



Preside Multiservice Data Manager

MDP Data Formats

Reference Guide

241-6001-806

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About this document

This guide provides network operating personnel with a description of the following data types for the specified Nortel Networks switch products:

- DPN-100 accounting and performance
- Passport accounting and performance
- Vector accounting and performance
- DPN-100 and Passport outage
- DPN-100 and Passport availability

Note: In this document, Passport is used as a generic term that includes all Passports Enterprise, Carrier, and Wireless. Where the Management Data Provider (MDP) handles Passports differently, the Passport series is identified.

This data is generated by Nortel Networks switches and transferred to a Management Data Provider (MDP) which converts the data to one, or more, of the following formats:

- Published Format (PF)
- Bulk Data Format (BDF)
- ASCII format

The MDP transfers converted data to customer hosts, as specified during switch configuration on the the MDP.

“Supported data conversion formats” (page 14) shows the data conversion format supported for each switch data type.

Table 1
Supported data conversion formats

Data Type	DPN	Passport	Vector
accounting	PF/BDF	PF/BDF	BDF
statistics	BDF	BDF	BDF
logs	BDF	BDF	
alarms	BDF	BDF	
SCN		BDF	
outage	BDF	BDF	
availability	BDF/ASCII	BDF/ASCII	
SRS		BDF	

Gen refers to data that is not switch type specific.

The following topics are discussed in this section:

- “Who should read this document and why” (page 14)
- “What you need to know” (page 14)
- “How this document is organized” (page 15)
- “Text conventions” (page 16)
- “Related documents” (page 17)

Who should read this document and why

This document is useful for personnel that process accounting and performance data from Passport, Vector and DPN-100 switches. Network administrators can use this document to locate useful switch and network diagnostic data .

What you need to know

You must have had some exposure to both computers and network concepts. Basic computer literacy is required to operate a Management Data Provider. You must know how to use a keyboard and a mouse, what a menu is, and how to start applications from a menu using a mouse.

A Management Data Provider (MDP) resides on a UNIX workstation. You should be familiar with a UNIX editing facility so that you are able to modify files. You should be familiar with SUN workstations, the UNIX operating system, and X.25 network communications.

Network management knowledge of networks that include Nortel Networks switches is required.

How this document is organized

This document contains the following sections:

- “Published Format accounting records” (page 19) describes the Published Format of Passport and DPN accounting records.
- “DPN-100 BDF accounting records” (page 85) describes Bulk Data Format (BDF) DPN accounting records.
- “Passport BDF accounting records” (page 129) describes Bulk Data Format (BDF) Passport accounting records.
- “DPN statistics records” (page 237) describes the Bulk Data Format of DPN statistics records.
- “DPN alarm records” (page 425) describes the Bulk Data Format of DPN alarm records.
- “DPN operator command logs” (page 429) describes the Bulk Data Format of DPN operator command logs.
- “Passport statistics, alarm, log, and scn data” (page 431) describes the Bulk Data Format of Passport performance records.
- “Outage records” (page 643) describes the Bulk Data Format of outage records.
- “Availability report records” (page 647) describes the Bulk Data Format of availability records.
- “Statistics Retrieval System records” (page 649) describes the Bulk Data Format of SRS records.
- “File processing audit records” (page 655) describes the fields contained by file processing audit report records.

- “Vector accounting records” (page 659) describes the Bulk Data Format of Vector accounting records.
- “Vector statistics records” (page 679) describes the Bulk Data Format of Vector statistics records.

Text conventions

This document uses the following text conventions:

- `nonproportional spaced plain type`
Nonproportional spaced plain type represents system generated text or text that appears on your screen.
- **nonproportional spaced bold type**
Nonproportional spaced bold type represents words that you should type or that you should select on the screen.
- *italics*
Statements that appear in italics in a procedure explain the results of a particular step and appear immediately following the step.

Words that appear in italics in text are for naming.
- `[optional_parameter]`
Words in square brackets represent optional parameters. The command can be entered with or without the words in the square brackets.
- `<general_term>`
Words in angle brackets represent variables which are to be replaced with specific values.
- `UPPERCASE,lowercase`
In MDM, uppercase and lowercase letters that appear in UNIX commands and parameters must be matched exactly. The system matches upper and lowercase characters differently.

- |
This symbol separates items from which you may select one; for example, ON|OFF indicates that you may specify ON or OFF. If you do not make a choice, a default ON is assumed.
- ...
Three dots in a command indicate that the parameter may be repeated more than once in succession.

The term absolute pathname refers to the full specification of a path starting from the root directory. Absolute pathnames always begin with the slash (/) symbol. A relative pathname takes the current directory as its starting point, and starts with any alphanumeric character (other than /).

Related documents

This section lists documents to which you can refer, including the following subjects:

- “General” (page 17)
- “Passport 6000” (page 18)
- “Passport 7000/15000” (page 18)
- “DPN” (page 18)
- “Vector” (page 18)

General

241-6001-101 *Preside MDM Engineering Guide*

241-6001-303 *Preside MDM Administrator Guide*

241-6001-309 *Preside MDM Management Data Provider User Guide*

This NTP also contains references to *SunSoft* applications publications, copies of which can be obtained by contacting Sun Microsystems at the following address:

Sun Microsystems Inc.
2550 Garcia Avenue,
Mountain View, CA 94043
United States of America

The SunSoft applications publications referred to in this document are as follows:

- *SPARC, Installing Solaris Software*
- *SunLink HSI/P x.x User's Guide*

Passport 6000

For a list of documents, see 241-6401-001 *Passport 6400 Documentation Guide*.

Passport 7000/15000

For a list of documents, see 241-5701-001 *Passport 7400, 15000, 20000 Documentation Guide*.

DPN

241-1001-100 *DPN-100 Product Overview*
241-1001-115 *DPN-100 Call Redirection System User Guide*
241-1001-320 *DPN-100 Accounting User Guide*
241-2001-332, *DPN-100 Data Spooling Description*

Vector

241-9501-010 *Vector General Description*
241-9501-103 *Vector Site Requirements and Preparation Guide*
241-9501-301 *Vector Operations and Maintenance Using VMI User Guide*
241-9501-302 *Open Management System for Vector (OMS-V) Guide*
241-9501-306 *Open Management System for Vector Error Messages*
241-9501-501 *Vector Hardware Maintenance User Guide*

Chapter 1

Published Format accounting records

A Management Data Provider (MDP) can convert DPN-100 and Passport raw accounting records to *Published Format (PF)* or *Bulk Data Format (BDF)* records before transferring them to a Billing customer host. This section describes the Published Format and includes:

- “Published Format overview” (page 19)
- “File-naming conventions” (page 20)
- “Field formats” (page 23)
- “Common fields” (page 23)
- “Time change records” (page 46)
- “Optional fields” (page 48)

Published Format overview

Each record has accounting information of both the calling and called ends. Each record has a variable length format that contains a *common (fixed)* portion, followed by an *optional* portion.

The *optional* portion may contain none, one, or more optional facility sections. An optional facility section contains information (fields) of an optional facility used on a call. An optional facility section for a particular optional facility does not appear in the optional portion of a Published Format accounting record if that optional facility is not used on the call. If none of these optional facilities are used, then the Published Format accounting record contains no optional sections following the fixed portion of the accounting record.

File-naming conventions

Published Format files are Passport or DPN-100 accounting files stored in the dump directory. The following sections describe the file-naming conventions for DPN-100 and Passport PF files.

File names for Published Format files are different according to the selected setting of the Published Format backward compatibility option. For more information about the Published Format backward compatibility option, see 241-6001-309 *Preside MDM Management Data Provider User Guide*.

- “Backward compatibility option enabled” (page 20)
- “Backward compatibility option disabled” (page 21)

Backward compatibility option enabled

If the Published Format backward compatibility option is enabled:

- Passport hourly files contain data already appended to the daily file.

`Pp_TFACT<?>.mmddHHO (opened file)`

`Pp_TFACT<?>.mmddHH (closed file)`

- DPN hourly files contain data already appended to the daily file

`Dpn_TFACT<?>.mmddHHMM (opened file)`

`Dpn_TFACT<?>.mmddHH (closed file)`

- the daily file

`TFACT<?>.mmdd`

Note: The daily Published Format file contains both Passport and DPN accounting records if both DPN and Passport switches exist in the network.

where:

mm indicates the month the file was received

dd indicates the day the file was received

HH indicates the hour the file was received

MM indicates the minute the file was received

O indicates the file is open

? is a variable indicating one of

- N a non-duplicate file—the accounting record is unique. This typically occurs for single-ended accounting.
- D a duplicate file—a matching accounting record exists from both ends of the call. This typically occurs for double-ended accounting.
- E a file containing Published Format records from a DPN accounting file that can only be partially converted. View this file using the *pfview* command.
- F a file containing corrupted raw accounting records for Passport. These files contain records that cannot be processed further and have to be analyzed by experts in Passport accounting.
- G a file containing corrupted raw accounting records for DPN. These files contain records that cannot be processed further and have to be analyzed by experts in DPN accounting.

Backward compatibility option disabled

If the Published Format backward compatibility option is disabled the Published Format filenames are as follows:

```
<family|switch_type>_<dataType>_<date_time>_<nodeID>_  
<seq#>.<?>.<ext>
```

where:

<family|switch_type> family is one of the Passport families.

switch_type is *dpn* for DPN-100.

<dataType> data_type is *acc* for accounting.

<date_time> is the date and time the file was opened on the switch, as follows;

- for Passport 7000/15000, this field contains YYYYMMDDThhmmss (YYYY=year, MM=month, DD=day, T=date/time delimiter, hh=hour, mm=minute, ss=seconds)

for Passport 6000, this field contains MMDDhhmm (MM=month, DD=day, hh=hour, mm=minute)

- for DPN-100, this field contains YYMMDDhhmmss (YY=year, MM=month, DD=day, hh=hour, mm=minute, ss=seconds).

The MDP published format converter uses the following algorithm to determine 'century' for DPN-100, whose raw switch records contain 2-digit years:

year = YY

YY >= 50 (indicates 20th century (0YYMMDD))

YY < 50 (indicates 21st century (1YYMMDD))

<nodeID> is the *nodeID* of the Passport or the *NAMSid* of the DPN-100 switch that generated the data.

<seq#> is a file sequence number assigned by a switch..

? is a variable indicating one of

- N a non-duplicate file—the accounting record is unique. This typically occurs for single-ended accounting.
- D a duplicate file—a matching accounting record exists from both ends of the call. This typically occurs for double-ended accounting.
- E a file containing Published Format records from a DPN accounting file that can only be partially converted. View this file using the *pfview* command.
- F a file containing corrupted raw accounting records for Passport. These files contain records that cannot be processed further and have to be analyzed by experts in Passport accounting.

- G a file containing corrupted raw accounting records for DPN. These files contain records that cannot be processed further and have to be analyzed by experts in DPN accounting.

<ext> is *pf_err* for a file that stores records that cannot be converted successfully (the error file is stored in the appropriate dump directory). This value is *pf* for a Published Format file.

Field formats

Accounting record fields are in one of the following COBOL-readable formats:

PIC X()	Character
COMP	Binary
COMP-3	Packed decimal with two BCD digits per byte and the sign is contained in the right-most four bits of the right-most byte. The valid BCD digits are digits 0 through 9. In the Published Format accounting record, the COMP-3 fields have value H.C (that is, positive) or value H.D (that is, negative) for the sign nibble.

Note: The COBOL COMP field format does not indicate the possible value range for that field. For example, a 9(5) COMP field does not mean that the field can have values up to 99999, and a 9(4) or 9999 COMP field does not mean that the field can have values up to 9999. As used in COBOL programs, these COBOL formats are used to indicate the number of bytes of data to be read for that field or the storage necessary to store all the possible values of the field. Refer to the descriptions of the fields in this document or other documents, and functional specifications for the valid ranges or formats of the fields.

Common fields

This section describes the *common (fixed) fields* in a Published Format accounting record.

The terms *calling* and *called* are used as part of some of the field names. The term *calling* end refers to that part of the switch interface that initiated the call request. The term *called* end refers to that part of the switch interface that

received the call request. For permanent virtual circuits (PVCs), the Master end initiated the call. For switched virtual circuits (SVCs), the calling device initiated the call.

Table 2
Common portion of a Published Format accounting record

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	recLen	REC_LEN	2	PIC 9999 COMP
2	recordType	ACCT_REC_ TYPE	2	PIC 9999 COMP
4	vintageNumber	VINTAGE #	1	PIC S9 COMP-3
5	startDate	START_DATE	4	PIC S9(7) COMP-3
9	startTime	START_TIME	4	PIC S9(7) COMP-3
13	endTime	END_TIME	4	PIC S9(7) COMP-3
17	timeFlag	TIME_FLAG	2	PIC 9999 COMP
19	callingNode Identifier	CLG_NAMS_ID	4	PIC 9(5) COMP
23	callingPort Identifier	CLG_PORT_ ID	2	PIC X(2)
25	callingNpi	CLG_NPI	1	PIC S9 COMP-3
26	callingAddress Length	CLG_ADDR_ LEN	2	PIC 9999 COMP
28	callingAddress	CLG_ADDR	8	PIC S9(15)COMP -3
(Sheet 1 of 4)				

Table 2 (continued)
Common portion of a Published Format accounting record

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
36	callingDlci	CLG_LCN	2	PIC 9999 COMP
38	callingDse	CLG_DSE	2	PIC 9999 COMP
40	callingService Type	CLG_SERV_ TYPE	2	PIC 9999 COMP
42	callingReceive Window and callingSend Window	CLG_XMIT_ RECV_WDWS	1 1	PIC 9999 COMP
44	calling Customer Identifier	CLG_CUST_ID	2	PIC X(2)
46	calledNode Identifier	CLD_NAMS_ID	4	PIC 9(5) COMP
50	calledPort Identifier	CLD_PORT_ID	2	PIC X(2)
52	calledNpi	CLD_NPI	1	PIC S9 COMP-3
53	calledAddress Length	CLD_ADDR_ LEN	2	PIC 9999 COMP
55	calledAddress	CLD_ADDR	8	PIC S9(15)COMP -3
63	calledDlci	CLD_LCN	2	PIC 9999 COMP
65	calledDse	CLD_DSE	2	PIC 9999 COMP
(Sheet 2 of 4)				

Table 2 (continued)
Common portion of a Published Format accounting record

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
67	calledService Type	CLD_SERV_ TYPE	2	PIC 9999 COMP
69	calledReceive Window and calledSend Window	CLD_XMIT_ RECV_WDWS	1 1	PIC 9999 COMP
71	called Customer Identifier	CLD_CUST_ID	2	PIC X(2)
73	callReference Number	CALL_ID	4	PIC 9(8) COMP
77	collectFlags	COLLECT_ FLAGS	2	PIC 9999 COMP
79	facilityFlags	FACILITY_ FLAGS	2	PIC 9999 COMP
81	callingCalled PktSize and calledCalling PktSize	PKT_SIZES	1 1	PIC 9999 COMP
83	callingCalled Thruput and calledCalling Thruput	THRPT_ CLASSES	1 1	PIC 9999 COMP
85	clearCause	CLEAR_ CAUSE	2	PIC X(2)
87	diagnostic Code	DIAGNOSTIC	2	PIC 9999 COMP
(Sheet 3 of 4)				

Table 2 (continued)
Common portion of a Published Format accounting record

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
89	transitDelay	TRANSIT_ DELAY	2	PIC 9999 COMP
91	segmentSize Index	SEG_SIZE	2	PIC 9999 COMP
93	tdaRates	TDA_RATES	2	PIC 9999 COMP
95	localUser Resets	RESETS	4	PIC 9(5) COMP
99	localEgress Segments	SEG_REC'D	4	PIC 9(8) COMP
103	localIngress Segments	SEG_XMIT	4	PIC 9(8) COMP
107	elapsedTime	DURATION	4	PIC 9(8) COMP
(Sheet 4 of 4)				

Common field descriptions

This section describes the *common (fixed) fields* of a Published Format accounting record:

recLen The length of the accounting record in bytes, which includes the optional facility portion but excludes this *rec_len* field.

recordType This field defines the type of accounting record.

1 = Accounting record

2 = Time change record

vintageNumber This number indicates the version of the Published Format accounting record used. The value of this field is set to 4 for a Published Format accounting record.

BCD Char.	Item	Hex Value
1	Vintage Number	4
2	Sign	C or D

startDate: This is the start date of the period accounted for in the record. It is in the format 0YYMDD. The first character is either 0 or 1; 0 indicates the 20th century (19xx) and 1 indicates the 21st century (20xx).

The MDP published format converter uses the following algorithm to determine 'century' for DPN-100, whose raw switch records contain 2-digit years:

year = YY

YY >= 50 (indicates 20th century (0YYMMDD))

YY < 50 (indicates 21st century (1YYMMDD))

BCD Char.	Item	Hex Value
1	Century	0 or 1
2-3	Year (YY)	00 - 99
4-5	Month (MM)	01 - 12
6-7	Day (DD)	01 - 31
8	Sign	C

startTime: Represents the starting time of the period accounted for in the record. For SVC, *start time* is the time when the call request packet was created. For PVC, *start time* is set by the Master VC when the master call request is formatted. On subsequent accounting records, *start time* corresponds to the end time of the previous record. If Time of Day Accounting (TODA) is used, *start time* (and *end time*) correspond to times set in the schedule.

It is in the format *hmmss0*. The last digit is set to zero.

BCD Char.	Item	Hex Value
1-2	Hour (hh)	00 - 24
3-4	Minute (mm)	00 - 59
5-6	Second (ss)	00 - 59
7	Padding	0
8	Sign	C

endTime: Represents the end of the period accounted for in the record. If Time of Day Accounting (TODA) is used, *end time* in non-final records is the time of the TODA period. For 12-hour accounting, *end time* in non-final records is the time when the 12-hour timer expires at the charged end. On final accounting records, *end time* is the time when the disconnect packet is first received. If Time of Day Accounting (TODA) is used, *end time* (and *start time*) correspond to times set in the schedule (provisioned on the Passport switch with the *Collector/accounting* component and the *collectionTimes* field).

The *end time* field is in the format *hhmmss0*, similar to *start time*.

timeFlag: This field is currently not used and the value is set to zero.

callingNodeIdentifier: This number uniquely identifies the node, in an autonomous network, where the call originates.

For Passport, the node identifier (nodeID) can be any integer between 1 and 4095.

For DPN, this field is the NAMSID. If the switch is NM equipped, the

NAMSID is the RID and can have a value in the range 1 to 126. If the switch is AM or RM equipped, this value can be any integer between 256 and 49151.

callingPortIdentifier: A 16-bit field that identifies the physical port number where the call originates.

If the physical port is on a DPN-100, the Port Number will be identified by a PE Number, PI Number, and a Port Number. In the case of X.75 multi-link, only the PE Number is specified (the PI and PO will be set to zero). For details, refer to “Port number (DPN-100)” (page 31).

For Passport, the PE portion is set to the logical processor (LP) number, PO is set to the physical port number of the interface used, and PI is set to zero. For details, refer to “Port identifier (Passport)” (page 31).

The Calling Port Number is 16 bits long and has the following format:

- PE Number is represented in the first 5 bits of the first byte of the calling port number.
- PI Number is represented in the next 5 bits of the calling port number.
- PO Number is represented in the last 6 bits of the second byte in the calling port number.

Note: If VirtualFramer is provisioned, the PO Number will always be set to 3F.

Information for the *callingPort Identifier* field may also appear in a record with the following three fields: *callingPEIdentifier*, *callingPIIdentifier*, and *callingPOIdentifier*. The *callingPEIdentifier* field actually refers to an LP when it appears in a Passport record.

Figure 1
Port number (DPN-100)

15	PO Number					10	9	PI Number					5	4	PE Number					0

Figure 2
Port identifier (Passport)

15	PO Number					10	9	PI Number					5	4	LP Number					0

(PI is set to zero on Passport.)

callingNpi: This field is the Numbering Plan Indicator that indicates the numbering plan used in the calling address.

0 = X.121 numbering plan

1 = E.164 numbering plan

other = undefined

BCD Char.	Item	Hex Value
1	Numbering plan index	0 - 1
2	Sign	C

callingAddressLength: The length of the callingAddress field in bytes.

callingAddress: The number of digits in the calling address (DNA) field. The maximum is 15. It also contains the full address field of the calling address (DNA), including the DNIC (first four digits) for X.121 or Country Code for E.164 address. The field is left-justified with trailing zeroes.

BCD Char.	Item	Hex Value
1-15	Digits	0 - 9
16	Sign	C

callingDlci: The Logical Channel Number of the calling end. The value ranges from 0 to 4095. For frame relay service, the valid range is 16 to 1007.

callingDse: This is the Data Service Exchange (DSE) of the calling end. The value ranges from 0 to 255. For transit/incoming X.75 SVC calls, the calling DSE information is valid only if the calling tariff is absent from the accounting record. DSE is defined in the DNA component on both Passport and DPN-100.

callingServiceType: The service supported by the port used by the calling end-user. The value ranges from 0 to 255. For transit/incoming X.75 SVC calls, the calling service type information is valid only if the calling tariff is absent from the accounting record. This number is defined as accountClass in the DNA component on both Passport and DPN-100.

callingReceiveWindow and **callingSendWindow:** This two-byte field consists of the values for the calling end local transmit and receive window sizes, arithmetically combined. The low-order byte contains the value for the calling end local transmit window size and the high-order byte contains the value for the calling end local receive window size. Both the calling end local transmit and receive window sizes have values

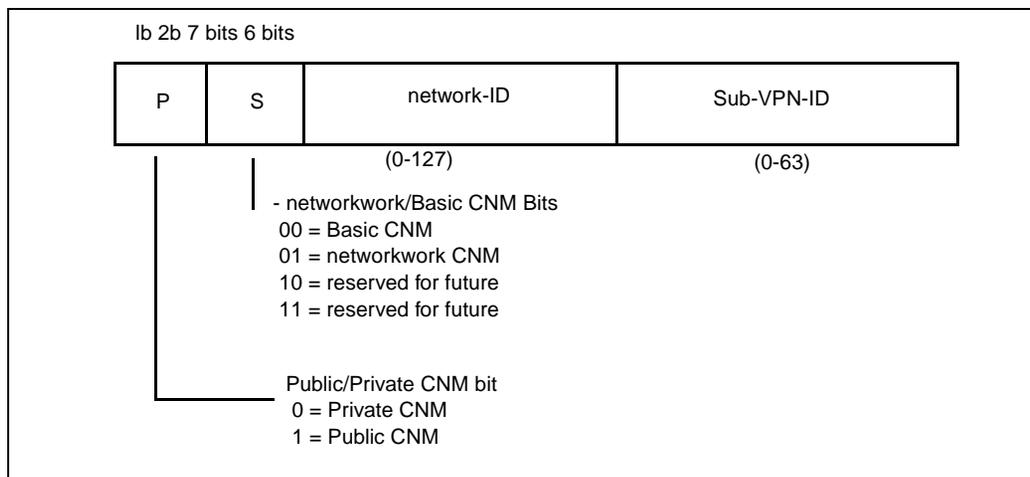
ranging from 1 to 7. For SVC, this field is only populated for X.25 and X.75 services. All other services have the value zero. For PVC, this field is populated as provided in the PVC envelope, for all services.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

callingCustomerIdentifier: This field is used as an optional identifier for the calling end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value zero is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.

For Passport, the field range is 0 - 8191. The format of this 16-bit field is:

Figure 3
16 bit field format



calledNodeIdentifier: This number uniquely identifies the node, in an autonomous network, where the call terminates.

For Passport, the node identifier (nodeID) can be any integer between 1 and 4095.

For DPN, this field is the NAMSID. If the switch is NM equipped, the NAMSID is the RID and can have a value in the range 1 to 126. If the switch is AM or RM equipped, this value can be any integer between 256 and 49151.

calledPortIdentifier: A 16-bit field that identifies the physical port number where the call terminates.

If the physical port is on a DPN-100, the Port Number will be identified by a PE Number, PI Number, and a Port Number. In the case of X.75 multi-link, only the PE Number is specified (the PI and PO will be set to zero). For details, refer to “Port number (DPN-100)” (page 31).

For Passport, the PE portion is set to the logical processor (LP) number, PO is set to the physical port number of the interface used, and PI is set to zero. For details, refer to “Port identifier (Passport)” (page 31).

The Called Port Number is 16 bits long and has the following format:

- PE Number is represented in the first 5 bits of the first byte of the called port number.
- PI Number is represented in the next 5 bits of the called port number.
- PO Number is represented in the last 6 bits of the second byte in the called port number.

Information for the *calledPort Identifier* field may also appear in a record with the following three fields: *calledPEIdentifier*, *calledPIIdentifier*, and *calledPOIdentifier*. The *calledPEIdentifier* field actually refers to an FP when it appears in a Passport record.

calledNpi: This field is the Numbering Plan Indicator that indicates the numbering plan used in the called address. The field format is similar to the *calling NPI* field.

0 = X.121 numbering plan

1 = E.164 numbering plan

other = undefined

calledAddressLength: This is the length of the calledAddress field in bytes.

calledAddress: The number of digits in the called address (DNA) field. The maximum is 15. It also provides the full address field of the called address (DNA), including the DNIC (first four digits) for X.121 or Country Code for E.164 address. The field is left-justified with trailing zeroes. The field has a maximum of 15 digits. The field format is similar to the *calling address* field.

calledDlci: The Logical Channel Number of the called end. The value ranges from 0 to 4095. For frame relay service, the range is 16 - 1007.

calledDse: This is the Data Service Exchange (DSE) of the called end. The value ranges from 0 to 255. For outgoing/transit X.75 SVC calls, the called DSE information is valid only if the called tariff is absent from the accounting record. DSE is defined in the DNA component on both Passport and DPN-100.

calledServiceType: The service supported by the port used by the called end-user. The value ranges from 0 to 255. For outgoing/transit X.75 SVC calls, the called service type information is valid only if the called tariff is absent from the accounting record. This number is defined in the DNA_CUG envelope as accountClass.

calledReceiveWindow and **calledSendWindow:** This two-byte field consists of the values for the called end local transmit and receive window sizes, arithmetically combined. The low-order byte contains the value for the called end local transmit window size and the high-order byte contains the value for the called end local receive window size. Both the called end local transmit and receive window sizes have values that range from 1 to 7. For SVC, this field is only populated for X.25 and X.75 services. All other services have the value zero. For PVC, this field is populated as provided in the PVC envelope, for all services. For Passport, the field range is 0 to 8191.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

calledCustomerIdentifier: This field is used as an optional identifier for the called end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the provisioning data for the access line, or more specifically, from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value zero is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided. The format of this 16-bit field can be found in “16 bit field format” (page 33).

callReferenceNumber: For Passport, this field is a randomly generated number.

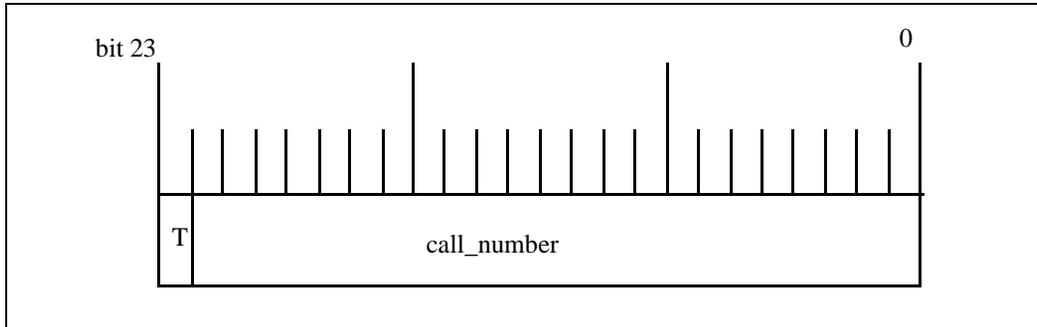
For DPN-100, the following description applies.

This is a three-byte number generated by the switch, or taken from the call identifier utility in the X.75 call request packet. The same call reference number is stored in the Published Format accounting record at both ends of the call. It is used as one of the fields in matching duplicate records generated at each end of the call or for reconciling records between networks. See “Call reference number generated by a PE on RM/AM and processor (DPN-100 only)” (page 37) for the format of the call reference number.

- T = 0 for SVC or 1 for PVC.
- call_number is initialized to a semi-random value (based on the time/date) when the service PE/processor first comes up as follows:
call_number = CENTURY/YEAR XOR MONTH/DAY XOR
HOUR/MINUTES.

The most significant byte of call_number is set to the SECONDS of the current time/date on the PE/processor. The call number is incremented by one for every outgoing call.

Figure 4
Call reference number generated by a PE on RM/AM and processor (DPN-100 only)



collectFlags: This is a field containing 15 one-bit flags. The flags, starting from bit 0 (the least significant bit), are as follows:

1. BIT 0 - WHO CLEARED (flags_calledCleared)
2. BIT 1 - WHO GENERATED (flags_calledGenerated)
3. BIT 2 - UNIQUE (flags_unique)
4. BIT 3 - CALL REACHED DATA TRANSFER (flags_reachedDataTransfer)
5. BIT 4 - FIRST RECORD FOR THIS CALL (accountingRecord_first)
6. BIT 5 - LAST RECORD FOR THIS CALL (accountingRecord_last)
7. BIT 6 - TERMINATOR IS GATEWAY (gateWay_originator)
8. BIT 7 - ORIGINATOR IS GATEWAY (gateWay_terminator)
9. BIT 8 - COLLECTION FOR BILLING (CALLING END) (callingCollectReason_bill)
10. BIT 9 - COLLECTION FOR TEST (CALLING END) (callingCollectReason_test)
11. BIT 10 - COLLECTION FOR STUDY (CALLING END) (callingCollectReason_study)

- 12. BIT 11 - COLLECTION FOR AUDIT (CALLING END)
(callingCollectReason_audit)
- 13. BIT 12 - COLLECTION FORCED (CALLING END)
(callingCollectReason_force)
- 14. BIT 13 - CALL DEFLECTION
- 15. BIT 14 - SPARE
- 16. BIT 15 - (not used - always set to zero)

These one-bit flags have the values 1 or 0 depending whether they are turned on or off. The values of the 15 one-bit flags are explained as follows:

1 WHO CLEARED:

- 0 - Cleared from calling end
- 1 - Cleared from called end

The callCleared bit is initialized to 0 on the calling end and initialized to 1 on the called end. If the call is cleared on the local switch, that switch retains its value for the callCleared bit and sends a disconnect message to the other end. When a switch receives a disconnect message, the switch takes the value for the callCleared flag from the remote end.

2 WHO GENERATED:

For SVC:

- 0 - Generated from calling end
- 1 - Generated from called end

For PVC:

- 0 - Generated from master end
- 1 - Generated from slave end

3 UNIQUE:

- 0 - Possible duplicate, both ends may have generated the accounting record
- 1 - No duplicates, only one end has generated the accounting record

- 4 CALL REACHED DATA TRANSFER:**
 - 0 - Call does not reach data transfer at both ends
 - 1 - Call reached data transfer at both ends

- 5 FIRST RECORD FOR THIS CALL:**
 - 0 - Not first record for the call
 - 1 - First record for the call

- 6 LAST RECORD FOR THIS CALL:**
 - 0 - Not last record for the call
 - 1 - Last record for the call

- 7 TERMINATOR IS GATEWAY:**
 - 0 - Terminator is not Gateway
 - 1 - Terminator is Gateway

- 8 ORIGINATOR IS GATEWAY:**
 - 0 - Originator is not Gateway
 - 1 - Originator is Gateway

- 9 COLLECTION FOR BILLING (CALLING END):**
 - 0 - Not collected for billing purposes
 - 1 - Collected for billing purposes

- 10 COLLECTION FOR TEST (CALLING END):**
 - 0 - Not collected for test purposes
 - 1 - Collected for test purposes

- 11 COLLECTION FOR STUDY (CALLING END):**
 - 0 - Not collected for study purposes
 - 1 - Collected for study purposes

- 12 COLLECTION FOR AUDIT (CALLING END):**
 - 0 - Not collected for audit purposes
 - 1 - Collected for audit purposes

13 COLLECTION FORCED (CALLING END):

- 0 - collection not forced by calling end
- 1 - collection forced by calling end

14 CALL DEFLECTION

- 0 - Call not deflected
- 1 - Call deflected

15 SPARE:

Bit 14 is a spare reserved for future use. It is set to zero.

facilityFlags: This is a field containing 15 one-bit flags. The flags, starting from bit 0 (the least significant bit), are as follows:

1. BIT 0 - REVERSE CHARGING (flags_calledEndCharging)
2. BIT 1 - FAST SELECT
3. BIT 2 - RESTRICTED RESPONSE
4. BIT 3 - PRIORITY(flags_highPriority)
5. BIT 4 - PERMANENT VIRTUAL CIRCUIT(flags_pvcType)
6. BIT 5 - USER DATA ON CALL
REQUEST(flagsuserDataInCallReq)
7. BIT 6 - HUNT GROUP(flags_hunted)
8. BIT 7 - CALL REDIRECTION(flags_redirected)
9. BIT 8 - COLLECTION FOR BILLING (CALLED
END)(calledCollectReason_bill)
10. BIT 9 - COLLECTION FOR TEST (CALLED
END)(calledCollectReason_test)
11. BIT 10 - COLLECTION FOR STUDY (CALLED
END)(calledCollectReason_study)
12. BIT 11 - COLLECTION FOR AUDIT (CALLED
END)(calledCollectReason_audit)
13. BIT 12 - CALLED END COLLECTION REASON
VALID(flags_collReasonValid)

- 14. BIT 13 - COLLECTION FORCED (CALLED END)(calledCollectReason_force)
- 15. BIT 14 - SPARE
- 16. BIT 15 - (Not used - always set to zero)

These one-bit flags have the values 1 or 0 depending whether they are turned on or off. The values of the 15 one-bit flags are as follows:

- 1 REVERSE CHARGING:**
 - 0 - Charged to calling end
 - 1 - Charged to called end
- 2 FAST SELECT:**
 - 0 - Not a fast select call
 - 1 - A fast select call
- 3 RESTRICTED RESPONSE:**
 - 0 - Restricted response option not used
 - 1 - Restricted response option used
- 4 PRIORITY:**
 - 0 - Normal priority
 - 1 - High priority
- 5 PERMANENT VIRTUAL CIRCUIT:**
 - 0 - SVC call
 - 1 - PVC call
- 6 USER DATA ON CALL REQUEST:**
 - 0 - No user data on call request
 - 1 - User data on call request
- 7 HUNT GROUP:**
 - 0 - Call has not been hunted
 - 1 - Call has been hunted

- 8 CALL REDIRECTION:
 - 0 - Call not redirected
 - 1 - Call redirected

- 9 COLLECTION FOR BILLING (CALLED END):
 - 0 - Not collected for billing purposes
 - 1 - Collected for billing purposes

- 10 COLLECTION FOR TEST (CALLED END):
 - 0 - Not collected for test purposes
 - 1 - Collected for test purposes

- 11 COLLECTION FOR STUDY (CALLED END):
 - 0 - Not collected for study purposes
 - 1 - Collected for study purposes

- 12 COLLECTION FOR AUDIT (CALLED END):
 - 0 - Not collected for audit purposes
 - 1 - Collected for audit purposes

- 13 CALLED END COLLECTION REASON VALID:
 - 0 - Called end collection reasons are not valid
 - 1 - Called end collection reasons are valid

- 14 COLLECTION FORCED (CALLED END):
 - 0 - collection not forced by called end
 - 1 - collection forced by called end

- 15 SPARES
 - Bit 14 is a spare reserved for future use. It is set to zero.

callingCalledPktSize and **calledCallingPktSize**: This two-byte field consists of the values of the packet size sent from the calling DTE to the called end and packet size sent from the called DTE to the calling end, arithmetically combined. The low-order byte contains the value of the packet size sent from the calling DTE to the called end. The value is the

base 2 logarithm of the actual packet size. The high-order byte contains the value of the packet size sent from the called DTE to the calling end. The value is the base 2 logarithm of the actual packet size.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

callingCalledThruput and calledCallingThruput: This field contains the throughput classes of packets sent from the calling DTE to the called end, and vice versa, arithmetically combined. The low-order byte contains the throughput class of the packet sent from the calling DTE to the called end and the high-order byte contains the throughput class of the packet sent from the called DTE to the calling end.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

Refer to “Throughput classes” (page 43) for throughput classes.

Table 3
Throughput classes

Value of low-order or high-order byte	Throughput class (bit/s)
0 - 2	Reserved
3	75
4	150
5	300
6	600
7	1200
8	2400
9	4800
10	9600
11	19200
(Sheet 1 of 2)	

Table 3 (continued)
Throughput classes

Value of low-order or high-order byte	Throughput class (bit/s)
12	48000
13	64000
14 - 15	Reserved
(Sheet 2 of 2)	

clearCause: This a clear cause indicator. It indicates the reason for a call termination. For additional details, refer to 241-1001-509 *DPN-100 Call Clear, Reset and Diagnostic Codes*.

diagnosticCode: This a clear diagnostic indicator. It is set to zero (0) on non-final records, and to the network diagnostic code of the call clear on the final record. For additional details, refer to 241-1001-509 *DPN-100 Call Clear, Reset and Diagnostic Codes*.

transitDelay: This field is to be used in the future to indicate transit delays. The value is currently set to zero.

segmentSizeIndex: This field gives the segment size used on the call. The value in this field is the base 2 logarithm of the actual segment size.

tdaRates: The field is currently not used and the value is set to zero.

localUserResets: Count of the customer-caused reset request packets, transmitted and received. The value ranges from 0 to 65535.

localEgressSegments/Frames: Number of Egress data segments/frames received from the network. The value ranges from 0 to 16777215. For all calls, the segments/frames received field in the accounting record is calculated for the data received in the data packets. For all calls, the segments/frames received field in the accounting record is calculated for the data received in the *interrupt* and *interrupt confirmation* packets. Only for Fast Select calls (both restricted and unrestricted response), the segments/frames received field in the accounting record is calculated for the data received in *call request*, *call confirm (accept)*, and *clear request*

packets. Non-Fast Select calls do not count the segments/frames in these three packets. For all the packets mentioned above, the calculation of segments/frames is performed in a common manner (based on the segment size index).

For *best effort delivery* services such as frame relay, the count is recorded at the entry and exit points to and from the network.

localIngressSegments/Frames: Number of Ingress data segments/frames sent to the network. The value ranges from 0 to 16777215. For all calls, the segments/frames sent field in the accounting record is calculated for the data sent in the data packets. For all calls, the segments/frames sent field in the accounting record is calculated for the data sent in the *interrupt* and *interrupt confirmation* packets. Only for Fast Select calls (both restricted and unrestricted response), the segments/frames sent field in the accounting record is calculated for the data sent in *call request*, *call confirm (accept)*, and *clear request* packets. Non-Fast Select calls do not count the segments/frames in these three packets. For all the packets mentioned above, the calculation of segments/frames is performed in a common manner (based on the segment size index).

For *best effort delivery* services such as frame relay, the count is recorded at the entry and exit points to and from the network.

elapsedTime: Duration of the call in 0.1 second increments. This time interval is started when the call request is processed. If the call does not reach the data transfer stage, *elapsed time* is set to zero. *Elapsed time* represents a true measure of the accounting period. It is measured independently of *start time* and *end time*. Since *start time* and *end time* can be changed externally by adjusting the clock, *elapsed time* can be shorter or longer than the difference between *start time* and *end time*. This difference can show as much as 60 seconds on accounting records for the VCs that are idle (carry no traffic) and when TODA is used and is caused, in this case, by an internal TODA detection mechanism. When the 12 hour accounting period is complete, *elapsed time* is exact or differs by a few seconds from 12 hour duration.

Time change records

Time change records contain fields that describe events caused by a change of time on the switch. When the time on the switch is adjusted by 2 seconds, or more, the time change record is issued and sent as part of the accounting stream. The time change record is used to keep track of clock changes on the switch and to explain potential inconsistencies in accounting records.

The *Time change record fields* in a Published Format accounting record have the following format:

Table 4
Time change records

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	recLen	REC_LEN	2	PIC 9999 COMP
2	recordType	ACCT_REC_ TYPE	2	PIC 9999 COMP
4	vintageNumber	VINTAGE #	1	PIC S9 COMP-3
5	oldDate	OLD_DATE	4	PIC S9(7) COMP-3
9	oldTime	OLD_TIME	4	PIC S9(7) COMP-3
13	newDate	NEW_DATE	4	PIC S9(7) COMP-3
17	newTime	NEW_TIME	4	PIC S9(7) COMP-3
21	namslid	NAMS_ID	4	PIC 9(5) COMP

Time change record field descriptions

This section describes the *Time change record fields* of aPublished Format accounting record:

recLen: The length of the accounting record in bytes, which includes the optional facility portion but excludes this *rec_len* field.

recordType: This field defines the type of record. This field is set to 2 for time change records.

vintageNumber: The version of the Published Format accounting record used. The value of this field is set to 4 for a Published Format accounting record.

BCD Char.	Item	Hex Value
1	Vintage Number	4
2	Sign	C or D

oldDate: The date on the switch before the time was adjusted. It is in the format 0YYMDD. The first character is either 0 or 1; 0 indicates the 20th century and 1 indicates the 21st century.

Note: The MDP published format converter uses the following algorithm to determine ‘century’ for DPN-100, whose raw switch records contain 2-digit years:

year = YY

YY >= 50 (indicates 20th century (0YYMMDD))

YY < 50 (indicates 21st century (1YYMMDD))

oldTime: The time on the switch before the time was adjusted.

newDate: The date on the switch after the time was adjusted. It is in the format 0YYMDD. The first character is either 0 or 1; 0 indicates the 20th century and 1 indicates the 21st century.

Note: The MDP published format converter uses the following algorithm to determine ‘century’ for DPN-100, whose raw switch records contain 2-digit years:

year = YY

YY >= 50 (indicates 20th century (0YYMMDD))

YY < 50 (indicates 21st century (1YYMMDD))

newTime: The time on the switch after the time was adjusted.

Accounting records are generated if the time change skips over the time set in Time of Day Accounting (TODA). For example, if TODA is set to 15:00 hours and the time change goes from 14:59 to 15:05, accounting records are generated. The TODA time is defined in the *collectionTimes* field of the *Collector/Accounting* component.

namsId: The NAMS ID of the switch that issued the time change record. The value of the NAMS ID is provisioned on the switch.

Optional fields

If an *optional* facility is used on a call, the information on the optional facility is captured in the optional facility section of the accounting record. If the optional facility is not used on the call, then that particular optional facility section will not appear in the accounting record for that call.

Every optional facility has a two-byte *code/length* field in the first two bytes. The low-order byte of this field contains the *length* value for the optional facility section and the high-order byte contains the *code* value. The *length* value gives the length of the optional facility section, excluding this *code/length* field. The *code* value identifies the optional facility section.

The terms *calling* and *called* are used as part of some of the optional field names. The term *calling* end refers to that part of the switch interface that initiated the call request. The term *called* end refers to that part of the switch interface that received the call request. For PVCs, the Master end initiated the call. For SVCs, the calling device initiated the call.

“Optional facility section code values” (page 49) lists the optional facilities selections and the code values that identify the optional facility sections.

Table 5
Optional facility section code values

Optional facility section	Code value
NUI	1
Inter-network	2
Original Called Address	3
GAS	4
National CUG	5
International CUG	6
Sensor identifier	7
X.75 interface identifier	8
Gateway type	9
Videotex	10
Routing class of service (RCOS)	11
Extended national Address	12
Frame relay Accounting - Local	13
Frame relay Accounting - Remote	14

The optional facility sections may appear in the accounting record in any order. The user’s software that processes the accounting records can identify the optional facility sections that need to be processed using the *code* values. The user’s software should be coded to ignore the optional facility sections with unwanted or unknown *code* values, if they are present in the accounting record, by skipping over the number of bytes specified by the *length* value. In this way, new optional facility sections can be added to the accounting record in future, without impacting the user’s software.

NUI option

The *NUI* option contains the information on the Network User Identification used on the call. There are two types of NUI: DPN-100 NUI and Calling Card NUI. The DPN-100 NUI is a character field of variable length. Currently, the maximum length is 8. The length of the Calling Card NUI is 8. The NUI Optional Facility Section has the following format:

Table 6
NUI optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	COBOL format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	NUI_TYPE	1	PIC S9 COMP-3
3	Not in Passport	NUI	n	PIC X(n)
				or
			8	PIC S9 (15) COMP-3
	Not in Passport	NUI_TYPE		COBOL
		Value	Type of NUI	Format
		1	DPN-100 NUI	PIC X(n)
		2	Calling card NUI	PIC 9(15) COMP-3
		3	Suppressed NUI	(no NUI value)

Note: In the above table, n is the number of DPN-100 NUI characters, where $n = \text{LENGTH} - 1$.

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section. The value of LENGTH is:

1 + n (for DPN-100 NUI), or
9 (for Calling Card NUI), or
1 (for Suppressed NUI).

nuiType: This field identifies the type of Network User Identification field that follows this field:

1 - DPN-100 NUI
2 - Calling Card NUI
3 - Suppressed NUI

BCD Char.	Item	Hex Value
1	NUI Type	1, 2, 3
2	Sign	C

nui: This field contains a DPN-100 NUI or a Calling Card NUI. The DPN-100 NUI is a variable length character string containing the exact number of characters of the network user identifier. Currently, the maximum length for the DPN-100 NUI is 8. Suppressed NUI has a length of zero.

The Calling Card NUI has the following format. A value of H.00 is placed in the first byte of the NUI field in the accounting record. This is an invalid DPN-100 NUI character, and signals that the information in the remaining 7 bytes of the NUI field consists of the Calling Card NUI information.

Table 7
Calling Card NUI

BCD Char.	Item	Hex Value
1	Padding	0
2-15	Digits	0-9
16	Sign	C (all valid digits) D (has invalid digits)

Table 8
Nibble description

0-1	H.00	(signals Calling Card information in the following bytes)
2		Indicates whether NUIOP is in effect. Possible Values: 0 = not used 1 = NUIOP not in effect 2 = NUIOP in effect
3		Indicates what information is present in nibbles 4-5. Possible Values: 0 = not used 1 = CCSAN present 2 = Error Code present 3 = CSDI present 4 = PSDI present 5 = PIN restricted
4-5		Contents depend on the contents of nibble 3. See "Nibble 4-5 description" (page 53)
6-15		Indicates Billing. Value is a 10-digit billing number

Table 9
Nibble 4-5 description

Nibble 3 content	Nibble 4-5 content	Description
0	00	Padding (not used)
1	two digits	CCSAN
2	01	Unexpected Component Sequence
	02	Unexpected Data Value
	03	Unavailable Network Resource
	04	Missing Record
	05	Reply Overdue
	06	Data Unavailable
	3	01
03		Service Denial on CCAN
4	02	Service Denial on PIN due to threshold exceeded
	03	Service Denial on PIN due to nonpayment
5	01	PIN restricted

Inter-network option

The *Inter-network* option contains the additional accounting information related to inter-network calls. The information includes: Gateway Identifiers, Tariffs, Clear Network Identifier, and Transit Network Identifier.

The number of TNICs, Transit Network Identifiers, that appear in this section is variable. It will be the exact number specified in the TOTAL_TNICS field. The maximum number of TNIC values is 10, contained in TNIC(1) to TNIC(10). No TNIC fields are included in the accounting record if the TOTAL_TNICS has the value zero, which means that there are no TNICs.

Table 10
Inter-network optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol Format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	INCOMING_GAT EWAY_ID	2	PIC 9999 COMP
4	Not in Passport	OUTGOING_GAT EWAY_ID	2	PIC 9999 COMP
6	Not in Passport	CLG_TARIFF	2	PIC S9(3) COMP-3
8	Not in Passport	CLD_TARIFF	2	PIC S9(3) COMP-3
10	Not in Passport	CNIC	3	PIC S9(4) COMP-3
13	Not in Passport	TOTAL_TNICS	2	PIC 9999 COMP
15	Not in Passport	TNIC(1)	3	PIC S9(4) COMP-3
.	Not in Passport	.	.	.
.	Not in Passport	.	.	.
.	Not in Passport	.	.	.
.	Not in Passport	TNIC(n)	3	PIC S9(4) COMP-3

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value

for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section. The value of LENGTH = 13 + (3*N) bytes.

incomingGatewayId: This field identifies the incoming (calling) Gateway ID on an X.75 gateway call. The incoming (calling) gateway is where a call request packet is received from another network. The value ranges from 0 to 9999.

outgoingGatewayId: This field identifies the outgoing (called) Gateway ID on an X.75 gateway call. The outgoing (called) gateway is where a call request packet is sent to another network. The value ranges from 0 to 9999.

clgTariff: This field contains the value of the calling tariff utility supplied in the incoming call request packet from the X.75 link. This field has the following format:

BCD Char.	Item	Hex Value
1-2	Primary Subclass Code	00-31
3	Secondary Subclass Code	0-9
4	Sign indicator	C (Calling Tariff present) D (Calling Tariff not present)

cldTariff: This field contains the value of the called tariff utility supplied in the call accept packet or call clear packet (in direct response to the call packet) from the X.75 link. This field is in the same format as the *clgTariff* field.

cnic: This field contains the Clearing Network Id Code. The value ranges from 0000 to 9999.

BCD Char.	Item	Hex Value
1	Padding	0
2-5	Digits	0-9
6	Sign indicator	C (CNIC present) D (CNIC not present)

totalTnics: Indicates the total number of TNICs, Transit Network Identifiers, in an international call. The value ranges from 1 to 10.

tnic: The transit network identifier. There are 1 to 10 identifiers depending on the value of total TNICs. The value ranges from 0000 to 9999.

BCD Char.	Item	Hex Value
1	Padding	0
2-5	Digits	0-9
6	Sign	C

Original called address option

The *Original called address* option provides the original called address if the call was redirected or hunted. The Original called address has the following format:

Table 11
Original called address optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	code/length	CODE/LENGTH	2	PIC 9999 COMP
2	originalNpi	ORIG_NPI	1	PIC S9 COMP-3
3	originalAddrLen	ORIG_ADDR_LE N	2	PIC 9999 COMP
5	originalAddress	ORIG_ADDR	8	PIC S9(15)COMP -3

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section. The value of LENGTH = 11.

origNpi: This field is the Numbering Plan Indicator to indicate the numbering plan used in the original called address. This field has the same format as the *callingNpi* field.

origAddrLen: This indicates the length of the address (DNA) in the *origAddr* field. The maximum is 15.

origAddr: Indicates the original called address (called address before the called DTE address was modified). The actual called DTE address is recorded in the *calledAddress* field. This field has the same format as the *calledAddress* field.

GAS option

The *GAS* option provides information on the *GAS*, Gateway Access Service, for the Transtext Universal Gateway used particularly by the BOC. The 52 bytes of *GAS* information in the *GAS* optional facility section of the Published Format accounting record are extracted directly from the 52 bytes of *GAS* optional facility data that appear in the Published Format accounting record when the facility is used.

Table 12
Optional gas facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	GAS data	52	PIC X(52)

Note: The value of LENGTH = 52.

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

gasData: A 52-byte data field that provides information on the Gateway Access Service (*GAS*) for the Transtext Universal Gateway.

National CUG option

The *National CUG* option contains the *CUG* Interlock code of the national *CUG* where the call is established.

Table 13
National CUG optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	CUG_ INTERLOCK_ CODE	4	PIC 9(5) COMP
6	Not in Passport	CUG_FLAGS	2	PIC 9999 COMP

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

cugInterlockCode: This field contains the CUG Interlock Code of the CUG where the call is established. The value ranges from 0 to 65535.

cugFlags: This is a two-byte binary field that contains four one-bit flags as follows:

BIT 0	- Outgoing Access(cugFlags_outgoingAccess)	(OA)
BIT 1	- IA/MA Bits Valid(cugFlags_validIaMaBits)	(VA)
BIT 2	- Incoming Access(cugFlags_incomingAccess)	(IA)
BIT 3	- CUGs Matched(cugFlags_cugsMatch)	(MA)

Outgoing Access (OA) This field specifies if the originator specified Outgoing Access (OA) on a call from a Closed User Group. Values:

- 0 indicates OA is NOT used.
- 1 indicates OA is used.

IA/MA Bits Valid (VA) This field indicates if the IA/MA bits are valid or not. Values:

- 0 indicates IA/MA bits are NOT valid.
- 1 indicates IA/MA bits are valid.

Incoming Access (IA) This field specifies if the destination of a call from a Closed User Group has Incoming Access (IA). Values:

- 0 indicates destination does NOT have IA.
- 1 indicates destination has IA.

CUGs Matched (MA) This field specifies if the CUGs matched at the destination of a call from a Closed User Group. Values:

- 0 indicates CUGS do NOT match.
- 1 indicates CUGs do match.

Note 1: The value for CODE is 5 to indicate the NCUG optional facility section.

Note 2: The value for LENGTH is 6 to indicate that six bytes of data (*cugInterlockCode* and *cugFlags*) follow the CODE/LENGTH field.

Note 3: The value for *cugInterlockCode* is extracted from the same field in the switch national CUG optional facility section.

Note 4: The range for *cugInterlockCode* is 0 to 65535.

International CUG option

The *International CUG* option contains the CUG Interlock Code, along with the DNIC, of the international CUG where the call is established.

Table 14
International CUG Optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	CUG_DNIC	3	PIC S9(4) COMP-3
5	Not in Passport	CUG_ INTERLOCK_ CODE	4	PIC 9(5) COMP
9	Not in Passport	CUG_FLAGS	2	PIC 9999 COMP

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

cugDnic: This field contains the DNIC of the International CUG where the call is established. It has the same format and value ranges as TNIC.

cugInterlockCode: This field contains the CUG Interlock Code of the CUG where the call is established. The value ranges from 0 to 65535.

cugFlags: This is a two-byte binary field that contains four one-bit flags as follows:

- 1 BIT 0 - Outgoing Access (OA)
- 2 BIT 1 - IA/MA Bits Valid (VA)
- 3 BIT 2 - Incoming Access (IA)
- 4 BIT 3 - CUGs Matched (MA)

These one-bit flags have the values 1 or 0 as follows:

- 1 **Outgoing Access (OA)**(icugFlags_outgoingAccess)
This field indicates if the originator specified Outgoing Access (OA) on a call from a Closed User Group:
0 indicates OA is NOT used
1 indicates OA is used
- 2 **IA/MA Bits Valid (VA)**(icugFlags_validIaMaBits)
This field indicates if the IA/MA bits are valid:
0 indicates IA/MA bits are not valid
1 indicates IA/MA bits are valid
- 3 **Incoming Access (IA)**(icugFlags_incomingAccess)
This field specifies if the destination of a call from a Closed User Group has Incoming Access (IA):
0 indicates destination does NOT have IA
1 indicates destination has IA.
- 4 **CUGs Matched (MA)**(icugFlags_cugsMatch)
This field specifies if the CUGs matched at the destination of a call from a Closed User Group:
0 indicates CUGs do NOT match
1 indicates CUGs do match

Note 1: The value for CODE is 6 to indicate the ICUG optional facility section.

Note 2: The value for LENGTH is 9 to indicate that nine bytes of data (*cugDnic*, *cugInterlockCode* and *cugFlags*) follow the CODE/LENGTH field.

Note 3: The values for *cugDnic* and *cugInterlockCode* are extracted from the same fields in the switch international CUG optional facility section.

Note 4: The format of the *cugDnic* field is as follows.

BCD Char.	Item	Hex Value
1	Padding	0
2 - 5	Digits	0 - 9
6	Sign	C

Note 5: The range for *cugInterlockCode* is 0 to 65535.

Note 6: The *cugFlags* field is described previously in National CUG layout.

Sensor identifier option

The *Sensor identifier* option contains the Sensor identifiers of the calling and called DTEs. The ISDN/PPSN bit is indicated in the 23rd bit of the integer and is extracted by dividing the value by 8388608.

Table 15
Sensor identifier optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	COBOL format
0	Not in Passport	CODE/LENGTH	2	PIC S9999 COMP
2	Not in Passport	CALLING SENSOR ID	4	PIC S9(7) COMP
6	Not in Passport	CALLED SENSOR ID	4	PIC S9(7) COMP

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note 1: The value of code is 0007.

Note 2: The value of length is 8.

callingSensorId: The sensor identifier of the calling DTE.

calledSensorId: The sensor identifier of the called DTE.

X.75 interface identifier option

The *X.75 interface identifier* option contains the incoming and outgoing X.75 interface identifiers. Zero is used to indicate that no value exists.

Table 16
X.75 interface identifier optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	COBOL format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	INCOMING X75II	6	PIC 9999999999 9 COMP-3
8	Not in Passport	OUTGOING X75II	6	PIC 9999999999 9 COMP-3

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note 1: The value of code is 0008.

Note 2: The value of length is 12.

incomingX75ii: The incoming X.75 interface identifier.

outgoingX75ii: The outgoing X.75 interface identifier.

Gateway option

The *Gateway* option contains the type of gateways traversed.

Table 17
Gateway type optional facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	COBOL format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	INCOMING GTWY TYPE	2	PIC 9999 COMP
4	Not in Passport	OUTGOING GTWY TYPE	2	PIC 9999 COMP

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note 1: The value of code is 0009.

Note 2: The value of length is 4.

incomingGtwyType: The incoming gateway type.

outgoingGtwyType: The outgoing gateway type.

Videotex option

The 90 bytes of Videotex information in the *Videotex* option are extracted directly from the 90 bytes of Videotex optional facility data that appear in the Published Format accounting record when the facility is used.

Table 18
Optional Videotex facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	Videotex data	90	PIC X(90)

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note 1: The value of code is 10.

Note 2: The value of length is 90.

videotexData: A 90-byte data field.

Routing class of service option

The *Routing class of service* option provides information about the Global Routing Class of Service (RCOS) settings on the called and calling ends of a call.

Table 19
Routing class of service (RCOS) section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	ACCT_CLG_ RCOS	1	PIC S9 COMP
3	Not in Passport	ACCT_CLD_ RCOS	1	PIC S9 COMP

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note 1: The value of LENGTH is 2 bytes.

Note 2: The value of CODE is 11.

acctClgRcos: This field is two bits indicating the class of service of the calling end.

- Bit 1(callingRcos_normalReliability) is the normal reliability bit. Normal reliability RCOS is used if it is set; otherwise high reliability RCOS is used.

- Bit 0(callingRcos_minimumDelay) is the minimum delay bit. Delay RCOS is used if it is set; otherwise it uses the throughput RCOS.

acctCldRcos: This field is two bits indicating the class of service of the called end.

- Bit 0(calledRcos_minimumDelay) is the minimum delay bit. Delay RCOS is used if it is set; otherwise it uses the throughput RCOS.
- Bit 1(calledRcos_normalReliability) is the normal reliability bit. Normal reliability RCOS is used if set; otherwise high reliability RCOS is used.

Extended national address option

The *Extended national address* option contains the Extended national address digits for the calling, called, and original called addresses.

The Extended national address facility will be included in the accounting record only when Extended national addressing is enabled, and the given call uses an extended national address.

Table 20
Extended national address facility section

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	Not in Passport	CODE/LENGTH	2	PIC 9999 COMP
2	Not in Passport	Calling address length/Calling address extension	3	PIC S9 (6) COMP
5	Not in Passport	Called address length/Called address extension	3	PIC S9 (6) COMP
8	Not in Passport	Original called address/ Extension called address	3	PIC S9 (6) COMP

code/length: This field contains a *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note 1: The value of LENGTH is 9 bytes.

Note 2: The value of CODE is 12.

Note 3: For Calling address length, Called address length, and Original called address, the lengths are 4 bits.

callingAddLength: The calling address extension.

calledAddLength: The called address extension.

orgCalledAdd: The extension called address.

Frame Relay option

The Published Format for *Frame relay* option is the base part of the traditional Published Format, plus two frame relay-specific optional facilities, and one Original Called Address optional facility (when call redirection is supported).

All frame relay usage data is contained in two optional sections: the local (calling) section and the remote (called) section. The local section contains the last snapshot of frame relay data from the local (calling) end taken by the frame relay protocol. The remote section contains the last snapshot of frame relay data from the remote (called) end taken by the frame relay protocol.

The terms *calling* and *called* are used as part of some of the frame relay field names. The term *calling* refers to the calling end, which is that part of the switch interface that initiated the call request. The term *called* refers to the called end, which is that part of the switch interface that received the call request. For PVCs, the Master end initiated the call. For SVCs, the calling device initiated the call.

In normal conditions, the calling end will generate both the calling and the called records, and the called end will not generate any records. In unusual circumstances, such as when the trunk is down, the calling end will generate both calling and called records, and the called end will also generate both calling and called records. However, the remote section may be accurate only up to the last count exchange, which could take place up to 15 minutes prior.

For the byte counts described, the frame header, frame trailer, DLCI header, and CRC bytes are not included.

For further details on frame relay refer to one of the following documents:

- Passport 6000
 - see the Passport 6000 documents; refer to 241-6401-001 *Passport 6400 Documentation Guide*
- Passport 7000/15000
 - see the Passport 7000/15000 documents; refer to 241-5701-001 *Passport 7400, 15000, 20000 Documentation Guide*
- DPN-100
 - 241-1001-120 *DPN-100 Frame Relay Service User Guide and Specification*

Local (calling) part of Frame Relay option

“Remote (called) part of the overall frame relay snapshot” (page 77) shows the optional facility for the local (calling) part of the overall frame relay snapshot.

Table 21**Local (calling) part of the overall frame relay snapshot**

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	code/length	CODE/LENGTH	2	PIC 9999 COMP
2	flags	Flags	2	PIC 9999 COMP
4	callingCir	Provisioned CIR	4	PIC 9 (8) COMP
8	callingEir	Provisioned EIR	4	PIC 9(8) COMP
12	callingEgress Bytes	Bytes received	8	PIC 9(16) COMP
20	callingIngress Bytes	Bytes sent	8	PIC 9 (16) COMP
28	callingEir EgressBytes	EIR bytes sent to the link	8	PIC 9(16) COMP
36	callingEir IngressBytes	EIR bytes sent to network	8	PIC 9(16) COMP
44	callingEgress Frames or callingEgress Segments	frames/segments received	4	PIC 9(8) COMP
48	callingIngress Frames or callingIngress Segments	frames/segments sent	4	PIC 9(8) COMP

(Sheet 1 of 2)

Table 21 (continued)
Local (calling) part of the overall frame relay snapshot

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
52	callingEir EgressFrames or callingEir Egress Segments	EIR frames/ segments sent to the link	4	PIC 9(8) COMP
56	callingEir IngressFrames or callingEir Ingress Segments	EIR frames/ segments sent to network	4	PIC 9(8) COMP
60	calling Discarded Frames or calling Discarded Segments	frames/segments discarded	4	PIC 9(8) COMP
64	calling Discarded Bytes	Bytes discarded	8	PIC 9(16) COMP
(Sheet 2 of 2)				

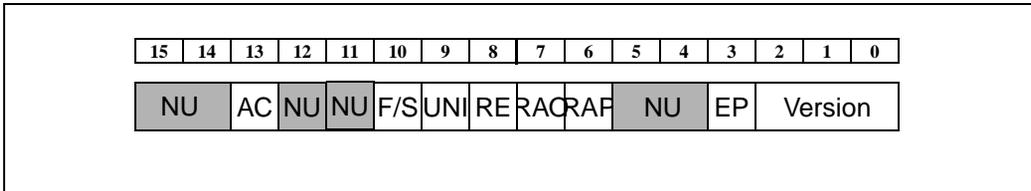
Local (calling) Frame Relay field descriptions. The following are the field descriptions for the local (calling) portion of the frame relay option.

code/length: The *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section, excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note: The value of CODE is 13.

flags: This 16-bit field contains values for call characteristics. The layout of the bits are explained below.

Figure 5
Layout of the “Flags” field



The acronyms shown in the layout of the flags field are defined as follows:

Note: For further details on any of the flags fields, refer to the frame relay documents listed in “Frame Relay option” (page 69).

Version: the version number of the accounting record. As new fields are added, the version number is incremented. That is, if a new release of software contains new fields, the version number will be incremented to indicate that new fields exist in the record. The range is 000 - 111.

EP (*callingClassOfService_emissionPri*): the emission priority. The emission priority lets you choose between two distinct classes of services. This value is provisioned. If set to 1, high emission priority is selected for low delay. If set to zero, normal emission priority is selected.

NU: This field is not used. It is not defined.

RAP (*callingRateAdaptation_provisioned*): The rate adaptation is a congestion control mechanism. This value is provisioned. If set to 1, the rate adaptation was provisioned “on”. If set to zero, the rate adaptation was provisioned “off”. Rate adaptation can only be turned on if rate enforcement is also turned on.

RAO (*callingRateAdaptation_occured*): If set to 1, rate adaptation occurred on the interface. If set to zero, rate adaptation did not occur on the interface during this accounting report interval.

RE (callingRateAdaptation_enforced): the rate enforcement. Rate Enforcement prevents one user from using an inequitable share of the network's resources by ensuring that user traffic follows the provisioned CIR and EIR rates. If set to 1, the rate enforcement was provisioned "on". If set to zero, the rate enforcement was provisioned "off".

UNI (flags_callingUni): If set to 1, the interface is UNI. If set to zero, the interface is NNI.

F/S: If set to 1, the accounting record contains frame counts. If set to zero, the accounting record contains segment counts.

AC (flags_callingAbit): If set to 1, the A-bit to or from the interface was changed on the interface during the current accounting period. If set to zero, the A-bit was not changed.

callingCir: The calling end provisioned CIR (Committed Information Rate). It is rounded up to the next 800 bits per second.

callingEir: The calling end provisioned EIR (Excess Information Rate). It is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.

callingEgressBytes: The total number of bytes received at the calling end dlcI. This is the number of bytes sent by frameRelay dlcI to the application. With no congestion and no errors, this number will be equal to the total number of ingress bytes (calledIngressBytes) at the called end of vc connection. The value for this field is metered at point E as shown in "Accounting meter reference points" (page 83).

callingIngressBytes: The total number of bytes sent at the calling end dlcI. This is the number of bytes sent by the application to frameRelay dlcI. With no congestion and no errors, this number will be equal to the total number of egress bytes (calledEgressBytes) at the called end of vc connection. Only good frames are passed to dlcI from the application. The frames discarded due to CRC error are not included in this count. It

does include the count *callingDiscardBytes*. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 83).

callingEirEgressBytes: The total number of EIR bytes received from the network at the calling end with discard eligibility bit set. This total is included in the value of *callingEgressBytes* at the called end of the connection. Note that the discard eligibility bit can be set by application or by frameRelay. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 83).

callingEirIngressBytes: The total number of EIR bytes sent to the network at the calling end from the application to frameRelay dlcI. This total is included in *callingIngressBytes* value. It is the number of bytes or frames that have the discard eligibility bit set by the application. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 83).

callingEgressFrames and **callingEgressSegments:** The total number of frames/segments sent at the calling end. This is the total number of frames/segments sent by frameRelay dlcI to the application. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses the F/S flag to determine whether this count reports frames or segments. The value for this field is metered at point E as shown in “Accounting meter reference points” (page 83).

callingIngressFrames and **callingIngressSegments:** The total number of frames/segments sent at the calling end. This is the number of frames/segments sent by the application to frameRelay dlcI. The frames discarded due to CRC error are not included in this count. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 83).

callingEirEgressFrames or **callingEirEgressSegments:** The total number of EIR frames/segments received at the calling end. This is the total number of frames/segments received by frameRelay dlcI from the

network with the discard eligibility bit set. This number is included in the *callingEgressFrames/callingEgressSegments*. Note that the discard eligibility bit can be set by the application or by frameRelay. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses the F/S flag to determine whether this count reports frames or segments. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 83).

callingEirIngressFrames or **callingEirIngressSegments**: The total number of EIR frames/segments sent to the network at the calling end. This is the total number of frames/segments sent by the FrameRelay dlcI to the network with the discard eligibility bit set. Note that the discard eligibility bit can be set by the application or by frameRelay. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses the F/S flag to determine whether this count reports frames or segments. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 83).

callingDiscardedFrames or **callingDiscardedSegments**: The number of Ingress frames/segments discarded at the calling end for the following reasons: A-Bit is off, Ingress frame is too long, Ingress frame is too short, or discarded due to rate enforcement. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 83).

callingDiscardedBytes: The number of Ingress bytes discarded at the calling end for the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 83).

Note: **callingTransferPriority**: is not converted to Published Format.

Remote (called) part of Frame Relay option

“Remote (called) part of the overall frame relay snapshot” (page 77) shows the optional facility for the remote (called) part of the overall frame relay snapshot.

Note: The formats of the remote and local fields are identical, they differ only in the value of the code subfield.

Table 22**Remote (called) part of the overall frame relay snapshot**

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
0	code/length	CODE/LENGTH	2	PIC 9999 COMP
2	flags	Flags	2	PIC 9999 COMP
4	calledCir	Provisioned CIR	4	PIC 9 (8) COMP
8	calledEir	Provisioned EIR	4	PIC 9(8) COMP
12	calledEgress Bytes	Bytes received	8	PIC 9(16) COMP
20	calledIngress Bytes	Bytes sent	8	PIC 9 (16) COMP
28	calledEir EgressBytes	EIR bytes sent to the link	8	PIC 9(16) COMP
36	calledEir IngressBytes	EIR bytes sent to network	8	PIC 9(16) COMP
44	calledEgress Frames or calledEgress Segments	frames/segments received	4	PIC 9(8) COMP
(Sheet 1 of 2)				

Table 22 (continued)
Remote (called) part of the overall frame relay snapshot

Offset (bytes)	Passport field names	DPN-100 field names	Field size (bytes)	Cobol format
48	calledIngress Frames or calledIngress Segments	frames/segments sent	4	PIC 9(8) COMP
52	calledEir EgressFrames or calledEir Egress Segments	EIR frames/ segments sent to the link	4	PIC 9(8) COMP
56	calledEir IngressFrames or calledEir Ingress Segments	EIR frames/ segments sent to network	4	PIC 9(8) COMP
60	called Discarded Frames or called Discarded Segments	frames/segments discarded	4	PIC 9(8) COMP
64	called Discarded Bytes	Bytes discarded	8	PIC 9(16) COMP
(Sheet 2 of 2)				

Remote (called) Frame Relay field descriptions. These are the field descriptions for the remote (called) portion of the frame relay option.

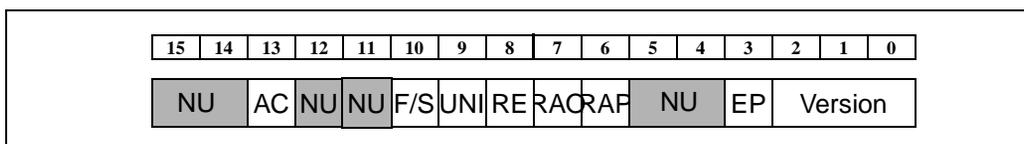
code/length: The *code* value and a *length* value, arithmetically combined. The *code* value identifies the optional facility section and the *length* value indicates the length of the optional facility section,

excluding this field. The low-order byte contains the *length* value for the optional facility section and the high-order byte contains the *code* value that identifies the optional facility section.

Note: The value of CODE is 14.

flags: This 16-bit field contains values for call characteristics. The layout of the bits are explained as follows.

Figure 6
Layout of the “Flags” field



The acronyms shown in the layout of the flags field are defined as follows:

Note: For further details on any of the flags fields, refer to one of the frame relay documents listed in “Frame Relay option” (page 69).

Version: the version number of the accounting record. As new fields are added, the version number is incremented. That is, if a new release of software contains new fields, the version number will be incremented to indicate that new fields exist in the record. The range is 000 - 111.

EP (called ClassOfService_emissionPri): the emission priority. The emission priority lets you choose between two distinct classes of services. This value is provisioned. If set to 1, high emission priority is selected for low delay. If set to zero, normal emission priority is selected.

NU: This field is not used. It is not defined.

RAP (called RateAdaptation_provisioned): The rate adaptation is a congestion control mechanism. This value is provisioned. If set to 1, the rate adaptation was provisioned “on”. If set to zero, the rate adaptation was provisioned “off”. Rate adaptation can only be turned on if rate enforcement is also turned on.

RAO (calledRateAdaptation_occured): If set to 1, rate adaptation occurred on the interface. If set to zero, rate adaptation did not occur on the interface during this accounting report interval.

RE (calledRateAdaptation_enforced): the rate enforcement. Rate Enforcement prevents one user from using an inequitable share of the network's resources by ensuring that user traffic follows the provisioned CIR and EIR rates. If set to 1, the rate enforcement was provisioned "on". If set to zero, the rate enforcement was provisioned "off".

UNI (flags_calledUni0): If set to 1, the interface is UNI. If set to zero, the interface is NNI.

F/S: If set to 1, the accounting record contains frame counts. If set to zero, the accounting record contains segment counts.

AC (flags_calledAbit): If set to 1, the A-bit to or from the interface was changed on the interface during the current accounting period. If set to zero, the A-bit was not changed.

calledCir: The called end provisioned CIR (Committed Information Rate). It is rounded up to the next 800 bits per second.

calledEir: The called end provisioned EIR (Excess Information Rate). It is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.

calledEgressBytes: The total number of bytes received at the called end dlci. This is the number of bytes sent by frameRelay dlci to the application. With no congestion and no errors, this number will be equal to the total number of ingress bytes (callingIngressBytes) at the calling end of vc connection. The value for this field is metered at point E as shown in "Accounting meter reference points" (page 83).

calledIngressBytes: The total number of bytes sent at the called end dlci. This is the number of bytes sent by the application to the frameRelay dlci. With no congestion and no errors, this number will be equal to the total number of egress bytes (callingEgressBytes) at the calling end of the virtual circuit connection. Only good frames are passed to dlci from the

application. The frames discarded due to CRC error are not included in this count. It does include the count *calledDiscardBytes*. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 83).

calledEirEgressBytes: The total number of EIR bytes received from the network at the called end with the discard eligibility bit set. This total is included in the value of *calledEgressBytes* at the called end of the connection. Note that the discard eligibility bit can be set by the application or by frameRelay. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 83).

calledEirIngressBytes: The total number of EIR bytes sent to the network at the called end from the application to frameRelay dlci. This total is included in the *calledIngressBytes* value. It is the number of bytes or frames that have the discard eligibility bit set by the application. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 83).

calledEgressFrames and **calledEgressSegments:** The total number of frames/segments sent at the called end. This is the total number of frames/segments sent by frameRelay dlci to the application. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses the F/S flag to determine whether this count reports frames or segments. The value for this field is metered at point E as shown in “Accounting meter reference points” (page 83).

calledIngressFrames and **calledIngressSegments:** The total number of frames/segments sent at the called end. This is the number of frames/segments sent by the application to frameRelay dlci. The frames discarded due to CRC error are not included in this count. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 83).

calledEirEgressFrames or **calledEirEgressSegments**: The total number of EIR frames/segments received at the called end. This is the total number of frames/segments received by the frameRelay dlci from the network with the discard eligibility bit set. This number is included in the *calledEgressFrames/calledEgressSegments*. Note that the discard eligibility bit can be set by the application or by frameRelay. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses the F/S flag to determine whether this count reports frames or segments. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 83).

calledEirIngressFrames or **calledEirIngressSegments**: The total number of EIR frames/segments sent to the network at the called end. This is the total number of frames/segments sent by the frameRelay dlci to the network with the discard eligibility bit set. Note that the discard eligibility bit can be set by the application or by frameRelay. The frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses the F/S flag to determine whether this count reports frames or segments. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 83).

calledDiscardedFrames or **calledDiscardedSegments**: The number of Ingress frames/segments discarded at the called end for the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 83).

calledDiscardedBytes: The number of Ingress bytes discarded at the called end for the following reasons: A-Bit is off, Ingress frame is too long, Ingress frame is too short, or discarded due to rate enforcement. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 83).

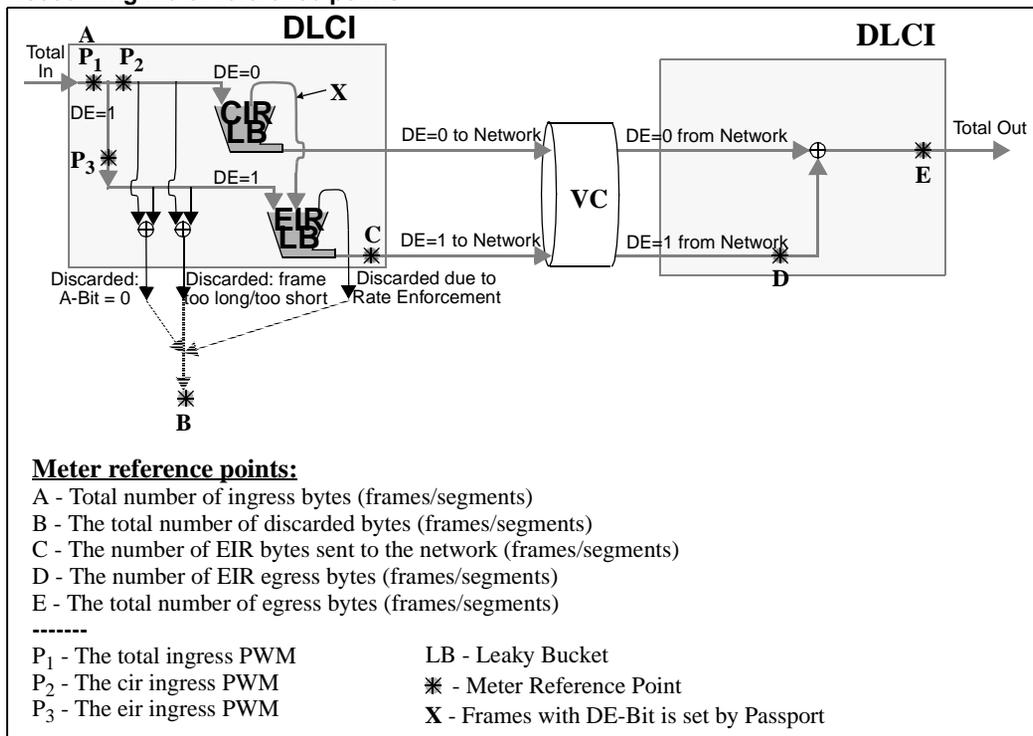
Note: calledTransferPriority: is not converted to Published Format.

Accounting meter reference points

The traffic at a DLCI or a virtual circuit (VC) is metered at reference points as shown in “Accounting meter reference points” (page 83). Although only traffic in one direction is shown, the same metering of the DLCI-VC-DLCI set is done in both directions.

“Accounting meter reference points” (page 83) depicts only those traffic metering reference points at which accounting data is collected. In addition to values collected by the accounting meter, real-time statistics contains other data, such as the number of bytes/frames discarded when A-Bit is off, the number of frames discarded due to the frame being too short, the number of bytes/frames discarded due to the frame being too long, or the number of bytes/frames discarded due to rate enforcement.

Figure 7
Accounting meter reference points



Chapter 2

DPN-100 BDF accounting records

This section describes DPN-100 BDF accounting records:

- “BDF file names” (page 85)
- “Common fields” (page 87)
- “Peak water mark fields” (page 104)
- “Time change records” (page 108)
- “Optional fields” (page 109)

The DPN-100 BDF accounting fields, and their sequence within a BDF accounting file, is determined by file `dpn_acc.rdf`.

BDF file names

Converted DPN accounting data files that are ready for transfer to a customer host are placed in directory `/opt/MagellanMDP/data/mdp/dump/accounting`.

BDF files without errors have a suffix of *bdf*. BDF files that contain errors have a suffix of *err*. Error messages that identify the records and fields with errors are written to the appropriate File Manager log file.

Note: Error files are not transferred to customer hosts.

BDF files use a normalized naming convention as follows:

```
<switch>_<dataType>_<date_time>_<nodeID>_<seq#>.<ext>
```

where:

switch

is *dpn* for DPN-100.

dataType

is *acc* for accounting.

date_time

is the date and time when the file was opened on the switch;

for DPN-100, this field contains YYMMDDhhmmss (YY=year, MM=month, DD=day, hh=hour, mm=minute, ss=seconds). The *date* fields of all records generated by DPN-100 switches contain two-digit years. This format requires that the MDP applies an algorithm in each of its data conversion processes to determine the appropriate century (19xx or 20xx); this algorithm is as follows:

```
year = YY
YY >= 50 (indicates 20th century)
YY < 50 (indicates 21st century)
```

nodeID

is the DPN-100 switch that generated the data.

seq#

is a file sequence number assigned by a switch.

ext

the file extension is *err* for a file that stores records that cannot be converted successfully (the error file is stored in the appropriate dump directory). This value is *bdf* for a BDF file.

Examples

```
dpn_acc_941101154905_2700_19.bdf
dpn_acc_941101154905_2700_19.err
```

Short BDF file names

A file name limitation exists for transferring BDF files to an IBM customer host; a maximum of 16 characters can be used. The use of the short file naming convention is specified during MDP configuration using the *Configure File Mover* option of the MDP Configuration Client *gmdpconfig*.

If multiple and different types of customer hosts (for example, IBM and VAX) are used, the same file naming convention must be used for all hosts; if one of the customer hosts is an IBM, the short file naming convention must be specified.

The File Mover process truncates the *switchID* to the first 4 characters of the full *switchID*. MDP does not check for unique *switch_id* naming. If short file names are used, it is your responsibility to ensure that the first 4 characters of the nodeID are unique.

The short file naming convention for open BDF files is:

```
<s><t>mmddhh.MM
```

The short file naming convention for closed BDF files is:

```
<s><t>mmddhh.MM<seq#><switchID>
```

where:

s=switch type (d=DPN); *t*=data type (a=accounting); *mm*=month; *dd*=day; *hh*=hour; *MM*=minutes; *seq#*=only the last 2 digits; *switchID*=only the first 4 digits.

If the long file naming convention is selected, the transfer of files to IBM customer hosts fails and the BDF file is renamed in the dump directory using the following naming format:

```
<switchType>_<dataType>_<date_time>_<nodeID>_<seq#>  
_bdf_#<failed host number>
```

Common fields

This section describes the *fixed fields* of a BDF accounting record for DPN.

The terms *calling* and *called* are used as part of some of the field names. The term *calling* end refers to that part of the switch interface that initiated the call request. The term *called* end refers to that part of the switch interface that

received the call request. For permanent virtual circuits (PVCs), the Master end initiated the call. For switched virtual circuits (SVCs), the calling device initiated the call.

Common field descriptions

This section describes the *fixed fields* of a DPN-100 BDF accounting record:

switchType: This field identifies the type of switch that generated the data record. This value is `dpn` for DPN.

dataType: This field identifies the data type of the record; with a value of `acc` for accounting data.

subDataType: This field identifies different record types (schemas) within each data type.

recordIdentifier: This field does not apply to DPN.

accountingType: This field defines the type of DPN accounting record.
1 = Accounting record
2 = Time change record

vintageNumber: This number indicates the version of the Bulk Data Format (BDF) accounting record used and is set to 4 for all BDF DPN accounting records.

namsCat: This DPN-100 field indicates the NAMS category.
4 = Vintage 4 Accounting
3 = Vintage 3 Accounting
2 = statistics
0 = alarms

startDateTime: This is the start time of the period accounted for in the record. It is in the format `YYYYMMDDThhmmss`, where: `YYYY` indicates the year, `MM` is for the month, `DD` is for the day, `T` indicates the beginning of the time data, `hh` is for the hour, `mm` is for the minute, and `ss` is for the seconds.

Note: Raw DPN records contain 2-digit years. The MDP BDF converter resolves these 2-digit years into 4-digit years using the following algorithm based on windows set by DPN:

year = YY

YY >= 50 (indicates 20th century (19xx))

YY < 50 (indicates 21st century (20xx))

A zero value in any of the time fields causes the field to be truncated. Even the T indicator will be dropped if the record begins at exactly midnight. For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).

For SVC, *startTime* is the time when the call request packet was created. For PVC, *startTime* is set by the Master VC when the master call request is formatted. On subsequent accounting records, *startTime* corresponds to the end time of the previous record. If Time of Day Accounting (TODA) is used, *startTime* (and *endTime*) correspond to times set in the schedule.

endTime: This is the end time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY indicates the year, MM is for the month, DD is for the day, T indicates the beginning of the time data, hh is for the hour, mm is for the minute, and ss is for the seconds.

Note: Raw DPN records contain 2-digit years. The MDP BDF converter resolves these 2-digit years into 4-digit years using the following algorithm based on windows set by DPN:

year = YY

YY >= 50 (indicates 20th century (19xx))

YY < 50 (indicates 21st century (20xx))

A zero value in any of the time fields causes the field to be truncated. Even the T indicator will be dropped if the record ends at exactly midnight. For example, 19970627T120300 is displayed as

19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).

If Time of Day Accounting (TODA) is used, *endTime* in non-final records is the time of the TODA period. For 12-hour accounting, *endTime* in non-final records is the time when the 12-hour timer expires at the charged end. On final accounting records, *endTime* is the time when the disconnect packet is first received. If Time of Day Accounting (TODA) is used, *endTime* (and *startTime*) correspond to times set in the schedule.

callingNodeIdentifier: This field uniquely identifies the node, in an autonomous network, where the call originates.

This field is the NAMSID. If the switch is NM equipped, the NAMSID is the RID and can have a value in the range 1 to 126. If the switch is AM or RM equipped, this value can be any integer between 256 and 49151.

callingPortIdentifier: A 16-bit field that identifies the physical port number where the call originates.

If the physical port is on a DPN-100, the Port Number will be identified by a PE Number, PI Number, and a Port Number. In the case of X.75 multi-link, only the PE Number is specified (the PI and PO will be set to zero).

The Calling Port Number is 16 bits long and has the following format:

- PE Number is represented in the first 5 bits of the first byte of the calling port number.
- PI Number is represented in the next 5 bits of the calling port number.
- PO Number is represented in the last 6 bits of the second byte in the calling port number.

Note: If VirtualFramer is provisioned, the PO Number will always be set to 3F.

Information for the *callingPort Identifier* field may also appear in a record with the following three fields: *callingPEIdentifier*, *callingPIIdentifier*, and *callingPOIdentifier*.

callingNpi: This field is the Numbering Plan Indicator that indicates the numbering plan used in the calling address, as follows:

- 0 = X.121 numbering plan
- 1 = E.164 numbering plan
- other = undefined

callingAddressLength: This is the length of the callingAddress field, in bytes.

callingAddress: This indicates the number of digits in the calling address (DNA) field. The maximum is 15. It also contains the full address field of the calling address (DNA), including the DNIC (first four digits) for X.121 or Country Code for E.164 address. The field is left-justified with trailing zeroes.

callingDlci: The Logical Channel Number of the calling end. The value ranges from 0 to 4095. For frame relay service, the valid range is 16 to 1007.

callingDse: This is the Data Service Exchange (DSE) of the calling end. The value ranges from 0 to 255. For transit/incoming X.75 SVC calls, the calling DSE information is valid only if the calling tariff is absent from the accounting record. DSE is defined in the DNA component on both Passport and DPN-100.

callingServiceType: Indicates the service supported by the port used by the calling end-user. The value ranges from 0 to 255. For transit/incoming X.75 SVC calls, the calling service type information is

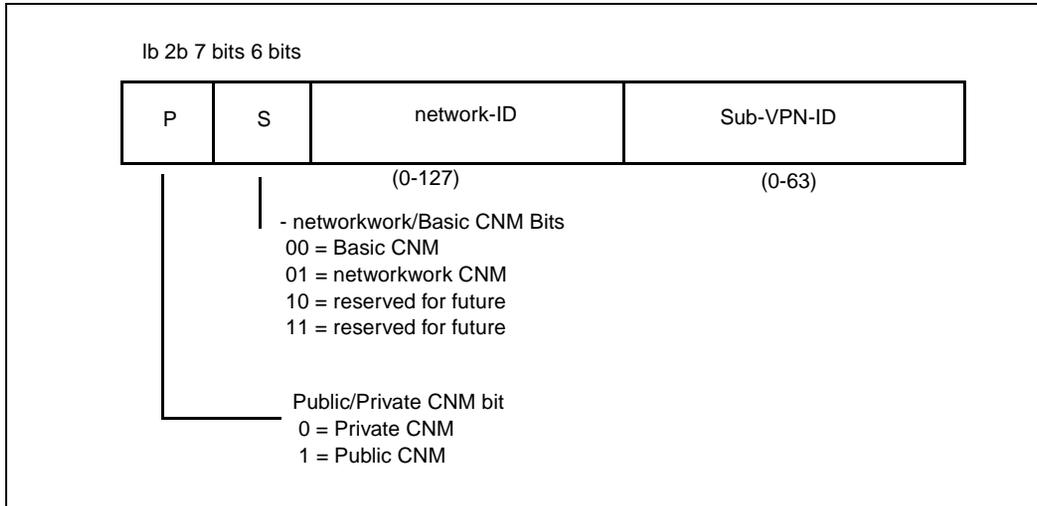
valid only if the calling tariff is absent from the accounting record. This number is defined as `accountClass` in the DNA component on both Passport and DPN-100.

callingReceiveWindow and **callingSendWindow**: This two-byte field consists of the values for the calling end local transmit and receive window sizes, arithmetically combined. The low-order byte contains the value for the calling end local transmit window size and the high-order byte contains the value for the calling end local receive window size. Both the calling end local transmit and receive window sizes have values ranging from 1 to 7. For SVC, this field is only populated for X.25 and X.75 services. All other services have the value 0. For PVC, this field is populated as provided in the PVC envelope, for all services.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

callingCustomerIdentifier: This field is used as an optional identifier for the calling end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.

Figure 8
16 bit field format



calledNodeIdentifier: This field uniquely identifies the node, in an autonomous network, where the call terminates.

For DPN, this field is the NAMSID. If the switch is NM equipped, the NAMSID is the RID and can have a value in the range 1 to 126. If the switch is AM or RM equipped, this value can be any integer between 256 and 49151.

calledPortIdentifier: A 16-bit field that identifies the physical port number where the call terminates.

If the physical port is on a DPN-100, the Port Number will be identified by a PE Number, PI Number, and a Port Number. In the case of X.75 multi-link, only the PE Number is specified (the PI and PO will be set to zero).

The Called Port Number is 16 bits long and has the following format:

- PE Number is represented in the first 5 bits of the first byte of the called port number.

- PI Number is represented in the next 5 bits of the called port number.
- PO Number is represented in the last 6 bits of the second byte in the called port number.

Information for the *calledPort Identifier* field may also appear in a record with the following three fields: *calledPEIdentifier*, *calledPIIdentifier*, and *calledPOIdentifier*.

calledNpi: This field is the Numbering Plan Indicator that indicates the numbering plan used in the called address. The field format is similar to the *calling NPI* field.

0 = X.121 numbering plan

1 = E.164 numbering plan

other = undefined

calledAddressLength: This is the length of the calledAddress field in bytes.

calledAddress: The number of digits in the called address (DNA) field. The maximum is 15. It also provides the full address field of the called address (DNA), including the DNIC (first four digits) for X.121 or Country Code for E.164 address. The field is left-justified with trailing zeroes. The field has a maximum of 15 digits. The field format is similar to the *calling address* field.

calledDlci: The Logical Channel Number of the called end. The value ranges from 0 to 4095. For frame relay service, the range is 16 to 1007.

calledDse: This is the Data Service Exchange (DSE) of the called end. The value ranges from 0 to 255. For outgoing/transit X.75 SVC calls, the called DSE information is valid only if the called tariff is absent from the accounting record. DSE is defined in the DNA component on both Passport and DPN-100.

calledServiceType: Indicates the service supported by the port used by the called end-user. The value ranges from 0 to 255. For outgoing/transit X.75 SVC calls, the called service type information is valid only if the called tariff is absent from the accounting record. This number is defined in the DNA_CUG envelope as accountClass.

calledReceiveWindow and **calledSendWindow:** This two-byte field consists of the values for the called end local transmit and receive window sizes, arithmetically combined. The low-order byte contains the value for the called end local transmit window size and the high-order byte contains the value for the called end local receive window size. Both the called end local transmit and receive window sizes have values that range from 1 to 7. For SVC, this field is only populated for X.25 and X.75 services. All other services have the value zero. For PVC, this field is populated as provided in the PVC envelope, for all services. For Passport, the field range is 0 to 8191.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

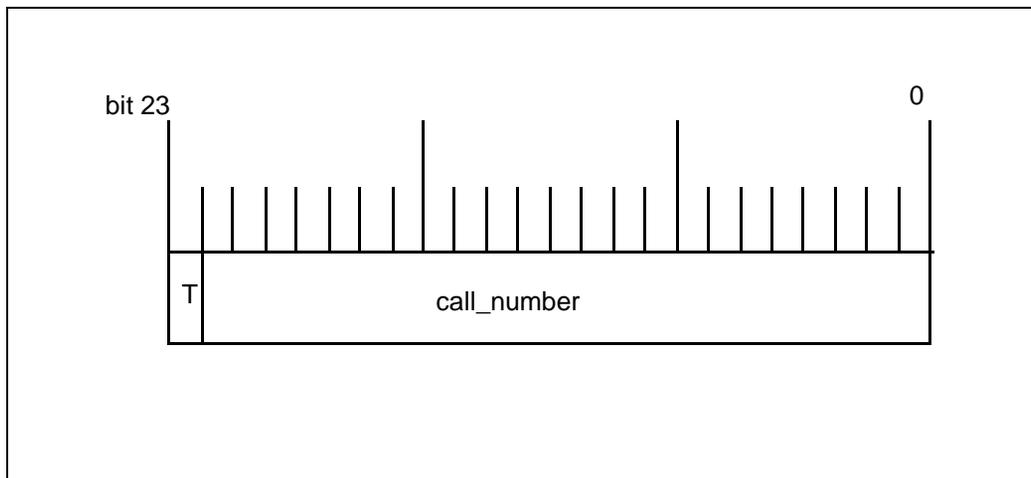
calledCustomerIdentifier: This field is used as an optional identifier for the called end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the provisioning data for the access line, or more specifically, from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value zero is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided. The format of this 16-bit field can be found in “16 bit field format” (page 93).

callReferenceNumber: This is a three-byte number generated by the switch, or taken from the call identifier utility in the X.75 call request packet. The same call reference number is stored in the BDF accounting record at both ends of the call. It is used as one of the fields in matching duplicate records generated at each end of the call or for reconciling records between networks. See “Call reference number generated by a PE on RM/AM and processor” (page 96) for the format of the call reference number.

- T = 0 for SVC or 1 for PVC.
- The call_number is initialized to a semi-random value (based on the time/date) when the service PE/processor first comes up as follows:
 $\text{call_number} = \text{CENTURY}/\text{YEAR XOR MONTH}/\text{DAY XOR HOUR}/\text{MINUTES}$.

The most significant byte of call_number is set to the SECONDS of the current time/date on the PE/processor. The call number is incremented by one for every outgoing call.

Figure 9
Call reference number generated by a PE on RM/AM and processor



flags: These one-bit flags have the values 1 or 0, depending whether they are turned on or off. The values of the flags are as follows:

- 1 WHO CLEARED(flags_calledCleared)
- 0 - Cleared from calling end
1 - Cleared from called end
- The callCleared bit is initialized to 0 on the calling end and initialized to 1 on the called end. If the call is cleared on the local switch, that switch retains its value for the callCleared bit and sends a disconnect message to the other end. When a switch receives a disconnect message, the switch takes the value for the callCleared flag from the remote end.
- 2 WHO GENERATED(flags_calledGenerated)
- For SVC:
0 - Generated from calling end
1 - Generated from called end
- For PVC:
0 - Generated from master end
1 - Generated from slave end
- 3 UNIQUE(flags_unique)
- 0 - Possible duplicate, both ends may have generated the accounting record
1 - No duplicates, only one end has generated the accounting record
- 4 CALL REACHED DATA
TRANSFER(flags_reachedDataTransfer)
- 0 - Call does not reach data transfer at both ends
1 - Call reached data transfer at both ends
- 5 FIRST RECORD FOR THIS CALL(record_first)
- 0 - Not first record for the call
1 - First record for the call

- 6 LAST RECORD FOR THIS CALL(record_last)
 - 0 - Not last record for the call
 - 1 - Last record for the call
- 7 TERMINATOR IS GATEWAY(callType_gateway)
 - 0 - Terminator is not Gateway
 - 1 - Terminator is Gateway
- 8 ORIGINATOR IS GATEWAY (callType_localNetwork)
 - 0 - Originator is not Gateway
 - 1 - Originator is Gateway
- 9 COLLECTION FOR BILLING (CALLING END)
(callingCollectReason_bill)
 - 0 - Not collected for billing purposes
 - 1 - Collected for billing purposes
- 10 COLLECTION FOR TEST (CALLING END)
(callingCollectReason_test)
 - 0 - Not collected for test purposes
 - 1 - Collected for test purposes
- 11 COLLECTION FOR STUDY (CALLING END)
(callingCollectReason_study)
 - 0 - Not collected for study purposes
 - 1 - Collected for study purposes
- 12 COLLECTION FOR AUDIT (CALLING END)
(callingCollectReason_audit)
 - 0 - Not collected for audit purposes
 - 1 - Collected for audit purposes

- 13 COLLECTION FORCED (CALLING END)
 (callingCollectReason_force)
- 0 - collection not forced by calling end
 1 - collection forced by calling end
- 14 CALL DEFLECTION
- 0 - Call not deflected
 1 - Call deflected
- 15 REVERSE CHARGING (flags_calledEndCharging)
- 0 - Charged to calling end
 1 - Charged to called end
- 16 FAST SELECT (flags_fastSelect)
- 0 - Not a fast select call
 1 - A fast select call
- 17 RESTRICTED RESPONSE (flags_restrictedResponse)
- 0 - Restricted response option not used
 1 - Restricted response option used
- 18 PRIORITY(flags_highPriority)
- 0 - Normal priority
 1 - High priority
- 19 PERMANENT VIRTUAL CIRCUIT(flags_pvcType)
- 0 - SVC call
 1 - PVC call
- 20 USER DATA ON CALL
 REQUEST(flagsuserDataInCallReq)
- 0 - No user data on call request
 1 - User data on call request

- 21 HUNT GROUP(flags_hunted)
- 0 - Call has not been hunted
 - 1 - Call has been hunted
- 22 CALL REDIRECTION(flags_redirected)
- 0 - Call not redirected
 - 1 - Call redirected
- 23 COLLECTION FOR BILLING (CALLED END)(calledCollectReason_bill)
- 0 - Not collected for billing purposes
 - 1 - Collected for billing purposes
- 24 COLLECTION FOR TEST (CALLED END)(calledCollectReason_test)
- 0 - Not collected for test purposes
 - 1 - Collected for test purposes
- 25 COLLECTION FOR STUDY (CALLED END)(calledCollectReason_study)
- 0 - Not collected for study purposes
 - 1 - Collected for study purposes
- 26 COLLECTION FOR AUDIT (CALLED END)(calledCollectReason_audit)
- 0 - Not collected for audit purposes
 - 1 - Collected for audit purposes
- 27 CALLED END COLLECTION REASON VALID(flags_collReasonValid)
- 0 - Called end collection reasons are not valid
 - 1 - Called end collection reasons are valid

28 COLLECTION FORCED (CALLED
 END)(calledCollectReason_force)

0 - collection not forced by called end

1 - collection forced by called end

callingCalledPktSize and **calledCallingPktSize**: This two-byte field consists of the values of the packet size sent from the calling DTE to the called end and packet size sent from the called DTE to the calling end, arithmetically combined. The low-order byte contains the value of the packet size sent from the calling DTE to the called end. The value is the base 2 logarithm of the actual packet size. The high-order byte contains the value of the packet size sent from the called DTE to the calling end. The value is the base 2 logarithm of the actual packet size.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

callingCalledThruput and **calledCallingThruput**: This field contains the throughput classes of packets sent from the calling DTE to the called end, and vice versa, arithmetically combined. The low-order byte contains the throughput class of the packet sent from the calling DTE to the called end and the high-order byte contains the throughput class of the packet sent from the called DTE to the calling end.

Note: For frame relay service, these values are not relevant and should be ignored. These fields do not apply because frame relay uses the lightweight virtual circuit instead of the flow-controlled virtual circuit.

Refer to “Throughput classes” (page 102) for throughput classes.

Table 23
Throughput classes

Value Of low-order or high-order byte	Throughput class (bit/s)
0 - 2	Reserved
3	75
4	150
5	300
6	600
7	1200
8	2400
9	4800
10	9600
11	19200
12	48000
13	64000
14 - 15	Reserved

clearCause: This a clear cause indicator. It indicates the reason for a call termination. For additional details, refer to 241-1001-509 *DPN-100 Call Clear, Reset and Diagnostic Codes*.

diagnosticCode: This a clear diagnostic indicator. It is set to zero (0) on non-final records, and to the network diagnostic code of the call clear on the final record. For additional details, refer to 241-1001-509 *DPN-100 Call Clear, Reset and Diagnostic Codes*.

transitDelay: This field is to be used in the future to indicate transit delays. The value is currently set to zero.

segmentSizeIndex: This field gives the segment size used on the call. The value in this field is the base 2 logarithm of the actual segment size.

localUserResets: Count of the customer-caused reset request packets, transmitted and received. The value ranges from 0 to 65535.

callingEgressSegments/Frames: Number of Egress data segments/frames received from the network. The value ranges from 0 to 16777215. For all calls, the segments/frames received field in the accounting record is calculated for the data received in the data packets. For all calls, the segments/frames received field in the accounting record is calculated for the data received in the *interrupt* and *interrupt confirmation* packets. Only for Fast Select calls (both restricted and unrestricted response), the segments/frames received field in the accounting record is calculated for the data received in *call request*, *call confirm (accept)*, and *clear request* packets. Non-Fast Select calls do not count the segments/frames in these three packets. For all the packets mentioned above, the calculation of segments/frames is performed in a common manner (that is, based on the segment size index).

For *best effort delivery* services such as frame relay, the count is recorded at the entry and exit points to and from the network.

callingIngressSegments/Frames: Number of Ingress data segments/frames sent to the network. The value ranges from 0 to 16777215. For all calls, the segments/frames sent field in the accounting record is calculated for the data sent in the data packets. For all calls, the segments/frames sent field in the accounting record is calculated for the data sent in the *interrupt* and *interrupt confirmation* packets. Only for Fast Select calls (both restricted and unrestricted response), the segments/frames sent field in the accounting record is calculated for the data sent in *call request*, *call confirm (accept)*, and *clear request* packets. Non-Fast Select calls do not count the segments/frames in these three packets. For all the packets mentioned above, the calculation of segments/frames is performed in a common manner (that is, based on the segment size index).

For *best effort delivery* services such as frame relay, the count is recorded at the entry and exit points to and from the network.

elapsedTime: Duration of the call in 0.1 second increments. This time interval is started when the call request is processed. If the call does not reach the data transfer stage, *elapsed time* is set to zero. *Elapsed time* represents a true measure of the accounting period. It is measured independently of *startDateTime* and *endTime*. Since *startDateTime* and *endTime* can be changed externally by adjusting the clock, *elapsed time* can be shorter or longer than the difference between *startDateTime* and *endTime*. This difference can show as much as 60 seconds on accounting records for the VCs that are idle (carry no traffic) and when TODA is used and is caused, in this case, by an internal TODA detection mechanism. When the 12-hour accounting period is complete, *elapsed time* is exact or differs by a few seconds from 12 hour duration.

Peak water mark fields

This section contains descriptions of the peak water mark fields that are used to record the peak byte usage at the network side of the interface when Time of Day Accounting (TODA) is provisioned.

The following must be considered:

- If TODA is not running, peak water mark fields are not included in the accounting record.
- Peak water mark monitoring is available only for the frame relay service, and Egress Accounting must be enabled in order for PWM to be applied.
- The peak water mark monitoring interval period is provisioned in the frame relay DNA CUG envelope.
- For each DLCI, the peak byte usage for CIR, EIR, and total traffic, as well as the interval in which the peak occurs are recorded. The terms *calling* and *called* refer to the interface at the calling and called end on the connection.

- The peak water mark fields can be used to validate the provisioned value of CIR and EIR against actual usage, resulting, possibly, in the re-engineering of the provisioned parameters. The frame header, frame trailer, DLCI header and CRC bytes are not included. LMI frames are also not included.
- When you use DE=0 or DE=1 traffic, but not both, the total peak water mark byte counts are the same as the CIR byte counts or the EIR byte counts.

callingTotalPwmBytes: This attribute contains the calling end peak water mark for the total number of ingress bytes. This peak occurs at the interval *callingTotalPwmIntervalNumber*. If the value of this attribute is zero (no traffic), *callingTotalPwmIntervalNumber* is also zero.

callingEirPwmBytes: This attribute contains the calling end peak water mark for the number of ingress bytes carried on frames with DE-bit = 1. The DE-bit is set by the user's equipment. This peak occurs at the interval *callingEirPwmIntervalNumber*. If the value of this attribute is zero (no traffic), *callingEirPwmIntervalNumber* is also zero.

callingCirPwmBytes: This attribute contains the calling end peak water mark for the number of ingress bytes carried on frames with DE-bit = 0. The DE-bit is set by the user's equipment. This peak occurs at the interval *callingCirPwmIntervalNumber*. If the value of this attribute is zero (no traffic), *callingCirPwmIntervalNumber* is also zero.

calledTotalPwmBytes: This attribute contains the called end peak water mark for the total number of ingress bytes. This peak occurs at the interval *calledTotalPwmIntervalNumber*. If the value of this attribute is zero (no traffic), *calledTotalPwmIntervalNumber* is also zero.

calledEirPwmBytes: This attribute contains the called end peak water mark for the number of ingress bytes carried on frames with DE-bit = 1. The DE-bit is set by the user's equipment. This peak occurs at the interval *calledEirPwmIntervalNumber*. If the value of this attribute is zero (no traffic), *calledEirPwmIntervalNumber* is also zero.

calledCirPwmBytes: This attribute contains the called end peak water mark for the number of ingress bytes carried on frames with DE-bit = 0. The DE-bit is set by the user's equipment. This peak occurs at the interval *calledCirPwmIntervalNumber*. If the value of this attribute is zero (no traffic), *calledCirPwmIntervalNumber* is also zero.

callingTotalPwmIntervalNumber: This attribute contains the number of the pwm (peak water mark) interval in which the *callingTotalPwmBytes* occurred.

If no traffic is sent (*callingTotalPwmBytes* is zero), the value of this attribute is also zero. The maximum possible value is 720 if *peakWaterMarkInterval* is set to one minute and the accounting period measured is 12 hours.

Interval numbers count down from the current change-over, ending with interval number one, which is the interval just prior to the next TODA change-over. For example, for a TODA period between 16:00 and 17:00, with a pwm interval time set to 5 minutes, if the traffic peak is reported in interval 9, the peak occurred between 16:15 and 16:20.

callingEirPwmIntervalNumber: This attribute contains the number of the pwm (peak water mark) interval in which the *callingEirPwmBytes* occurred.

If no traffic is sent (*callingEirPwmBytes* is zero), the value of this attribute is also zero. The maximum possible value is 720 if *peakWaterMarkInterval* is set to one minute and the accounting period measured is 12 hours.

Interval numbers count down from the current change-over, ending with interval number one, which is the interval just prior to the next TODA change-over. For example, for a TODA period between 16:00 and 17:00, with a pwm interval time set to 5 minutes, if the traffic peak is reported in interval 9, the peak occurred between 16:15 and 16:20.

callingCirPwmIntervalNumber: This attribute contains the number of the pwm (peak water mark) interval in which the *callingCirPwmBytes* occurred.

If no traffic is sent (*callingCirPwmBytes* is zero), the value of this attribute is also zero. The maximum possible value is 720 if *peakWaterMarkInterval* is set to one minute and the accounting period measured is 12 hours.

Interval numbers count down from the current change-over, ending with interval number one, which is the interval just prior to the next TODA change-over. For example, for a TODA period between 16:00 and 17:00, with a pwm interval time set to 5 minutes, if the traffic peak is reported in interval 9, the peak occurred between 16:15 and 16:20.

calledTotalPwmIntervalNumber: This attribute contains the number of the pwm (peak water mark) interval in which the *calledTotalPwmBytes* occurred.

If no traffic is sent (*calledTotalPwmBytes* is zero), the value of this attribute is also zero. The maximum possible value is 720 if *peakWaterMarkInterval* is set to one minute and the accounting period measured is 12 hours.

Interval numbers count down from the current change-over, ending with interval number one, which is the interval just prior to the next TODA change-over. For example, for a TODA period between 16:00 and 17:00, with a pwm interval time set to 5 minutes, if the traffic peak is reported in interval 9, the peak occurred between 16:15 and 16:20.

calledEirPwmIntervalNumber: This attribute contains the number of the pwm (peak water mark) interval in which the *calledEirPwmBytes* occurred.

If no traffic is sent (*calledEirPwmBytes* is zero), the value of this attribute is also zero. The maximum possible value is 720 if *peakWaterMarkInterval* is set to one minute and the accounting period measured is 12 hours.

Interval numbers count down from the current change-over, ending with interval number one, which is the interval just prior to the next TODA change-over. For example, for a TODA period between 16:00 and 17:00, with a pwm interval time set to 5 minutes, if the traffic peak is reported in interval 9, the peak occurred between 16:15 and 16:20.

calledCirPwmIntervalNumber: This attribute contains the number of the pwm (peak water mark) interval in which the *calledCirPwmBytes* occurred.

If no traffic is sent (*calledCirPwmBytes* is zero), the value of this attribute is also zero. The maximum possible value is 720 if *peakWaterMarkInterval* is set to one minute and the accounting period measured is 12 hours.

Interval numbers count down from the current change-over, ending with interval number one, which is the interval just prior to the next TODA change-over. For example, for a TODA period between 16:00 and 17:00, with a pwm interval time set to 5 minutes, if the traffic peak is reported in interval 9, the peak occurred between 16:15 and 16:20.

Time change records

Time change records contain attributes that describe events caused by a change of time on the switch. When the time on the switch is adjusted by 2 seconds, or more, the time change record is issued and sent as part of the accounting stream. The time change record is used to keep track of clock changes on the switch and to explain potential inconsistencies in the accounting records.

DPN time change record field descriptions

The *Time change record fields* of the BDF accounting record for DPN are:

oldDateTime: The date and time on the switch before the time was adjusted.

newDateTime: The date and time on the switch after the time was adjusted.

The format is `YYYYMMDDThhmmss` (year, month, day, T=delimiter, hours, minutes, seconds).

Accounting records are generated if the time change skips over the time set in Time of Day Accounting (TODA). For example, if TODA is set to 15:00 hours and the time change goes from 14:59 to 15:05, accounting records are generated. The TODA time is defined in the *collectionTimes* attribute of the *Collector/Accounting* component.

Note: Raw DPN records contain 2-digit years. The MDP BDF converter resolves these 2-digit years into 4-digit years using the following algorithm based on windows set by DPN:

year = YY
YY >= 50 (indicates 20th century (19xx))
YY < 50 (indicates 21st century (20xx))

namsId: The NAMS ID of the switch that issued the time change record. The value of the NAMS ID is provisioned on the switch.

Optional fields

If an *optional* facility is used on a call, the information on the optional facility is captured in the optional facility section of the accounting record. If the optional facility is not used on the call, then that particular optional facility section will not appear in the BDF accounting record for that call.

The terms *calling* and *called* are used as part of some of the optional field names. The term *calling* end refers to that part of the switch interface that initiated the call request. The term *called* end refers to that part of the switch interface that received the call request. For PVCs, the Master end initiated the call. For SVCs, the calling device initiated the call.

The following optional facilities are available:

- “NUI option” (page 110)
- “Free-format NUI option” (page 110)
- “Inter-network option” (page 110)
- “Original Called Address option” (page 112)
- “GAS option” (page 112)
- “National CUG option” (page 113)
- “International CUG option” (page 114)
- “Sensor identifier option” (page 116)
- “X.75 interface identifier option” (page 116)
- “Gateway option” (page 116)
- “Videotex option” (page 116)
- “Routing class of service option” (page 117)
- “X.75 interface identifier option” (page 116)

- “Frame Relay options” (page 118)
- “Extended national address option” (page 117)
- “Customized accounting information option” (page 127)

NUI option

The *NUI* option contains information about the Network User Identifier (NUI) used on a DPN-100 call. This information exists in the *nuiData* field of the DPN-100 accounting record.

nuiType: The first portion of the *nuiData* field describes the type of NUI.

- 1 - DPN-100 NUI
- 2 - Calling Card NUI
- 3 - Suppressed NUI

nui: The second portion of the *nuiData* field contains a DPN-100 NUI or a Calling Card NUI. The DPN-100 NUI is a variable length character string, with a maximum of 8 characters. The Calling Card NUI has a fixed length of 8 characters. Suppressed NUI has a length of zero.

Free-format NUI option

If the *Free-format NUI* option is used for a DPN-100 connection, 2 BDF fields are populated with information about the free-format Network User Identifier (NUI) used on the call. If the Free-format NUI option is not used, these 2 fields are empty.

billingIdType: This field contains a decimal value of zero, as there is currently only one type of free-format NUI billing identifier available.

billingId: This field contains a DPN-100 free-format NUI. The DPN-100 free-format NUI is a variable length character string, with a maximum of 41 characters.

Inter-network option

The *Inter-network* option contains the additional accounting information related to inter-network calls. The information includes: Gateway Identifiers, Tariffs, Clear Network Identifier, and Transit Network Identifier.

The number of TNICs, Transit Network Identifiers, that appear in this section is variable. It will be the exact number specified in the TOTAL_TNICS field. The maximum number of TNIC values is 10, contained in TNIC(1) to TNIC(10). No TNIC fields are included in the accounting record if the TOTAL_TNICS has the value zero, which means that there are no TNICs.

incomingGatewayId: This field identifies the incoming (calling) Gateway ID on an X.75 gateway call. The incoming (calling) gateway is where a call request packet is received from another network. The value ranges from 0 to 9999.

outgoingGatewayId: This field identifies the outgoing (called) Gateway ID on an X.75 gateway call. The outgoing (called) gateway is where a call request packet is sent to another network. The value ranges from 0 to 9999.

clearNetworkId: This field contains the Clearing Network Id Code. The value ranges from 0000 to 9999. The initialization value FFFF can be inserted into the record to indicate the absence of the CNIC in the clear block.

totalTnics: This field indicates the number of inter-networks. The value ranges from 0 to 10.

callingTariffValid: This field indicates the validity of the *callingTariff* value. 1 indicates the *callingTariff* is valid, while 0 indicates the *callingTariff* is invalid.

calledTariffValid: This field indicates the validity of the *calledTariff* value. 1 indicates the *calledTariff* is valid, while 0 indicates the *calledTariff* is invalid.

callingTariff: This field contains the value of the calling tariff utility supplied in the incoming call request packet from the X.75 link.

calledTariff: This field contains the value of the called tariff utility supplied in the call accept packet or call clear packet (in direct response to the call packet) from the X.75 link. This field is in the same format as the *clgTariff* field.

transitNetworkId: The transit network identifier (tnic). There are 1 to 10 identifiers depending on the value of total TNICs. The value ranges from 0000 to 9999.

Original Called Address option

The *Original called address* option provides the original called address if the call was redirected or hunted.

originalNpi: This field is the Numbering Plan Indicator to indicate the numbering plan used in the original called address. This field has the same format as the *callingNpi* field.

origAddrLen: This portion of the *originalAddress* field indicates the length of the address (DNA) in the *origAddr* field. The maximum is 15.

origAddr: This portion of the *originalAddress* field indicates the original called address (that is, the called address before the called DTE address was modified). The actual called DTE address is recorded in the *calledAddress* field. This field has the same format as the *calledAddress* field.

GAS option

The *GAS* option provides information on the *GAS*, Gateway Access Service, for the Transtext Universal Gateway used particularly by the BOC. The 52 bytes of *GAS* information in the *GAS* optional facility section of the Bulk data format accounting record are extracted directly from the 52 bytes of *GAS* optional facility data that appear in the Bulk data format accounting record when the facility is used.

gasData: A 52-byte data field that provides information on the Gateway Access Service (*GAS*) for the Transtext Universal Gateway.

National CUG option

The *National CUG* option contains the CUG Interlock code of the national CUG where the call is established.

cugInterlockCode: This field contains the CUG Interlock Code of the CUG where the call is established. The value ranges from 0 to 65535.

cugFlags: This is a two-byte binary field that contains four one-bit flags as follows:

BIT 0	- Outgoing Access(cugFlags_outgoingAccess)	(OA)
BIT 1	- IA/MA Bits Valid(cugFlags_validIaMaBits)	(VA)
BIT 2	- Incoming Access(cugFlags_incomingAccess)	(IA)
BIT 3	- CUGs Matched(cugFlags_cugsMatch)	(MA)

These one-bit flags have the values 1 or 0 as follows.

- 1 Outgoing Access (OA)(cugFlags_outgoingAccess)
The field indicates if the originator specified Outgoing Access (OA) on a call from a Closed User Group:
0 indicates OA is NOT used
1 indicates OA is used
- 2 IA/MA Bits Valid (VA)(cugFlags_validIaMaBits)
This field indicates if the IA/MA bits are valid:
0 indicates IA/MA bits are not valid
1 indicates IA/MA bits are valid
- 3 Incoming Access (IA)(cugFlags_incomingAccess)
This field specifies if the destination of a call from a Closed User Group has Incoming Access (IA):
0 indicates destination does NOT have IA
1 indicates destination has IA.

4 CUGs Matched (MA)(cugFlags_cugsMatch)

This field specifies if the CUGs matched at the destination of a call from a Closed User Group:

0 indicates CUGs do NOT match

1 indicates CUGs do match

Note 1: The value for CODE is 5, which indicates the NCUG optional facility section.

Note 2: The value for LENGTH is 6 to indicate that six bytes of data (*cugInterlockCode* and *cugFlags*) follow the CODE/LENGTH field.

Note 3: The value for *cugInterlockCode* is extracted from the same field in the switch national CUG optional facility section.

Note 4: The range for *cugInterlockCode* is 0 to 65535.

International CUG option

The *International CUG* option contains the CUG Interlock Code, along with the DNIC, of the international CUG where the call is established.

cugDnic: This field contains the DNIC of the International CUG where the call is established. It has the same format and value ranges as TNIC.

cugInterlockCode: This field contains the CUG Interlock Code of the CUG where the call is established. The value ranges from 0 to 65535.

cugFlags: This is a two-byte binary field that contains four one-bit flags as follows:

BIT 0	- Outgoing Access(icugFlags_outgoingAccess)	(OA)
BIT 1	- IA/MA Bits Valid(icugFlags_validIaMaBits)	(VA)
BIT 2	- Incoming Access(icugFlags_incomingAccess)	(IA)
BIT 3	- CUGs Matched(icugFlags_cugsMatch)	(MA)

These one-bit flags have the values 1 or 0 as follows.

- 1 **Outgoing Access (OA)**(icugFlags_outgoingAccess)
The field indicates if the originator specified Outgoing Access (OA) on a call from a Closed User Group:
0 indicates OA is NOT used
1 indicates OA is used
- 2 **IA/MA Bits Valid (VA)**(icugFlags_validIaMaBits)
This field indicates if the IA/MA bits are valid:
0 indicates IA/MA bits are not valid
1 indicates IA/MA bits are valid
- 3 **Incoming Access (IA)**(icugFlags_incomingAccess)
This field specifies if the destination of a call from a Closed User Group has Incoming Access (IA):
0 indicates destination does NOT have IA
1 indicates destination has IA.
- 4 **CUGs Matched (MA)**(icugFlags_cugsMatch)
This field specifies if the CUGs matched at the destination of a call from a Closed User Group:
0 indicates CUGs do NOT match
1 indicates CUGs do match

Note 1: The value for CODE is 6 to indicate the ICUG optional facility section.

Note 2: The value for LENGTH is 9 to indicate that nine bytes of data (*cugDnic*, *cugInterlockCode* and *cugFlags*) follow the CODE/LENGTH field.

Note 3: The values for *cugDnic* and *cugInterlockCode* are extracted from the same fields in the switch international CUG optional facility section.

Note 4: The range for *cugInterlockCode* is 0 to 65535.

Note 5: The *cugFlags* field is described previously in National CUG layout.

Sensor identifier option

The *Sensor identifier* option contains the Sensor identifiers of the calling and called DTEs. The ISDN/PPSN bit is indicated in the 23rd bit of the integer and is extracted by dividing the value by 8388608.

callingIsdn: A value of 0 indicates the calling DTE is PPSN and a value of 1 indicates the calling DTE is ISDN.

callingSensorId: The sensor identifier of the calling DTE.

calledIsdn: A value of 0 indicates the called DTE is PPSN and a value of 1 indicates the called DTE is ISDN.

calledSensorId: The sensor identifier of the called DTE.

X.75 interface identifier option

The *X.75 interface identifier* option contains the incoming and outgoing X.75 interface identifiers. Zero is used to indicate that no value exists.

incomingX75ii: The incoming X.75 interface identifier.

outgoingX75ii: The outgoing X.75 interface identifier.

Gateway option

The *Gateway* option contains the type of gateways traversed.

incomingGtwyType: The incoming gateway type.

outgoingGtwyType: The outgoing gateway type.

Videotex option

The 90 bytes of Videotex information in the *Videotex* option are extracted directly from the 90 bytes of Videotex optional facility data that appear in the Bulk data format accounting record when the facility is used.

videotexData: A 90-byte data field.

Routing class of service option

The *Routing class of service* option provides information about the Global Routing Class of Service (RCOS) settings on the called and calling ends of a call.

acctClgRcos: This field is two bits indicating the class of service of the calling end.

- Bit 1(callingRcos_normalReliability) is the normal reliability bit. Normal reliability RCOS is used if it is set; otherwise high reliability RCOS is used.
- Bit 0(callingRcos_minimumDelay) is the minimum delay bit. Delay RCOS is used if it is set; otherwise it uses the throughput RCOS.

acctCldRcos: This field is two bits indicating the class of service of the called end.

- Bit 0(calledRcos_minimumDelay) is the minimum delay bit. Delay RCOS is used if it is set; otherwise it uses the throughput RCOS.
- Bit 1(calledRcos_normalReliability) is the normal reliability bit. Normal reliability RCOS is used if set; otherwise high reliability RCOS is used.

Extended national address option

The *Extended national address* option contains the Extended national address digits for the calling, called, and original called addresses.

The Extended national address facility will be included in the accounting record only when Extended national addressing is enabled, and the given call uses an extended national address.

callingAddLength: The calling address extension.

calledAddLength: The called address extension.

orgCalledAdd: The extension called address.

Frame Relay options

The BDF for *frame relay* option is the base part of the traditional BDF, plus two frame relay-specific optional facilities, and one Original Called Address optional facility (when call redirection is supported).

All frame relay usage data is contained in two optional sections: the local (*calling*) section and the remote (*called*) section. The local section contains the last snapshot of frame relay data from the local (*calling*) end taken by the frame relay protocol. The remote section contains the last snapshot of frame relay data from the remote (*called*) end taken by the frame relay protocol.

The terms *calling* and *called* are used as part of some of the frame relay field names. The term *calling* refers to the calling end, which is that part of the switch interface that initiated the call request. The term *called* refers to the called end, which is that part of the switch interface that received the call request. For PVCs, the Master end initiated the call. For SVCs, the calling device initiated the call.

In normal conditions, the calling end will generate both the calling and the called records, and the called end will not generate any records. In unusual circumstances, such as when the trunk is down, the calling end will generate both calling and called records, and the called end will also generate both calling and called records. However, the remote section may be accurate only up to the last count exchange, which could take place up to 15 minutes prior.

For the byte counts described, the frame header, frame trailer, DLCI header, and CRC bytes are not included.

For further details on frame relay refer to the following document
241-1001-120 DPN-100 Frame Relay Service User Guide and Specification

Local (calling) Frame Relay field descriptions

The following are the field descriptions for the local (*calling*) portion of the frame relay option.

EP(callingClassOfService_emissionPri): the emission priority. The emission priority lets you choose between two distinct classes of services. This value is provisioned. If set to 1, high emission priority is selected for low delay. If set to 0, normal emission priority is selected.

RAP (callingRateAdaptation_provisioned): The rate adaptation is a congestion control mechanism. This value is provisioned. If set to 1, the rate adaptation was provisioned “on”. If set to 0, the rate adaptation was provisioned “off”. Rate adaptation can only be turned on if rate enforcement is also turned on.

RAO (callingRateAdaptation_occured): If set to 1, rate adaptation occurred on the interface. If set to 0, rate adaptation did not occur on the interface during this accounting report interval.

RE (callingRateAdaptation_enforced): the rate enforcement. Rate Enforcement prevents one user from using an inequitable share of the network’s resources by ensuring that user traffic follows the provisioned CIR and EIR rates. If set to 1, the rate enforcement was provisioned “on”. If set to 0, the rate enforcement was provisioned “off”.

UNI (flags_callingUni): If set to 1, the interface is UNI. If set to 0, the interface is NNI.

flags_callingFramesOrSegments (DPN): If set to 1, the accounting record contains frame counts. If set to 0, the accounting record contains segment counts.

AC (flags_callingAbit): If set to 1, the A-bit to or from the interface was changed on the interface during the current accounting period. If set to 0, the A-bit was not changed.

callingCir: The calling end provisioned CIR (Committed Information Rate). It is rounded to the next 800 bits per second.

callingEir: The calling end provisioned EIR (Excess Information Rate). It is provisioned as excessive burst size and is rounded to the next 800 bytes per second.

callingEgressBytes: The total number of bytes received at the calling end dlcI. This is the number of bytes sent by frameRelay dlcI to the application. With no congestion and no errors, this number will be equal

to the total number of ingress bytes (*calledIngressBytes*) at the called end of vc connection. The value for this field is metered at point E as shown in “Accounting meter reference points” (page 126).

callingIngressBytes: The total number of bytes sent at the calling end dlci. This is the number of bytes sent by the application to frameRelay dlci. With no congestion and no errors, this number will be equal to the total number of egress bytes (*calledEgressBytes*) at the called end of vc connection. Only good frames are passed to dlci from the application. The frames discarded due to CRC error are not included in this count. It does include the count *callingDiscardBytes*. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 126).

callingEirEgressBytes: The total number of EIR bytes received from the network at the calling end with discard eligibility bit set. This total is included in the value of *callingEgressBytes* at the called end of the connection. Note that discard eligibility bit can be set by application or by frameRelay. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 126).

callingEirIngressBytes: The total number of EIR bytes sent to the network at the calling end from application to frameRelay dlci. This total is included in *callingIngressBytes* value. It is the number of bytes or frames that have the discard eligibility bit set by the application. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 126).

callingEgressFrames and **callingEgressSegments:** The total number of frames/segments sent at the calling end. This is the total number of frames/segments sent by frameRelay dlci to the application. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses

flags_callingFramesOrSegments to determine whether this count reports frames or segments. The value for this field is metered at point E as shown in “Accounting meter reference points” (page 126).

callingIngressFrames and **callingIngressSegments**: The total number of frames/segments sent at the calling end. This is the number of frames/segments sent by the application to frameRelay dlci. The frames discarded due to CRC error are not included in this count. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 126).

callingEirEgressFrames or **callingEirEgressSegments**: The total number of EIR frames/segments received at the calling end. This is the total number of frames/segments received by frameRelay dlci from the network with discard eligibility bit set. This number is included in *callingEgressFrames/callingEgressSegments*. Note that discard eligibility bit can be set by application or by frameRelay. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses *flags_callingFramesOrSegments* to determine whether this count reports frames or segments. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 126).

callingEirIngressFrames or **callingEirIngressSegments**: The total number of EIR frames/segments sent to the network at the calling end. This is the total number of frames/segments sent by frameRelay dlci to the network with the discard eligibility bit set. Note that discard eligibility bit can be set by application or by frameRelay. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses *flags_callingFramesOrSegments* to determine whether this count reports frames or segments. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 126).

callingDiscardedFrames or **callingDiscardedSegments**: The number of Ingress frames/segments discarded at the calling end for the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 126).

callingDiscardedBytes: The number of Ingress bytes discarded at the calling end for the following reasons: A-Bit is off, Ingress frame is too long, Ingress frame is too short, or discarded due to rate enforcement. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 126).

callingTransferPriority: The transfer priority is a preference specified by an application according to its time-sensitivity requirement. Frames with high transfer priority are served by the network before the frames with normal priority. The transfer priority standard is defined to have 16 levels from 0 to 15, with 0 denoting the lowest priority and 15 the highest.

Remote (called) Frame Relay field descriptions

The following are the field descriptions for the remote (*called*) portion of the frame relay option.

EP (calledClassOfService_emptionPri): the emission priority. The emission priority lets you choose between two distinct classes of services. This value is provisioned. If set to 1, high emission priority is selected for low delay. If set to 0, normal emission priority is selected.

RAP (calledRateAdaptation_provisioned): The rate adaptation is a congestion control mechanism. This value is provisioned. If set to 1, the rate adaptation was provisioned “on”. If set to 0, the rate adaptation was provisioned “off”. Rate adaptation can only be turned on if rate enforcement is also turned on.

RAO (calledRateAdaptation_occured): If set to 1, rate adaptation occurred on the interface. If set to 0, rate adaptation did not occur on the interface during this accounting report interval.

RE (calledRateAdaptation_enforced): the rate enforcement. Rate Enforcement prevents one user from using an inequitable share of the network's resources by ensuring that user traffic follows the provisioned CIR and EIR rates. If set to 1, the rate enforcement was provisioned "on". If set to 0, the rate enforcement was provisioned "off".

UNI (flags_calledUni): If set to 1, the interface is UNI. If set to 0, the interface is NNI.

flags_calledFramesOrSegments (DPN): If set to 1, the accounting record contains frame counts. If set to 0, the accounting record contains segment counts.

AC (flags_calledAbit): If set to 1, the A-bit to or from the interface was changed on the interface during the current accounting period. If set to 0, the A-bit was not changed.

calledCir: The called end provisioned CIR (Committed Information Rate). It is rounded to the next 800 bits per second.

calledEir: The called end provisioned EIR (Excess Information Rate). It is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.

calledEgressBytes: The total number of bytes received at the called end dlci. This is the number of bytes sent by frameRelay dlci to the application. With no congestion and no errors, this number will be equal to the total number of ingress bytes (*callingIngressBytes*) at the calling end of vc connection. The value for this field is metered at point E as shown in "Accounting meter reference points" (page 126).

calledIngressBytes: The total number of bytes sent at the called end dlci. This is the number of bytes sent by the application to frameRelay dlci. With no congestion and no errors, this number will be equal to the total number of egress bytes (*callingEgressBytes*) at the calling end of vc connection. Only good frames are passed to dlci from the application. The frames discarded due to CRC error are not included in this count. It

does include the count *calledDiscardBytes*. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 126).

calledEirEgressBytes: The total number of EIR bytes received from the network at the called end with discard eligibility bit set. This total is included in the value of *calledEgressBytes* at the called end of the connection. Note that discard eligibility bit can be set by application or by frameRelay. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 126).

calledEirIngressBytes: The total number of EIR bytes sent to the network at the called end from application to frameRelay dlcI. This total is included in *calledIngressBytes* value. It is the number of bytes or frames that have the discard eligibility bit set by the application. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 126).

calledEgressFrames and **calledEgressSegments:** The total number of frames/segments sent at the called end. This is the total number of frames/segments sent by frameRelay dlcI to the application. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses *flags_calledFramesOrSegments* to determine whether this count reports frames or segments. The value for this field is metered at point E as shown in “Accounting meter reference points” (page 126).

calledIngressFrames and **calledIngressSegments:** The total number of frames/segments sent at the called end. This is the number of frames/segments sent by the application to frameRelay dlcI. The frames discarded due to CRC error are not included in this count. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. The value for this field is metered at point A as shown in “Accounting meter reference points” (page 126).

calledEirEgressFrames or **calledEirEgressSegments:** The total number of EIR frames/segments received at the called end. This is the total number of frames/segments received by frameRelay dlcI from the

network with discard eligibility bit set. This number is included in *calledEgressFrames/calledEgressSegments*. Note that discard eligibility bit can be set by application or by frameRelay. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses *flags_calledFramesOrSegments* to determine whether this count reports frames or segments. The value for this field is metered at point D as shown in “Accounting meter reference points” (page 126).

calledEirIngressFrames or **calledEirIngressSegments**: The total number of EIR frames/segments sent to the network at the called end. This is the total number of frames/segments sent by frameRelay dlci to the network with discard eligibility bit set. Note that discard eligibility bit can be set by application or by frame relay. Frames or segments to be counted is provisioned as attribute *unitsCounted* in the *ModuleData VirtualCircuitSystem* component. A billing system uses *flags_calledFramesOrSegments* to determine whether this count reports frames or segments. The value for this field is metered at point C as shown in “Accounting meter reference points” (page 126).

calledDiscardedFrames or **calledDiscardedSegments**: The number of Ingress frames/segments discarded at the called end for the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 126).

calledDiscardedBytes: The number of Ingress bytes discarded at the called end for the following reasons: A-Bit is off, Ingress frame is too long, Ingress frame is too short, or discarded due to rate enforcement. The value for this field is metered at point B as shown in “Accounting meter reference points” (page 126).

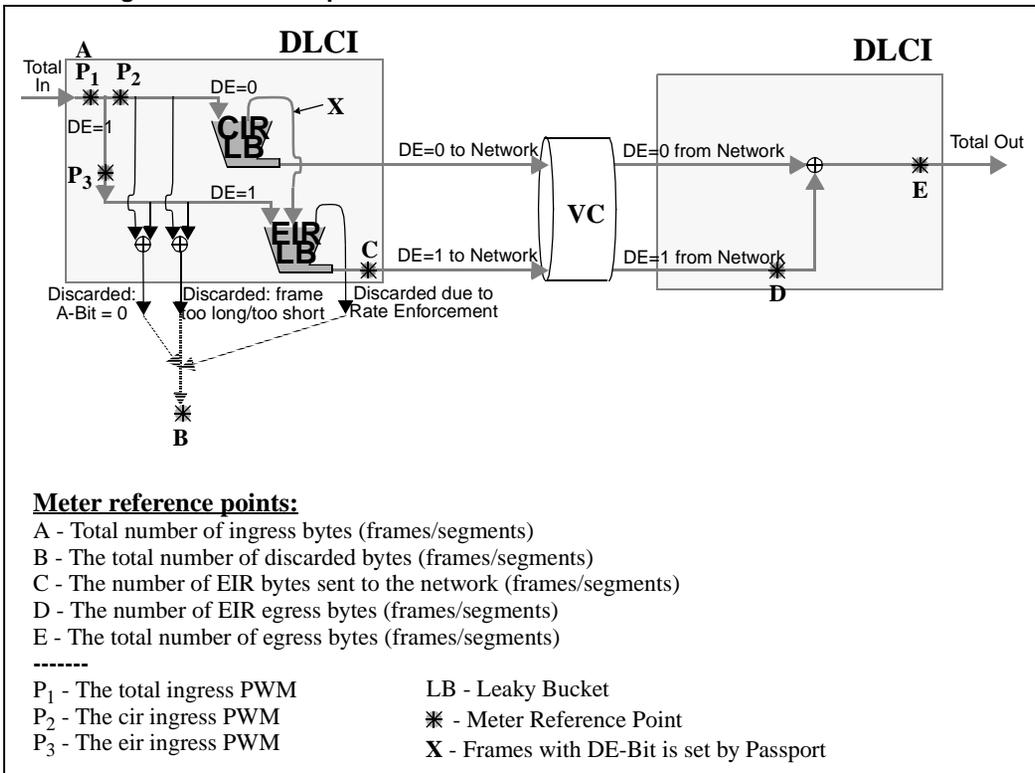
calledTransferPriority: The transfer priority is a preference specified by an application according to its time-sensitivity requirement. Frames with high transfer priority are served by the network before the frames with normal priority. The transfer priority standard is defined to have 16 levels from 0 to 15, with 0 denoting the lowest priority and 15 the highest.

Accounting meter reference points

The traffic at a DLCI or a VC is metered at reference points as shown in “Accounting meter reference points” (page 126). Although traffic is only shown in one direction in the diagram, the same metering of the DLCI-VC-DLCI set is done in both directions.

Note: “Accounting meter reference points” (page 126) only depicts traffic metering reference points at which accounting data is collected. In addition to values collected by the accounting meter, real-time statistics contains other data, such as the number of bytes/frames discarded when A-Bit is off, the number of frames discarded due to the frame being too short, the number of bytes/frames discarded due to the frame being too long, or the number of bytes/frames discarded due to rate enforcement.

Figure 10
Accounting meter reference points



Customized accounting information option

The customized accounting information option provides from 0 to 63 bytes of call information that usually comes from an off-network database. The data format is network specific. It can be in any format defined in the database providing the information. Currently, this information can be supplied by CSTIP databases that support customized accounting information. The output format of the customized accounting information is a hexadecimal string.

customAccInfo: is a variable length field with between 0 to 63 bytes of customized accounting information.

Chapter 3

Passport BDF accounting records

This section describes Passport BDF accounting records:

- “Time change” (page 130)
- “Frame relay” (page 133)
- “ATM” (page 168)
- “FR-ATM” (page 190)
- “Voice networking” (page 201)
- “MPANL voice” (page 216)
- “IP VPN” (page 229)

The BDF conversion of Passport accounting records uses schema files to interpret the binary switch data. A schema file is required for each record type of a data type generated by each switch type. Schema files cannot be modified.

The BDF conversion of Passport accounting records also uses record description files (RDF) to specify the record format of the converted metric data. RDFs are used to control which fields are converted and their field position in the converted record. RDFs can be modified using the MDP Administration Client; see 241-6001-309 *Preside MDM Management Data Provider User Guide*

Note: Nortel Networks recommends the customization of BDF records. Customizing BDF record content ensures that only those fields required by down-stream processing (billing and performance analysis

applications) are converted and transferred. Depending on your requirements, BDF record customization can provide substantial MDP performance gains.

The terms *calling* and *called* are used as part of some of the field names. The term *calling* end refers to that part of the switch interface that initiated the call request. The term *called* end refers to that part of the switch interface that received the call request. For permanent virtual circuits (PVCs), the Master end initiated the call. For switched virtual circuits (SVCs), the calling device initiated the call.

Time change

Time change records describe a change of time on the switch. If the time on the switch is adjusted by 2 seconds, or more, a time change record is issued and sent as part of the accounting stream. The time change record tracks clock changes on the switch and can be used to explain potential inconsistencies in accounting records.

New accounting records are generated if the time change skips over the time set in Time of Day Accounting (TODA). For example, if TODA is set to 15:00 hours and the time change goes from 14:59 to 15:05, new accounting records are generated. The TODA time is defined in the collectionTimes attribute of the Collector/Accounting component.

“Time change fields” (page 130) describes the Passport accounting fields applicable to Passport BDF Time change accounting records.

Table 24
Time change fields

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).

(Sheet 1 of 3)

Table 24 (continued)
Time change fields

Field name	Field type	Field value	Field description
recordIdentifier	int	always = 6	Identifies this record as being a time change record.
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
oldDate	time		<p>This is the previous date and time on this Passport.</p> <p>Uses a format YYYYMMDDThmmss, where: YYYY indicates the year, MM is for the month, DD is for the day, T indicates the beginning of the time data, hh is for the hour, mm is for the minute, and ss is for the seconds. May also contain a format of YYYYMMDDThmmss.iiiiii, where: iiiiiii is for the microseconds.</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 2 of 3)			

Table 24 (continued)
Time change fields

Field name	Field type	Field value	Field description
newDate	time		<p>This is the new date and time on this Passport.</p> <p>Uses a format YYYYMMDDThhmmss, where: YYYY indicates the year, MM is for the month, DD is for the day, T indicates the beginning of the time data, hh is for the hour, mm is for the minute, and ss is for the seconds. May also contain a format of YYYYMMDDThhmmss.iiiiii, where: iiiiii is for the microseconds.</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
namsId	int		The namsID of the Passport that generated this record.

(Sheet 3 of 3)

Frame relay

This section describes the fields applicable to Passport frame relay accounting records.

In normal conditions, the calling end generates both the calling and the called records, and the called end does not generate any records. In unusual circumstances, such as when the trunk is down, the calling end generates both calling and called records, and the called end also generates both calling and called records. However, the remote (called) fields may be accurate only up to the last count exchange, which could take place up to 15 minutes prior.

Note: Byte counts in this section do not include bytes from the frame header, frame trailer, DLCI header, and CRC.

For more information about accounting record generation, see 241-5701-900 *Passport 7400, 15000, 20000 Frame Relay UNI Guide*.

Peak Water Mark (PWM)

This record contains Peak Water Mark (PWM) fields that record the peak byte usage on the network side of the interface when Time of Day Accounting (TODA) is provisioned.

Consider the following:

- If TODA is not running, peak water mark fields are not included in the accounting record.
- You can select the peak water mark monitoring interval period in the modulewide provisioning data component.
- For each DLCI, the peak byte usage for CIR, EIR, and total traffic, as well as the interval in which the peak occurs are recorded. The terms *calling* and *called* refer to the interface at the calling and called end on the connection.
- The peak water mark fields can be used to validate the provisioned value of CIR and EIR against actual usage, resulting, possibly, in the re-engineering of the provisioned parameters. The frame header, frame trailer, DLCI header and CRC bytes are not included. LMI frames are also not included.

- When you use DE=0 or DE=1 traffic, but not both, the total peak water mark byte counts are the same as the CIR byte counts or the EIR byte counts.

“Frame relay” (page 134) describes the frame relay BDF fields.

Table 25
Frame relay

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
(Sheet 1 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
recordIdentifier	int	0=gvcVintage4 1=frsVintage4 2=frsLocalCounts 3=frsLocalAndRemoteCounts 4=frsShortLocalCounts 5=frsShortLocalAndRemoteCounts 100=PVC interworking 101=SVC interworking 103=IpConnection	<p>Identifies the type of Passport frame relay accounting record.</p> <p>gvcVintage4 is the fixed part of a record for VC.</p> <p>frsVintage4 is the fixed part of a record for frame relay. This record is generated when egressAccounting is set to 'no'.</p> <p>frsLocalCounts - this record is generated when egressAccounting is set to 'yes', but the egress protocol is not running. This record includes the fixed part and a local snapshot.</p> <p>frsLocalAndRemoteCounts - this record is generated when the egress protocol is running. This record has the fixed part and local (calling) and remote (called) snapshots.</p> <p>frsShortLocalCounts - this record is obsolete and will not be generated.</p> <p>frsShortLocalAndRemoteCounts - this record is obsolete and will not be generated.</p> <p>PVC interworking is an accounting record for a PVC between Passport and BNX frame relay interfaces across an IP backbone. This record is generated for BNX interworking connections when egressAccounting is set to 'yes'.</p> <p>SVC interworking - this record is obsolete and will not be generated.</p> <p>IpConnection is an accounting record for an IP-optimized DLCI.</p>

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callType_gateway	bit	0 = not a Gateway 1 = is a Gateway	Indicates whether or not this call terminates at a gateway. Not applicable to type 100 or 101 records.
callType_localNetwork	bit	0 = not a Gateway 1 = is a Gateway	Indicates whether or not this call originates at a gateway. Not applicable to type 100 or 101 records.
callReferenceNumber	int	T = 0 (SVC) T = 1 (PVC) century/year or month/day or hour/minutes	A random number based on date and time. This call identifier is generated when the in-service PE becomes in-service. The significant byte is set to seconds as generated by the current date/time of the PE. The callReferenceNumber is incremented for each outgoing call.
callingNodeIdentifier	int	256 - 49151	This attribute identifies the calling (originating) node (Passport) by a unique number assigned to each node in the ModuleData component. (In Dpn it is named NamsId).
callingCustomerIdentifier	int	0 - 8191	An optional identifier for the calling end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.
(Sheet 3 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingPortIdentifier	int	0 - 65535	The function processor number used by the service issuing the accounting record for the calling (originating) part of the call. If the port information is from DPN, then the pe, port and pi numbers are encoded as 5, 5, 6 bits..
callingNpi	int	0=X.121 1=E.164 other=undefined	The Numbering Plan Indicator indicates the numbering plan used in the calling address.
callingAddress	bcd		The calling address (DNA) of the call. This field is 0-15 digits in length and is left-justified with trailing zeroes.
callingDlci	int	0 - 4095 Frame Relay: 16 - 1007	The Logical Channel Number of the calling end.
calledNodeIdentifier	int	256 - 49151	This attribute identifies the called (terminating) node (Passport) by a unique number assigned to each node in the ModuleData component. (In Dpn it is named Namslid).
(Sheet 4 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledCustomerIdentifier	int	0 - 8191	An optional identifier for the called end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.
calledPortIdentifier	int	0 - 65535	The function processor number used by the service issuing the accounting record for the called (terminating) part of the call. If the port information is from DPN, then the pe, port and pi numbers are encoded as 5, 5, 6 bits..
calledNpi	int	0=X.121 1=E.164 other=undefined	The Numbering Plan Indicator indicates the numbering plan used in the called address.
calledAddress	bcd		The called address (DNA) of the call. This field is 0-15 digits in length and is left-justified with trailing zeroes.
calledDlci	int	0 - 4095 Frame Relay: 16 - 1007	The Logical Channel Number of the called end.
(Sheet 5 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
segmentSizeIndex	int	0 - 16	The segment size index provisioned on the module. It is used to calculate the number of segments sent and received in the accounting record. Two to the power of segmentSizeIndex is equal to the segment size (in bytes) provisioned in the VirtualCircuitSystem component. For example, if the segment size is 128, then segmentSizeIndex is 7.
clearCause	int	160 = network congestion 176 = timer expired at the TODA 177 = remote user clear 180 = remote process error	Indicates the reason for a call termination. For more information, see 241-5701-900 <i>Passport 7400, 15000, 20000 Frame Relay UNI Guide</i> .
diagnosticCode	int		This is the clear diagnostic indicator. It is set to zero (0) on non-final records, and to the network diagnostic code of the call clear on the final record. For more information, see 241-5701-900 <i>Passport 7400, 15000, 20000 Frame Relay UNI Guide</i> .
callingCir	int		The calling end provisioned CIR (Committed Information Rate). This rate is rounded up to the next 800 bits per second.
callingEir	int		The calling end provisioned EIR (Excess Information Rate). This rate is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.
(Sheet 6 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingServiceType	int	0 - 255	Indicates the service supported by the port used by the calling end-user. For transit/incoming X.75 SVC calls, the calling service type information is valid only if the calling tariff is absent from the accounting record. This number is defined as accountClass in the DNA component.
callingCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
callingCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
callingCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
callingCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
callingCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the calling end.
callingDse	int	0 - 255	The Data Service Exchange (DSE) of the calling end. For transit/incoming X.75 SVC calls, the calling DSE information is valid only if the calling tariff is absent from the accounting record. DSE is defined in the DNA component.
callingRateAdaptation_provisioned	bit	0 = off 1 = on OR "EIR only"	Rate adaptation is a congestion control mechanism. This value is provisioned. Rate adaptation can only be turned on if rate enforcement is also turned on.
callingRateAdaptation_occurred	bit	0 = none 1 = occurred	Indicates rate adaptation occurrences on the interface.

(Sheet 7 of 34)

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingRateAdaptation_enforced	bit	0 = off 1 = on	Rate Enforcement prevents one user from using an inequitable share of the networks resources by ensuring that user traffic follows the provisioned CIR and EIR rates. This value is provisioned.
callingClassOfService_emissionPriority	bit	0 = normal 1 = high	The emission priority allows you to choose between two distinct classes of services. This value is provisioned.
calledCir	int		The called end provisioned CIR (Committed Information Rate). This rate is rounded up to the next 800 bits per second.
calledEir	int		The called end provisioned EIR (Excess Information Rate). This rate is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.
calledServiceType	int	0 - 255	Indicates the service supported by the port used by the called end-user. For transit/outgoing X.75 SVC calls, the called service type information is valid only if the called tariff is absent from the accounting record. This number is defined as accountClass in the DNA_CUG envelope.
calledCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
calledCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
calledCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
calledCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
(Sheet 8 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the called end.
calledDse	int	0 - 255	The Data Service Exchange (DSE) of the called end. For transit/outgoing X.75 SVC calls, the calling DSE information is valid only if the called tariff is absent from the accounting record. DSE is defined in the DNA component.
calledRateAdaptation_provisioned	bit	0 = off 1 = on	Rate adaptation is a congestion control mechanism. This value is provisioned. Rate adaptation can only be turned on if rate enforcement is also turned on.
calledRateAdaptation_occurred	bit	0 = none 1 = occurred	Indicates rate adaptation occurrences on the interface.
calledRateAdaptation_enforced	bit	0 = off 1 = on	Rate Enforcement prevents one user from using an inequitable share of the networks resources by ensuring that user traffic follows the provisioned CIR and EIR rates. This value is provisioned.
calledClassOfService_emissionPriority	bit	0 = normal 1 = high	The emission priority allows you to choose between two distinct classes of services. This value is provisioned.
flags_calledEndCharging	bit	0 = calling end 1 = called end	Indicates to which end the call is charged.
flags_highPriority	bit	0 = normal 1 = high	Indicates the call priority.
flags_pvcType	bit	0 = SVC 1 = PVC	Indicates if call is SVC or PVC.
flags_hunted	bit	0 = not hunted 1 = hunted	Indicates if call has been hunted or not.
flags_redirected	bit	0 = not redirected 1 = redirected	Indicates if call has been redirected or not.
(Sheet 9 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
flags_calledGenerated	bit	SVC: 0 = calling end 1 = called end PVC: 0 = master end 1 = slave end	Indicates which end generated this call accounting record.
flags_calledCleared	bit	0 = calling end 1 = called end	The callCleared bit is initialized to 0 on the calling end and initialized to 1 on the called end. If the call is cleared on the local switch, that switch retains its value for the callCleared bit and sends a disconnect message to the other end. When a switch receives a disconnect message, the switch takes the value for the callCleared flag from the remote end.
flags_unique	bit	0 = possible duplicate 1 = no duplicate	Indicates the possible duplication of a call accounting record, or confirms that only one end of a call generated an accounting record. If set to 0, the generation mode is set to both ends.
flags_reachedDataTransfer	bit	0 = does not reach data transfer at both ends 1 = reached data transfer at both ends	Indicates data transfer state.
flags_collReasonValid	bit	0 = invalid 1 = valid	Indicates validity of called end collection reasons. Set to 0 if other end not responding (for example, connection clears due to trunk or remote node failure).
flags_userDataInCallReq	bit	0 = no user data 1 = user data	Indicates if user data on call request is available.
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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
flags_callingUni	bit	0 = NNI 1 = UNI	Indicates a user-network or network-network interface.
flags_calledUni	bit	0 = NNI 1 = UNI	Indicates a user-network or network-network interface.
flags_callingAbit	bit	0 = no change 1 = changed	Indicates whether or not the A-bit to or from the interface was changed on the interface during the current accounting period.
flags_calledAbit	bit	0 = no change 1 = changed	Indicates whether or not the A-bit to or from the interface was changed on the interface during the current accounting period.

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
startTime	time		<p>This is the start time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain a YYYYMMDDThhmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T0000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p> <p>For SVC, <i>startTime</i> is the time when the call request packet was created. For PVC, <i>startTime</i> is set by the Master VC when the master call request is formatted. On subsequent accounting records, <i>startTime</i> corresponds to the end time of the previous record. If Time of Day Accounting (TODA) is used, <i>startTime</i> (and <i>endTime</i>) correspond to times set in the schedule.</p>
(Sheet 12 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
endTime	time		<p>This is the end time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY indicates the year, MM is for the month, DD is for the day, T indicates the beginning of the time data, hh is for the hour, mm is for the minute, and ss is for the seconds. May also contain a format of YYYYMMDDThhmmss.iiiiii, where: iiiiiii is for the microseconds.</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p> <p>If Time of Day Accounting (TODA) is used, <i>endTime</i> in non-final records is the time of the TODA period. For 12-hour accounting, <i>endTime</i> in non-final records is the time when the 12-hour timer expires at the charged end. On final accounting records, <i>endTime</i> is the time when the disconnect packet is first received.</p>

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
endTime (continued)			If Time of Day Accounting (TODA) is used, <i>endTime</i> (and <i>startTime</i>) correspond to times set in the schedule (provisioned on the Passport switch with the <i>Collector/accounting</i> component and the <i>collectionTimes</i> attribute).
elapsedTime	int		Duration of the call in 0.1 second increments. This time interval is started when the call request is processed. If the call does not reach the data transfer stage, <i>elapsed time</i> is set to zero. <i>Elapsed time</i> represents a true measure of the accounting period. It is measured independently of <i>startDateTime</i> and <i>endTime</i> . Since <i>startDateTime</i> and <i>endTime</i> can be changed externally by adjusting the clock, <i>elapsed time</i> can be shorter or longer than the difference between <i>startDateTime</i> and <i>endTime</i> . This difference can show as much as 60 seconds on accounting records for the VCs that are idle (carry no traffic) and when TODA is used and is caused, in this case, by an internal TODA detection mechanism. When the 12-hour accounting period is complete, <i>elapsed time</i> is exact or differs by a few seconds from 12 hour duration.
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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingEgressBytes	L_int		The total number of bytes received at the calling end dlcI. This is the number of bytes sent by frameRelay dlcI to the application. With no congestion and no errors, this number is equal to the total number of ingress bytes (<i>calledIngressBytes</i>) at the called end of vc connection.
callingIngressBytes	L_int		The total number of bytes sent at the calling end dlcI. This is the number of bytes sent by the application to frameRelay dlcI. With no congestion and no errors, this number is equal to the total number of egress bytes (<i>calledEgressBytes</i>) at the called end of vc connection. Only good frames are passed to dlcI from the application. The frames discarded due to CRC error are not included in this count. This number does include the count <i>callingDiscardBytes</i> .
callingEgressFrames			The total number of frames sent at the calling end. This is the total number of frames sent by frameRelay dlcI to the application. Frames to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
(Sheet 15 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingIngressFrames	L_int		The total number of frames sent at the calling end. This is the number of frames sent by the application to frameRelay dcli. The frames discarded due to CRC error are not included in this count. Frames to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
callingEgressSegments	L_int		The total number of segments sent at the calling end. This is the total number of segments sent by frameRelay dcli to the application. Segments to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
callingIngressSegments	L_int		The total number of segments sent at the calling end. This is the number of segments sent by the application to frameRelay dcli. Segments to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
callingEirEgressBytes	L_int		The total number of EIR bytes received from the network at the calling end with discard eligibility bit set. This total is included in the value of <i>callingEgressBytes</i> at the called end of the connection. The discard eligibility bit can be set by the application or by frame relay.

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingEirIngressBytes	L_int		The total number of EIR bytes sent to the network at the calling end from the application to the frame relay dlcI. This total is included in <i>callingIngressBytes</i> value. This field includes the number of bytes or frames that have the discard eligibility bit set by the application.
callingEirEgressFrames	L_int		The total number of EIR frames received at the calling end. This is the total number of frames received by frameRelay dlcI from the network with the discard eligibility bit set. This number is included in <i>callingEgressFrames</i> . The discard eligibility bit can be set by application or by frameRelay. Frames to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
callingEirIngressFrames	L_int		The total number of EIR frames sent to the network at the calling end. This is the total number of frames sent by frameRelay dlcI to the network with the discard eligibility bit set. The discard eligibility bit can be set by application or by frameRelay. Frames to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingEirEgressSegments	L_int		The total number of EIR segments received at the calling end. This is the total number of segments received by frameRelay dcli from the network with the discard eligibility bit set. This number is included in <i>callingEgressSegments</i> . The discard eligibility bit can be set by application or by frameRelay. Segments to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
callingEirIngressSegments	L_int		The total number of EIR segments sent to the network at the calling end. This is the total number of segments sent by frameRelay dcli from the network with the discard eligibility bit set. The discard eligibility bit can be set by application or by frameRelay. Segments to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
callingDiscardedBytes	L_int		The number of Ingress bytes discarded at the calling end for one of the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short.

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingDiscardedFrames	L_int		The number of Ingress frames discarded at the calling end for one of the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short.
callingDiscardedSegments	L_int		The number of Ingress segments discarded at the calling end for one of the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short.
calledEgressBytes	L_int		The total number of bytes received at the called end dlcI. This is the number of bytes sent by frameRelay dlcI to the application. With no congestion and no errors, this number is equal to the total number of ingress bytes (<i>callingIngressBytes</i>) at the calling end of vc connection.
calledIngressBytes	L_int		The total number of bytes sent at the called end dlcI. This is the number of bytes sent by the application to frameRelay dlcI. With no congestion and no errors, this number is equal to the total number of egress bytes (<i>callingEgressBytes</i>) at the calling end of vc connection. Only good frames are passed to dlcI from the application. The frames discarded due to CRC error are not included in this count. This number does include the count <i>calledDiscardBytes</i> .
(Sheet 19 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledEgressFrames			The total number of frames sent at the called end. This is the total number of frames sent by frameRelay dcli to the application. Frames to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
calledIngressFrames	L_int		The total number of frames sent at the called end. This is the number of frames sent by the application to frameRelay dcli. The frames discarded due to CRC error are not included in this count. Frames to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
calledEgressSegments	L_int		The total number of segments sent at the called end. This is the total number of segments sent by frameRelay dcli to the application. Segments to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
calledIngressSegments	L_int		The total number of segments sent at the called end. This is the number of segments sent by the application to frameRelay dcli. Segments to be counted are provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledEirEgressBytes	L_int		The total number of EIR bytes received from the network at the called end with discard eligibility bit set. This total is included in the value of <i>calledEgressBytes</i> at the called end of the connection. The discard eligibility bit can be set by the application or by frame relay.
calledEirIngressBytes	L_int		The total number of EIR bytes sent to the network at the called end from the application to the frame relay dcli. This total is included in <i>calledIngressBytes</i> value. This field includes the number of bytes or frames that have the discard eligibility bit set by the application.
calledEirEgressFrames	L_int		The total number of EIR frames received at the called end. This is the total number of frames received by frameRelay dcli from the network with the discard eligibility bit set. This number is included in <i>calledEgressFrames</i> . The discard eligibility bit can be set by application or by frameRelay. Frames to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
(Sheet 21 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledEirIngressFrames	L_int		The total number of EIR frames sent to the network at the called end. This is the total number of frames sent by frameRelay dlcI to the network with the discard eligibility bit set. The discard eligibility bit can be set by application or by frameRelay. Frames to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
calledEirEgressSegments	L_int		The total number of EIR segments received at the called end. This is the total number of segments received by frameRelay dlcI from the network with the discard eligibility bit set. This number is included in <i>calledEgressSegments</i> . The discard eligibility bit can be set by application or by frameRelay. Segments to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.
calledEirIngressSegments	L_int		The total number of EIR segments sent to the network at the called end. This is the total number of segments sent by frameRelay dlcI from the network with the discard eligibility bit set. The discard eligibility bit can be set by application or by frameRelay. Segments to be counted is provisioned as attribute <i>unitsCounted</i> in the <i>ModuleData VirtualCircuitSystem</i> component.

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledDiscardedBytes	L_int		The number of Ingress bytes discarded at the called end for one of the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short.
calledDiscardedFrames	L_int		The number of Ingress frames discarded at the called end for one of the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short.
calledDiscardedSegments	L_int		The number of Ingress segments discarded at the called end for one of the following reasons: rate enforcement, A-Bit is off, Ingress frame is too long, or Ingress frame is too short.
callingTotalPwmBytes	L_int		The calling end peak water mark for the total number of ingress bytes. This peak occurs at the interval <i>callingTotalPwmIntervalNumber</i> . If the value of this attribute is zero (no traffic), <i>callingTotalPwmIntervalNumber</i> is also zero.
(Sheet 23 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingEirPwmBytes	L_int		The calling end peak water mark for the number of ingress bytes carried on frames with DE-bit = 1. The DE-bit is set by the users equipment. This peak occurs at the interval <i>callingEirPwmIntervalNumber</i> . If the value of this attribute is zero (no traffic), <i>callingEirPwmIntervalNumber</i> is also zero.
callingCirPwmBytes	L_int		The calling end peak water mark for the number of ingress bytes carried on frames with DE-bit = 0. The DE-bit is set by the users equipment. This peak occurs at the interval <i>callingCirPwmIntervalNumber</i> . If the value of this attribute is zero (no traffic), <i>callingCirPwmIntervalNumber</i> is also zero.
calledTotalPwmBytes	L_int		The called end peak water mark for the total number of ingress bytes. This peak occurs at the interval <i>calledTotalPwmIntervalNumber</i> . If the value of this attribute is zero (no traffic), <i>calledTotalPwmIntervalNumber</i> is also zero.
(Sheet 24 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledEirPwmBytes	L_int		The called end peak water mark for the number of ingress bytes carried on frames with DE-bit = 1. The DE-bit is set by the users equipment. This peak occurs at the interval <i>calledEirPwmIntervalNumber</i> . If the value of this attribute is zero (no traffic), <i>calledEirPwmIntervalNumber</i> is also zero.
calledCirPwmBytes	L_int		The called end peak water mark for the number of ingress bytes carried on frames with DE-bit = 0. The DE-bit is set by the users equipment. This peak occurs at the interval <i>calledCirPwmIntervalNumber</i> . If the value of this attribute is zero (no traffic), <i>calledCirPwmIntervalNumber</i> is also zero.

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingTotalPwmInterval Number	int		<p>The number of the PWM (peak water mark) interval in which the <i>callingTotalPwmBytes</i> occurred.</p> <p>If no traffic is sent (<i>callingTotalPwmBytes</i> is zero), the value of this attribute is also zero. The maximum possible value is 720 if <i>peakWaterMarkInterval</i> is set to one minute and the accounting period measured is 12 hours.</p> <p>Normally, the value of this attribute starts at one. The value is relative to the <i>collectionTimes</i> attribute, together with the <i>peakWaterMarkInterval</i> attribute in the <i>Collector</i> component. For example, if <i>collectionTimes</i> is set to 16:00 and the value of <i>callingTotalPwmIntervalNumber</i> is reported as four and the attribute <i>peakWaterMarkInterval</i> in the <i>Collector</i> component is set to 5 minutes, then peak traffic happened between 16:15 and 16:20.</p>
(Sheet 26 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingEirPwmInterval Number	int		<p>The number of the PWM (peak water mark) interval in which the <i>callingEirPwmBytes</i> occurred.</p> <p>If no traffic is sent (<i>callingEirPwmBytes</i> is zero), the value of this attribute is also zero. The maximum possible value is 720 if <i>peakWaterMarkInterval</i> is set to one minute and the accounting period measured is 12 hours.</p> <p>Normally, the value of this attribute starts at one. The value is relative to the <i>collectionTimes</i> attribute, together with the <i>peakWaterMarkInterval</i> attribute in the <i>Collector</i> component. For example, if <i>collectionTimes</i> is set to 16:00 and the value of <i>callingEirPwmIntervalNumber</i> is reported as four and the attribute <i>peakWaterMarkInterval</i> in the <i>Collector</i> component is set to 5 minutes, then peak traffic happened between 16:15 and 16:20.</p>
(Sheet 27 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
callingCirPwmInterval Number	int		<p>The number of the PWM (peak water mark) interval in which the <i>callingCirPwmBytes</i> occurred.</p> <p>If no traffic is sent (<i>callingCirPwmBytes</i> is zero), the value of this attribute is also zero. The maximum possible value is 720 if <i>peakWaterMarkInterval</i> is set to one minute and the accounting period measured is 12 hours.</p> <p>Normally, the value of this attribute starts at one. The value is relative to the <i>collectionTimes</i> attribute, together with the <i>peakWaterMarkInterval</i> attribute in the <i>Collector</i> component. For example, if <i>collectionTimes</i> is set to 16:00 and the value of <i>callingCirPwmIntervalNumber</i> is reported as four and the attribute <i>peakWaterMarkInterval</i> in the <i>Collector</i> component is set to 5 minutes, then peak traffic happened between 16:15 and 16:20.</p>
(Sheet 28 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledTotalPwmInterval Number	int		<p>The number of the PWM (peak water mark) interval in which the <i>calledTotalPwmBytes</i> occurred.</p> <p>If no traffic is sent (<i>calledTotalPwmBytes</i> is zero), the value of this attribute is also zero. The maximum possible value is 720 if <i>peakWaterMarkInterval</i> is set to one minute and the accounting period measured is 12 hours.</p> <p>Normally, the value of this attribute starts at one. The value is relative to the <i>collectionTimes</i> attribute, together with the <i>peakWaterMarkInterval</i> attribute in the <i>Collector</i> component. For example, if <i>collectionTimes</i> is set to 16:00 and the value of <i>calledTotalPwmIntervalNumber</i> is reported as four and the attribute <i>peakWaterMarkInterval</i> in the <i>Collector</i> component is set to 5 minutes, then peak traffic happened between 16:15 and 16:20.</p>
(Sheet 29 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledEirPwmInterval Number	int		<p>The number of the PWM (peak water mark) interval in which the <i>calledEirPwmBytes</i> occurred.</p> <p>If no traffic is sent (<i>calledEirPwmBytes</i> is zero), the value of this attribute is also zero. The maximum possible value is 720 if <i>peakWaterMarkInterval</i> is set to one minute and the accounting period measured is 12 hours.</p> <p>Normally, the value of this attribute starts at one. The value is relative to the <i>collectionTimes</i> attribute, together with the <i>peakWaterMarkInterval</i> attribute in the <i>Collector</i> component. For example, if <i>collectionTimes</i> is set to 16:00 and the value of <i>calledEirPwmIntervalNumber</i> is reported as four and the attribute <i>peakWaterMarkInterval</i> in the <i>Collector</i> component is set to 5 minutes, then peak traffic happened between 16:15 and 16:20.</p>
(Sheet 30 of 34)			

Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledCirPwmInterval Number	int		<p>The number of the PWM (peak water mark) interval in which the <i>calledCirPwmBytes</i> occurred.</p> <p>If no traffic is sent (<i>calledCirPwmBytes</i> is zero), the value of this attribute is also zero. The maximum possible value is 720 if <i>peakWaterMarkInterval</i> is set to one minute and the accounting period measured is 12 hours.</p> <p>Normally, the value of this attribute starts at one. The value is relative to the <i>collectionTimes</i> attribute, together with the <i>peakWaterMarkInterval</i> attribute in the <i>Collector</i> component. For example, if <i>collectionTimes</i> is set to 16:00 and the value of <i>calledCirPwmIntervalNumber</i> is reported as four and the attribute <i>peakWaterMarkInterval</i> in the <i>Collector</i> component is set to 5 minutes, then peak traffic happened between 16:15 and 16:20.</p>
originalNpi	int	0=X.121 1=E.164 other=undefined	This Numbering Plan Indicator indicates the numbering plan used in the original called address.
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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
originalAddress	bcd		This field includes the number of digits in this field (the maximum is 15 digits) and the original called address (DNA). originalAddress is the calledAddress before the DTE address was modified. This field includes the DNIC (first four digits) for X.121 or Country Code for E.164 address. This field is left-justified with trailing zeroes.
originalServiceType	int	0 - 255	The service supported by the calling end port. This value is provisioned on each interface <i>Dna</i> as <i>accountClass</i> .
callingTransferPriority	int	0 - 15 Supported by Passport frame relay: 0, 6, 9, 11.	The transfer priority is a preference specified by an application according to its time-sensitivity requirement. Frames with high transfer priority are served by the network before the frames with normal priority. The frame relay transfer priority in Passport determines characteristics: trunk queue (among interrupting, delay, throughput), routing metric (between delay and throughput) and frame relay egress queues (between high and normal priority).
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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
calledTransferPriority	int	0 - 15 Supported by Passport frame relay: 0, 6, 9, 11.	The transfer priority is a preference specified by an application according to its time-sensitivity requirement. Frames with high transfer priority are served by the network before the frames with normal priority. The frame relay transfer priority in Passport determines characteristics: trunk queue (among interrupting, delay, throughput), routing metric (between delay and throughput) and frame relay egress queues (between high and normal priority).

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Table 25 (continued)
Frame relay

Field name	Field type	Field value	Field description
circuitId	string		<p>A unique string, set by the operator, that identifies the call for accounting purposes. Downstream processing uses this attribute to correlate accounting records issued at different nodes in the network.</p> <p>Normally, this attribute is provisioned with the same value at both ends of the connection. This attribute is optional, available for FrUni and FrNni PVCs, and is part of the enhanced accounting data for FrUni and FrNni PVC DLCIs.</p> <p>The default is no call correlation tag against the DLCI.</p> <p>For single sided accounting with the Egress Protocol on, the call correlation tag specifies the call correlation tag value provisioned at the local interface. There is no call correlation tag for the remote DLCI in the record. For double sided accounting, the accounting records generated at each end contain the local call correlation tag value.</p>
callingIpAddress	IP		<p>The calling IP address of the frame relay interface for the connection. The field format is ###.###.###.###.</p>
calledIpAddress	IP		<p>The called IP address for the connection. The field format is ###.###.###.###.</p>
(Sheet 34 of 34)			

ATM

“ATM fields” (page 168) describes the Passport ATM accounting fields.

Table 26
ATM fields

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
recordIdentifier	int	always = 20	Identifies this record as being an ATM accounting record.
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
callConnId	hex	32 characters	This attribute may be used by downstream processing systems to correlate the accounting records issued for the same call at different interfaces (nodes) in the network. For SVCs (switched virtual connections) and S-PVCs (soft permanent virtual connections), the callConnId is generated by the switch and is unique for every call in the network. For PVCs (permanent virtual connections), the callConnId is provisioned in the correlationTag attribute of the AtmIf Vcc Vcd or AtmIf Vpc Vpd component.
callingCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
callingCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
(Sheet 1 of 22)			

Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
callingCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
callingCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
callingCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the calling end.
calledCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
calledCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
calledCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
calledCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
calledCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the called end.
callingServiceType	int	0 - 255	Indicates the service type of the interface that generated the accounting record. The value is provisioned in field <i>accountClass</i> for each ATM interface (under the UNI or IISP component). This field is present only for incoming calls.
calledServiceType	int	0 - 255	Indicates the service type of the interface that generated the accounting record. The value is provisioned in field <i>accountClass</i> for each ATM interface (under the UNI or IISP component). This field is present only for outgoing calls.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
callingDse	int	0 - 255	Defines the Data Service Exchange associated with the ATM interface. This attribute reflects the value provisioned in field <i>serviceExchange</i> of component UNI or IISP. This field is present only for incoming calls.
calledDse	int	0 - 255	Defines the Data Service Exchange associated with the ATM interface. This attribute reflects the value provisioned in field <i>serviceExchange</i> of component UNI or IISP. This field is present only for outgoing calls.
callOrigMethod	int	0 = pt-to-pt 1 = pt-to-mpt 2 = mpt-to-pt 3 = mpt-to-mpt	Indicates call origination characteristics: point-to-point (pt-to-pt), point-to-multipoint (pt-to-mpt), multipoint-to-point (mpt-to-pt), multipoint-to-multipoint (mpt-to-mpt).
callType	int	0 = PVC 1 = PVPC 2 = SVC 3 = SPVC 6 = SVP 7 = SPVP	Indicates the type of call: PVC (permanent virtual connection), PVPC (permanent virtual path connection), SVC (switched virtual connection), SPVC (soft permanent virtual connection), SVP (switched virtual path), or SPVP (soft permanent virtual path).
connPointType	int	0 = originating 1 = intermediate 2 = terminating	Indicates the type of connection point that generated the call record: originating, intermediate or terminating. This field can be used by downstream processing systems when correlating two or more records for the same call.

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
atmInterfaceNumber	int		The number of the ATM interface that generated the accounting record.
callVpi	int		The VPI of the connection point at the interface where the accounting record is generated.
callVci	int		The VCI of the connection point at the interface where the accounting record is generated.
atmCallTermCauseValue	int		The call termination cause value as defined by the ATM Forum UNI 3.1 specification. For non-final records, this value is 0.
callTermInSetup	int		Indicates unsuccessful call attempts.
cellCountValidityFlag	int	0 = invalid 1 = valid	Indicates the validity of the cell counts in this accounting record.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
startTime	time		<p>This is the start time of the period accounted for in the record. The format is YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May also contain YYYYMMDDThhmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In the first accounting record for a call, this field is the time the call was set up. In subsequent records, this field is the time the current accounting collection interval started. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/accounting collectionTimes field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to truncate. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds truncate) and 19970627T000000 displays as 19970627 (all of the time fields are truncated, including the T indicator).</p>

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
endTime	time		<p>This is the end time of the period accounted for in the record. The format is YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is for minute, and ss is seconds. May also contain YYYYMMDDThhmmss.iiiii, where: iiii is microseconds.</p> <p>In non-final accounting records, this field represents the time the current accounting collection interval ended. In the final record for a call, this field represents the time the call was cleared. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/ accounting collectionTimes field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 6 of 22)			

Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
elapsedTime	int		The duration of the accounting interval in 0.1 second increments. This is the true duration of the accounting interval, measured independently of the start and end time (since start time and end time can be affected by the adjustment of the clock, elapsed time can be shorter or longer than the difference between them). For calls terminated in setup the elapsed time is set to 0.
callingNsapAddr	hex		The NSAP address of the calling party. This field is not included for PVC calls.
calledNsapAddr	hex		The NSAP address of the called party. This field is not included for PVC calls.
callingNsapSubAddr	hex		The saved NSAP address of the calling party. This address is restored when leaving the public network.
calledNsapSubAddr	hex		The saved NSAP address of the called party. This address is restored when leaving the public network.
callForwPcrClp0	L_int		The Peak Cell Rate (PCR) for the connection in the forward direction, for high-priority cells (with CLP=0). The value is in cells per second.
callForwPcrClp01	L_int		The Peak Cell Rate (PCR) for the connection in the forward direction, for all cells (with CLP=0 or CLP=1). The value is in cells per second.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
callForwScrClp0	L_int		The Sustained Cell Rate (SCR) for the connection in the forward direction, for high-priority cells (with CLP=0). Holds the minimum cell rate for a call for UBR+ connections. The value is in cells per second.
callForwScrClp01	L_int		The Sustained Cell Rate (SCR) for the connection in the forward direction, for all cells (with CLP=0 or CLP=1). The value is in cells per second.
callForwMbsClp0	L_int		The Maximum Burst Size (MBS) for the connection in the forward direction, for high-priority cells (with CLP=0). The value is in cells per second.
callForwMbsClp01	L_int		The Maximum Burst Size (MBS) for the connection in the forward direction, for all cells (with CLP=0 or CLP=1). The value is in cells per second.
callForwQos	int	0 - unspecified QoS 1 - QoS Class 1 2 - QoS Class 2 3 - QoS Class 3 4 - QoS Class 4	The quality of service (QoS) for the connection in the forward direction. The values conform to the ATM Forum UNI 4.0 specification.
callBackPcrClp0	L_int		The Peak Cell Rate (PCR) for the connection in the backward direction, for high-priority cells (with CLP=0). The value is in cells per second.
(Sheet 8 of 22)			

Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
callBackPcrClp01	L_int		The Peak Cell Rate (PCR) for the connection in the backward direction, for all cells (with CLP=0 or CLP=1). The value is in cells per second.
callBackScrClp0	L_int		The Sustained Cell Rate (SCR) for the connection in the backward direction, for high-priority cells (with CLP=0). Holds the minimum cell rate for a call for UBR+ connections. The value is in cells per second.
callBackScrClp01	L_int		The Sustained Cell Rate (SCR) for the connection in the backward direction, for all cells (with CLP=0 or CLP=1). The value is in cells per second.
callBackMbsClp0	L_int		The Maximum Burst Size (MBS) for the connection in the backward direction, for high-priority cells (with CLP=0). The value is in cells per second.
callBackMbsClp01	L_int		The Maximum Burst Size (MBS) for the connection in the backward direction, for all cells (with CLP=0 or CLP=1). The value is in cells per second.
callBackQos	int	0 - unspecified QoS 1 - QoS Class 1 2 - QoS Class 2 3 - QoS Class 3 4 - QoS Class 4	The quality of service (QoS) for the connection in the backward direction. The values conform to the ATM Forum UNI 4.0 specification.
ingressCellCountClp0	L_int		The number of high priority cells (with CLP=0) received from the link during the accounting period.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
ingressCellCountClp01	L_int		The total number of cells (with CLP=0 or CLP=1) received from the link during the accounting period.
egressCellCountClp0	L_int		The number of high priority cells (with CLP=0) transmitted on the link during the accounting period.
egressCellCountClp01	L_int		The total number of cells (with CLP=0 or CLP=1) transmitted on the link during the accounting period.
ingressDiscardedClp0	L_int		The number of cells or packets (with CLP=0) received from the link and discarded (not transmitted to the switch) during the accounting period. The count is expressed in packets when AAL5 is being used to be consistent with existing operational measurements.
ingressDiscardedClp01	L_int		The total number of cells or packets (with CLP=0 or CLP=1) received from the link and discarded (not transmitted to the switch) during the accounting period. The count is expressed in packets when AAL5 is being used to be consistent with existing operational measurements.
egressDiscardedClp0	L_int		The number of high priority cells or packets (with CLP=0) received from the switch and discarded (not transmitted on the link) during the accounting period. The count is expressed in packets when AAL5 is being used to be consistent with existing operational measurements.

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
egressDiscardedClp01	L_int		The total number of cells or packets (with CLP=0 or CLP=1) received from the switch and discarded (not transmitted on the link) during the accounting period. The count is expressed in packets when AAL5 is being used to be consistent with existing operational measurements.
callTrafficMgmt_tagFwd	bit	0 = disabled 1 = enabled	The traffic management policy in effect for the call in the forward direction: tagging (setting CLP=1) or dropping cells.
callTrafficMgmt_tagBwd	bit	0 = disabled 1 = enabled	The traffic management policy in effect for the call in the backward direction: tagging (setting CLP=1) or dropping cells.
callBestEffort	int	0 = best effort off 1 = best effort on	Indicates if "best effort" was requested in the call setup message.
callingCustomerIdentifier	int	0 - 8191	An optional identifier for the calling end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
calledCustomerIdentifier	int	0 - 8191	An optional identifier for the called end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.
callingNodeIdentifier	int	256 - 49151	This attribute identifies the calling node by a unique number assigned to each node. This value is provisioned in the attribute namsld of the component ModuleData. For SVCs and SPVCs, this attribute is present only for incoming calls. For PVCs, only calledNodeIdentifier is present for both incoming and outgoing calls.
calledNodeIdentifier	int	256 - 49151	This attribute identifies the called node by a unique number assigned to each node. This value is provisioned in the attribute namsld of the component ModuleData. For SVCs and SPVCs, this attribute is present only for outgoing calls. For PVCs, only calledNodeIdentifier is present for both incoming and outgoing calls.
(Sheet 12 of 22)			

Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
minimumCtd	int		<p>The minimum calculated cell transfer delay value for this connection. This field is expressed in units of microseconds. Cell transfer delay is calculated as half of the measured segment round trip delay of a loopback cell.</p> <p>The minimumCtd value is generated for SPVC and SPVP connections if the ctdCalculation attribute of the AtmIf component is on and the segSwitchSideLoopback attribute value is on for the connection.</p> <p>The value is 0 if the switch-side loopback is not functioning.</p>
maximumCtd	int		<p>The maximum calculated cell transfer delay value for this connection. This field is expressed in units of microseconds. Cell transfer delay is calculated as half of the measured segment round trip delay of a loopback cell.</p> <p>The maximumCtd value is generated for SPVC and SPVP connections if the ctdCalculation attribute of the AtmIf component is on and the segSwitchSideLoopback attribute value is on for the connection.</p> <p>The value is 0 if the switch-side loopback is not functioning.</p>

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
averageCtd	int		<p>The average of all calculated cell transfer delay values for this connection. This field is expressed in units of microseconds. Cell transfer delay is calculated as half of the measured segment round trip delay of a loopback cell.</p> <p>The averageCtd value is generated for SPVC and SPVP connections if the ctdCalculation attribute of the AtmIf component is on and the segSwitchSideLoopback attribute value is on for the connection.</p> <p>The value is 0 if the switch-side loopback is not functioning.</p>
sampleSizeCtd	int		<p>The number of loopback cells sampled for cell transfer delay calculations</p> <p>The sampleSizeCtd value is indicated for SPVC and SPVP connections if the ctdCalculation attribute of the AtmIf component is on and the segSwitchSideLoopback attribute value is on for the connection.</p>
IFwdTotalUserCellTxClp0	L_int		<p>The total number of cells (with CLP=0) transmitted from the local side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the link side.</p>
(Sheet 14 of 22)			

Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
IFwdTotalUserCellTxClp01	L_int		The total number of cells (with CLP=0 or CLP=1) transmitted from the local side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the link side.
IFwdTotalUserCellRxClp0	L_int		The total number of cells (with CLP=0) received on the remote side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the link side.
IFwdTotalUserCellRxClp01	L_int		The total number of cells (with CLP=0 or CLP=1) received on the remote side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the link side.
IFwdTotalPmCellDiscard Count	L_int		The total number of Performance Monitoring cells discarded in the forward direction. This value is included if Performance Monitoring is enabled on the link side.
IBwdTotalUserCellTxClp0	L_int		The total number of user cells (with CLP=0) transmitted from the remote side in the backward direction. This value is included if Performance Monitoring is enabled on the link side.
IBwdTotalUserCellTxClp01	L_int		The total number of user cells (with CLP=0 or CLP=1) transmitted from the remote side in the backward direction. This value is included if Performance Monitoring is enabled on the link side.

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
IBwdTotalUserCellRxClp0	L_int		The total number of user cells (with CLP=0) received on the local side in the backward direction. This value is included if Performance Monitoring is enabled on the link side.
IBwdTotalUserCellRxClp01	L_int		The total number of user cells (with CLP=0 or CLP=1) received on the local side in the backward direction. This value is included if Performance Monitoring is enabled on the link side.
IBwdTotalPmCellDiscard Count	L_int		The total number of Performance Monitoring cells discarded in the backward direction. This value is included if Performance Monitoring is enabled on the link side.
IArTotalTime	L_int		The total time, in seconds, used to calculate the Availability Ratio. This value is included if Performance Monitoring is enabled on the link side.
IArAvailableTime	L_int		The total time, in seconds, that a connection was available. This value is included if Performance Monitoring is enabled on the link side.
sFwdTotalUserCellTxClp0	L_int		The total number of cells (with CLP=0) transmitted from the local side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the switch side.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
sFwdTotalUserCellTxClp01	L_int		The total number of cells (with CLP=0 or CLP=1) transmitted from the local side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the switch side.
sFwdTotalUserCellRxClp0	L_int		The total number of cells (with CLP=0) received on the remote side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the switch side.
sFwdTotalUserCellRxClp01	L_int		The total number of cells (with CLP=0 or CLP=1) received on the remote side in the forward direction during the accounting period. This value is included if Performance Monitoring is enabled on the switch side.
sFwdTotalPmCellDiscard Count	L_int		The total number of Performance Monitoring cells discarded in the forward direction. This value is included if Performance Monitoring is enabled on the switch side.
sBwdTotalUserCellTxClp0	L_int		The total number of user cells (with CLP=0) transmitted from the remote side in the backward direction. This value is included if Performance Monitoring is enabled on the switch side.
sBwdTotalUserCellTxClp01	L_int		The total number of user cells (with CLP=0 or CLP=1) transmitted from the remote side in the backward direction. This value is included if Performance Monitoring is enabled on the switch side.

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
sBwdTotalUserCellRxClp0	L_int		The total number of user cells (with CLP=0) received on the local side in the backward direction. This value is included if Performance Monitoring is enabled on the switch side.
sBwdTotalUserCellRxClp01	L_int		The total number of user cells (with CLP=0 or CLP=1) received on the local side in the backward direction. This value is included if Performance Monitoring is enabled on the switch side.
sBwdTotalPmCellDiscardCount	L_int		The total number of Performance Monitoring cells discarded in the backward direction. This value is included if Performance Monitoring is enabled on the switch side.
sArTotalTime	L_int		The total time, in seconds, used to calculate the Availability Ratio. This value is included if Performance Monitoring is enabled on the switch side.
sArAvailableTime	L_int		The total time, in seconds, that a connection was available. This value is included if Performance Monitoring is enabled on the switch side.
atmServiceCategory	int	cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The ATM service category for both directions of the connection.
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
circuitId	string	32 characters	This attribute indicates a unique string, set by the operator allowing the customer to assign a meaningful name to identify and manage the VCC/VPC level components that make up a circuit. It is provisioned in the correlationTag attribute of the AtmIf Vcc Vcd or AtmIf Vpc Vpd component. Downstream processing may use this attribute to correlate accounting records issued at different nodes in the network.

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
rxUpcViolationOnEnforcer1	L_int		<p>This attribute counts the number of UPC violations observed by the Generic Cell Rate Algorithm (GCRA) Enforcer 1. This attribute is only applicable if UPC is enforced or monitored. This attribute is not applicable for standard VPT VCCs.</p> <p>This attribute is not applicable and is not displayed on CQC-based, APC-based, and QRD-based ATM cards.</p> <p>When the value of rxTrafficDescType for this connection is 3, 4, 5, 6, 7 or 8, Enforcer 1 enforces conformance of traffic received from the interface to PCR CLP0+1.</p> <p>When the value of rxTrafficDescType for this connection is 9, Enforcer 1 performs the Dynamic Generic Cell Rate Algorithm (DGCRA) used for the Available Bit Rate (ABR) service category.</p> <p>If UPC is enforced all non-conforming cells are discarded by this enforcer. These discarded cells are included in rxCellDiscard.</p> <p style="text-align: right;">continued...</p>
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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
			<p>For basic Vpts, this attribute provides an aggregated total of all rxUpcViolationOnEnforcer1 values for the Vccs associated with theVpt.</p> <p>The counter wraps to zero if it exceeds its maximum value of $(2^{**}64)-1$.</p>
rxUpcViolationOnEnforcer2	L_int		<p>This attribute counts the number of UPC violations observed by the Generic Cell Rate Algorithm (GCRA) Enforcer 2. This attribute is only applicable if UPC is enforced or monitored. This attribute is not applicable for standard VPT VCCs.</p> <p>This attribute is not applicable and is not displayed on CQC-based, APC-based, and QRD-based ATM cards.</p> <p>Enforcer2 is applicable only if the rxTrafficDescType for this connection is 4, 5, 6, 7 or 8.</p> <p>When the value of rxTrafficDescType 4 or 5, Enforcer 2 enforces conformance of traffic received from the interface to PCR CLP0.</p> <p style="text-align: right;">continued...</p>

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Table 26 (continued)
ATM fields

Field name	Field type	Field value	Field description
			<p>When the value of rxTrafficDescType 6, Enforcer 2 enforces conformance of traffic received from the interface to SCR CLP0+1.</p> <p>When the value of rxTrafficDescType 7 or 8, Enforcer 2 enforces conformance of traffic received from the interface to SCR CLP0.</p> <p>If UPC is enforced, enforcer 2 discards non-conforming cells for rxTrafficDescType values of 4, 6 and 7. It tags non-conforming cells for rxTrafficDescType values of 5 and 8. Discarded cells are counted in the rxCellDiscard attribute.</p> <p>For basic Vpts, this attribute provides an aggregated total of all rxUpcViolationOnEnforcer2 values for the Vccs associated with the Vpt.</p> <p>The counter wraps to zero if it exceeds its maximum value of $(2^{*}64)-1$.</p>
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FR-ATM

“FR-ATM fields” (page 190) describes the Passport accounting fields applicable to frame relay and ATM from mixed protocol calls.

Table 27
FR-ATM fields

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
recordIdentifier	int	always = 30	Identifies this record as being an FR-ATM accounting record.
callConnId	hex	32 characters	This attribute may be used by downstream processing systems to correlate the accounting records issued for the same call at different interfaces (nodes) in the network. For SPVCs (soft permanent virtual connections), the callConnId is generated by the switch and is unique for every call in the network. For NPVCs (nailed-up permanent virtual connections), the callConnId is provisioned in the correlationTag attribute of the FrAtm Dlci Siwf Npvc component.
callType	int	0 = NPVC 1 = SPVC	Indicates the type of call: NPVC (nailed-up permanent virtual connection), or SPVC (soft permanent virtual connection).
(Sheet 1 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
interworkingType	int	0 = FRF.8 1 = FRF.5	The type of Frame Relay - ATM interworking.
callingNodeIdentifier	int	256 - 49151	This attribute identifies the calling (originating) node by a unique number assigned to each node in the ModuleData component.
callingCustomerIdentifier	int	0 - 8191	An optional identifier for the calling end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.
callingNsapAddr	hex		The NSAP address of the calling party. This field is not included for PVC calls.
callingEndPointNsapAddr	hex		The NSAP address of the calling end point.
callingDlci	int	0 - 4095 Frame Relay: 16 - 1007	The Logical Channel Number of the calling end.
callingVpi	int		The VPI of VCC associated with the calling DLCI.
callingVci	int		The VCI of VCC associated with the calling DLCI.
(Sheet 2 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
calledNodelfdentifier	int	256 - 49151	This attribute identifies the called (terminating) node by a unique number assigned to each node in the ModuleData component.
calledCustomerIdentifier	int	0 - 8191	An optional identifier for the called end of the call in the Customer Network Management (CNM) and Virtual Private Network environment. The value in this field is taken from the Customer Network Management Identifier (CID) field in the DNA-CUG envelope for the access line. The value 0 is the default value reserved for all ports that are not associated with a Virtual Private Network and for which CNM is not provided.
calledNsapAddr	hex		The NSAP address of the called party. This field is not included for PVC calls.
calledEndPointNsapAddr	hex		The NSAP address of the called end point.
calledDlci	int	0 - 4095 Frame Relay: 16 - 1007	The Logical Channel Number of the called end.
calledVpi	int		The VPI of VCC associated with the called DLCI.
calledVci	int		The VCI of VCC associated with the called DLCI.
atmCallTermCauseValue	int		The call termination cause value as defined by the ATM Forum UNI 3.1 specification. For non-final and Siwif NPVC records, this value is 0.
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Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
callingCir	int		The calling end provisioned CIR (Committed Information Rate). If this record is generated by the called end, this is the provisioned egress CIR. If egress CIR is not provisioned, this is just the CIR. This rate is rounded up to the next 800 bits per second.
callingEir	int		The calling end provisioned EIR (Excess Information Rate). If this record is generated by the called end, this is the provisioned egress EIR. If egress EIR is not provisioned, this is just the EIR. This rate is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.
callingServiceType	int	0 - 255	Indicates the service type of the interface that generated the accounting record. The value is provisioned in field <i>accountClass</i> for each ATM interface (under the UNI or IISP component). This field is present only for incoming calls.
callingCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
callingCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
callingCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
callingCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
callingCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the calling end.
(Sheet 4 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
callingDse	int	0 - 255	Defines the Data Service Exchange associated with the ATM interface. This attribute reflects the value provisioned in field <i>serviceExchange</i> of component UNI or IISP. This field is present only for incoming calls.
calledCir	int		If this record is generated by the calling end, this is the provisioned egress CIR (Committed Information Rate). If this record is generated by the called end, this is the provisioned CIR. If egress CIR is not provisioned, this is just the CIR. This rate is rounded up to the next 800 bits per second.
calledEir	int		If this record is generated by the calling end, this is the provisioned egress EIR (Excess Information Rate). If this record is generated by the called end, this is the provisioned EIR. If egress EIR is not provisioned, this is just the EIR. This rate is provisioned as excessive burst size and is rounded up to the next 800 bytes per second.
calledServiceType	int	0 - 255	Indicates the service type of the interface that generated the accounting record. The value is provisioned in field <i>accountClass</i> for each ATM interface (under the UNI or IISP component). This field is present only for outgoing calls.

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Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
calledCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
calledCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
calledCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
calledCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
calledCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the called end.
calledDse	int	0 - 255	Defines the Data Service Exchange associated with the ATM interface. This attribute reflects the value provisioned in field <i>serviceExchange</i> of component UNI or IISP. This field is present only for outgoing calls.
flags_calledGenerated	bit	0 = calling end 1 = called end	Indicates which end generated this call accounting record.
flags_calledCleared	bit	0 = calling end 1 = called end	The callCleared bit is initialized to 0 on the calling end and initialized to 1 on the called end. If the call is cleared on the local switch, that switch retains its value for the callCleared bit and sends a disconnect message to the other end. When a switch receives a disconnect message, the switch takes the value for the callCleared flag from the remote end.

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Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
startTime	time		<p>This is the start time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May also contain YYYYMMDDThhmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In the first accounting record for a call, this field represents the time the call was set up. In subsequent records, this field represents the time the current accounting collection interval started. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/accounting collectionTimes field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>

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Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
endTime	time		<p>This is the end time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May also contain YYYYMMDDThhmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In non-final accounting records, this field represents the time the current accounting collection interval ended. In the final record for a call, this field represents the time the call was cleared. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/ accounting collectionTimes field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 8 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
elapsedTime	int		The duration of the accounting interval in 0.1 second increments. This is the true duration of the accounting interval, measured independently of the start and end time (since start time and end time can be affected by the adjustment of the clock, elapsed time can be shorter or longer than the difference between them). For calls terminated in setup the elapsed time is set to 0.
callingEgressBytes	L_int		The total number of bytes sent to the link at the calling end.
callingIngressBytes	L_int		The total number of bytes received from the link at the calling end.
callingEgressFrames	L_int		The total number of frames sent to the link at the calling end.
callingIngressFrames	L_int		The total number of frames received from the link at the calling end.
callingEirEgressBytes	L_int		The total number of EIR bytes sent to the link at the calling end.
callingEirIngressBytes	L_int		The total number of EIR bytes received from the link at the calling end.
callingEirEgressFrames	L_int		The total number of EIR frames sent to the link at the calling end.
callingEirIngressFrames	L_int		The total number of EIR frames received from the link at the calling end.
callingDiscardedBytes	L_int		The total number of bytes discarded at the calling end due to rate enforcement.
callingDiscardedFrames	L_int		The total number of frames discarded at the calling end due to rate enforcement.
(Sheet 9 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
calledEgressBytes	L_int		The total number of bytes sent to the link at the called end.
calledIngressBytes	L_int		The total number of bytes received from the link at the called end.
calledEgressFrames	L_int		The total number of frames sent to the link at the called end.
calledIngressFrames	L_int		The total number of frames received from the link at the called end.
calledEirEgressBytes	L_int		The total number of EIR bytes sent to the link at the called end.
calledEirIngressBytes	L_int		The total number of EIR bytes received from the link at the called end.
calledEirEgressFrames	L_int		The total number of EIR frames sent to the link at the called end.
calledEirIngressFrames	L_int		The total number of EIR frames received from the link at the called end.
calledDiscardedBytes	L_int		The total number of bytes discarded at the called end due to rate enforcement.
calledDiscardedFrames	L_int		The total number of frames discarded at the called end due to rate enforcement.
(Sheet 10 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
callingTransferPriority	int	0 - 15 Supported by Passport frame relay: 0, 6, 9, 11.	The transfer priority is a preference specified by an application according to its time-sensitivity requirement. Frames with high transfer priority are served by the network before the frames with normal priority. The frame relay transfer priority in Passport determines characteristics: trunk queue (among interrupting, delay, throughput), routing metric (between delay and throughput) and frame relay egress queues (between high and normal priority).
calledTransferPriority	int	0 - 15 Supported by Passport frame relay: 0, 6, 9, 11.	The transfer priority is a preference specified by an application according to its time-sensitivity requirement. Frames with high transfer priority are served by the network before the frames with normal priority. The frame relay transfer priority in Passport determines characteristics: trunk queue (among interrupting, delay, throughput), routing metric (between delay and throughput) and frame relay egress queues (between high and normal priority).
(Sheet 11 of 12)			

Table 27 (continued)
FR-ATM fields

Field name	Field type	Field value	Field description
circuitId	string		This attribute indicates a unique string, set by the operator as the "correlationTag" provisioned attribute, which identifies the call for accounting purposes. Downstream processing uses this attribute to correlate accounting records issued at different nodes in the network. Typically, the attribute is provisioned, as the correlationTag, with the same value at both ends of the connection, but this is not mandatory. As a default, there is no correlationTag provisioned against the DLCI.

(Sheet 12 of 12)

Voice networking

The BDF record for Passport Voice Networking includes those fields used by usage-based accounting for voice traffic on Passport switches.

Usage-based accounting includes the requirement to collect per-call data and timing information.

Accounting can be enabled at one end of the switched connection (single-ended accounting) or at both ends of the switched connection (double-ended accounting).

Double-ended accounting is when accounting records are generated at both ends of a call. The destination Passport node and the source Passport node both generate accounting records for the same call. The voice networking accounting software at each end Passport node do not communicate with each other or exchange accounting information other than the source Passport sends the callCorrelationIdentifier value to the destination Passport. The

common callCorrelationIdentifier value is included in all accounting records generated by both Passports to enable down-stream software to correlate collected accounting records.

Single-ended accounting must not be confused with egress accounting. Single-ended accounting is when one end Passport, in the process of double-ended accounting, is able to perform single-ended accounting by disabling accounting on one end Passport involved in the call.

“Voice networking” (page 202) describes fields for Voice Networking accounting on Passport switches (in the order in which they appear in a Passport BDF record):

Table 28
Voice networking

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
recordIdentifier	int	always = 40	Identifies this record as being a voice network accounting record.
(Sheet 1 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
callCorrelationIdentifier	hex		<p>A unique value assigned to all accounting records generated by calling- and called-Passport nodes for this call. The <i>callCorrelationId</i> is used during post processing of accounting records to correlate records generated by different Passports.</p> <p>The <i>callCorrelationId</i> is always unique in the network with respect to <i>callCorrelationIds</i> generated by other function processors.</p> <p>The value of <i>callCorrelationId</i> repeats after 16,777,216 calls on the same, continually active function processor.</p>
(Sheet 2 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
startTime	time		<p>This is the start time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is for the day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain YYYYMMDDThhmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In the first accounting record for a call, this field represents the time the call was set up. In subsequent records, this field represents the time the current accounting collection interval started. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/accounting <i>collectionTimes</i> field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 3 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
endTime	time		<p>This is the end time of the period accounted for in the record. It is in the format YYYYMMDDThhmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain YYYYMMDDThhmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In non-final accounting records, this field represents the time the current accounting collection interval ended. In the final record for a call, this field represents the time the call was cleared. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/ accounting <i>collectionTimes</i> field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 4 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
elapsedTime	int		The duration of the accounting interval in 0.1 second increments. This is the true duration of the accounting interval, measured independently of the start and end time (since start time and end time can be affected by the adjustment of the clock, elapsed time can be shorter or longer than the difference between them). For calls terminated in setup the elapsed time is set to 0.
localNodeIdentifier	int		The <i>nodeID</i> of the Passport that generated the accounting record. <i>nodeID</i> is assigned to each node in the <i>ModuleData</i> component.
localLogicalProcessor	int		The logical processor used by the service issuing the accounting record.
localPort	int		The port used by the service issuing the accounting record.
localTimeslots_1	bit	0 = unused 1 = used	A timeslot that can be used by the Passport issuing the accounting record. In ISDN, multiple timeslots (maximum 31) can be assigned to a single call. Accounting records are not generated for call attempts that fail to get a timeslot.
localTimeslots_10	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_11	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_12	bit	0 = unused 1 = used	See field description for localTimeslots_1
(Sheet 5 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
localTimeslots_13	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_14	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_15	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_16	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_17	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_18	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_19	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_2	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_20	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_21	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_22	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_23	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_24	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_25	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_26	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_27	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_28	bit	0 = unused 1 = used	See field description for localTimeslots_1
(Sheet 6 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
localTimeslots_29	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_3	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_30	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_31	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_4	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_5	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_6	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_7	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_8	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_9	bit	0 = unused 1 = used	See field description for localTimeslots_1
callingNumber	str		The calling number signalled to the Passport. This field can have a length of 0 if the calling number was not provided. The maximum length is 16 digits.
localDlci	int		The local dlci number of the interface. dlci is sometimes called LCN - logical channel number. This number is assigned to the call request by the node generating this accounting record.

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Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
calledNumber	str		The called number signalled to the Passport. If <i>Vroute/n Acct digitsSuppressed</i> was provisioned with a non-zero value, that number of trailing digits in <i>calledNumber</i> are replaced with "X"s. The maximum length is 32 digits.
connectedNumber	str		The connected number signalled to the Passport. This field can have a length of zero if the connected number was not provided. The maximum length is 16 digits.
sourceNpi	int		The Numbering Plan Indicator (NPI) of the <i>sourceDna</i> . This is the value sent by the source accounting node to the destination accounting node during call setup. The <i>sourceDna</i> can belong to X.121 or E.164 plans. X.121 is used in packet switched data networks.
sourceDna	bcd		The data network address (the unique identifier) of the calling addressable switched voice application. This is the value sent by the source accounting node to the destination accounting node during call setup. This value is valid in accounting records generated by both ends of the call.
destinationNpi	int		The Numbering Plan Indicator (NPI) of the destinationDNA. This is the value sent by the destination accounting node to the source accounting node during call setup. The <i>destinationDna</i> may belong to X.121 or E.164 plans. X.121 is used in packet switched data networks.
(Sheet 8 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
destinationDna	bcd		The data network address (the unique identifier) of the called addressable switched voice application <i>VoiceRoute</i> . This is the value sent by the destination accounting node to the source accounting node during call setup. This field value is valid in accounting records generated by both ends of the call.
callVncs	int		The <i>VoiceNetworkingCallServer</i> used locally for this call by it's instance value. This field has a value of 0 in an accounting record generated by a terminating end Passport
callProfile	int		The <i>VoiceProfile</i> instance used locally for this call. <i>VoiceProfile</i> instance values are only unique with respect to a particular <i>Vncs</i> instance. This field has a value of 0 in an accounting record generated by a terminating end Passport.
vnetCallType	int	0 = voice (all other calls 1 = data (ISDN data call) 2 = modem (a 2100Hz tone was detected) 3 = faxRelay 4 = modemRelay	The type of call for which this accounting record is issued.
(Sheet 9 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
clearCause	int		Indicates the reason for a call termination. This field is set to zero (0) for intermediate records. For more information, see <i>241-5701-900 Passport 7400, 15000, 20000 Frame Relay UNI Guide</i> .
diagnosticCode	int		This is the clear diagnostic indicator. It is set to zero (0) on non-final records, and to the network diagnostic code of the call clear on the final record. For more information, see <i>241-5701-900 Passport 7400, 15000, 20000 Frame Relay UNI Guide</i> .
localServiceType	int		The service supported by the port used by the local interface. This number is provisioned on each interface as <i>accountClass</i> .
localCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
localCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
localCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
localCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
localCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the calling end.
localDse	int		The local end Data Service Exchange (DSE), provisioned as an arbitrary number in the <i>serviceExchange</i> attribute.
(Sheet 10 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
localCustomerIdentifier	int		A number assigned in each service to a customer. This field identifies the customer in the Customer Network Management on the end that generated the accounting record.
vnetFlags_answered	bit	0 = false 1 = true	The call was answered.
vnetFlags_bumped	bit	0 = false 1 = true	The call was bumped to another path by a higher priority call in the accounting interval reported by this record.
vnetFlags_clearedInSubnet	bit	0 = outside 1 = inside	Indicates if the call was cleared from inside or from outside of the Passport subnet. This flag is only valid in the final accounting record.
vnetFlags_faxRelayDown speed	bit	0 = false 1 = true	The fax relay call, accounted by this record, lowered the relay rate in the accounting interval reported by this record.
vnetFlags_frameCounts Valid	bit	0 = false 1 = true	The frame counts in this accounting record are valid.
vnetFlags_optimized	bit	0 = false 1 = true	The path of the call was altered in the accounting interval reported by this record.
vnetFlags_originating	bit	0 = far-end 1 = local-end	Indicates which end originated the call.
vnetFlags_tandemPass Through	bit	0 = false 1 = true	The Passport which generated this record used tandem pass-through for this call.
vnetFlags_unique	bit	0 = false 1 = true	If this is set to 1, it guarantees that only the local end generated one, or more, accounting records for this call.
(Sheet 11 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
callRingTime	int	0 - 255	The time in seconds between the setup indication and the call answered indication for answered calls. For unanswered calls, this field indicates the time between the setup indication and the call release indication. For values greater than 255 seconds this field indicates 255 seconds.
framesAtRate1ToNetwork	L_int		The total number of rate 1 frames sent to the network.
framesAtRate2ToNetwork	L_int		The total number of rate 2 frames sent to the network.
framesAtRate3ToNetwork	L_int		The total number of rate 3 frames sent to the network.
framesAtRate1From Network	L_int		The total number of rate 1 frames received from the network.
framesAtRate2From Network	L_int		The total number of rate 2 frames received from the network.
framesAtRate3From Network	L_int		The total number of rate 3 frames received from the network.
rate1	int		The bit rate of the rate 1 statistics, in units of bits per second.
rate2	int		The bit rate of the rate 2 statistics, in units of bits per second.
rate3	int		The bit rate of the rate 3 statistics, in units of bits per second.
rate1Compression Algorithm	int	0 = none 1 = g711 2 = g726 3 = 9728 4 = g729 5 = faxRelay 6 = modemRelay	The compression algorithm used for the rate 1 statistics. If no compression algorithm is used, the value is <i>none</i> .
(Sheet 12 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
rate2Compression Algorithm	int	0 = none 1 = g711 2 = g726 3 = 9728 4 = g729 5 = faxRelay 6 = modemRelay	The compression algorithm used for the rate 2 statistics. If no compression algorithm is used, the value is <i>none</i> .
rate3Compression Algorithm	int	0 = none 1 = g711 2 = g726 3 = 9728 4 = g729 5 = faxRelay 6 = modemRelay	The compression algorithm used for the rate 3 statistics. If no compression algorithm is used, the value is <i>none</i> .
rate1FrameSize	int	0 - 999	The size of the rate 1 frames, in bytes.
rate2FrameSize	int	0 - 999	The size of the rate 2 frames, in bytes.
rate3FrameSize	int	0 -999	The size of the rate 3 frames, in bytes.
frmLostInNetwork	int	0 - 65535	The number of frames lost in the network. If this value is greater than 65535, the value reported is 65535.
frmDumped	int	0 - 255	The number of frames dumped to limit the size of the egress queue. <i>frmDumped</i> can be an indication of persistent network clock synchronization problems between the interfaces involved in the calls. If this value is greater than 255, the value reported is 255.
(Sheet 13 of 14)			

Table 28 (continued)
Voice networking

Field name	Field type	Field value	Field description
frmUnderRuns	int	0 - 255	The number of frames that arrived late to prevent the egress queue from becoming empty. <i>frmUnderRuns</i> are an indication of network clock synchronization problems between the interfaces involved in the calls. If it is greater than 255, the value reported is 255.
localMpanlInstanceNo	int	0 - 255	The MPANL instance number that is issuing this accounting record.
mpaVoiceFlags_answered	bit	0 = false 1 = true	The call was answered.
mpaVoiceFlags_originating	bit	0 = far-end 1 = local-end	Indicates which end originated the call.
mpaVoiceFlags_unique	bit	0 = false 1 = true	If this is set to 1, it guarantees that only the local end generated one, or more, accounting records for this call.
mpaVoiceFlags_clearedInSubnet	bit	0 = outside 1 = inside	Indicates if the call was cleared from inside or from outside of the Passport subnet of this MPANL instance. This flag is only valid in the final accounting record.
callAnswerTime	int	0 - 255	The time in seconds between the setup indication and call answered indication for answered calls. For unanswered calls, this field indicates the time between the setup indication and the call release indication. For values greater than 255, 255 seconds is reported.
(Sheet 14 of 14)			

MPANL voice

“MPANL voice” (page 216) describes fields for voice calls on the MPANL of Passport switches (in the order in which they appear in a Passport BDF record):

Table 29
MPANL voice

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
recordIdentifier	int	always = 40	Identifies this record as being a voice network accounting record.
callCorrelationIdentifier	hex		<p>A unique value assigned to all accounting records generated by calling- and called-Passport nodes for this call. The <i>callCorrelationId</i> is used during post processing of accounting records to correlate records generated by different Passports.</p> <p>The <i>callCorrelationId</i> is always unique in the network with respect to <i>callCorrelationIds</i> generated by other function processors.</p> <p>The value of <i>callCorrelationId</i> repeats after 16,777,216 calls on the same, continually active function processor.</p>
(Sheet 1 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
startTime	time		<p>This is the start time of the period accounted for in the record. It is in the format YYYYMMDDThmmss, where: YYYY is year, MM is month, DD is for the day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain YYYYMMDDThmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In the first accounting record for a call, this field represents the time the call was set up. In subsequent records, this field represents the time the current accounting collection interval started. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/accounting <i>collectionTimes</i> field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 2 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
endTime	time		<p>This is the end time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain YYYYMMDDThhmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In non-final accounting records, this field represents the time the current accounting collection interval ended. In the final record for a call, this field represents the time the call was cleared. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/ accounting <i>collectionTimes</i> field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>
(Sheet 3 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
elapsedTime	int		The duration of the accounting interval in 0.1 second increments. This is the true duration of the accounting interval, measured independently of the start and end time (since start time and end time can be affected by the adjustment of the clock, elapsed time can be shorter or longer than the difference between them). For calls terminated in setup the elapsed time is set to 0.
localNodeIdentifier	int		The <i>nodeID</i> of the Passport that generated the accounting record. <i>nodeID</i> is assigned to each node in the <i>ModuleData</i> component.
localLogicalProcessor	int		The logical processor used by the service issuing the accounting record.
localPort	int		The port used by the service issuing the accounting record.
localTimeslots_1	bit	0 = unused 1 = used	A timeslot that can be used by the Passport issuing the accounting record. In ISDN, multiple timeslots (maximum 31) can be assigned to a single call. Accounting records are not generated for call attempts that fail to get a timeslot.
localTimeslots_10	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_11	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_12	bit	0 = unused 1 = used	See field description for localTimeslots_1
(Sheet 4 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
localTimeslots_13	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_14	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_15	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_16	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_17	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_18	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_19	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_2	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_20	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_21	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_22	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_23	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_24	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_25	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_26	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_27	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_28	bit	0 = unused 1 = used	See field description for localTimeslots_1
(Sheet 5 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
localTimeslots_29	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_3	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_30	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_31	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_4	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_5	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_6	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_7	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_8	bit	0 = unused 1 = used	See field description for localTimeslots_1
localTimeslots_9	bit	0 = unused 1 = used	See field description for localTimeslots_1
callingNumber	str		The calling number signalled to the Passport. This field can have a length of 0 if the calling number was not provided. The maximum length is 16 digits.
localDlci	int		The local dlci number of the interface. dlci is sometimes called LCN - logical channel number. This number is assigned to the call request by the node generating this accounting record.

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Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
calledNumber	str		The called number signalled to the Passport. If <i>Vroute/n Acct digitsSuppressed</i> was provisioned with a non-zero value, that number of trailing digits in <i>calledNumber</i> are replaced with "X"s. The maximum length is 32 digits.
connectedNumber	str		The connected number signalled to the Passport. This field can have a length of zero if the connected number was not provided. The maximum length is 16 digits.
sourceNpi	int		The Numbering Plan Indicator (NPI) of the <i>sourceDna</i> . This is the value sent by the source accounting node to the destination accounting node during call setup. The <i>sourceDna</i> can belong to X.121 or E.164 plans. X.121 is used in packet switched data networks.
sourceDna	bcd		The data network address (the unique identifier) of the calling addressable switched voice application. This is the value sent by the source accounting node to the destination accounting node during call setup. This value is valid in accounting records generated by both ends of the call.
destinationNpi	int		The Numbering Plan Indicator (NPI) of the destinationDNA. This is the value sent by the destination accounting node to the source accounting node during call setup. The <i>destinationDna</i> may belong to X.121 or E.164 plans. X.121 is used in packet switched data networks.
(Sheet 7 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
destinationDna	bcd		The data network address (the unique identifier) of the called addressable switched voice application <i>VoiceRoute</i> . This is the value sent by the destination accounting node to the source accounting node during call setup. This field value is valid in accounting records generated by both ends of the call.
callVncls	int		The <i>VoiceNetworkingCallServer</i> used locally for this call by its instance value. This field has a value of 0 in an accounting record generated by a terminating end Passport
callProfile	int		The <i>VoiceProfile</i> instance used locally for this call. <i>VoiceProfile</i> instance values are only unique with respect to a particular <i>Vncls</i> instance. This field has a value of 0 in an accounting record generated by a terminating end Passport.
vnetCallType	int	0 = voice (all other calls 1 = data (ISDN data call) 2 = modem (a 2100Hz tone was detected) 3 = faxRelay 4 = modemRelay	The type of call for which this accounting record is issued.

(Sheet 8 of 13)

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
clearCause	int		Indicates the reason for a call termination. This field is set to zero (0) for intermediate records. For more information, see <i>241-5701-900 Passport 7400, 15000, 20000 Frame Relay UNI Guide</i> .
diagnosticCode	int		This is the clear diagnostic indicator. It is set to zero (0) on non-final records, and to the network diagnostic code of the call clear on the final record. For more information, see <i>241-5701-900 Passport 7400, 15000, 20000 Frame Relay UNI Guide</i> .
localServiceType	int		The service supported by the port used by the local interface. This number is provisioned on each interface as <i>accountClass</i> .
localCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
localCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
localCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
localCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
localCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the calling end.
localDse	int		The local end Data Service Exchange (DSE), provisioned as an arbitrary number in the <i>serviceExchange</i> attribute.
(Sheet 9 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
localCustomerIdentifier	int		A number assigned in each service to a customer. This field identifies the customer in the Customer Network Management on the end that generated the accounting record.
vnetFlags_answered	bit	0 = false 1 = true	The call was answered.
vnetFlags_bumped	bit	0 = false 1 = true	The call was bumped to another path by a higher priority call in the accounting interval reported by this record.
vnetFlags_clearedInSubnet	bit	0 = outside 1 = inside	Indicates if the call was cleared from inside or from outside of the Passport subnet. This flag is only valid in the final accounting record.
vnetFlags_faxRelayDown speed	bit	0 = false 1 = true	The fax relay call, accounted by this record, lowered the relay rate in the accounting interval reported by this record.
vnetFlags_frameCounts Valid	bit	0 = false 1 = true	The frame counts in this accounting record are valid.
vnetFlags_optimized	bit	0 = false 1 = true	The path of the call was altered in the accounting interval reported by this record.
vnetFlags_originating	bit	0 = far-end 1 = local-end	Indicates which end originated the call.
vnetFlags_tandemPass Through	bit	0 = false 1 = true	The Passport which generated this record used tandem pass-through for this call.
vnetFlags_unique	bit	0 = false 1 = true	If this is set to 1, it guarantees that only the local end generated one, or more, accounting records for this call.
(Sheet 10 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
callRingTime	int	0 - 255	The time in seconds between the setup indication and the call answered indication for answered calls. For unanswered calls, this field indicates the time between the setup indication and the call release indication. For values greater than 255 seconds this field indicates 255 seconds.
framesAtRate1ToNetwork	L_int		The total number of rate 1 frames sent to the network.
framesAtRate2ToNetwork	L_int		The total number of rate 2 frames sent to the network.
framesAtRate3ToNetwork	L_int		The total number of rate 3 frames sent to the network.
framesAtRate1From Network	L_int		The total number of rate 1 frames received from the network.
framesAtRate2From Network	L_int		The total number of rate 2 frames received from the network.
framesAtRate3From Network	L_int		The total number of rate 3 frames received from the network.
rate1	int		The bit rate of the rate 1 statistics, in units of bits per second.
rate2	int		The bit rate of the rate 2 statistics, in units of bits per second.
rate3	int		The bit rate of the rate 3 statistics, in units of bits per second.
rate1Compression Algorithm	int	0 = none 1 = g711 2 = g726 3 = 9728 4 = g729 5 = faxRelay 6 = modemRelay	The compression algorithm used for the rate 1 statistics. If no compression algorithm is used, the value is <i>none</i> .

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Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
rate2Compression Algorithm	int	0 = none 1 = g711 2 = g726 3 = 9728 4 = g729 5 = faxRelay 6 = modemRelay	The compression algorithm used for the rate 2 statistics. If no compression algorithm is used, the value is <i>none</i> .
rate3Compression Algorithm	int	0 = none 1 = g711 2 = g726 3 = 9728 4 = g729 5 = faxRelay 6 = modemRelay	The compression algorithm used for the rate 3 statistics. If no compression algorithm is used, the value is <i>none</i> .
rate1FrameSize	int	0 - 999	The size of the rate 1 frames, in bytes.
rate2FrameSize	int	0 - 999	The size of the rate 2 frames, in bytes.
rate3FrameSize	int	0 -999	The size of the rate 3 frames, in bytes.
frmLostInNetwork	int	0 - 65535	The number of frames lost in the network. If this value is greater than 65535, the value reported is 65535.
frmDumped	int	0 - 255	The number of frames dumped to limit the size of the egress queue. <i>frmDumped</i> can be an indication of persistent network clock synchronization problems between the interfaces involved in the calls. If this value is greater than 255, the value reported is 255.
(Sheet 12 of 13)			

Table 29 (continued)
MPANL voice

Field name	Field type	Field value	Field description
frmUnderRuns	int	0 - 255	The number of frames that arrived late to prevent the egress queue from becoming empty. <i>frmUnderRuns</i> are an indication of network clock synchronization problems between the interfaces involved in the calls. If it is greater than 255, the value reported is 255.
localMpanlInstanceNo	int	0 - 255	The MPANL instance number that is issuing this accounting record.
mpaVoiceFlags_answered	bit	0 = false 1 = true	The call was answered.
mpaVoiceFlags_originating	bit	0 = far-end 1 = local-end	Indicates which end originated the call.
mpaVoiceFlags_unique	bit	0 = false 1 = true	If this is set to 1, it guarantees that only the local end generated one, or more, accounting records for this call.
mpaVoiceFlags_clearedInSubnet	bit	0 = outside 1 = inside	Indicates if the call was cleared from inside or from outside of the Passport subnet of this MPANL instance. This flag is only valid in the final accounting record.
callAnswerTime	int	0 - 255	The time in seconds between the setup indication and call answered indication for answered calls. For unanswered calls, this field indicates the time between the setup indication and the call release indication. For values greater than 255, 255 seconds is reported.
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IP VPN

The BDF record for Passport IP VPN includes usage-based accounting fields for IP traffic between Virtual Private Network (VPN) sites.

“IP VPN fields” (page 229) describes IP VPN accounting fields from Passport switches:

Table 30
IP VPN fields

Field name	Field type	Field value	Field description
switchType	str	pp	The type of switch that generated this record.
dataType	str	acc or acc_DMId_RDFv	Identifies this record as being an accounting record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
recordType_first	bit	0 = not first record 1 = first record	Indicates whether or not this is the first call accounting record for a call.
recordType_last	bit	0 = not last record 1 = last record	Indicates whether or not this is the last call accounting record for a call.
recordIdentifier	int	always = 60	Identifies this record as being a IP VPN accounting record.
vpild	int	0 - 2047	Indicates the Virtual Private Intranet (VPI) associated with this Virtual Router (see vrInstance). If this attribute is not set to the default value, it must be unique on the Passport. Interconnected Virtual Routers on different Passports should have the same VPI value. Note that this attribute will be obsoleted in the near future. It's functionality is replaced by the vpnlId. Any affected tools using this attribute should be converted to use the vpnlId attribute instead.
(Sheet 1 of 8)			

Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
virtualPrivateNetworkIdentifier (vpnId)	str	7 character, dashed-hex default = 00-00-00-00-00-00-00	Indicates the VPN associated with this Virtual Router (see vrInstance). This is a globally unique identifier composed of a three-octet long Organizationally Unique Identifier (OUI) followed by a four-octet long VPN index. The value "00-00-00-00-00-00-00" identifies an unspecified vpnId and should be set to other non-zero values when the autoDiscovery attribute under same virtual router vr/x ip tunnel msep/y is enabled.
localCollectReason_bill	bit	0 = not for billing 1 = for billing	Indicates whether or not this record is for billing purposes.
localCollectReason_test	bit	0 = not for testing 1 = for testing	Indicates whether or not this record is for testing purposes.
localCollectReason_study	bit	0 = not for study 1 = for study	Indicates whether or not this record is for study purposes.
localCollectReason_audit	bit	0 = not for audit 1 = for audit	Indicates whether or not this record is for audit purposes.
localCollectReason_force	bit	0 = not forced 1 = forced	Indicates whether or not data collection was forced by the calling end.
protocolPortIfIndex	int		The integer index of the protocol port that generated this record.
protocolPortInstance	str		The instance name of the protocol port that generated this record.
mediaType	int	0 = pt-to-pt 1 = pt-to-mpt 2 = frDte 3 = atmMpe	The type of IP connection: point-to-point tunnel (pt-to-pt), point-to-multipoint tunnel (pt-to-mpt), frDte, or atmMpe..
localNodeIdentifier	int		The <i>nodeID</i> of the Passport that generated the accounting record. <i>nodeID</i> is assigned to each node in the <i>ModuleData</i> component.
(Sheet 2 of 8)			

Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
vrlInstance	str		The virtual router (VR) that generated this record.
startTime	time		<p>This is the start time of the period accounted for in the record. It is in the format YYYYMMDDThmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain a YYYYMMDDThmmss.iiiiii, where: iiiiiii is microseconds.</p> <p>In the first accounting record for a call, this field represents the time the call was set up. In subsequent records, this field represents the time the current accounting collection interval started. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/accounting <i>collectionTimes</i> field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>

(Sheet 3 of 8)

Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
endTime	time		<p>This is the start time of the period accounted for in the record. It is in the format YYYYMMDDThhmmss, where: YYYY is year, MM is month, DD is day, T is start of the time data, hh is hour, mm is minute, and ss is seconds. May contain a YYYYMMDDThhmmss.iiiii, where: iiii is microseconds.</p> <p>In non-final accounting records, this field represents the time the current accounting collection interval ended. In the final record for a call, this field represents the time the call was cleared. When TODA is enabled, the collection intervals are delimited by the entries in the TODA schedule (the Col/ accounting <i>collectionTimes</i> field). When TODA is disabled, they are delimited by a timer that expires every 12-hours (per call).</p> <p>A zero value in any of the time fields causes the field to be truncated. The T indicator is dropped if the record begins at exactly midnight.</p> <p>For example, 19970627T120300 is displayed as 19970627T1203 (the 00 seconds have been truncated) and 19970627T000000 is displayed as 19970627 (all of the time fields have been truncated, including the T indicator).</p>

(Sheet 4 of 8)

Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
elapsedTime	int		The duration of the accounting interval in 0.1 second increments. This is the true duration of the accounting interval, measured independently of the start and end time (since start time and end time can be affected by the adjustment of the clock, elapsed time can be shorter or longer than the difference between them). For calls terminated in setup the elapsed time is set to 0.
ipTunnelSrcAddr	IP		The source IP Tunnel address in the shared domain. This field appears in the accounting record only if the mediaType is point-to-point tunnel or point-to-multipoint tunnel. The field format is ###.###.###.###.
ipTunnelDestAddr	IP		The destination IP Tunnel address in the shared domain. This field appears in the accounting record only if the mediaType is point-to-point tunnel or point-to-multipoint tunnel. The field format is ###.###.###.###.
InOctets	L_int		The aggregate number of octets received by the protocol port during the accounting interval.
OutOctets	L_int		The aggregate number of octets transmitted by the protocol port during the accounting interval.
InPkts	L_int		The aggregate number of packets received by the protocol port during the accounting interval.
(Sheet 5 of 8)			

Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
OutPkts	L_int		The aggregate number of packets transmitted by the protocol port during the accounting interval.
InDiscards	L_int		The aggregate number of packets received by the protocol port and discarded during the accounting interval.
OutDiscards	L_int		The aggregate number of packets transmitted by the protocol port and discarded during the accounting interval.
Cos0InOctets	L_int		The total number of Cos0 octets received by the protocol port during the accounting interval.
Cos0OutOctet	L_int		The total number of Cos0 octets transmitted by the protocol port during the accounting interval.
Cos0InPkts	L_int		The total number of Cos0 packets received by the protocol port during the accounting interval.
Cos0OutPkts	L_int		The total number of Cos0 packets transmitted by the protocol port during the accounting interval.
Cos0InDiscards	L_int		The total number of Cos0 packets received and discarded by the protocol port during the accounting interval.
Cos0OutDiscards	L_int		The total number of Cos0 packets transmitted and discarded by the protocol port during the accounting interval.
Cos1InOctets	L_int		The total number of Cos1 octets received by the protocol port during the accounting interval.
Cos1OutOctet	L_int		The total number of Cos1 octets transmitted by the protocol port during the accounting interval.

(Sheet 6 of 8)

Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
Cos1InPkts	L_int		The total number of Cos1 packets received by the protocol port during the accounting interval.
Cos1OutPkts	L_int		The total number of Cos1 packets transmitted by the protocol port during the accounting interval.
Cos1InDiscards	L_int		The total number of Cos1 packets received and discarded by the protocol port during the accounting interval.
Cos1OutDiscards	L_int		The total number of Cos1 packets transmitted and discarded by the protocol port during the accounting interval.
Cos2InOctets	L_int		The total number of Cos2 octets received by the protocol port during the accounting interval.
Cos2OutOctet	L_int		The total number of Cos2 octets transmitted by the protocol port during the accounting interval.
Cos2InPkts	L_int		The total number of Cos2 packets received by the protocol port during the accounting interval.
Cos2OutPkts	L_int		The total number of Cos2 packets transmitted by the protocol port during the accounting interval.
Cos2InDiscards	L_int		The total number of Cos2 packets received and discarded by the protocol port during the accounting interval.
Cos2OutDiscards	L_int		The total number of Cos2 packets transmitted and discarded by the protocol port during the accounting interval.
Cos3InOctets	L_int		The total number of Cos3 octets received by the protocol port during the accounting interval.

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Table 30 (continued)
IP VPN fields

Field name	Field type	Field value	Field description
Cos3OutOctet	L_int		The total number of Cos3 octets transmitted by the protocol port during the accounting interval.
Cos3InPkts	L_int		The total number of Cos3 packets received by the protocol port during the accounting interval.
Cos3OutPkts	L_int		The total number of Cos3 packets transmitted by the protocol port during the accounting interval.
Cos3InDiscards	L_int		The total number of Cos3 packets received and discarded by the protocol port during the accounting interval.
Cos3OutDiscards	L_int		The total number of Cos3 packets transmitted and discarded by the protocol port during the accounting interval.
ipTunnelVcgVr	str		The IP tunnel Carrier VR (VCG) is used by the RTD feature, only. This attribute appears in the accounting record only if the mediaType is one of: pointToPointTunnel or pointToMultipointTunnel.
ipTunnelVcglpAddr	IP		The BGP loopback IP address of the VCR VR used by the RTD feature. This attribute appears in the accounting record only if the mediaType is one of: pointToPointTunnel or pointToMultipointTunnel.
(Sheet 8 of 8)			

Chapter 4

DPN statistics records

Each DPN module in a network provides statistics information on network component availability, average and peak loads, and the number of packets received and transmitted. These DPN statistics enable coordinated network maintenance, provide an overview of network behavior, and provide a base for planning future improvements to subscriber service.

The following fields are common to DPN statistics records:

switchType: dpn

dataType: sta

subDataType: subtype #

dateTime: *yyyymmDDTHHMMSS.ss* yyyy=year; mm=month; DD=day; HH=hour; MM=minute; SS=seconds; ss=tenths of a second

customerId: Customer Network Management Identifier assigned to network components (PEs and POs) dedicated to a Virtual Private Network

dspId: Module DSP group ID

namsId: Integers which identify AM, RM, or PM

seqNum: Sequence number assigned by the network administration and management system (NAMS) device.

componentId: A component identifier describes a NAMS object. A component identifier is composed of a list of qualifiers; each with two elements—category (PE, PI, PO, CH) and a uniquely numbered name.

All other fields within BDF sta files are controlled by the 39file.

DPN statistics types quick reference

Table 31
DPN statistics types quick reference

Statistics group	Statistics name	Comment
AM/RM Office, PE, VC	"OfficeMaster (subtype 18)" (page 323) "PE286386 (subtype 30)" (page 326) "HighPerfPE (subtype 75)" (page 323) "VC (subtype 67)" (page 365) "GVCG34 (subtype 74)" (page 369)	
RM Servers	"CallRouterSrc (subtype 28)" (page 256) "CallRouterDst (subtype 29)" (page 254) "CallRedirSvrRSI (subtype 33)" (page 254) "NUIValidRemSvrRSI (subtype 34)" (page 322) "CallRouterGateDst (subtype 40)" (page 255) "CallRouterGateSrc (subtype 39)" (page 255)	
AM/RM Servers	"CallRedirSvr (subtype 32)" (page 253) "DialOutRouting (subtype 36)" (page 260) "NCSOpAgent (subtype 42)" (page 308) "NUIDatabaseInt (subtype 43)" (page 319)	
API Service	"APIDevice (subtype 19)" (page 246) "APILink (subtype 11)" (page 247)	
Asynchronous Services	"ITI (subtype 12)" (page 294) "ITIEnhanced (subtype 57)" (page 296)	G28 and earlier G29 and later
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Table 31 (continued)
DPN statistics types quick reference

Statistics group	Statistics name	Comment
Frame Relay	“FrameRelay (subtype 59)” (page 261)	G2908, G3007, G31 and later
	“ITI (subtype 12)” (page 294)	
	“FrameRelayDLCIG33 (subtype 69)” (page 270)	
	“FrameRelayDLCIG34 (subtype 73)” (page 274)	
ISDN, LAPD Service	“LAPDPhysical (subtype 23)” (page 299)	
	“LAPDSignalling (subtype 47)” (page 302)	
	“ISDN DLCI (subtype 24)” (page 282)	
SNA, Token-Ring, 3270, SDLC Services	“ISRB Phase 2 (subtype 68)” (page 284)	
	“3270TermPAD (subtype 20)” (page 243)	
	“3270HostPAD (subtype 22)” (page 240)	
	“SNALink (subtype 26)” (page 331)	G29 and later RAUTP286 image UTP386 image only, G31 and later RAUTP286 image UTP386 image only, G31 and later
	“SNALogicalUnit (subtype 27)” (page 333)	
	“TokenRing (subtype 53)” (page 335)	
	“TokenRingDevice (subtype 52)” (page 338)	
Trunk and Network Link	“NLLAPBEnhanced (subtype 58)” (page 309)	
	“UTP (subtype 35)” (page 350)	
	“UTPEnhanced (subtype 65)” (page 354)	
	“NLOverFR (subtype 72)” (page 359)	
	“TrunkRMUTP (subtype 25)” (page 341)	
	“TrunkRMUTPEnhanced (subtype 64)” (page 345)	
X25 Services	“X25MLAgent (subtype 61)” (page 386)	G30 and later
(Sheet 2 of 3)		

Table 31 (continued)
DPN statistics types quick reference

Statistics group	Statistics name	Comment
X75 Services	"X25MLSerPort (subtype 62)" (page 394)	G30 and later
	"X25Port (subtype 63)" (page 374)	G30 and later
	"X75PortG32 (subtype 70)" (page 412)	G32 and later
	"X75MLAgentG32 (subtype 71)" (page 405)	G32 and later
Custom Services	"GASTrtxtUnivGate (subtype 44)" (page 280)	
	"BOLDTermPAD (subtype 45)" (page 250)	
	"ACPPAD (subtype 76)" (page 252)	
	"SABRE (subtype 46)" (page 328)	
	"ClusterRemoteDU (subtype 51)" (page 257)	
(Sheet 3 of 3)		

3270HostPAD (subtype 22)

Table 32
3270 Host PAD statistics (subtype 22)

Field	Type
genPollCnt	integer
selectPollCnt	integer
selectCnt	integer
frmSnt	integer
frmRcv	integer
enqSnt	integer
enqRcv	integer
cmdAbort	integer
respUndlvrd	integer
frmRxmt	integer
(Sheet 1 of 2)	

Table 32 (continued)
3270 Host PAD statistics (subtype 22)

Field	Type
crcVrcErr	integer
overruns	integer
underruns	integer
badFrmSize	integer
modemChanges	integer
protocolErr	integer
lrcErr	integer
noBuffer	integer
frmAbort	integer
maxCalls	integer
frmSsqSnt	integer
frmSsqRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer
(Sheet 2 of 2)	

genPollCnt	The number of general polls which the HPAD has received.
selectPollCnt	The number of specific polls which the HPAD has received.
selectCnt	The number of selects which the HPAD has received.
frmSnt	The number of data frames that the HPAD has sent to the host.
frmRcv	The number of data frames which the HPAD has received from the host.
enqSnt	The number of BSC ENQ sequences sent to the host.

enqRcv	The number of BSC ENQ sequences received from the host.
cmdAbort	The number of times the host goes down or becomes inactive.
respUndlvrd	The number of device responses which failed to be delivered to the host.
frmRxmt	The number of frames which had to be retransmitted.
crcVrcErr	The number of vertical redundancy check errors and LRC errors received by the HPAD. Only applicable when the ASCII character set is used.
overruns	The number of times a received character was lost because the HPAD was busy processing the preceding character.
underruns	The number of times the HPAD was unable to provide a character to the link when it had completed output of the previous character.
badFrmSize	The number of frames received from the host which exceeded the maximum allowable frame.
modemChanges	The number of modem status changes detected.
protocolErr	The number of BSC.3 protocol errors detected from the host.
lrcErr	The number of frames which were available for transmission, but in which an LRC error prevented them from being transmitted.
noBuffer	The number of failures in obtaining a free block for incoming data.
frmAbort	The number of frames received with the last character being ENQ. This indicates a frame abort being sent from the host.
maxCalls	The maximum number of calls up in the 15 minute period.

frmSsqSnt	The sum square of the total number of transmitted bytes to the host.
frmSsqRcv	The sum square of the total number of received bytes from the host.
frmBytesSnt	The total number of transmitted data bytes.
frmBytesRcv	The total number of received data bytes.

3270TermPAD (subtype 20)

Table 33
3270 TPAD statistics (subtype 20)

Field	Type
genPollCnt	integer
selectPollCnt	integer
selectCnt	integer
frmSnt	integer
frmRcv	integer
enqSnt	integer
enqRcv	integer
respAbort	integer
cmdUndlvr	integer
frmRxmt	integer
crcVrcErr	integer
overruns	integer
underruns	integer
badFrmSize	integer
modemChanges	integer
protocolErr	integer
lrcErr	integer
(Sheet 1 of 2)	

Table 33 (continued)
3270 TPAD statistics (subtype 20)

Field	Type
noBuffer	integer
frmAbort	integer
minbuffAbort	integer
frmSsqSnt	integer
frmSsqRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer
(Sheet 2 of 2)	

genPollCnt	The number of times the TPAD has polled the controllers.
selectPollCnt	The number of times that the TPAD has requested status data from a controller.
selectCnt	The number of SELECTs performed by the TPAD.
frmSnt	The number of frames that the TPAD has sent to the controller.
frmRcv	The number of frames that the TPAD has received from the controller.
enqSnt	The number of BSC ENQ sequences sent to the controller.
enqRcv	The number of BSC ENQ sequences received from the controllers.
respAbort	The number of invalid message sequences which the TPAD received and responded with an abort sequence.
cmdUndlvrd	The number of commands sent by the TPAD which were not correctly acknowledged by the controllers.
frmRxmt	The number of frames which had to be retransmitted.

crcVrcErr	The number of cyclic redundancy check errors received by the TPAD. Only applicable when the EBCDIC character set is used.
overruns	The number of times a received character was lost because the TPAD was busy processing the preceding character.
underruns	The number of times the TPAD was unable to provide a character to the link when it had completed output of the previous character.
badFrmSize	The number of bad size frames detected. Frames were too long.
modemChanges	The number of modem status changes occurring in the last 15-minute period.
protocolErr	The number of BSC.3 protocol errors detected by the TPAD.
lrcErr	Total number of packets received with LRC errors.
noBuffer	The count of failures in obtaining a free block for incoming data.
frmAbort	The number of frames received with the last character being ENQ. This indicates a data check condition by the controller.
minbuffAbort	The number of minimum buffer aborts detected on the link.
frmSsqSnt	The sum square of the total number of transmitted bytes to the host.
frmSsqRcv	The sum square of the total number of received bytes from the host.
frmBytesSnt	The total number of transmitted data bytes.
frmBytesRcv	The total number of received data bytes.

APIDevice (subtype 19)

Table 34
API Device statistics (subtype 19)

Field	Type
nacksToSelects	integer
noRespToPoll	integer
nacksToInMsg	integer
nacksToOutMsg	integer
parityErr	integer
msgAbortRcv	integer
timeoutOnSelect	integer
enqSnt	integer
enqRcv	integer
timeoutRcv	integer
devSuspWindowClosure	integer
hostSntIntPkts	integer
padCallAtmpt	integer
dataMsgsRcv	integer
dataMsgsSnt	integer

nacksToSelects	The number of NAK responses to select.
noRespToPoll	The number of timeouts (No response to poll).
nacksToInMsg	The number of NAKs sent to input messages.
nacksToOutMsg	The number of NAK responses to output messages.
parityErr	The number of parity errors on control sequences.
msgAbortRcv	The number of message aborts (EOT received).
timeoutOnSelect	The number of timeouts on select.
enqSnt	The number of BSC ENQ sequences sent to the controllers.

enqRcv	The number of BSC ENQ sequences received from the controllers.
timeoutRcv	The number of timeouts received.
devSuspWindow Closure	The number of times the device was suspended due to window closure.
hostSntIntPkts	The number of times the device was suspended due to host sending Interrupt packet.
padCallAttmpt	The number of call attempts by the PAD, whether good or bad.
dataMsgsRcv	The number of incoming data messages from the device.
dataMsgsSnt	The number of outgoing data messages to the device.

APILink (subtype 11)

Table 35
API Link statistics (subtype 11)

Field	Type
frmSnt	integer
frmRcv	integer
crcErr	integer
lrcErr	integer
underruns	integer
overruns	integer
protocolErr	integer
zeroCnt	integer
breakErr	integer
frmErr	integer
longMsg	integer
incpltMsg	integer
(Sheet 1 of 2)	

Table 35 (continued)
API Link statistics (subtype 11)

Field	Type
circuitReset	integer
errMsg	integer
frmBytesRcv	integer
frmBytesSnt	integer
frmSsqRcv	integer
frmSsqSnt	integer
histogramRcv	integer
histogramSnt	integer
(Sheet 2 of 2)	

frmSnt	The number of messages sent.
frmRcv	The number of messages received.
crcErr	The number of messages with cyclic redundancy check errors.
lrcErr	The number of messages with LRC errors.
underruns	The number of times the service was unable to provide a character to the link when it had completed output of previous character.
overruns	The number of times a received character was lost because the service was busy processing the preceding character.
protocolErr	The number of protocol violations detected by all logical links.
zeroCnt	Not used (always 0).
breakErr	Not used (always 0).
frmErr	The number of invalid frames received from device or sent to device.

longMsg	Host message received by the API is too long.
incpltMsg	Incomplete message received from device.
circuitReset	The number of circuit resets sent.
errMsg	The number of error messages sent and received.
frmBytesRcv	The total number of data characters received.
frmBytesSnt	The total number of data characters transmitted.
frmSsqRcv	The sum of the square of received message lengths.
frmSsqSnt	The sum of the square of transmitted message lengths.
histogramRcv	Histogram of data message length for received messages, in increments of 10 characters up to 250 characters and increments of 50 characters up to 500 characters. One additional field for messages greater than 500 characters.
histogramSnt	Histogram of data message length for sent messages, in increments of 10 characters up to 250 characters and increments of 50 characters up to 500 characters. One additional field for messages greater than 500 characters.

BOLDTermPAD (subtype 45)

Table 36
BOLD TermPAD link statistics (subtype 45)

Field	Type
frmSnt	integer
frmRcv	integer
enqSnt	integer
enqRcv	integer
frmRxmt	integer
crcErr	integer
overruns	integer
underruns	integer
badFrm	integer
modemChanges	integer
protocolErr	integer
noBuffer	integer
frmAbort	integer
frmSsqSnt	integer
frmSsqRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer

frmSnt	The number of messages sent.
frmRcv	The number of messages received.
enqSnt	The number of BSC ENQ sequences sent to the host.
enqRcv	The number of BSC ENQ sequences received from the host.
frmRxmt	Frames recent to the DTE.
crcErr	CRC errors on frames from DTE.

overruns	The number of times a received character was lost because the service was busy processing the preceding character.
underruns	The number of times the service was unable to provide a character to the link when it had completed output of previous character.
badFrm	Frames from DTE that are either longer than allowed by service data, or are less than 4 octets long.
modemChanges	Modem status changes.
protocolErr	The total number of SWIFT BOLD PAD protocol violations for all PUs on this link during the past interval.
noBuffer	No message blocks are available for interrupt handle.
frmAbort	The number of frames received with the last character being ENQ. This indicates a frame abort being sent from the host.
frmSsqSnt	The sum of the square of the lengths of all RUs sent to the DTE (field length = 6 bytes).
frmSsqRcv	The sum of the square of the lengths of all RUs received from the DTE (field length = 6 bytes).
frmBytesSnt	The sum of the lengths of all RUs sent to the DTE (excludes CRC and flag) (field length = 4 bytes).
frmBytesRcv	The sum of the lengths of all RUs received from the DTE (excludes CRC and flag) (field length = 4 bytes).

ACPPAD (subtype 76)

Table 37
ACPPAD statistics (subtype 76)

Field	Type
lpcErrors	integer
overruns	integer
underruns	integer
badInputMessages	integer
modemChanges	integer
parityErrors	integer
lineUtl	integer
frmSnt	integer
frmRcv	integer
frmDisc	integer
xmitDataBytes	integer
rcvDataBytes	integer

lpcErrors	The number of received messages with LPC(C) error.
overruns	The number of times a received character was lost because the PAD was busy processing the preceding characters.
underruns	The number of times the PAD was unable to provide a character to the link when it had completed output of the previous character.
badInputMessages	The number of bad input messages.
modemChanges	The number of modem changes.
parityErrors	The number of received messages that contain a parity error.

lineUtl	This is a measure of the line utilization, and is in units of characters per second.
frmSnt	This is a measure of the total number of frames that have been transmitted.
frmRcv	This is a measure of the total number of frames that have been received.
frmDisc	This is a measure of the total number of frames that have been discarded.
xmitDataBytes	The total number of data bytes transmitted. This consists of the bytes contained between the STX and ETX character sequence of information messages.
rcvDataBytes	The total number of data bytes received. This consists of the bytes contained between the STX and ETX character sequence of information messages.

CallRedirSvr (subtype 32)

Table 38
Call redirection statistics (subtype 32)

Field	Type
redir	integer
redirFail	integer
dnaRedir	integer
dnicRedir	integer
numberAttempts	integer

redir	The number of calls received by the redirection server.
redirFail	The number of call redirection failures. Requests for DNA redirection not defined in the DNA redirection lists.
dnaRedir	The number of calls received for DNA redirection.

dnicRedir	The number of calls received for DNIC redirection.
numberAttempts	The number of call redirection attempts to redirection members in the list (member 1 to member 7).

CallRedirSvrRSI (subtype 33)

Table 39
Call redirection RSI statistics (subtype 33)

Field	Type
dnaReq	integer
ridReq	integer

dnaReq	The number of DNA requests handled.
ridReq	The number of requests handled by RID redirection.

CallRouterDst (subtype 29)

Table 40
Destination call router statistics (subtype 29)

Field	Type
callsProc	integer
callsFwd	integer
midCalls	integer
callsRedir	integer

callsProc	The number of calls processed.
callsFwd	The number of calls call-forwarded.
midCalls	The number of calls to MIDs.
callsRedir	The number of calls redirected.

CallRouterGateDst (subtype 40)

Table 41
Gateway destination call router statistics (subtype 40)

Field	Type
callsToGty	integer
callsToGscr	integer

callsToGty Number of calls routed to a gateway.

callsToGscr Number of calls sent to the GSCR for re-routing purposes.

CallRouterGateSrc (subtype 39)

Table 42
Gateway source call router statistics (subtype 39)

Field	Type
callsToRpoa	integer
barredCalls	integer
clgCldCalls	integer
dstAdrCalls	integer

callsToRpoa The number of calls routed by RPOA.

barredCalls The number of barred calls.

clgCldCalls The number of calls routed, based on the calling/called prefix DNA pair.

dstAdrCalls The number of calls routed, based on the destination network address.

CallRouterSrc (subtype 28)

Table 43
Source call router statistics (subtype 28)

Field	Type
callsProc	integer
ridCalls	integer
anidCalls	integer
nnidCalls	integer

callsProc The number of calls processed.

ridCalls The number of calls routed to a RID.

anidCalls The number of calls routed to an ANID.

nnidCalls The number of calls routed to an NNID.

ClusterRemoteDU (subtype 51)

One link level statistics record is maintained for the CRDU TPAD service. The statistics record is reported in response to a statistics probe. These statistics are reset after the service has responded to a statistics probe. The statistics are reported on a per TPAD basis.

Table 44
CRDU statistics (subtype 51)

Field	Type
nacks	integer
krpts	integer
parityErr	integer
msgTooLong	integer
msgExceed	integer
protocolErr	integer
modemChanges	integer
overruns	integer
underruns	integer
avgRespTime	integer
lineUtl	integer
bytesSnt	integer
bytesRcv	integer

nacks

The number of NACK messages that the TPAD relays from the CRDU to the AF Host.

krpts

The number of KRPT messages that the TPAD relays from the CRDU to the AF Host.

parityErr

The number of messages received by the TPAD from the CRDU which contain parity errors.

msgTooLong The number of messages received by the TPAD from the CRDU which exceed maximum message lengths defined in service data (either single or changed messages).

msgExceed A count of the number of occurrences of message response times exceeding the maximum normal response time defined in service data.

protocolErr A count of the occurrences of protocol errors detected by the TPAD.

Where protocol errors on messages received from the CRDU consist of:

- ELG field of the TC1 envelope is less than H.2B (i.e. TC1 envelope is too short).
- Message is not in a recognizable field specification format.
- Message from the CRDU is an invalid response to the message just sent to the CRDU.
- Message from a device on a CRDU configured as TC1, does not contain a TC1 envelope.

Alternatively, message from a device on a CRDU configured as TU, does contain a TC1 envelope.

Where protocol errors on messages received from the AF Host consist of:

- F0 (CONTROL MESSAGE) field of EAF has a value of 1.
- TERMINAL IRT field of the EAF does not match the configured IRT number of the TPAD that received this AF host message.
- TERMINAL TYPE field of the EAF does not match the configured type of CRDU for which this AF host message is intended.
- CRT# field of the EAF is not a configured device on the TPAD.
- LEN OF ENV field of the EAF is less than H.06.
- LGC field of the EAF is not equal to the length of the TEXT portion of the EAF message (including TC1, TEXT and ETX).
 - ELG field of the TC1 envelope is less than H.2B (i.e. TC1 envelope is too short).

modemChanges	The number of modem status changes occurring in the last 15-minute period.
overruns	The number of times a received character was lost because the TPAD was busy processing the preceding character.
underruns	The number of times the TPAD was unable to provide a character to the link when it had completed output of the previous character.
avgRespTime	Indicates the average response time of all response times gathered (from the CRDU) by the TPAD. This average is in units of tenths of a second.

lineUtl This is a measure of the line utilization, and is in units of characters per second. This line utilization is calculated as follows:

$$\text{Utilization (chars./sec.)} = \frac{(\text{TxBytes} + \text{RxBytes})}{900 \text{ sec.}}$$

where:

TxBytes: total number of transmitted data bytes

RxBytes: total number of received data bytes

900: represents the 15 minute measurement interval (in seconds).

bytesSnt The total number of data bytes transmitted to the CRDU. This consists of the bytes contained between the SOH and ETX character sequence of information messages.

bytesRcv The total number of data bytes received from CRDU. This consists of the bytes contained between the SOH and ETX/EOT character sequence of information messages (includes ACKs, NACKs and KRPTs).

DialOutRouting (subtype 36)

Table 45
Dial out routing statistics (subtype 36)

Field	Type
doCallReq	integer
doCallFail	integer
altDoAttmpt	integer
altDoFail	integer
prefixDoas	string

doCallReq	The number of dial-out call requests received.
doCallFail	The number of original dial-out call failures.
altDoAttmp	The number of alternate dial attempts.
altDoFail	The number of alternate dial-out failures.
prefixDoas	Variable length prefix/DOAS.

FrameRelay (subtype 59)

Table 46
Frame Relay statistics (subtype 59)

Field	Type
version	integer
service	integer
lclRid	integer
lclMid	integer
maxCalls	integer
linkSpeed	integer
currFrmQueued	integer
modType	integer
frmQueued	integer
overruns	integer
frmAbort	integer
noBuffer	integer
badFrmSize	integer
lrcErr	integer
crcErr	integer
cardErr	integer
underruns	integer
(Sheet 1 of 2)	

Table 46 (continued)
Frame Relay statistics (subtype 59)

Field	Type
modemChanges	integer
protocolErr	integer
frmSnt	long integer
frmRcv	long integer
ifrmSnt	integer
ifrmRcv	integer
ifrmSsqSnt	integer
ifrmSsqRcv	integer
bytesSnt	integer
bytesRcv	integer
(Sheet 2 of 2)	

version

This field indicates the version number of the statistics record, currently zero.

service

This field indicates the access service with which this link is running. Values:

- 0 = Frame Relay Service
- 1 = Network Link over Frame Relay.

lclRid

This field specifies the routing id (RID) of the module on which this link is running. This field is 0 for an AM.

lclMid

This field specifies the module id (MID) of the module on which this link is running. If 0, the module does not have a module id.

maxCalls

This field indicates the maximum number of calls which were active over the frame relay service during the statistics interval.

linkSpeed	<p>This field specifies the speed of the link. The speed is denoted in kbit/s.</p> <p>For example, this field can contain a decimal value of 56, representing a link speed of 56,000 bit/s. A speed of 2,048,000 bit/s is represented by a decimal value of 2048.</p>
currFrmQueued	<p>This field specifies the number of frames queued for transmission to the link, when the statistics probe was processed by the link.</p>
modType	<p>This field specifies the type of module on which this link is running. If set to 3, then the module is an AM; if set to 2, then the module is an RM.</p>
frmQueued	<p>This field specifies the high-water-mark number of frames queued for transmission to the link when the statistics probe was processed by the link. If the number of frames queued is greater than 255, then this field has a value of 255, or H.FF. The true count of frames queued is in the statistical counter CURRENTFRAMESQD. This statistic usually indicates that the link is overloaded, and may have to be reengineered to handle the offered traffic.</p>

NOTE: This field is not as useful as the CURRENTFRAMESQD, but is used at the link for thresholding. The thresholds all have maximum values of 254, as there is no need in most cases to keep counting the number of link errors after hitting the upper bound. For example, the number of modem status changes in a statistics interval is counted until a value of 254 is reached, then the counting stops. In the case of frames queued, the true count of frames queued is available in CURRENTFRAMESQD.

overruns This field specifies the number of overruns in this statistics interval on the link. The PE is unable to accept a frame before the next frame has been accepted by the receiver on the PI.

This statistic usually indicates that the PE is overloaded, and should be reengineered in order that the traffic capacity not be exceeded.

frmAbort This field specifies the number of aborted frames in this statistics interval on the link.

This statistic usually indicates a problem at the remote end of the line (it is sending aborts), or on the facility (it is turning data on the line into aborts).

noBuffer This field specifies the number of times in this statistics interval that the receive buffer used by the interrupt handler was insufficient to handle incoming traffic from the link.

This statistic usually indicates that the link is overloaded, and requires reengineering.

badFrmSize This field specifies the number of frames received in this statistics interval from the link with a bad frame size (too long or too short).

This usually indicates a problem at the remote end of the line; it is sending frames of an incorrect size.

lrcErr This field specifies the number of LRC errors in this statistics interval on the link.

This statistic usually indicates a data corruption problem somewhere in the module.

crcErr	<p>This field specifies the number of CRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a problem with the quality of the line.</p>
cardErr	<p>This field specifies the number of line errors in this statistics interval.</p> <p>This statistic usually indicates a problem on the SCC of the PI.</p>
underruns	<p>This field specifies the number of underruns in this statistics interval on the link. The interrupt handler is unable to give the next character to the SCC in time.</p>
modemChanges	<p>This field specifies the number of modem status changes in this statistic interval on the link.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end. An unterminated cable plugged into the PI may also cause excessive modem status changes.</p>
protocolErr	<p>This field indicates the number of link protocol errors in this statistics interval on the link.</p> <p>This statistic, if coupled with other statistics errors, can indicate a problem on the hardware for the line. Otherwise, it indicates a problem with the remote end, where the protocol has not been implemented properly.</p>
frmSnt	<p>This field specifies the number of frames sent to the link. The count includes both the I-frames and the LMI frames.</p>
frmRcv	<p>This field specifies the number of frames received from the link. The count includes both the I-frames and the LMI frames.</p>

ifrmSnt	This field specifies the number of I-frames sent to the link. I-frames do not include LMI frames.
ifrmRcv	This field specifies the number of I-frames received from the link. I-frames do not include LMI frames.
ifrmSsqSnt	This field specifies the statistical sum of squares for the number of bytes in I-frames sent to the link in this statistics interval. I-frames do not include LMI frames.
ifrmSsqRcv	This field specifies the statistical sum of squares for the number of bytes in I-frames received from the link in this statistics interval. I-frames do not include LMI frames.
bytesSnt	This field specifies the total number of user bytes sent to the link in the statistics interval.
bytesRcv	This field specifies the total number of user bytes received from the link in the statistics interval.

FrameRelayDLCIEnhanced (subtype 66)

Table 47
Frame Relay DLCI Enhanced statistics (subtype 66)

Field	Type
service	integer
lclRid	integer
lclMid	integer
frmSnt	integer
frmRcv	integer
bytesSnt	integer
bytesRcv	integer
deFrmSnt	integer
deFrmRcv	integer
excessFrmRcv	integer
deBytesSnt	integer
deBytesRcv	integer
excessBytesRcv	integer
rateReductions	integer
reductionPeriod	integer
fecnSnt	integer
fecnRcv	integer
becnSnt	integer
becnRcv	integer
becnByPh	integer
discFrmEgressCong	integer
discFrmIngressCong	integer
discFrmRateEnforce	integer
(Sheet 1 of 2)	

Table 47 (continued)
Frame Relay DLCI Enhanced statistics (subtype 66)

Field	Type
duplicatePkts	integer
pktsOutOfRange	integer
(Sheet 2 of 2)	

service	This field indicates the access service for this link. Values: 0 = Frame Relay Service.
lclRid	This field specifies the routing identifier (RID) of the module for this link. This field is 0 for an AM.
lclMid	This field specifies the module identifier (MID) of the module for this link. If zero, the module does not have a MID.
frmSnt	This field specifies the number of frames (DE = 0 and DE = 1) sent to the link.
frmRcv	This field specifies the number of frames (DE = 0 and DE = 1) accepted from the link.
bytesSnt	This field specifies the total number of user bytes in the frames (DE = 0 and DE = 1) sent to the link.
bytesRcv	This field specifies the total number of user bytes in the frames (DE = 0 and DE = 1) accepted from the link.
deFrmSnt	This field specifies the number of DE = 1 frames sent to the link.
deFrmRcv	This field specifies the number of (user-set) DE = 1 frames accepted from the link.
excessFrmRcv	This field specifies the number of DE = 0 frames accepted from the link, and subsequently set to DE = 1 by the PH.
deBytesSnt	This field specifies the number of bytes in the DE = 1 frames sent to the link.

deBytesRcv	This field specifies the number of bytes in the (user-set) DE = 1 frames accepted from the link.
excessBytesRcv	This field specifies the number of bytes in the DE = 0 frames accepted from the link, and subsequently set to DE = 1 by the PH.
rateReductions	This field indicates the number of times the allowable bandwidths have been reduced due to the rate adaptation. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
reductionPeriod	This field indicates the accumulated time interval in 0.1-sec units during which the rate adaptation mechanism is in effect.
fecnSnt	This field specifies the number of FECN = 1 frames sent to the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
fecnRcv	This field specifies the number of FECN = 1 frames accepted from the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
becnSnt	This field specifies the number of BECN = 1 frames sent to the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
becnRcv	This field specifies the number of BECN = 1 frames accepted from the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
becnByPh	This field specifies the total number of BECN = 0 frames that the PH sets to BECN = 1 for all frames that have been sent to and receive from the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.

discFrmEgressCong	This field specifies the number of frames discarded at the egress access point due to congestion conditions. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
discFrmIngress Cong	This field specifies the number of frames discarded at the ingress access point due to congestion conditions. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
discFrmRateEnforce	This field specifies the total number of frames discarded at the ingress access point due to rate enforcement, or because the DLCI is inactive. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
duplicatePkts	This field specifies the number of duplicated subnet packets received by the egress virtual circuit.
pktsOutOfRange	This field specifies the number of out-of-range subnet packets received by the egress virtual circuit.

FrameRelayDLCIG33 (subtype 69)

Table 48
Frame Relay DLCI G33 statistics (subtype 69)

Field	Type
version	integer
service	integer
lclRid	integer
lclMid	integer
frmSnt	integer
frmRcv	integer
bytesSnt	integer
bytesRcv	integer
deFrmSnt	integer
(Sheet 1 of 3)	

Table 48 (continued)
Frame Relay DLCI G33 statistics (subtype 69)

Field	Type
deFrmRcv	integer
excessFrmRcv	integer
deBytesSnt	integer
deBytesRcv	integer
excessBytesRcv	integer
rateReductions	integer
reductionPeriod	integer
fecnSnt	integer
fecnRcv	integer
becnSnt	integer
becnRcv	integer
becnPhToSubnet	integer
becnPhToLink	integer
becnFromNetRcv	integer
fecnFromNetRcv	integer
frmToDteDisc	integer
deFrmToDteDisc	integer
bytesToDteDisc	integer
deBytesToDteDisc	integer
frmFromDteDisc	integer
deFrmFromDteDisc	integer
bytesFromDteDisc	integer
deBytesFromDteDisc	integer
discFrmRateEnforce	integer
duplicatePkts	integer
(Sheet 2 of 3)	

Table 48 (continued)
Frame Relay DLCI G33 statistics (subtype 69)

Field	Type
pktsOutOfRange	integer
aBitChanges	integer
(Sheet 3 of 3)	

version	This field indicates the version number of the statistics record, currently zero.
service	The access service for this link. Values: 0 = Frame Relay Service.
lclRid	The routing identifier (RID) of the module for this link. This field is zero for an AM.
lclMid	The module identifier (MID) of the module for this link. If zero, the module does not have a MID.
frmSnt	The number of frames (DE = 0 and DE = 1) sent to the link.
frmRcv	The number of frames (DE = 0 and DE = 1) accepted from the link.
bytesSnt	The total number of user bytes in the frames (DE = 0 and DE = 1) sent to the link.
bytesRcv	The total number of user bytes in the frames (DE = 0 and DE = 1) accepted from the link.
deFrmSnt	The number of DE = 1 frames sent to the link.
deFrmRcv	The number of (user-set) DE = 1 frames accepted from the link.
excessFrmRcv	The number of DE = 0 frames accepted from the link, and subsequently set to DE = 1 by the PH.
deBytesSnt	The number of bytes in the DE = 1 frames sent to the link.
deBytesRcv	The number of bytes in the (user set) DE = 1 frames accepted from the link.

excessBytesRcv	The number of bytes in the DE = 0 frames accepted from the link, and subsequently set to DE = 1 by the PH.
rateReductions	The number of times the allowable bandwidths have been reduced due to rate adaptation. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
reductionPeriod	The accumulated time interval in 0.1-sec. units during which the rate adaptation mechanism is in effect.
fecnSnt	The number of FECN = 1 frames sent to the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
fecnRcv	The number of FECN = 1 frames accepted from the link. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
becnSnt	The number of BECN = 1 frames sent to the link. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
becnRcv	The number of BECN = 1 frames accepted from the link. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
becnPhToSubnet	The number of BECNs sent to the subnet by the local Frame Relay service.
becnPhToLink	The number of BECNs sent to the link by the local Frame Relay service.
becnFromNetRcv	The number of BECNs received since the BCI bit was set by the network.
fecnFromNetRcv	The number of FECNs received since the FCI bit was set by the network.
frmToDteDisc	The number of frames discarded at egress due to local congestion.

deFrmToDteDisc	The number of frames with DE=1 discarded at egress due to local congestion.
bytesToDteDisc	The number of bytes discarded at egress due to local congestion.
deBytesToDteDisc	The number of bytes with DE=1 discarded at egress due to local congestion.
frmFromDteDisc	The number of frames discarded at ingress due to local congestion.
deFrmFromDteDisc	The number of frames with DE=1 discarded at ingress due to local congestion.
bytesFromDteDisc	The number of bytes discarded at ingress due to local congestion.
deBytesFromDteDisc	The number of bytes with DE=1 discarded at ingress due to local congestion.
discFrmRateEnforce	The total number of frames discarded at the ingress access point due to rate enforcement, or because the DLCI is inactive. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
duplicatePkts	The number of duplicated subnet packets received by the egress virtual circuit.
pktsOutOfRange	The number of out-of-range subnet packets received by the egress virtual circuit.
aBitChanges	The number of times the effective A-bit (for both directions) changes from active to inactive.

FrameRelayDLCIG34 (subtype 73)

Table 49
Frame Relay DLCI G34 statistics (subtype 73)

Field	Type
version	integer
service	integer
(Sheet 1 of 3)	

Table 49 (continued)
Frame Relay DLCI G34 statistics (subtype 73)

Field	Type
lclRid	integer
lclMid	integer
frmSnt	integer
frmRcv	integer
bytesSnt	integer
bytesRcv	integer
deFrmSnt	integer
deFrmRcv	integer
excessFrmRcv	integer
deBytesSnt	integer
deBytesRcv	integer
excessBytesRcv	integer
rateReductions	integer
reductionPeriod	integer
fecnSnt	integer
fecnRcv	integer
becnSnt	integer
becnRcv	integer
becnPhToSubnet	integer
becnPhToLink	integer
becnFromNetRcv	integer
fecnFromNetRcv	integer
frmToDteDisc	integer
deFrmToDteDisc	integer
bytesToDteDisc	integer
(Sheet 2 of 3)	

Table 49 (continued)
Frame Relay DLCI G34 statistics (subtype 73)

Field	Type
deBytesToDteDisc	integer
frmFromDteDisc	integer
deFrmFromDteDisc	integer
bytesFromDteDisc	integer
deBytesFromDteDisc	integer
discFrmRateEnforce	integer
discFrmTooShort	integer
discFrmTooLong	integer
discFrmInactive	integer
discBytesRateEnforce	integer
discBytesTooLong	integer
discBytesInactive	integer
duplicatePkts	integer
pktsOutOfRange	integer
aBitChanges	integer
(Sheet 3 of 3)	

version	This field indicates the version number of the statistics record, currently zero.
service	The access service for this link. Values: 0 = Frame Relay Service.
lclRid	The routing identifier (RID) of the module for this link. This field is zero for an AM.
lclMid	The module identifier (MID) of the module for this link. If zero, the module does not have a MID.
frmSnt	The number of frames (DE = 0 and DE = 1) sent to the link.

frmRcv	The number of frames (DE = 0 and DE = 1) accepted from the link.
bytesSnt	The total number of user bytes in the frames (DE = 0 and DE = 1) sent to the link.
bytesRcv	The total number of user bytes in the frames (DE = 0 and DE = 1) accepted from the link.
deFrmSnt	The number of DE = 1 frames sent to the link.
deFrmRcv	The number of (user-set) DE = 1 frames accepted from the link.
excessFrmRcv	The number of (user-set or PH set) DE = 1 frames accepted from the link.
deBytesSnt	The number of bytes in the DE = 1 frames sent to the link.
deBytesRcv	The number of bytes in the (user set) DE = 1 frames accepted from the link.
excessBytesRcv	The number of bytes in the (user-set or PH set) DE = 1 frames accepted from the link.
rateReductions	The number of times the allowable bandwidths have been reduced due to rate adaptation. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
reductionPeriod	The accumulated time interval in 0.1-sec. units during which the rate adaptation mechanism is in effect.
fecnSnt	The number of FECN = 1 frames sent to the link. Once the counter reaches the high value, it will stay at 65535 until the next statistics probe.
fecnRcv	The number of FECN = 1 frames accepted from the link. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
becnSnt	The number of BECN = 1 frames sent to the link. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.

becnRcv	The number of BECN = 1 frames accepted from the link. Once the counter reaches the high value, it stays at 65535 until the next statistics probe.
becnPhToSubnet	The number of BECNs sent to the subnet by the local Frame Relay service.
becnPhToLink	The number of BECNs sent to the link by the local Frame Relay service.
becnFromNetRcv	The number of BECNs received since the BCI bit was set by the network.
fecnFromNetRcv	The number of FECNs received since the FCI bit was set by the network.
frmToDteDisc	The number of frames discarded at egress due to local congestion.
deFrmToDteDisc	The number of frames with DE=1 discarded at egress due to local congestion.
bytesToDteDisc	The number of bytes discarded at egress due to local PE congestion.
deBytesToDteDisc	The number of bytes with DE=1 discarded at egress due to local congestion.
frmFromDteDisc	The number of frames discarded at ingress due to local congestion.
deFrmFromDteDisc	The number of frames with DE=1 discarded at ingress due to local congestion.
bytesFromDteDisc	The number of bytes discarded at ingress due to local PE congestion.
deBytesFromDteDisc	The number of bytes with DE=1 discarded at ingress due to local congestion.
discFrmRateEnforce	The number of frames discarded due to rate enforcement.
discFrmTooShort	The number of frames discarded due to zero frame size.

discFrmTooLong	The number of frames discarded due to frame size being greater than the maximum frame size dN1.
discFrmInactive	The number of frames discarded due to the DLCI being inactive.
discBytesRate Enforce	The number of bytes discarded due to rate enforcement.
discBytesTooLong	The number of bytes discarded due to frame size being greater than the maximum frame size dN1.
discBytesInactive	The number of bytes discarded due to the DLCI being inactive.
duplicatePkts	The number of duplicated subnet packets received by the egress virtual circuit.
pktsOutOfRange	The number of out-of-range subnet packets received by the egress virtual circuit.
aBitChanges	The number of times the effective A-bit (for both directions) changes from active to inactive.

GASTrtxtUnivGate (subtype 44)

Table 50
GAS trtxt univ gate statistics (subtype 44)

Field	Type
newSmartSess	integer
maxSmartSess	integer
minSmartSess	integer
newDumbSess	integer
maxDumbSess	integer
minDumbSess	integer
newCsSess	integer
maxCsSess	integer
minCsSess	integer
newUavSess	integer
maxUavSess	integer
minUavSess	integer
newEumRedir	integer

- newSmartSess** This field indicates the total number of new smart sessions since the last probe.
- maxSmartSess** This field indicates the maximum number of smart sessions that occurred simultaneously since the last probe.
- minSmartSess** This field indicates the minimum number of smart sessions that occurred simultaneously since the last probe.
- newDumbSess** This field indicates the total number of new dumb sessions since the last probe.
- maxDumbSess** This field indicates the maximum number of dumb sessions that occurred simultaneously since the last probe.

minDumbSess	This field indicates the minimum number of dumb sessions that occurred simultaneously since the last probe.
newCsSess	This field indicates the total number of new CS sessions since the last probe.
maxCsSess	This field indicates the maximum number of new CS sessions that occurred simultaneously since the last probe.
minCsSess	This field indicates the minimum number of CS sessions that occurred simultaneously since the last probe.
newUavSess	This field indicates the total number of UAV queries completed since the last probe.
maxUavSess	This field indicates the maximum number of UAV queries that occurred simultaneously since the last probe.
minUavSess	This field indicates the minimum number of UAV queries that occurred simultaneously since the last probe.
newEumRedir	This field indicates the total number of EUM redirections completed since the last probe.

ISDNDLCI (subtype 24)

Table 51
ISDN DLCI statistics (subtype 24)

Field	Type
minCalls	integer
maxCalls	integer
maxNuiErr	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
frmSnt	integer
frmRcv	integer
badFrmSize	integer
protocolErr	integer
frmRxmt	integer
lrcErr	integer
frmQueued	integer
ifrmSnt	integer
ifrmRcv	integer
rrSnt	integer
rrRcv	integer
mrSnt	integer
mrRcv	integer
rejSnt	integer
rejRcv	integer
frmrSnt	integer
frmrRcv	integer
bytesSnt	integer
bytesRcv	integer

minCalls	Minimum number of calls up in a 15 minute period.
maxCalls	Maximum number of calls up in a 15 minute period.
maxNuiErr	Maximum number of NUI validation errors.
lclFlowCtrl	Total time interval which DPN access module has flow controlled on input (2 words).
rmtFlowCtrl	Total time interval which DPN access module has been flow controlled by the DTE (2 words).
frmSnt	Number of frames transmitted to the DTE, including information, supervisory, unnumbered and retransmitted frames, but not aborted frames (2 words).
frmRcv	Number of frames received from the DTE, including I, S and U frames, but not aborted frames, frames received with CRC errors or IBADFRMSIZE errors (2 words).
badFrmSize	Total number of frames received of the wrong size by level 2.
protocolErr	Total number of protocol violations detected.
frmRxmt	Total number of retransmits caused by an REJ or after a timeout on an information frame.
lrcErr	Total number of frames received with LRC errors.
frmQueued	Number of frames queued.
ifrmSnt	Number of I-frames transmitted.
ifrmRcv	Number of I-frames received.
rrSnt	Number of RRs transmitted.
rrRcv	Number of RRs received.
rnrSnt	Number of RNRs transmitted.
rnrRcv	Number of RNRs received.
rejSnt	Number of REJs transmitted.

rejRcv	Number of REJs received.
frmrSnt	Number of FRMRs transmitted.
frmrRcv	Number of FRMRs received.
bytesSnt	Number of bytes transmitted in I-frames information field (2 words).
bytesRcv	Number of bytes received in I-frames information field (2 words).

ISRB Phase 2 (subtype 68)

Table 52
ISRB Phase 2 statistics (subtype 68)

Field	Type
srbFrmFromLan	integer
srbFrmToSubnet	integer
srbFrmFromSubnet	integer
srbFrmToLan	integer
srbByteFromLan	integer
srbByteToSubnet	integer
srbByteFromSubnet	integer
srbByteToLan	integer
arbFrmFromLan	integer
arbFrmToSubnet	integer
arbFrmFromSubnet	integer
arbFrmToLan	integer
arbByteFromLan	integer
arbByteToSubnet	integer
arbByteFromSubnet	integer

(Sheet 1 of 4)

Table 52 (continued)
ISRB Phase 2 statistics (subtype 68)

Field	Type
arbByteToLan	integer
srfFrmFromLan	integer
srfFrmToSubnet	integer
srfFrmFromSubnet	integer
srfFrmToLan	integer
srfByteFromLan	integer
srfByteToSubnet	integer
srfByteFromSubnet	integer
srfByteToLan	integer
frmDeBitOnIn	integer
frmDeBitOnOut	integer
frmLwvcMacCmprEligIn	integer
frmLwvcMacCmprIn	integer
frmLwvcMacCmprOut	integer
frmProxyUpdateIn	integer
frmProxyUpdateOut	integer
frmProxiedOut	integer
frmIbpduIn	integer
frmIbpduOut	integer
frmDiscSrbIn	integer
frmDiscSrbOut	integer
frmDiscRingFiltIn	integer
frmDiscRingFiltOut	integer
frmDiscDmacFiltIn	integer
frmDiscDmacFiltOut	integer
(Sheet 2 of 4)	

Table 52 (continued)
ISRB Phase 2 statistics (subtype 68)

Field	Type
frmDiscSmacFiltIn	integer
frmDiscSmacFiltOut	integer
frmDiscDsapFiltIn	integer
frmDiscDsapFiltOut	integer
frmDiscSsapFiltIn	integer
frmDiscSsapFiltOut	integer
frmDiscInvFormatIn	integer
frmDiscInvFormatOut	integer
frmDiscInvIbpdu	integer
frmDiscREnforceIn	integer
frmDiscCongIn	integer
frmDiscCongOut	integer
frmDiscOtherIn	integer
frmDiscOtherOut	integer
frmDiscLwvcDown	integer
frmDiscExcessHopsIn	integer
frmDiscExcessHopsOut	integer
frmDiscOvrsizeLwvcIn	integer
frmDiscOvrsizeLwvcOut	integer
frmDiscOvrsizeBcstIn	integer
frmDiscOvrsizeBcstOut	integer
qToBcstOverflow	integer
frmDiscCompFiltIn	integer
frmDiscCompFiltOut	integer
(Sheet 3 of 4)	

Table 52 (continued)
ISRB Phase 2 statistics (subtype 68)

Field	Type
frmDiscServREnforceln	integer
frmProxyDiscardln	integer
(Sheet 4 of 4)	

srbFrmFromLan	The number of single-route broadcast frames received from the physical Token-Ring LAN.
srbFrmToSubnet	The number of single-route broadcast frames sent to the DPN subnet.
srbFrmFromSubnet	The number of single-route broadcast frames received from the DPN subnet.
srbFrmToLan	The number of single-route broadcast frames sent to the Token-Ring LAN.
srbByteFromLan	The number of single-route broadcast frames (in bytes) received from the physical Token-Ring LAN.
srbByteToSubnet	The number of single-route broadcast frames (in bytes) sent to the DPN subnet.
srbByteFromSubnet	The number of single-route broadcast frames (in bytes) received from the DPN subnet.
srbByteToLan	The number of single-route broadcast frames (in bytes) sent to the Token-Ring LAN.
arbFrmFromLan	The number of all-routes broadcast frames received from the physical Token-Ring LAN.
arbFrmToSubnet	The number of all-routes broadcast frames sent to the DPN subnet.
arbFrmFromSubnet	The number of all-routes broadcast frames received from the DPN subnet.
arbFrmToLan	The number of all-routes broadcast frames sent to the Token-Ring LAN.

arbByteFromLan	The number of all-routes broadcast frames (in bytes) received from the physical Token-Ring LAN.
arbByteToSubnet	The number of all-routes broadcast frames (in bytes) sent to the DPN subnet.
arbByteFromSubnet	The number of all-routes broadcast frames (in bytes) received from the DPN subnet.
arbByteToLan	The number of all-routes broadcast frames (in bytes) sent to the Token-Ring LAN.
srfFrmFromLan	The number of specifically routed frames received from the physical Token-Ring LAN.
srfFrmToSubnet	The number of specifically routed frames sent to the DPN subnet.
srfFrmFromSubnet	The number of specifically routed frames received from the DPN subnet.
srfFrmToLan	The number of specifically routed frames sent to the Token-Ring LAN.
srfByteFromLan	The number of specifically routed frames (in bytes) received from the physical Token-Ring LAN.
srfByteToSubnet	The number of specifically broadcast frames (in bytes) sent to the DPN subnet.
srfByteFromSubnet	The number of specifically routed frames (in bytes) received from the DPN subnet.
srfByteToLan	The number of specifically routed frames (in bytes) sent to the Token-Ring LAN.
frmDeBitOnIn	The number of frames that came from the LAN and were sent to the DPN subnet with the discard eligible (DE) bit on. A frame is tagged with the DE bit when it passes through the service-level rate enforcement with credit from the Service Excess Burst Size.

frmDeBitOnOut	The number of frames that came from the DPN subnet for the LAN with the discard eligible (DE) bit on. A frame is tagged with the DE bit when it passes through the service level rate enforcement with credit from the Service Excess Burst Size at the remote ISRB.
frmLwvcMacCmprElign	The number of frames received from the LAN that are eligible for LWVC MAC header compression. The number includes both compressed and uncompressed frames. This field is updated only if LWVC MAC header compression is in use.
frmLwvcMacCmprIn	The number of frames received from the LAN that are subjected to LWVC MAC header compression before being sent through the LWVC. This field is updated only if LWVC MAC header compression is in use.
frmLwvcMacCmprOut	The number of frames received from the DPN subnet that have been MAC header compressed. This field is updated only if LWVC MAC header compression is in use.
frmProxyUpdateIn	The number of proxy update frames which have been sent to the Broadcast System. A proxy update frame may be a new proxied frame or a change to an existing proxied frame.
frmProxyUpdateOut	The number of proxy update frames which came from the Broadcast System. A proxy update frame may be a new proxied frame or a change to an existing proxied frame.
frmProxiedOut	The number of proxied frames sent to the LAN by this ISRB on behalf of the remote ISRBs.
frmIbpduln	The number of ISRB Bridge Protocol Data Units (IBPDU) received.

frmIbpdOut	The number of ISRB Bridge Protocol Data Units (IBPDU) sent to the physical Token-Ring network.
frmDiscSrbln	The number of single-route broadcast frames received from the LAN that have been discarded because the bridge is a not a single-route broadcast bridge.
frmDiscSrbOut	The number of single-route broadcast frames received from the DPN subnet that have been discarded because this ISRB is a not a single-route broadcast bridge.
frmDiscRingFiltIn	The number of frames received from the LAN that have been discarded because of ring filtering.
frmDiscRingFiltOut	The number of frames received from the DPN subnet that have been discarded because of ring filtering.
frmDiscDmacFiltIn	The number of frames received from the LAN that have been discarded because of destination MAC address filtering.
frmDiscDmacFiltOut	The number of frames received from the DPN subnet that have been discarded because of destination MAC address filtering.
frmDiscSmacFiltIn	The number of frames received from the LAN that have been discarded because of source MAC address filtering.
frmDiscSmacFiltOut	The number of frames received from the DPN subnet that have been discarded because of source MAC address filtering.
frmDiscDsapFiltIn	The number of frames received from the LAN that have been discarded because of destination SAP address filtering.

frmDiscDsapFiltOut	The number of frames received from the DPN subnet that have been discarded because of destination SAP address filtering.
frmDiscSsapFiltIn	The number of frames received from the LAN that have been discarded because of source SAP address filtering.
frmDiscSsapFiltOut	The number of frames received from the DPN subnet that have been discarded because of source SAP address filtering.
frmDiscInvFormatIn	<p>The number of frames received from the LAN that have been discarded because of the following conditions:</p> <ul style="list-style-type: none">•Frame too short•Frame too long•Duplicate ring numbers in routing information•Invalid routing information field
frmDiscInvFormatOut	<p>The number of frames received from the DPN subnet that have been discarded because of the following conditions:</p> <ul style="list-style-type: none">•Frame too short•Frame too long•Duplicate ring numbers in routing information•Invalid routing information field
frmDiscInvlb pdu	The number of invalid ISRB BPDUs that have been received and discarded.
frmDiscREnforceln	The number of frames received from the LAN that have been discarded because of rate enforcement.
frmDiscCongln	The number of frames received from the LAN that have been discarded because of congestion or rate adaptation.

frmDiscCongOut	The number of frames received from the DPN subnet that have been discarded because of congestion or rate adaptation.
frmDiscOtherIn	The number of frames received from the LAN that have been discarded because of uncatagorized reasons.
frmDiscOtherOut	The number of frames received from the DPN subnet that have been discarded because of uncatagorized reasons.
frmDiscLwvcDown	The number of frames received from the LAN that have been discarded because the Light Weight Virtual Circuit cannot be setup.
frmDiscExcessHopsIn	The number of frames received from the LAN that have been discarded because of their excessive hop counts.
frmDiscExcessHopsOut	The number of frames received from the DPN subnet that have been discarded because of their excessive hop counts.
frmDiscOvrsizeLwvcIn	The number of frames received from the LAN that have been discarded because the frames are too large for the LWVCs.
frmDiscOvrsizeLwvcOut	The number of frames received from the LWVCs that have been discarded because the frames are too large.
frmDiscOvrsizeBcstIn	The number of frames received from the LAN that have been discarded because the frames are too large for the immediate broadcast server.
frmDiscOvrsizeBcstOut	The number of frames received from the broadcast server that have been discarded because the frames are too large.
qToBcstOverflow	The number of messages that have been discarded because the send queue to the broadcast server has reached a threshold.

frmDiscCompFiltIn	The number of frames received from the LAN that have been discarded because of composite filtering.
frmDiscCompFiltOut	The number of frames received from the DPN subnet that have been discarded because of composite filtering.
frmDiscServREnforceIn	The number of frames received from the LAN that have been discarded because of service-level rate enforcement.
frmProxyDiscardIn	The number of frames received from the LAN that have been discarded because of proxying of certain types of broadcast frames. Other ISRBs in the broadcast group already have a copy of these frames and will send these frames to their attached LANs on behalf of this ISRB. This field is updated only if proxy broadcast is in use.

ITI (subtype 12)

Table 53
ITI statistics (subtype 12)

Field	Type
modemChanges	integer
pktsRcv	integer
pktsSnt	integer
bytesRcv	integer
bytesSnt	integer
pktsSsqRcv	integer
pktsSsqSnt	integer
nuiReq	integer
nuiValid	integer
nuiInvalid	integer
nuiCnv	integer
length	integer
parityErr	integer
frmErr	integer
overruns	integer
nuiErr	integer
lrcErr	integer
l1PktsErr	integer
params	integer
parityThresh	integer
overrunsThresh	integer
nuiDie	integer
nuiDegrades	integer

modemChanges	The number of modem status changes occurring in the last 15-minute period.
pktsRcv	The sum of all packets received from the DTE.
pktsSnt	The sum of all packets sent to the DTE.
bytesRcv	The sum of all bytes received from the DTE.
bytesSnt	The sum of all bytes sent to the DTE.
pktsSsqRcv	The sum of squares of received packet lengths.
pktsSsqSnt	The sum of squares of sent packet lengths.
nuiReq	The number of NUI/translation requests sent for validation to the database.
nuiValid	The number of valid NUI/translation replies received.
nuiInvalid	The number of invalid NUI/translation replies received.
nuiCnv	The number of cannot validate NUI/translation replies received.
length	The length in bytes of the remaining statistics in this record.
parityErr	The number of incoming character parity errors.
frmErr	The number of incoming character framing errors.
overruns	The number of times a received character was lost because the service was busy processing the preceding character.
nuiErr	The number of illegal NUIs received.
lrcErr	The number of messages with LRC errors.
l1PktsErr	The number of invalid L1-packets received.
params	Parameter_1 to Parameter_22, Parameter_121, Parameter_122, Parameter_125: The ITI parameters P1 to P22, P121, P122, P125.

parityThresh	An alarm is generated if the number of parity errors exceeds this threshold set by operator (default = 2).
overrunsThresh	An alarm is generated if the number of overruns exceeds this threshold set by operator (default = 20).
nuiDie	Threshold set by the operator (default = 12), if exceeded on a dedicated line then an alarm is sent out and the link is disabled, if exceeded on a dial-up port then the service is turned off and no alarm is sent.
nuiDegrades	Threshold set by the operator (default = 4), if exceeded on a dedicated line then input is blocked for one minute and no alarm is sent, if exceeded on a dial-up port the service is turned off and no alarm is sent.

ITIEnhanced (subtype 57)

Table 54
ITI Enhanced statistics (subtype 57)

Field	Type
modemChanges	integer
pktsRcv	integer
pktsSnt	integer
bytesRcv	integer
bytesSnt	integer
pktsSsqRcv	integer
pktsSsqSnt	integer
nuiReq	integer
nuiValid	integer
nuiInvalid	integer
nuiCnv	integer
(Sheet 1 of 2)	

Table 54 (continued)
ITI Enhanced statistics (subtype 57)

Field	Type
length	integer
parityErr	integer
frmErr	integer
overruns	integer
nuiErr	integer
lrcErr	integer
l1PktsErr	integer
params	integer
parityThresh	integer
overrunsThresh	integer
nuiDie	integer
nuiDegrades	integer
callReqRcv	integer
callConnSnt	integer
accessNoCall	integer
(Sheet 2 of 2)	

modemChanges	The number of modem status changes occurring in the last 15-minute period.
pktsRcv	The sum of all packets received from the DTE.
pktsSnt	The sum of all packets sent to the DTE.
bytesRcv	The sum of all bytes received from the DTE.
bytesSnt	The sum of all bytes sent to the DTE.
pktsSsqRcv	The sum of squares of received packet lengths.
pktsSsqSnt	The sum of squares of sent packet lengths.

nuiReq	The number of NUI/translation requests sent for validation to the database.
nuiValid	The number of valid NUI/translation replies received.
nuiInvalid	The number of invalid NUI/translation replies received.
nuiCnv	The number of cannot validate NUI/translation replies received.
length	The length in bytes of the remaining statistics in this record.
parityErr	The number of incoming character parity errors.
frmErr	The number of incoming character framing errors.
overruns	The number of times a received character was lost because the service was busy processing the preceding character.
nuiErr	The number of illegal NUIs received.
lrcErr	The number of messages with LRC errors.
l1PktsErr	The number of invalid L1-packets received.
params	Parameter_1 to Parameter_22, Parameter_121, Parameter_122, Parameter_125: The ITI parameters P1 to P22, P121, P122, P125.
parityThresh	An alarm is generated if the number of parity errors exceeds this threshold set by operator (default = 2).
overrunsThresh	An alarm is generated if the number of overruns exceeds this threshold set by operator (default = 20).
nuiDie	Threshold set by the operator (default = 12), if exceeded on a dedicated line then an alarm is sent out and the link is disabled, if exceeded on a dial-up port then the service is turned off and no alarm is sent.

nuiDegrades	Threshold set by the operator (default = 4), if exceeded on a dedicated line then input is blocked for one minute and no alarm is sent, if exceeded on a dial-up port the service is turned of and no alarm is sent.
callReqRcv	The number of call request packets received from link.
callConnSnt	The number of incoming/outgoing service signals to the link.
accessNoCall	The number of times switched circuit call to the PAD port did not result in call setup.

LAPDPhysical (subtype 23)

Table 55
LAPD Physical statistics (subtype 23)

Field	Type
badFrmSize	integer
underruns	integer
modemChanges	integer
lineFail	integer
frmAbort	integer
noBuffer	integer
crcErr	integer
overruns	integer
frmSnt	integer
frmRcv	integer
bytesSnt	integer
bytesRcv	integer
rrSnt	integer
rnrSnt	integer
(Sheet 1 of 2)	

Table 55 (continued)
LAPD Physical statistics (subtype 23)

Field	Type
rejSnt	integer
frmrSnt	integer
ifrmSnt	integer
rrRcv	integer
mnrRcv	integer
rejRcv	integer
frmrRcv	integer
ifrmRcv	integer
l2BadFrmSize	integer
protocolErr	integer
frmRxmt	integer
frmQueued	integer
lrcErr	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
(Sheet 2 of 2)	

badFrmSize	Total number of frames received of the wrong size by the interrupt handler.
underruns	Total number of times the PE has been unable to supply data fast enough to keep up continuous flow.
modemChanges	Total number of modem errors detected by the PI.
lineFail	Total number of line failures detected.
frmAbort	Count of frames aborted. Indicates a transmission fault detected by the PI.

noBuffer	Count of number of times that no buffers were available to the interrupt handler when data was coming in.
crcErr	Total number of frames received with CRC errors.
overruns	Number of overruns. PE cannot handle data at this rate.
frmSnt	Number of frames sent. This includes, I, S, U frames of all logical links of the port (2 words).
frmRcv	Number of frames received. This includes I, S, U frames of all logical links of the port (2 words).
bytesSnt	Number of bytes sent. This includes the I-frames information field of all logical links on the port (2 words).
bytesRcv	Number of bytes received. This includes the I-frames information field of all logical links on the port (2 words).
rrSnt	Number of RRs transmitted for all logical links.
rrrSnt	Number of RNRs transmitted for all logical links.
rejSnt	Number of REJs transmitted for all logical links.
frmrSnt	Number of FRMRs transmitted for all logical links.
ifrmSnt	Number of I-frames transmitted for all logical links.
rrRcv	Number of RRs received for all logical links.
rrrRcv	Number of RNRs received for all logical links.
rejRcv	Number of REJs received for all logical links.
frmrRcv	Number of FRMRs received for all logical links.
ifrmRcv	Number of I-frames received for all logical links.
I2BadFrmSize	Total number of frames received of the wrong size by all logical links.
protocolErr	Total number of protocol violations detected by all logical links.

frmRxmt	Total number of retransmits caused by an REJ or after a timeout on an information frame.
frmQueued	Number of frames queued for all logical links.
lrcErr	Total number of frames received with LRC errors for all logical links.
lclFlowCtrl	Total time interval which DPN access module has flow controlled on input (2 words) (for all logical links).
rmtFlowCtrl	Total time interval which DPN access module has been flow controlled by the DTE (2 words) (for all logical links).

LAPDSignalling (subtype 47)

Table 56
LAPD signalling statistics (subtype 47)

Field	Type
minCalls	integer
maxCalls	integer
callsTotal	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
frmSnt	integer
frmRcv	integer
badFrmSize	integer
protocolErr	integer
frmRxmt	integer
lrcErr	integer
frmQueued	integer
ifrmSnt	integer
(Sheet 1 of 2)	

Table 56 (continued)
LAPD signalling statistics (subtype 47)

Field	Type
ifrmRcv	integer
rrSnt	integer
rrRcv	integer
rnrSnt	integer
rnrRcv	integer
rejSnt	integer
rejRcv	integer
frmrSnt	integer
frmrRcv	integer
bytesSnt	integer
bytesRcv	integer
(Sheet 2 of 2)	

minCalls	Minimum number of calls up in a 15-minute period.
maxCalls	Maximum number of calls up in a 15-minute period.
callsTotal	Total number of calls that reached the active state within the statistics interval.
lclFlowCtrl	Total time interval which DPN access module has flow controlled on input (2 words).
rmtFlowCtrl	Total time interval which DPN access module has been flow controlled by the DTE (2 words).
frmSnt	Number of frames transmitted to the DTE, including information, supervisory, unnumbered and retransmitted frames, but not aborted frames (2 words).

frmRcv	Number of frames received from the DTE, including I, S and U frames, but not aborted frames, frames received with CRC errors or IBADFRMSIZE errors (2 words).
badFrmSize	Total number of frames received of the wrong size by level 2.
protocolErr	Total number of protocol violations detected.
frmRxmt	Total number of retransmits caused by an REJ or after a timeout on an information frame.
lrcErr	Total number of frames received with LRC errors.
frmQueued	Number of frames queued.
ifrmSnt	Number of I-frames transmitted.
ifrmRcv	Number of I-frames received.
rrSnt	Number of RRs transmitted.
rrRcv	Number of RRs received.
rnrsnt	Number of RNRs transmitted.
rnrrcv	Number of RNRs received.
rejSnt	Number of REJs transmitted.
rejRcv	Number of REJs received.
frmrSnt	Number of FRMRs transmitted.
frmrRcv	Number of FRMRs received.
bytesSnt	Number of bytes transmitted in I-frames information field (2 words).
bytesRcv	Number of bytes received in I-frames information field (2 words).

LAPDE_Physical (subtype 77)

Note: This statistic is not currently generated by the DPN-100.

Table 57
LAPDE Physical statistics (subtype 77)

Field	Type
badFrmSize	integer
underruns	integer
modemChanges	integer
lineFail	integer
frmAbort	integer
noBuffer	integer
crcErr	integer
overruns	integer
frmSnt	integer
frmRcv	integer
bytesSnt	integer
bytesRcv	integer
rrSnt	integer
rnrSnt	integer
rejSnt	integer
frmrSnt	integer
ifrmSnt	integer
rrRcv	integer
rnrRcv	integer
rejRcv	integer
frmrRcv	integer
ifrmRcv	integer
(Sheet 1 of 2)	

Table 57 (continued)
LAPDE Physical statistics (subtype 77)

Field	Type
l2BadFrmSize	integer
protocolErr	integer
frmRxmt	integer
frmQueued	integer
lrcErr	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
resetSnt	integer
resetRcv	integer
(Sheet 2 of 2)	

badFrmSize	Total number of frames received of the wrong size by the interrupt handler.
underruns	Total number of times the PE has been unable to supply data fast enough to keep up continuous flow.
modemChanges	Total number of modem errors detected by the PI.
lineFail	Total number of line failures detected.
frmAbort	Count of frames aborted. Indicates a transmission fault detected by the PI.
noBuffer	Count of number of times that no buffers were available to the interrupt handler when data was coming in.
crcErr	Total number of frames received with CRC errors.
overruns	Number of overruns. PE cannot handle data at this rate.
frmSnt	Number of frames sent. This includes, I, S, U frames of all logical links of the port (2 words).

frmRcv	Number of frames received. This includes I, S, U frames of all logical links of the port (2 words).
bytesSnt	Number of bytes sent. This includes the I-frames information field of all logical links on the port (2 words).
bytesRcv	Number of bytes received. This includes the I-frames information field of all logical links on the port (2 words).
rrSnt	Number of RRs transmitted for all logical links.
rnrSnt	Number of RNRs transmitted for all logical links.
rejSnt	Number of REJs transmitted for all logical links.
frmrSnt	Number of FRMRs transmitted for all logical links.
ifrmSnt	Number of I-frames transmitted for all logical links.
rrRcv	Number of RRs received for all logical links.
rnrRcv	Number of RNRs received for all logical links.
rejRcv	Number of REJs received for all logical links.
frmrRcv	Number of FRMRs received for all logical links.
ifrmRcv	Number of I-frames received for all logical links.
l2BadFrmSize	Total number of frames received of the wrong size by all logical links.
protocolErr	Total number of protocol violations detected by all logical links.
frmRxmt	Total number of retransmits caused by an REJ or after a timeout on an information frame.
frmQueued	Number of frames queued for all logical links.
lrcErr	Total number of frames received with LRC errors for all logical links.
lclFlowCtrl	Total time interval which DPN access module has flow controlled on input (2 words) (for all logical links).

rmtFlowCtrl	Total time interval which DPN access module has been flow controlled by the DTE (2 words) (for all logical links).
resetSnt	Number of resets sent.
resetRcv	Number of resets received.

NCSOpAgent (subtype 42)

Table 58
NCS Op Agent statistics (subtype 42)

Field	Type
alarmRcv	integer
statsRcv	integer
logsRcv	integer
accntRcv	integer

alarmRcv	The number of alarm records received from outside the Operating Agent (OA) across a virtual circuit.
statsRcv	The number of statistics records received from outside the OA across a virtual circuit.
logsRcv	The number of log records received from outside the OA across a virtual circuit.
accntRcv	The number of accounting records received from outside the OA across a virtual circuit.

NLLAPBEnhanced (subtype 58)

Table 59
NL (extended) statistics (subtype 58)

Field	Type
lclType	integer
lclRid	integer
lclMid	integer
rmtType	integer
rmtRid	integer
rmtMid	integer
rmtNamsid	integer
rmtPortType	integer
rmtPortId	integer
lclPkts	integer
tdmPkts	integer
currFrmQueued	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
frmSnt	integer
frmRcv	integer
frmQueued	integer
overruns	integer
frmAbort	integer
noBuffer	integer
badFrmSize	integer
crcErr	integer
cardErr	integer
underruns	integer
(Sheet 1 of 3)	

Table 59 (continued)
NL (extended) statistics (subtype 58)

Field	Type
lrcErr	integer
frmRxmt	integer
modemChanges	integer
protocolErr	integer
nrSnt	integer
nrRcv	integer
rejSnt	integer
rejRcv	integer
frmrSnt	integer
frmrRcv	integer
rrSnt	integer
rrRcv	integer
ifrmSnt	integer
ifrmRcv	integer
ifrmSsqSnt	integer
ifrmSsqRcv	integer
ifrmBytesSnt	integer
ifrmBytesRcv	integer
x21DiSuc	integer
x21DiInc	integer
x21DiErr	integer
x21DoSuc	integer
x21DoInc	integer
x21DoErr	integer
x21ClrErr	integer
(Sheet 2 of 3)	

Table 59 (continued)
NL (extended) statistics (subtype 58)

Field	Type
x21ParityErr	integer
linkSpeed	integer
frmBytesSnt	integer
frmBytesRcv	integer
(Sheet 3 of 3)	

lclType This field specifies the module type of the module on which this Network Link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.

lclRid This field specifies the Routing ID (RID) of the module on which this link is running. If 0, then the module does not have a Routing ID. (On an AM, this field is 0; on an RM, this field is set).

lclMid This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a module ID.

rmtType This field specifies the module type of the module to which the RM UTP Network Link is connected. If set to 2, then the module is an RM; if set to 3, then the module is an AM.

rmtRid The number of the remote RID of this trunk.

rmtMid This field specifies the Module ID (MID) of the module to which this RM UTP Network Link is connected.

If 0, then the module on the far end of the RM UTP Network Link does not have a Module ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.

rmtNamsid	This field specifies the Unique NAMS ID of the module to which this RM UTP Network Link is connected. If 0, then the module on the far end of the RM UTP Network Link does not have access to the Unique NAMS ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.
rmtPortType	<p>The type of the port that the software generating this record runs on. Values:</p> <ul style="list-style-type: none">•0 - Not running on port (reserved for Multilink procedure)•1 - V.24•2 - V.35•3 - X.21 <p>The Single Link Procedure runs always on port, so the only values the PORTTYPE may assume for this statistics record are 1, 2 or 3.</p>
rmtPortId	<p>This field identifies the port information of the far end of the Trunk.</p> <ul style="list-style-type: none">•If the REMOTEPORTTYPE is set to a value of 1, then the first three bytes of this field specify: REMOTEPORTID [0] = Processor (decimal) REMOTEPORTID [1] = Scanner (decimal) REMOTEPORTID [2] = Line (decimal)•If the REMOTEPORTTYPE is set to a value of 2, then the first three bytes of this field specify: REMOTEPORTID [0] = PE (decimal) REMOTEPORTID [1] = PI (decimal) REMOTEPORTID [2] = Port (decimal)•If the REMOTEPORTTYPE is set to any other value, then this field is not useful.
lciPkts	Number of packets received that are destined for this node.
tdmPkts	Number of packets received that are destined for other nodes.

currFrmQueued	This field specifies the number of frames queued for transmission to the link at the point that the statistics probe was processed by the link.
lclFlowCtrl	Total time interval which DPN access module has flow controlled on input (2 words) (for all logical links).
rmtFlowCtrl	This field specifies the time, in seconds, that the Network Link has been flow controlled by the far end. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.
frmSnt	This field specifies the number of frames sent to the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.
frmRcv	This field specifies the number of frames received from the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.

frmQueued This field specifies the number of frames queued for transmission to the link at the point that the statistics probe was processed by the link. If the number of frames queued is greater than 255, then this field has a value of 255, or H.FF, and the true count of frames queued is in the statistical counter CURRENT FRAMES QD.

Note that this field is not quite as useful as the CURRENT FRAMES QD, it is used at the link for thresholding. The thresholds all have maximum values of 254, and there is no need in most cases, to keep counting the number of link errors after hitting the upper bound. For example, the number of modem status changes in a statistics interval is counted up to a value of 254, and then counting stops. In the case of frames queued, the true count of frames queued is available in the software, so is provided in CURRENT FRAMES QD.

This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.

overruns This field specifies the number of overruns in this statistics interval on the link. The PE is unable to accept a character before the next character has been accepted by the SCC on the PI.

This statistic usually indicates that the PE is overloaded, and should be re-engineered in order that its traffic capacity is not exceeded.

frmAbort This field specifies the number of frame aborts in this statistics interval on the link.

This statistic usually indicates a problem at the remote end of the line (it is sending aborts), or on the facility (it is turning data on the line into aborts).

noBuffer	<p>This field specifies the number of times in this statistics interval that the receive buffer used by the interrupt handler was insufficient to handle incoming traffic from the link.</p> <p>This statistic usually indicates that the link is overloaded, and requires re-engineering.</p>
badFrmSize	<p>This field specifies the number of frames received in this statistics interval from the link with a bad frame size (too long or too short).</p> <p>This statistic usually indicates a problem at the remote end of the line, it is sending frames of an incorrect frame size.</p>
crcErr	<p>This field specifies the number of CRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a data corruption problem somewhere in the network.</p>
cardErr	<p>This field specifies the number of line errors in this statistics interval on the link.</p> <p>This statistic usually indicates a problem on the SCC on the PI.</p>
underruns	<p>This field specifies the number of underruns in this statistics interval on the link, (the interrupt handler is unable to give the next character to the SCC in time).</p> <p>This statistic usually indicates that the PE is overloaded, and should be re-engineered so that its traffic capacity is not exceeded.</p>
lrcErr	<p>This field specifies the number of LRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a data corruption problem somewhere in the network.</p>

frmRxmt	<p>This field specifies the number of times in this statistics interval on the link, that a frame had to be retransmitted due to frames being rejected or timeouts.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end.</p>
modemChanges	<p>This field specifies the number of modem status changes in this statistics interval on the link.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end; an unterminated EIA cable plugged into the PI may also cause excessive modem status changes.</p>
protocolErr	<p>This field specifies the number of link protocol errors in this statistics interval on the link.</p> <p>This statistic, if coupled with other statistics errors, can indicate a problem on the hardware for the line. cable plugged into the PI may also cause excessive modem status changes. Otherwise, it indicates a problem with the remote end, where the protocol has not been implemented properly.</p>
nrnSnt	<p>This field specifies the number of LAP-B Level 2 RNRs sent to the link in this statistics interval.</p>
nrnRcv	<p>This field specifies the number of LAP-B Level 2 RNRs received from the link in this statistics interval.</p>
rejSnt	<p>This field specifies the number of LAP-B Level 2 REJs sent to the link in this statistics interval.</p>
rejRcv	<p>This field specifies the number of LAP-B Level 2 REJs received from the link in this statistics interval.</p>
frmrSnt	<p>This field specifies the number of LAP-B Level 2 FREJs sent to the link in this statistics interval.</p>
frmrRcv	<p>This field specifies the number of LAP-B Level 2 FREJs received from the link in this statistics interval.</p>

rrSnt	This field specifies the number of LAP-B Level 2 RRs sent to the link in this statistics interval.
rrRcv	This field specifies the number of LAP-B Level 2 RRs received from the link in this statistics interval.
ifrmSnt	This field specifies the number of I-frames sent to the link. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmRcv	This field specifies the number of I-frames received from the link. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmSsqSnt	This field specifies the statistical sum of squares, for the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmSsqRcv	This field specifies the statistical sum of squares, for the number of bytes in I-frames received from the link in this statistics interval. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmBytesSnt	This field specifies the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmBytesRcv	This field specifies the number of bytes in I-frames received from the link in this statistics interval. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
x21DiSuc	Number of successful X.25/X.21 dial-in call attempts (level 1 established). Not meaningful for SLP.

x21DiInc	Number of incomplete X.25/X.21 dial-in call attempts (call cleared before level 1 established). Not meaningful for SLP.
x21DiErr	Number of successful X.25/X.21 call attempts (dial-in only) that encountered an X.21 protocol violation during disconnection. Not meaningful for SLP.
x21DoSuc	Number of successful X.25/X.21 dial-out call attempts (level 1 established). Not meaningful for SLP.
x21DoInc	Number of incomplete X.25/X.21 dial-out call attempts (call cleared before level 1 established). Not meaningful for SLP.
x21DoErr	Number of incomplete X.25/X.21 dial-out call attempts aborted by an X.21 protocol violation (level 1 not established). Not meaningful for SLP.
x21ClrErr	Number of successful X.25/X.21 call attempts (both dial-in and dial-out) that encountered an X.21 protocol violation during disconnection. Not meaningful for SLP.
x21ParityErr	Number of X21 parity errors. Applicable only if port is an X.21 one.
linkSpeed	This field indicates the speed of the link in bytes per second.
frmBytesSnt	The number of bytes including frame overhead sent to link in this statistics interval.
frmBytesRcv	The number of bytes including frame overhead received from link in this statistics interval.

NUIDatabaseInt (subtype 43)

Table 60
NDI statistics (subtype 43)

Field	Type
maxOutCalls	integer
maxInCalls	integer
noTransToDb	integer
noTransFromDb	integer
noTransPass	integer
noTransFail	integer
unableToValidate	integer
protocolErr	integer
pktSizeErr	integer
dbProbesFrDb	integer
dbProbesRepFromDb	integer
dbProbesToDb	integer

- maxOutCalls** This field indicates the maximum number of calls set up from the NDI to the off-network database in the statistical interval.
- maxInCalls** This field indicates the maximum number of calls set up to the NDI from NUI-RSIs and/or NSIs in the statistical interval.
- noTransToDb** This field indicates the number of transactions which were sent to the off-network database in the statistical interval.
- noTransFromDb** This field indicates the number of transactions which were received from the off-network database in the statistical interval.

noTransPass

This field indicates the number of database transactions received from the off-network database which were completely successful in the statistical interval.

If the off-network database simply validates NUIs (Network User Identifiers), then this count represents the number of valid NUIs within the statistical interval.

This is the case for both of the following types of off-network NUI databases:

- DPN Off-Network NUI
- LIDB Calling Card

If the off-network database performs further translations, then this count represents the number of transactions in which all translations were successful. This is the case for the following types of off-network databases:

- NSHS

noTransFail

This field indicates the number of database transactions received from the off-network database which were unsuccessful in the statistical interval.

If the off-network database simply validates NUIs (Network User Identifiers), then this count represents the number of invalid NUIs within the statistical interval. This is the case for the following types of off-network databases:

- DPN Off-Network NUI
- LIDB Calling Card

If the off-network database performs further translations, then this count represents the number of transactions in which any one translation was unsuccessful. This is the case for the following types of off-network databases:

- NSHS

unableToValidate

This field indicates the number of translation requests received from the network destined to the off-network database that could not be forwarded to the off-network database. The resultant translation is considered to be invalid.

Network translation requests are not sent to the off-network database for several reasons:

- All SVCs to the off-network database are down
- The NUI Database Interface (NDI) protocol does not support the specific translation request received from the network.
- The translation request received from the network is invalid.

protocolErr	This field indicates the number of packets received from the off-network database which were discarded by NDI due to a perceived protocol violation. This count is accumulated over the statistical interval.
pktSizeErr	This field indicates the number of translation requests received from the network destined to the off-network database which were discarded by NDI due to the fact that the packet size on the SVC between NDI and the off-network database could not accommodate the translation.
dbProbesFrDb	This field indicates the number of probes received from the off-network database. Currently, the only off-network database supported by NDI which handles probes is the DPN Off-Network NUI database. In all other cases, this statistical count is 0.
dbProbesRepFromDb	This field indicates the number of probes responses received from the off-network database. Currently, the only off-network database supported by NDI which handles probes is the DPN Off-Network NUI database. In all other cases, this statistical count is 0.
dbProbesToDb	This field indicates the number of probes sent to the off-network database. Currently, the only off-network database supported by NDI which handles probes is the DPN Off-Network NUI database. In all other cases, this statistical count is 0.

NUIValidRemSvrRSI (subtype 34)

Table 61
NUI validation RSI statistics (subtype 34)

Field	Type
srvReq	integer

srvReq The number of requests sent to NDIs.

OfficeMaster (subtype 18)

Table 62
OM statistics (subtype 18)

Field	Type
totalCommonBlks	integer
freeQueueSize	integer

totalCommonBlks For every sample taken, the number of memory blocks available at DPN-AM initialization is added to this field.

freeQueueSize The number of free blocks found by sampling.

HighPerfPE (subtype 75)

Table 63
High Performance PE statistics (subtype 75)

Field	Type
heapSize	integer
heapUse	integer
heapHwm	integer
pcbUse	integer
pcbHwm	integer
totalMsgBlks	integer
freeQueueSize	integer
freeQueueLwm	integer
intraSnt	integer
interSnt	integer

(Sheet 1 of 2)

Table 63 (continued)
High Performance PE statistics (subtype 75)

Field	Type
msgRcv	integer
cpuUtl	integer
cpuUtlHwm	integer
procDisp	integer
portPkts	integer
ntwkPkts	integer
expdHeapUse	integer
expdHeapHwm	integer
pbusHeapUse	integer
pbusHeapHwm	integer
(Sheet 2 of 2)	

heapSize	Maximum number of K words of local secondary storage (LSS) allocated in PE. This quantity is a constant for a given PE subject to changes in software.
heapUse	Amount of K words of local secondary storage (LSS) that is being used. This value is subject to change as calls are made on existing lines or new lines/ service data is added to PE.
heapHwm	Maximum amount of K words of local secondary storage (LSS) that is used during each 15 minute interval.
pcbUse	Amount of blocks (64 bytes/block) of process control block (PCB) storage that is being used.
pcbHwm	Maximum number of blocks (64 bytes/block) of process control block that is used during each 15 minute interval.

totalMsgBlks	For every sample period, the number of free message blocks available at PE initialization is added to this field.
freeQueueSize	The number of local free message blocks found by sampling is kept in this field.
freeQueueLwm	The minimum number of free blocks found by sampling is kept in this field.
intraSnt	The number of messages originating from a local process.
interSnt	The number of messages originating from a local process and sent externally.
msgRcv	The number of messages originating from an external process.
cpuUtl	The processing element utilization calculated and put in this field.
cpuUtlHwm	PE CPU utilization High Water Mark (HWM) value.
procDisp	The number of processes that are run on PE over 1 minute interval.
portPkts	The total packets from port. (Include Call packets).
ntwkPkts	The total packets from network. (Include Call packets).
expdHeapUse	Amount of K words of local secondary storage (LSS) that is being used. This value is subject to change as calls are made on existing lines or new lines, or as service data is added to PE.
expdHeapHwm	Maximum amount of K words of local secondary storage (LSS) that is used during each 15 minute interval.

pbusHeapUse	Amount of peripheral bus static RAM heap storage that is currently in use. The value is in K words.
pbusHeapHwm	Maximum amount of K words of peripheral bus static RAM heap storage that is used during each 15 minute interval.

PE286386 (subtype 30)

Table 64
PE (80286) statistics (subtype 30)

Field	Type
heapSize	integer
heapUse	integer
heapHwm	integer
pcbUse	integer
pcbHwm	integer
totalMsgBlks	integer
freeQueueSize	integer
freeQueueLwm	integer
intraSnt	integer
interSnt	integer
msgRcv	integer
cpuUtl	integer
cpuUtilHwm *	integer
procDisp	integer
portPkts	integer
ntwkPkts	integer
expdHeapUse	integer
(Sheet 1 of 2)	

Table 64 (continued)
PE (80286) statistics (subtype 30)

Field	Type
expdHeapHwm	integer
* The field pcbTotal was reused as cpuUtilHwm in G34.	
(Sheet 2 of 2)	

heapSize	Maximum number of K words of local secondary storage (LSS) allocated in PE. This quantity is a constant for a given PE subject to changes in software.
heapUse	Amount of K words of local secondary storage (LSS) that is being used. This value is subject to change as calls are made on existing lines or new lines/ service data is added to PE.
heapHwm	Maximum amount of K words of local secondary storage (LSS) that is used during each 15 minute interval.
pcbUse	Amount of blocks (64 bytes/block) of process control block (PCB) storage that is being used.
pcbHwm	Maximum number of blocks (64 bytes/block) of process control block that is used during each 15 minute interval.
totalMsgBlks	For every sample period, the number of free message blocks available at PE initialization is added to this field.
freeQueueSize	The number of local free message blocks found by sampling is kept in this field.
freeQueueLwm	The minimum number of free blocks found by sampling is kept in this field.
intraSnt	The number of messages originating from a local process.

interSnt	The number of messages originating from a local process and sent externally.
msgRcv	The number of messages originating from an external process.
cpuUtl	The processing element utilization calculate and put in this field.
cpuUtilHwm	PE CPU utilization High Water Mark (HWM) value.
procDisp	The number of processes that are run on PE over 1 minute interval.
portPkts	The total packets from port. (Include Call packets).
ntwkPkts	The total packets from network. (Include Call packets).
expdHeapUse	Amount of K words of local secondary storage (LSS) that is being used. This value is subject to change as calls are made on existing lines or new lines, or as service data is added to PE.
expdHeapHwm	Maximum amount of K words of local secondary storage (LSS) that is used during each 15 minute interval.

SABRE (subtype 46)

Table 65
Sabre statistics (subtype 46)

Field	Type
badOutSeg	integer
protocolErr	integer
cccErr	integer
overruns	integer
underruns	integer
badInSeg	integer
(Sheet 1 of 2)	

Table 65 (continued)
Sabre statistics (subtype 46)

Field	Type
modemChanges	integer
badResp	integer
frmSnt	integer
frmRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer
frmSsqSnt	integer
frmSsqRcv	integer
(Sheet 2 of 2)	

badOutSeg

This statistic will be updated for the following error conditions:

- inconsistent LN of the outbound segment
- no EOM character in the outbound segment
- outbound segment shorter than 5 bytes
- too long outbound segment

protocolErr

The number of link level protocol errors detected by the TPAD.

cccErr

The number of CCC errors received by the TPAD.

overruns

The number of times a received character was lost because the TPAD was busy processing the preceding character.

underruns

The number of times the TPAD was unable to provide a character to the link when it had completed output of the previous character.

badInSeg	<p>This statistic will be updated for the following error condition:</p> <ul style="list-style-type: none">•wrong EOM of an input segment•inconsistent IA TA in a multi-segment message•inconsistent Si in a multi-segment message•exceeding the allowable segment length•exceeding the allowable message length•inconsistent segment lengths in multi-segment message•timeout on long message assembly
modemChanges	<p>The number of modem status changes occurring in the last 15-minute period.</p>
badResp	<p>This statistic will be updated for the following error conditions:</p> <ul style="list-style-type: none">•S1 or Idle in the middle of poll response•Lacking 'Ga G Idle' at the end of poll response•Exceeding the allowable number of segments in a poll response
frmSnt	<p>The number of frames that the TPAD has on this link.</p>
frmRcv	<p>The number of frames that the TPAD has received on this link.</p>
frmBytesSnt	<p>The total number of transmitted data bytes.</p>
frmBytesRcv	<p>The total number of received data bytes.</p>
frmSsqSnt	<p>Sum of squares of bytes in transmitted frames.</p>
frmSsqRcv	<p>Sum of squares of bytes in received frames.</p>

SNALink (subtype 26)

Table 66
SNA link statistics (subtype 26)

Field	Type
modemChanges	integer
abortFrm	integer
underruns	integer
overwrite	integer
crcErr	integer
badFrmSize	integer
nonOctetFrm	integer
lrcErr	integer
frmRxmt	integer
rnrRcv	integer
rnrSnt	integer
freeQueueUse	integer
cardErr	integer
noMsgBlk	integer
protocolErr	integer
frmSnt	integer
frmRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer
frmSsqSnt	integer
frmSsqRcv	long integer
flowCtrlDuration	long integer
duration	integer

modemChanges	Modem status changes.
abortFrm	Aborted frames.
underruns	Underruns.
overwrite	Number of overwrites.
crcErr	CRC errors on frames from DTE.
badFrmSize	Frames from DTE longer than allowed by service data, or less than 4 octets long.
nonOctetFrm	Non octet frames from DTE.
lrcErr	LRC errors on frames to DTE.
frmRxmt	Frames resent to DTE.
rnrRcv	RNRs received by the PAD.
rnrSnt	RNRs sent to the DTE.
freeQueueUse	Maximum of FREEQ (or high water mark) used by a port.
cardErr	Number of card errors.
noMsgBlk	No msg blks are available for interrupt handle.
protocolErr	Total number of SNA protocol violations for all PUs on this link during the past interval.
frmSnt	RUs sent to the DTE (field length = 4 bytes).
frmRcv	RUs received from the DTE (field length = 4 bytes).
frmBytesSnt	The sum of the lengths of all RUs sent to the DTE (excludes CRC and flag) (field length = 4 bytes).
frmBytesRcv	The sum of the lengths of all RUs received from the DTE (excludes CRC and flag) (field length = 4 bytes).
frmSsqSnt	The sum of the square of the lengths of all RUs sent to the DTE (field length = 6 bytes).
frmSsqRcv	The sum of the square of the lengths of all RUs received from the DTE (field length = 6 bytes).

flowCtrlDuration	Duration of the time interval covered by this statistics record during which the service was flow controlling boundary links by RNR polling. (expressed in milliseconds, field length = 4 bytes).
duration	Duration of the time interval covered by this statistics record in seconds. (field length = 2 bytes).

SNALogicalUnit (subtype 27)

Table 67
DPN-AM and DPN-RM SNA LU statistics (subtype 27)

Field	Type
frmSnt	integer
frmRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer
frmSsqSnt	long integer
frmSsqRcv	long integer
duration	integer

frmSnt	RUs sent to the DTE (field length = 4 bytes).
frmRcv	RUs received from the DTE (field length = 4 bytes).
frmBytesSnt	The sum of the lengths of all RUs sent to the DTE (excludes CRC and flag) (field length = 4 bytes).
frmBytesRcv	The sum of the lengths of all RUs received from the DTE (excludes CRC and flag) (field length = 4 bytes).
frmSsqSnt	The sum of the square of the lengths of all RUs sent to the DTE (field length = 6 bytes).
frmBytesRcv	The sum of the lengths of all RUs received from the DTE (excludes CRC and flag) (field length = 4 bytes).
frmSsqSnt	The sum of the square of the lengths of all RUs sent to the DTE (field length = 6 bytes).

frmSsqRcv	The sum of the square of the lengths of all RUs received from the DTE (field length = 6 bytes).
duration	The period in seconds (coded in binary) over which the LU statistics have been collected. Normally indicates the 15 minute interval between statistics probes, but may be less if the collection of statistics was only active during part of that period. (field length = 2 bytes).

TokenRing (subtype 53)

Table 68
Token Ring statistics (subtype 53)

Field	Type
frmSnt	integer
frmRcv	integer
frmBytesSnt	integer
frmBytesRcv	integer
lineErr	integer
ariFciErr	integer
burstErr	integer
rcvCongest	integer
lostFrmErr	integer
frmCpdErr	integer
tokenErr	integer
dmaParityErr	integer
dmaBusErr	integer
signalLoss	integer
hardErr	integer
softErr	integer
sntBeacon	integer
lobeWireFlt	integer
autoRmErr	integer
rmRcv	integer
counterOvfl	integer
singleStation	integer
ringRecov	integer

frmSnt	The number of frames sent to the TokenRing.
frmRcv	The number of frames received from the Token-Ring.
frmBytesSnt	The number of bytes in frames sent to the Token-Ring.
frmBytesRcv	The number of bytes in frames received from the Token-Ring.
lineErr	<p>This count is incremented whenever:</p> <ol style="list-style-type: none">1) a frame is copied or repeated2) the error indicator bit is zero in the incoming frame, and3) if at least one of the following conditions exist: <ul style="list-style-type: none">•code violation exists between the starting delimiter and the ending delimiter of the frame•code violation in the token•frame check sequence error
ariFciErr	This count is incremented when the adapter detects that the upstream neighbor is unable to set the AIR/FCI bits in a frame that it has copied.
burstErr	The burst error count is incremented when the adapter detects the absence of transitions for five half-bit times between start and end delimiter or end and start delimiter.
rcvCongest	This count is incremented when the adapter recognizes a frame addressed to it and has no buffer space available to copy the frame.
lostFrmErr	This count is incremented when an adapter is in transmit mode and fails to receive the end of the frame it transmitted.
frmCpdErr	This count is incremented when the adapter recognizes a frame addressed to it but finds that the air bits are not set to 0.

tokenErr	<p>This count is active only if the adapter is the active monitor. It is incremented if the adapter detects at least one of the following conditions:</p> <ul style="list-style-type: none">•monitorCount bit of a token with non-zero priority equals 1•monitorCount bit of a frame equals 1•no token/frame received within a 10-ms window•the starting delimiter/token sequence has a code violation
dmaParityErr	Indicates the occurrences of DMA parity errors.
dmaBusErr	Indicates the occurrences of DMA bus errors.
signalLoss	This count is incremented when the adapter detects a signal loss on the ring.
hardErr	Indicates the occurrences of transmitting or receiving beacon frames to or from the ring.
softErr	This field is incremented when the adapter transmits a report error MAC frame.
sntBeacon	Indicates the occurrences of transmitting beacon frames to the ring.
lobeWireFlt	This field is incremented when the adapter is closed due to the detection of an open or short circuit in the cable to the wiring concentrator.
autoRmErr	This field is incremented when the adapter is closed due to failing the lobe wrap test from the beacon auto-removal process.
rmRcv	This field is incremented when the adapter is closed after receiving a remove ring station MAC frame request.
counterOvfl	This field is incremented when one of the adapter error counters has incremented from 254 to 255.

singleStation	This field is incremented when the adapter detects it is the only station on the ring.
ringRecov	This field is incremented when the adapter observes claim token MAC frames on the ring.

TokenRingDevice (subtype 52)

Table 69
Token Ring Device statistics (subtype 52)

Field	Type
devMacAddr	long integer
devSapAddr	integer
ifrmSnt	integer
ifrmBytesSnt	integer
ifrmRcv	integer
ifrmBytesRcv	integer
tiExp	integer
discRcv	integer
reallocate	integer
linkDown	integer
frmSnt	integer
frmRcv	integer
lclBusy	integer
rmtBusy	integer
ringProtocol	integer
qllcProtocol	integer
badFrm	integer
discTimeout	integer
xidTimeout	integer

devMacAddr	MAC address of the device.
devSapAddr	SAP address of the device.
ifrmSnt	This field specifies the number of information (I) frames and unnumbered information (UI) frames sent on all LLC connections to that device. Information frames do not include frames such as LLC control frames (for example, RR, RNR, and UA).
ifrmBytesSnt	This field specifies the number of bytes in information (I) frames and unnumbered information (UI) frames sent on all LLC connections to that device.
ifrmRcv	This field specifies the number of information (I) frames and unnumbered information (UI) frames received from all LLC connections to that device. Information frames do not include frames such as LLC control frames (for example, RR, RNR, and UA).
ifrmBytesRcv	This field specifies the number of bytes in information (I) frames and unnumbered information (UI) frames received from all LLC connections to that device.
tiExp	This field specifies the number of times that the inactivity timer has expired. The only occurrences that are counted are when the LLC is not in ABM.
discRcv	This field specifies the number of DM or DISC frames received.
reallocate	This field specifies the number of failed re-allocates where resources were not available for a link station.
linkDown	This field specifies the number of times that a link went down.
frmSnt	This field specifies the number of FRMR frames transmitted.

frmRcv	This field specifies the number of FRMR frames received.
lclBusy	This field specifies the number of times that local busy state was entered.
rmtBusy	This field specifies the number of times that the remote end has entered the local busy state.
ringProtocol	This field specifies the number of ring protocol errors encountered.
qllcProtocol	This field specifies the number of QLLC protocol errors encountered.
badFrm	This field specifies the number of bad frames received from the ring. This includes frames that have an incorrect length or invalid header.
discTimeout	This field specifies the number of connections that were cleared due to a disconnect timeout.
xidTimeout	This field specifies the number of connections that were cleared due to XID timeouts while XID contacting the device.

TrunkRMUTP (subtype 25)

Table 70
RM trunk statistics (subtype 25)

Field	Type
lclRid	integer
rmtRid	integer
lclMid	integer
rmtMid	integer
rmtNamsid	integer
rmtPortType	integer
rmtPortId	integer
frmRcv	integer
hiPrtySnt	integer
loPrtySnt	integer
lclPkts	integer
tdmPkts	integer
frmBytesRcv	integer
frmRxmt	integer
discPkts	integer
ayt	integer
windowClosure	integer
underruns	integer
lrcErr	integer
crcErr	integer
overruns	integer
modemChanges	integer
frmBytesSnt	integer
(Sheet 1 of 2)	

Table 70 (continued)
RM trunk statistics (subtype 25)

Field	Type
linkSpeed	integer
bifurcation	integer
(Sheet 2 of 2)	

lclRid This field specifies the Routing ID (RID) of the module on which this Trunk is running.

rmtRid This field specifies the Routing ID (RID) of the module to which this Trunk is connected.

lclMid This field specifies the Module ID (MID) of the module on which this Trunk is running.

rmtMid This field specifies the Module ID (MID) of the module to which this Trunk is connected.

If 0, then the module on the far end of the Trunk does not have a Module ID, or the Trunk has not been connected to a far end in this statistics interval. (Where the far end of the Trunk is an NM, this field is 0; otherwise, this field is set).

rmtNamsid This field specifies the Unique NAMS ID of the module to which this Trunk is connected. If 0, then the module on the far end of the Trunk does not have access to the Unique NAMS ID, or the Trunk has not been connected to a far end in this statistics interval. (Where the far end of the Trunk is an NM, this field is 0; otherwise, this field is set).

rmtPortType	<p>If the Trunk has been up in this statistics interval, then this field indicates the type of port on the far end of the Trunk.</p> <p>If the Trunk has not been up in this statistics interval, then this field is 0.</p> <p>If this field is set to a value of 1, then the far end of the Trunk has a Port ID of the format (Processor, Scanner, Line).</p> <p>If this field is set to a value of 2, then the far end of the Trunk has a Port ID of the format (PE,PI, Port).</p> <p>If this field is set to a value other than 1, or 2, then the port type of the far end of the Trunk is not yet defined.</p>
rmtPortId	<p>This field identifies the port information of the far end of the Trunk.</p> <ul style="list-style-type: none"> •If the REMOTEPORTTYPE is set to a value of 1, then the first three bytes of this field specify: REMOTEPORTID [0] = Processor (decimal) REMOTEPORTID [1] = Scanner (decimal) REMOTEPORTID [2] = Line (decimal) •If the REMOTEPORTTYPE is set to a value of 2, then the first three bytes of this field specify: REMOTEPORTID [0] = PE (decimal) REMOTEPORTID [1] = PI (decimal) REMOTEPORTID [2] = Port (decimal) •If the REMOTEPORTTYPE is set to any other value, then this field is not useful.
frmRcv	Number of frames (data and control) received.
hiPrtySnt	Number of high priority frames transmitted.
loPrtySnt	Number of low priority frames transmitted.
lclPkts	Number of packets received that are destined for this node.

tdmPkts	Number of packets received that are destined for other nodes.
frmBytesRcv	Number of bytes received, including protocol overhead and control frames.
frmRxmt	Number of times retransmission occurs.
discPkts	Number of packets discarded due to local congestion (only those received from a trunk link) or transmit buffer overflow.
ayt	Number of times entered into AYT mode and recovered.
windowClosure	Number of times the transmit window closed.
underruns	Number of underruns detected.
lrcErr	Number of packets with LRC error on the transmit side. They are reported as they occur.
crcErr	Number of packets received with CRC error.
overruns	Number of overruns detected.
modemChanges	Number of transient modem status changed without causing a communication error.
frmBytesSnt	Number of bytes transmitted, including protocol overhead and control frames.
linkSpeed	This field gives the measured link speed reported in kilobits per second.
bifurcation	Number of tandem packets bifurcated when sending to the congested trunk.

TrunkRMUTPEnhanced (subtype 64)

Table 71
Frame trunk statistics (subtype 64)

Field	Type
lclRid	integer
rmtRid	integer
lclMid	integer
rmtMid	integer
rmtNamsid	integer
rmtPortType	integer
rmtPortId	integer
frmRcv	integer
hiPrtySnt	integer
loPrtySnt	integer
lclPkts	integer
tdmPkts	integer
frmBytesRcv	integer
frmRxmt	integer
discPkts	integer
ayt	integer
windowClosure	integer
underruns	integer
lrcErr	integer
crcErr	integer
overruns	integer
modemChanges	integer
frmBytesSnt	integer
(Sheet 1 of 2)	

Table 71 (continued)
Frame trunk statistics (subtype 64)

Field	Type
linkSpeed	integer
bifurcation	integer
delayHiFrmSnt	integer
delayLoFrmSnt	integer
delayHiFrmBytesSnt	integer
thrptHiFrmBytesSnt	integer
delayLoFrmBytesSnt	integer
(Sheet 2 of 2)	

lclRid This field specifies the Routing ID (RID) of the module on which this Trunk is running.

rmtRid This field specifies the Routing ID (RID) of the module to which this Trunk is connected.

lclMid This field specifies the Module ID (MID) of the module on which this Trunk is running.

rmtMid This field specifies the Module ID (MID) of the module to which this Trunk is connected.

If 0, then the module on the far end of the Trunk does not have a Module ID, or the Trunk has not been connected to a far end in this statistics interval. (Where the far end of the Trunk is an NM, this field is 0; otherwise, this field is set).

rmtNamsid

This field specifies the Unique NAMS ID of the module to which this Trunk is connected. If 0, then the module on the far end of the Trunk does not have access to the Unique NAMS ID, or the Trunk has not been connected to a far end in this statistics interval. (Where the far end of the Trunk is an NM, this field is 0; otherwise, this field is set).

rmtPortType

If the Trunk has been up in this statistics interval, then this field indicates the type of port on the far end of the Trunk.

If the Trunk has not been up in this statistics interval, then this field is 0.

If this field is set to a value of 1, then the far end of the Trunk has a Port ID of the format (Processor, Scanner, Line).

If this field is set to a value of 2, then the far end of the Trunk has a Port ID of the format (PE,PI, Port).

If this field is set to a value other than 1, or 2, then the port type of the far end of the Trunk is not yet defined.

rmtPortId	<p>This field identifies the port information of the far end of the Trunk.</p> <ul style="list-style-type: none">•If the REMOTEPORTTYPE is set to a value of 1, then the first three bytes of this field specify: REMOTEPORTID [0] = Processor (decimal) REMOTEPORTID [1] = Scanner (decimal) REMOTEPORTID [2] = Line (decimal)•If the REMOTEPORTTYPE is set to a value of 2, then the first three bytes of this field specify: REMOTEPORTID [0] = PE (decimal) REMOTEPORTID [1] = PI (decimal) REMOTEPORTID [2] = Port (decimal)•If the REMOTEPORTTYPE is set to any other value, then this field is not useful.
frmRcv	Number of frames (data and control) received.
hiPrtySnt	Number of high priority frames transmitted.
loPrtySnt	Number of low priority frames transmitted.
lclPkts	Number of packets received that are destined for this node.
tdmPkts	Number of packets received that are destined for other nodes.
frmBytesRcv	Number of bytes received, including protocol overhead and control frames.
frmRxmt	Number of times retransmission occurs.
discPkts	Number of packets discarded due to local congestion (only those received from a trunk link) or transmit buffer overflow.
ayt	Number of times entered into AYT mode and recovered.
windowClosure	Number of times the transmit window closed.
underruns	Number of underruns detected.
lrcErr	Number of packets with LRC error on the transmit side. They are reported as they occur.

crcErr	Number of packets received with CRC error.
overruns	Number of overruns detected.
modemChanges	Number of transient modem status changed without causing a communication error.
frmBytesSnt	Number of bytes transmitted, including protocol overhead and control frames.
linkSpeed	This field gives the measured link speed reported in kilobits per second.
bifurcation	Number of tandem packets bifurcated when sending to the congested trunk.
delayHiFrmSnt	Contains the number of frames transmitted for delay and high priority class.
delayLoFrmSnt	Contains the number of frames transmitted for delay and low priority class.
delayHiFrmBytesSnt	Contains the number of bytes transmitted for delay and high priority class.
thrptHiFrmBytesSnt	Contains the number of bytes transmitted for throughput and high priority class.
delayLoFrmBytesSnt	Contains the number of bytes transmitted for delay and low priority class.

UTP (subtype 35)

Table 72
UTP statistics (subtype 35)

Field	Type
lclType	integer
lclRid	integer
lclMid	integer
rmtType	integer
rmtRid	integer
rmtMid	integer
rmtNamsid	integer
rmtPortType	integer
rmtPortId	integer
frmRcv	integer
hiPrtySnt	integer
loPrtySnt	integer
lclPkts	integer
tdmPkts	integer
frmBytesRcv	integer
frmRxmt	integer
discPkts	integer
ayt	integer
windowClosure	integer
underruns	integer
lrcErr	integer
crcErr	integer
overruns	integer
(Sheet 1 of 2)	

Table 72 (continued)
UTP statistics (subtype 35)

Field	Type
modemChanges	integer
frmBytesSnt	integer
linkSpeed	integer
(Sheet 2 of 2)	

lclType This field specifies the module type of the module on which this Network Link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.

lclRid This field specifies the Routing ID (RID) of the module on which this link is running. If 0, then the module does not have a Routing ID. (On an AM, this field is 0; on an RM, this field is set).

lclMid This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a module ID.

rmtType This field specifies the module type of the module to which the RM UTP Network Link is connected. If set to 2, then the module is an RM; if set to 3, then the module is an AM.

rmtRid This field specifies the Routing ID (RID) of the module to which this RM UTP Network Link is connected.

If 0, the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval, or the far end does not have RID.

rmtMid	<p>This field specifies the Module ID (MID) of the module to which this RM UTP Network Link is connected.</p> <p>If 0, then the module on the far end of the RM UTP Network Link does not have a Module ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.</p>
rmtNamsid	<p>This field specifies the Unique NAMS ID of the module to which this RM UTP Network Link is connected. If 0, then the module on the far end of the RM UTP Network Link does not have access to the Unique NAMS ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.</p>
rmtPortType	<p>The type of the port that the software generating this record runs on. Values:</p> <ul style="list-style-type: none">•0 - Not running on port (reserved for Multilink procedure)•1 - V.24•2 - V.35•3 - X.21 <p>The Single Link Procedure runs always on port, so the only values the PORTTYPE may assume for this statistics record are 1, 2 or 3.</p>

rmtPortId	<p>This field identifies the port information of the far end of the Trunk.</p> <ul style="list-style-type: none"> •If the REMOTEPORTTYPE is set to a value of 1, then the first three bytes of this field specify: REMOTEPORTID [0] = Processor (decimal) REMOTEPORTID [1] = Scanner (decimal) REMOTEPORTID [2] = Line (decimal) •If the REMOTEPORTTYPE is set to a value of 2, then the first three bytes of this field specify: REMOTEPORTID [0] = PE (decimal) REMOTEPORTID [1] = PI (decimal) REMOTEPORTID [2] = Port (decimal) •If the REMOTEPORTTYPE is set to any other value, then this field is not useful.
frmRcv	Number of frames (data and control) received.
frmBytesRcv	Number of bytes received, including protocol overhead and control frames.
frmRxmt	Number of times retransmission occurs.
discPkts	Number of packets discarded due to local congestion (only those received from an RM UTP Network link) or transmit buffer overflow.
ayt	Number of times entered into AYT mode and recovered.
windowClosure	Number of times the transmit window closed.
underruns	Number of underruns detected.
lrcErr	Number of packets with LRC error on the transmit side. They are reported as they occur.
crcErr	Number of packets received with CRC error.
overruns	Number of overruns detected.
modemChanges	Number of modem status changes.

frmBytesSnt	Number of bytes transmitted, including protocol overhead and control frames.
linkSpeed	This field specifies the speed of the link. The speed is in kilobits per second, and is a decimal value. For example, for a link speed of 128 kbit/s, this field contains a decimal value of 128.

UTPEnhanced (subtype 65)

Table 73
UTPEnhanced statistics (subtype 65)

Field	integer
lclType	integer
lclRid	integer
lclMid	integer
rmtType	integer
rmtRid	integer
rmtMid	integer
rmtNamsid	integer
rmtPortType	integer
rmtPortId (0)	integer
rmtPortId (1)	integer
rmtPortId (2)	integer
rmtPortId (3)	integer
rmtPortId (4)	integer
frmRcv	integer
hiPrtySnt	integer
loPrtySnt	integer
lclPkts	integer
tdmPkts	integer
(Sheet 1 of 2)	

Table 73 (continued)
UTPEnhanced statistics (subtype 65)

Field	integer
frmBytesRcv	integer
frmRxmt	integer
discPkts	integer
ayt	integer
windowClosure	integer
underruns	integer
lrcErr	integer
crcErr	integer
overruns	integer
modemChanges	integer
frmBytesSnt	integer
bifurcation	integer
linkSpeed	integer
delayHiFrmSnt	integer
delayLoFrmSnt	integer
delayHiFrmBytesSnt	integer
thrptHiFrmBytesSnt	integer
delayLoFrmBytesSnt	integer
(Sheet 2 of 2)	

lclType

This field specifies the module type of the module on which this Network Link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.

lclRid

This field specifies the Routing ID (RID) of the module on which this link is running. If 0, then the module does not have a Routing ID. (On an AM, this field is 0; on an RM, this field is set).

lclMid	<p>This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a module ID.</p> <p>If the module is a stub-AM, the lower 11 bits of the field contains the MID of one of the stub-AM's connected AMs.</p>
rmtType	<p>This field specifies the module type of the module to which the RM UTP Network Link is connected. If set to 2, then the module is an RM; if set to 3, then the module is an AM.</p>
rmtRid	<p>This field specifies the Routing ID (RID) of the module to which this RM UTP Network Link is connected.</p> <p>If 0, the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval, or the far end does not have RID.</p>
rmtMid	<p>This field specifies the Module ID (MID) of the module to which this RM UTP Network Link is connected.</p> <p>If 0, then the module on the far end of the RM UTP Network Link does not have a Module ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.</p> <p>If the module is an AM linked to an RM, the field contains the value $1910 + \text{RM RID value}$.</p> <p>If the module is an AM connected to a stub-AM, the field contains the value $6144 + \text{stub-id value}$.</p>

rmtNamsid	This field specifies the Unique NAMS ID of the module to which this RM UTP Network Link is connected. If 0, then the module on the far end of the RM UTP Network Link does not have access to the Unique NAMS ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.
rmtPortType	<p>If the Trunk has been up in this statistics interval, then this field indicates the type of port on the far end of the Trunk.</p> <p>If the Trunk has not been up in this statistics interval, then this field is 0.</p> <p>If this field is set to a value of 1, then the far end of the Trunk has a Port ID of the format (Processor, Scanner, Line).</p> <p>If this field is set to a value of 2, then the far end of the Trunk has a Port ID of the format (PE,PI, Port).</p> <p>If this field is set to a value other than 1, or 2, then the port type of the far end of the Trunk is not yet defined.</p>

rmtPortId	<p>This field identifies the port information of the far end of the Trunk.</p> <ul style="list-style-type: none">•If the REMOTEPORTTYPE is set to a value of 1, then the first three bytes of this field specify: REMOTEPORTID [0] = Processor (decimal) REMOTEPORTID [1] = Scanner (decimal) REMOTEPORTID [2] = Line (decimal)•If the REMOTEPORTTYPE is set to a value of 2, then the first three bytes of this field specify: REMOTEPORTID [0] = PE (decimal) REMOTEPORTID [1] = PI (decimal) REMOTEPORTID [2] = Port (decimal)•If the REMOTEPORTTYPE is set to any other value, then this field is not useful.
frmRcv	Number of frames (data and control) received.
hiPrtySnt	Number of high priority frames transmitted.
loPrtySnt	Number of low priority frames transmitted.
lclPkts	Number of packets received that are destined for this node.
tdmPkts	Number of packets received that are destined for other nodes.
frmBytesRcv	Number of bytes received, including protocol overhead and control frames.
frmRxmt	Number of times retransmission occurs.
discPkts	Number of packets discarded due to local congestion (only those received from an RM UTP Network link) or transmit buffer overflow.
ayt	Number of times entered into AYT mode and recovered.
windowClosure	Number of times the transmit window closed.
underruns	Number of underruns detected.
lrcErr	Number of packets with LRC error on the transmit side. They are reported as they occur.

crcErr	Number of packets received with CRC error.
overruns	Number of overruns detected.
modemChanges	Number of modem status changes.
frmBytesSnt	Number of bytes transmitted, including protocol overhead and control frames.
bifurcation	Number of tandem packets bifurcated when sending to the congested trunk.
linkSpeed	This field specifies the speed of the link. The speed is in kilobits per second, and is a decimal value. For example, for a link speed of 128 kbit/s, this field contains a decimal value of 128.
delayHiFrmSnt	Contains the number of frames transmitted for delay and high priority class.
delayLoFrmSnt	Contains the number of frames transmitted for delay and low priority class.
delayHiFrmBytesSnt	Contains the number of bytes transmitted for delay and high priority class.
thrptHiFrmBytesSnt	Contains the number of bytes transmitted for throughput and high priority class.
delayLoFrmBytesSnt	Contains the number of bytes transmitted for delay and low priority class.

NLOverFR (subtype 72)

Table 74
NLOverFR statistics (subtype 72)

Field	Type
lclType	integer
lclRid	integer
lclMid	integer
rmtType	integer
(Sheet 1 of 3)	

Table 74 (continued)
NLOverFR statistics (subtype 72)

Field	Type
rmtRid	integer
rmtMid	integer
rmtNamsid	integer
rmtPortType	integer
rmtPortId (0)	integer
rmtPortId (1)	integer
rmtPortId (2)	integer
rmtPortId (3)	integer
rmtPortId (4)	integer
netLinkType	integer
frmRcv	integer
hiPrtySnt	integer
loPrtySnt	integer
lclPkts	integer
tdmPkts	integer
frmBytesRcv	integer
frmRxmt	integer
discPkts	integer
ayt	integer
windowClosure	integer
underruns	integer
lrcErr	integer
crcErr	integer
overruns	integer
modemChanges	integer
(Sheet 2 of 3)	

Table 74 (continued)
NLOverFR statistics (subtype 72)

Field	Type
frmBytesSnt	integer
linkSpeed	integer
delayHiFrmSnt	integer
delayLoFrmSnt	integer
delayHiFrmBytesSnt	integer
thrptHiFrmBytesSnt	integer
delayLoFrmBytesSnt	integer
frFrmLost	integer
(Sheet 3 of 3)	

lclType

This field specifies the module type of the module on which this Network Link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.

lclRid

This field specifies the Routing ID (RID) of the module on which this link is running. If 0, then the module does not have a Routing ID. (On an AM, this field is 0; on an RM, this field is set).

lclMid

This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a module ID.

If the module is a stub-AM, the lower 11 bits of the field contains the MID of one of the stub-AM's connected AMs.

rmtType

This field specifies the module type of the module to which the RM UTP Network Link is connected. If set to 2, then the module is an RM; if set to 3, then the module is an AM.

rmtRid

This field specifies the Routing ID (RID) of the module to which this RM UTP Network Link is connected.

If 0, the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval, or the far end does not have RID.

rmtMid

This field specifies the Module ID (MID) of the module to which this RM UTP Network Link is connected.

If 0, then the module on the far end of the RM UTP Network Link does not have a Module ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.

If the module is an AM linked to an RM, the field contains the value 1910 + RM RID value.

If the module is an AM connected to a stub-AM, the field contains the value 6144 + stub-id value.

rmtNamsid

This field specifies the Unique NAMS ID of the module to which this RM UTP Network Link is connected. If 0, then the module on the far end of the RM UTP Network Link does not have access to the Unique NAMS ID, or the RM UTP Network Link is not connected to a far RM UTP Network Link at the end of this statistics interval.

rmtPortType	<p>If the Trunk has been up in this statistics interval, then this field indicates the type of port on the far end of the Trunk.</p> <p>If the Trunk has not been up in this statistics interval, then this field is 0.</p> <p>If this field is set to a value of 1, then the far end of the Trunk has a Port ID of the format (Processor, Scanner, Line).</p> <p>If this field is set to a value of 2, then the far end of the Trunk has a Port ID of the format (PE,PI, Port).</p> <p>If this field is set to a value other than 1, or 2, then the port type of the far end of the Trunk is not yet defined.</p>
rmtPortId	<p>This field identifies the port information of the far end of the Trunk.</p> <ul style="list-style-type: none">•If the REMOTEPORTTYPE is set to a value of 1, then the first three bytes of this field specify: REMOTEPORTID [0] = Processor (decimal) REMOTEPORTID [1] = Scanner (decimal) REMOTEPORTID [2] = Line (decimal)•If the REMOTEPORTTYPE is set to a value of 2, then the first three bytes of this field specify: REMOTEPORTID [0] = PE (decimal) REMOTEPORTID [1] = PI (decimal) REMOTEPORTID [2] = Port (decimal)•If the REMOTEPORTTYPE is set to any other value, then this field is not useful.
netLinkType	<p>Identifies this Network Link as either a UTP Network Link or a Network Link running on Frame Relay:</p> <ul style="list-style-type: none">•0 = UTP Network Link•1 = Network Link over Frame Relay

frmRcv	Number of frames (data and control) received.
hiPrtySnt	Number of high priority frames transmitted.
loPrtySnt	Number of low priority frames transmitted.
lciPkts	Number of packets received that are destined for this node.
tdmPkts	Number of packets received that are destined for other nodes.
frmBytesRcv	Number of bytes received, including protocol overhead and control frames.
frmRxmt	Number of times retransmission occurs.
discPkts	Number of packets discarded due to local congestion (only those received from an RM UTP Network link) or transmit buffer overflow.
ayt	Number of times entered into AYT mode and recovered.
windowClosure	Number of times the transmit window closed.
underruns	Number of underruns detected.
lrcErr	Number of packets with LRC error on the transmit side. They are reported as they occur.
crcErr	Number of packets received with CRC error.
overruns	Number of overruns detected.
modemChanges	Number of modem status changes.
frmBytesSnt	Number of bytes transmitted.
linkSpeed	This field specifies the speed of the link. The speed is in kilobits per second, and is a decimal value. For example, for a link speed of 128kbit/s, this field contains a decimal value of 128.
delayHiFrmSnt	Contains the number of frames transmitted for delay and high priority class.
delayLoFrmSnt	Contains the number of frames transmitted for delay and low priority class.

delayHiFrmBytesSnt	Contains the number of bytes transmitted for delay and high priority class.
thrpHiFrmBytesSnt	Contains the number of bytes transmitted for throughput and high priority class.
delayLoFrmBytesSnt	Contains the number of bytes transmitted for delay and low priority class.
frFrmLost	Number of frames lost on the External/Public Frame Relay connection for Network Link running over Frame Relay. This is detected by the sequence number mechanism. The transmit Network Link attaches a sequence number to each sent frame and the receive Network Link checks the numbers received. Any gap in sequence numbers means a lost frame, registered by this statistic.

This statistic applies only to the receive direction of transmission. The count is always 0 for regular Network Links.

VC (subtype 67)

Table 75
VC statistics (subtype 67)

Field	Type
srcDna	string
srcLcn	integer
destDna	string
destLcn	integer
callRef	integer
dataPktsSnt	integer
dataPktsRcv	integer
(Sheet 1 of 2)	

Table 75 (continued)
VC statistics (subtype 67)

Field	Type
pktsRxmt	integer
outOfSeqPkts	integer
vcRecoveries	integer
rcvQueueHwm	integer
duplicatedPkts	integer
pktsNotXmt	integer
ackStaTimer	integer
windAdptTrig	integer
timeWindAdptState	integer
windCycles	integer
lwmDynamWind	integer
currSzeDynamWind	integer
fciFromSbnet	integer
bciFromSbnet	integer
bciToSbnet	integer
(Sheet 2 of 2)	

srcDna

This fields contain full calling address (including DNIC for X.121 and Country Code for E.164); maximum 15 digits.

Note: This is not necessary address of the source of the record. Source of the record can be identified from NAMS ID, PE# and component id fields.

srcLcn

Logical Channel Number of the calling end of the call.

destDna	This fields contain full called address (including DNIC for X.121 and Country Code for E.164); maximum 15 digits.
destLcn	Logical channel number of the called end of the call.
callRef	Call reference number. It is a three byte random number generated by the switch used as one of the fields in matching duplicated records generated at each end of the call.
dataPktsSnt	This statistic contains the total number of packets forwarded to the subnet by VC. This counter contains only the number of packets which were forwarded by an application (AP) i.e. the retransmissions are not included. The total number of retransmissions is given in the <i>packets retransmitted</i> statistic.
dataPktsRcv	This statistic contains the total number of data packets received from the remote end. The duplicated packets are counted as one.
pktsRxmt	This is the total number of times packets were retransmitted to the subnet after retransmission timer expired. This includes all the retransmitted packets (data packets, idle probe, reset packets). This statistic does not tell how many times individual packets were retransmitted but it provides the total number of retransmissions which took place.

outOfSeqPkts	All data packets sent by the VC are equipped with the unique sequence number. The expected sequence number for the next receive packet is in the range which is determined by the last sequence number received and the receive credits available. All data packets which are received with out of sequence number but within the expected sequence range are enqueued into the receive queue in order to wait for all the preceding packets. This statistic contains the total number of packets which had to be enqueued into receive queue.
vcRecoveries	If the acknowledgment for the packet is not received after two retransmissions it is assumed that the call path is broken and the call recovery procedure is requested. This statistic contains the total number of times the recovery was attempted after path failure and the call was successfully recovered
rcvQueueHwm	This statistic contains the high water mark for the receive queue.
duplicatedPkts	Due to the retransmissions done by the source VC or by the trunks, some packets can be received as duplicates of the previously received packets at the destination VC. This statistic contains the total number of duplicated packets received.
pktsNotXmt	All packets received from AP are immediately forwarded to the subnet by VC. However in some cases packets could not be forwarded due to congestion of local resources (common memory congestion, UTP trunk/NL congestion or destination PE congestion if destination resides on the same module). This counter contains the total number of instances were packets could not be forwarded to the subnet due to this reason.

ackStaTimer	When the ack stacking feature is enabled the acknowledgment is held for the finite time period in the hope that it can be piggybacked on the data packet heading in the other direction. This statistic contains the total number of times the ack stacking timer has expired.
windAdptTrig	The number of times the dynamic window enters the adaptation state. Once the count is incremented it is not incremented again until the window leaves the adaptation state and enters it again.
timeWindAdptState	The total time in minutes during which the window was throttled because of all adaptation periods.
windCycles	The total number of window cycles during all window adaptation periods.
lwmDynamWind	The lowest value that the window reached since the last probe.
currSizeDynamWind	The current size of the window.
fciFromSbnet	The total number of frames (not only data) received since the last probe with the FCI bit set.
bciFromSbnet	The number of frames received since the last probe with the BCI bit set.
bciToSbnet	The number of frames sent to the subnet with the BCI bit set.

GVCG34 (subtype 74)

Table 76
GVCG34 statistics (subtype 74)

Field	Type
srcDna	string
srcLcn	integer
destDna	string
(Sheet 1 of 2)	

Table 76 (continued)
GVCG34 statistics (subtype 74)

Field	Type
destLcn	integer
callRef	integer
dataPktsSnt	integer
dataPktsRcv	integer
pktsRxmt	integer
outOfSeqPkts	integer
vcRecoveries	integer
rcvQueueHwm	integer
duplicatedPkts	integer
pktsNotXmt	integer
ackStaTimer	integer
windAdptTrig	integer
timeWindAdptState	integer
windCycles	integer
lwmDynamWind	integer
currSzeDynamWind	integer
fciFromSbnet	integer
bciFromSbnet	integer
bciToSbnet	integer
(Sheet 2 of 2)	

srcDna	This fields contain full calling address (including DNIC for X.121 and Country Code for E.164); maximum 15 digits. Note: This is not necessary address of the source of the record. Source of the record can be identified from NAMS ID, PE# and component id fields.
srcLcn	Logical Channel Number of the calling end of the call.
destDna	This fields contain full called address (including DNIC for X.121 and Country Code for E.164); maximum 15 digits.
destLcn	Logical channel number of the called end of the call.
callRef	Call reference number. It is a three byte random number generated by the switch used as one of the fields in matching duplicated records generated at each end of the call.
dataPktsSnt	This statistic contains the total number of packets forwarded to the subnet by VC. This counter contains only the number of packets which were forwarded by an application (AP) i.e. the retransmissions are not included. The total number of retransmissions is given in the <i>packets retransmitted</i> statistic.
dataPktsRcv	This statistic contains the total number of data packets received from the remote end. The duplicated packets are counted as one.

pktsRxmt	This is the total number of times packets were retransmitted to the subnet after retransmission timer expired. This includes all the retransmitted packets (data packets, idle probe, reset packets). This statistic does not tell how many times individual packets were retransmitted but it provides the total number of retransmissions which took place.
outOfSeqPkts	All data packets sent by the VC are equipped with the unique sequence number. The expected sequence number for the next receive packet is in the range which is determined by the last sequence number received and the receive credits available. All data packets which are received with out of sequence number but within the expected sequence range are enqueued into the receive queue in order to wait for all the preceding packets. This statistic contains the total number of packets which had to be enqueued into receive queue.
vcRecoveries	If the acknowledgment for the packet is not received after two retransmissions it is assumed that the call path is broken and the call recovery procedure is requested. This statistic contains the total number of times the recovery was attempted after path failure and the call was successfully recovered
rcvQueueHwm	This statistic contains the high water mark for the receive queue.
duplicatedPkts	Due to the retransmissions done by the source VC or by the trunks, some packets can be received as duplicates of the previously received packets at the destination VC. This statistic contains the total number of duplicated packets received.

pktsNotXmt	All packets received from AP are immediately forwarded to the subnet by VC. However in some cases packets could not be forwarded due to congestion of local resources (common memory congestion, UTP trunk/NL congestion or destination PE congestion if destination resides on the same module). This counter contains the total number of instances were packets could not be forwarded to the subnet due to this reason.
ackStaTimer	When the ack stacking feature is enabled the acknowledgment is held for the finite time period in the hope that it can be piggybacked on the data packet heading in the other direction. This statistic contains the total number of times the ack stacking timer has expired.
windAdptTrig	The number of times the dynamic window enters the adaptation state. Once the count is incremented it is not incremented again until the window leaves the adaptation state and enters it again.
timeWindAdptState	The total time in minutes during which the window was throttled because of all adaptation periods.
windCycles	The total number of window cycles during all window adaptation periods.
lwmDynamWind	The lowest value that the window reached since the last probe.
currSzeDynamWind	The current size of the window.
fciFromSbnet	The total number of frames (not only data) received since the last probe with the FCI bit set.
bciFromSbnet	The number of frames received since the last probe with the BCI bit set.
bciToSbnet	The number of frames sent to the subnet with the BCI bit set.

X25Port (subtype 63)

Table 77
DPN-AM and DPN-RM X.25 statistics (subtype 63)

Field	Type
version	integer
service	integer
type	integer
portType	integer
gtyld	integer
modType	integer
lclRid	integer
lclMid	integer
anid	integer
minCalls	integer
maxCalls	integer
maxNuiErr	integer
currFrmQueued	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
frmSnt	integer
frmRcv	integer
frmQueued	integer
overruns	integer
frmAbort	integer
noBuffer	integer
badFrmSize	integer
crcErr	integer
lineFail	integer
(Sheet 1 of 3)	

Table 77 (continued)
DPN-AM and DPN-RM X.25 statistics (subtype 63)

Field	Type
underruns	integer
lrcErr	integer
frmRxmt	integer
modemChanges	integer
protocolErr	integer
ifrmSnt	integer
ifrmRcv	integer
rrSnt	integer
rrRcv	integer
rnrSnt	integer
rnrRcv	integer
rejSnt	integer
rejRcv	integer
frmrSnt	integer
frmrRcv	integer
frmSsqSnt	long integer
frmSsqRcv	long integer
ifrmBytesSnt	long integer
ifrmBytesRcv	long integer
x21DiSuc	integer
x21DiInc	integer
x21DiErr	integer
x21DoSuc	integer
x21DoInc	integer
x21DoErr	integer
(Sheet 2 of 3)	

Table 77 (continued)
DPN-AM and DPN-RM X.25 statistics (subtype 63)

Field	Type
x21ClrErr	integer
x21ParityErr	integer
callReqSnt	integer
callReqRcv	integer
callConnSnt	integer
callConnRcv	integer
dataPktsSnt	integer
dataPktsRcv	integer
dataBytesSnt	integer
dataBytesRcv	integer
lclValAttmpt	integer
lclValFail	integer
lclXlateAttmpt	integer
lclXlateFail	integer
rmtValAttmpt	integer
rmtValFail	integer
rmtXlateAttmpt	integer
rmtXlateFail	integer
frmBytesSnt	long integer
frmBytesRcv	long integer
linkSpeed	integer
(Sheet 3 of 3)	

version	This field indicates the version number of the statistics record, currently 0.
service	This field indicates the Access Service that this link is running. Values: <ul style="list-style-type: none"> •0 - X.75 (not applicable in this case) •1 - X.25 •2 - X.25 Gateway
type	This TYPE field in combination with the SERVICE field indicates what component of a service is generating this statistics record and consequently what format the statistics will take on. Values: <ul style="list-style-type: none"> •0 Single Link Service (record format given here) •1-Multilink Service •2-Single Link Within Multilink Group
portType	The type of the port that the software generating this record runs on. Values: <ul style="list-style-type: none"> •0- Not running on port (reserved for Multilink Procedure) •1- V.24 •2- V.35 •3- X.21
gtyld	For this statistics record the only possible value is 0. If this statistics record is generated by an X.25 Gateway Service this field gives the unique GID assigned to this gateway.
modType	This field specifies the module type of the module on which this link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.

lclRid	<p>This field specifies the link access procedure implemented at the link layer, as follows:</p> <ul style="list-style-type: none">•LAPB = 0 (LAP-B)•LAPBES = 1 (LAP-B Extended, Single Octet)•LAPBED = 2 (LAP-B Extended, Double Octet)
lclMid	<p>This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a Module ID.</p>
anid	<p>This field contains the Adjacent Network ID of the adjacent network accessed through this X.25 gateway link. Values: 128 to 2048. This field is only relevant for X.25 gateways.</p>
minCalls	<p>Minimum number of calls up.</p>
maxCalls	<p>Maximum number of calls up.</p>
maxNuiErr	<p>Total number of illegal passwords received by the service over all its logical channels.</p>
lclFlowCtrl	<p>This field specifies the time, in seconds, that the link has flow controlled the remote end. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.</p>
rmtFlowCtrl	<p>This field specifies the time, in seconds, that the link has been flow controlled by the remote end. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.</p>
frmSnt	<p>This field specifies the number of frames sent to the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.</p>

frmRcv	This field specifies the number of frames received from the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.
currFrmQueued	<p>This field specifies the number of frames queued for transmission to the link at the point that the statistics probe was processed by the link.</p> <p>This field specifies the number of frames queued for transmission to the link at the point that the statistics probe was processed by the link. If the number of frames queued is greater than 255, then this field has a value of 255, or H.FF, and the true count of frames queued is in the statistical counter CURRENT FRAMES QD.</p> <p>Note that this field is not quite as useful as the CURRENT FRAMES QD, it is used at the link for thresholding. The thresholds all have maximum values of 254, and there is no need in most cases, to keep counting the number of link errors after hitting the upper bound. For example, the number of modem status changes in a statistics interval is counted up to a value of 254, and then counting stops. In the case of frames queued, the true count of frames queued is available in the software, so is provided in CURRENT FRAMES QD.</p> <p>This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.</p>

overruns	<p>This field specifies the number of overruns in this statistics interval on the link. The PE is unable to accept a character before the next character has been accepted by the SCC on the PI.</p> <p>This statistic usually indicates that the PE is overloaded, and should be re-engineered in order that its traffic capacity is not exceeded.</p>
frmAbort	<p>This field specifies the number of frame aborts in this statistics interval on the link.</p> <p>This statistic usually indicates a problem at the remote end of the line (it is sending aborts), or on the facility (it is turning data on the line into aborts).</p>
noBuffer	<p>This field specifies the number of times in this statistics interval that the receive buffer used by the interrupt handler was insufficient to handle incoming traffic from the link.</p> <p>This statistic usually indicates that the link is overloaded, and requires re-engineering.</p>
badFrmSize	<p>This field specifies the number of frames received in this statistics interval from the link with a bad frame size (too long or too short).</p> <p>This statistic usually indicates a problem at the remote end of the line, it is sending frames of an incorrect frame size.</p>
crcErr	<p>This field specifies the number of CRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a data corruption problem somewhere in the network.</p>

lineFail	<p>This field specifies the number of line errors in this statistics interval on the link.</p> <p>This statistic usually indicates a problem on the SCC on the PI.</p>
underruns	<p>This field specifies the number of underruns in this statistics interval on the link, (the interrupt handler is unable to give the next character to the SCC in time).</p> <p>This statistic usually indicates that the PE is overloaded, and should be re-engineered so that its traffic capacity is not exceeded.</p>
lrcErr	<p>This field specifies the number of LRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a data corruption problem somewhere in the network.</p>
frmRxmt	<p>This field specifies the number of times in this statistics interval on the link, that a frame had to be retransmitted due to frames being rejected or timeouts.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end.</p>
modemChanges	<p>This field specifies the number of modem status changes in this statistics interval on the link.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end; an unterminated EIA cable plugged into the PI may also cause excessive modem status changes.</p>

protocolErr	<p>This field specifies the number of link protocol errors in this statistics interval on the link.</p> <p>This statistic, if coupled with other statistics errors, can indicate a problem on the hardware for the line. cable plugged into the PI may also cause excessive modem status changes. Otherwise, it indicates a problem with the remote end, where the protocol has not been implemented properly</p>
ifrmSnt	<p>This field specifies the number of I-frames sent to the link. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.</p>
ifrmRcv	<p>This field specifies the number of I-frames received from the link. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.</p>
rrSnt	<p>This field specifies the number of LAP-B Level 2 RRs sent to the link in this statistics interval.</p>
rrRcv	<p>This field specifies the number of LAP-B Level 2 RRs received from the link in this statistics interval.</p>
rnrSnt	<p>This field specifies the number of LAP-B Level 2 RNRs sent to the link in this statistics interval.</p>
rnrRcv	<p>This field specifies the number of LAP-B Level 2 RNRs received from the link in this statistics interval.</p>
rejSnt	<p>This field specifies the number of LAP-B Level 2 REJs sent to the link in this statistics interval.</p>
rejRcv	<p>This field specifies the number of LAP-B Level 2 REJs received from the link in this statistics interval.</p>
frmrSnt	<p>This field specifies the number of LAP-B Level 2 FREJs sent to the link in this statistics interval.</p>

frmrRcv	This field specifies the number of LAP-B Level 2 FREJs received from the link in this statistics interval.
frmSsqSnt	This field specifies the statistical sum of squares, for the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
frmSsqRcv	This field specifies the statistical sum of squares, for the number of bytes in I-frames received from the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmBytesSnt	This field specifies the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmBytesRcv	This field specifies the number of bytes in I-frames received from the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
x21DiSuc	Number of successful X.25/X.21 dial-in call attempts (level 1 established). Not meaningful for SLP.
x21DiInc	Number of incomplete X.25/X.21 dial-in call attempts (call cleared before level 1 established). Not meaningful for SLP.
x21DiErr	Number of incomplete X.25/X.21 dial-in call attempts aborted by an X.21 protocol violation (level 1 not established). Not meaningful for SLP.
x21DoSuc	Number of successful X.25/X.21 dial-out call attempts (level 1 established). Not meaningful for SLP.

x21DoInc	Number of incomplete X.25/X.21 dial-out call attempts (call cleared before level 1 established). Not meaningful for SLP.
x21DoErr	Number of incomplete X.25/X.21 dial-out call attempts aborted by an X.21 protocol violation (level 1 not established). Not meaningful for SLP.
x21ClrErr	Number of successful X.25/X.21 call attempts (both dial-in and dial-out) that encountered an X.21 protocol violation during disconnection. Not meaningful for SLP.
x21ParityErr	Number of X21 parity errors. Applicable only if port is an X.21 one.
callReqSnt	The number of call request packets sent to the link.
callReqRcv	The number of call request packets received from the link.
callConnSnt	The number of call connect packets sent to the link.
callConnRcv	The number of call connect packets received from the link.
dataPktsSnt	The number of data packets sent to the link.
dataPktsRcv	The number of data packets received from the link.
dataBytesSnt	The number of data bytes in the data packets sent to the link.
dataBytesRcv	The number of data bytes in the data packets received from the link.
lclValAttmp	The number of attempts made to validate a local address at this gateway. Only relevant for X.25 gateway.
lclValFail	The number of failed local validation attempts made at this gateway. Only relevant for X.25 gateway.
lclXlateAttmp	The number of attempts made to translate a local address at this gateway. Only relevant for X.25 gateway.

lclXlateFail	The number of failed local translation attempts made at this gateway. Only relevant for X.25 gateway.
rmtValAttmpt	The number of attempts made to validate a remote address at this gateway. Only relevant for X.25 gateway.
rmtValFail	The number of failed remote validation attempts made at this gateway. Only relevant for X.25 gateway.
rmtXlateAttmpt	The number of attempts made to translate a remote address at this gateway. Only relevant for X.25 gateway.
rmtXlateFail	The number of failed remote translation attempts made at this gateway. Only relevant for X.25 gateway.
frmBytesSnt	The number of bytes including the frame overhead sent to the link in this statistics interval.
frmBytesRcv	The number of bytes including the frame overhead received from the link in this statistics interval.
linkSpeed	This field indicates the speed of the link in bytes per second.

X25MLAgent (subtype 61)

This statistics record is generated by an X.25 Multilink Service and is generated by the Multilink Agent which manages all of the single links within the Multilink Group as well as provides packet layer processing. Each of the Single Links within the Multilink Group also generate a statistics record to provide link layer information. The statistics record generated by each of the Single Links is the X.25 SLP statistics record. The set of statistics records generated by an X.25 Multilink Group can be correlated by the GROUPID, a number unique in module (when the X.25 Multilink Service is not a gateway) or across the network (when the X.25 multilink is an X.25 gateway).

Table 78
DPN-AM and DPN-RM X.25 multilink agent statistics (subtype 61)

Field	Type
version	integer
service	integer
type	integer
portType	integer
gtyld	integer
modType	integer
lclRid	integer
lclMid	integer
anid	integer
minCalls	integer
maxCalls	integer
maxNuiErr	integer
maxOutPktsQueued	integer
maxInPktsQueued	integer
lostPktsOut	integer
lostPktsIn	integer
(Sheet 1 of 2)	

Table 78 (continued)
DPN-AM and DPN-RM X.25 multilink agent statistics (subtype 61)

Field	Type
duplicPkts	integer
discPkts	integer
mlReset	integer
slpRxmtPkts	integer
pktsSnt	integer
pktsRcv	integer
badPktSize	integer
mlProtocolErr	integer
callReqSnt	integer
callReqRcv	integer
callConnSnt	integer
callConnRcv	integer
dataPktsSnt	integer
dataPktsRcv	integer
dataBytesSnt	integer
dataBytesRcv	integer
lclValAttmpt	integer
lclValFail	integer
lclXlateAttmpt	integer
lclXlateFail	integer
rmtValAttmpt	integer
rmtValFail	integer
rmtXlateAttmpt	integer
rmtXlateFail	integer
linkId	string
(Sheet 2 of 2)	

version	This field indicates the version number of the statistics record, currently 0.
service	<p>This field indicates the Access Service that this link is running. Values:</p> <ul style="list-style-type: none">•0 - X.75 (not applicable for the format described here)•1 - X.25•2 - X.25 Gateway <p>For this statistics record (Multilink Agent), the only possible values are 1 or 2.</p>
type	<p>This TYPE field in combination with the SERVICE field indicates what component of a service is generating this statistics record and consequently what format the statistics will take on. Values:</p> <ul style="list-style-type: none">•0 - Single Link Service•1 - Multilink Service (record described here)•2 - Single Link Within Multilink Group (see above)•For this statistics record (Multilink Agent), the only possible value is 1.
portType	<p>The type of the port that the software generating this record runs on. Values:</p> <ul style="list-style-type: none">•0- Not running on port (reserved for Multilink Procedure)•1- V.24•2- V.35•3- X.21•For this statistics record the only possible value is 0.

gtyld	This field identifies the Multilink Group handled by this Multilink Agent.
	If the X.25 Service is not a Gateway, then this is a MutlinkGroupID (1..64), a number unique in the module. If the X.25 Multilink Service is an X.25 gateway, then this number is a GatewayID, a number unique throughout the network.
	In an X.25 Multilink Service, several statistics records are generated. Each Single Link within the Multilink Group generates an X.25 SLP statistics record, as well as does the Multilink Agent that oversees the group and its single links and provides the packet layer processing. This number enables correlation of this different statistic records.
modType	This field specifies the module type of the module on which this link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.
lclRid	This field specifies the Routing ID (RID) of the module on which this link is running. If 0, then the module does not have a Routing ID. (On an AM, this field is 0; on an RM, this field is set).
lclMid	This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a Module ID.
anid	This field contains the Adjacent Network ID of the adjacent network accessed through this X.25 gateway link.
	This field only applies for X.25 Gateway statistics records.
	Values: 128 to 2048
minCalls	Minimum number of calls up.

maxCalls	Maximum number of calls up.
maxNuiErr	Total number of illegal passwords received by the service over all its logical channels.
maxOutPktsQueued	<p>This field specifies the maximum number of multilink frames which were queued (at any given time) for output to the remote end by the Multilink Procedure.</p> <p>Multilink frames include all X.25 information frames (or Level 3 packets) which traverse a single link in the multilink configuration. This includes all packets on a virtual call, and permanent virtual circuit. It also includes all control packets such as the Level 3 restart request packet, and restart confirmation packet, and the multilink reset request packet, and multilink reset confirmation packet.</p> <p>This field does not include supervisory and unnumbered Link Layer frames.</p>
maxInPktsQueued	<p>This field specifies the maximum number of multilink frames which were queued (at any given time) on input from the remote end by the X.25 Multilink Procedure.</p> <p>Multilink frames include all X.25 information frames (or Level 3 packets) which traverse a single link in the multilink configuration. This includes all packets on a virtual call, and permanent virtual circuit. It also includes all control packets such as the Level 3 restart request packet, and restart confirmation packet, and the multilink reset request packet, and multilink reset confirmation packet.</p> <p>This field does not include supervisory and unnumbered Link Layer frames.</p>

lostPktsOut	This field specifies the total number of X.25 information frames (or Level 3 packets) destined to the X.25 Multilink which were discarded or perceived to be lost since the last statistics probe.
lostPktsIn	This field specifies the total number of X.25 information frames (or Level 3 packets) received from the X.25 Multilink which were perceived to be lost since the last statistics probe.
duplicPkts	This field indicates the number of packets that have been received from the remote which are duplicates of packets already received by the Multilink Procedure since the last statistics probe.
discPkts	This field indicates the number of packets that have been received from the remote which are outside of the Multilink Received Window since the last statistics probe.
	This statistic may be indicative of a problem in the Multilink Procedure implementation at the remote end. It may also indicate that the Multilink Window Sizes on the local and remote end are not identical.
mlReset	This field specifies the total number of times that the Multilink Resetting Procedure has been invoked since the last statistics probe.
slpRxmtPkts	This field indicates the number of packets that have been returned from a single link to the Multilink Procedure for retransmission over the same or a different single link since the last statistics probe.
	This statistic is indicative of a transmission problem on at least one of the X.25 Single Links within the Multilink Group. Examine the statistics record for the Single Links within the same Multilink Group to determine which link is problematic and diagnose the problem.

pktsSnt	<p>This field indicates the number of packets sent to the X.25 Multilink. Packets include all information packets, and level 3 control packets, such as Idle Probes and Restarts.</p> <p>This field will closely match the sum of the IFRAMESENT fields from all of the X.25 SLP statistics records from each of the X.25 Single Links.</p>
pktsRcv	<p>This field indicates the number of packets received from the X.25 Multilink. Packets include all information packets, and level 3 control packets, such as Idle Probes and Restarts.</p> <p>This field will closely match the sum of the IFRAMESRCVD fields from all of the X.25 SLP statistics records from each of the X.25 Single Links.</p>
badPktSize	<p>This field indicates the number of packets received from the X.25 Multilink which do not contain a full Multilink Header.</p> <p>This statistic indicates that the remote side of the link is generating packets incorrectly.</p>
mlProtocolErr	<p>This field indicates that the Multilink Control Field in the Multilink Header of the packet received from the X.25 Multilink is formatted incorrectly.</p> <p>This statistic indicates that the remote side of the link is generating packets incorrectly.</p>
callReqSnt	<p>The number of call request packets sent to the link.</p>
callReqRcv	<p>The number of call requests packets received from the link.</p>
callConnSnt	<p>The number of call connect packets sent to the link.</p>
callConnRcv	<p>The number of call connect packets received from the link.</p>
dataPktsSnt	<p>The number of data packets sent to the link.</p>

dataPktsRcv	The number of data packets received from the link.
dataBytesSnt	The number of data bytes in the data packets sent to the link.
dataBytesRcv	The number of data bytes in the data packets received from the link.
lclValAttmpt	The number of attempts made to validate a local address at this gateway. Only valid when this multilink group is a gateway.
lclValFail	The number of failed local validation attempts made at this gateway. Only valid when this multilink group is a gateway.
lclXlateAttmpt	The number of attempts made to translate a local address at this gateway. Only valid when this multilink group is a gateway.
lclXlateFail	The number of failed local translation attempts made at this gateway. Only valid when this multilink group is a gateway.
rmtValAttmpt	The number of attempts made to validate a remote address at this gateway. Only valid when this multilink group is a gateway.
rmtValFail	The number of failed remote validation attempts made at this gateway. Only valid when this multilink group is a gateway.
rmtXlateAttmpt	The number of attempts made to translate a remote address at this gateway. Only valid when this multilink group is a gateway.
rmtXlateFail	The number of failed remote translation attempts made at this gateway. Only valid when this multilink group is a gateway.
linkId	Link identifier.

X25MLSerPort (subtype 62)

This statistics record is generated by each Single Link within an X.25 Multilink Group.

Table 79
DPN-AM and DPN-RM X.25 SLP statistics (subtype 62)

Field	Type
version	integer
service	integer
type	integer
portType	integer
gtyld	integer
modType	integer
linkProc	integer
lclRid	integer
lclMid	integer
anid	integer
currFrmQueued	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
frmSnt	integer
frmRcv	integer
frmQueued	integer
overruns	integer
frmAbort	integer
noBuffer	integer
badFrmSize	integer
crcErr	integer
lineFail	integer
(Sheet 1 of 3)	

Table 79 (continued)
DPN-AM and DPN-RM X.25 SLP statistics (subtype 62)

Field	Type
underruns	integer
lrcErr	integer
frmRxmt	integer
modemChanges	integer
protocolErr	integer
ifrmSnt	integer
ifrmRcv	integer
rrSnt	integer
rrRcv	integer
rnrSnt	integer
rnrRcv	integer
rejSnt	integer
rejRcv	integer
frmrSnt	integer
frmrRcv	integer
frmSsqSnt	long integer
frmSsqRcv	long integer
ifrmBytesSnt	long integer
ifrmBytesRcv	long integer
x21DiSuc	integer
x21DiInc	integer
x21DiErr	integer
x21DoSuc	integer
x21DoInc	integer
x21DoErr	integer
(Sheet 2 of 3)	

Table 79 (continued)
DPN-AM and DPN-RM X.25 SLP statistics (subtype 62)

Field	Type
x21ClrErr	integer
x21ParityErr	integer
frmBytesSnt	long integer
frmBytesRcv	long integer
linkSpeed	integer
(Sheet 3 of 3)	

- version** This field indicates the version number of the statistics record, currently 0.
- service** This field indicates the access service that this link is running. Values:
- 0 - X.75
 - 1 - X.25
 - 2 - X.25 Gateway
 - For this statistics record (Single Link in Multilink Group) this field can assume only values 1 or 2.
- type** This field in combination with the service field indicates what component of a service is generating this statistics record and consequently what format the statistics will take on. Values:
- 0 - Single Link Service
 - 1 - Multilink Service
 - 2 - Single Link Within Multilink Group
 - For this statistics record (Single Link in Multilink Group) this field can only assume a value of 2.

portType	<p>The type of the port that the software generating this record runs on. Values:</p> <ul style="list-style-type: none">•0 - Not running on port (reserved for Multilink procedure)•1 - V.24•2 - V.35•3 - X.21 <p>•The Single Link Procedure runs always on port, so the only values the PORTTYPE may assume for this statistics record are 1, 2 or 3.</p>
gtyld	<p>This field identifies the Multilink Group to which the SLP that generates this record belongs. If the Multilink service is an X.25 service (not a gateway), then this is a MultilinkGroupID (1...64). When the Multilink service is an X.25 gateway, then this field is a GatewayID (1...9999). This field can be used to correlate the various statistics records from the different components of the Multilink Group.</p>
modType	<p>This field specifies the module type of the module on which this link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.</p>
linkProc	<p>This field specifies the link access procedure implemented at the link layer, as:</p> <ul style="list-style-type: none">•LAPB = 0 (LAP-B)•LAPBES = 1 (LAP-B Extended, Single Octet)•LAPBED= 2 (LAP-B Extended, Double Octet)
lclRid	<p>This field specifies the Routing ID (RID) of the module on which this link is running. If 0, then the module does not have a Routing ID. (On an AM, this field is 0; on an RM, this field is set).</p>

lclMid	This field specifies the Module ID (MID) of the module on which this link is running. If 0, then the module does not have a module ID.
anid	This field contains the Adjacent Network ID of the adjacent network accessed through this X.25 gateway link. This field only applies for X.25 gateway statistics records. Values: 128 to 2048
lclFlowCtrl	This field specifies the time, in seconds, that the link has flow controlled the remote end. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.
rmtFlowCtrl	This field specifies the time, in seconds, that the link has been flow controlled by the remote end. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.
frmSnt	This field specifies the number of frames sent to the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.
frmRcv	This field specifies the number of frames received from the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.

currFrmQueued

This field specifies the number of frames queued for transmission to the link at the moment that the statistics probe was processed by the link.

This field specifies the number of frames queued for transmission to the link at the moment that the statistics probe was processed by the link. If the number of frames queued is greater than 255, then this field has a value of 255, or H.ff, and the true count of frames queued is in the statistical counter CURRENT FRAMES QD.

Note that this field is not quite as useful as the CURRENT FRAMES QD, but it is used at the link for thresholding. The thresholds all have maximum values of 254, and there is no need in most cases, to keep counting the number of link errors after hitting the upper bound. For example, the number of modem status changes in a statistics interval is counted up to a value of 254, and then counting stops. In the case of frames queued, the true count of frames queued is available in the software, so is provided in CURRENT FRAMES QD.

This statistic usually indicates that the link is overloaded, and may have to be re-engineered to hand the offered traffic.

overruns

This field specifies the number of overruns in this statistics interval on the link. The PE is unable to accept a character before the next character has been accepted by the SCC on the PI.

This statistic usually indicates that the PE is overloaded, and should be re-engineered in order that its traffic capacity is not exceeded.

frmAbort	<p>This field specifies the number of frame aborts in this statistics interval on the link.</p> <p>This statistic usually indicates a problem at the remote end of the line (it is sending aborts), or on the facility (it is turning data on the line into aborts).</p>
noBuffer	<p>This field specifies the number of times in this statistics interval that the receive buffer used by the interrupt handler was insufficient to handle incoming traffic from the link.</p> <p>This statistic usually indicates that the link is overloaded and requires re-engineering.</p>
badFrmSize	<p>This field specifies the number of frames received in this statistics interval from the link with a bad frame size (too long or too short).</p> <p>This statistic usually indicates a problem at the remote end of the line, it is sending frames of an incorrect frame size.</p>
crcErr	<p>This field specifies the number of CRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a data corruption problem somewhere in the network.</p>
lineFail	<p>This field specifies the number of line errors in this statistics interval on the link.</p> <p>This statistic usually indicates a problem on the SCC on the PI.</p>

underruns	<p>This field specifies the number of underruns in this statistics interval on the link, (the interrupt handler is unable to give the next character to the SCC in time).</p> <p>This statistic usually indicates that the PE is overloaded, and should be re-engineered so that its traffic capacity is not exceeded.</p>
lrcErr	<p>This field specifies the number of LRC errors in this statistics interval on the link.</p> <p>This statistic usually indicates a data corruption problem somewhere in the network.</p>
frmRxmt	<p>This field specifies the number of times in this statistics interval on the link, that a frame had to be retransmitted due to frames being rejected or timeouts.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end.</p>
modemChanges	<p>This field specifies the number of modem status changes in this statistics interval on the link.</p> <p>This statistic usually indicates a problem with the PI, the facility or the remote end; an unterminated EIA cable plugged into the PI may also cause excessive modem status changes.</p>
protocolErr	<p>This field specifies the number of link protocol errors in this statistics interval on the link.</p> <p>This statistic, if coupled with other statistics errors, can indicate a problem on the hardware for the link. Otherwise, it indicates a problem with the remote end, where the protocol has not been implemented properly.</p>

ifrmSnt	This field specifies the number of I-frames send to the link. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmRcv	This field specifies the number of I-frames received from the link. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
rrSnt	This field specifies the number of LAP-B Level 2 RRs sent to the link in this statistics interval.
rrRcv	This field specifies the number of LAP-B Level 2 RRs received from the link in this statistics interval.
rnrSnt	This field specifies the number of LAP-B Level 2 RNRs sent to the link in this statistics interval.
rnrRcv	This field specifies the number of LAP-B Level 2 RNRs received from the link in this statistics interval.
rejSnt	This field specifies the number of LAP-B Level 2 REJs sent to the link in this statistics interval.
rejRcv	This field specifies the number of LAP-B Level 2 REJs received from the link in this statistics interval.
frmrSnt	This field specifies the number of LAP-B Level 2 FREJs sent to the link in this statistics interval.
frmrRcv	This field specifies the number of LAP-B Level 2 FREJs received from the link in this statistics interval.
frmSsqSnt	This field specifies the statistical sum of squares, for the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.

frmSsqRcv	This field specifies the statistical sum of squares, for the number of bytes in I-frames received from the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmBytesSnt	This field specifies the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmBytesRcv	This field specifies the number of bytes in I-frames received from the link in this statistics interval. I-frames include all inter-network packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
x21DiSuc	Number of successful X.25/X.21 dial-in call attempts (level 1 established). Not meaningful for SLP.
x21DiInc	Number of incomplete X.25/X.21 dial-in call attempts (call cleared before level 1 established). Not meaningful for SLP.
x21DiErr	Number of incomplete X.25/X.21 dial-in call attempts aborted by an X.21 protocol violation (level 1 not established). Not meaningful for SLP.
x21DoSuc	Number of successful X.25/X.21 dial-out call attempts (level 1 established). Not meaningful for SLP.
x21DoInc	Number of incomplete X.25/X.21 dial-out call attempts (call cleared before level 1 established). Not meaningful for SLP.
x21DoErr	Number of incomplete X.25/X.21 dial-out call attempts aborted by an X.21 protocol violation (level 1 not established). Not meaningful for SLP.

x21ClrErr	Number of successful X.25/X.21 call attempts (both dial-in and dial-out) that encountered an X.21 protocol violation during disconnection. Not meaningful for SLP.
x21ParityErr	Number of X21 parity errors. Applicable only if port is an X.21 one.
frmBytesSnt	The number of bytes including the frame overhead sent to the link in this statistics interval.
frmBytesRcv	The number of bytes including the frame overhead received from the link in this statistics interval.
linkSpeed	This field specifies the speed of the link. For speeds below 32 kbytes/sec (=256 kbits/sec) linkspeed is specified in bytes per second, is a decimal value, and has bit 16 set to 0. For speeds 32 kbytes/sec, or more, linkspeed is specified in kbytes per second, is a decimal value, and has bit 16 set to 1.

X75MLAgentG32 (subtype 71)

Table 80
X.75 ML (G32) statistics (subtype 71)

Field	Type
version	integer
service	integer
type	integer
gtyld	integer
modType	integer
lclRid	integer
lclMid	integer
anid	integer
maxCalls	integer
locValAttempts	integer
locValFailures	integer
locXlatAttempts	integer
locXlatFailures	integer
locRcValAttempts	integer
locRcValFailures	integer
remValAttempts	integer
remValFailures	integer
remXlatAttempts	integer
remXlatFailures	integer
remRcValAttempts	integer
remRcValFailures	integer
maxOutPktsQueued	integer
maxInPktsQueued	integer
lostPktsOut	integer
(Sheet 1 of 2)	

Table 80 (continued)
X.75 ML (G32) statistics (subtype 71)

Field	Type
lostPktsIn	integer
duplicPkts	integer
discPkts	integer
mlReset	integer
slpRxmtPkts	integer
pktsSnt	integer
pktsRcv	integer
badPktSize	integer
mlProtocolErr	integer
callReqSnt	integer
callReqRcv	integer
callConnSnt	integer
callConnRcv	integer
dataPktsSnt	integer
dataPktsRcv	integer
dataBytesSnt	integer
dataBytesRcv	integer
linkId	string
(Sheet 2 of 2)	

Note: If this statistics record is generated from an X.75 single link within an X.75 gateway offering multilink service, (that is, the TYPE field is set to 2), then these fields contain a value of 0, and are not relevant. The multilink agent, which also produces its own statistics record, provides the information for these fields as a whole.

version	This field indicates the version number of the statistics record, currently 0.
service	This field indicates the access service that this link is running. Values: 0 - X.75
type	This statistics record is generated by the X.75 multilink agent in an X.75 gateway offering multilink service, as identified by this field. Values: 1 - X.75 gateway multilink service
gtyld	<p>This field indicates the unique (network wide) gateway ID that identifies the X.75 gateway.</p> <p>An X.75 gateway offering multilink service, generates several statistics records. Each single link within the multilink group generates an X.75 port statistics record. The multilink agent which oversees the X.75 gateway and its single links, provides the packet layer processing which generates these statistic records, also using the unique gateway ID. The X.75 gateway offering multilink service, uses this gateway ID to correlate the various statistics records from the different components of the multilink gateway.</p>
modType	This field specifies the module type of the module on which the X.75 gateway is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.
lclRid	This field specifies the routing ID, (RID), of the module on which this link is running. If 0, then the module does not have a routing ID. (On an AM, this field is 0; on an RM, the field is set).
lclMid	This field specifies the module ID, (MID), of the module on which this X.75 link is running. If 0, then the module does not have a module ID.

anid	This field contains the adjacent network ID of the adjacent network accessed through the X.75 link. Values: 128 to 2048
maxCalls	This field indicates the maximum number of calls which were up over the X.75 gateway, during the statistics interval. Values: 0 to 1000
locValAttempts	The number of attempts made to validate a local address at this gateway.
locValFailures	The number of failed local validations made at this gateway.
locXlatAttempts	The number of attempts made to translate a local address at this gateway.
locXlatFailures	The number of failed local translation attempts made at this gateway.
locRcValAttempts	The number of attempts made to validate the presence of the reverse charge facility against the local address specified, at this gateway.
locRcValFailures	The number of failed local reverse charging validations made at this gateway.
remValAttempts	The number of attempts made to validate a remote address at this gateway.
remValFailures	The number of failed remote validations made at this gateway.
remXlatAttempts	The number of attempts made to translate a remote address at this gateway.
remXlatFailures	The number of failed remote translation attempts made at this gateway.
remRcValAttempts	The number of attempts made to validate the presence of the reverse charge facility against the remote address specified, at this gateway.
remRcValFailures	The number of failed remote reverse charging validations made at this gateway.

maxOutPktsQueued This field specifies the maximum number of multilink frames which were queued (at any given time) for output to the remote STE, due to the X.75 gateway implementing the multilink procedure.

Multilink frames include all X.75 information frames (or level 3 packets) which traverse a single link in the multilink configuration. This includes all packets on a virtual call, and on a permanent virtual circuit. It also includes all control packets such as the level 3 restart request packet, the restart confirmation packet, the multilink reset request packet, and the multilink reset confirmation packet. This field does not include supervisory and unnumbered link layer frames.

maxInPktsQueued This field specifies the maximum number of multilink frames which were queued (at any given time) on input from the remote STE, due to the X.75 gateway implementing the multilink procedure.

Multilink frames include all X.75 information frames (or level 3 packets) which traverse a single link in the multilink configuration. This includes all packets on a virtual call, and on a permanent virtual circuit. It also includes all control packets such as the level 3 restart request packet, the restart confirmation packet, the multilink reset request packet, and the multilink reset confirmation packet. This field does not include supervisory and unnumbered link layer frames.

lostPktsOut This field specifies the total number of X.75 information frames (or Level 3 packets) destined to the X.75 gateway, which were discarded or perceived to be lost since the last statistics probe.

lostPktsIn	This field specifies the total number of X.75 information frames (or Level 3 packets) received from the X.75 gateway, which were perceived to be lost since the last statistics probe.
duplicPkts	This field indicates the number of packets received from the remote end, which are duplicates of packets already received by the multilink procedure, since the last statistics probe.
discPkts	This field indicates the number of packets received from the remote STE, which are outside of the multilink received window, since the last statistics probe. This statistic may be indicative of a problem in the multilink procedure implementation at the remote STE. It may also indicate that the multilink window sizes on the local and remote STEs are not identical.
mlReset	This field specifies the total number of times that the multilink resetting procedure has been invoked since the last statistics probe.
slpRxmtPkts	This field indicates the number of packets that have been returned from a single link to the multilink procedure for retransmission over the same or a different single link since the last statistics probe. This statistic is indicative of a transmission problem on at least one of the X.75 single links within the multilink group. Examine the statistics record for the single links within the same multilink group to determine which link is problematic and diagnose the problem.

pktsSnt	<p>This field indicates the number of packets sent to the X.75 gateway. Packets include all internetwork packets, and include X.75 link specific packets such as level 3 idle probes and restarts.</p> <p>This field will closely match the sum of the IFRAMESENT fields from all of the X.75 port statistics records from each of the X.75 single links.</p>
pktsRcv	<p>This field indicates the number of packets received from the X.75 gateway. Packets include all internetwork packets, and include X.75 link specific packets such as level 3 idle probes and restarts.</p> <p>This field will closely match the sum of the IFRAMESRCVD fields from all of the X.75 port statistics records from each of the X.75 single links.</p>
badPktSize	<p>This field indicates the number of packets received from the X.75 gateway which do not contain a full multilink header.</p> <p>This statistic indicates that the remote end of the link is generating packets incorrectly.</p>
mlProtocolErr	<p>This field indicates that the multilink control field in the multilink header of the packet, received from the X.75 gateway, is formatted incorrectly.</p> <p>This statistic indicates that the remote end of the link is generating packets incorrectly.</p>
callReqSnt	The number of call request packets sent to link.
callReqRcv	The number of call request packets received from link.
callConnSnt	The number of call connect packets sent to link.
callConnRcv	The number of call connect packets received from link.
dataPktsSnt	The number of data packets sent to link.

dataPktsRcv	The number of data packets received from link.
dataBytesSnt	The number of data bytes in the data packets sent to link.
dataBytesRcv	The number of data bytes in data packets received from link.
linkId	Link identifier.

X75PortG32 (subtype 70)

Table 81
X.75 port (G32) statistics (subtype 70)

Field	Type
version	integer
service	integer
type	integer
gtyld	string
modType	integer
linkProc	integer
lclRid	integer
lclMid	integer
anid	integer
maxCalls	integer
locValAttempts	integer
locValFailures	integer
locXlatAttempts	integer
locXlatFailures	integer
locRcValAttempts	integer
locRcValFailures	integer
remValAttempts	integer

(Sheet 1 of 3)

Table 81 (continued)
X.75 port (G32) statistics (subtype 70)

Field	Type
remValFailures	integer
remXlatAttempts	integer
remXlatFailures	integer
remRcValAttempts	integer
remRcValFailures	integer
currFrmQueued	integer
lclFlowCtrl	integer
rmtFlowCtrl	integer
frmSnt	integer
frmRcv	integer
frmQueued	integer
overruns	integer
frmAbort	integer
noBuffer	integer
badFrmSize	integer
crcErr	integer
cardErr	integer
underruns	integer
lrcErr	integer
frmRxmt	integer
modemChanges	integer
protocolErr	integer
ifrmSnt	integer
ifrmRcv	integer
rrSnt	integer
(Sheet 2 of 3)	

Table 81 (continued)
X.75 port (G32) statistics (subtype 70)

Field	Type
rrRcv	integer
rnrSnt	integer
rnrRcv	integer
rejSnt	integer
rejRcv	integer
frmRnt	integer
frmRcv	integer
ifrmSsqSnt	long integer
ifrmSsqRcv	long integer
ifrmBytesSnt	long integer
ifrmBytesRcv	long integer
linkSpeed	integer
callReqSnt	integer
callReqRcv	integer
callConnSnt	integer
callConnRcv	integer
dataPktsSnt	integer
dataPktsRcv	integer
dataBytesSnt	integer
dataBytesRcv	integer
frmBytesSnt	long integer
frmBytesRcv	long integer
(Sheet 3 of 3)	

Note: If this statistics record is generated from an X.75 single link within an X.75 gateway offering multilink service, (that is, the TYPE field is set to 2), then these fields contain a value of 0, and are not relevant. The multilink agent, which also produces its own statistics record, provides the information for these fields as a whole.

version	This field indicates the version number of the statistics record, currently 0.
service	This field indicates the access service which this link is running. Values: 0 - X.75
type	<p>As this statistics record is generated both by the X.75 gateway offering single link service (directly running a LAP-B port), and by each X.75 single link within an X.75 multilink group, (each also directly running a LAP-B port), this field distinguishes between the two types of services.</p> <p>Values:</p> <ul style="list-style-type: none">•0 - X.75 gateway single link service•2 - X.75 single link within multilink group

gtyld	<p>If this statistics record is generated by an X.75 gateway offering single link service, (that is, the TYPE field is set to 0), then this field indicates the unique (network wide), gateway ID that identifies the X.75 gateway.</p> <p>If this statistics record is generated from an X.75 single link within an X.75 gateway offering multilink service, (that is, the TYPE field is set to 2), then this field also indicates the unique gateway ID identifying the X.75 multilink gateway. However, in the case of the multilink, several statistics records are generated. Each single link within the multilink group generates this statistics record. The multilink agent which oversees the X.75 gateway and its single links, provides the packet layer processing and generates a different statistics record also with this unique gateway ID. For the X.75 gateway offering multilink service, this gateway ID can be used to correlate the various statistics records from the different components of the multilink gateway.</p>
modType	<p>This field specifies the module type of the module on which this link is running. If set to 3, then the module is an AM or a DPNAC; if set to 2, then the module is an RM.</p>
linkProc	<p>This field specifies the link access procedure implemented at the link layer, as:</p> <ul style="list-style-type: none">•LAPB = 0 (LAP-B)•LAPBES = 1 (LAP-B extended, Single octet)•LAPBED = 2 (LAP-B extended, double octet)
lclRid	<p>This field specifies the routing ID, (RID), of the module on which this link is running. If 0, then the module does not have a routing ID. (On an AM, this field is 0; on an RM, this field is set.)</p>

lclMid	This field specifies the module ID, (MID), of the module on which this link is running. If 0, then the module does not have a module ID.
anid	This field contains the adjacent network ID of the adjacent network accessed through this X.75 link. Values: 128 to 2048
maxCalls	<p>If this statistics record is generated from an X.75 gateway offering single link service, (that is, the TYPE field is set to 0), then this field indicates the maximum number of calls which were up over the X.75 gateway during the statistics interval.</p> <p>If this statistics record is generated from an X.75 single link within an X.75 gateway offering multilink service, (that is, the TYPE field is set to 2), then this field contains a value of 0, and is not relevant. The multilink agent, which also produces its own statistics record, provides the maximum number of calls up over the X.75 gateway as a whole.</p> <p>Values: 0 to 1000</p>
locValAttempts	The number of attempts made to validate a local address at this gateway.
locValFailures	The number of failed local validations made at this gateway.
locXlatAttempts	The number of attempts made to translate a local address at this gateway.
locXlatFailures	The number of failed local translation attempts made at this gateway.
locRcValAttempts	The number of attempts made to validate the presence of the reverse charge facility against the local address specified, at this gateway.
locRcValFailures	The number of failed local reverse charging validation made at this gateway.

remValAttempts	The number of attempts made to validate a remote address at this gateway.
remValFailures	The number of failed remote validation made at this gateway.
remXlatAttempts	The number of attempts made to translate a remote address at this gateway.
remXlatFailures	The number of failed remote translation attempts made at this gateway.
remRcValAttempts	The number of attempts made to validate the presence of the reverse charge facility against the remote address specified, at this gateway.
remRcValFailures	The number of failed remote reverse charging validations made at this gateway.
currFrmQueued	This field specifies the number of frames queued for transmission to the link, when the statistics probe was processed by the link.
lclFlowCtrl	<p>This field specifies the time, in seconds, that the link has flow controlled the remote end.</p> <p>This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.</p>
rmtFlowCtrl	This field specifies the time, in seconds, that the link has been flow controlled by the remote end. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.
frmSnt	This field specifies the number of frames sent to the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.

frmRcv	This field specifies the number of frames received from the link. This count includes I-frames (containing internetwork packets, and link specific packets), and Level 2 control frames, such as RRs, RNRs, REJs, FREJs, SABM, UA, etc.
frmQueued	<p>This field specifies the high water mark of the number of frames queued for transmission to the link when the statistics probe was processed by the link. If the number of frames queued is greater than 255, then this field has a value of 255, or H.FF. The true count of frames queued is in the statistical counter CURRENT FRAMES QD. This statistic usually indicates that the link is overloaded, and may have to be re-engineered to handle the offered traffic.</p> <p>This field is not quite as useful as the CURRENT FRAMES QD, but it is used at the link for thresholding. The thresholds all have maximum values of 254, as there is no need in most cases, to keep counting the number of link errors after hitting the upper bound. For example, the number of modem status changes in a statistics interval is counted until a value of 254 is reached, then counting stops. In the case of frames queued, the true count of frames queued is available in the software, (provided in CURRENT FRAMES QD).</p>
overruns	This field specifies the number of overruns in this statistics interval on the link. The PE is unable to accept a character before the next character has been accepted by the SCC on the PI. This statistic usually indicates that the PE is overloaded, and should be re-engineered in order that its traffic capacity not be exceeded.

frmAbort	<p>This field specifies the number of frame aborts in this statistics interval on the link.</p> <p>This statistic usually indicates a problem at the remote end of the line (it is sending aborts), or on the facility (it is turning data on the line into aborts).</p>
noBuffer	<p>This field specifies the number of times in this statistics interval that the receive buffer, used by the interrupt handler, was insufficient to handle incoming traffic from the link.</p> <p>This statistic usually indicates that the link is overloaded, and requires re-engineering.</p>
badFrmSize	<p>This field specifies the number of frames, received in this statistics interval from the link, with a bad frame size (too long or too short). This statistic usually indicates a problem at the remote end of the line, it is sending frames of an incorrect frame size.</p>
crcErr	<p>This field specifies the number of CRC errors in this statistics interval on the link. This statistic usually indicates a data corruption problem somewhere in the network.</p>
cardErr	<p>This field specifies the number of line errors in this statistics interval. This statistic usually indicates a problem on the SCC on the PI.</p>
underruns	<p>This field specifies the number of underruns in this statistics interval on the link, (the interrupt handler is unable to give the next character to the SCC in time). This statistic usually indicates that the PE is overloaded, and should be re-engineered so that its traffic capacity is not exceeded.</p>
lrcErr	<p>This field specifies the number of LRC errors in this statistics interval on the link. This statistic usually indicates a data corruption problem somewhere in the module.</p>

frmRxmt	This field specifies the number of times in this statistics interval on the link, that a frame had to be retransmitted due to frames being rejected or timeouts. This statistic usually indicates a problem with the PI, the facility or the remote end.
modemChanges	This field specifies the number of modem status changes in this statistics interval on the link. This statistic usually indicates a problem with the PI, the facility or the remote end; an unterminated cable plugged into the PI may also cause excessive modem status changes.
protocolErr	This field specifies the number of link protocol errors in this statistics interval on the link. This statistic, if coupled with other statistics errors, can indicate a problem on the hardware for the line. A cable plugged into the PI may also cause excessive modem status changes. Otherwise, it indicates a problem with the remote end, where the protocol has not been implemented properly.
ifrmSnt	This field specifies the number of I-frames sent to the link. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
ifrmRcv	This field specifies the number of I-frames received from the link. I-frames include all internetwork packets, and include link specific packets such as Level 3 Idle Probes, and Restarts.
rrSnt	This field specifies the number of LAP-B level 2 RRs sent to the link in this statistics interval.
rrRcv	This field specifies the number of LAP-B level 2 RRs received from the link in this statistics interval.
rnrSnt	This field specifies the number of LAP-B level 2 RNRs sent to the link in this statistics interval.

rnRcv	This field specifies the number of LAP-B level 2 RNRs received from the link in this statistics interval.
rejSnt	This field specifies the number of LAP-B level 2 REJs sent to the link in this statistics interval.
rejRcv	This field specifies the number of LAP-B level 2 REJs received from the link in this statistics interval.
frmrSnt	This field specifies the number of LAP-B level 2 FREJs sent to the link in this statistics interval.
frmrRcv	This field specifies the number of LAP-B level 2 FREJs received from the link in this statistics interval.
ifrmSsqSnt	This field specifies the statistical sum of squares, for the number of bytes in I-frames sent to the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as level 3 idle probes, and restarts.
ifrmSsqRcv	This field specifies the statistical sum of squares, for the number of bytes in I-frames received from the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as level 3 idle probes, and restarts.
ifrmBytesSnt	This field specifies the number of user bytes in I-frames sent to the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as level 3 idle probes, and restarts.
ifrmBytesRcv	The number of bytes including frame overhead received from the link in this statistics interval.
linkSpeed	This field indicates the speed of the link in bytes per second.
callReqSnt	The number of call request packets sent to link.
callReqRcv	The number of call request packets received from link.

callConnSnt	The number of call connect packets sent to link.
callConnRcv	The number of call connect packets received from link.
dataPktsSnt	The number of data packets sent to link.
dataPktsRcv	The number of data packets received from link.
dataBytesSnt	The number of data bytes in the data packets sent to link.
dataBytesRcv	The number of data bytes in data packets received from link.
frmBytesSnt	The number of bytes including frame overhead sent to the link in this statistics interval.
frmBytesRcv	This field specifies the number of user bytes in I-frames received from the link in this statistics interval. I-frames include all internetwork packets, and include link specific packets such as level 3 idle probes, and restarts.

Chapter 5

DPN alarm records

DPN alarms are generated when hardware or software malfunctions are detected or cleared. Alarms provide information on fault conditions which is sent to monitoring devices such as local consoles or Preside Multiservice Data Manager (MDM) workstations. This provides a network-wide view of occurring problems, which in turn helps to pinpoint malfunctions or abnormalities at any site in the network.

The following fields are common to all BDF DPN alarm records:

switchType: dpn

dataType: ala

dateTime: `yyyymmddTHHMMSS.ss`, where `yyyy`=year; `mm`=month; `dd`=day; `HH`=hour; `MM`=minute; `SS`=seconds; `ss`=tenths of a second

customerId: Customer Network Management Identifier assigned to network components (PEs and POs) dedicated to a Virtual Private Network

dspId: Module DSP group ID

namsId: Integers which identify AM, RM, or PM

seqNum: Sequence number assigned by the network administration and management system (NAMS) device

componentId: A component identifier describes a NAMS object. A component identifier is composed of a list of qualifiers; each with two elements—category (PE, PI, PO, CH) and a uniquely numbered name.

All other fields within BDF alarm files are controlled by the `dpn_ala.rdf` file.

Alarm output format

The alarm record fields are briefly described below. For information on interpreting alarms, see 241-1001-506 *DPN-100 Alarm Console Indications*.

Table 82
ASCII alarm output format

Field	Type
severity	enumerated
alarmType	enumerated
sourceId	integer and hexadecimal
faultCode	integer and hexadecimal
condition	string
action	enumerated
operatorData	formatted hexadecimal
expertData	formatted hexadecimal
comment	string

severity	The severity level of the alarm is: process degrade overload minor major wildcard
alarmType	<p>This field specifies how this alarm interacts with any active alarm list that this alarm might be directed to. Values are:</p> <p>set clear message</p> <p>A clear removes a set alarm in an active alarm list. The alarm is removed if the following fields match the clear alarm: Severity, Condition number, Action Code, NCS-NAMS Component Identifier. A generalized clear operation is achieved by a “wild card” value in the fields of an alarm clear. This excludes this field from comparison when performing an alarm clear.</p> <p>The NCS-NAMS Component Identifier if not completely specified in the clear alarm removes alarms that match the component as far as specified. Any alarms in the active alarm list with components that match the clear to this point but have been further specified are cleared.</p>
sourceId	Use as index into 241-1001-506 <i>DPN-100 Alarm Console Indications</i> .
faultCode	Use as index into 241-1001-506 <i>DPN-100 Alarm Console Indications</i> .
condition	The condition of the alarm in ASCII.

action	This code indicates what category of action this alarm requires. Values are: serviceData hardwareFault softwareFault securityViolation protocolViolation debugInfo network engineering operation wildcard
operatorData	Extra data that would be useful to the operator.
expertData	Extra data that would be useful to an expert at an STC. Trap data could go here.
comment	This is the ASCII text that is generated by the module for the module's local operator.

Note: Alarm comment and condition field use the BDF escape sequence.

Chapter 6

DPN operator command logs

Each operator command (local or remote) that is issued to a node or module in the network is logged and transferred to a Management Data Provider (MDP). The log records are also displayed on the selected NCS consoles or on the Preside MDM log display tool .

The following fields are common to all BDF DPN log records:

switchType: dpn

dataType: log

dateTime: *yyyymmDDTHHMMSS.ss*, where *yyyy*=year; *mm*=month; *DD*=day; *HH*=hour; *MM*=minute; *SS*=seconds; *ss*=tenths of a second

customerId: Customer Network Management Identifier assigned to network components (PEs and POs) dedicated to a Virtual Private Network

dspId: Module DSP group ID

namsId: Integers which identify AM, RM, or PM

seqNum: Sequence number assigned by the network administration and management system (NAMS) device

All other fields within BDF log files are controlled by the `dpn_log.rdf` file.

Log record format

“Log records” (page 430) describes the log format used for operator command logs.

Table 83
Log records

Field	Type
significantData	string
otherData	string

significantData This field holds a string that indicates why this data is being logged. An example would be the transaction termination code of an operator command.

otherData This field holds the data that is to be logged. An example would be an operator command.

Note: Both *significantData* and *otherData* use the BDF escape sequence.

Chapter 7

Passport statistics, alarm, log, and scn data

The Management Data Provider (MDP) converts Passport statistics, alarm, log, and state change notification (scn) data to bulk data format (BDF) and stores the converted data in the directory `/opt/MagellanMDP/data/mdp/dump/<data_type>`. The converted data files are then transferred to a customer host.

For a general description of how Passport spool data is collected, see 241-6001-309 *Preside MDM Management Data Provider User Guide*.

Passport 6000

For a list of documents, see 241-6401-001 *Passport 6400 Documentation Guide*.

Passport 7000/15000

For a list of documents, see 241-5701-001 *Passport 7400, 15000, 20000 Documentation Guide*.

The following topics are discussed in this section:

- “Passport components” (page 432) provides an overview of Passport component definitions.
- “Statistics data” (page 433) describes Passport statistical records.
- “Alarm data” (page 636) describes the purpose of Passport alarms.
- “Log data” (page 636) describes the purpose of Passport logs.
- “SCN data” (page 638) describes the purpose of Passport state change notifications (SCNs) and describes the fields reported by MDP.

Passport components

Since all Passport data refers to Passport components, this section gives a brief overview of Passport component definitions.

Passport components are manageable entities which control Passport software, hardware capabilities, and access services. Passport components are defined in terms of:

- “Components and subcomponents” (page 432)
- “Type” (page 432)
- “Instance” (page 432)
- “Name” (page 432)
- “Verbs” (page 433)
- “Attributes” (page 433)
- “Groups” (page 433)

Components and subcomponents

Components and subcomponents have the same properties, "sub" indicates the component's relative position within a component hierarchy. In some cases, components may have an operational influence over their respective parent and subcomponents.

Type

A component type refers to a specific type of component.

Instance

When more than one of a component type exists, they are differentiated by an instance value. The instance value is information (such as a decimal or a string) appended to the component type. The component instance is separated from the type by a slash (/). When only one instance of a component exists on the node, the component is identified by its type; that is, without a slash and instance value.

Name

The component name combines the component type with the instance. Every component has a name. A component name is constructed by the concatenation of several component/instance pairs.

Verbs

Verbs are commands applied to Passport components. Commands carry out tasks necessary to provision, maintain and operate a Passport node. Verbs are the action portion of the command.

Within Passport, there are a number of verbs which can be issued against all components. These are called common verbs and are described in the Passport documents. In addition to common commands, there commands that are specific to particular subsystems and their components, see the Passport documents.

Attributes

Components have attributes that define the behavior or informational aspects associated with a specific component. Components can have both operational and provisionable attributes. Component:

- **operational attributes**—provide information or data used for monitoring the operation of Passport and its services. The values of operational attributes are not retained across system restarts.
- **provisionable attribute**—values can be configured by the network operator or administrator so that Passport subsystems or services perform or behave in a certain manner. All components which are provisioned are saved across system restarts. Some components with provisionable attributes are mandatory and are created automatically by their parent.

Groups

The attributes of a component are divided into one or more groups whose members share similar characteristics. The characteristics that may be shared could include operating characteristics, or will define whether the attribute is operational or provisionable.

Statistics data

Passport statistics data is used for mid- to long-term planning and network engineering. On a Passport node, statistics data is available from the spooled data files, only. When statistics data is required, its agent queue size must be set to a non-zero value and its spooling option set to on.

For more information on collecting Passport statistics, including the collection intervals, see the Passport documents.

You can obtain extensive descriptions of each statistic by using the *componentName* and the associated attribute to lookup this statistic in the appropriate Passport document.

The fields and their sequence within the bulk data format (BDF) Passport statistics file are controlled by record description files (RDFs).

The following tables describe those Passport statistics that can be collected for each statistics collection interval.

The following tables are partitioned by the common statistics generated (for example, each service for the *trunk* component):

- “All Passport statistics records” (page 438)
- “Trunk/PORS statistics” (page 439)
- “Trunk/VNS statistics” (page 440)
- “Trunk/DPNGateway statistics” (page 442)
- “Trunk/DPRS statistics” (page 443)
- “Trunk/ATM statistics” (page 444)
- “AtmEp AAL2 SVC statistics” (page 448)
- “LP statistics” (page 451)
- “Port/Framer statistics” (page 453)
- “VoiceRoute statistics” (page 453)
- “VoiceSubRoute, SignallingChannel, and CAS statistics” (page 454)
- “VoiceSubRoute and SignallingChannel statistics” (page 454)
- “VoiceSubRoute statistics” (page 455)
- “SignallingChannel statistics” (page 457)
- “CAS statistics” (page 457)
- “VoiceNet statistics” (page 458)
- “DataShunt statistics” (page 459)
- “TimeChange statistics” (page 460)

- “McsMgr statistics” (page 461)
- “ATM Port statistics” (page 463)
- “PCU PCM link and PCU BVC statistics” (page 469)
- “PCU LAPD Signaling statistics” (page 471)
- “PCU cell statistics” (page 472)
- “PCU BVC statistics” (page 477)
- “PCU TDMA statistics” (page 480)
- “PCU CCCH statistics” (page 486)
- “PCU PBlock statistics” (page 489)
- “GPRS BSS Virtual Connection (BVC) statistics” (page 490)
- “GPRS GTL NSE, PTP BVC, NS-VC, and SIG BVC statistics” (page 491)
- “GPRS PTP BVC and SIG BVC statistics” (page 493)
- “GPRS PTP BSS Virtual Connection (BVC) statistics” (page 494)
- “GPRS/UMTS Map Client statistics” (page 494)
- “GPRS Mobility Management (GMM) statistics” (page 510)
- “GPRS Mobility Management (GMM) attach rejects statistics” (page 516)
- “GPRS Mobility Management (GMM) attach rejects per cell statistics” (page 519)
- “GPRS Session Management (SM) Packet Data Protocol (PDP) statistics” (page 523)
- “GPRS Home Location Register (HLR) Cache statistics” (page 527)
- “GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures statistics” (page 528)
- “GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures per cell statistics” (page 532)
- “GPRS Logical Link Context (LLC) statistics” (page 536)
- “GPRS Sndcp statistics” (page 537)

- “GPRS (Serving GPRS) SG Network Service Virtual Connections (NS-VC) statistics” (page 538)
- “GPRS Network initialized deactivations of PDP contexts statistics” (page 539)
- “GPRS Packet Control Units (PCU) Network Service Virtual Connections (NS-VC) and PCU Network Service Entity (NSE) statistics” (page 540)
- “GPRS Packet Control Units (PCU) Network Service Virtual Connections (NS-VC) statistics” (page 541)
- “GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSms) statistics” (page 541)
- “GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSms) Service Control Point (SCP) statistics” (page 544)
- “GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics” (page 550)
- “GPRS SGSN Accounting Server (SAS) statistics” (page 569)
- “SGSN Tiered Subscription Service statistics” (page 576)
- “GPRS Session Management statistics” (page 578)
- “Wireless Gateway Circuit Switched (CS) domain statistics” (page 578)
- “SS7 MTP 3 linkset statistics” (page 582)
- “SS7 SAAL-NNI statistics” (page 582)
- “SS7 Signalling Connection Control Part (SCCP) statistics” (page 583)
- “GPRS Mobility Management (GMM) for UMTS statistics” (page 585)
- “UMTS GPRS Tunneling Protocol statistics” (page 590)
- “UMTS GPRS Tunneling Protocol Management statistics” (page 591)
- “GPRS Tunneling Protocol statistics” (page 593)
- “UMTS Home Location Register (HLR) Cache statistics” (page 594)
- “UMTS RAB assignment request failure statistics” (page 596)
- “UMTS RANAP protocol layer message statistics” (page 597)

- “UMTS Session Management (SM) statistics” (page 598)
- “UMTS Session Management message (SM) failure statistics” (page 600)
- “UMTS Subscriber Data Path statistics” (page 601)
- “Virtual Media Gateway interface statistics” (page 603)
- “UMTS Mobile Application Part (MAP) Stack statistics” (page 605)
- “UMTS Traffic Class Service statistics” (page 607)
- “UMTS Traffic Class Differentiated Service statistics” (page 609)
- “SS7 NSTA VGS BRAG MTP2 statistics” (page 609)
- “SS7 MTP3 linkset PDU statistics” (page 610)
- “BCN statistics” (page 612)
- “PCS test statistics specific to a Logical Processor (LP)” (page 617)
- “Mobile Subscriber Purge functionality on the (UMTS) Serving GPRS Support Node (USGSN or SGSN) statistics” (page 619)
- “Overload controls on the Gsc and Usc components statistics” (page 622)
- “Overload controls statistics” (page 623)
- “Session Management (SM) for Packet Data Protocol (PDP) context modification statistics” (page 623)
- “Location Services (Lcs) statistics” (page 625)
- “GPRS Subscriber Control Local Services statistics” (page 629)
- “Virtual Media Gateway (VMG) statistics” (page 630)
- “UMTS Session Management for Packet Data Protocol (PDP) context modification statistics” (page 631)
- “UMTS Location Services (Lcs) statistics” (page 632)
- “IP Round Trip Delay (RTD) statistics” (page 633)
- “Dummy test statistics” (page 635)

Table 84
All Passport statistics records

Field name	Field type	Default field position	Field value	Field description
switchType	str	001	pp	The type of switch that generated this record.
dataType	str	002	sta or sta_DMId_RDFv	Identifies this record as being a statistics record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
componentName	str	003		This field identifies the Passport component type and location for which this statistical record was generated.
timeOfRecord	time	004		This field identifies the date and time that this record was produced on switch. It is in the format YYYYMMDDThhmmss, where: YYYY indicates the year, MM is for the month, DD is for the day, T indicates the beginning of the time data, hh is for the hour, mm is for the minute, and ss is for the seconds. May also contain a format of YYYYMMDDThhmmss.iiiiii, where: iiiiiii is for the microseconds.
customerIdentifier	int	005		This field identifies the switch customer.

Table 85
Trunk/PORS statistics

Field name	Field type	Default field position	Field value	Field description
porsNormPktFromlf	L_int			The number of normal priority packets received on the PORS Trunk normal priority queue.
porsNormDiscUnforwardFromlf	L_int			The number of normal priority packets discarded from the PORS Trunk normal priority queue.
porsNormOctetFromlf	L_int			The number of normal priority bytes received on the PORS Trunk normal priority queue.
porsIntPktFromlf	L_int			The number of interrupting priority packets received on the PORS Trunk interrupting priority queue.
porsIntDiscUnforwardFromlf	L_int			The number of interrupting priority packets discarded from the PORS Trunk interrupting priority queue.
porsIntOctetFromlf	L_int			The number of interrupting priority bytes received on the PORS Trunk interrupting priority queue.
porsPktFromlfByPrio	array			The total number of PORS packets received by the Trunk in the last statistics collection interval. It is an array indexed by the emission priorities (ep0, ep1 and ep2) and discard priorities (dp0, dp1, dp2 and dp3) of the packets. The highest emission priority is ep0 and the least discardable priority is dp0.
(Sheet 1 of 2)				

Table 85 (continued)
Trunk/PORS statistics

Field name	Field type	Default field position	Field value	Field description
porsDiscPktFromlfByPrio	array			The total number of PORS packets received and discarded by the Trunk in the last statistics collection interval. It is an array indexed by the emission priorities (ep0, ep1 and ep2) and discard priorities (dp0, dp1, dp2 and dp3) of the packets. The highest emission priority is ep0 and the least discardable priority is dp0.
porsOctetFromlfByPrio	array			The total number of PORS octets received by the Trunk in the last statistics collection interval. It is an array indexed by the emission priorities (ep0, ep1 and ep2) and discard priorities (dp0, dp1, dp2 and dp3) of the packets. The highest emission priority is ep0 and the least discardable priority is dp0.
(Sheet 2 of 2)				

Table 86
Trunk/VNS statistics

Field name	Field type	Default field position	Field value	Field description
vnsPktFromlf	L_int			The number of virtual networking system packets received.
vnsDiscUnforwardFromlf	L_int			The number of virtual networking system packets discarded.
(Sheet 1 of 2)				

Table 86 (continued)
Trunk/VNS statistics

Field name	Field type	Default field position	Field value	Field description
vnsOctetFromIf	L_int			The number of virtual networking system bytes received.
vnsPktFromIfByPrio	array			The total number of VNS packets of each discard priority received on each of the Trunk's three priority queues. It is a 3x4 array based on three emission priorities (EP0, EP1, EP2) and four discard priorities (DP0, DP1, DP2, DP3).
vnsDiscPktFromIfByPrio	array			The total number of VNS packets of each discard priority received on each of the Trunk's three priority queues and discarded. It is a 3x4 array based on three emission priorities (EP0, EP1, EP2) and four discard priorities (DP0, DP1, DP2, DP3).
vnsOctetFromIfByPrio	array			The total number of VNS octets of each discard priority received on each of the Trunk's three priority queues. It is a 3x4 array based on three emission priorities (EP0, EP1, EP2) and four discard priorities (DP0, DP1, DP2, DP3).
(Sheet 2 of 2)				

Table 87
Trunk/DPNGateway statistics

Field name	Field type	Default field position	Field value	Field description
remoteComponentName	str			The remote end's component name.
measuredSpeedTolFMax	L_int			The maximum measured transmit speed (bit/s) of the link.
measuredSpeedTolFMin	L_int			The minimum measured transmit speed (bit/s) of the link.
measuredSpeedTolF Current	L_int			The current measured transmit speed (bit/s) of the link.
measuredRoundTripDelay Max	int			The maximum measured Round Trip Delay (ms).
measuredRoundTripDelay Min	int			The minimum measured Round Trip Delay (ms).
measuredRoundTripDelay Current	int			The current measured Round Trip Delay (ms).
fwdPktFromlf	L_int			The number of forwarding packets received.
fwdDiscUnforwardFromlf	L_int			The number of forwarding packets discarded.
fwdOctetFromlf	L_int			The number of forwarding bytes received.

Table 88
Trunk/DPRS statistics

Field name	Field type	Default field position	Field value	Field description
dprsPktFromlfByPrio	array			The total number of DPRS packets of each discard priority received on each of the Trunk's three priority queues. It is a 3x4 array based on three emission priorities (EP0, EP1, EP2) and four discard priorities (DP0, DP1, DP2, DP3).
dprsDiscPktFromlfByPrio	array			The total number of DPRS packets of each discard priority received on each of the Trunk's three priority queues and discarded. It is a 3x4 array based on three emission priorities (EP0, EP1, EP2) and four discard priorities (DP0, DP1, DP2, DP3)
dprsOctetFromlfByPrio	array			The total number of DPRS octets of each discard priority received on each of the Trunk's three priority queues. It is a 3x4 array based on three emission priorities (EP0, EP1, EP2) and four discard priorities (DP0, DP1, DP2, DP3)

Table 89
Trunk/ATM statistics

Field name	Field type	Default field position	Field value	Field description
interfaceName	str			The component name of the ATM Layer 2 AAI5 interface that the <i>AtmAccesscomponent</i> uses.
txCell	L_int			The total number of cells that have been transmitted to the interface on the Vcc in the last collection interval.
txCellClp	L_int			The total number of cells that have been transmitted to the interface on the Vcc with the CLP=1 in the last collection interval.
txDiscard	L_int			The total number of cells or frames, received from the bus on the Vcc, that have been discarded due to congestion or when the Vcc's interface is disabled in the last collection interval.
txDiscardClp	L_int			The total number of cells or frames, received from the bus on the Vcc, with the CLP=1, that have been discarded due to congestion or when the Vcc's interface is disabled in the last collection interval.
rxCell	L_int			The total number of cells that have been received from the interface on the Vcc in the last collection interval.
rxCellClp	L_int			The total number of cells that have been received from interface on the Vcc, with the CLP=1, in the last collection interval.
(Sheet 1 of 5)				

Table 89 (continued)
Trunk/ATM statistics

Field name	Field type	Default field position	Field value	Field description
rxDiscard	L_int			The total number of received cells or frames from the interface on the Vcc that have been discarded due to congestion, non-conformance with UPC, or AAL reassembly problems in the last collection interval.
rxDiscardClp	L_int			The total number of received cells or frames from the interface on the Vcc, with the CLP=1, that have been discarded due to congestion, non-conformance with UPC, or AAL reassembly problems in the last collection interval.
txCellRateMax	L_int			The maximum transmit cell throughput rate (cells/s) in the last collection interval. It is calculated based on the transmit cell throughput rate sampled every minute in the last collection interval.
txCellRateMin	L_int			The minimum transmit cell throughput rate (cells/s) in the last collection interval. It is calculated based on the transmit cell throughput rate sampled every minute in the last collection interval.
txCellRateAvg	L_int			The average transmit cell throughput rate (cells/s) in the last collection interval. It is calculated based on the transmit cell throughput rate sampled every minute in the last collection interval.

(Sheet 2 of 5)

Table 89 (continued)
Trunk/ATM statistics

Field name	Field type	Default field position	Field value	Field description
txClpCellRateMax	L_int			The maximum transmit cell throughput rate (cells/s), with the CLP=1 (cells/s), in the last collection interval. It is calculated based on the transmit cell throughput rate, with the CLP=1, sampled every minute in the last collection interval.
txClpCellRateMin	L_int			The minimum transmit cell throughput rate, with the CLP=1 (cells/s), in the last collection interval. It is calculated based on the transmit cell throughput rate, with the CLP=1, sampled every minute in the last collection interval.
txClpCellRateAvg	L_int			The average transmit cell throughput rate, with the CLP=1 (cells/s), in the last collection interval. It is calculated based on the transmit cell throughput rate, with the CLP=1, sampled every minute in the last collection interval.
txTotalVccUtil	int			The average total Vcc utilization, expressed as a percentage, computed based on the total number of cells transmitted on the Vcc in the last collection interval.
rxCellRateMax	L_int			The maximum receive cell throughput rate (cells/s) in the last collection interval. It is calculated based on the receive cell throughput rate sampled every minute in the last collection interval.
(Sheet 3 of 5)				

Table 89 (continued)
Trunk/ATM statistics

Field name	Field type	Default field position	Field value	Field description
rxCellRateMin	L_int			The minimum receive cell throughput rate (cells/s) in the last collection interval. It is calculated based on the receive cell throughput rate sampled every minute in the last collection interval.
rxCellRateAvg	L_int			The average receive cell throughput rate (cells/s) in the last collection interval. It is calculated based on the receive cell throughput rate sampled every minute in the last collection interval.
rxClpCellRateMax	L_int			The maximum receive cell throughput rate, with the CLP=1 (cells/s), in the last collection interval. It is calculated based on the receive cell throughput rate, with the CLP=1, sampled every minute in the last collection interval.
rxClpCellRateMin	L_int			The minimum receive cell throughput rate, with the CLP=1 (cells/s), in the last collection interval. It is calculated based on the receive cell throughput rate, with the CLP=1, sampled every minute in the last collection interval.
rxClpCellRateAvg	L_int			The average receive cell throughput rate, with the CLP=1 (cells/s), in the last collection interval. It is calculated based on the receive cell throughput rate, with the CLP=1, sampled every minute in the last collection interval.

(Sheet 4 of 5)

Table 89 (continued)
Trunk/ATM statistics

Field name	Field type	Default field position	Field value	Field description
rxTotalVccUtil	int			The average total Vcc utilization, expressed as a percentage, computed based on the total number of cells received on the Vcc in the last collection interval.
(Sheet 5 of 5)				

Table 90
AtmEp AAL2 SVC statistics

Field name	Field type	Default field position	Field value	Field description
txCells	L_int			This attribute counts the cells transmitted to the AAL2 SAR function on this SVC (egress direction). The counter wraps to zero when it reaches the maximum value
txCellDiscards	L_int		0...4294967295	This attribute counts the cells discarded when transmitting (egress direction) to the AAL2 SAR function on this SVC. The counter wraps to zero when it reaches the maximum value.
rxCells	L_int			This attribute counts the cells received by the AAL2 SAR function on this SVC (ingress direction). The counter wraps to zero when it reaches the maximum value.
(Sheet 1 of 3)				

Table 90 (continued)
AtmEp AAL2 SVC statistics

Field name	Field type	Default field position	Field value	Field description
rxDiscard	L_int			The total number of received cells or frames from the interface on the Vcc that have been discarded due to congestion, non-conformance with UPC, or AAL reassembly problems in the last collection interval.
txCellDiscards	L_int		0...4294967295	This attribute counts the cells discarded when transmitting (egress direction) to the AAL2 SAR function on this SVC. The counter wraps to zero when it reaches the maximum value
txAal2Packets	L_int			This attribute counts the packets transmitted by the AAL2 SAR function toward the receiving applications. The counter wraps to zero when it exceeds the maximum value
rxAal2Packets	L_int			This attribute counts the packets received by the AAL2 SAR function from the sending applications. The counter wraps to zero when it reaches the maximum value.
(Sheet 2 of 3)				

Table 90 (continued)
AtmEp AAL2 SVC statistics

Field name	Field type	Default field position	Field value	Field description
aal2StartFieldErrors	L_int		0...4294967295	<p>This attribute counts the cells received with an AAL2 Common Part Sublayer Protocol Data Unit (CPS-PDU) Start Field error.</p> <p>A Start Field error includes a cell with a parity error or a cell in which the packet pointed to by the offset field (OSF) has a packet HEC error.</p> <p>The counter wraps to zero when it reaches the maximum value.</p>
aal2SequenceErrors	L_int		0...4294967295	<p>This attribute counts the cells received with an unexpected AAL2 Common Part Sublayer Protocol Data Unit (CPS-PDU) sequence number. The counter wraps to zero when it reaches the maximum value.</p>
numAllocatedCids	int		0...256	<p>This attribute specifies the number of CIDs currently allocated for the SVC.</p>
(Sheet 3 of 3)				

Table 91
LP statistics

Field name	Field type	Default field position	Field value	Field description
cardNumber	int			The logical processor's card number.
cardStatus	int		1 = standby 2 = active	The logical processor's card is <i>active</i> or <i>standby</i> .
cpuUtilAvg	int			An average processor utilization level.
cpuUtilAvgMin	int			The minimum processor utilization level.
cpuUtilAvgMax	int			The maximum processor utilization level.
memoryCapacity	vector decimal		0..2147483647	The processor's memory capacity (in kilobytes) for each memory type (fastRam, normalRam, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
memoryUsageAvg	vector decimal		0..2147483647	The processor's average memory utilization (in kilobytes) for each memory type (fastRam, normalRun, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
memoryUsageAvgMin	vector decimal		0..2147483647	The processor's minimum memory utilization (in kilobytes) for each memory type (fastRam, normalRun, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.

(Sheet 1 of 2)

Table 91 (continued)
LP statistics

Field name	Field type	Default field position	Field value	Field description
memoryUsageAvgMax	vector decimal		0..2147483647	The processor's maximum memory utilization (in kilobytes) for each memory type (fastRam, normalRun, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
sharedMsgBlockCapacity	int			The processor's shared message block memory capacity (in kilobytes).
sharedMsgBlockUsageAvg	int			The processor's average memory utilization (in kilobytes) of shared message blocks.
sharedMsgBlockUsageAvg Min	int			The processor's minimum memory utilization (in kilobytes) of shared message blocks.
sharedMsgBlockUsageAvg Max	int			The processor's maximum memory utilization (in kilobytes) of shared message blocks.
localMsgBlockCapacity	int			The processor's message block memory capacity (in kilobytes), for local messaging.
localMsgBlockUsageAvg	int			The processor's average memory utilization (in kilobytes) of message blocks, for local messaging.
localMsgBlockUsageMin	int			The processor's minimum memory utilization (in kilobytes) of message blocks, for local messaging.
localMsgBlockUsageMax	int			The processor's maximum memory utilization (in kilobytes) of message blocks, for local messaging.

(Sheet 2 of 2)

Table 92
Port/Framer statistics

Field name	Field type	Default field position	Field value	Field description
rxBytes	L_int			The number of bytes received on the link.
rxFrames	L_int			The number of frames received on the link.
txBytes	L_int			The number of bytes transmitted on the link.
txFrames	L_int			The number of frames transmitted on the link.
rxTotalLinkUtil	int			The average total link utilization, based on the total number of bytes received on the link.

Table 93
VoiceRoute statistics

Field name	Field type	Default field position	Field value	Field description
totalCallsFromSubnet	int			The number of calls received from the Passport subnet.
callsClearedNoChannel	int			The number of calls, from the subnet, which were rejected because all in-service channels were busy.
callsClearedOutOfService	int			The number of calls, from the subnet, which were rejected because all of the channels were out-of-service.

Table 93 (continued) (continued)
VoiceRoute statistics

Field name	Field type	Default field position	Field value	Field description
callsRejected	int			The number of calls, from the subnet, which were rejected.

Table 94
VoiceSubRoute, SignallingChannel, and CAS statistics

Field name	Field type	Default field position	Field value	Field description
peakActiveChannels	int			The maximum number of channels that have been simultaneously active.

Table 95
VoiceSubRoute and SignallingChannel statistics

Field name	Field type	Default field position	Field value	Field description
totalCallsFromIf	int			The number of calls that have been received by this VoiceSubRoute from the PBX.
peakActiveVoiceChannels	int			The maximum number of voice channels that have been simultaneously active.

Table 95 (continued)
VoiceSubRoute and SignallingChannel statistics

Field name	Field type	Default field position	Field value	Field description
peakActiveDataChannels	int			The maximum number of B-channels, carrying data, that have been simultaneously active.

Table 96
VoiceSubRoute statistics

Field name	Field type	Default field positions	Field value	Field description
totalFailedCallsFromIf	int			The number of calls that have been received by this VoiceSubRoute, from the PBX, which failed to be routed through the subnet.
invalidNumberingPlanCalls	int			The number of calls, from the interface, for which the type of number and the numbering plan identification was not associated with a known <i>DialingPlan</i> .
addressResolutionFailed Calls	int			The number of calls from the interface which had dialled numbers for which no entry existed in the <i>VoiceNetworkingCallServer</i> database.
addressIncompleteCalls	int			The number of calls from the interface which had dialled numbers with insufficient digits to identify a unique entry in the <i>VoiceNetworkingCallServer</i> database.
(Sheet 1 of 2)				

Table 96 (continued)
VoiceSubRoute statistics

Field name	Field type	Default field positions	Field value	Field description
pathAttributesNotMetCalls	int			The number of calls from the interface for which a path to the far end could not be established based on the attributes specified in the <i>VoiceProfile</i> .
pathSetupTimeOutCalls	int			The number of calls from the interface for which a path to the far end could not be established <i>due to a subnet path setup time-out</i> .
callsRejectedLocally	int			The number of calls, from the subnet, which were rejected by the originating end.
callsRejectedByFarEnd	int			The number of calls, from the subnet, which were rejected by the far end.
peakActiveModem Channels	int			The maximum number of B-channels, on which a 2100Hz tone was detected, that have been simultaneously active.
peakActiveFaxRelay Channels	int			The maximum number of B-channels, carrying fax relay calls, that have been simultaneously active.
totalCalls	vector decimal		0..65535	The number of call attempts processed on this channel (both directions).
totalCallSeconds	vector decimal		0..65535	The number of seconds spent handling a call.
voiceRouteInstance	int			The value of the <i>VoiceRoute</i> linked to this <i>VoiceSubRoute</i> .
(Sheet 2 of 2)				

Table 97
SignallingChannel statistics

Field name	Field type	Default field position	Field value	Field description
totalCallsTolf	int			The number of calls made to the link interface.
nonCallAssocSessionsTolf	int			The number of non-call associated sessions to the link interface.
nonCallAssocSessionsFromlf	int			The number of non-call associated sessions from the link interface.
frmTolf	L_int			The number of frames transmitted to the link interface.
frmFromlf	L_int			The number of frames received from the link interface.
octetFromlf	L_int			The number of bytes received from the link interface.
octetTolf	L_int			The number of bytes transmitted to the link interface.

Table 98
CAS statistics

Field name	Field type	Default field position	Field value	Field description
totalCallsOutgoing	int			The number of outgoing node call attempts made to this link.
totalCallsIncoming	int			The number of incoming link call attempts made to this node.
(Sheet 1 of 2)				

Table 98 (continued)
CAS statistics

Field name	Field type	Default field position	Field value	Field description
seizeFailures	int			The number of outgoing node call attempts to this link for which the link failed to respond correctly upon receiving a seize signal.
releaseFailures	int			The number of times that the link failed to respond correctly during the disconnect sequence of a call.
outgoingAnsweredCalls	int			The number of outgoing node calls to this link that were answered by the link.
incomingAnsweredCalls	int			The number of incoming link calls that were answered by this node.
(Sheet 2 of 2)				

Table 99
VoiceNet statistics

Field name	Field type	Default field position	Field value	Field description
totalTranslations	int			The total number of translations requests received.
completeTranslations	vector decimal		0..65535	The number of completed translations handled under each <i>DiallingPlan</i> component.
incompleteTranslations	vector decimal		0..65535	The number of incomplete translations handled under each <i>DiallingPlan</i> component.
failedTranslations	vector decimal		0..65535	The number of failed translations handled under each <i>DiallingPlan</i> component.

Table 99 (continued)
VoiceNet statistics

Field name	Field type	Default field position	Field value	Field description
usageCount	vector decimal		0..65535	The number of times each <i>VoiceProfile</i> is accessed to set up a connection.

Table 100
DataShunt statistics

Field name	Field type	Default field position	Field value	Field description
serviceCategory	int			The ATM service category of the transport connection.
pktFromMcs	vector decimal			The number of packets received on the Data Shunt for each discard priority (dp0 dp1 dp2 dp3).
octetsFromMcs	vector decimal			The number of octets received on the Data Shunt for each discard priority (dp0 dp1 dp2 dp3).
pktDiscCongestedFromMcs	vector decimal			The number of packets received on the Data Shunt for each discard priority (dp0 dp1 dp2) that have been discarded at the transport card due to free list congestion at the access card.
pktDiscErroredFromMcs	L_int			The number of packets received on the Data Shunt that have been discarded.

Table 101
TimeChange statistics

Field name	Field type	Default field position	Field value	Field description
oldDateTime	time		yyymmddT hhmmss	The old date/time immediately prior to the time change.
newDateTime	time		yyymmddT hhmmss	The new date/time immediately after the time change.

Table 102
McsMgr statistics

Field name	Field type	Default field position	Field value	Field description
bandwidthHWM	int			The high-water mark bandwidth (in bits/sec) at which the transport connection agrees to transfer data during the last statistics collection interval. The value for this attribute is equal to the provisioned bandwidth when the connection is up, and is 0 when the transport connection is down. This attribute, when combined with <i>bandwidthLWM</i> , can also be used to indicate a transport connection outage occurrence.
bandwidthLWM	int			The low-water mark bandwidth (in bits/sec) at which the transport connection agrees to transfer data during the last statistics collection interval. The value for this attribute is equal to the provisioned bandwidth when the connection is up, and is 0 when the transport connection is down. This attribute, when combined with <i>bandwidthHWM</i> , can also be used to indicate a transport connection outage occurrence.
(Sheet 1 of 2)				

Table 102 (continued)
McsMgr statistics

Field name	Field type	Default field position	Field value	Field description
effectiveBandwidth	L_int			The level of effective bandwidth available during the last statistics collection interval, as indicated by the effectiveBandwidth attribute of the McsMgr DprsMcsEpG/m EndPoint/n Cac component. This value is expressed in thousands of bits per second.
effectiveBandwidth AvailableLWM	L_int			The lowest level of effective bandwidth available during the last statistics collection interval, as indicated by the effective BandwidthAvailable attribute of the McsMgr DprsMcsEp/m EndPoint/n Cac component. This value is expressed in thousands of bits per second.
numberOfCallsActiveHWM	int			The highest level of the numberOfCallsActive attribute of the McsMgr DprsMcsEp/m EndPoint/n Cac component during the last statistics collection interval.
numberOfCacFailures	L_int			The number of call admission failures during the last statistics collection interval. This value equals the increase in the numberOfCacFailures attribute of the McsMgr DprsMcsEp/m EndPoint/n Cac component during the last statistics collection interval.

(Sheet 2 of 2)

Table 103
ATM Port statistics

Field name	Field type	Default field position	Field value	Field description
remoteInstance	string			The name of the remote ATM interface instance.
provRate	L_int			The provisioned link rate for this ATM interface component in cells per second.
actualRate	L_int			The actual bandwidth for this ATM interface component in cells per second. When no errors occur the value of this field is equal to the provRate. When the link (or IMA group) is down for the entire collection interval, the value of this field is the average bandwidth.
txUtilization	int			The average transmit link utilization during the collection interval, expressed as a percentage of the provisioned maximum.
rxUtilization	int			The average receive link utilization during the collection interval, expressed as a percentage of the provisioned maximum.
txMaxCellRate	L_int			The transmit cell rate (CLP=0+1) during the busiest minute of the collection interval, in cells per second.
txMinCellRate	L_int			The transmit cell rate (CLP=0+1) during the least busy minute of the collection interval, in cells per second.
(Sheet 1 of 6)				

Table 103 (continued)
ATM Port statistics

Field name	Field type	Default field position	Field value	Field description
txAvgCellRate	L_int			The average transmit cell rate (CLP=0+1) during the collection interval, in cells per second.
rxMaxCellRate	L_int			The receive cell rate (CLP=0+1) during the busiest minute of the collection interval, in cells per second.
rxMinCellRate	L_int			The receive cell rate (CLP=0+1) during the least busy minute of the collection interval, in cells per second.
rxAvgCellRate	L_int			The average receive cell rate (CLP=0+1) during the collection interval, in cells per second.
txMaxCellRateClp	L_int			The transmit cell rate (CLP=1) during the busiest minute of the collection interval, in cells per second.
txMinCellRateClp	L_int			The transmit cell rate (CLP=1) during the least busy minute of the collection interval, in cells per second.
txAvgCellRateClp	L_int			The average transmit cell rate (CLP=1) during the collection interval, in cells per second.
rxMaxCellRateClp	L_int			The receive cell rate (CLP=1) during the busiest minute of the collection interval, in cells per second.
rxMinCellRateClp	L_int			The receive cell rate (CLP=1) during the least busy minute of the collection interval, in cells per second.
(Sheet 2 of 6)				

Table 103 (continued)
ATM Port statistics

Field name	Field type	Default field position	Field value	Field description
rxAvgCellRateClp	L_int			The average receive cell rate (CLP=1) during the collection interval, in cells per second.
txCellDiscards	L_int			The number of transmit discarded cells (CLP=0+1).
rxCellDiscards	L_int			The number of receive discarded cells (CLP=0+1).
txFrameDiscards	L_int			The number of transmit discarded frames (CLP=0+1).
rxFrameDiscards	L_int			The number of receive discarded frames (CLP=0+1).
txCellDiscardsClp	L_int			The number of transmit discarded cells (CLP=1).
rxCellDiscardsClp	L_int			The number of receive discarded cells (CLP=1).
txFrameDiscardsClp	L_int			The number of transmit discarded frames (CLP=1).
rxFrameDiscardsClp	L_int			The number of receive discarded frames (CLP=1).
txMaxCellRateByService Cat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The transmit cell rate (CLP=0+1) during the busiest minute of the collection interval, in cells per second, by service category.
txMinCellRateByService Cat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The transmit cell rate (CLP=0+1) during the least busy minute of the collection interval, in cells per second, by service category.
txAvgCellRateByService Cat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The average transmit cell rate (CLP=0+1) during the collection interval, in cells per second, by service category.

(Sheet 3 of 6)

Table 103 (continued)
ATM Port statistics

Field name	Field type	Default field position	Field value	Field description
rxMaxCellRateByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The receive cell rate (CLP=0+1) during the busiest minute of the collection interval, in cells per second, by service category.
rxMinCellRateByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The receive cell rate (CLP=0+1) during the least busy minute of the collection interval, in cells per second, by service category.
rxAvgCellRateByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The average receive cell rate (CLP=0+1) during the collection interval, in cells per second, by service category.
txMaxCellRateClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The transmit cell rate (CLP=1) during the busiest minute of the collection interval, in cells per second, by service category.
txMinCellRateClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The transmit cell rate (CLP=1) during the least busy minute of the collection interval, in cells per second, by service category.
txAvgCellRateClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The average transmit cell rate (CLP=1) during the collection interval, in cells per second, by service category.
(Sheet 4 of 6)				

Table 103 (continued)
ATM Port statistics

Field name	Field type	Default field position	Field value	Field description
rxMaxCellRateClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The receive cell rate (CLP=1) during the busiest minute of the collection interval, in cells per second, by service category.
rxMinCellRateClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The receive cell rate (CLP=1) during the least busy minute of the collection interval, in cells per second, by service category.
rxAvgCellRateClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The average receive cell rate (CLP=1) during the collection interval, in cells per second, by service category.
txCellDiscardsByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of transmit discarded cells (CLP=0+1) during the collection interval, by service category.
rxCellDiscardsByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of receive discarded cells (CLP=0+1) during the collection interval, by service category.
txFrameDiscardsByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of transmit discarded frames (CLP=0+1) during the collection interval, by service category.
(Sheet 5 of 6)				

Table 103 (continued)
ATM Port statistics

Field name	Field type	Default field position	Field value	Field description
rxFrameDiscardsByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of receive discarded frames (CLP=0+1) during the collection interval, by service category.
txCellDiscardsClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of transmit discarded cells (CLP=1) during the collection interval, by service category.
rxCellDiscardsClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of receive discarded cells (CLP=1) during the collection interval, by service category.
txFrameDiscardsClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of transmit discarded frames (CLP=1) during the collection interval, by service category.
rxFrameDiscardsClpByServiceCat	vector decimal		cbr=0 rtvbr=1 nrtvbr=2 abr=3 ubr=4	The number of receive discarded frames (CLP=1) during the collection interval, by service category.

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Table 104
PCU PCM link and PCU BVC statistics

Field name	Field type	Default field position	Field value	Field description
pduDn	L_int		0.. 4294967295	<p>If this field is included with a PCU PCM link statistics record: the number of BSSGP PDUs received from the SGSN by all the BVCs associated to this PCM link.</p> <p>If this field is included with a PCU BVC statistics record: the number of PDUs received by this BVC from the Gb interface.</p>
pduUp	L_int		0.. 4294967295	<p>If this field is included with a PCU PCM link statistics record: the number of BSSGP PDUs transmitted to the SGSN by all the BVCs associated to this PCM link.</p> <p>If this field is included with a PCU BVC statistics record: the number of PDUs sent by this BVC to the Gb interface.</p>
octetsDn	L_int		0.. 4294967295	<p>If this field is included with a PCU PCM link statistics record: the number of octets received by all the BVCs associated to this PCM link.</p> <p>If this field is included with a PCU BVC statistics record: the number of octets received by the BVC from the Gb interface.</p>
(Sheet 1 of 2)				

Table 104 (continued)
PCU PCM link and PCU BVC statistics

Field name	Field type	Default field position	Field value	Field description
octetsUp	L_int		0.. 4294967295	If this field is included with a PCU PCM link statistics record: the number of octets sent by all the BVCs associated to this PCM link. If this field is included with a PCU BVC statistics record: the number of octets sent by the BVC to the Gb interface.
psPaging	L_int		0.. 4294967295	If this field is included with a PCU PCM link statistics record: the number of BSSGP PAGING PS PDUs received from the SGSN by this PCM link.
csPaging	L_int		0.. 4294967295	If this field is included with a PCU PCM link statistics record: the number of BSSGP PAGING CS PDUs received from the SGSN by this PCM link.
dyAgprsLackOfTimeslots	L_int		0.. 4294967295	If this field is included with a PCU PCM link statistics record: the number of times that the PCU has not been able to satisfy the request sent by the most loaded cell on which there appears a lack of resources..
(Sheet 2 of 2)				

Table 105
PCU LAPD Signaling statistics

Field name	Field type	Default field position	Field value	Field description
framesLostOverflowUp	L_int		0.. 4294967295	The number of uplink frames lost due to data overrun or receive buffer overflow.
framesLostOverflowDn	L_int		0.. 4294967295	The number of downlink frames which were not sent because of buffer overflow.
errorsCRC	L_int		0.. 4294967295	The number of frames with CRC errors received.
framesLostAlignment	L_int		0.. 4294967295	The number of frames lost due to aborts or lack of alignment.
supervisoryFramesUp	L_int		0.. 4294967295	The number of supervisory frames received.
iFramesUp	L_int		0.. 4294967295	The number of I frames received.
uiFramesUp	L_int		0.. 4294967295	The number of unnumbered I frames received.
iOctetsUp	L_int		0.. 4294967295	The number of I octets received.
uiOctetsUp	L_int		0.. 4294967295	The number of unnumbered I octets received.
supervisoryFramesDn	L_int		0.. 4294967295	The number of supervisory frames transmitted.
iFramesDn	L_int		0.. 4294967295	The number of I frames transmitted.
uiFramesDn	L_int		0.. 4294967295	The number of unnumbered I frames transmitted.
iOctetsDn	L_int		0.. 4294967295	The number of I octets transmitted.
uiOctetsDn	L_int		0.. 4294967295	The number of unnumbered I octets transmitted.

(Sheet 1 of 2)

Table 105 (continued)
PCU LAPD Signaling statistics

Field name	Field type	Default field position	Field value	Field description
iFramesRetriesDn	L_int		0.. 4294967295	The number of I frames retransmitted.
(Sheet 2 of 2)				

Table 106
PCU cell statistics

Field name	Field type	Default field position	Field value	Field description
cellBVCi	int		0..65535	This field indicates the corresponding BSSGP Virtual Channel Identifier.
upMultiSlotRequests	vector decimal		0.. 4294967295 for each index (1..4)	<p>The number of multislot allocation requests received by the PCU from the mobile station.</p> <ul style="list-style-type: none"> • Index 1 counts the number of 1 timeslot allocation requests. • Index 2 counts the number of 2 timeslots allocation requests. • Index 3 counts the number of 3 timeslots allocation requests. • Index 4 counts the number of 4 or more timeslots allocation requests.
(Sheet 1 of 6)				

Table 106 (continued)
PCU cell statistics

Field name	Field type	Default field position	Field value	Field description
upMultiSlotAllocations	vector decimal		0..4294967295 for each index (1..4)	<p>The number of multislot granted allocations received by the PCU from the mobile station.</p> <ul style="list-style-type: none"> • Index 1 counts the number of 1 timeslot granted allocations. • Index 2 counts the number of 2 timeslots granted allocations. • Index 3 counts the number of 3 timeslots granted allocations. • Index 4 counts the number of 4 or more timeslots granted allocations.
dnMultiSlotRequests	vector decimal		0..4294967295 for each index (1..4)	<p>The number of multislot allocation requests received by the mobile station from the PCU.</p> <ul style="list-style-type: none"> • Index 1 counts the number of 1 timeslot allocation requests. • Index 2 counts the number of 2 timeslots allocation requests. • Index 3 counts the number of 3 timeslots allocation requests. • Index 4 counts the number of 4 or more timeslots allocation requests.
(Sheet 2 of 6)				

Table 106 (continued)
PCU cell statistics

Field name	Field type	Default field position	Field value	Field description
dnMultiSlotAllocations	vector decimal		0..4294967295 for each index (1..4)	The number of multislot granted allocations received by the mobile station from the PCU. <ul style="list-style-type: none"> • Index 1 counts the number of 1 timeslot granted allocations. • Index 2 counts the number of 2 timeslots granted allocations. • Index 3 counts the number of 3 timeslots granted allocations. • Index 4 counts the number of 4 or more timeslots granted allocations.
fullDuplexTbfEstablishment	L_int		0..4294967295	The number of full duplex TBFs established.
upTbfReleases	L_int		0..4294967295	The number of uplink TBFs released.
cumulativeTimeUpTbf	L_int		0..4294967295 units of seconds	The cumulative duration of all uplink TBFs released.
maxTimeUpTbf	L_int		0..4294967295 units of seconds	The duration of the longest TBF of all the uplink TBFs released.
allocatedBlocksUpTbf	L_int		0..4294967295	The number of blocks allocated for the uplink TBFs.
nonAckUpTbfEstablishment	L_int		0..4294967295	The number of non-acknowledged uplink TBFs established.
ackUpTbfEstablishment	L_int		0..4294967295	The number of acknowledged uplink TBFs established.

(Sheet 3 of 6)

Table 106 (continued)
PCU cell statistics

Field name	Field type	Default field position	Field value	Field description
closeEndedUpTbfEstablishment	L_int		0.. 4294967295	The number of closed-ended uplink TBFs established.
upTbfTotalSignaling	L_int		0.. 4294967295	The number of uplink TBFs bearing Mobility Management signaling or paging response.
dnTbfReleases	L_int		0.. 4294967295	The number of downlink TBFs released.
cumulativeTimeDnTbf	L_int		0.. 4294967295 units of seconds	The cumulative duration of all downlink TBFs released.
maxTimeDnTbf	L_int		0.. 4294967295 units of seconds	The duration of the longest TBF of all the downlink TBFs released.
allocatedBlocksDnTbf	L_int		0.. 4294967295	The number of blocks allocated for the downlink TBFs.
nonAckDnTbfEstablishment	L_int		0.. 4294967295	The number of non-acknowledged downlink TBFs established.
ackDnTbfEstablishment	L_int		0.. 4294967295	The number of acknowledged downlink TBFs established.
dnTbfTotalSignaling	L_int		0.. 4294967295	The number of downlink TBFs bearing Mobility Management signaling or paging response.
dyAgprsNbModif	L_int		0.. 4294967295	The number of modifications to Agprs timeslots allocated in the cell.
dyAgprsAvgNbTimeslots	L_int		0.. 4294967295	The average number of Agprs timeslots allocated in the cell.
dyAgprsMinNbTimeslots	L_int		0.. 4294967295	The minimum number of Agprs timeslots allocated in the cell.
dyAgprsMaxNbTimeslots	L_int		0.. 4294967295	The maximum number of Agprs timeslots allocated in the cell.
(Sheet 4 of 6)				

Table 106 (continued)
PCU cell statistics

Field name	Field type	Default field position	Field value	Field description
dyAgprsAvgLoadCriterion	int		0..100	The average Agprs load criterion value.
dyAgprsMaxLoadCriterion	int		0..100	The maximum Agprs load criterion value.
dnTbfGoldSatisfactMore 90pCent	L_int		0..4294967295	The number of downlink TBFs with gold QOS that have a satisfaction rate greater or equal to 90 per cent.
dnTbfGoldSatisfactBet50 90pCent	L_int		0..4294967295	The number of downlink TBFs with gold QOS that have a satisfaction rate between 50 to 90 per cent.
dnTbfGoldSatisfactLess 50pCent	L_int		0..4294967295	The number of downlink TBFs with gold QOS that have a satisfaction rate lower than 50 per cent.
dnTbfGoldRejectedForMin Tput	L_int		0..4294967295	The number of downlink TBFs with gold QOS rejected at the establishment due to non-allocation of corresponding minimum throughput.
dnTbfSilverSatisfactMore 90pCent	L_int		0..4294967295	The number of downlink TBFs with silver QOS that have a satisfaction rate greater or equal to 90 per cent.
dnTbfSilverSatisfactBet50 90pCent	L_int		0..4294967295	The number of downlink TBFs with silver QOS that have a satisfaction rate between 50 to 90 per cent.
dnTbfSilverSatisfactLess 50pCent	L_int		0..4294967295	The number of downlink TBFs with silver QOS that have a satisfaction rate lower than 50 per cent.
dnTbfSilverRejectedForMin Tput	L_int		0..4294967295	The number of downlink TBFs with silver QOS rejected at the establishment due to non allocation of corresponding minimum throughput.

(Sheet 5 of 6)

Table 106 (continued)
PCU cell statistics

Field name	Field type	Default field position	Field value	Field description
dnTbfBronzeSatisfactMore90pCent	L_int		0..4294967295	The number of downlink TBFs with bronze QOS that have a satisfaction rate greater or equal to 90 per cent.
dnTbfBronzeSatisfactBet5090pCent	L_int		0..4294967295	The downlink TBFs with bronze QOS that have a satisfaction rate between 50 to 90 per cent.
dnTbfBronzeSatisfactLess50pCent	L_int		0..4294967295	The number of downlink TBFs with bronze QOS that have a satisfaction rate lower than 50 per cent.
dnTbfBronzeRejectedForMinTput	L_int		0..4294967295	The number of downlink TBFs with bronze QOS rejected at the establishment due to non-allocation of corresponding minimum throughput.
(Sheet 6 of 6)				

Table 107
PCU BVC statistics

Field name	Field type	Default field position	Field value	Field description
cell	int		0..65535	This field indicates the cell identity number associated with this BVC.
pduDataDn	L_int		0..4294967295	The number of UNIT-DATA PDUs received by the BVC from the Gb interface.
(Sheet 1 of 3)				

Table 107 (continued)
PCU BVC statistics

Field name	Field type	Default field position	Field value	Field description
pduDataUp	L_int		0..4294967295	The number of UNIT-DATA PDUs sent by the BVC to the Gb interface.
octetsDataDn	L_int		0..4294967295	The number of octets received by the BVC from the Gb interface in DL-UNIT-DATA PDUs.
octetsDataUp	L_int		0..4294967295	The number of octets sent by the BVC to the Gb interface in UL-UNIT-DATA PDUs.
maxSizeDataDn	L_int		0..4294967295	The maximum size of LLC frames received.
maxSizeDataUp	L_int		0..4294967295	The maximum size of LLC frames sent.
bvcBlockRequests	int		0..65535	The number of BVC-BLOCK PDUs messages sent by the BVC.
bvcUnBlockRequests	int		0..65535	The number of BVC-UNBLOCK PDUs messages sent by the BVC.
bvct1TimeOuts	int		0..65535	The number of BVC-BLOCK-ACK and BVC-UNBLOCK-ACK timers expirations.
bvcResetRequestsUp	int		0..65535	The number of BVC-RESET PDUs messages sent by a BVC.
bvcResetRequestsDn	int		0..65535	The number of BVC-RESET PDUs messages received by a BVC.
bvct2TimeOuts	int		0..65535	The number of BVC-RESET-ACK timer expirations.
bvcFlowControlRequests	int		0..65535	The number of FLOW-CONTROL-BVC PDUs sent by the BVC.
msFlowControlRequests	int		0..65535	The number of FLOW-CONTROL-MS PDUs sent by the BVC.
bvcPagingRequests	int		0..65535	The number of PAGING-REQUEST messages sent by the BVC.
(Sheet 2 of 3)				

Table 107 (continued)
PCU BVC statistics

Field name	Field type	Default field position	Field value	Field description
llcDiscardedPdu	int		0..65535	The number of LLC-DISCARDED PDUs sent by the BVC.
llcDiscardedOctets	int		0..65535	The number of octets discarded with an LLC-DISCARDED-INDICATION message sent by the BVC.
nmStatusUp	int		0..65535	The number of NM-STATUS PDUs sent by a BVC.
nmStatusDn	int		0..65535	The number of NM-STATUS PDUs received by a BVC.
msFlushLLRequest	int		0..65535	The number of FLUSH-LL PDUs relative to the BVC sent from the SGSN to the PCU.
msRadioStatusInd	int		0..65535	The number of INDICATION messages for radio exception conditions that occurred on the radio interface in the BVC.
msSuspendReq	int		0..65535	The number of SUSPEND PDUs sent by the BVC.
msRaCapabilityInd	int		0..65535	The number of RA-CAPABILITY-INDICATION PDUs received by the BVC.
msRaCapabilityUpdateReq	int		0..65535	The number of RA-CAPABILITY-UPDATE PDUs sent by the BVC.
bvct3TimeOuts	int		0..65535	The number of SUSPEND-ACK timer expirations.
bvct5TimeOuts	int		0..65535	The number of RA-CAPABILITY-UPDATE-ACK timer expirations.
msCellTransitionDn	int		0..65535	The number of FLUSH-LL PDUs that are sent by the SGSN to the PCU when the mobile station, located on a cell indicated by the BVCI, has moved to another cell indicated to the new BVCI.

(Sheet 3 of 3)

Table 108
PCU TDMA statistics

Field name	Field type	Default field position	Field value	Field description
localBusy	L_int		0.. 4294967295	The number of blocks sent with the window stalled indicator set.
remoteBusy	L_int		0.. 4294967295	The number of blocks received with the window stalled indicator set.
configuredTimeslots	L_int		0.. 4294967295	The number of configured timeslots at the end of the statistics collection interval.
cumulativeUnavailableTime slots	L_int		0.. 4294967295	The cumulative number of unavailable timeslots at the sample time. The average can be calculated by dividing this value by the nbSamples value.
maxUnavailableTimeslots	L_int		0.. 4294967295	The maximum number of unavailable timeslots at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
cumulativeUpActiveTime slots	L_int		0.. 4294967295	The cumulative number of active uplink timeslots bearing at least one TBF at the sample time. The average can be calculated by dividing this value by the nbSamples value.
(Sheet 1 of 6)				

Table 108 (continued)
PCU TDMA statistics

Field name	Field type	Default field position	Field value	Field description
maxUpActiveTimeslots	L_int		0.. 4294967295	The maximum number of active uplink timeslots bearing at least one TBF at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
cumulativeUpTbfPerTdma	L_int		0.. 4294967295	The cumulative number of uplink TBFs in the TDMA at the sample time. The average can be calculated by dividing this value by the nbSamples value.
maxUpTbfPerTdma	L_int		0.. 4294967295	The maximum number of uplink TBFs in the TDMA at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
cumulativeUpTbfPerTime slots	L_int		0.. 4294967295	The cumulative number of uplink TBFs per timeslot for all the timeslots in the TDMA at the sample time. The average can be calculated by dividing this value by the nbSamples value.
maxUpTbfPerTimeslots	L_int		0.. 4294967295	The maximum number of uplink TBFs on one timeslot at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
(Sheet 2 of 6)				

Table 108 (continued)
PCU TDMA statistics

Field name	Field type	Default field position	Field value	Field description
cumulativeDnActiveTime slots	L_int		0.. 4294967295	The cumulative number of active downlink timeslots bearing at least one TBF at the sample time. The average can be calculated by dividing this value by the nbSamples value.
maxDnActiveTimeslots	L_int		0.. 4294967295	The maximum number of active downlink timeslots bearing at least one TBF at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
cumulativeDnTbfPerTdma	L_int		0.. 4294967295	The cumulative number of downlink TBFs in the TDMA at the sample time. The average can be calculated by dividing this value by the nbSamples value.
maxDnTbfPerTdma	L_int		0.. 4294967295	The maximum number of downlink TBFs in the TDMA at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
cumulativeDnTbfPerTime slots	L_int		0.. 4294967295	The cumulative number of downlink TBFs per timeslot for all the timeslots in the TDMA at the sample time. The average can be calculated by dividing this value by the nbSamples value.
(Sheet 3 of 6)				

Table 108 (continued)
PCU TDMA statistics

Field name	Field type	Default field position	Field value	Field description
maxDnTbfPerTimeslots	L_int		0.. 4294967295	The maximum number of downlink TBFs on one timeslot at a given sample time. The number of samples during the statistics collection interval is indicated by nbSamples.
nbSamples	L_int		0.. 4294967295	The number of samples taken. This value can be used with cumulative attributes to calculate averages.
llcPacketsUp	L_int		0.. 4294967295	The number of LLC packets reassembled and transmitted to the LLC relay.
dataBlocksUp	L_int		0.. 4294967295	The number of uplink RLC data blocks received.
controlBlocksUp	L_int		0.. 4294967295	The number of uplink RLC control blocks received.
invalidBlocksUp	L_int		0.. 4294967295	The number of invalid uplink radio blocks received.
invalidProtocolErrorBlocksUp	L_int		0.. 4294967295	The number of invalid uplink radio blocks received with invalid RLC protocol.
outOfSequenceBlocksUp	L_int		0.. 4294967295	The number of data blocks received uplink with a Block Sequence Number outside the received window.
packetAckNackUp	L_int		0.. 4294967295	The number of PACKET-UPLINK-ACK-NACK messages received.
totalRetransmissionRequested	L_int		0.. 4294967295	The number of RLC/MAC block retransmission requests.

(Sheet 4 of 6)

Table 108 (continued)
PCU TDMA statistics

Field name	Field type	Default field position	Field value	Field description
cumulativeUpRxQual	L_int		0.. 4294967295	The cumulative uplink RxQual value applied. The average can be calculated by dividing this value by the nbSamples value.
cumulativeUpRxLev	L_int		0.. 4294967295	The cumulative uplink RxLev value applied. The average can be calculated by dividing this value by the nbSamples value.
nbSamplesUpQuality	L_int		0.. 4294967295	The number of samples for RxQual and RxLev cumulative values.
llcPacketsDn	L_int		0.. 4294967295	The number of LLC packets, segmented into RLC data blocks, received.
dataBlocksDn	L_int		0.. 4294967295	The number of downlink RLC data blocks transmitted.
controlBlocksDn	L_int		0.. 4294967295	The number of downlink RLC control blocks transmitted.
retransmittedDataBlocksDn	L_int		0.. 4294967295	The number of data blocks retransmitted downlink.
packetAckNackDn	L_int		0.. 4294967295	The number of PACKET-DOWNLINK-ACK-NACK messages transmitted.
cumulativeDnRxQual	L_int		0.. 4294967295	The cumulative downlink RxQual value applied. The average can be calculated by dividing this value by the nbSamples value.
nbSamplesDnQuality	L_int		0.. 4294967295	The number of samples for RxQual cumulative values.
(Sheet 5 of 6)				

Table 108 (continued)
PCU TDMA statistics

Field name	Field type	Default field position	Field value	Field description
tbfNormalReleaseUp	L_int		0..4294967295	The number of uplink TBFs that terminated normally.
tbfNormalReleaseDn	L_int		0..4294967295	The number of downlink TBFs that terminated normally.
noPacketResourceReq	L_int		0..4294967295	The number of TBFs abnormally released due to non-receipt of Packet Resource Request.
lossOfComNN002Max	L_int		0..4294967295	The number of TBFs abnormally released due to V(Q) non-progression.
lossOfComT3169	L_int		0..4294967295	The number of TBFs abnormally released due to timer T3169 expiry.
lossOfComNT0001	L_int		0..4294967295	The number of TBFs abnormally released due to timer NT0001 expiry.
lossOfComT3195	L_int		0..4294967295	The number of TBFs abnormally released due to timer T3195 expiry.
lossOfComT3191	L_int		0..4294967295	The number of TBFs abnormally released due to timer T3191 expiry.
lossOfComNT1001	L_int		0..4294967295	The number of TBFs abnormally released due to timer NT1001 expiry.
(Sheet 6 of 6)				

Table 109
PCU CCCH statistics

Field name	Field type	Default field position	Field value	Field description
upTbflmmmediateAssignment	L_int		0.. 4294967295	The number of IMMEDIATE-ASSIGNMENT messages generated by the PCU to the mobile station in the first phase of the two_phase access uplink TBF establishment.
upTbflmmAssigRejectNoPdch	L_int		0.. 4294967295	The number of IMMEDIATE-ASSIGNMENT-REJECT messages generated by the PCU to the mobile station with a cause of "No PDCH available for GPRS" in the first phase of the two_phase access uplink TBF establishment.
upTbflmmAssigRejectNoTs	L_int		0.. 4294967295	The number of IMMEDIATE-ASSIGNMENT-REJECT messages generated by the PCU to the mobile station with a cause of "Maximum MS per TS is reached" in the first phase of the two_phase access uplink TBF establishment.
upTbflmmAssigRejectNoTbf	L_int		0.. 4294967295	The number of IMMEDIATE-ASSIGNMENT-REJECT messages generated by the PCU to the mobile station with a cause of "Maximum TBF per TDMA is reached" in the first phase of the two_phase access uplink TBF establishment.
channelRequest	L_int		0.. 4294967295	The number of CHANNEL-REQUEST messages received by the PCU from the mobile station in the first phase of the two_phase access uplink TBF establishment.

(Sheet 1 of 4)

Table 109 (continued)
PCU CCCH statistics

Field name	Field type	Default field position	Field value	Field description
packetResourceRequest	L_int		0.. 4294967295	The number of PACKET-RESOURCE-REQUEST messages received by the PCU from the mobile station in the second phase of the two_phase access uplink TBF establishment.
deleteIndicationUp	L_int		0.. 4294967295	The number of DELETE-INDICATION messages sent by the BTSs when an IMMEDIATE-ASSIGNMENT message for uplink transfer is dropped.
packetUpAssignment	L_int		0.. 4294967295	The number of PACKET-UPLINK-ASSIGNMENT messages generated by the PCU after a PACKET-RESOURCE-REQUEST in the second phase of the two_phase access uplink TBF establishment.
upTbfPacketAccessReject NoPdch	L_int		0.. 4294967295	The number of PACKET-ACCESS-REJECT messages generated by the PCU to the mobile station with a cause of "No PDCH available for GPRS" in the second phase of the two_phase access uplink TBF establishment.
upTbfPacketAccessReject NoTs	L_int		0.. 4294967295	The number of PACKET-ACCESS-REJECT messages generated by the PCU to the mobile station with a cause of "Maximum MS per TS is reached" in the second phase of the two_phase access uplink TBF establishment.
(Sheet 2 of 4)				

Table 109 (continued)
PCU CCCH statistics

Field name	Field type	Default field position	Field value	Field description
upTbfPacketAccessRejectNoTbf	L_int		0..4294967295	The number of PACKET-ACCESS-REJECT messages generated by the PCU to the mobile station with a cause of "Maximum TBF per TDMA is reached" in the second phase of the two_phase access uplink TBF establishment.
dnTbfImmediateAssignment	L_int		0..4294967295	The number of IMMEDIATE-ASSIGNMENT messages sent for a downlink TBF establishment from the PCU to the mobile station.
pagingRequest	L_int		0..4294967295	The number of PAGING-REQUEST messages generated by the PCU to the mobile station.
deleteIndicationDn	L_int		0..4294967295	The number of DELETE-INDICATION messages sent by the BTSs when an IMMEDIATE-ASSIGNMENT message for downlink transfer is dropped.
packetDnAssignment	L_int		0..4294967295	The number of PACKET-DOWNLINK-ASSIGNMENT messages generated by the PCU to the mobile station in the downlink TBF establishment phase.
dnTbfPacketAccessRejectNoPdch	L_int		0..4294967295	The number of PACKET-ACCESS-REJECT messages generated by the PCU to the mobile station with a cause of "No PDCH available for GPRS" in the second phase of the two_phase access downlink TBF establishment.
(Sheet 3 of 4)				

Table 109 (continued)
PCU CCCH statistics

Field name	Field type	Default field position	Field value	Field description
dnTbfPacketAccessRejectNoTs	L_int		0..4294967295	The number of PACKET-ACCESS-REJECT messages generated by the PCU to the mobile station with a cause of "Maximum MS per TS is reached" in the second phase of the two_phase access downlink TBF establishment.
dnTbfPacketAccessRejectNoTbf	L_int		0..4294967295	The number of PACKET-ACCESS-REJECT messages generated by the PCU to the mobile station with a cause of "Maximum TBF per TDMA is reached" in the second phase of the two_phase access downlink TBF establishment.

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Table 110
PCU PBlock statistics

Field name	Field type	Default field position	Field value	Field description
cpuPBlockUtilAvg	int		0..100	The average PBlock CPU load during the statistics collection interval, expressed as a percentage.
cpuPBlockUtilMin	int		0..100	The minimum PBlock CPU load during the statistics collection interval, expressed as a percentage.

(Sheet 1 of 2)

Table 110 (continued)
PCU PBlock statistics

Field name	Field type	Default field position	Field value	Field description
cpuPBlockUtilMax	int	309 n/a to pp	0..100	The maximum PBlock CPU load during the statistics collection interval, expressed as a percentage.
(Sheet 2 of 2)				

Table 111
GPRS BSS Virtual Connection (BVC) statistics

Field name	Field type	Default field position	Field value	Field description
currentBvcs	L_int		0.. 4294967295	The current number of BSS GPRS Virtual Connections (BVCs) on this Network Service Entity (NSE).

Table 112
GPRS GTL NSE, PTP BVC, NS-VC, and SIG BVC statistics

Field name	Field type	Default field position	Field value	Field description
octetsToPcu	L_int		0.. 4294967295	<p>If this field is included with a GPRS GTL NSE record, this field indicates the number of octets transmitted to the Packet Control Unit (PCU) by all the Network Service Virtual Connections (NS-VCs) served by this Network Service Entity (NSE).</p> <p>If this field is included with a PTP BVC record, this field indicates the number of octets transmitted to the Packet Control Unit (PCU) from the BSS GPRS Virtual Connection (BVC).</p> <p>If this field is included with an SG NS-VC record, this field indicates the number of octets the Network Service Virtual Connection (NS-VC) has processed and transmitted to the Packet Control Unit (PCU).</p> <p>If this field is included with a SIG BVC record, this field indicates the number of octets transmitted to the Packet Control Unit (PCU) from the BSS GPRS Virtual Connection (BVC).</p>
(Sheet 1 of 2)				

Table 112 (continued)
GPRS GTL NSE, PTP BVC, NS-VC, and SIG BVC statistics

Field name	Field type	Default field position	Field value	Field description
octetsFromPcu	L_int		0..4294967295	<p>If this field is included with a GPRS GTL NSE record, this field indicates the number of octets received from all the Network Service Virtual Connections (NS-VCs) of the Packet Control Unit served by the peer Network Service Entity (NSE).</p> <p>If this field is included with a PTP BVC record, this field indicates the number of octets received from the Packet Control Unit (PCU) by the BSS GPRS Virtual Connection (BVC).</p> <p>If this field is included with an SG NS-VC record, this field indicates the number of octets the Network Service Virtual Connection (NS-VC) has processed and received from the Packet Control Unit (PCU).</p> <p>If this field is included with a SIG BVC record, this field indicates the number of octets received from the Packet Control Unit (PCU) by the BSS GPRS Virtual Connection (BVC).</p>
(Sheet 2 of 2)				

Table 113
GPRS PTP BVC and SIG BVC statistics

Field name	Field type	Default field position	Field value	Field description
pdusFromPcu	L_int		0.. 4294967295	<p>If this field is included with a PTP BVC record, this field indicates the number of protocol data units (PDUs) received from the Packet Control Unit (PCU) by the BSS GPRS Virtual Connection (BVC).</p> <p>If this field is included with a SIG BVC record, this field indicates the number of protocol data units (PDUs) received from the Packet Control Unit (PCU) by the BSS GPRS Virtual Connection (BVC).</p>
pdusToPcu	L_int		0.. 4294967295	<p>If this field is included with a PTP BVC record, this field indicates the number of protocol data units (PDUs) transmitted to the Packet Control Unit (PCU) from the BSS GPRS Virtual Connection (BVC).</p> <p>If this field is included with a SIG BVC record, this field indicates the number of protocol data units (PDUs) received from the Packet Control Unit (PCU) by the BSS GPRS Virtual Connection (BVC).</p>

Table 114
GPRS PTP BSS Virtual Connection (BVC) statistics

Field name	Field type	Default field position	Field value	Field description
bvcFlowCntlFromPcu	L_int		0.. 4294967295	The number of FLOW-CONTROL-BVC Protocol Data Units (PDUs) received by the BSS GPRS Virtual Connection (BVC).
msFlowCntlFromPcu	L_int		0.. 4294967295	The number of BSSGP-FLOW-CONTROL-MS Protocol Data Units (PDUs) received by the BSS GPRS Virtual Connection (BVC).

Table 115
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
currentTransactions	L_int		0.. 4294967295	The current number of concurrent transactions being handled by the MapClient. This is the value at the end of the statistics collection interval.
uglMsgs	L_int		0.. 4294967295	The number of MAP-UPDATE GPRS LOCATION messages sent to the Home Location Register (HLR).
uglResponseMsgs	L_int		0.. 4294967295	The number of MAP-UPDATE GPRS LOCATION RESPONSE messages received from the Home Location Register (HLR).

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Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
isdMsgs	L_int		0.. 4294967295	The number of MAP-INSERT SUBSCRIBER DATA messages sent to the Home Location Register (HLR).
isdResponseMsgs	L_int		0.. 4294967295	The number of MAP-INSERT SUBSCRIBER DATA RESPONSE messages received from the Home Location Register (HLR).
dsdMsgs	L_int		0.. 4294967295	The number of MAP-DELETE SUBSCRIBER DATA messages sent to the Home Location Register (HLR).
dsdResponseMsgs	L_int		0.. 4294967295	The number of MAP-DELETE SUBSCRIBER DATA RESPONSE messages received from the Home Location Register (HLR).
clMsgs	L_int		0.. 4294967295	The number of MAP-CANCEL LOCATION messages sent to the Home Location Register (HLR).
clResponseMsgs	L_int		0.. 4294967295	The number of MAP-CANCEL LOCATION RESPONSE messages received from the Home Location Register (HLR).
rstMsgs	L_int		0.. 4294967295	The number of MAP-RESET messages received from the Home Location Register (HLR).
saiMsgs	L_int		0.. 4294967295	The number of MAP-SEND AUTHENTICATION INFO messages sent to the Home Location Register (HLR).

(Sheet 2 of 16)

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
saiResponseMsgs	L_int		0.. 4294967295	The number of MAP-SEND AUTHENTICATION INFO RESPONSE messages received from the Home Location Register (HLR).
transLimitDiscards	L_int		0.. 4294967295	The number of transactions rejected by the MapClient when the maximum number of Mobile Application Part (MAP) transactions (attribute maxTransactions) has been exceeded.
tmrExpiries	L_int		0.. 4294967295	The number of times the mcTimer (defined in component Sgsn GprsSubscriberControl) expires before receiving a response from the Home Location Register (HLR). This field can be used to determine if the provisionable attribute mcTimer needs to be changed, or if a problem exists between the Serving GPRS Support Node (SGSN) and the Home Location Register (HLR).
sigErrs	L_int		0.. 4294967295	The number of errors encountered by the MapClient when decoding a message from the Signaling System 7-Internet Protocol (SS7-IP) Gateway. This field can be used to determine if a problem exists (such as formatting or corrupt data) with the messages received from the SS7-IP Gateway.
(Sheet 3 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
sigErrsRcvd	L_int		0.. 4294967295	The number of messages containing an ERROR or REJECT component from the Signaling System 7-Internet Protocol (SS7-IP) Gateway. This field can be used to identify potential problems between the SS7-IP Gateway and the Serving GPRS Support Node (SGSN).
ofsmMsgs	L_int		0.. 4294967295	The number of MAP-MO-FORWARD-SHORT-MESSAGE messages received by the Inter-working Mobile Switching Center (IWMSC) from the MAP Client.
ofsmResMsgs	L_int		0.. 4294967295	The number of MAP-MO-FORWARD-SHORT-MESSAGE response messages received by the MAP Client from the Inter-working Mobile Switching Center (IWMSC).
tfsmMsgs	L_int		0.. 4294967295	The number of MAP-MT-FORWARD-SHORT-MESSAGE messages received by the MAP Client from the Inter-working Mobile Switching Center (IWMSC).
tfsmResMsgs	L_int		0.. 4294967295	The number of MAP-MT-FORWARD-SHORT-MESSAGE response messages received by the Inter-working Mobile Switching Center (IWMSC) from the MAP Client.
rsmMsgs	L_int		0.. 4294967295	The number of MAP-READY-FOR-SM messages received by the Home Location Register (HLR) from the MAP Client.

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Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
rsmResMsgs	L_int		0.. 4294967295	The counts the MAP-READY-FOR-SM response messages received by the MAP Client from the Home Location Register (HLR).
afrMsgs	L_int		0.. 4294967295	The number of AUTHENTICATION FAILURE REPORT messages sent to the Home Location Register (HLR). UMTS, only.
afrResponseMsgs	L_int		0.. 4294967295	The number of AUTHENTICATION FAILURE REPORT RESPONSE messages received from the Home Location Register (HLR). UMTS, only.
sccpServiceRequest Timeouts	L_int		0.. 4294967295	This attribute indicates the MAP Stack Service request timeouts in the collection interval. This could occur if the MAP Stack was not responding to Service requests from the MAP Clients, or if there was an SS7-IP Gateway (SIG) or IP network problem. Retries of the Service request are infinite since the MAP Client can not send or receive MAP messages until it is successfully registered with the MAP Stack.
decodeErrors	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of MAP messages received from the peer nodes that are not decodable. The inability to decode the MAP message is caused by the MAP Client receiving a message with invalid data.

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Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
dataMissingRespSent	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of "data missing" error responses sent to the peer nodes. This error may occur when optional data is missing from a MAP message received, when required data is missing from a MAP message received, or when an internal data structure is missing data.
unexpectedDataValuesRespSent	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of "unexpected data value" error responses sent to the peer nodes. This error may occur when the parameter type is correct in a MAP message received but contains data which is not relevant for the type of MAP service being invoked.
unidentifiedSubscribersRespSent	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of "unidentified subscriber" error responses sent to the peer nodes. This error may occur when the subscriber is not contained in the subscriber database resulting in the failure to establish a call.
uAbortMsgSent	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of MAP USER ABORT messages sent by the MAP Client to the peer nodes. This message may be sent as a result of a resource limitation caused by congestion or as a result of the unavailability of resources.
(Sheet 6 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
pAbortMsgRecv	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of MAP PROVIDER ABORT messages received by the MAP Client from the peer nodes. This message indicates to the MAP service-user to abort a MAP dialogue. This message may be received due to a MAP service-provider malfunction, supporting dialogue/transaction release, resource limitation, maintenance activity, version incompatibility, or an abnormal MAP dialogue.
uAbortMsgRecv	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of MAP USER ABORT messages received by the MAP Client from the peer nodes. This message indicates to the MAP service-provider to abort a MAP dialogue. This message may be received due to a resource limitation caused by congestion or by unavailability of resources.
dataMissingRespRecv	L_int		0.. 4294967295	This attribute indicates, over the collection interval, the number of "data missing" error responses received from the peer nodes. This error may occur when optional data is missing from a MAP message sent, when required data is missing from a MAP message sent, or when an internal data structure is missing data.
(Sheet 7 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
unexpectedDataValuesRespRecv	L_int		0..4294967295	This attribute indicates, over the collection interval, the number of "unexpected data value" error responses received from the peer nodes. This error may occur when the parameter type is correct in a MAP message sent but contains data which is not relevant for the type of MAP service being invoked.
systemFailuresRespRecv	L_int		0..4294967295	This attribute indicates, over the collection interval, the number of "system failure" error responses received from the peer nodes. This error may occur when a task specified by a MAP message sent cannot be performed because of a problem with another entity.
systemFailuresRespSent	L_int		0..4294967295	This attribute indicates the number of "system failure" error responses sent to the peer nodes. This error may occur when a task specified in MAP message received cannot be performed because of a problem with another entity. The counter wraps to zero when it exceeds the maximum value. GPRS, only.
unknownSubscribersRespRecv	L_int		0..4294967295	This attribute indicates the number of "unknown subscriber" error responses received from the peer nodes. This error may occur when a message sent is processed for a subscription that does not exist. The counter wraps to zero when it exceeds the maximum value.
(Sheet 8 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
roamingNotAllowedResp Recv	L_int		0.. 4294967295	This attribute indicates the number of "roaming not allowed" error responses received from the peer nodes. This error may occur when a location update attempt is made in an area not covered by the subscription. The counter wraps to zero when it exceeds the maximum value.
invalidMessages	L_int		0.. 4294967295	This attribute indicates the number of invalid messages received by the MAP Client. This may occur if the MAP Client receives an unsolicited message, a message with an invalid header, or an invalid dialogue ID. The counter wraps to zero when it exceeds the maximum value.
isdMsgsUpdateLocation	L_int		0.. 4294967295	This attribute indicates the number of MAP-INSERT SUBSCRIBER DATA messages received from the Home Location Register (HLR) during a GPRS Update Location procedure. The counter wraps to zero when it exceeds the maximum value.
isdMsgsHlrSubUpdate	L_int		0.. 4294967295	This attribute indicates the number of MAP-INSERT SUBSCRIBER DATA messages received from the Home Location Register (HLR) due to an HLR operator intervention. The counter wraps to zero when it exceeds the maximum value.
(Sheet 9 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
isdFailures	L_int		0..4294967295	This attribute indicates the number of MAP-INSERT SUBSCRIBER DATA messages sent to the Home Location Register (HLR) that could not be processed due to one of the following errors: Data Missing Unexpected Data Value Unidentified Subscriber Decode errors The counter wraps to zero when it exceeds the maximum value.
clMsgsHlrDetach	L_int		0..4294967295	This attribute indicates the number of MAP-CANCEL LOCATION messages received from the Home Location Register (HLR) due to an HLR initiated Detach. The counter wraps to zero when it exceeds the maximum value.
clMsgsSgsnChange	L_int		0..4294967295	This attribute indicates the number of MAP-CANCEL LOCATION messages received from the Home Location Register (HLR) due to a Service GPRS Support Node (SGSN) change. The counter wraps to zero when it exceeds the maximum value.
(Sheet 10 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
clMsgsHlrOther	L_int		0.. 4294967295	This attribute indicates the number of MAP-CANCEL LOCATION messages received from the Home Location Register (HLR) with a cancellation type other than a Service GPRS Support Node (SGSN) change or an HLR initiated Detach. The counter wraps to zero when it exceeds the maximum value.
clFailures	L_int		0.. 4294967295	This attribute counts the MAP-CANCEL LOCATION messages received from the Home Location Register (HLR) that could not be processed due to one of the following errors: Data Missing Unexpected Data Value Decode errors The counter wraps to zero when it exceeds the maximum value.
dsdFailures	L_int		0.. 4294967295	This attribute indicates the number of MAP-DELETE SUBSCRIBER DATA messages sent to the Home Location Register (HLR) that could not be processed due to one of the following errors: Data Missing Unexpected Data Value Unidentified Subscriber Decode errors The counter wraps to zero when it exceeds the maximum value.
(Sheet 11 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
pmsMsgs	L_int		0.. 4294967295	This attribute counts the number of Mobile Subscriber Purge messages sent to the Home Location Register (HLR). The counter wraps to zero when it exceeds the maximum value.
pmsResponseMsgs	L_int		0.. 4294967295	This attribute counts the number of Mobile Subscriber Purge MS Response messages received from the Home Location Register(HLR). The counter wraps to zero when it exceeds the maximum value.
psiMsgs	L_int		0.. 4294967295	This attribute counts the MAP-PROVIDE SUBSCRIBER LOCATION messages received by the MAP Client from the Gateway Mobile Location Center (GMLC). The counter wraps to zero when it exceeds the maximum value.
psiRespMsgs	L_int		0.. 4294967295	This attribute counts the MAP-PROVIDE SUBSCRIBER LOCATION response messages sent by the MAP Client to the Gateway Mobile Location Center (GMLC). The counter wraps to zero when it exceeds the maximum value.
(Sheet 12 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
unauthorizedReqNetworkRespSent	L_int		0..4294967295	This attribute counts the number of "Unauthorized Requested Network" error responses sent to the Gateway Mobile Location Center (GMLC). This error may occur when a Location Request is denied due to the GMLC not being in the home country. The counter wraps to zero when it exceeds the maximum value.
unauthorizedLcsClientRespSent	L_int		0..4294967295	This attribute counts the number of "Unauthorized LCS Client" error responses sent to the Gateway Mobile Location Center (GMLC). This error may occur when a Location Request is denied due to privacy restrictions. The counter wraps to zero when it exceeds the maximum value.
positionMethodFailureRespSent	L_int		0..4294967295	This attribute counts the number of "Positioning Method Failure" error responses sent to the Gateway Mobile Location Center (GMLC). This error may occur when the position of the mobile cannot be retrieved. The counter wraps to zero when it exceeds the maximum value.
(Sheet 13 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
absentSubscriberRespSent	L_int		0..4294967295	This attribute counts the number of "Absent Subscriber" error responses sent to the Gateway Mobile Location Center (GMLC). This error may occur when the subscriber is International Mobile Subscriber Identity (IMSI) detached, in a restricted area, or does not respond to paging. The counter wraps to zero when it exceeds the maximum value.
facilityNotSupportedRespSent	L_int		0..4294967295	This attribute indicates, over the collection interval, the number of "facility not supported" error responses sent to the peer nodes. This error may occur when the requested facility, such as SMS, is not supported. GPRS, only.
facilityNotSupportedRespRecv	L_int		0..4294967295	This attribute indicates, over the collection interval, the number of "facility not supported" error responses received from the HLR or SMSC. This error may occur when the requested facility, such as SMS, is not supported. GPRS, only.
smDeliveryFailuresRespSent	L_int		0..4294967295	This attribute indicates the number of "short message delivery failure" error responses sent to the SMSC. This error may occur when the mobile runs out of memory to store short messages. The counter wraps to zero when it exceeds the maximum value. GPRS, only.

(Sheet 14 of 16)

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
smDeliveryFailuresRespRecv	L_int		0..4294967295	This attribute indicates, over the collection interval, the number of "short message delivery failure" error responses received from the SMSC. This error may occur when the Short Message Service Center returns a delivery error indication in response to a message sent by the MAP Client. GPRS, only.
illegalSubscribersRespSent	L_int		0..4294967295	This attribute indicates the number of "illegal subscriber" error responses sent to the peer nodes. This error may occur when an illegal access attempt is determined during the authentication process. The counter wraps to zero when it exceeds the maximum value. GPRS, only.
illegalEquipmentRespSent	L_int		0..4294967295	This attribute indicates the number of "illegal equipment" error responses sent to the peer nodes. This error may occur when the International Mobile station Equipment Identity (IMEI) is either blacklisted or not whitelisted. The counter wraps to zero when it exceeds the maximum value. GPRS, only.
(Sheet 15 of 16)				

Table 115 (continued)
GPRS/UMTS Map Client statistics

Field name	Field type	Default field position	Field value	Field description
subscriberBusyForMtSmsRespSent	L_int		0..4294967295	This attribute indicates the number of "subscriber busy for mobile-terminated short message service" error responses sent to the SMSC. This error may occur when mobile terminated short messages cannot be completed. The counter wraps to zero when it exceeds the maximum value. GPRS, only.
absentSubscriberSmRespSent	L_int		0..4294967295	This attribute indicates the number of "absent subscriber short message service" error responses sent to the SMSC. This error may occur when the mobile terminated short message transfer cannot be completed because the network cannot contact the subscriber. This may be caused by the mobile being turned off. The counter wraps to zero when it exceeds the maximum value. GPRS, only.
(Sheet 16 of 16)				

Table 116
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
authenticationRequests	L_int		0.. 4294967295	The number of AUTHENTICATION AND CIPHERING REQUEST messages sent to the MS requiring only authentication and messages requiring both authentication and ciphering.
cipheringRequests	L_int		0.. 4294967295	The number of AUTHENTICATION AND CIPHERING REQUEST messages sent to the Mobile Stations (MS) requiring only ciphering.
identityRequests	L_int		0.. 4294967295	The number of IDENTITY REQUEST messages sent to the Mobile Stations (MS).
ptmsiReallocationRequests	L_int		0.. 4294967295	The number of implicit and explicit P-TMSI REALLOCATION messages sent to the Mobile Stations (MS).
bssgpSuspendMsgs	L_int		0.. 4294967295	The number of SUSPEND messages received by the Serving GPRS Support Node (SGSN) from the Base Station System (BSS). The BSS sends these messages when a mobile subscriber switches from packet-switched mode to circuit-switched mode.
(Sheet 1 of 7)				

Table 116 (continued)
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
bssgpResumeMsgs	L_int		0.. 4294967295	The number of RESUME messages received by the Serving GPRS Support Node (SGSN) from the Base Station System (BSS). The BSS sends these messages when a mobile subscriber switches from circuit-switched mode to packet-switched mode.
readyStateSubscribers	L_int		0.. 4294967295	The number of mobile subscribers that are GPRS-attached and in Ready state. This value is reported at the end of the statistics collection interval.
currentlyAttached	L_int		0.. 4294967295	The number of Mobile Stations (MS) that are currently GPRS-attached and in Ready or Standby state. This value is reported at the end of the statistics collection interval.
attachesSuccessful	L_int		0.. 4294967295	The number of GPRS-attaches to this Serving GPRS Support Node (SGSN) that were successful.
attachesRejected	L_int		0.. 4294967295	The number of GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected.
attachesWithKnownTlli	L_int		0.. 4294967295	The number of ATTACH REQUEST messages received with a Temporary Logical Link Identifier (TLLI) previously assigned by this Serving GPRS Support Node (SGSN). This includes all successful and unsuccessful attempts.
(Sheet 2 of 7)				

Table 116 (continued)
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
attachesWithUnknownTlli	L_int		0..4294967295	The number of ATTACH REQUEST messages received with a Temporary Logical Link Identifier (TLLI) not assigned by this Serving GPRS Support Node (SGSN). This includes all successful and unsuccessful attempts.
attachesWithImsi	L_int		0..4294967295	This attribute counts the ATTACH REQUEST messages received with an International Mobile Subscriber Identity (IMSI) as an identifier. This includes all successful and unsuccessful attempts.
attachesWithInfoAttempts	L_int		0..4294967295	The number of ATTACH attempts by mobile subscribers using the GPRS Mobility Management (GMM) context in the Serving GPRS Support Node (SGSN). This includes all successful and unsuccessful attempts.
detachesSuccessful	L_int		0..4294967295	The number of successful mobile or network initiated DETACHes.
msDetachRequests	L_int		0..4294967295	The number of Mobile Station (MS) initiated DETACH REQUEST messages received by this Serving GPRS Support Node (SGSN).
msDetachRejected	L_int		0..4294967295	The number of Mobile Station (MS) initiated GPRS-DETACH REQUEST messages that have been rejected by this Serving GPRS Support Node (SGSN).
nwkDetachRequests	L_int		0..4294967295	The number of network initiated DETACH REQUEST messages transmitted to a mobile subscriber.

(Sheet 3 of 7)

Table 116 (continued)
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
authenticationsRejected	L_int		0..4294967295	The number of AUTHENTICATION AND CIPHERING REJECT messages transmitted to the Mobile Station (MS) due to authentication failures.
oldCredentialsPresented	L_int		0..4294967295	The number of old authentication credentials used in an AUTHENTICATION AND CIPHERING RESPONSE received from a Mobile Station (MS).
normalIntraSgsnRaUpdate	L_int		0..4294967295	The number of normal intra-Serving GPRS Support Node (SGSN) ROUTING AREA UPDATE REQUEST messages received from the Mobile Station (MS).
periodicIntraSgsnRaUpdate	L_int		0..4294967295	The number of periodic intra-Serving GPRS Support Node (SGSN) ROUTING AREA UPDATE REQUEST messages received from the Mobile Station (MS).
normalInterSgsnRaUpdate	L_int		0..4294967295	The number of normal inter-Serving GPRS Support Node (SGSN) ROUTING AREA UPDATE REQUEST messages received from the Mobile Station (MS).
intraRaCellChange	L_int		0..4294967295	The number of intra-Serving GPRS Support Node (SGSN) intra-Routing Area Update cell changes performed by the Mobile Station (MS).
initialPsPageRequests	L_int		0..4294967295	The number of initial PS (Packet-Switched) PAGE REQUEST messages transmitted to the Mobile Station (MS).

(Sheet 4 of 7)

Table 116 (continued)
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
reattemptPsPageRequests	L_int		0.. 4294967295	The number of re-attempted PS (Packet-Switched) PAGE REQUEST messages transmitted to the Mobile Station (MS) after the initial page request.
interSgsnRaUpdate Accepts	L_int		0.. 4294967295	The number of ROUTING AREA UPDATE ACCEPT messages sent from this SGSN, while acting as the new SGSN, to the Mobile Station (MS).
t3Timeouts	L_int		0.. 4294967295	The number of times the t3TunnelTimer (defined in Sgsn GprsSubscriberControl) expires in this SGSN, while acting as the old SGSN, and the CANCEL LOCATION message has been received.
msPresentAttempts	L_int		0.. 4294967295	This attribute indicates, for the collection interval, the number of times the SGSN detects that the Mobile Station (MS) has recovered operation such as responded to a paging request via the SGSN. If the MS has alerted the SGSN and the HLR that its memory has exceeded, then the HLR will not notify the Service Center that the MS is ready for Short Message Services (SMS).
(Sheet 5 of 7)				

Table 116 (continued)
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
nwkDetachReachable Timer	L_int		0..4294967295	This attribute counts the number of network initiated detaches due to the expiration of reachable timer. The mobileReachableTimer attribute is provisioned in the Sgsn Gsc component. The counter counts the events in the collection interval.
nwkDetachCancelLocation	L_int		0..4294967295	This attribute counts the number of network initiated detaches due to the receipt of CANCEL LOCATION Messages from the Home Location Register (HLR). The counter counts the events in the collection interval.
nwkDetachDuplicateAttach	L_int		0..4294967295	This attribute counts the number of network initiated detaches due to mobile reattaches with a new random Packet Temporary Mobile Subscriber Identity (PTMSI) without first performing a detach. The counter counts the events in the collection interval.
nwkDetachTempNetwork Failure	L_int		0..4294967295	This attribute counts the number of network initiated detaches due to temporary network problems. The counter counts the events in the collection interval.
(Sheet 6 of 7)				

Table 116 (continued)
GPRS Mobility Management (GMM) statistics

Field name	Field type	Default field position	Field value	Field description
nwkDetachForReattach	L_int		0..4294967295	This attribute counts the number of network initiated detaches with a detach type of "reattach required". The counter counts the events in the collection interval.
(Sheet 7 of 7)				

Table 117
GPRS Mobility Management (GMM) attach rejects statistics

Field name	Field type	Default field position	Field value	Field description
attachRejIllegalMs	L_int		0..4294967295	This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause Illegal Ms. The counter wraps to zero when it exceeds the maximum value.
attachRejGprsServNot Allowed	L_int		0..4294967295	This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause Gprs Service not allowed. The counter wraps to zero when it exceeds the maximum value.
(Sheet 1 of 4)				

Table 117 (continued)
GPRS Mobility Management (GMM) attach rejects statistics

Field name	Field type	Default field position	Field value	Field description
attachRejGprsServNot AllowedInPlmn	L_int		0..4294967295	This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause "Gprs Service not allowed in this PLMN". The counter wraps to zero when it exceeds the maximum value.
attachRejPlmnNotAllowed	L_int		0..4294967295	This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause PLMN not allowed. The counter wraps to zero when it exceeds the maximum value.
attachRejPacketNetwork Failure	L_int		0..4294967295	This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause Network Failure. The counter wraps to zero when it exceeds the maximum value.
attachRejSgsnCongestion	L_int		0..4294967295	This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause Congestion. The counter wraps to zero when it exceeds the maximum value.
(Sheet 2 of 4)				

Table 117 (continued)
GPRS Mobility Management (GMM) attach rejects statistics

Field name	Field type	Default field position	Field value	Field description
attachRejMsgError	L_int		0..4294967295	<p>This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of one of the following reject causes:</p> <p>Semantically incorrect message, Invalid mandatory information, Message type non-existence or not implemented, Message type not compatible with the protocol state, Information element non-existent or not implemented, Conditional IE error, Message not compatible with the protocol state, Protocol error, unspecified.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 3 of 4)				

Table 117 (continued)
GPRS Mobility Management (GMM) attach rejects statistics

Field name	Field type	Default field position	Field value	Field description
attachRejRoamNotAllowedInLocArea	L_int		0..4294967295	<p>This attribute counts the GPRS-attaches to this Serving GPRS Support Node (SGSN) that were rejected because of the reject cause "roaming not allowed in location area".</p> <p>This counter is incremented when a Unit Data Transfer Service message (UDTS) is received from the SS7/IP Gateway (SIG) for a Update GPRS Location (UGL) or a Send Authentication Info (SAI), or when the global title translation failure occurs in the MapClient component.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 4 of 4)				

Table 118
GPRS Mobility Management (GMM) attach rejects per cell statistics

Field name	Field type	Default field position	Field value	Field description
msAttachAttemptsPerCell	L_int		0..4294967295	<p>This attribute counts the number of attach requests received from the mobile subscribers in this cell.</p> <p>The counter counts the events in the collection interval.</p>
(Sheet 1 of 5)				

Table 118 (continued)
GPRS Mobility Management (GMM) attach rejects per cell statistics

Field name	Field type	Default field position	Field value	Field description
attachRejIllegalMsPerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause Illegal Ms. The counter wraps to zero when it exceeds the maximum value.
attachRejGprsSvcNot AllowedPerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause Gprs Service not allowed. The counter wraps to zero when it exceeds the maximum value.
attachRejGprsSvcNot AllowInPlmnPerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause "Gprs Service not allowed in this PLMN". The counter wraps to zero when it exceeds the maximum value.
attachRejPlmnNotAllowed PerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause PLMN not allowed. The counter wraps to zero when it exceeds the maximum value.
attachRejPacketNetFailure PerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause Network Failure. The counter wraps to zero when it exceeds the maximum value.
(Sheet 2 of 5)				

Table 118 (continued)
GPRS Mobility Management (GMM) attach rejects per cell statistics

Field name	Field type	Default field position	Field value	Field description
attachRejSgsnCongestionPerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause Congestion. The counter wraps to zero when it exceeds the maximum value.
attachRejMsgErrorPerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of one of the following reject causes: Semantically incorrect message, Invalid mandatory information, Message type non-existence or not implemented, Message type not compatible with the protocol state, Information element non-existent or not implemented, Conditional IE error, Message not compatible with the protocol state, Protocol error, unspecified. The counter wraps to zero when it exceeds the maximum value.
attachRejRoamNotAllowedInLocAreaPerCell	L_int		0..4294967295	This attribute counts the GPRS-attaches to this cell that were rejected because of the reject cause "roaming not allowed in location area". The counter wraps to zero when it exceeds the maximum value.

(Sheet 3 of 5)

Table 118 (continued)
GPRS Mobility Management (GMM) attach rejects per cell statistics

Field name	Field type	Default field position	Field value	Field description
nwkDetachReachableTimerPerCell	L_int		0..4294967295	This attribute counts the number of network initiated detaches in this cell due to the expiration of reachable timer. The mobileReachableTimer attribute is provisioned in the Sgsn Gsc component. The counter counts the events in the collection interval.
nwkDetachCancelLocationPerCell	L_int		0..4294967295	This attribute counts the number of network initiated detaches in the specified cell due to the receipt of CANCEL LOCATION Messages from the HLR. The counter counts the events in the collection interval.
nwkDetachDuplicateAttachPerCell	L_int		0..4294967295	This attribute counts the number of network initiated detaches in this cell due to mobile reattaches with a new random Packet Temporary (PTMSI) without first performing a detach. This is an implicit detach and no detach message is sent to the mobile. The counter counts the events in the collection interval.
nwkDetachTempNwkFailurePerCell	L_int		0..4294967295	This attribute counts the number of network initiated detaches or termination of mobility contexts in this cell due to temporary network problems. The counter counts the events in the collection interval.

(Sheet 4 of 5)

Table 118 (continued)
GPRS Mobility Management (GMM) attach rejects per cell statistics

Field name	Field type	Default field position	Field value	Field description
nwkDetachForReattachPer Cell	L_int		0..4294967295	This attribute counts the number of network initiated detaches in this cell with a detach cause of "reattach required". The counter counts the events in the collection interval.
(Sheet 5 of 5)				

Table 119
GPRS Session Management (SM) Packet Data Protocol (PDP) statistics

Field name	Field type	Default field position	Field value	Field description
currentPdpContexts	L_int		0..4294967295	The number of active Packet Data Protocol (PDP) contexts.
mobileInitActivations	L_int		0..4294967295	The number of successful Mobile-initiated Packet Data Protocol (PDP) context activations for this SessionManagement (SM) component.
mobileInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated by the Mobile Station (MS).
ggsnInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated by the Gateway GPRS Support Node (GGSN).
(Sheet 1 of 4)				

Table 119 (continued)
GPRS Session Management (SM) Packet Data Protocol (PDP) statistics

Field name	Field type	Default field position	Field value	Field description
sgsnInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated locally from the Serving GPRS Support Node (SGSN) (for example, as a result of a DETACH from the Mobile Station (MS)).
hlrInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated by the Home Location Register (HLR) (for example, Delete Subscriber Data (DSD) withdrawing subscription for an active session).

(Sheet 2 of 4)

Table 119 (continued)
GPRS Session Management (SM) Packet Data Protocol (PDP) statistics

Field name	Field type	Default field position	Field value	Field description
currentQosReliability	vector decimal		0..4294967295 for each index (0..5)	<p>This attribute indicates the currently active Packet Data Protocol (PDP) contexts for each Quality of Service (QoS) Reliability Class. This is the value at the end of the statistics collection interval.</p> <p>The Reliability values have the following meaning: RelClass = GTP LLC RLC Data where GTP is GPRS Tunnelling Protocol, LLC is Logical Link Control, and RLC is Radio Link Control.</p> <ul style="list-style-type: none"> • 1 = Acked Acked Acked Protected • 2 = UnAcked Acked Acked Protected • 3 = UnAcked UnAcked Acked Protected • 4 = UnAcked UnAcked UnAcked Protected • 5 = UnAcked UnAcked UnAcked UnProtected
(Sheet 3 of 4)				

Table 119 (continued)
GPRS Session Management (SM) Packet Data Protocol (PDP) statistics

Field name	Field type	Default field position	Field value	Field description
totalQosReliability	vector decimal		0.. 4294967295 for each index (0..5)	<p>The number of Packet Data Protocol (PDP) contexts that were activated for each Quality of Service (QoS) Reliability Class.</p> <p>The Reliability values have the following meaning: RelClass = GTP LLC RLC Data where GTP is GPRS Tunnelling Protocol, LLC is Logical Link Control, and RLC is Radio Link Control.</p> <ul style="list-style-type: none"> • 1 = Acked Acked Acked Protected • 2 = UnAcked Acked Acked Protected • 3 = UnAcked UnAcked Acked Protected • 4 = UnAcked UnAcked UnAcked Protected • 5 = UnAcked UnAcked UnAcked UnProtected
nwkPdpModifyInitiated	L_int		0.. 4294967295	The number of NWK PDP MODIFY CONTEXT REQUEST messages sent to the Mobile Station (MS). This counter is incremented in the SGSN acting as the new SGSN.
nwkPdpModifyRetries Exhausted	L_int		0.. 4294967295	The number of times the nwkPdpModifyRetires attribute is exhausted. This counter is incremented in the SGSN acting as the new SGSN.
(Sheet 4 of 4)				

Table 120
GPRS Home Location Register (HLR) Cache statistics

Field name	Field type	Default field position	Field value	Field description
cacheHits	L_int		0.. 4294967295	The number of instances where the HlrCache contained subscriber information locally and did not need to retrieve information from the Home Location Register (HLR).
cacheMisses	L_int		0.. 4294967295	The number of instances where the HlrCache did not contain subscriber information locally and needed to retrieve information from the Home Location Register (HLR).

Table 121
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures statistics

Field name	Field type	Default field position	Field value	Field description
insufficientResources	L_int		0.. 4294967295	The number of Mobile Station (MS) initiated activations rejected by the Serving GPRS Support Node (SGSN) due to insufficient resources. This counter is incremented either due to the SGSN having insufficient resources for the session, or the Gateway GPRS Support Node (GGSN) returning a cause code of "No resources available" in the CREATE PDP CONTEXT RESPONSE message.
missingOrUnknowApn	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation due to the requested service being rejected by the external packet data network because the Access Point Name (APN) was not included, although required, or if the APN was not resolved.

(Sheet 1 of 5)

Table 121 (continued)
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures
statistics

Field name	Field type	Default field position	Field value	Field description
unknownPdpAddrOrPdp Type	L_int		0..4294967295	The number of times a CREATE PDP CONTEXT RESPONSE message was received from the Gateway GPRS Support Node (GGSN) with the cause "Service not supported". This could be because the requested service was rejected by the external packet data network because the Packet Data Protocol (PDP) address or the PDP type was not recognized.
userAuthenticationsFailed	L_int		0..4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because the requested service was rejected by the external packet data network due to a failed user authentication. The SGSN increments this counter when a cause code of "User Authentication Failed" is received from the Gateway GPRS Support Node (GGSN) in the CREATE PDP CONTEXT REQUEST message.

(Sheet 2 of 5)

Table 121 (continued)
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures statistics

Field name	Field type	Default field position	Field value	Field description
activationRejectedByGgsn	L_int		0..4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because the requested service was rejected by the Gateway GPRS Support Node (GGSN) with a cause code that is not mappable to a cause code in the ACTIVATE PDP CONTEXT REJECT message. These events were counted.
activationRejected Unspecified	L_int		0..4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation due to unspecified reasons.
reqServiceOptionNot Subscribed	L_int		0..4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because the MS requested a service for which it has no subscription. These events were counted.
serviceOptionTempOutOf Order	L_int		0..4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because of temporary outage of one or more functions required for supporting the service. These events were counted.
(Sheet 3 of 5)				

Table 121 (continued)
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures
statistics

Field name	Field type	Default field position	Field value	Field description
nsapiAlreadyUsed	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because of the MS requesting a Network-Service Access Point Identifier (N-SAPI) in the Packet Data Protocol (PDP) context activation, that is already used by another active PDP context of this MS. These events were counted.
semanticallyIncorrect Mesage	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because of the receipt of a message with semantically incorrect contents. These events were counted.
invalidMandatoryInfo Element	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because of the receipt of a message with errors in a mandatory Information Element (IE). These events were counted.
msgTypeNotCompWithProt State	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because of the receipt of a message type not compatible with the current protocol state. These events were counted.
(Sheet 4 of 5)				

Table 121 (continued)
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures statistics

Field name	Field type	Default field position	Field value	Field description
protocolErrorUnspecified	L_int		0..4294967295	The number of times the Serving GPRS Support Node (SGSN) rejected a Mobile Station (MS) initiated activation because of a protocol error event that does not fit into any specific protocol error class values. These events were counted.
(Sheet 5 of 5)				

Table 122
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures per cell statistics

Field name	Field type	Default field position	Field value	Field description
msActivationAttemptsPerCell	L_int		0..4294967295	This attribute counts the number of Activate PDP context request message received by this SGSN from Mobile Station (MS) in this cell. The counter counts the events in the collection interval.
(Sheet 1 of 4)				

Table 122 (continued)

GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures per cell statistics

Field name	Field type	Default field position	Field value	Field description
insufficientResourcesPerCell	L_int		0..4294967295	This attribute counts the number of PDP activations rejected by this SGSN in this cell due to reject cause "insufficient resources". The counter counts the events in the collection interval.
missingOrUnknowApnPerCell	L_int		0..4294967295	This attribute counts the number of PDP activations rejected by this SGSN in this cell due to reject cause "missing or unknown APN". The counter counts the events in the collection interval.
unkPdpAddrOrPdpTypePerCell	L_int		0..4294967295	This attribute counts the number of PDP activations rejected by this SGSN in this cell due to reject cause "unknown PDP address or PDP type". The counter counts the events in the collection interval.
activationsRejByGgsnPerCell	L_int		0..4294967295	This attribute counts the number of Packet Data Protocol (PDP) activations rejected by this SGSN in this cell due to reject cause "activation rejected by GGSN". The counter counts the events in the collection interval.
(Sheet 2 of 4)				

Table 122 (continued)
GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures per cell statistics

Field name	Field type	Default field position	Field value	Field description
activationRejUnspecifiedPerCell	L_int		0..4294967295	This attribute counts the number of Packet Data Protocol (PDP) activations rejected by this SGSN in this cell due to reject cause "unspecified reason". The counter counts the events in the collection interval.
serviceOptionNotSupportedPerCell	L_int		0..4294967295	This attribute counts the number of Packet Data Protocol (PDP) activations rejected by this SGSN in this cell due to reject cause "service option not supported". The counter counts the events in the collection interval.
reqSvcOptionNotSubscribedPerCell	L_int		0..4294967295	This attribute counts the number of Packet Data Protocol (PDP) activation rejected by this SGSN in this cell due to reject cause "requested service option not subscribed". The counter counts the events in the collection interval.
svcOptionTempOutOfOrderPerCell	L_int		0..4294967295	This attribute counts the number of Packet Data Protocol (PDP) activation reject by this SGSN in this cell due to reject cause "service option temporarily out of order". The counter counts the events in the collection interval.

(Sheet 3 of 4)

Table 122 (continued)

GPRS Mobile Station (MS) initialization of Packet Data Protocol (PDP) context failures per cell statistics

Field name	Field type	Default field position	Field value	Field description
protocolErrorPerCell	L_int		0..4294967295	This attribute counts the number of Packet Data Protocol (PDP) activation reject by this SGSN in this cell currently because of one of the following reject causes: Semantically incorrect message, Invalid mandatory information, Message not compatible with the protocol state, Protocol error, unspecified. The counter counts the events in the collection interval.
currentPdpContextPerCell	L_int		0..4294967295	This attribute counts the number of currently active Packet Data Protocol (PDP) contexts in this cell. The counter counts the events in the collection interval.
(Sheet 4 of 4)				

Table 123
GPRS Logical Link Context (LLC) statistics

Field name	Field type	Default field position	Field value	Field description
currentLlesForUserData	L_int		0.. 4294967295	The number of Logical Link Entities (LLEs) used to handle the user data SAPs (Service Access Points) for the GprsSubscriberDataPath (Gsd). This is the peak value in the statistics collection interval.
unknownTllis	L_int		0.. 4294967295	The number of frames received from the Mobile Station (MS) for an unmapped Temporary Logical Link Identity (TLLI). An unmapped TLLI is one for which no Logical Link Context (LLC) mobile context exists. These frames were counted.
currentLlesForUserSms	L_int		0.. 4294967295	The current number of Logical Link Entities (LLEs) used to handle the Short Message Service (SMS) Service Access Points (SAPs) for the GprsSubscriberDatapath (Gsd). This value reported is the peak value in the collection interval.
framesRetransmitted	L_int		0.. 4294967295	This attribute counts the number of total frames retransmitted by the LLC layer. The counter counts the events in the collection interval.
crcErrorsFromMs	L_int		0.. 4294967295	This attribute counts the frames received from the Mobile Station (MS) that contained Cyclic Redundancy Check (CRC) errors. The counter counts the events in the collection interval.

Table 124
GPRS SMDCP statistics

Field name	Field type	Default field position	Field value	Field description
currentNsapis	L_int		0.. 4294967295	The number of Network-Service Access Point Identifiers (N-SAPs) for this instance of GprsSubscriberDataPath (Gsd). This is the peak value in the statistics collection interval.
currentV42bisEntities	L_int		0.. 4294967295	The number of RFC 1144 header compression entities in the last statistics collection interval for this instance of GprsSubscriberDataPath (Gsd). This is the peak value in the statistics collection interval.
currentRfc1144Entities	L_int		0.. 4294967295	The number of V.42bis compression entities in the last statistics collection interval for this instance of GprsSubscriberDataPath (Gsd). This is the peak value in the statistics collection interval.
snPdusToMs	L_int		0.. 4294967295	The number of SMDCP-Protocol Data Units (SN-PDUs) sent to the Mobile Station (MS).
snPdusFromMs	L_int		0.. 4294967295	The number of SMDCP-Protocol Data Units (SN-PDUs) received from the Mobile Station (MS) (that is, the total number of LL-UNITDATA-PDU and LL-DATA-PDU received from the Logical Link Context (LLC)).
(Sheet 1 of 2)				

Table 124 (continued)
GPRS SNDCP statistics

Field name	Field type	Default field position	Field value	Field description
discardedNpdusFromMs	L_int		0..4294967295	The number of Network-Protocol Data Units (N-PDUs) that originated from the Mobile Station (MS) that could not be re-assembled. This could result from N-PDUs lost or re-ordered. These N-PDUs were counted.
(Sheet 2 of 2)				

Table 125
GPRS (Serving GPRS) SG Network Service Virtual Connections (NS-VC) statistics

Field name	Field type	Default field position	Field value	Field description
unitDatasFromPcu	L_int		0..4294967295	The number of NS-UNITDATA Protocol Data Units (PDUs) received from the Packet Control Unit (PCU).
unitDatasToPcu	L_int		0..4294967295	The number of NS-UNITDATA Protocol Data Units (PDUs) sent to the Packet Control Unit (PCU).

Table 126
GPRS Network initialized deactivations of PDP contexts statistics

Field name	Field type	Default field position	Field value	Field description
networkFailure	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) sent a Packet Data Protocol (PDP) CONTEXT DEACTIVATION REQUEST message to the Mobile Station (MS) with a cause code of NETWORK FAILURE. This cause code is sent because of an error situation in the network. These events were counted.
reactivationRequested	L_int		0.. 4294967295	The number of times the Serving GPRS Support Node (SGSN) sent a Packet Data Protocol (PDP) CONTEXT DEACTIVATION REQUEST message to the Mobile Station (MS) with a cause code of REACTIVATE REQUEST. This cause code is sent to MS to request session reactivation. These events were counted.

Table 127
GPRS Packet Control Units (PCU) Network Service Virtual Connections (NS-VC) and PCU Network Service Entity (NSE) statistics

Field name	Field type	Default field position	Field value	Field description
octetsFromSgsn	L_int		0.. 4294967295	<p>If this field was included with a PCU NS-VC record, the number of octets the Network Service Virtual Connection (NS-VC) has processed that were received from the Serving GPRS Support Node (SGSN).</p> <p>If this field was included with a PCU NSE record, the number of octets received from the Serving GPRS Support Node's (SGSN) Network Service Virtual Connections (NS-VCs) served by the peer Network Service Entity (NSE).</p>
octetsToSgsn	L_int		0.. 4294967295	<p>If this field is included with a PCU NS-VC record, the number of octets the Network Service Virtual Connection (NS-VC) has processed that were sent to the Serving GPRS Support Node (SGSN).</p> <p>If this field is included with a PCU NSE record, the number of octets sent to the Serving GPRS Support Node (SGSN) by all the Network Service Virtual Connections (NS-VCs) served by this Network Service Entity (NSE).</p>

Table 128
GPRS Packet Control Units (PCU) Network Service Virtual Connections (NS-VC) statistics

Field name	Field type	Default field position	Field value	Field description
unitDatasFromSgsn	L_int		0..4294967295	The number of NS-UNITDATA Protocol Data Units (PDUs) received from the Serving GPRS Support Node (SGSN).
unitDatasToSgsn	L_int		0..4294967295	The number of NS-UNITDATA Protocol Data Units (PDUs) sent to the Serving GPRS Support Node (SGSN).

Table 129
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) statistics

Field name	Field type	Default field position	Field value	Field description
peakConcurrentTransactions	L_int		0..4294967295	The peak number of concurrent Prepaid Short Message Service (PSMS) transactions that have occurred on this GprsSubscriberControl (Gsc).
activeConnections	L_int		0..4294967295	The number of connections that are currently active between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps). This reflects only those connections that are currently in the Network Connection Control Protocol (NCCP) data exchange state.

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Table 129 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) statistics

Field name	Field type	Default field position	Field value	Field description
totalSuccessfulConnections	L_int		0..4294967295	The number of connections between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps) that have successfully reached the Network Connection Control Protocol (NCCP) data exchange state.
totalFailedConnections	L_int		0..4294967295	The number of connections attempts between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps) that have failed to reach the Network Connection Control Protocol (NCCP) data exchange state.
totalTransactionSuccesses	L_int		0..4294967295	The number of Prepaid Short Message Service (PSMS) transactions that have successfully completed between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps). Specifically, this indicates the Prepaid CTP INCREMENT DECREMENT RESPONSE messages that have been successfully received before the transactionTime has expired.
(Sheet 2 of 3)				

Table 129 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) statistics

Field name	Field type	Default field position	Field value	Field description
totalTransactionFailures	L_int		0..4294967295	The number of Prepaid Short Message Service (PSMS) transactions that have failed between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps). This includes failures due to failed connections, late responses, resource limitations and protocol errors.
totNwkRelatedTransaction Failures	L_int		0..4294967295	The total number of Prepaid Short Message Service (PSMS) transactions that have failed between the GprsSubscriberControl (Gsc) and this external Service Control Point (SCP) due to network related events. This includes transactions rejected due to connection failures, network congestion, and local network resource limitations. This counter counts the events in the collection interval.

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Table 130
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) Service Control Point (SCP) statistics

Field name	Field type	Default field position	Field value	Field description
transactionSuccesses	L_int		0.. 4294967295	The number of Prepaid Short Message Service (PSMS) transactions that have successfully completed between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps). Specifically, this indicates the Prepaid CTP INCREMENT DECREMENT RESPONSE messages that have been successfully received before the transactionTime has expired.
transactionFailures	L_int		0.. 4294967295	The number of Prepaid Short Message Service (PSMS) transactions that have failed between the GprsSubscriberControl (Gsc) and the external Service Control Points (Scps). This includes failures due to failed connections, late responses, resource limitations and protocol errors.
prepaidCtpLocalProtocol Errors	L_int		0.. 4294967295	The number of Prepaid-CTP protocol errors that have been committed locally and the external Service Control Point (Scp) has detected and has reported back to the GprsSubscriberControl (Gsc). The count consists of the transaction portion, component portion, and parameter error categories.
(Sheet 1 of 6)				

Table 130 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSms) Service Control Point (SCP) statistics

Field name	Field type	Default field position	Field value	Field description
prepaidCtpRemoteGeneral Errors	L_int		0..4294967295	The number of Prepaid-CTP general errors that have occurred on the external Service Control Point (Scp) and that have been reported back to the GprsSubscriberControl (Gsc). The count consists of the general error category as described in the Prepaid-CTP specification.
prepaidCtpRemoteProtocol Errors	L_int		0..4294967295	The number of Prepaid-CTP protocol errors that have been committed remotely by the external Service Control Point (Scp) that have been detected and has reported back to the GprsSubscriberControl (Gsc). The count consists of the transaction portion, component portion, and parameter error categories as described in the Prepaid-CTP specification.
nccpLoginSuccesses	L_int		0..4294967295	The number of Network Connection Control Protocol (NCCP) logins that have successfully completed between the GprsSubscriberControl (Gsc) and this external Service Control Point (Scp). Specifically, this indicates the NCCP LOGIN RESPONSE messages received from this Scp before the nccpLoginResponseTimer has expired.

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Table 130 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSms) Service Control Point (SCP) statistics

Field name	Field type	Default field position	Field value	Field description
nccpLoginFailures	L_int		0.. 4294967295	The number of Network Connection Control Protocol (NCCP) logins that have failed between the GprsSubscriberControl (Gsc) and this external Service Control Point (Scp). This count includes failures due to rejected logins as well as late or lost responses.
nccpLoginResponse Timeouts	L_int		0.. 4294967295	The number of times that the nccpLoginResponseTimer expires before receiving a response from the external Service Control Point (Scp) for the Network Connection Control Protocol (NCCP) LOGIN REQUEST message sent.
nccpLogoutSuccesses	L_int		0.. 4294967295	The number of Network Connection control Protocol (NCCP) logouts that have successfully completed between the GprsSubscriberControl (Gsc) and this external Service Control Point (Scp). Specifically, this indicates the NCCP LOGOUT RESPONSE messages received from this Scp before the nccpLogoutResponseTimer has expired.
(Sheet 3 of 6)				

Table 130 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) Service Control Point (SCP) statistics

Field name	Field type	Default field position	Field value	Field description
nccpLogoutFailures	L_int		0.. 4294967295	The number of Network Connection control Protocol (NCCP) logouts that have failed between the GprsSubscriberControl (Gsc) and this external Service Control Point (Scp). Specifically, this indicates the nccpLogoutResponseTimer expirations that have occurred.
nccpRemoteAborts	L_int		0.. 4294967295	The number of Network Connection control Protocol (NCCP) ABORT messages that have been received from this external Service Control Point (Scp).
nccpLocalAborts	L_int		0.. 4294967295	The number of Network Connection control Protocol (NCCP) ABORT messages that have been sent to this external Service Control Point (Scp). This counter also includes the NCCP ABORT messages sent due to aborts caused by the expiration of the NCCP KeepAlive timer.
nccpKeepAliveTimeouts	L_int		0.. 4294967295	The number of Network Connection control Protocol (NCCP) KeepAlive timer expirations that have occurred while communicating with this external Service Control Point (Scp).
(Sheet 4 of 6)				

Table 130 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) Service Control Point (SCP) statistics

Field name	Field type	Default field position	Field value	Field description
nccpKeepAliveAborts	L_int		0.. 4294967295	The number of aborts caused by the Network Connection control Protocol (NCCP) KeepAlive timer expiry. Specifically, this counts the number of NCCP Abort messages that have been sent to this external Service Control Point (Scp) due to aborts caused by KeepAlive timer expirations.
nccpRoundRobinTimeouts	L_int		0.. 4294967295	The number of nccpRoundRobinTimer expirations before the SGSN could establish a connection with any of the Service Processors (SPs) of this external Service Control Point (Scp).
nccpReconnectTimeouts	L_int		0.. 4294967295	The number of nccpReconnectTimer expirations that have occurred while communicating with this external Service Control Point (Scp).
nccpLocalProtocolErrors	L_int		0.. 4294967295	The number of Network Connection Control Protocol (NCCP) protocol errors that have been committed locally and the external Service Control Point (Scp) has detected and has reported back to the GprsSubscriberControl (Gsc).
nccpRemoteProtocolErrors	L_int		0.. 4294967295	The number of Network Connection Control Protocol (NCCP) protocol errors that have been committed remotely by this external Service Control Point (Scp) that have been detected and reported back to the GprsSubscriberControl (Gsc).

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Table 130 (continued)
GPRS Subscriber Control (Gsc) Prepaid Short Message Service (PSMs) Service Control Point (SCP) statistics

Field name	Field type	Default field position	Field value	Field description
tcpConnectSuccesses	L_int		0.. 4294967295	The number of TCP connections that have been successfully established between the GprsSubscriberControl (Gsc) and this Service Control Point (Scp).
tcpConnectFailures	L_int		0.. 4294967295	The number of failed TCP connection attempts between the GprsSubscriberControl (Gsc) and the external Service Control Point (Scp).
networkRelatedTransaction Failures	L_int		0.. 4294967295	The number of Prepaid Short Message Service (PSMS) transactions that have failed between the GprsSubscriberControl (Gsc) and this external Service Control Point (SCP) due to network related events. This includes transactions rejected due to connection failures, network congestion, and local network resource limitations.
(Sheet 6 of 6)				

Table 131
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
cpResponseExhaust	L_int		0.. 4294967295	The number of cpResponseTimer expirations and the cpResponseRetries threshold has been reached before receiving a CP-ACK or CP-ERROR message from the Mobile Station (MS).
rpResponseTimeouts	L_int		0.. 4294967295	The number of rpResponseTimer expirations before receiving a RP-ACK or RP-ERROR message from the Mobile Station (MS).
iwmscResponseTimeouts	L_int		0.. 4294967295	The number of iwmscResponseTimer expirations before receiving a MOBILE ORIGINATED FORWARD SHORT MESSAGE from the Service Center.
moAttempts	L_int		0.. 4294967295	The number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages sent to the ShortMessageService (Sms) from the Mobile Station (MS).
(Sheet 1 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailures	L_int		0..4294967295	The number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages sent to the ShortMessageService (Sms) from the Mobile Station (MS) that failed because of one of the following conditions: Network Out Of Order Protocol Error Congestion Operator Determined Barring Unidentified Subscriber Unknown Subscriber Invalid Transaction Identifier Value Message Type non-existence Invalid mandatory information Invalid short message transfer reference value Message not compatible with short message protocol state Requested Facility not subscribed Requested Facility not implemented Unassigned number Short Message transfer reject.
(Sheet 2 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailUnidentified Subscriber	L_int		0..4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages received by the ShortMessageService (Sms) from the Mobile Station (MS) that failed because the MS is not registered in the Public Land Mobile Network (PLMN), the MS is not subscribed in a Service Center (SC) or the MS Prepaid Mobile Originated SMS account is depleted.</p> <p>This counter is incremented when the SGSN sends a CP-Data(RP-Error) message to the MS with error cause "unidentifiedSubscriber" selected. The value of this attribute is included in the count of moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 3 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailNetworkFailures	L_int		0..4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages received by the ShortMessageService (Sms) from the Mobile Station (MS) that failed because the MS is not registered in the Public Land Mobile Network (PLMN), the MS is not subscribed in a Service Center (SC) or the MS Prepaid Mobile Originated SMS account is depleted.</p> <p>This counter is incremented when the SGSN sends a CP-Data(RP-Error) message to the MS with error cause "unidentifiedSubscriber" selected. The value of this attribute is included in the count of moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 4 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailFacilityNotSupp	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages received by the ShortMessageService (Sms) from the Service Center (SC) that failed because the network is unable to provide the requested short message services.</p> <p>This counter is incremented when the SGSN receives a MOForwardMessageAckRsp message with "facilityNotSupported" error cause selected. The value of this attribute is included in the count of moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 5 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailCongestion	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages received by the ShortMessageService (Sms) from the Mobile Station (MS) that failed because the short message service cannot be serviced because of high traffic.</p> <p>This counter is incremented when the SGSN receives a Mobile Originated message with "SC-congestion" error cause selected from the SMS-IWMSC (Short Message Service-InterWorking MSC). The value of this attribute is included in the count of the moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 6 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailUnknownService Center	L_int		0..4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Mobile Station (MS) that failed because the destination requested by the MS is not currently assigned or allocated.</p> <p>This counters is incremented when the SGSN receives a MOForwardShortMessageAckRsp message with "unknownServiceCenter" error cause selected. The value of this attribute is included in the count of the moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 7 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailInvalidSmeAddress	L_int		0..4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages received by the ShortMessageService (Sms) from the Mobile Station (MS) that failed because the Service Center (SC) received an invalid Short Message Entity address.</p> <p>This counter is incremented when the SGSN receives a MOForwardShortMessageAckRsp message with "invalidSMEAddress" error cause selected. The value of this attribute is included in the count of the moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 8 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailMissingSms Subscription	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Mobile Station (MS) that failed because the Mobile Subscriber subscription information does not include Mobile Originated Short Message Services.</p> <p>This counter is incremented when the SGSN sends a CP-Data (RP-Error) message to the MS with error cause "RequestedFacilityNotSubscribed" selected. The value of this attribute is included in the count of the moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 9 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailOdbSubscriber	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE ORIGINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Mobile Station (MS) that failed because the MS is forbidden from originating Short Message Services (SMS) messages.</p> <p>This counter is incremented when the SGSN sends a CP-Data (RP-Error) message to the MS with error cause "Operator Determined Barring" selected. The value of this attribute is included in the count of the moFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 10 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
moFailOthers	L_int		0.. 4294967295	<p>This attribute counts the MOBILE ORIGINATED FORWARD SHORT MESSAGE messages received by the ShortMessageService (Sms) component from the Mobile Station (MS) that failed due to one of the following conditions:</p> <ul style="list-style-type: none"> Unknown Subscriber Invalid Transaction Identifier Value Message Type non-existence Invalid mandatory information Invalid short message transfer reference value Message not compatible with short message protocol state Unassigned number Short Message transfer reject <p>The counter wraps to zero when it exceeds the maximum value.</p>
mtAttempts	L_int		0.. 4294967295	<p>The number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent to the ShortMessageService (Sms) from the Service Center. This includes the failures counted by mtFailures.</p>
(Sheet 11 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailures	L_int		0.. 4294967295	The number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent to the ShortMessageService (Sms) from the Service Center that failed because of one of the following conditions: Network Out Of Order Unidentified Subscriber Absent Subscriber Subscriber Busy for SMS Unexpected Data Value Data Missing Equipment Protocol Error Equipment Not SM-Equipped Message Type non-existence Invalid mandatory information Invalid short message transfer reference value Message not compatible with short message protocol state Requested Facility not subscribed Memory Capacity Exceeded Semantically incorrect message.
(Sheet 12 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailUnidentified Subscriber	L_int		0..4294967295	<p>This attribute counts the number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Service Center that failed because the Mobile Station (MS) is not known within the SGSN or the MS location is not confirmed in the HLR.</p> <p>This counter is incremented when the SGSN sends a negative MTForwardShortMessageAckRsp message to the SIG (SS7 Ip Gateway) with "unidentified Subscriber" error cause selected. The value of this attribute is included in the count of mtFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 13 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailSubscriberAbsent	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Service Center that failed because a Mobile Station (MS) did not respond to a Packet Paging Request or a MS is detached from the network.</p> <p>This counter is incremented when the SGSN sends a negative MTForwardShortMessageAckRsp message to the SIG (SS7 IP Gateway) with "Absent Subscriber_SM" error cause and "Gprs Detached" or "No Paging Response from GPRS" diagnostic information selected. The value of this attribute is included in the count of the mtFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 14 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailSubscriberBusy	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Service Center that failed because an another mobile terminated short message transfer is going on and the Mobile Terminated SMS Message Buffer Queue has reached its capacity limit, the message was buffered but it is not possible to deliver the message before the expiry of the buffering time or the Mobile Station (MS) is performing an inter SGSN routing area update. The value of this attribute is included in the mtFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>

(Sheet 15 of 19)

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailSubscriberNotSm Equipped	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Service Center that failed because the Mobile Station did not support Short Message Services (SMS) messages.</p> <p>This counter is incremented when the SGSN sends a negative MTForwardShortMessageAckRsp message to the SIG (SS7 Ip Gateway) with "equipmentNotSM-Equipped" user error selected. The value of this attribute is included in the count of mtfailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
mtFailNetworkFailures	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Service Center that failed because the network is not functioning correctly, a task cannot be performed because of a problem with the network or an equipment protocol error occurs. The value of this attribute is included in the count of mtFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>

(Sheet 16 of 19)

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailMemCapExceed	L_int		0.. 4294967295	<p>This attribute counts the number of MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) to the Mobile Subscriber (MS) that failed because the MS cannot store the incoming short message due to lack of storage capacity.</p> <p>This counter is incremented when the SGSN sends a negative MTForwardShortMessageAckRsp message to the SIG (SS7 Ip Gateway) with "SM-DeliveryFailure cause: MemoryCapacityExceeded" user error selected. The value of this attribute is included in the count of mtFailures.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
(Sheet 17 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mtFailOthers	L_int		0.. 4294967295	<p>This attribute counts the MOBILE TERMINATED FORWARD SHORT MESSAGE messages sent from the ShortMessageService (Sms) component to the Service Center that failed due to one of the following conditions:</p> <ul style="list-style-type: none"> Unexpected Data Value Data Missing Message Type non-existence Invalid mandatory information Invalid short message transfer reference value Message not compatible with short message protocol state Semantically incorrect message System Failures <p>The counter wraps to zero when it exceeds the maximum value.</p>
mmaAttempts	L_int		0.. 4294967295	<p>The number of MORE MEMORY AVAILABLE messages sent to the ShortMessageService (Sms) from the Mobile Station (MS). This includes the failures counted by mmaFailures.</p>
(Sheet 18 of 19)				

Table 131 (continued)
GPRS Subscriber Control (Gsc) Short Message Service (Sms) statistics

Field name	Field type	Default field position	Field value	Field description
mmaFailures	L_int		0..4294967295	The number of MORE MEMORY AVAILABLE messages sent to the ShortMessageService (Sms) from the Mobile Station (MS) that failed because of one of the following conditions: Network Out Of Order Protocol Error Congestion Operator Determined Barring Unidentified Subscriber Unknown Subscriber Invalid Transaction Identifier Value Message Type non-existence Invalid mandatory information Invalid short message transfer reference value Message not compatible with short message protocol state Requested Facility not implemented.
(Sheet 19 of 19)				

Table 132
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
openScdrs	L_int		0.. 4294967295	The number of SGSN Packet Data Protocol Call Detail Records (S-CDRs) opened by the SGSN Accounting Server (SAS).
openMcdrs	L_int		0.. 4294967295	The number of Mobility Call Detail Records (M-CDRs) opened by the SGSN Accounting Server (SAS).
closedScdrs	L_int		0.. 4294967295	The number of SGSN Packet Data Protocol Call Detail Records (S-CDRs) closed by the SGSN Accounting Server (SAS). Closed S-CDRs are those CDRs that have been written to disk.
closedMcdr	L_int		0.. 4294967295	The number of Mobility Call Detail Records (M-CDRs) opened by the SGSN Accounting Server (SAS). Closed CDRs are those M-CDRs that have been written to disk.
scdrsUpdated	L_int		0.. 4294967295	The number of SGSN Packet Data Protocol Call Detail Records (S-CDRs) updated in the SGSN Accounting Server (SAS). Updated means that an open CDR was modified due to some external event. An S-CDR can be updated more than once, and this attribute is incremented for each update.
(Sheet 1 of 8)				

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
mcdrsUpdated	L_int		0.. 4294967295	The number of Mobility Call Detail Records (M-CDRs) updated in the SGSN Accounting Server (SAS). Updated means that an open CDR was modified due to some external event. An M-CDR can be updated more than once, and this attribute is incremented for each update.
smoCdrs	L_int		0.. 4294967295	The number of Mobile Originated Short Message Service (SMS) Call Detail Records (CDRs) generated in the SGSN Accounting Server (SAS). The SMS CDRs do not have states (such as opened, closed) like other CDR types. When SAS receives a message that a SMS CDR message is sent through the network, SAS writes the SMS CDR directly to disk, which means an SMS CDR is generated.
smtCdrs	L_int		0.. 4294967295	The number of Mobile Terminated Short Message Service (SMS) Call Detail Records (CDRs) generated in the SGSN Accounting Server (SAS). The SMS CDRs do not have states (such as opened, closed) like other CDR types. When SAS receives a message that a SMS CDR message is sent through the network, SAS writes the SMS CDR directly to disk, which means an SMS CDR is generated.
(Sheet 2 of 8)				

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
partialScdrs	L_int		0.. 4294967295	The number of SGSN Packet Data Protocol Call Detail Record (S-CDR) partial records generated in the SGSN Accounting Server (SAS) due to the expiry of the scdrPartialRecordInterval.
dataVolumeLimitPartialScdrs	L_int		0.. 4294967295	This attribute counts the partial SGSN Packet Data Protocol (PDP) Call Detail Records (S-CDRs) generated in the SGSN Accounting Server (SAS) when the threshold of the dataVolumeLimit attribute (defined in the Usgsn and Sgsn components for UMTS and GPRS, respectively) is reached. This counter counts the events in the collection interval.
timeDurationLimitPartialScdrs	L_int		0.. 4294967295	This attribute counts the partial SGSN Packet Data Protocol (PDP) Call Detail Records (S-CDRs) generated in the SGSN Accounting Server (SAS) due to the expiry of the scdrPartialRecordInterval attribute. This counter counts the events in the collection interval.
(Sheet 3 of 8)				

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
maxChargingCondition PartialScdrs	L_int		0.. 4294967295	This attribute counts the partial SGSN Packet Data Protocol (PDP) Call Detail Records (S-CDRs) generated in the SGSN Accounting Server (SAS) when the maximum number of charging condition changes, as specified by the scdrMaxContainers attribute, is reached. This counter counts the events in the collection interval.
mgmtInterventionPartial Scdrs	L_int		0.. 4294967295	This attribute counts the partial SGSN Packet Data Protocol (PDP) Call Detail Records (S-CDRs) generated in the SGSN Accounting Server (SAS) with a partial record reason of "management intervention". This counter counts the events in the collection interval.
qosChangeScdrContainers	L_int		0.. 4294967295	This attribute counts the SGSN Packet Data Protocol (PDP) Call Detail Record (S-CDR) "List of Traffic Data Volumes" containers closed in the SGSN Accounting Server (SAS) due to a QoS change. This counter counts the events in the collection interval.
(Sheet 4 of 8)				

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
tariffTimeChangeScdr Containers	L_int		0.. 4294967295	This attribute counts the SGSN Packet Data Protocol (PDP) Call Detail Record (S-CDR) "List of Traffic Data Volumes" containers closed in the SGSN Accounting Server (SAS) due to a tariff time change. This counter counts the events in the collection interval.
partialMcdrs	L_int		0.. 4294967295	The number of Mobility Call Detail Record (M-CDR) partial records generated in the SGSN Accounting Server (SAS) due to the expiry of the mcdrPartialRecordInterval.
timeDurationLimitPartial Mcdrs	L_int		0.. 4294967295	This attribute counts the partial Mobility Call Detail Records (M-CDRs) generated in the SGSN Accounting Server (SAS) due to the expiry of the mcdrPartialRecordInterval attribute. This counter counts the events in the collection interval.
maxChangeCondition PartialMcdrs	L_int		0.. 4294967295	This attribute counts the partial Mobility Call Detail Records (M-CDRs) generated in the SGSN Accounting Server (SAS) when the maximum number of mobility changes, as specified by the mcdrMaxContainers attribute, is reached. This counter counts the events in the collection interval.
(Sheet 5 of 8)				

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
mobilityChangeMcdr Containers	L_int		0.. 4294967295	This attribute counts the Mobility Call Detail Record (M-CDR) "Change of Location" containers closed in the SGSN Accounting Server (SAS) due to a mobility change. This counter counts the events in the collection interval.
cdrsXferCgf1	L_int		0.. 4294967295	The number of Call Detail Records (CDRs) successfully transferred from the SGSN Accounting Server (SAS) to the primary Charging Gateway Functionality (CGF). This attribute is incremented each time a CDR is transferred to the CGF.
cdrsXferCgf1Fail	L_int		0.. 4294967295	The number of unsuccessful Call Detail Record (CDR) transfers from the SGSN Accounting Server (SAS) to the primary Charging Gateway Functionality (CGF). This value is incremented whenever a CDR fails to get transferred to the primary CGF. Multiple attempts to send a CDR increment the statistic only once.
cdrsXferCgf2	L_int		0.. 4294967295	The number of Call Detail Records (CDRs) successfully transferred from the SGSN Accounting Server (SAS) to the secondary Charging Gateway Functionality (CGF). This attribute is incremented each time a CDR is transferred to the CGF.
(Sheet 6 of 8)				

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
cdrsXferCgf2Fail	L_int		0.. 4294967295	The number of unsuccessful Call Detail Record (CDR) transfers from the SGSN Accounting Server (SAS) to the secondary Charging Gateway Functionality (CGF). This value is incremented whenever a CDR fails to get transferred to the secondary CGF. Multiple attempts to send a CDR increment the statistic only once.
gtpMsgXferCgf1	L_int		0.. 4294967295	The number of GPRS Tunnelling Protocol (GTP) messages successfully transferred to the primary Charging Gateway Functionality (CGF).
gtpMsgXferCgf1Fail	L_int		0.. 4294967295	The number of unsuccessful GPRS Tunnelling Protocol (GTP) message transfers to the primary Charging Gateway Functionality (CGF). The value is incremented whenever a GTP message is rejected or unacknowledged by the primary CGF. Multiple message attempts increment the statistic only once.
gtpMsgXferCgf2	L_int		0.. 4294967295	The number of GPRS Tunnelling Protocol (GTP) messages successfully transferred to the secondary Charging Gateway Functionality (CGF).

(Sheet 7 of 8)

Table 132 (continued)
GPRS SGSN Accounting Server (SAS) statistics

Field name	Field type	Default field position	Field value	Field description
gtpMsgXferCgf2Fail	L_int		0.. 4294967295	The number of unsuccessful GPRS Tunnelling Protocol (GTP) message transfers to the secondary Charging Gateway Functionality (CGF). The value is incremented whenever a GTP message is rejected or unacknowledged by the secondary CGF. Multiple message attempts increment the statistic only once.

(Sheet 8 of 8)

Table 133
SGSN Tiered Subscription Service statistics

Field name	Field type	Default field position	Field value	Field description
pktsPerTierToMobile	L_int		0.. 4294967295	The number of packets successfully serviced by SGSN for each tier in the down link direction.
octetsPerTierToMobile	L_int		0.. 4294967295	The number of octets successfully serviced by SGSN for each tier in the down link direction.

(Sheet 1 of 2)

Table 133 (continued)
SGSN Tiered Subscription Service statistics

Field name	Field type	Default field position	Field value	Field description
pktsDropped	L_int		0.. 4294967295	The number of packets dropped by the Tiered Subscription of the SGSN/USGSN for each tier in the collection interval. For example, if the peak throughput for a context is 56kbit/s and there is a burst of downlink data packets exceeding 56kbit/s, then the excess packets are dropped, and the pktsDropped attribute is incremented each time a packet is dropped.
activePdpCServiced	L_int		0.. 4294967295	The current number of PDP contexts that are active for each tier. This value is incremented on a PDP context activation for a tier and decremented when a PDP context is deactivated for the tier. This value is reported at the end of the collection interval.
peakPdpCServiced	L_int		0.. 4294967295	The maximum number of PDP contexts serviced for the tier. The value is incremented every time currentPdpCServiced for that tier exceeds the current value of peakPdpCServiced for that tier. It is reset to currentPdpCServiced after every data collection.
(Sheet 2 of 2)				

Table 134
GPRS Session Management statistics

Field name	Field type	Default field position	Field value	Field description
currentRoamers	L_int		0.. 4294967295	The number of current roamers that are currently being serviced by the SGSN. A roamer is a mobile that is not in its H-PLMN. This attribute is incremented whenever a PDP context is activated and is decremented whenever a PDP context is de-activated. This counter counts the events at the end of the collection interval.

Table 135
Wireless Gateway Circuit Switched (CS) domain statistics

Field name	Field type	Default field position	Field value	Field description
rabAssignRequests	L_int		0.. 4294967295	The number of RAB ASSIGNMENT REQUEST messages that were sent to the RNC.
relocRequests	L_int		0.. 4294967295	The number of RELOCATION REQUEST messages that were sent to the RNC.
paging	L_int		0.. 4294967295	The number of PAGING messages that were sent to the RNC.
iuReleaseCmds	L_int		0.. 4294967295	The number of IU RELEASE COMMAND messages that were sent to the RNC.
(Sheet 1 of 5)				

Table 135 (continued)
Wireless Gateway Circuit Switched (CS) domain statistics

Field name	Field type	Default field position	Field value	Field description
relocCmds	L_int		0.. 4294967295	The number of RELOCATION COMMAND messages that were sent to the RNC.
relocPrepFailures	L_int		0.. 4294967295	The number of RELOCATION PREPARATION FAILURE messages that were sent to the RNC.
relocCancelAcks	L_int		0.. 4294967295	The number of RELOCATION CANCEL ACKNOWLEDGE messages that were sent to the RNC.
commonIds	L_int		0.. 4294967295	The number of COMMON ID messages that were sent to the RNC.
cnInvokeTraces	L_int		0.. 4294967295	The number of CN INVOKE TRACE messages that were sent to the RNC.
securityModeCmds	L_int		0.. 4294967295	The number of SECURITY MODE COMMAND messages that were sent to the RNC.
directTransfers	L_int		0.. 4294967295	The total number of DIRECT TRANSFER messages between the RNC and the Core Network in either direction.
resets	L_int		0.. 4294967295	The total number of RESET messages between the RNC and the Core Network in either direction.
resetAcks	L_int		0.. 4294967295	The total number of RESET ACKNOWLEDGE messages between the RNC and the Core Network in either direction.
(Sheet 2 of 5)				

Table 135 (continued)
Wireless Gateway Circuit Switched (CS) domain statistics

Field name	Field type	Default field position	Field value	Field description
errorIndications	L_int		0.. 4294967295	The total number of ERROR INDICATION messages between the RNC and the Core Network in either direction.
initialUeMessages	L_int		0.. 4294967295	The number of INITIAL UE messages that were received from the RNC.
rabAssignResponses	L_int		0.. 4294967295	The number of RAB ASSIGNMENT RESPONSE messages that were received from the RNC.
rabReleaseRequests	L_int		0.. 4294967295	The number of RAB RELEASE REQUEST messages that were received from the RNC.
iuReleaseRequests	L_int		0.. 4294967295	The number of Iu RELEASE REQUEST messages that were received from the RNC.
iuReleaseComps	L_int		0.. 4294967295	The number of Iu RELEASE COMPLETE messages that were received from the RNC.
relocRqds	L_int		0.. 4294967295	The number of RELOCATION REQUIRED messages that were received from the RNC.
relocRequestAcks	L_int		0.. 4294967295	The number of RELOCATION REQUEST ACKNOWLEDGE messages that were received from the RNC.
relocDetects	L_int		0.. 4294967295	The number of RELOCATION DETECT messages that were received from the RNC.
relocComps	L_int		0.. 4294967295	The number of RELOCATION COMPLETE messages that were received from the RNC.

(Sheet 3 of 5)

Table 135 (continued)
Wireless Gateway Circuit Switched (CS) domain statistics

Field name	Field type	Default field position	Field value	Field description
relocFailures	L_int		0.. 4294967295	The number of RELOCATION FAILURE messages that were received from the RNC.
relocCancels	L_int		0.. 4294967295	The number of RELOCATION CANCEL messages that were received from the RNC.
securityModeComps	L_int		0.. 4294967295	The number of SECURITY MODE COMPLETE messages that were received from the RNC.
resetCircuits	L_int		0.. 4294967295	The number of RESET CIRCUIT messages between the Core Network and the DMS Call Server.
unequipCircuits	L_int		0.. 4294967295	The number of UNEQUIPPED CIRCUIT messages received from the DMS Call Server.
blocks	L_int		0.. 4294967295	The number of BLOCK messages that were sent to the DMS Call Server.
unblocks	L_int		0.. 4294967295	The number of UNBLOCK messages that were sent to the DMS Call Server.
circuitGrpBlocks	L_int		0.. 4294967295	The number of CIRCUIT GROUP BLOCK messages that were sent to the DMS Call Server.
circuitGrpUnblocks	L_int		0.. 4294967295	The number of CIRCUIT GROUP UNBLOCK messages that were sent to the DMS Call Server.
securityModeRjcts	L_int		0.. 4294967295	The number of SECURITY MODE REJECT messages that were received from the RNC.
rabSetups	L_int		0.. 4294967295	The number of RAB SETUP messages that were received from the Virtual Media Gateway.
(Sheet 4 of 5)				

Table 135 (continued)
Wireless Gateway Circuit Switched (CS) domain statistics

Field name	Field type	Default field position	Field value	Field description
rabSetupResps	L_int		0.. 4294967295	The number of RAB SETUP RESPONSE messages that were received from the RNC.
releases	L_int		0.. 4294967295	The number of RELEASE messages between RANAP-CS and the Virtual Media Gateway.
(Sheet 5 of 5)				

Table 136
SS7 MTP 3 linkset statistics

Field name	Field type	Default field position	Field value	Field description
linkSetsUnavailable	L_int		0.. 4294967295	The number of linkset unavailable conditions.

Table 137
SS7 SAAL-NNI statistics

Field name	Field type	Default field position	Field value	Field description
insvFailures	L_int		0.. 4294967295	The number of in-service link outages. It does not include failures which occur during the alignment process.

Table 137 (continued)
SS7 SAAL-NNI statistics

Field name	Field type	Default field position	Field value	Field description
pduTx	L_int		0.. 4294967295	The number of protocol data units transmitted.
pduRx	L_int		0.. 4294967295	The number of protocol data units recieved.
pduOctetsTx	L_int		0.. 4294967295	The number of payload PDU octets transmitted.
pduRetransmits	L_int		0.. 4294967295	The number of protocol data units retransmitted because of negative acknowledgements.

Table 138
SS7 Signalling Connection Control Part (SCCP) statistics

Field name	Field type	Default field position	Field value	Field description
activeConnections	L_int		0.. 4294967295	The number of open signalling connections for the SCCP component. The maximum number of open signalling connections is set by attribute maxConnections.
(Sheet 1 of 3)				

Table 138 (continued)
SS7 Signalling Connection Control Part (SCCP) statistics

Field name	Field type	Default field position	Field value	Field description
rejectedConnections	L_int		0.. 4294967295	The number of times a signalling connection establishment request by the application was refused. The reasons include: the subsystem being down, the number of open connections exceeding the limit specified by the attribute maxConnections. This includes the number of rejected connections indicated by attribute maxConnExhausted.
maxConnectionsExhausted	L_int		0.. 4294967295	The number of times a signalling connection establishment request by the application was refused because the number of open connections reached the limit specified by the attribute maxConnection.
lostConnections	L_int		0.. 4294967295	The number of open signalling connections lost due to unavailability of the SCCP Subsystem.
invalidMessages	L_int		0.. 4294967295	The number of invalid (syntax error or undecodable) messages received.
messagesTx	L_int		0.. 4294967295	The number of messages sent to layer 3. This includes maintenance messages.
payloadMessagesTx	L_int		0.. 4294967295	The number of payload messages transmitted.
messagesRx	L_int		0.. 4294967295	The number of messages received from layer 3. This includes maintenance messages.
(Sheet 2 of 3)				

Table 138 (continued)
SS7 Signalling Connection Control Part (SCCP) statistics

Field name	Field type	Default field position	Field value	Field description
payloadMessagesRx	L_int		0.. 4294967295	The number of payload messages received.
localRoutingFailures	L_int		0.. 4294967295	The number of routing failures to the local subsystem.
remoteRoutingFailures	L_int		0.. 4294967295	The number of routing failures to the remote subsystem.
(Sheet 3 of 3)				

Table 139
GPRS Mobility Management (GMM) for UMTS statistics

Field name	Field type	Default field position	Field value	Field description
pmmIdleStateSubscribers	L_int		0.. 4294967295	The number of mobile subscribers that are GPRS-attached and in the PMM-IDLE state
pmmConnectedState Subscribers	L_int		0.. 4294967295	The number of mobile subscribers that are GPRS-attached and in the PMM-CONNECTED state.
currentlyAttached	L_int		0.. 4294967295	The number of Mobile Stations (MS) that are currently GPRS-attached and in the PMM-IDLE or PMM-CONNECTED state. The maximum subscribers that can be GPRS-attached is provisioned in the maxAttachedSubscribers attribute of the parent UmtsSubscriberControl (Usc) component.
(Sheet 1 of 5)				

Table 139 (continued)
GPRS Mobility Management (GMM) for UMTS statistics

Field name	Field type	Default field position	Field value	Field description
attachesSuccessful	L_int		0.. 4294967295	The number of GPRS-attaches to this UMTS Serving GPRS Support Node (USGSN) that were successful.
attachesWithKnownPtmsi	L_int		0.. 4294967295	The number of ATTACH REQUEST messages received with a Packet-Temporary Mobile Subscriber Identity (P-TMSI) previously assigned by this UMTS Serving GPRS Support Node (USGSN). This includes all successful and unsuccessful attempts.
attachesWithUnknownPtmsi	L_int		0.. 4294967295	The number of ATTACH REQUEST messages received with a Packet-Temporary Mobile Subscriber Identity (P-TMSI) not assigned by this UMTS Serving GPRS Support Node (USGSN). This includes all successful and unsuccessful attempts.
attachesWithImsi	L_int		0.. 4294967295	The number of ATTACH REQUEST messages received with an International Mobile Subscriber Identity (IMSI) as an identifier. This includes all successful and unsuccessful attempts.
authenticationRequests	L_int		0.. 4294967295	The number of AUTHENTICATION AND CIPHERING REQUEST messages sent to the MS requiring only authentication and messages requiring both authentication and ciphering.
(Sheet 2 of 5)				

Table 139 (continued)
GPRS Mobility Management (GMM) for UMTS statistics

Field name	Field type	Default field position	Field value	Field description
cipheringRequests	L_int		0.. 4294967295	The number of AUTHENTICATION AND CIPHERING REQUEST messages sent to the Mobile Stations (MS) requiring only ciphering.
securityModeRequests	L_int		0.. 4294967295	This attribute counts the number of times the Security Mode procedure was initiated by the UMTS Serving GPRS Support Node (USGSN). The counter counts the events in the collection interval.
serviceRequestsFor Signalling	L_int		0.. 4294967295	The number of SERVICE REQUEST messages sent by mobile stations (MS) requesting a signalling connection in order to send uplink signalling messages (such as ATTACH REQUEST, PDP CONTEXT REQUEST).
serviceRequestsForData	L_int		0.. 4294967295	The number of SERVICE REQUEST messages sent by mobile stations (MS) requesting a resource reservation for active PDP contexts.
serviceRequestsForPaging Response	L_int		0.. 4294967295	The number of SERVICE REQUEST messages sent by mobile stations (MS) indicating a paging response.
detachesSuccessful	L_int		0.. 4294967295	The number of successful DETACHes that are either mobile or network initiated.
(Sheet 3 of 5)				

Table 139 (continued)
GPRS Mobility Management (GMM) for UMTS statistics

Field name	Field type	Default field position	Field value	Field description
msDetachRejected	L_int		0.. 4294967295	The number of Mobile Station (MS) initiated GPRS-DETACH REQUEST messages that have been rejected by this UMTS Serving GPRS Support Node (USGSN).
normalIntraUSGSNRa Update	L_int		0.. 4294967295	The number of normal intra-Serving GPRS Support Node ROUTING AREA UPDATE REQUEST messages received from the Mobile Station (MS).
periodicIntraUSGSNRa Update	L_int		0.. 4294967295	The number of periodic intra-Serving GPRS Support Node ROUTING AREA UPDATE REQUEST messages from the Mobile Station (MS).
normalInterUSGSNRa Update	L_int		0.. 4294967295	The number of inter-UMTS Serving GPRS Support Node ROUTING AREA UPDATE REQUEST messages from the Mobile Station (MS).
intraRaCellChange	L_int		0.. 4294967295	The number of intra-Serving GPRS Support Node Routing Area Update cell changes performed by the Mobile Station (MS).
initialPsPageRequests	L_int		0.. 4294967295	The number of initial PS (Packet-Switched) PAGE REQUEST messages sent to the Mobile Station (MS).
reattemptPsPageRequests	L_int		0.. 4294967295	The re-attempt PS (Packet-Switched) PAGE REQUEST messages sent to the Mobile Station (MS) after the initial page request.
(Sheet 4 of 5)				

Table 139 (continued)
GPRS Mobility Management (GMM) for UMTS statistics

Field name	Field type	Default field position	Field value	Field description
psPagingProcFailures	L_int		0.. 4294967295	This attribute indicates the PS (Packet-Switched) paging procedures initiated by the UMTS Serving GPRS Support Node (USGSN) over the lu interface that are rejected by the Mobile Station (MS). This counter counts the events in the collection interval.
interSgsnRaUpdateAccepts	L_int		0.. 4294967295	The number of ROUTING AREA UPDATE ACCEPT messages sent from this SGSN, while acting as the new SGSN, to the Mobile Station (MS).
interSgsnRaUpdateRejects	L_int		0.. 4294967295	The number of ROUTING AREA UPDATE REJECT messages sent from this SGSN, while acting in the role of new SGSN, to the Mobile Station (MS).
intraSgsnRaUpdateRejects	L_int		0.. 4294967295	The number of ROUTING AREA UPDATE REJECT messages sent during an Intra-SGSN Routing Area Update to the Mobile Station (MS).
periodicRaUpdateRejects	L_int		0.. 4294967295	The number of ROUTING AREA UPDATE REJECT messages sent during Periodic Routing Area Updates to the Mobile Station (MS).
(Sheet 5 of 5)				

Table 140
UMTS GPRS Tunneling Protocol statistics

Field name	Field type	Default field position	Field value	Field description
echoRqstsTx	L_int		0.. 4294967295	The number of Echo Request Messages sent over the collection interval. The count is taken at the end of the collection interval.
gnEchoRespTx	L_int		0.. 4294967295	The number of Echo Response Messages sent on the Gn Interface over the collection interval. The count is taken at the end of the collection interval.
pathFailures	L_int		0.. 4294967295	This attribute indicates the number of path failures detected by GTPC, based on the attribute strictPathSupervision in Usgrn Usc, over the collection interval. If strictPathSupervision has the value enabled, failure of the remote end to respond to any GTP request will result in path failure being declared. If strictPathSupervision has the value disabled, then failure of the remote end to respond to an echo request will be marked as a path failure, but all other failures will not be detected.
idenRqstMsgsTx	L_int		0.. 4294967295	The number of times the USGSN sent a IDENTIFICATION REQUEST message to the Mobile Station (MS) over the collection interval. The count is taken at the end of the collection interval.

(Sheet 1 of 2)

Table 140 (continued)
UMTS GPRS Tunneling Protocol statistics

Field name	Field type	Default field position	Field value	Field description
sgsnCntxtRqstMsgsTx	L_int		0.. 4294967295	The number of times the USGSN sent a SGSN CONTEXT REQUEST Message to the Mobile Station (MS) over the collection interval. The count is taken at the end of the collection interval.
sgsnCntxtAckRqstMsgsTx	L_int		0.. 4294967295	The number of times the USGSN sent a SGSN CONTEXT ACKNOWLEDGE REQUEST Message to the Mobile Station (MS). The count is taken at the end of the collection interval.
(Sheet 2 of 2)				

Table 141
UMTS GPRS Tunneling Protocol Management statistics

Field name	Field type	Default field position	Field value	Field description
echoRequestsTransmitted	L_int		0.. 4294967295	The number of Echo Request Messages sent over the Gn interface. The counter wraps to zero when it exceeds the maximum value.
echoResponsesTransmitted	L_int		0.. 4294967295	The number of Echo Response Messages sent on the Gn Interface. The counter wraps to zero when it exceeds the maximum value.
(Sheet 1 of 2)				

Table 141 (continued)
UMTS GPRS Tunneling Protocol Management statistics

Field name	Field type	Default field position	Field value	Field description
pathFailures	L_int		0.. 4294967295	<p>This attribute counts the path failures detected by the GPRS Tunnelling Protocol (GTP), based on the attribute strictPathSupervision, provisioned in the Sgsn Gsc component.</p> <p>If the attribute strictPathSupervision has a value enabled, failure of the remote end to respond to any GTP request will result in a path failure being declared.</p> <p>If the attribute strictPathSupervision has a value disabled, then failure of the remote end to respond to an echo request will be marked as a path failure, but all other failures will not be detected.</p> <p>The counter wraps to zero when it exceeds the maximum value.</p>
incomingRequestsRejected	L_int		0.. 4294967295	<p>This attribute counts the number of the incoming GPRS Tunnelling Protocol (GTP) requests that were rejected because the maximum number of outstanding incoming requests was exceeded. This maximum is based on the attribute maxIncomingRequests.</p> <p>The counter wraps to zero when it exceeds its maximum value.</p>

(Sheet 2 of 2)

Table 142
GPRS Tunneling Protocol statistics

Field name	Field type	Default field position	Field value	Field description
octetsToNetwork	L_int		0.. 4294967295	This attribute counts the total octets of the GPRS Tunneling Protocol (GTP) transmitted in Packet Data Unit (PDU) to Gateway GPRS Support Node (GGSN). The counter counts the events in the collection interval.
octetsFromNetwork	L_int		0.. 4294967295	This attribute counts the total octets of the GPRS Tunneling Protocol (GTP) received in Packet Data Unit (PDU) from the Gateway GPRS Support Node (GGSN). The counter counts the events in the collection interval.
pdusToNetwork	L_int		0.. 4294967295	This attribute counts the GPRS Tunneling Protocol (GTP) Data Units (PDU) transmitted to the Gateway GPRS Support Node (GGSN). The counter counts the events in the collection interval.
pdusFromNetwork	L_int		0.. 4294967295	This attribute counts the GPRS Tunneling Protocol (GTP) Data Units (PDU) received from the Gateway GPRS Support Node (GGSN). The counter counts the events in the collection interval.
(Sheet 1 of 2)				

Table 142 (continued)
GPRS Tunneling Protocol statistics

Field name	Field type	Default field position	Field value	Field description
discPdusFromNetwork	L_int		0..4294967295	This attribute counts the incoming GPRS Tunneling Protocol (GTP) Protocol Data Units (PDUs) discarded because of traffic congestion or because no Packet Data Protocol (PDP) Context has been established. The counter counts the events in the collection interval.
(Sheet 2 of 2)				

Table 143
UMTS Home Location Register (HLR) Cache statistics

Field name	Field type	Default field position	Field value	Field description
currHlrCachePdpContexts	L_int		0..4294967295	The current number of Packet Data Protocol (PDP) context subscription data records that are stored in the HLR Cache. The maximum number of PDP contexts that can be stored in the HLR Cache is provisioned in attribute maxPdpContexts.
cacheHits	L_int		0..4294967295	The number of times the HLR Cache had the subscriber information locally and did not need to retrieve information from the Home Location Register (HLR).
(Sheet 1 of 3)				

Table 143 (continued)
UMTS Home Location Register (HLR) Cache statistics

Field name	Field type	Default field position	Field value	Field description
cacheMisses	L_int		0.. 4294967295	The number of times the HLR Cache does not have the subscriber information locally and must retrieve information from the HLR.
recordsInactive	L_int		0.. 4294967295	The number of HLR Cache Records that are currently inactive, that is, the number of records for which subscribers are detached from the UMTS Serving GPRS Support Node (USGSN).
recordsActive	L_int		0.. 4294967295	The number of HLR Cache Records that are currently active, that is, the number of records that are active and the UPDATE GPRS LOCATION RESPONSE has been received from the Home Location Register (HLR).
recordsToBeReset	L_int		0.. 4294967295	The number of HLR Cache Records waiting to be reset. When a RESET message is received from a Home Location Register (HLR), all Location Confirmation flags of the HLR Cache Records, corresponding to the HLR is set to false. The GPRS Mobility Management (GMM) is notified to request UPDATE GPRS LOCATION for the HLR Cache Records corresponding to the reset HLR. The value of recordstoBeReset indicates the number of HLR Cache Records for which the GMM needs to be notified.

(Sheet 2 of 3)

Table 143 (continued)
UMTS Home Location Register (HLR) Cache statistics

Field name	Field type	Default field position	Field value	Field description
recordsWaitingForHlrConf	L_int		0..4294967295	The number of HLR Cache Records that are active and waiting for Home Location Register (HLR) Confirmation, that is, number of records which are yet to receive UPDATE GPRS LOCATION RESPONSE from the HLR.
(Sheet 3 of 3)				

Table 144
UMTS RAB assignment request failure statistics

Field name	Field type	Default field position	Field value	Field description
rabAssgnRqstSetupFailure Msgs	L_int		0..4294967295	The number of times a RAB assignment request of type setup was rejected by the RNC.
rabAssgnRqstRelFailure Msgs	L_int		0..4294967295	The number of times a RAB assignment message of type release was rejected by the RNC

Table 145
UMTS RANAP protocol layer message statistics

Field name	Field type	Default field position	Field value	Field description
rabAssignmentMsgs	L_int		0.. 4294967295	The number of RAB Assignment messages that were sent to the RNC.
rabSetupRequestMsgs	L_int		0.. 4294967295	The number of RAB SETUP REQUEST messages that were sent to the RNC.
rabReleaseRequestMsgs	L_int		0.. 4294967295	The number of RAB RELEASE REQUEST messages that were sent to the RNC.
iuReleaseRequestRxMsgs	L_int		0.. 4294967295	The number of IU RELEASE REQUEST messages that were received from the RNC.
iuReleaseCommandTx Msgs	L_int		0.. 4294967295	The number of LU RELEASE COMMAND messages that were sent to the RNC.
relocRequestMsgs	L_int		0.. 4294967295	The number of Relocation Request messages that were sent to the RNC.
pagingMsgs	L_int		0.. 4294967295	The number of Paging messages that were sent to the RNC.
resetMsgs	L_int		0.. 4294967295	The number of Reset messages that were received from the RNC.
initialUeMsgs	L_int		0.. 4294967295	The number of Initial UE messages that were received from the RNC.
errorIndicationMsgsRx	L_int		0.. 4294967295	The number of Error Indication messages that were received from the RNC.
errorIndicationMsgsTx	L_int		0.. 4294967295	The number of Error Indication messages that were sent to the RNC.

(Sheet 1 of 2)

Table 145 (continued)
UMTS RANAP protocol layer message statistics

Field name	Field type	Default field position	Field value	Field description
locationReportingControl Msgs	L_int		0..4294967295	This attribute indicates the number of Location Reporting Control messages that are sent to the Radio Network Controller over the collection interval.
locationReportMsgs	L_int		0..4294967295	This attribute indicates the number of Location Report messages that are received from the Radio Network Controller over the collection interval.
(Sheet 2 of 2)				

Table 146
UMTS Session Management (SM) statistics

Field name	Field type	Default field position	Field value	Field description
currentPdpContexts	L_int		0..4294967295	The number of currently active Packet Data Protocol (PDP) contexts.
mobileInitActivations	L_int		0..4294967295	The number of successful Packet Data Protocol (PDP) context activations initiated by the Mobile Station (MS).
mobileInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated by the Mobile Station (MS).
(Sheet 1 of 3)				

Table 146 (continued)
UMTS Session Management (SM) statistics

Field name	Field type	Default field position	Field value	Field description
ggsnInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated by the Gateway GPRS Support Node (GGSN).
usgsnInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated locally from the UMTS Serving GPRS Support Node (USGSN), for example, as a result of DETACH from the Mobile Station (MS).
hlrInitDeacts	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context deactivations initiated by the Home Location Register (HLR), for example, Delete Subscriber Data (DSD) withdrawing subscription for an active session.
usgsnInitModifies	L_int		0..4294967295	The number of Packet Data Protocol (PDP) context Modifications initiated from the UMTS Serving GPRS Support Node (USGSN), for example, as a result of QoS renegotiations with the Mobile Station (MS).
currentRoamers	L_int		0..4294967295	The number of mobiles that have entered the PLMN that is not their home PLMN, and are served by the UMTS Serving GPRS Support Node (USGSN).
(Sheet 2 of 3)				

Table 146 (continued)
UMTS Session Management (SM) statistics

Field name	Field type	Default field position	Field value	Field description
tRabAssgtTimeouts	L_int		0.. 4294967295	The number of times the tRabAssgtTimer expires. If the value of this attribute increases consistently, the value of the tRabAssgtTimer can be increased.
usgsnInitModifyExhaust	L_int		0.. 4294967295	The number of times the usgsnInitModifies attribute is exhausted during Inter-SGSN Routing Area Update. This counter is incremented in the new SGSN.
(Sheet 3 of 3)				

Table 147
UMTS Session Management message (SM) failure statistics

Field name	Field type	Default field position	Field value	Field description
idenRespMsgsRx	L_int		0.. 4294967295	The number of IDENTIFICATION RESPONSE message failures received with the cause indicated by the instance of the component.
sgsnCntxtRespMsgsRx	L_int		0.. 4294967295	The number of SGSN CONTEXT RESPONSE message failures received with the cause indicated by the instance of the component.
sgsnCntxtAckRespMsgsRx	L_int		0.. 4294967295	The number of SGSN CONTEXT ACKNOWLEDGE RESPONSE message failures received with the cause indicated by the instance of the component.
(Sheet 1 of 2)				

Table 147 (continued)
UMTS Session Management message (SM) failure statistics

Field name	Field type	Default field position	Field value	Field description
createPdpCntxtRespMsgs Rx	L_int		0..4294967295	The number of CREATE PDP CONTEXT RESPONSE message failures received with the cause indicated by the instance of the component.
updatePdpCntxtRespMsgs Tx	L_int		0..4294967295	The number of UPDATE PDP CONTEXT RESPONSE message failures received with the cause indicated by the instance of the component.
deletePdpCntxtRespMsgs Rx	L_int		0..4294967295	The number of DELETE PDP CONTEXT RESPONSE message failures received with the cause indicated by the instance of the component.
(Sheet 2 of 2)				

Table 148
UMTS Subscriber Data Path statistics

Field name	Field type	Default field position	Field value	Field description
currentActiveSessions	int			The current number of active session contexts for this instance of UmtsSubscriberDataPath (Usd). The maximum number of active sessions allowed is provisioned in the attribute maxActiveSessions.
pdusToUtran	L_int		0..4294967295	The number of Protocol Data Units (PDUs) sent to the UTRAN.
(Sheet 1 of 3)				

Table 148 (continued)
UMTS Subscriber Data Path statistics

Field name	Field type	Default field position	Field value	Field description
pdusFromUtran	L_int		0..4294967295	The number of Protocol Data Units (PDUs) received from the UTRAN.
pdusToNetwork	L_int		0..4294967295	The number of GPRS Tunneling Protocol (GTP-U) Protocol Data Units (PDUs) transmitted to the Gateway GPRS Support Node (GGSN).
pdusFromNetwork	L_int		0..4294967295	The number of GPRS Tunneling Protocol (GTP-U) Protocol Data Units (PDUs) received from the Gateway GPRS Support Node (GGSN). This includes PDUs counted in the attribute discardedPduFromNetwork.
discardedPduFromNetwork	L_int		0..4294967295	The number of Protocol Data Units (PDUs) received from the Network (GNS) that were discarded, including erroneously received packets dropped due to GTP-U protocol errors, packets received with no currently linked session context, packets received without a path to send them or packets dropped due to the Tiered Subscription feature policing downlink data.
(Sheet 2 of 3)				

Table 148 (continued)
UMTS Subscriber Data Path statistics

Field name	Field type	Default field position	Field value	Field description
discardedPdu	L_int		0.. 4294967295	This attribute indicates the number of discarded Protocol Data Units (PDUs) received from the GPRS Support Nodes (GSNs) or UMTS Terrestrial Radio Access Network (UTRAN). This includes packets dropped due to GPRS Tunneling Protocol (GTP-U) protocol errors, packets received with no currently linked session context, packets received without a path to send them or packets dropped due to the Tiered Subscription feature policing downlink data. The counter counts events in the collection interval.
(Sheet 3 of 3)				

Table 149
Virtual Media Gateway interface statistics

Field name	Field type	Default field position	Field value	Field description
crxMsgs	L_int		0.. 4294967295	The number of CONNECTION REQUEST messages sent to the Media Gateway.
dlcxMsgs	L_int		0.. 4294967295	The number of DELETE REQUEST messages sent to the Media Gateway.
(Sheet 1 of 2)				

Table 149 (continued)
Virtual Media Gateway interface statistics

Field name	Field type	Default field position	Field value	Field description
rinfMsgs	L_int		0.. 4294967295	The number of REQUEST FOR INFORMATION messages sent to the Media Gateway.
resetMsgs	L_int		0.. 4294967295	The total number of RESET messages sent in either direction
crcxAckMsgs	L_int		0.. 4294967295	The number of CONNECTION REQUEST ACKNOWLEDGE messages received from the Media Gateway.
dlcxAckMsgs	L_int		0.. 4294967295	The number of DELETE REQUEST ACKNOWLEDGE messages received from the Media Gateway.
updateCicInfo	L_int		0.. 4294967295	The number of UPDATE CIC INFO messages received from the Media Gateway.
sigFailMsgs	L_int		0.. 4294967295	The number of SIGNALLING FAILURE messages received from the Media Gateway.
sigOkMsgs	L_int		0.. 4294967295	The number of SIGNALLING OK messages received from the Media Gateway.
(Sheet 2 of 2)				

Table 150
UMTS Mobile Application Part (MAP) Stack statistics

Field name	Field type	Default field position	Field value	Field description
uglTimeouts	L_int		0.. 4294967295	The number of expiries of the timer specified by the attribute uglSanityTimer.
saiTimeouts	L_int		0.. 4294967295	The number of expiries of the saiSanityTimer.
clTimeouts	L_int		0.. 4294967295	The number of expiries of the clSanityTimer.
isdTimeouts	L_int		0.. 4294967295	The number of expiries of the isdSanityTimer.
dsdTimeouts	L_int		0.. 4294967295	The number of expiries of the dsdSanityTimer.
mtfsmTimeouts	L_int		0.. 4294967295	The number of expiries of the mtfsmSanityTimer.
mofsmTimeouts	L_int		0.. 4294967295	The number of expiries of the mofsmSanityTimer.
fsmTimeouts	L_int		0.. 4294967295	The number of expiries of the fsmSanityTimer.
rfsmTimeouts	L_int		0.. 4294967295	The number of expiries of the rfsmSanityTimer.
afrTimeouts	L_int		0.. 4294967295	The number of expiries of the afrSanityTimer.
pslTimeouts	L_int		0.. 4294967295	This attribute counts the expiries of the timer specified by the pslSanityTimer attribute in the collection interval.
rejectsSent	L_int		0.. 4294967295	The number of TCAP REJECT messages sent to the SCCP layer.
rejectsReceived	L_int		0.. 4294967295	The number of TCAP REJECT messages received from the SCCP layer.
(Sheet 1 of 2)				

Table 150 (continued)
UMTS Mobile Application Part (MAP) Stack statistics

Field name	Field type	Default field position	Field value	Field description
mapConcurrTransactionsLow	L_int		0..4294967295	The lowest number of simultaneously active MAP dialogues.
mapConcurrentTransactionAvg	L_int		0..4294967295	The average number of simultaneous MAP dialogues active. The algorithm to compute the average is approximately the sum of the simultaneous MAP Transactions polled every second divided by 900 seconds.
mapConcurrentTransactionHigh	L_int		0..4294967295	The highest number of active simultaneous MAP dialogues.
mapConcurrentInvokesLow	L_int		0..4294967295	The lowest number of simultaneously active MAP Invokes.
mapConcurrentInvokesAvg	L_int		0..4294967295	The average number of simultaneous MAP Invokes active during the collection interval. The algorithm to compute the average is approximately the sum of the simultaneous MAP Invokes polled every second divided by 900 seconds.
mapConcurrentInvokesHigh	L_int		0..4294967295	The highest number of simultaneously active MAP Invokes.
pmsTimeouts	L_int		0..4294967295	This attribute indicates the number of expiries of the pmsSanityTimer attribute in the collection interval.
(Sheet 2 of 2)				

Table 151
UMTS Traffic Class Service statistics

Field name	Field type	Default field position	Field value	Field description
createPdpReq	L_int		0.. 4294967295	The number of CREATE PDP CONTEXT REQUEST messages sent by the (UMTS) Serving GPRS Support Node (USGSN or SGSN) for the allocation retention priority and traffic class represented by this component.
createPdpRes	L_int		0.. 4294967295	The number of CREATE PDP CONTEXT RESPONSE messages received with the cause REQUEST ACCEPTED for the allocation retention priority and traffic class represented by this component.
sgsnInitPdpUpdateReq	L_int		0.. 4294967295	The number of UPDATE PDP CONTEXT REQUEST messages sent by the (UMTS) Serving GPRS Support Node (USGSN or SGSN) for the allocation retention priority and traffic class represented by this component.
sgsnInitPdpUpdateRes	L_int		0.. 4294967295	The number of UPDATE PDP CONTEXT RESPONSE messages sent by the (UMTS) Serving GPRS Support Node (USGSN or SGSN) for the allocation retention priority and traffic class represented by this component.
(Sheet 1 of 2)				

Table 151 (continued)
UMTS Traffic Class Service statistics

Field name	Field type	Default field position	Field value	Field description
ggsnInitPdpUpdateReq	L_int		0..4294967295	The number of UPDATE PDP CONTEXT REQUEST messages received from the Gateway Serving GPRS Support Node (GGSN) for the allocation retention priority and traffic class represented by this component.
wlcGgsnInitPdpUpdateRes	L_int		0..4294967295	The number of UPDATE PDP CONTEXT RESPONSE messages sent with a cause REQUEST ACCEPTED by the (UMTS) Serving GPRS Support Node (USGSN or SGSN) for the allocation retention priority and traffic class represented by this component.
(Sheet 2 of 2)				

Table 152
UMTS Traffic Class Differentiated Service statistics

Field name	Field type	Default field position	Field value	Field description
dsUplink	L_int		0.. 4294967295	The number of octets transferred uplink for the allocation retention priority and traffic class represented by this component
dsDownlink	L_int		0.. 4294967295	The number of octets transferred downlink for the allocation retention priority and traffic class represented by this component.

Table 153
SS7 NSTA VGS BRAG MTP2 statistics

Field name	Field type	Default field position	Field value	Field description
insvFailures	L_int		0.. 4294967295	The number of in-service link outages. It does not include failures which occur during the alignment process.
msusTx	L_int		0.. 4294967295	The number of message signal units transmitted. This includes the number of message signal units retransmitted, indicated by the attribute msuRetransmits.
msuRetransmits	L_int		0.. 4294967295	The number of message signal units retransmitted because of negative acknowledgments.

(Sheet 1 of 2)

Table 153 (continued)
SS7 NSTA VGS BRAG MTP2 statistics

Field name	Field type	Default field position	Field value	Field description
msusRx	L_int		0.. 4294967295	The number of message signal units received. This includes the MSUs with errors, indicated by the attribute msuErrors.
msuErrors	L_int		0.. 4294967295	The number of ingress signal units discarded because of sequence number, length or CRC errors.
msuOctetsTx	L_int		0.. 4294967295	The number of layer 3 payload octets transmitted.
msuOctetsRx	L_int		0.. 4294967295	The number of layer 3 payload octets received.
(Sheet 2 of 2)				

Table 154
SS7 MTP3 linkset PDU statistics

Field name	Field type	Default field position	Field value	Field description
pdusRx	L_int		0.. 4294967295	The Protocol Data Units (PDUs) received from layer 2. This includes the PDUs with and without user payload.
payloadPduRx	L_int		0.. 4294967295	The Protocol Data Units (PDUs) with payload received from layer 2.
pdusTx	L_int		0.. 4294967295	The Protocol Data Units sent to layer 2. This includes the PDUs with and without user payload.
payloadPduTx	L_int		0.. 4294967295	The Protocol Data Units (PDUs) with payload sent to layer 2.
(Sheet 1 of 2)				

Table 154 (continued)
SS7 MTP3 linkset PDU statistics

Field name	Field type	Default field position	Field value	Field description
invalidPduRx	L_int		0..4294967295	The number of invalid Protocol Data Units received from Layer 2.
sltFailures	L_int		0..4294967295	The number of signalling link test message failure conditions.
changeovers	L_int		0..4294967295	The number of link changeover conditions.
(Sheet 2 of 2)				

Table 155
UMTS GPRS Support Node statistics

Field name	Field type	Default field position	Field value	Field description
incomingRequestsRejected	L_int		0..4294967295	The number of incoming request messages on the Gn interface that were rejected during the collection interval because the maximum number of outstanding incoming requests was exceeded.

Table 156
BCN statistics

Field name	Field type	Default field position	Field value	Field description
trafficSubRange	int		0..3	Uniquely identifies a traffic sub-range within a DiscoBcnlf traffic address. This attribute is applicable to the DiscoBcnlf, only.
txPackets	L_int		0.. 4294967295	The number of packets transmitted from the BCN interface. This attribute does not include the packets discarded indicated by the attribute txPacketDiscards.
txOctets	L_int		0.. 4294967295	The number of octets of the packets transmitted from the BCN interface. This attribute includes the packet overhead, which consists of the CRC and the HDLC interframe flag. This attribute is not applicable to and is not displayed for ATM-based BCN interfaces.
rxPackets	L_int		0.. 4294967295	The number of packets received by the BCN interface. This attribute includes the packets discarded which are indicated by the attributes rxBroadcastPacketDiscard and rxPacketDiscards. This attribute also includes the packets discarded, which are not indicated by the attributes rxBroadcastPacketDiscard and rxPacketDiscards.
(Sheet 1 of 5)				

Table 156 (continued)
BCN statistics

Field name	Field type	Default field position	Field value	Field description
rxOctets	L_int		0..4294967295	The number of octets of the packets received by the BCN interface. This attribute includes the packet overhead, which consists of the CRC and the HDLC interframe flag. This attribute is not applicable to ATM-based BCN interfaces.
txPeakLinkUtilization	int		0...100	The peak transmit link capacity utilization during the collection interval, expressed as a percentage of the available bandwidth. The utilization is measured over a one minute interval.
rxPeakLinkUtilization	int		0...100	The peak receive link capacity utilization during the collection interval, expressed as a percentage of the available bandwidth. The utilization is measured over a one minute interval.
txAvgLinkUtilization	int		0...100	The average transmit link capacity utilization during the collection interval, expressed as a percentage of the available bandwidth. The utilization is measured over a one minute interval.
rxAvgLinkUtilization	int		0...100	The average receive link capacity utilization during the collection interval, expressed as a percentage of the available bandwidth. The utilization is measured over a one minute interval.
(Sheet 2 of 5)				

Table 156 (continued)
BCN statistics

Field name	Field type	Default field position	Field value	Field description
txMinLinkUtilization	int		0...100	The lowest transmit link capacity utilization during the collection interval, expressed as a percentage of the available bandwidth. The utilization is measured over a one minute interval.
rxMinLinkUtilization	int		0...100	The lowest receive link capacity utilization during the collection interval, expressed as a percentage of the available bandwidth. The utilization is measured over a one minute interval.
txPeakPacketRate	L_int		0.. 4294967295	The transmitted packet rate during the busiest minute of the collection interval. The measurement unit for this rate is packets per second (pkt/s)
txPeakThroughput	L_int		0.. 4294967295	The throughput of the bits transmitted during the busiest minute of the collection interval, based on the number of octets in the txOctets attribute. This attribute is not applicable to ATM-based BCN interfaces.
txAvgPacketRate	L_int		0.. 4294967295	The average transmitted packet rate during the collection interval. The measurement unit for this rate is packets per second (pkt/s)
txAvgThroughput	L_int		0.. 4294967295	The average throughput of the bits transmitted during the collection interval, based on the number of octets in the txOctets attribute. This attribute is not applicable to ATM-based BCN interfaces.

(Sheet 3 of 5)

Table 156 (continued)
BCN statistics

Field name	Field type	Default field position	Field value	Field description
rxPeakPacketRate	L_int		0.. 4294967295	The received packet rate during the busiest minute of the collection interval. The measurement unit for this rate is packets per second (pkt/s)
rxPeakThroughput	L_int		0.. 4294967295	The throughput of the bits received during the busiest minute of the collection interval, based on the number of octets in the rxOctets attribute. This attribute is not applicable to ATM-based BCN interfaces.
rxAvgPacketRate	L_int		0.. 4294967295	The average received packet rate during the collection interval. The measurement unit for this rate is packets per second (pkt/s)
rxAvgThroughput	L_int		0.. 4294967295	The average throughput of the bits received during the collection interval, based on the number of octets in the txOctets attribute. This attribute is not applicable to ATM-based BCN interfaces.
txPacketDiscards	L_int		0.. 4294967295	The number of packets that could not be transmitted due to protocol errors or lack of resources during the collection interval. The count includes packets counted by txPktDiscardPriority1 and txPktDiscardPriority2 attributes. The protocol errors include HEC errors and LRC errors.
(Sheet 4 of 5)				

Table 156 (continued)
BCN statistics

Field name	Field type	Default field position	Field value	Field description
txPacketDiscardPriority1	L_int		0.. 4294967295	The number of priority 1 packets that could not be transmitted due to queue congestion and HEC errors during the collection interval. The congestion threshold is determined by the provisionable BCN Traffic Management attribute, txQueueSize.
txPacketDiscardPriority2	L_int		0.. 4294967295	The number of priority 2 packets that could not be transmitted due to queue congestion and HEC errors during the collection interval. The congestion threshold is determined by the provisionable BCN Traffic Management attribute, txQueueSize.
rxPacketDiscards	L_int		0.. 4294967295	The number of packets that could not be received due to protocol errors or lack of resources during the collection interval. The packets are discarded when there is a lack of resources. The protocol errors include HDLC errors, HEC errors, and CRC errors. Packets discarded due to a loopback condition, when the loopback detection mechanism is active, are also included.
rxBroadcastPacketDiscard	L_int		0.. 4294967295	The number of received broadcast packets that were discarded due to an invalid BCN address. This attribute is not applicable to ATM-based BCN interfaces.

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Table 157
PCS test statistics specific to a Logical Processor (LP)

Field name	Field type	Default field position	Field value	Field description
cardNumber	int			The logical processor's card number.
cardStatus	int		1 = standby 2 = active	The logical processor's card is <i>active</i> or <i>standby</i> .
memoryCapacity	vector decimal		0..2147483647	The processor's memory capacity (in kilobytes) for each memory type (fastRam, normalRam, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
msgBlockCapacity	int			The processor's shared message block memory capacity (in kilobytes).
cpuUtilAvg	int			This attribute indicates an average processor utilization level over the specified time period, timeInterval. This average is calculated based on one minute CPU utilization averages.
cpuUtilMin	int			This attribute indicates the minimum processor utilization level over the specified time period, timeInterval. This is calculated based on one minute CPU utilization averages.
cpuUtilMax	int			This attribute indicates the maximum processor utilization level over the specified time period, timeInterval. This is calculated based on one minute CPU utilization averages.
(Sheet 1 of 3)				

Table 157 (continued)
PCS test statistics specific to a Logical Processor (LP)

Field name	Field type	Default field position	Field value	Field description
memoryUsageAvg	vector decimal		0..2147483647	The processor's average memory utilization (in kilobytes) for each memory type (fastRam, normalRun, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
memoryUsageMin	vector decimal		0..2147483647	The processor's minimum memory utilization (in kilobytes) for each memory type (fastRam, normalRun, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
memoryUsageMax	vector decimal		0..2147483647	The processor's maximum memory utilization (in kilobytes) for each memory type (fastRam, normalRun, and sharedRam) in the specified collection interval. This statistic is calculated using 15 second samples.
msgBlockUsageAvg	int			This attribute indicates the processor's average message block memory utilization (in kilobytes) over a specified time period, timeDuration. This is calculated using 15 second samples.
msgBlockUsageMin	int			This attribute indicates the processor's maximum (low water mark) message block memory utilization (in kilobytes) over a specified time period, timeDuration. This is calculated using 15 second samples.

(Sheet 2 of 3)

Table 157 (continued)
PCS test statistics specific to a Logical Processor (LP)

Field name	Field type	Default field position	Field value	Field description
msgBlockUsageMax	int			This attribute indicates the processor card's maximum (high water mark) message block memory utilization (in kilobytes) over a specified time period, timeDuration. This is calculated using 15 second samples.
(Sheet 3 of 3)				

Table 158
Mobile Subscriber Purge functionality on the (UMTS) Serving GPRS Support Node (USGSN or SGSN) statistics

Field name	Field type	Default field position	Field value	Field description
explicitDetachPurge	L_int		0.. 4294967295	This attribute counts the Mobile Subscriber (MS) Purge requests initiated due to an explicit mobile detach. Mobile Subscriber Purge requests are initiated upon explicit detach when the purgeOnExplicitDetach attribute in (U) SGSN MobileSubscriberPurge is enabled. The counter wraps to zero when it exceeds the maximum value.
(Sheet 1 of 3)				

Table 158 (continued)
Mobile Subscriber Purge functionality on the (UMTS) Serving GPRS Support Node (USGSN or SGSN) statistics

Field name	Field type	Default field position	Field value	Field description
operatorInitiatedPurge	L_int		0.. 4294967295	This attribute counts the Mobile Subscriber (MS) Purge requests initiated by the operator. An operator initiated the Mobile Subscriber Purge request by issuing the clear command on an (U) SGSN Imsi component. The counter wraps to zero when it exceeds the maximum value.
contextReusePurge	L_int		0.. 4294967295	This attribute counts the Mobile Subscriber (MS) Purge requests initiated due to context reuse. The counter wraps to zero when it exceeds the maximum value.
periodicAuditPurge	L_int		0.. 4294967295	This attribute counts the Mobile Subscriber (MS) Purge requests initiated due to periodic audit. During a periodic audit, Mobile Subscribers whose age is greater than the value specified by the auditPurgeMinimumInactiveAge attribute in (U) SGSN MobileSubscriberPurge are considered candidates for purge. The counter wraps to zero when it exceeds the maximum value.
(Sheet 2 of 3)				

Table 158 (continued)
Mobile Subscriber Purge functionality on the (UMTS) Serving GPRS Support Node (USGSN or SGSN) statistics

Field name	Field type	Default field position	Field value	Field description
msPurgeAckFailures	L_int		0.. 4294967295	This attribute counts the Mobile Subscriber (MS) Purge Acknowledgement Failures received from the Home Location Register (HLR). The counter wraps to zero when it exceeds the maximum value.
msPurgeSendFailures	L_int		0.. 4294967295	This attribute counts the Mobile Subscriber (MS) Purge requests that were not sent from the (UMTS) Serving GPRS Support Node (USGSN or SGSN) due to network related faults such as SIG failure. The counter wraps to zero when it exceeds the maximum value.
(Sheet 3 of 3)				

Table 159
Overload controls on the Gsc and Usc components statistics

Field name	Field type	Default field position	Field value	Field description
cpuOvldAttachesDiscarded	L_int		0.. 4294967295	This attribute counts the number of GPRS Mobility Management (GMM) attach request messages that are discarded due to a CPU overload condition on the GSC and USC applications. The counter counts the events in the collection interval.
cpuOvldActivations Discarded	L_int		0.. 4294967295	This attribute counts the number of Session Management (SM) session activate request messages that are discarded due to CPU overload on the GSC and USC applications. The counter counts the events in the collection interval.
subCountOvldAttaches Discarded	L_int		0.. 4294967295	This attribute counts the number of GPRS Mobility Management (GMM) attach request messages that are discarded due to subscriber count overload, which occurs when the value of the currentlyAttached attribute is equal to the value of the maxAttachedSubscribers attribute. The counter counts the events in the collection interval.

Table 160
Overload controls statistics

Field name	Field type	Default field position	Field value	Field description
cpuOvldMovingAvg	int			This attribute indicates the CPU moving average calculated from within the defined moving window, the size of which is determined by the value of cpuOvldWindowSize attribute.

Table 161
Session Management (SM) for Packet Data Protocol (PDP) context modification statistics

Field name	Field type	Default field position	Field value	Field description
sgsnInitModifyAttempts	L_int		0.. 4294967295	This attribute counts the number of Packet Data Protocol (PDP) context modifications initiated by the Serving GPRS Support Node (SGSN), for example, as a result of QoS renegotiations with the Mobile Station (MS). This counter is pegged only during SGSN Initiated PDP Context Modification. The counter counts the events in the collection interval.

(Sheet 1 of 3)

Table 161 (continued)
Session Management (SM) for Packet Data Protocol (PDP) context modification statistics

Field name	Field type	Default field position	Field value	Field description
sgsnInitFailAtMs	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Serving GPRS Support Node (SGSN) that failed at the Mobile Station (MS). The counter counts the events in the collection interval.
sgsnInitFailAtGgsn	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Serving GPRS Support Node (SGSN) that failed at the Gateway GPRS Support Node (GGSN). The counter counts the events in the collection interval.
sgsnInitFailAtSgsn	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Serving GPRS Support Node (SGSN) that failed at the SGSN. The counter counts the events in the collection interval.
msInitModifyAttempts	L_int		0.. 4294967295	This attribute counts the number of Packet Data Protocol (PDP) context modifications initiated by the Mobile Station (MS). The counter counts the events in the collection interval.
(Sheet 2 of 3)				

Table 161 (continued)
Session Management (SM) for Packet Data Protocol (PDP) context modification statistics

Field name	Field type	Default field position	Field value	Field description
msInitFailAtGgsn	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Mobile Station (MS) that failed at the Gateway GPRS Support Node (GGSN). The counter counts the events in the collection interval.
msInitFailAtSgsn	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Mobile Station (MS) that failed at the SGSN. The counter counts the events in the collection interval.
(Sheet 3 of 3)				

Table 162
Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
lcsMaxCurrentEnabled Subscribers	L_int		0.. 4294967295	This attribute indicates the current number of location services enabled subscribers. The value reported is the peak value for the duration of the collection interval.
(Sheet 1 of 5)				

Table 162 (continued)
Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
IcsMtRequests	L_int		0.. 4294967295	This attribute counts the total mobile terminated location requests. The counter counts the events in the collection interval.
IcsMtFailures	L_int		0.. 4294967295	This attribute counts the total unsuccessful mobile terminated location requests. The counter counts the events in the collection interval.
IcsPagingRequests	L_int		0.. 4294967295	This attribute counts the total paging requests sent by the LocationServices component. The counter counts the events in the collection interval.
IcsPagingFailures	L_int		0.. 4294967295	This attribute counts the total unsuccessful paging requests sent by the LocationServices component. The counter counts the events in the collection interval.
IcsRequestTypeNot Supported	L_int		0.. 4294967295	This attribute counts the total failed location requests due to a requested location that is not supported. The counter counts the events in the collection interval.
(Sheet 2 of 5)				

Table 162 (continued)
Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
IcsDataMissing	L_int		0.. 4294967295	This attribute counts the total failed location requests due to missing information. For example, Imsi or Msisdn is missing in the location request message. The counter counts the events in the collection interval.
IcsSubscriberNotAttached	L_int		0.. 4294967295	This attribute counts the total failed location requests due to the subscriber not currently attached. The counter counts the events in the collection interval.
IcsUnauthorizedGmlc	L_int		0.. 4294967295	This attribute counts the total failed location requests due to location requests messages received from an unauthorized Gateway Mobile Location Center. The counter counts the events in the collection interval.
IcsUnauthorizedClient	L_int		0.. 4294967295	This attribute counts the total failed location requests due to location requests messages received from an unauthorized client. The counter counts the events in the collection interval.
IcsServiceBusy	L_int		0.. 4294967295	This attribute counts the total failed location requests due to another location request already in progress for the same subscriber. The counter counts the events in the collection interval.
(Sheet 3 of 5)				

Table 162 (continued)
Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
lcsNotificationNotPossible	L_int		0..4294967295	This attribute counts the total failed location requests due to the reason that it is impossible to send a notification message to the mobile. The counter counts the events in the collection interval.
lcsGadShapeNotSupported	L_int		0..4294967295	This attribute counts the total failed location requests due to the obtained location estimates using a Geographical Area Description (GAD) shape that are not supported in the Location Request message. The counter counts the events in the collection interval.
lcsInterrupted	L_int		0..4294967295	This attribute counts the total failed location requests due to information received from the Radio Network Controller (RNC) showing that the Location Services (LCS) entity has been interrupted. For example, LCS can be interrupted by an Inter-SGSN Routing Area Update (IRAU). The counter counts the events in the collection interval.

(Sheet 4 of 5)

Table 162 (continued)
Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
IcsQosNotAttained	L_int		0.. 4294967295	This attribute counts the total failed location requests due to the quality of service information not matching the requested quality of service in the Provide Subscriber Location (PSL) message from the Gateway Mobile Location Center (GMLC). The counter counts the events in the collection interval.
(Sheet 5 of 5)				

Table 163
GPRS Subscriber Control Local Services statistics

Field name	Field type	Default field position	Field value	Field description
IcsCellInfoMissing	L_int		0.. 4294967295	This attribute counts the total unsuccessful location requests due to the cell information missing in the local cell database. The counter counts the events in the collection interval.

Table 164
Virtual Media Gateway (VMG) statistics

Field name	Field type	Default field position	Field value	Field description
estReqMsgs	L_int		0.. 4294967295	This attribute counts Q.2630 ERQ (establish request) messages that were received from the RNC. The counter counts the events in the collection interval.
rejectedCalls	L_int		0.. 4294967295	This attribute counts the number of calls rejected by the Media Gateways controlled by this component. The counter counts the events in the collection interval.
peakUsedPercentage	L_int		0.. 4294967295	This attribute indicates the peak percentage of provisioned DS0s for this component that are in a non-idle state. The value is set to the current percentage at the beginning of the collection interval.

Table 165
UMTS Session Management for Packet Data Protocol (PDP) context modification statistics

Field name	Field type	Default field position	Field value	Field description
sgsnInitFailAtRnc	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the UMTS Serving GPRS Support Node (USGSN) that failed at the Radio Network Controller (RNC). The counter counts the events in the collection interval.
mslInitFailAtMs	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Mobile Station (MS) that failed at the MS. The counter counts the events in the collection interval.
mslInitFailAtRnc	L_int		0.. 4294967295	This attribute counts the unsuccessful Packet Data Protocol (PDP) context modifications initiated by the Mobile Station (MS) that failed at the Radio Network Controller (RNC). The counter counts the events in the collection interval.

Table 166
UMTS Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
IcsNotificationRequests	L_int		0.. 4294967295	This attribute counts the total notification requests to the mobile subscribers. The counter counts the events in the collection interval.
IcsNotificationFailures	L_int		0.. 4294967295	This attribute counts the total unsuccessful notification requests to the mobile subscribers. The counter counts the events in the collection interval.
IcsReportExpiries	L_int		0.. 4294967295	This attribute counts the timer expiries associated with the locationReportTimer attribute. The counter counts the events in the collection interval.
IcsNotifyExpiries	L_int		0.. 4294967295	This attribute counts the timer expiries associated with the locationNotifyTimer attribute. The counter counts the events in the collection interval.
IcsClientDeniedByMs	L_int		0.. 4294967295	This attribute counts the location requests that fail due to the subscriber denying the request. The counter counts the events in the collection interval.
(Sheet 1 of 2)				

Table 166 (continued)
UMTS Location Services (Lcs) statistics

Field name	Field type	Default field position	Field value	Field description
IcsRncPositioningFailure	L_int		0.. 4294967295	This attribute counts the total failed location requests due to the Radio Network Controller (RNC) failing to determine the location of the subscriber. The counter counts the events in the collection interval.
(Sheet 2 of 2)				

Table 167
IP Round Trip Delay (RTD) statistics

Field name	Field type	Default field position	Field value	Field description
localNodeIdentifier	int			The <i>nodeID</i> of the Passport that generated the accounting record. <i>nodeID</i> is assigned to each node in the <i>ModuleData</i> component.
ipVcgInstance	str			This attribute indicates the VCG VR that generated this record.
localVcgIpAddress	IP			The VCG loopback IP address of the VCG VR that generated this record.
remoteVcgIpAddress	IP			The remote VCG destination address for which delays are measured.
framesSent	vector decimal			The number of frames transmitted by the Virtual Carrier Gateway (VCG) during the collection interval

Table 167 (continued)
IP Round Trip Delay (RTD) statistics

Field name	Field type	Default field position	Field value	Field description
framesReceived	vector decimal			The number of frames received by the Virtual Carrier Gateway (VCG) during the collection interval
sample1StartTime	time DHMS			The timestamp when the first sample was sent to this remote Virtual Carrier Gateway (VCG).
RoundTripDelays1	vector decimal			An array of round trip delays for the first sample of packets received by the Virtual Carrier Gateway during the last monitoring session, for each class of service (0 to 3).
sample2StartTime	time DHMS			The timestamp when the second sample was sent to this remote Virtual Carrier Gateway (VCG).
RoundTripDelays2	vector decimal			An array of round trip delays for the second sample of packets received by the Virtual Carrier Gateway during the last monitoring session, for each class of service (0 to 3).
sample3StartTime	time DHMS			The timestamp when the third sample was sent to this remote Virtual Carrier Gateway (VCG).
RoundTripDelays3	vector decimal			An array of round trip delays for the third sample of packets received by the Virtual Carrier Gateway during the last monitoring session, for each class of service (0 to 3).
sample4StartTime	time DHMS			The timestamp when the fourth sample was sent to this remote Virtual Carrier Gateway (VCG).
RoundTripDelays4	vector decimal			An array of round trip delays for the fourth sample of packets received by the Virtual Carrier Gateway during the last monitoring session, for each class of service (0 to 3).

Table 167 (continued)
IP Round Trip Delay (RTD) statistics

Field name	Field type	Default field position	Field value	Field description
sample5StartTime	time DHMS			The timestamp when the fifth sample was sent to this remote Virtual Carrier Gateway (VCG).
RoundTripDelays5	vector decimal			An array of round trip delays for the fifth sample of packets received by the Virtual Carrier Gateway during the last monitoring session, for each class of service (0 to 3).

Table 168
Dummy test statistics

Field name	Field type	Default field position	Field value	Field description
testStat1	L_int		0.. 4294967295	This attribute is the 1st test stat, an enum.
testStat2	L_int		0.. 4294967295	This attribute is the 2nd test stat, an unsigned integer.
testStat3	L_int		0.. 4294967295	This attribute is the 3rd test stat, an ASCII string.

Alarm data

Alarm data is essential for the real-time surveillance of Passport nodes. Alarm data is also used for post-processing and analysis of down-time and other service-affecting problems.

Alarm data collection should be active at all times; this ensures that there is sufficient information to analyze the cause of problems, should they occur. Each alarm is described in Passport documents. Also see responses *DcsAlarmInfo*, *DcsAlarmOptInfo*, and *OsiStateStatusResponse* in the Passport documents.

Log data

Passport logs are used to monitor the operator command activity on a node.

For a description of common operator commands and component-specific commands and responses, refer to the Passport documents.

“Passport log records” (page 636) describes the fields in Passport spooled log records.

Table 169
Passport log records

Field name	Field type	Default field position	Field value	Field description
switchType	str	001	pp	The type of switch that generated this record.
dataType	str	002	log	Identifies this record as being a command log.
componentName	str	003		This field identifies the Passport component type and location for which this statistical record was generated.

(Sheet 1 of 3)

Table 169 (continued)
Passport log records

Field name	Field type	Default field position	Field value	Field description
timeOfRecord	time	004	yyymmddT hhmmss.xxxxxx yyyy = year mm = month dd = day T = date/time split hh = hour mm = minutes ss = seconds xxxxxx = 0..999999 microseconds	This field identifies the date and time that this record was produced on switch.
customerIdentifier	int	005		This field identifies the switch customer.
userId	str	006	0..8	The userID of the user that issued the command.
sessionSequenceNumber	L_int	007	0.. 4294967295	A numeric session sequence number. A "login" Log and all commands issued during that particular session has the same sequence number. The next time a user (the same one or a different one) logs in, a new sequence number is used.
command	str	008		The actual command.
response	str	009		The success/failure indicator of the command. This is not the full textual response.
managerIpAddress	str	010		The SNMP Management station (manager) that issued the SNMP command.
snmpCommand	str	011		The command received by the SNMP Agent.
(Sheet 2 of 3)				

Table 169 (continued)
Passport log records

Field name	Field type	Default field position	Field value	Field description
cliCommand	str	012		The command line interface (CLI) equivalent of the command received by the SNMP Agent.
(Sheet 3 of 3)				

SCN data

State change notification (SCN) data is used by Preside Multiservice Data Manager (MDM) to update the Network Model database. The Network Model is a common repository of network configuration information used by any number of applications on MDM. See response *OsiStateStatusResponse* in the Passport documents.

Passport spooled SCN data is also collected by MDPs File Prober, converted to BDF, and transferred to a customer performance host.

“Passport SCN records” (page 638) describes the fields in Passport spooled SCN records.

Table 170
Passport SCN records

Field name	Field type	Default field position	Field value	Field description
switchType	str	001	pp	The type of switch that generated this record.
dataType	str	002	scn or scn_DMId_RDFv	Identifies this record as being a state change notification (scn) record. If configured, can include: Data Model Identifier (DMId) and RDF version (RDFv).
(Sheet 1 of 5)				

Table 170 (continued)
Passport SCN records

Field name	Field type	Default field position	Field value	Field description
componentName	str	003		This field identifies the Passport component type and location for which this statistical record was generated.
timeOfRecord	time	004	yyymmddT hhmmss.xxxxx yyyy = year mm = month dd = day T = date/time split hh = hour mm = minutes ss = seconds xxxxxx = 0.999999 microseconds	This field identifies the date and time that this record was produced on switch.
customerIdentifier	int	005		This field identifies the switch customer.
adminState	int	006	0 = locked 1 = unlocked 2 = shutting down	Indicates the ability of the component to execute the loaded software. locked prevents execution, unlocked enables execution and shutting down indicates that the component is in an intermediate state waiting for executing software to terminate.
operationalState	int	007	0 = disabled 1 = enabled	Indicates the ability of the component to operate. disabled indicates that the component is inoperable and enabled indicates that the component is at least partially in operation.
(Sheet 2 of 5)				

Table 170 (continued)
Passport SCN records

Field name	Field type	Default field position	Field value	Field description
usageState	int	008	0 = idle 1 = active 2 = busy	Indicates the current status of the component. idle indicates that the component is not in use. active indicates that the component is in use and is capable of handling additional load. busy indicates that the component is in use and is not capable of handling additional load.
availabilityStatus_inTest	bit	009		The component is being tested.
availabilityStatus_failed	bit	010		The component is inoperable.
availabilityStatus_powerOff	bit	011		The component requires power to become operable.
availabilityStatus_offLine	bit	012		The component requires activation to become operable.
availabilityStatus_offDuty	bit	013		The component has been deactivated according to a scheduled outage.
availabilityStatus_dependency	bit	014		The component is inoperable because an associated component is unavailable.
availabilityStatus_degraded	bit	015		The component is operable but in a degraded state.
availabilityStatus_notInstalled	bit	016		This component does not exist.
availabilityStatus_logFull	bit	017		Indicates a log full condition.
proceduralStatus_initializationRequired	bit	018		The component requires activation to become operable. Operator intervention is required.
proceduralStatus_notInitialized	bit	019		The component requires activation to become operable. The component will activate itself.
proceduralStatus_initializing	bit	020		The component is being activated.
(Sheet 3 of 5)				

Table 170 (continued)
Passport SCN records

Field name	Field type	Default field position	Field value	Field description
proceduralStatus_reporting	bit	021		The component is responding to an operation and is generating the results (for example, testing).
proceduralStatus_terminating	bit	022		The component is terminating operation.
controlStatus_subjectToTest	bit	023		The component is available for normal and testing operations.
controlStatus_partOfServicesLocked	bit	024		A portion of the services provided by this component are restricted.
controlStatus_reservedForTest	bit	025		The component is being tested.
controlStatus_suspended	bit	026		Service on this component is suspended by operator.
alarmStatus_underRepair	bit	027		The component is being repaired.
alarmStatus_critical	bit	028		One, or more, critical alarms exist.
alarmStatus_major	bit	029		One, or more, major alarms exist.
alarmStatus_minor	bit	030		One, or more, minor alarms exist.
alarmStatus_alarmOutstanding	bit	031		One, or more, alarms exist.
standbyStatus	bit	032	0 = hot 1 = cold 2 = providing 15 = notSet	Indicates the service status of the component. hot indicates that the component is not currently providing service but is available in sync mode. cold indicates that the component is not currently providing service and is not available in sync mode. providing indicates that the component is providing service. notSet indicates the status is not set.
(Sheet 4 of 5)				

Table 170 (continued)
Passport SCN records

Field name	Field type	Default field position	Field value	Field description
unknownStatus	bit	033	0 = false 1 = true	Indicates the accuracy of the component or service state attributes. true indicates that the reported values are accurate. false indicates that the reported values may not be accurate.

(Sheet 5 of 5)

Chapter 8

Outage records

This chapter describes MDP Outage Calculator outage records.

- “DPN outage records” (page 643)
- “Passport outage records” (page 645)

DPN outage records

Outage records can be generated for DPN-100 nodes. The records use a Bulk Data Format (BDF) and are generated from alarm records processed by an MDP outage calculator. The content and sequence of all fields within BDF outage files are controlled by the `dpn_otg.rdf` RDF file.

For DPN BDF outage record details, see “DPN BDF outage record fields” (page 643).

Table 171
DPN BDF outage record fields

Field name	Description or value
switchType	dpn
dataType	otg
customerId	Customer Network Management Identifier assigned to network components (PEs and POs) dedicated to a Virtual Private Network.
dspld	Module DSP group ID.
namslid	Integers which identify AM, RM, or PM.
(Sheet 1 of 2)	

Table 171 (continued)
DPN BDF outage record fields

Field name	Description or value
seqNum	Sequence number assigned by the network administration and management system (NAMS) device.
componentId	A component identifier describes a NAMS object. A component identifier is composed of a list of qualifiers; each with two elements—category (PE, PI, PO, CH) and a uniquely numbered name.
outageType	Can have a value of: Component, Possible, Combined, or Indeterminate.
componentType	Can have a value of: Processor, LinkTrunk, Module, or Port
startDateTime	The date and time of the first alarm record processed. The format is: yyyyymmDDTHHMMSS.t, where yyyy=year; mm=month; DD=day; HH=hour; MM=minute; SS=seconds; and t=tenths of a second.
endDateTime	The date and time of the last alarm record processed. The format is: yyyyymmddTHHMMSS.t, where yyyy=year; mm=month; DD=day; HH=hour; MM=minute; SS=seconds; and t=tenths of a second.
duration	Outage duration in seconds.
sourceID	Use as index into 241-1001-506 <i>DPN-100 Alarm Console Indications</i> (DPN)
faultCode	Use as index into 241-1001-506 <i>DPN-100 Alarm Console Indications</i> (DPN)
(Sheet 2 of 2)	

Note: Comment and condition fields use the BDF escape sequence.

Passport outage records

Outage records can be generated for Passport nodes. The records use a Bulk Data Format (BDF) and are generated from alarm and State Change Notification (SCN) records processed by an MDP outage calculator.

The fields and their sequence within the BDF Passport outage file are controlled by RDFs.

For Passport BDF outage record details, see “Passport BDF outage record fields” (page 645).

Table 172
Passport BDF outage record fields

Field name	Position	Description or value
switchType	001	pp for Passport
dataType	002	otg
componentName	003	The component identifier of the alarm.
customerIdentifier	004	Customer Network Management Identifier assigned to network components dedicated to a Virtual Private Network.
outageType	005	Can have a value of: Component, Partial, Indeterminate, CP SwitchOver, or SoftwareMigration.
componentType	006	Can have a value of: Module, ShelfCard (CARD), LogicalProcessor (LP), Trunk, DpnGateway, CP, or Unknown.
startDateTime	007	The date and time of the first alarm or scn record processed. The format is: yyyyymmDDTHHMMSS.t, where yyyy=year; mm=month; DD=day; HH=hour; MM=minute; SS=seconds; and t=tenths of a second.
endDateTime	008	The date and time of the last alarm or scn record processed. The format is: yyyyymmddTHHMMSS.t, where yyyy=year; mm=month; DD=day; HH=hour; MM=minute; SS=seconds; and t=tenths of a second. The endDateTime value will be set to zero if the outageType is Partial.
(Sheet 1 of 2)		

Table 172 (continued)
Passport BDF outage record fields

Field name	Position	Description or value
duration	009	Outage duration in seconds. Duration is specified only if startDateTime and endDateTime are both non-zero values; otherwise duration is set to zero.
ntpIndex	010	Use as an index to Passport alarm NTPs
(Sheet 2 of 2)		

Note: Comment and condition fields use the BDF escape sequence.

Chapter 9

Availability report records

Availability report records use a Bulk Data Format (BDF) and are generated from outage file records created by an MDP Outage Calculator. The content and sequence of all fields within BDF availability records is controlled by the gen_ava.rdf RDF file. See “BDF availability record fields” (page 647).

Table 173
BDF availability record fields

Field name	Description or value
switchType	dpn for DPN-100, pp for Passport.
dataType	ava
dateTime	Start date and time of the availability sample period. The format is: YYYYMMDDThmmss.s, where YYYY=year; MM=month; DD=day; hh=hour; mm=minute; ss=seconds; s=tenths of a second.
switchID	For DPN-100, switchID identifies the AM, RM, or PM. For Passport, switchID is a nodeID or nodename.
componentId	The component identifier formatted in pairs of: category/value.
componentType	For DPN-100: Module, Processor, LinkTrunk, Port. For Passport: Module, Card, LP, Trunk, DpnGate, CPSwitch
sampleTime	Duration of the sample period in seconds
outageTime	Sum of individual outage durations in seconds
(Sheet 1 of 2)	

Table 173 (continued)
BDF availability record fields

Field name	Description or value
serviceTime	Total time, in seconds, of sample period less any service windows defined in the exceptions file
nofOutages	Number of individual outages
mtbf	Mean time between failure in seconds
mttr	Mean time to repair in seconds
availPcnt	Percentage availability
accsampleTime	Duration of the accumulated sample period in seconds
accOutageTime	Accumulated outage time in seconds
accServiceTime	Accumulated service time in seconds
accNofOutages	Accumulated number of outages
accMtbf	Accumulated mean time between failures in seconds
accMttr	Accumulated mean time to repair in seconds
accAvailPcnt	Accumulated availability percentage
(Sheet 2 of 2)	

Note: Comment and condition fields use the BDF escape sequence.

Chapter 10

Statistics Retrieval System records

Statistics Retrieval System (SRS) records use a Bulk Data Format (BDF) and are generated by the SRS. The content and sequence of all fields within BDF SRS records is controlled by the pp_srs.rdf RDF. For a description of the original Nortel Networks supplied SRS RDF, see “SRS records” (page 649).

Table 174
SRS records

Field name	Field type	Default field position	Field value	Field description
switchType	str	001	pp	The type of switch that generated this record.
dataType	str	002	srs_<identifier> where <identifier> is the name of the applied RCF	This field identifies this record as being an SRS record and identifies the applied RCF.
componentName	str	003		This field identifies the Passport component type and location for which this statistical record was generated.

(Sheet 1 of 5)

Table 174 (continued)
SRS records

Field name	Field type	Default field position	Field value	Field description
timeOfRecord	time	004	yyyymmddT hhmmss.xxxxxx yyyy = year mm = month dd = day T = date/time split hh = hour mm = minutes ss = seconds xxxxxx = 0..999999 microseconds	This field identifies the date and time that this record was generated on switch.
deltaTime	L_int	005	units = seconds	The time, in seconds, since this component was last polled. The actual polling interval.
customerIdentifier	int	006		This field identifies the switch customer.
txCellDelta	L_int	007		The total number of cells that have been transmitted to the interface since the last SRS poll.
txCellClpDelta	L_int	008		The total number of cells that have been transmitted to the interface with CLP=1 since the last SRS poll.
txDiscardDelta	L_int	009		The total number of cells or frames, transmitted to the bus that have been discarded due to congestion, or a disabled interface, since the last SRS poll.
txDiscardClpDelta	L_int	010		The total number of cells or frames, transmitted to the bus with CLP=1 that have been discarded due to congestion, or a disabled interface, since the last SRS poll.
(Sheet 2 of 5)				

Table 174 (continued)
SRS records

Field name	Field type	Default field position	Field value	Field description
rxCellDelta	L_int	011		The total number of cells that have been recieved from the interface since the last SRS poll.
rxCellClpDelta	L_int	012		The total number of cells that have been recieved from the interface with CLP=1 since the last SRS poll.
rxDiscardDelta	L_int	013		The total number of cells or frames, received from the bus that have been discarded due to congestion, or a disabled interface, since the last SRS poll.
rxDiscardClpDelta	L_int	014		The total number of cells or frames, received from the bus with CLP=1 that have been discarded due to congestion, or a disabled interface, since the last SRS poll.
cellsTransmittedDelta	L_int	015		The total number of cells transmitted to the backplane (ingress direction) since the last SRS poll. This includes cells containing CBR data, trunk conditioning cells (structured services), and unframed AIS cells (unstructured services).
cellsReceivedDelta	L_int	016		The total number of cells received from the backplane (egress direction) since the last SRS poll. This includes CBR user data cells, cells with AAL1 header errors (correctable and non-correctable) and cells with AAL1 sequencing errors.
(Sheet 3 of 5)				

Table 174 (continued)
SRS records

Field name	Field type	Default field position	Field value	Field description
lostCellsDelta	L_int	017		The number of cells declared as never received by the AAL1 protocol layer since the last SRS poll.
bufferUnderflowsDelta	L_int	018		The number of times the AAL1 reassembly buffer underflows that have occurred since the last SRS poll. In the case of a continuous buffer starvation, a single buffer underflow event is counted.
bufferOverflowsDelta	L_int	019		The number of times the AAL1 reassembly buffer overflows that have occurred since the last SRS poll. Buffer overflows occur when AAL1 cells arrive at a rate above that which is expected. Occurrences of this condition may be reduced by increasing the value of the attributes bufferSize or maximumBufferDelay.
reassembledCellsDelta	L_int	020		The number of received cells whose payload has been played out to the service interface since the last SRS poll.
headerErrorsDelta	L_int	021		The number of cells received with AAL1 header errors since the last SRS poll.
(Sheet 4 of 5)				

Table 174 (continued)
SRS records

Field name	Field type	Default field position	Field value	Field description
pointerReframesDelta	L_int	022		The number of times that the AAL1 reassembly unit found an SDT pointer where it was not expected and as a result had to reacquire the SDT pointer since the last SRS poll. Errors of this type can occur because of problems at the far end. This attribute is meaningful for structured services , only, and are set to 0 for unstructured services.
pointerParityErrorsDelta	L_int	023		The number of times that the AAL1 reassembly unit detects a parity check failure at the point where an SDT pointer is expected since the last SRS poll. Errors of this type can occur because of problems at the far end. This attribute is meaningful for structured services, only, and are set to 0 for unstructured services.
aal1SequenceErrorsDelta	L_int	024		The number of times that the sequence number of an incoming AAL1 Type 1 SAR-PDU gets out of synchronization as defined by ITU-T Recommendation I.363.1 since the last SRS poll.
misinsertedCellsDelta	L_int	025		The number of AAL1 sequence violations that the AAL convergence sublayer interprets as misinserted cells as defined by ITU-T I.363.1 since the last SRS poll.
(Sheet 5 of 5)				

Chapter 11

File processing audit records

Header records that identify each field in the file processing audit records are optionally provided at the top of each detail or summary report page. Header records are indicated by the letter H in field 1.

For a description of the file processing audit detail records, see “File processing audit detail records” (page 655).

For a description of the file processing audit summary records, see “File processing audit summary records” (page 657).

Table 175
File processing audit detail records

Field name	Field type	Default field position	Field value	Field description
recordType	str	001	always “D”	This field identifies this audit record as a detail record.
fileName	str	002		The filename of the converted raw data file.
dataType	str	003	one of: acc, ala, log, scn, or sta	This field identifies the datatype of the converted raw data file.
nodeID	str	004		The nodename or nodeID of the originating switch.

(Sheet 1 of 3)

Table 175 (continued)
File processing audit detail records

Field name	Field type	Default field position	Field value	Field description
sizeBytes	str	005	7 digits, 0 filled	The size of the spooled data file in bytes.
recordsCount	str	006	7 digits, 0 filled	The number of successfully converted records.
bytesCorrupt	str	007	7 digits, 0 filled	The number of corrupted bytes in the spooled file.
conversionResult	str	008	one of: CONVERTED PARTIAL ERROR OTHER_ERR ZERO_LEN NONE UNKNOWN	This field indicates the status of the file conversion. CONVERTED indicates successful BDF conversion. PARTIAL indicates some records were converted and a BDF file was generated. ERROR indicates that no records were converted. OTHER_ERR indicates that other processing errors occurred while processing this file. ZERO_LEN indicates that this file was zero length and removed from the spool directory. NONE indicates that no conversion occurred because the file was missing, was waiting in the spool directory, or is not to be converted (for example, an SRS file). UNKNOWN indicates the file status is unknown.
(Sheet 2 of 3)				

Table 175 (continued)
File processing audit detail records

Field name	Field type	Default field position	Field value	Field description
deliverResult	str	009	one of: MISSING <seq> INSPOOL DELIVERED NONE	This optional field indicates the status of the file delivery. MISSING <seq> indicates that a spool file with sequence number <seq> was not received. INSPOOL indicates that a data file is received and waiting in the spool directory. DELIVERED indicates that the file was delivered to a customer host. NONE indicates that the file was not delivered to a customer host.
receivingHost/server	str	010	maximum 3 values, comma delimited	This optional field identifies the customer host(s) that received the converted BDF file. This field can contain hostnames or IP addresses.
(Sheet 3 of 3)				

Table 176
File processing audit summary records

Field name	Field type	Default field position	Field value	Field description
recordType	str	001	always "S"	This field identifies this audit record as a summary record.
date	str	002	YYYYMMDD	The date of the record.
dataType	str	003	one of: acc, ala, log, scn, or sta	This field identifies the datatype of the converted raw data file.
(Sheet 1 of 2)				

Table 176 (continued)
File processing audit summary records

Field name	Field type	Default field position	Field value	Field description
nodeID	str	004		The nodename or nodeID of the originating switch.
detailCount	str	005	5 digits, 0 filled	The number of records per node.
totalBytes/node	str	006	10 digits, 0 filled	The number of bytes processed per node.
totalRecs/node	str	007	10 digits, 0 filled	The number of successfully converted records per node.
corruptedBytes/node	str	008	10 digits, 0 filled	The number of corrupted bytes per node.
zeroCount	str	009	5 digits, 0 filled	The number of zero length files per node.
errorCount	str	010	5 digits, 0 filled	The number error files per node.
missgCount	str	011	5 digits, 0 filled	The number of missing spool files per node.
delivCount	str	012	5 digits, 0 filled	The number of BDF files successfully delivered to customer hosts.
(Sheet 2 of 2)				

Chapter 12

Vector accounting records

A Management Data Provider (MDP) host converts Vector raw accounting records into Bulk Data Format (BDF) records before transferring them to a customer host.

See “BDF accounting records” (page 659) for a description of Vector BDF accounting records.

BDF accounting records

This section describes the format of Vector accounting Bulk Data Format (BDF) records generated by a Management Data Provider (MDP).

An MDP stores BDF output files in the `/opt/MagellanMDP/data/mdp/dump/<data_type>` directory before being transferred to a customer host by the MDP. Vector accounting BDF output files use the following file-naming convention:

```
<switch_type>_<data_type>_<date_time>_<switch_id>.bdf
```

where:

```
<switch_type>
```

is *vss* for Vector switches

```
<data_type>
```

is *acc* for accounting data

<date_time>

is the date and time (YYYYMMDDhhmm = year, month, day, hours, and minutes) when the file was opened on the node

<switch_id>

is the *switch_id* of the Vector switch that generated the data

“Vector BDF accounting record fields” (page 660) lists the field descriptions for a Vector BDF accounting record.

The fields and their sequence within a Vector BDF accounting file is controlled by the *vss_acc.rdf* file.

Table 177
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
switchType	str	3	vss	Always set to “vss”	Vector switch identification
dataType	str	3	acc	Always set to “acc”	MDP data_type identification
subDataType	int	1	1 - PVC/PVP 2 - SVC/SVP 3 - SPVC/SPVP		The virtual connection type.
callConnID	hex	32	PVC/PVP: User configured ASCII string SVC/SVP and SPVC/SPVP: Machine generated identifier represented as 32 byte hex string		The connection identifier.

(Sheet 1 of 19)

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callStartTime	time	18	YYYYMMDDThhmmss.ss		The time the call was created.
callCollectTime	time	18	YYYYMMDDThhmmss.ss		For calls still in progress, this field indicates the time of data collection. For calls terminated during the billing interval, this field has the time of call termination.
callElapsedTime	int	4			The duration of the MDP billing interval in 0.1 second increments. For those calls terminated in setup, the elapsed time is set to 0. This field is calculated using the callStartTime and callCollectTime fields.
callOrigMethod	int	1	0 - point - to - point 1 - point - to - multipoint		The method of call origination
callType	int	1	0 - PVC 1 - PVP 2 - SVC 3 - SPVC 6 - SVP 7 - SPVP		The virtual connection type.
(Sheet 2 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
connectPointType	int	1	0 - originating 1 - intermediate or transit 2 - terminating	PVC/PVP: User configured as orig(0), tran(1), or term(2). These values are automatically assigned for all other call types.	This field indicates whether the ATM port which generated this accounting record is the originating, intermediate, or terminating end of the connection.
atmPortNumber	str	6	format: <bnp> or CTL where: b is the switch board or fabric (1 or 3), n is the netmod (A to D) and p is the port (1 to 8). CTL - Control Port	The control port (CTL) is used by the switch control processor (SCP) to communicate with the network. Control port connections are not user initiated and would typically be ignored by billing systems.	The ATM port associated with this accounting record.
callVpi	int	2	Decimal (0 to 4095)		The Virtual Path Identifier at the interface where the accounting record is generated.
(Sheet 3 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callVci	int	2	Decimal (0 to 65535)		The Virtual Channel Identifier at the interface where the accounting record is generated.
callRecordType	int	1	0 - call in-progress 1 - new call in interval 2 - call terminated in interval 3 - call setup and terminated within interval		Indicates the status of the call during the MDP billing interval (1 hour).
termInSetup	int	1	0 - call setup successfully 1 - call terminated before setup		This field indicates call termination during setup.
(Sheet 4 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
cellCountValidityFlag	int	1	0 - invalid 1 - valid	<p>Flag set to invalid if any of the following are encountered:</p> <ul style="list-style-type: none"> - billing counter failure on switch - SWACT on the switch - reboot in the switch - missing cell count files on the MDP - an incomplete compliment of files sent by the switch to the MDP - call is point to multipoint - call was in-progress at the time of a legacy to egress billing transition - call is using an egress port of a non-Series D netmod 	<p>This flag can indicate that the cell counts in this record are invalid.</p> <p>This is a requested field in the GR1110 specification (Bellcore BBS Generic Requirements Usage Information to Support Billing).</p>
ingressCellCount Clp01	double	8			The total number of cells (with CLP = 0 or CLP = 1) received at the fabric during the MDP billing interval.

(Sheet 5 of 19)

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
egressCellCount Clp01	double	8			The total number of cells (with CLP = 0 or CLP = 1) transmitted at the fabric during the MDP billing interval.
ingressDiscarded Clp01	double	8			The total number of cells (with CLP = 0 or CLP = 1) discarded by the switch, during the MDP billing interval.
egressDiscarded Clp01	double	8			The total number of cells (with CLP = 0 or CLP = 1) discarded by the switch during the MDP billing interval.
ingressPeakCell CountClp01	int	4		Vector billing interval cell counts are normalized to 5 minutes.	The highest number of cells (with CLP = 0 or CLP = 1) received in any Vector billing interval (configured on the switch and normally 5 minutes duration) received over the MDP billing interval (normally 1 hour).
(Sheet 6 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
egressPeakCellCountClp01	int	4		Vector billing interval cell counts are normalized to 5 minutes.	The highest number of cells (with CLP = 0 or CLP = 1) transmitted in any Vector billing interval (configured on the switch and normally 5 minutes duration) received over the MDP billing interval (normally 1 hour)
ingressPeakDiscardedClp01	int	4		Vector billing interval cell counts are normalized to 5 minutes.	The highest number of cells (with CLP = 0 or CLP = 1) discarded by the switch in any Vector billing interval (configured on the switch and normally 5 minutes duration) received over the MDP billing interval (normally 1 hour)
egressPeakDiscardedClp01	int	4		Vector billing interval cell counts are normalized to 5 minutes.	The highest number of cells (with CLP = 0 or CLP = 1) discarded by the switch in any Vector billing interval (configured on the switch and normally 5 minutes duration) received over the MDP billing interval (normally 1 hour)
(Sheet 7 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callInterfaceld	str	variable		Not currently supported. Added in R9.6 but never used.	This is a requested field in the GR1110 specification (Bellcore BBS Generic Requirements Usage Information to Support Billing) to support PVC cell relay service.
callingNsapAddr	hex	20		For subDataTypes 2 (SVC/SVP) and 3 (SPVC/SPVP) only. Optional field. Will not appear unless specified by the user.	Calling NSAP (Network Service Access Point) address as defined in ATM Forum specifications
callingNsapSubAddr	hex	20		For subDataTypes 2 (SVC/SVP) and 3 (SPVC/SPVP) only. Optional field. Will not appear unless specified by the user.	Calling NSAP (Network Service Access Point) subaddress as defined in the ATM forum specification.
(Sheet 8 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
calledNsapAddr	hex	20		For subDataTypes 2 (SVC/SVP) and 3 (SPVC/SPVP) only.	Called NSAP (Network Service Access Point) address as defined in the ATM forum specification
calledNsapSubAddr	hex	20		For subDataTypes 2 (SVC/SVP) and 3 (SPVC/SPVP) only. Optional field. Will not appear unless specified by the user.	Called NSAP (Network Service Access Point) subaddress as defined in the ATM forum specification.
callForwPcrClp0	int	4		Optional field. Will not appear unless specified by the user. Measured in cells per second.	The Peak Cell Rate (PCR) of the connection in the forward direction, for high - priority cells (with CLP = 0). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.
(Sheet 9 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callForwPcrClp01	int	4		<p>PVC/PVP: If the PCR is not specified then this field will not appear.</p> <p>SVC/SVP and SPVC/SPVP: If the PCR is not specified then the PCR = link rate.</p> <p>Measured in cells per second.</p>	<p>The Peak Cell Rate (PCR) of the connection in the forward direction, for all cells (with CLP = 0 or CLP = 1).</p> <p>PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch.</p> <p>SVC/SVP: Set in the call setup message according to ATM forum UNI specification.</p>
callBackPcrClp0	int	4		<p>Optional field. Will not appear unless specified by the user.</p> <p>Measured in cells per second.</p>	<p>The Peak Cell Rate (PCR) for the connection in the backward direction, for high - priority cells (with CLP = 0).</p> <p>PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch.</p> <p>SVC/SVP: Set in the call setup message according to ATM forum UNI specification.</p>

(Sheet 10 of 19)

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callBackPcrClp01	int	4		<p>PVC/PVP: If the PCR is not specified then this field will not appear.</p> <p>SVC/SVP and SPVC/SPVP: If the PCR is not specified then the PCR = link rate.</p> <p>Measured in cells per second.</p>	<p>The Peak Cell Rate (PCR) for the connection in the backward direction, for all cells (with CLP = 0 or CLP = 1).</p> <p>PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch.</p> <p>SVC/SVP: Set in the call setup message according to ATM forum UNI specification.</p>
callForwScrClp0	int	4		<p>Optional field. Will not appear unless specified by the user.</p> <p>Measured in cells per second.</p>	<p>The Sustained Cell Rate (SCR) for the connection in the forward direction, for high priority cells (with CLP = 0).</p> <p>PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch.</p> <p>SVC/SVP: Set in the call setup message according to ATM forum UNI specification.</p>

(Sheet 11 of 19)

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callForwScrClp01	int	4		Optional field. Will not appear unless specified by the user. Measured in cells per second.	The Sustained Cell Rate (SCR) for the connection in the forward direction, for all cells (with CLP = 0 or CLP = 1). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.
callBackScrClp0	int	4		Optional field. Will not appear unless specified by the user. Measured in cells per second.	The Sustained Cell Rate (SCR) for the connection in the backward direction, for high - priority cells (with CLP = 0). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.

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Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callBackScrClp01	int	4		Optional field. Will not appear unless specified by the user. Measured in cells per second.	The Sustained Cell Rate (SCR) for the connection in the backward direction, for all cells (with CLP = 0 or CLP = 1). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.
callForwMbsClp0	int	4		Optional field. Will not appear unless specified by the user. The value is in cells.	The Maximum Burst Size (MBS) for the connection in the forward direction, for high-priority cells (with CLP=0). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.

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Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callForwMbsClp01	int	4		Optional field. Will not appear unless specified by the user. The value is in cells.	The Maximum Burst Size (MBS) for the connection in the forward direction, for all cells (with CLP=0 or CLP=1). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.
callBackMbsClp0	int	4		Optional field. Will not appear unless specified by the user. The value is in cells.	The Maximum Burst Size (MBS) for the connection in the backward direction, for high-priority cells (with CLP=0). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.

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Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callBackMbsClp01	int	4		Optional field. Will not appear unless specified by the user. The value is in cells.	The Maximum Burst Size (MBS) for the connection in the backward direction, for all cells (with CLP=0 or CLP=1). PVC/PVP and SPVC/SPVP: Set by UPC contract on the switch. SVC/SVP: Set in the call setup message according to ATM forum UNI specification.
callForwQos	int	1	0 - unspecified QoS 1 - QoS Class 1 2 - QoS Class 2 3 - QoS Class 3 4 - QoS Class 4	For SVC/SVP and SPVC/SPVP only. This field is not supported for SPVC/SPVP.	This field specifies the quality of service (QoS) for the connection in the forward direction. SVC/SVP: QoS is a mandatory IE in the call setup message. The values of QoS conform to the ATM Forum UNI specification.
(Sheet 15 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callBackQos	int	1	0 - unspecified QoS 1 - QoS Class 1 2 - QoS Class 2 3 - QoS Class 3 4 - QoS Class 4	For SVC/SVP and SPVC/SPVP only. This field is not supported for SPVC/SPVP.	This field specifies the quality of service (QoS) for the connection in the backward direction. SVC/SVP: QoS is a mandatory IE in the call setup message. The values of QoS conform to the ATM Forum UNI specification.
atmCallTermCause Value	int	1	PVC/PVP: 0 - Normal termination. 255 - Call terminated due to upgrade from PP to PMP. SVC/SVP and SPVC/SPVP: All values - Call Termination SPVC/SPVP: 0 - Operator initiated normal termination on the originating fabric.	For calls in-progress this field is always set to 0. This field is only relevant when the call is terminated.	Call termination cause value. SVC/SVP: Call termination cause according to ATM forum UNI specification. SPVC/SPVP: Call termination cause according to ATM forum UNI specification except cause value 0.
(Sheet 16 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callAssocId	hex	32		For SPVCs and SPVPs, only. This field only appears in the billing record generated on the originating switch fabric.	User configured ASCII string assigned to a SPVC or SPVP when it is created.
callTrafficMgmt	int	1	0 - tagging not requested 1 - tag in forward direction 2 - tag in backward direction 3 - tag in both directions	SVC/SVP and SPVC/SPVP: This field will not appear unless tagging is requested. PVC/PVP: The field is always present.	Call traffic management flag to indicate the traffic management policy in effect for the call; tagging (setting CLP = 1) or dropping cells. PVC/PVP and SPVC/SPVP: Tagging policy is determined by the use of a UPC contract. SVC/SVP: Tagging is requested in the call setup message according to the ATM UNI specification.
(Sheet 17 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
callBestEffort	int	1	0 - Not specified 1 - Best Effort		<p>Call Best Effort Flag.</p> <p>PVC/PVP:</p> <p>Set to 1 when no UPC contract has been specified or when a UBR contract has been specified.</p> <p>SVC/SVP and SPVC/SPVP:</p> <p>Indicates the presence of the callBestEffort flag in the call setup message according to the ATM Forum UNI specification.</p>
egressXmitdClp0	double	8		Added in Vector 4.0.	The number of high priority cells (with CLP = 0) transmitted on the link during the MDP billing interval.
egressXmitdClp1	double	8		Added in Vector 4.0.	The number of low priority cells (with CLP = 1) transmitted on the link during the MDP billing interval.
(Sheet 18 of 19)					

Table 177 (continued)
Vector BDF accounting record fields

Field Name	Field Type	Field Size (bytes)	Field Value	Field Notes	Field Description
egressPeakXmitd Clp0	int	4		Added in Vector 4.0.	The highest number of high priority cells (with CLP = 0) transmitted on the link from any of the Vector billing intervals (configured on the switch and normally 5 minutes in length) within the MDP billing interval (normally 60 minutes in length).
egressPeakXmitd Clp1	int	4		Added in Vector 4.0.	The highest number of low priority cells (with CLP = 1) transmitted on the link from any of the Vector billing intervals (configured on the switch and normally 5 minutes in length) within the MDP billing interval (normally 60 minutes in length).
callRtvbrPvcPvp	int	1	0 - CBR, nrt-VBR, or UBR connection 1 - rt-VBR connection	Only applicable to PVC or PVP connections. Added in Vector 4.0.	Real-time VBR flag. Indicates whether a PVC or PVP connection is a real-time VBR (rtVBR) connection.
(Sheet 19 of 19)					

Chapter 13

Vector statistics records

This chapter describes the format of Vector statistics Bulk Data Format (BDF) records generated by a Management Data Provider (MDP) host.

A MDP stores BDF output files in directory `/opt/MagellanMDP/data/mdp/dump/<data_type>` before they are transferred to a customer host. BDF output files have the following naming convention:

```
<switch_type>_<data_type>_<date_time>_<switch_id>.bdf
```

where:

```
<switch_type>
```

is *vss* for Vector switches

```
<data_type>
```

is *sta* for statistical data

```
<date_time>
```

is the date and time (YYYYMMDDhhmm = year, month, day, hours, and minutes) when the file was opened on the switch

```
<switch_id>
```

is the *switch_id* of the Vector switch that generated the data

The following tables show the field descriptions for a Vector statistics record. The *Field value* column in this table indicates the field values that are present in the BDF output record for a given input performance monitoring record type.

The field formats and their order within a Vector BDF statistics file is controlled by the file `vss_sta.rdf`.

The following tables are partitioned by the common statistics generated:

- “All Vector statistics records” (page 681)
- “Board statistics records” (page 682)
- “Netmod statistics records” (page 683)
- “PSM and DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records” (page 684)
- “Port Shared Memory Priority statistics records” (page 685)
- “DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records” (page 686)
- “DS1, DS3, E1, E3, and J2 port statistics records” (page 688)
- “DS1, DS3, E1, and E3 port statistics records” (page 689)
- “DS3, E1, and E3 port statistics records” (page 689)
- “DS1 port statistics records” (page 690)
- “DS3 port statistics records” (page 692)
- “E1 port statistics records” (page 692)
- “E3 port statistics records” (page 693)
- “J2 port statistics records” (page 693)
- “OC3 and OC12 port statistics records” (page 694)

“All Vector statistics records” (page 681) shows the Vector statistic fields that are applicable to *all* Vector statistics records.

Table 178
All Vector statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
switchType	str		always “vss”	This field identifies the switch from which this record was generated as being a Vector.
dataType	str		always “sta”	This field identifies this record as being a statistical record.
subDataType	int		100 - board type 110 - netmod type 120 - port shared memory priority 19 - DS1 port 3 - DS3 port 4 - OC3 port 8 - OC12 port 20 - E1 port 17 - E3 port 18 - J2 port	This field identifies the Vector component for which this statistical record was generated.
(Sheet 1 of 2)				

Table 178 (continued)
All Vector statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
recordIdentifier	str	16	board: "B/<board_index>" netmod: "B/<board_index> N/<netmod_index>" port shared memory priority: "B/<board_index> N/<netmod_index> P/<port_index> PR/<priority_index>" port types: "B/<board_index> N/<netmod_index> P/<port_index>" where: board_index = 0 to 3 netmod_index = 0 to 3 port_index = 0 to x (x depends on the netmod model) priority_index = 1 to 3	This field identifies the record type. The value is dependant upon the subDataType.
(Sheet 2 of 2)				

“Board statistics records” (page 682) shows the Vector statistic fields that are applicable to *board* statistics records.

Table 179
Board statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
switchName	str	128		This field identifies the individual switch by name.
(Sheet 1 of 2)				

Table 179 (continued)
Board statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalVpiLookupErrors	double	8		The total number of VPI lookup errors.
peakVpiLookupErrors	int	4		The number of VPI lookup errors of all 5 minute collection intervals within an aggregation period.
totalVciLookupErrors	double	8		The total number of VCI lookup errors.
peakVciLookupErrors	int	4		The number of VCI lookup errors of all 5 minute collection intervals within an aggregation period.
(Sheet 2 of 2)				

“Netmod statistics records” (page 683) shows the Vector statistic fields that are applicable to *netmod* statistics records.

Table 180
Netmod statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
moduleUpTime	double	8		The length of time this network module has been up, in hundredths of a second.

“PSM and DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records” (page 684) shows the Vector statistic fields that are applicable to *Port Shared Memory* and *DS1, DS3, OC3, OC12, E1, E3, and J2 port* statistics records.

Table 181
PSM and DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalCellsTransmitted	double	8		For Port Shared Memory, the total number of cells transmitted within the hour period for this traffic type. For DS1, DS3, OC3, OC12, E1, E3, and J2, the total number of cells transmitted within the hour period.
peakCells Transmitted	int	4		For Port Shared Memory, the peak number of cells transmitted within the hour period for this traffic type. For DS1, DS3, OC3, OC12, E1, E3, and J2, the peak number of cells transmitted within the hour period.

“Port Shared Memory Priority statistics records” (page 685) shows the Vector statistic fields that are applicable to *Port Shared Memory Priority* statistics records.

Table 182
Port Shared Memory Priority statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
minimumDedicatedQueueSize	int	4		The minimum dedicated queue size for a collection interval within the hour period for this traffic type.
peakDedicatedQueueSize	int	4		The peak dedicated queue size for a collection interval within the hour period for this traffic type.
minimumQueueSize	int	4		The minimum queue size for a collection interval within the hour period for this traffic type.
peakQueueSize	int	4		The peak queue size for a collection interval within the hour period for this traffic type.
totalCellsLost	double	8		The total number of cells that were lost within the hour period for this traffic type.
peakCellsLost	int	4		The peak number of cells that were lost within the hour period for this traffic type.

“DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records” (page 686) shows the Vector statistic fields that are applicable to *DS1*, *DS3*, *OC3*, *OC12*, *E1*, *E3*, and *J2 port* statistics records.

Table 183
DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
minimumPortBuffer Size	int	4		The minimum logical size of this ports output buffer (in cells) for a collection interval within the hour period.
peakPortBufferSize	int	4		The peak logical size of this ports output buffer (in cells) for a collection interval within the hour period.
minimumPortQueue Length	int	4		The minimum number of cells in this ports output buffer for a collection interval within the hour period.
peakPortQueue Length	int	4		The peak number of cells in this ports output buffer for a collection interval within the hour period.
totalPortOverflows	double	8		The total number of half-seconds within the hour period in which cells were dropped because the output buffer was full.
peakPortOverflows	int	4		The peak number of half-seconds for a collection interval within the hour period in which cells were dropped because the output buffer was full.
totalPortErrors	double	8		The total number of half-seconds within the hour period in which errored cells were dropped by this port.
(Sheet 1 of 3)				

Table 183 (continued)
DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
peakPortErrors	int	4		The peak number of half-seconds for a collection interval within the hour period in which errored cells were dropped by this port.
minimumIncomingVirtualPaths	int	4		The minimum number of incoming virtual paths, for the port, for a collection interval within the hour period.
peakIncomingVirtualPaths	int	4		The peak number of incoming virtual paths, for the port, for a collection interval within the hour period.
minimumAllocatedIncomingBandwidth	int	4		The minimum allocated incoming bandwidth (in cells/sec), for the port, for a collection interval within the hour period.
peakAllocatedIncomingBandwidth	int	4		The peak allocated incoming bandwidth (in cells/sec), for the port, for a collection interval within the hour period.
totalCellsReceived	double	8		The total number of cells received, for the port, within the hour interval.
peakCellsReceived	int	4		The peak number of cells received, for the port, for a collection interval within the hour interval.
minimumOutgoingVirtualPaths	int	4		The minimum number of outgoing virtual paths, for the port, for a collection interval within the hour period.
(Sheet 2 of 3)				

Table 183 (continued)
DS1, DS3, OC3, OC12, E1, E3, and J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
peakOutgoingVirtualPaths	int	4		The peak number of outgoing virtual paths, for the port, for a collection interval within the hour period.
minimumAllocatedOutgoingBandwidth	int	4		The minimum allocated outgoing bandwidth (in cells/sec), for the port, for a collection interval within the hour period.
peakAllocatedOutgoingBandwidth	int	4		The peak allocated outgoing bandwidth (in cells/sec), for the port, for a collection interval within the hour period.
(Sheet 3 of 3)				

“DS1, DS3, E1, E3, and J2 port statistics records” (page 688) shows the Vector statistic fields that are applicable to *DS1*, *DS3*, *E1*, *E3*, and *J2 port* statistics records.

Table 184
DS1, DS3, E1, E3, and J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalAtmHcs	double	8		The total number of header check sequence errors found within the hour period.
peakAtmHcs	int	4		The peak number of header check sequence errors found for a collection interval within the hour period.

“DS1, DS3, E1, and E3 port statistics records” (page 689) shows the Vector statistic fields that are applicable to *DS1*, *DS3*, *E1*, and *E3 port* statistics records.

Table 185
DS1, DS3, E1, and E3 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalPlcpBip8	double	8		The total number of bit interleaved parity-8 (BIP-8) errors found within the hour period.
peakPlcpBip8	int	4		The peak number of bit interleaved parity-8 (BIP-8) errors found for a collection interval within the hour period.
totalPlcpFebe	double	8		The total number of ATM Far End Block errors found within the hour period.
peakPlcpFebe	int	4		The peak number of ATM Far End Block errors found for a collection interval within the hour period.

“DS1, DS3, E1, and E3 port statistics records” (page 689) shows the Vector statistic fields that are applicable to *DS3*, *E1*, and *E3 port* statistics records.

Table 186
DS3, E1, and E3 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalLineCv	double	8		The total number of Line Code Violations detected within the hour period by the DS3 receive frame block.

(Sheet 1 of 2)

Table 186 (continued)
DS3, E1, and E3 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
peakLineCv	int	4		The peak number of Line Code Violations detected for a collection interval within the hour period by the DS3 receive frame block.
totalFramingFebe	double	8		The total number of Far End Block errors found within the hour period.
peakFramingFebe	int	4		The peak number of Far End Block errors found for a collection interval within the hour period.
(Sheet 2 of 2)				

“DS1 port statistics records” (page 690) shows the Vector statistic fields that are applicable to *DS1 port* statistics records.

Table 187
DS1 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalFramingB8zs Patterns	double	8		The total number of seconds within the hour period in which B8ZS pattern errors were detected.
peakFramingB8zs Patterns	int	4		The peak number of seconds for a collection interval within the hour period in which B8ZS pattern errors were detected.
(Sheet 1 of 2)				

Table 187 (continued)
DS1 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalFraming8Zeros	double	8		The total number of seconds within the hour period in which 8 zero errors were detected.
peakFraming8Zeros	int	4		The peak number of seconds for a collection interval within the hour period in which 8 zero errors were detected.
totalFraming16Zeros	double	8		The total number of seconds within the hour period in which 16 zero errors were detected.
peakFraming16Zeros	int	4		The peak number of seconds for a collection interval within the hour period in which 16 zero errors were detected.
totalFramingBit EncodingErrors	double	8		The total number of bit encoding errors found within the hour period.
peakFramingBit EncodingErrors	int	4		The peak number of bit encoding errors found for a collection interval within the hour period.
(Sheet 2 of 2)				

“DS3 port statistics records” (page 692) shows the Vector statistic fields that are applicable to *DS3 port* statistics records.

Table 188
DS3 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalFramingPBit Errors	double	8		The total number of P-bit parity errors found within the hour period.
peakFramingPBit Errors	int	4		The peak number of P-bit parity errors found for a collection interval within the hour period.
totalFramingCBit Errors	double	8		The total number of C-bit parity errors found within the hour period.
peakFramingCBit Errors	int	4		The peak number of C-bit parity errors found for a collection interval within the hour period.

“E1 port statistics records” (page 692) shows the Vector statistic fields that are applicable to *E1 port* statistics records.

Table 189
E1 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalFramingCrc	double	8		The total number of Cyclic Redundancy errors found within the hour period.
peakFramingCrc	int	4		The peak number of Cyclic Redundancy errors found for a collection interval within the hour period.

“E3 port statistics records” (page 693) shows the Vector statistic fields that are applicable to *E3 port* statistics records.

Table 190
E3 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalFramingBip8	double	8		The total number of bit interleaved parity-8 (BIP-8) error events found within the hour period.
peakFramingBip8	int	4		The peak number of bit interleaved parity-8 (BIP-8) error events found for a collection interval within the hour period.

“J2 port statistics records” (page 693) shows the Vector statistic fields that are applicable to *J2 port* statistics records.

Table 191
J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalB8zsEncoding Errors	double	8		The total number of B8ZS coding violation errors found within the hour period.
peakB8zsEncoding Errors	int	4		The peak number of B8ZS coding violation errors found for a collection interval within the hour period.
totalCRC5Errors	double	8		The total number of Cyclic Redundancy 5 (CRC-5) errors found within the hour period.

(Sheet 1 of 2)

Table 191 (continued)
J2 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
peakCRC5Errors	int	4		The peak number of Cyclic Redundancy 5 (CRC-5) errors found for a collection interval within the hour period.
(Sheet 2 of 2)				

“OC3 and OC12 port statistics records” (page 694) shows the Vector statistic fields that are applicable to *OC3* and *OC12 port* statistics records.

Table 192
OC3 and OC12 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
totalSectionBip8	double	8		The total number of section bit interleaved parity-8 (BIP-8) error events found within the hour period.
peakSectionBip8	int	4		The peak number of section bit interleaved parity-8 (BIP-8) error events found for a collection interval within the hour period.
totalLineBip24	double	8		The total number of line bit interleaved parity-24 (BIP-24) error events found within the hour period.
(Sheet 1 of 3)				

Table 192 (continued)
OC3 and OC12 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
peakLineBip24	int	4		The peak number of line bit interleaved parity-24 (BIP-24) error events found for a collection interval within the hour period.
totalLineFebe	double	8		The total number of line Far End Block errors found within the hour period.
peakLineFebe	int	4		The peak number of line Far End Block errors found for a collection interval within the hour period.
totalPathBip8	double	8		The total number of path bit interleaved parity-8 (BIP-8) error events found within the hour period.
peakPathBip8	int	4		The peak number of path bit interleaved parity-8 (BIP-8) error events found for a collection interval within the hour period.
totalPathFebe	double	8		The total number of path Far End Block errors found within the hour period.
peakPathFebe	int	4		The peak number of path Far End Block errors found for a collection interval within the hour period.
totalAtmCorrectable Hcs	double	8		The total number of correctable header check sequence errors found within the hour period.
(Sheet 2 of 3)				

Table 192 (continued)
OC3 and OC12 port statistics records

Field name	Field type	Field size (bytes)	Field value	Field description
peakAtmCorrectableHcs	int	4		The peak number of correctable header check sequence errors found for a collection interval within the hour period.
totalAtmUncorrectableHcs	double	8		The total number of uncorrectable header check sequence errors found within the hour period.
peakAtmUncorrectableHcs	int	4		The peak number of uncorrectable header check sequence errors found for a collection interval within the hour period.
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