DEFINITY®
Enterprise Communications Server
What's New for Release 9

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This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications. Le Présent Appareil Nomérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A préscrites dans le reglement sur le brouillage radioélectrique édicté par le ministére des Communications du Canada.

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"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

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Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of your company's telecommunications equipment) by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based) or asynchronous (character-, message-, or packet-based) equipment or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll-facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

Your Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you – an Avaya customer's system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

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To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure your:

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- Any other equipment networked to your Avaya products

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About this Document

Overview

This document introduces new and enhanced features and capabilities of DEFINITY Enterprise Communications Server (ECS) Release 9. Features marked "Category A and B" are available with ECS/ProLogix, DEFINITY ONE, and BCS/GuestWorks. Features marked "Category A Only" are available with ECS/ProLogix and DEFINITY ONE, but are not available with BCS/GuestWorks.

This document does not contain comprehensive instructions for switch administration or complete feature descriptions, nor does it contain information about how to install, maintain, repair, or troubleshoot the switch. For complete information and instructions, see the *DEFINITY ECS Release 9* documentation CD.

Audience

This document is intended for DEFINITY system administrators and managers, users interested in information about specific features, and Avaya personnel responsible for planning, designing, configuring, selling, and supporting the system.

This document assumes that you are familiar with administration of DEFINITY ECS, GuestWorks, DEFINITY BCS and DEFINITY ONE in a recent release of DEFINITY software.

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1 **Global**

Avaya Directory Gateway — Administration Change Notification

(Category A and B)

Overview

Administration Change Notification is an R9 service that provides real-time updates whenever administration changes occur in a particular object (e.g., station). These notifications are normally provided by using a SAT/OSSI connection. This feature enables R9 to communicate with the Avaya Directory Gateway application, a Lightweight Directory Access Protocol (LDAP) enabled product.

The Directory Gateway affords a standards based access to communications systems data and presents the ability to synchronize data between DEFINITY and Intuity AUDIX administration data as defined by the customer.

The types of administration data changes that are tracked include:

- Changes made by an administrator using a SAT interface (local or remote).

- An INADS port.

- A Property Management System (PMS).

- Call Management System (CMS).

- Terminal Translation Initialization (TTI).

- Administration changes made using an OSSI interface from an adjunct (such as, DNA, DEFINITY Site Administration or Directory Gateway).

- Station changes by an end user.

Actual details of the data for the object that has changed are not provided, but may be retrieved using another SAT/OSSI connection.

Administration

Administration Forms - New
A new form, Administration Changes, provides real-time notification of administration changes. It is a display-only (report) form.

This form is accessed using the **notify history** command.

Figure 1.   Administration Changes

```
 notify history
                              ADMINISTRATION CHANGES


  Date   Time   Login   Actn   Object       Qualifier
  4/26   12:28
  4/26   12:29
  4/26   12:30   Init    Rel    Trunk        1
  4/26   12:30   Init    Busy   Trunk        1
  4/26   12:31   Init    Cha    Trunk-group  1
  4/26   12:32   Init    Rel    Trunk        1
  4/26   12:32   init    Busy   trunk        1
  4/26   12:33
```

Field Values:

- Date/Time - indicates the date and time of the change or heartbeat message.

- Login - the login.

- Actn - the recorded activity.

- Object - the type of object.

- Qualifier - identifying data for requested object.

Note: A line containing only date and time indicate a heartbeat message.

Administration Forms - Changes

The System Parameters Features form has a new field:
Record PMS/AD Transactions in History Log?

This is a y/n field, which indicates if admin changes are to be recorded. The default is **n**. If the DNA field is set to **y**, this field upgrades to **y**.

Previously, the Property Management System (PMS) and Abbreviated Dialing (AD) administration changes recorded only when the DNA field on the System Parameters Customer Options form was set to **y**.

On the System Parameters Customer Options form, the wireless parameters on page 2 have been moved to page 10.

The following new events were added to the History log:

• Automatic switch resets that reload translations.

• Automatic daylight savings time changes to system time.

• Automatic save translations.

The following modified events were added to the History log for **next**:

• Log specifies specific value generated.

• Some object names are truncated.

ATM WAN Spare Processors (WSP)

(Category A Only)

Overview

The purpose of a WAN Spare Processor (WSP) is to function as a PPN in case of catastrophic failure in the network.

A WSP is capable of running the entire R9r system, as well as any EPNs with which it can establish links, while the ATM network is down.

Description

A WSP can be thought of as a PPN (without port cards). Its purpose is to take over the PPN functions in case of a catastrophic network failure.

DEFINITY R9r systems with multiple port networks connected via ATM will have the ability to support up to seven WSPs. Each WSP will have the ability to function as the R9r Switch Processing Element (SPE) if the PPN is not functional or is not connected to one or more of the other port networks.

WSPs will be in constant communication with the PPN as well as WSPs of high priority. WSPs will be administered in a priority order such that a WSP can only become active if it loses connectivity with the PPN and all other WSPs of higher priority. The WSP will be in a stand-by mode until or unless it is activated to take the place of the PPN.

In order to function effectively, WSPs must have translations based on the PPN. WSP databases can be updated manually while in a stand-by mode. Alternatively, the

DEFINITY Translator for ATM WSP (DTA) tool can be used to maintain mirror image databases on each WSP.

In case of a PPN failure, automatic switchover to WSP control is not instantaneous. Existing calls will be lost. The WSP will wait an administered interval (5-99 minutes) and take control in about 15 minutes.

Restoration to normal PPN operation is performed manually and again is neither instantaneous nor call preserving. Restoral procedures should take place at a time least disruptive. It is possible to login remotely to perform the restoral.

Administration

There are two levels of system reliability: Standard and High. The WSPs must be administered to interact in conjunction with the level of reliability required.

Administration Forms - New

There is a new form, ATM WAN Spare Processor X used to add, change, display or remove information about a specific WSP. When used for standard and high reliability systems, the form appears as shown below.

This form will appear at the **Add**, **Change**, **Display** or **Remove ATM WSP X** command.

Note: For high reliability systems, this form is two pages. Page 2 contains additional data for the second A-PNC.

Figure 2.   ATM WAN Spare Processor 2

```
change atm wsp 2                                                    page 1 of 1

                          ATM WAN SPARE PROCESSOR 2

   Name: Denver                          Product Identification:_____
 Priority: 3

         A-PNC


 Address Format: E.164 ATM Private
           AFI: 45
          E.164: 1234567890123456
        HO-DSP: 12345678
           ESI: 123456789012
           SEL: 12


 Command:
```

Field Values

• ATM WAN Spare Processor **#** (#=1-7) - Identifies the specific WSP (display only).

- Name - Identification of WSP.

- Priority (1-7) - Indicates hierarchical position of WSP.

- Product Identification - 10-digit field beginning with **1**. Must be unique:

  ~ can only be changed by init login; otherwise it is a display only field.

  ~ used by services to identify which switch is experiencing problems.

- Address Format - Indicates type of address format to be used.

- AFI - Authority and Format Identifier (display only). Determined by value of Address Format as follows:

  ~ **39** = DCC (Data Country Code) format.

  ~ **45** = E.164 format (International public telecommunication numbering plan).

  ~ **47** = ICD (International Code Designator) ATM format.

- E.164 - Appears only if Address Format = E.164. Indicates actual address.

Note: Address will appear in DCC or ICD ATM format if appropriate.

- HO-DSP - High Order-Domain Specific Part.

- ESI - End System Identifier.

- SEL - Selector

- A new form, ATM WAN Spare Processor is used to determine WSP status. The form appears as shown below.

This form will appear at the **status atm wsp** command.

Figure 3. ATM WAN Spare Processor

```
status atm wsp                                          page  1 of 1

                    ATM WAN SPARE PROCESSOR

  WAN Processor Role:  Spare      WSP Number:  1      State: standby    Priority: 1


  WSP        Name         Priority       A-PNC Link Status:

  Main       Denver       <blank>        Up
  2          Westminster  2              Up
  3          Greenwood    3              Unknown




  Command:
```

Field Values

• Field values returned at the **status atm wsp** command show the status of the WSPs (standby or active), as well as name, priority and the status (up, down or unknown) of the links associated with the WSP.

Note:

- **Up** status indicates that all ATM E1 boards in the main PPN, the WSP, and the ATM network are operational.

- **Down** indicates communication between the main PPN and the WSP, or between two WSPs, has *not* occurred for at least one minute.

- **Unknown** indicates that a WSP is unable to check the status of a higher priority WSP.

A new form, ATM WAN Spare Processor Main is used to change the PPN's ATM address on a spare WSP, or to change reliability levels. The ATM WAN Spare Processor Main form is identical to the ATM WAN Spare Processor X form with the following exceptions:

- There is no Priority field since the priority of the PPN is always **0**.

- The form is two pages if and only if PNC Duplication has been set to **n** on the Customer Options form.

This form will appear at the **change atm wsp main** or **display atm wsp main** commands.

Administration Forms - Changes
There is a new field on System-Parameters Customer Options form, ATM WAN Spare Processor? This is a y/n field. The value must be set to **y** to enable the ATM WAN Spare Processor feature.

Maintenance

Maintenance Forms - Changes

A new page has been added to the Maintenance Related System Parameters form. It is used to add a number of ATM parameter fields.

Figure 4.   Maintenance-Related System Parameters

```
                                                              page 4 of 4

                    MAINTENANCE-RELATED SYSTEM PARAMETERS

ATM PARAMETERS
              WAN Processor Role: spare
                    WSP Number: 5
        WSP Activation Timer (mins): 5


                              A-PNC

            Board Location:  1B02

```

Field Values

- WAN Processor Role - Identifies the processor as **main**, **spare** or **pending**. If **spare** the following fields are prompted for:

- WSP Number - Indicates the number of the WSP.

- WSP Activation Timer - Indicates the number of minutes (5-99) before a WSP will attempt to take over PPN responsibilities.

- Board Location - Indicates the board location (carrier and slot).

Firmware Download

(Category A and B)

Overview

With earlier releases of DEFINITY, circuit pack boards that needed firmware updates were returned to the factory for reprogramming. The new Firmware Download capability allows Avaya customers to download a new "image" (similar to a patch for software) to easily upgrade a circuit pack.

Description

Firmware download is a process for downloading an image into DEFINITY and then using that image to reprogram the application code of a port circuit pack. The Firmware Download feature gives DEFINITY R9 customers the capability to update a circuit pack's firmware remotely (via the web). The feature enables the application code for port boards to be reprogrammed in the field without physically removing the board from the carrier. Customers will download this new image from the customer self-service website to their PC. Then FTP to the DEFINITY C-Lan board and via the DEFINITY system administration, apply the image from the C-Lan files to the circuit pack.

Administration

Download status can be displayed using the **status firmware download** command for a firmware download in progress.

Administration Forms - New   The Firmware Download form appears at the **Change Firmware Download** command.

Figure 5.   Firmware Download

```
change firmware download                                    Page  1 of  1
                         FIRMWARE  DOWNLOAD
     Source Board Location: _____
Firmware Image File Name: _____
        Target Board Code: _____  Suffix: ___  Firmware Vintage: _____
        Schedule Download: y   Remove Image After Successful Download?: n
Start Date/Time: __/__/____  __:__        Stop Date/Time: __/__/____  __:__

     Target          Target          Target          Target          Target
    Location        Location        Location        Location        Location
 1.  _____    11.  _____    21.  _____    31.  _____    41.  _____
 2.  _____    12.  _____    22.  _____    32.  _____    42.  _____
 3.  _____    13.  _____    23.  _____    33.  _____    43.  _____
 4.  _____    14.  _____    24.  _____    34.  _____    44.  _____
 5.  _____    15.  _____    25.  _____    35.  _____    45.  _____
 6.  _____    16.  _____    26.  _____    36.  _____    46.  _____
 7.  _____    17.  _____    27.  _____    37.  _____    47.  _____
 8.  _____    18.  _____    28.  _____    38.  _____    48.  _____
 9.  _____    19.  _____    29.  _____    39.  _____    49.  _____
10.  _____    20.  _____    30.  _____    40.  _____    50.  _____


Enter 5 character board number; cabinet (1-30): carrier (A-E): slot (0-20)
```

Figure Notes

• Source Board Location - enter source board location TN799C.

- Firmware Image Filename - enter Firmware Image Filename use List directory to view filenames.

- Schedule Download.

  - ~ If **y**, complete Start Date/Time fields (Stop Date/Time optional).

  - ~ If **n**, download will begin immediately.

- Remove Image After Successful Download?

  - ~ If **y**, system will automatically remove the download file.

  - ~ If **n**, removal must be manual using **Remove File** command.

- Target Location - enter target board locations (up to 50 locations).

Note: Firmware Download form may not be modified once download has begun.

New Hardware

- TN799C CLAN board with administered ethernet data module.

- Available ethernet port.

- Programmable circuit packs, e.g., TN464GP, TN2302AP, TN2464BP, TN2313AP.

- Boards that can be programmed using the Firmware Download feature are identified with the suffix **P**. Currently Firmware Download applies to TN4646P, TN2464BP, TN2313AP, and Maintenance Test (TNTT1DP).

Increased Memory Capacity

(Category A and B)

Overview

With R9, the DEFINITY memory capacity is increased. This provides the capability for additional switch features.

R9 capacities are:

- csi = 32MB Read Only Memory (ROM) and 32 MB Dynamic Random Access Memory (DRAM).
- si = 32MB Read Only Memory (ROM) and 32 MB Dynamic Random Access (DRAM).
- r = 128 MB DRAM.

Description

R9 csi uses a TN2402 processor circuit pack and si systems use a new TN2404 processor circuit pack. Both use a 5volt APA memory card to increase DRAM and Flash to 32 MB. The NtPkt will change to TN2401.

- New R9 processor circuit packs can read, but can not save, translations to older (R8 and earlier) flash cards.

- The R9 flash cards are thicker than the flash card slots of older systems, and will not easily fit in older systems. Thicker cards and warning labels will help prevent users from accidentally using the wrong card.

- If a user were to put an R9 card into an older system and try to save translations, the command would fail. The switch would generate an error log entry and an alarm.

- New R9 flash cards are not write protected. Back-up cards are recommended to prevent loss of translations.

R9 r systems use an additional (4th) TN1650B memory board and a TN1657disk drive V9 or later. The additional board resides in the slot marked "Memory 4". This enhancement increases DRAM to 128 MB.

In addition to the above memory board and disk drive, upgrades to R9 will also require tape units to be upgraded to TN2211 Optical Drive and UN332C MSS Network Control.

Step-by-Step

The following are simplified step-by-step instructions for upgrading older systems to R9.

Upgrade Simplex System (csi and si)

Begin

1 Save translations to current translation flash card.

2 Power down the switch.

3 Remove the TN798/B for csi systems, or remove the TN790/B and TN777B/TN794 for si systems.

4 Install R9 boards.

5 Insert an R9 Software Upgrade card.

6 Power up the switch.

7 When prompted by the system, replace the Software Upgrade card with the translation card created in Step 1.

8 Once NORMAL OP is reached, log into the system.

9 Replace the Translation card with an R9 translation card.

10 Save translation to the R9 card. Also save translations to a backup R9 card.

End

Upgrade Duplex System (csi and si)

Begin

1 Save translations to a current translation flash card.

2 Power down the system.

3 Remove the TN790/Bs and TN777B, orTN794s.

4 Install the R9 boards and insert the translation card created in Step 1.

5 Power up the system.

6 When NORMAL OP is reached, log into the system and execute the **list con fig soft mem** command.

7 If the version of software listed matches that on the upgrade card, go to Step 12. Otherwise, insert an R9 Software Upgrade card into the standby carrier.

8 Refresh the SPE.

9 Execute **stat system 1** command to verify that the standby is in "standby" mode.

10 If the standby is in "standby" mode, enter **upgrade software**.

11 Once NORMAL OP is reached, log into the system.

12 Replace the translation card with an R9 ATA translation flash card.

13 Save translation to the R9 card.

14 Make a back up card. New cards are not write protected and may be inadvertently erased.

End

Upgrade System (r)

Begin

1 Upgrade any tape units to TN2211 Optical Drive and UN332C MSS Network Control.

2 Upgrade to TN1657 Disk Drive V9 or later.

3 Add fourth memory board in slot marked Memory 4 in the processor complex.

End

IP Asynchronous Links

(Category A and B)

Overview

This R9 feature provides the option of TCP/IP connectivity for some asynchronous switch adjuncts to the DEFINITY ECS, GuestWorks, ProLogix and DEFINITY BCS.

This feature provides a telnet server to connect system management applications, such as DSA, DNA, DNM, ProVision and Avaya Directory Gateway.

For the user, this means the ability to support more adjuncts with less hardware, as well as increased data speed.

This feature is similar to synchronous application links introduced in R7.

Note: Client applications such as CDR, PMS, Journal Printers and system printers will be supported in a future release.

Description

DEFINITY will continue to support existing connectivity and functionality that is available to adjuncts and applications via data channels and data modules.

Adjuncts with TCP/IP capability connect directly via the LAN/WAN. Adjuncts supporting RS232 interface will be able to connect through a terminal server or router.

This duality allows the user to replace older adjuncts over a period of time.

Figure 6.   Adjuncts
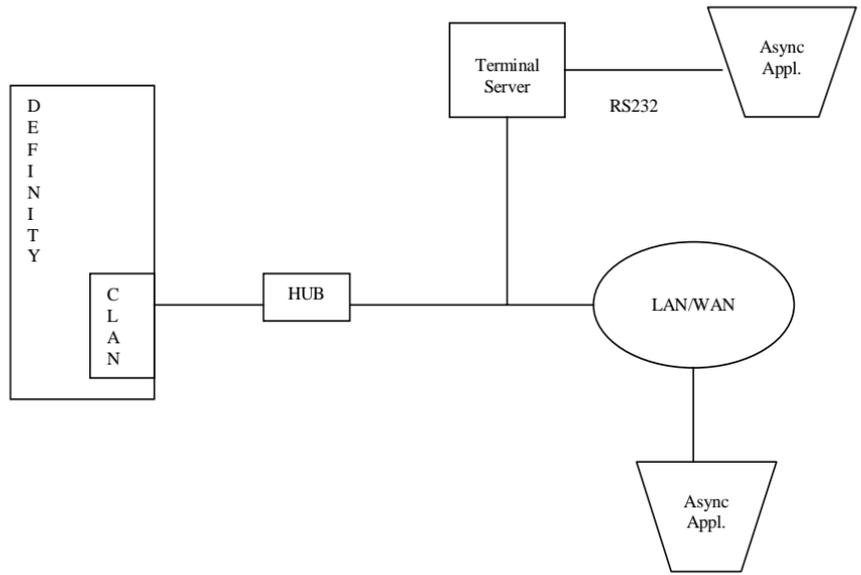
System Server Management applications supported include SAT, DSA, DNA, DNM, Provision Tools and Directory Gateway.

Additional Highlights

- R9 supports DCS signaling over analog trunks via a PPP connection. Connectivity is achieved using a router or external modem configuration at each end.

- The feature will provide the ability to access the switch via TCP/IP using remote SAT.

Hardware Requirements

Requires TN799B C-LAN board or later release. If existing board is TN799, it must be upgraded.

Administration

Administration Forms - New   The new form, Change/Display IP Services is used to set up nodes and ports for asynchronous link connections. The type of service defined will determine if the DEFINITY should provide server or client connections to the remote application.

The form is accessed using the change and display commands. All data will remain in the location entered by the administrator (not shuffled).

Figure 7.   IP Services

```
  Change ip-services                                    Page    1 of   x
                                    IP SERVICES
  Enabled Service Type   Local Node Local Port    Remote Node    Remote Port
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n    _____      _____  _____         _____    _____
     n
```

Field Values:

Enabled—Determines if this ip-service is enabled. If enabled flag is set (**y**), and the application is defined as TCP/IP, the socket will be established.

Service Type—Uses keywords to define the service to be provided on a link.

• Server application keyword: **SAT**.

Local Node—Identifies the switch or adjunct at the near end of the link. Node names from pages 2-6 of the node-names form and processor are valid node names.

The node name *must be defined* on the IP-interface form for ethernet services.

Local Port—If the DEFINITY is to act as server, the originating port number (between 5000 - 9999) is entered.

Remote Node—Identifies the switch or adjunct at the far end of the link. A specific node name is not necessary. However, identifying a node name provides added security. An entry of **any** may also be used.

The remote node *should not be defined* as a link on the IP-interface form or the Data Module form.

Remote Port—For server applications, the field is defaulted to zero, and is not changeable

Administration Forms - Changes   Existing administration forms are modified to accept adjunct keywords in addition to extension numbers as Endpoints.

Note: Remote Alarm Out requires different endpoints for First OSS and Second OSS. One of them must be a telephone number or an extension number.

Avaya R300 Remote Office Communicator

(Category A and B)

Overview

The DEFINITY Avaya R300 Remote Office Communicator (Avaya R300) will enable telephony and data capabilities in remote office locations equal to those station end points directly connected to the DEFINITY server.

Description

Avaya R300 is a single product solution supporting voice and data network connectivity in a small office. It builds on the Ascend MAX 3000.

Avaya R300 operates like a simple switch at the remote site for connections made between remoted stations, and between remoted stations and local access trunks. Voice traffic is communicated back to the main DEFINITY site only if necessary (for example, a station call from the main DEFINITY site to a station at a remote office).

The role of the DEFINITY is that of a call feature server.

All call processing decisions are made by DEFINITY. The highlights of this feature are:

- 24 digital voice ports.

- 2 analog stations.

- All features of the DEFINITY feature server are enabled at the remote location.

- 2 T1 WAN digital trunks (plus 1 drop and insert T1). Later releases will include a 2E1 model, a 6BRI ST and a 6 BRI U interface.

- 2 WAN analog trunks.

- Supports IP routing for data and voice.

- Supports a VOIP gateway for conversion of TDM to/from IP audio.

- Multiple remote locations can be administered from a central location.

- Built in modems available on some models for remote access server capability.

Administration

Avaya R300 may be administered remotely via the WAN, or locally via the LAN or a serial port connection.

The Remote Office feature will make use of many of the capabilities implemented as part of the IP Solutions feature. These capabilities must be enabled whenever the Remote Office feature is enabled.

Administration Forms - New   A new form, Remote Office allows the user to add, change or remove a remote office. The form is accessed using **add remote-office**, **change remote-office** or **remove remote-office** commands.

Figure 8. Remote Office

```
╭─────────────────────────────────────────────────────╮
│                                                       │
│   add remote-office  nnn                 page  1 of  1│
│                          REMOTE OFFICE                │
│                                                       │
│                                                       │
│         Node Name:    _____                │
│    Network Region:    __                              │
│          Location:    __                              │
│         Site Data:    _____    │
│                       _____    │
│                       _____    │
│                                                       │
│                                                       │
│                                                       │
╰─────────────────────────────────────────────────────╯
```

Field Values:

- Node Name—Specifies the node name (IP address) of the remote office.

- Network Region—Specifies the network region to be assigned to all stations supported on this remote office.

- Location—Specifies the remote office location

• Site Data—These fields may be filled with any desired information, such as contact name, contact phone number, specific location, etc.

A new form, Display Remote Office, accessed by the **display remote-office <office number>** command, displays the node name, region, location and site data for the requested office.

A new form, List Remote Office, accessed by **list remote-office** command, displays a list of administered Remote Offices with the associated IP address.

A new form, Status Remote Office, accessed by **status remote-office <office number>** command, displays the status of the requested office. Form displays:

• node name.

• extension, port identifier, endpoint status for each registered station.

• list of gateway signaling groups.

The command **list node names** invokes a list of all node names, with Audix names listed first, then MSA names, then IP names.

Administration Forms - Changes

The following lists the changes to existing administration forms.

The Optional Features form (page 1) has 2 new fields: Maximum Remote Office Trunks and Maximum Remote Office Stations.

- The Optional Features form (page 3) has a new field: Remote Office.

- The System Capacity form (page 7) has 2 new fields: Remote Office Trunks (included in ʼTrunk ports) and Remote Office Stations (included in Station ports).

- The Node Names form is now divided into 2 separate forms; 1 for administration of Audix-MSA node names and 1 for administration of IP node names.

- The Signalling Group form has 2 new fields: Remote Office? (y/n) and RRQ Required? (y/n).

Note: When RRQ Required? = **y** indicates that the signaling group serves a gateway rather than gatekeeper.

- The Station form has a new field, Remote Office Phone? (y/n).

- When the station is registered from a remote office, the Status Station form will display the node name of the remote office in the far-end IP address fields.

Maintenance

The DEFINITY Avaya R300 and all of its terminations will be treated as one external maintenance object by DEFINITY maintenance software. Therefore, it may

be reasonable to consider the Avaya R300 as a combo board for maintenance purposes.

Station Used as Virtual Extensions

(Category A Only)

Overview

The Station Used as Virtual Extension feature allows customers to assign multiple individual extension numbers to a single physical analog set.

Description

Customers may assign multiple individual virtual extensions to a physical station without needing to supply additional hardware.

One or more virtual extensions can be mapped back to one physical station. Each virtual extension (as well as the physical station extension) will have its own number and can have its own voice mail.

In addition, the feature can be administered so that each virtual extension has a distinctive ringing pattern (1, 2 or 3 rings) that identifies the virtual extension being called.

The feature affects only incoming calls. Outgoing calls reflect the physical station extension.

An example of the use of this feature would be a phone shared by three people in a dormitory room. Each person would have a different phone number, all of which would map to the same physical station. The number being called would be identified by a distinctive ringing pattern.

Administration

Administration Forms - Changes

The System-Parameters Customer-Options form has a new field: Station Used as Virtual Extension?. This is a y/n field. **Y** indicates that the user is allowed to create virtual station types.

The Station form has new fields and new field values.

- Type - **virtual** is allowed as a value.
- Map-to Station - A new field indicating the physical station to which the virtual extension is to be mapped. The physical station must be analog.
- Personalized Ringing Pattern - Identifies the ringing pattern (1, 2 or 3 rings) for the virtual extension.

The command **list usage extension <physical extension #>** displays all virtual stations mapped to the requested physical extension.

UDS1 with Echo Cancellation

(Category A and B)

Overview

The TN464GP and TN2464BP are new suffixes to circuit packs available beginning with R9. They are essentially the same as existing TN464F and TN2464 circuit packs, with the addition of echo cancellation circuitry and firmware downloadable capabilities.

Echo is most likely to occur when the DEFINITY is configured for ATM, IP, wideband or other complex services or when interfaced with less sophisticated local services providers that may not have echo cancellation facilities. The echo cancellation is intended to limit the echo on channels supporting voice.

Description

With R9, echo cancellation is a software right-to-use feature intended for channels supporting voice.

When turned on, this feature will remove perceivable echo from a customer's system a majority of the time. Echo cancellation is intended only for channels supporting voice and is not desirable over channels that support data communication capabilities. The new circuit boards have the capability to detect modem tone and turn off echo cancellation accordingly (for duration of the call).

Echo cancellation is selectable per channel even though it is administrable on a trunk group basis.

Administration

Administration Forms - Changes

Page 1 of the System-Parameters Customer-Options form has a new field: Maximum Number of DS1 Boards with Echo Cancellation. This field indicates the number of purchased boards for which echo cancellation can be turned on.

Page 2 of the System-Parameters Customer-Options form has a new field: DS1 Echo Cancellation?. This is a y/n field. **Y** allows systemwide activation of echo cancellation on a per-port basis.

The Trunk Group form has a new field: DS1 Echo Cancellation?. This is a y/n field. **Y** activates echo cancellation for the specific trunk group.

Note: Echo cancellation should not be activated for data trunk groups, including ISDN-BRI, ATM, IP, CPE, CAMA, and MASI.

The DS1 Circuit Pack form has 3 new fields:

- Echo Cancellation? - A y/n field. **Y** activates echo cancellation on this circuit pack.
- EC Direction - Appears only if Echo Cancellation field = **y**. Indicates the direction of echo to be cancelled (inward or outward).
- EC Configuration - Appears only if Echo Cancellation field = **y**. Used to determine which set of echo cancellation defaults to administer. The field accepts values of 1-15 though only 1-4 are implemented.

The Personal CO Line Group form has a new field: DS1 Echo Cancellation?. This is a y/n field. **Y** activates echo cancellation per channel.

Global Power Supply

(Category A and B)

Overview

With R9, the power supply for the DEFINITY ECS, GuestWorks, ProLogix, and DEFINITY BCS multi-carrier cabinet (MCC) platforms is simplified. Two options are available instead of four.

The global power supply was introduced in R5 for international systems. With R9, it becomes a truly global offering available for both domestic and international systems. It replaces the existing US AC MCC cabinet configuration.

Description

The Global MCC automatically accepts 200 to 240 volt AC power at 50 or 60 HZ and complies with all emission and safety requirements for customer applications worldwide. The power system consists of:

- NP850 rectifiers.

- 649A power supplies.

- battery interface/alarm unit.

- battery connections.

- alarm outputs.

The NP850 rectifiers are cabinet-level power units located in the power distribution unit at the bottom of the MCC cabinet. The 649A power supplies are DC/DC converters providing carrier-level power. The cabinet input cord is NEMA 6-30P in the United States.

The Global MCC power architecture offers optional short- or long-term power backup. Short-term backup is provided via batteries internal to the MCC cabinet while long term is via external battery cabinets. Because of its long-term power backup capabilities, the GMCC will significantly reduce or eliminate the need for UPS and DC battery plants for most customer applications.

Note: Cabinet installation costs will be reduced because the integrated power system is factory installed.

Hardware Requirements

The Global MCC hardware includes:

• Cost-reduced 649A DC/DC converters

• The NP0850A rectifier (Comcode 108654567), which replaces the old RM0850. The chart below identifies the required number of rectifiers per cabinet.

Table 1. NP0850A rectifier

Carriers per Cabinet	NP0850A Power Units per Cabinet
1	2
2	3
3	3
4	4
5	4
Future Growth	5

Mobility Enhancements

(Category A and B)

Cluster ID Administration

Overview   Cluster ID Administration is an R9 mobility enhancement to the DEFINITY Wireless Business System (DWBS).

The Cluster ID Administration feature assigns and reuses cluster IDs on a per-radio-controller basis.

Description

- The radio controller (TN789 circuit pack) provides the interface between a DEFINITY ECS and the DWBS radio subsystem.

- Each radio controller (RC) must have a cluster ID.

- Valid cluster IDs are in the range 1-32.

- DEFINITY assigns cluster IDs 1 through 32 to the first 32 RC cards and then repeats.

- Reusing cluster IDs can cause base station interference.

- Base stations connected to the same RC will not interfere with each other.

- Base stations connected to different RCs will interfere if the cluster ID is the same and the bases are within each others coverage area.

- With R9, there is a new administrative procedure that allows the system administrator to change cluster IDs based on the radio coverage area and adjacent cluster IDs.

- Reduces radio interference.

- Eases provisioning in systems having more than 32 radio controllers.

Administration   **Administration Forms - Changes**

- There is a new second page of the System-parameters Wireless form.

- It is initially populated by the system as RC cards are added.

Increased Radio Controller Capacity

Overview   DWBS is an in-building wireless communications system. It offers mobility to small and large business customers, by integrating wireless capabilities into their DEFINITY.

The radio controller (RC) provides the interface between a DEFINITY and the DWBS radio subsystem. The RC is a standard-port circuit pack (TN789) that can be installed in any available universal port slot of a DEFINITY.

Note: This offering is available only for DEFINITY G3r systems.

Description   Each Radio Controller card can handle:

- 12 simultaneous calls.

- Up to 8 antennas.

In R9, a DEFINITY G3r may have up to 150 RC cards. The number of wireless terminals supported remains limited to 1500.

Administration   **Administration Forms - Changes**

Changes to the System-parameters Wireless form include:

- The Maximum Radio Controllers field now allows 3 digits.

- More pages have been added to support cluster ID administration for additional RCs.

X-Station Mobility Large Displays

Overview   X-Station Mobility Large Displays is an R9 mobility enhancement to the DWBS.

The X-Station sets have a built-in display. R9 enhances the display format.

Description   X-Mobile Station is an analog set with a built-in display.

- R8 X-Mobile display has:

    ~ One 15-character line.

~ Subset of displays.

~ Non-standard format.

In R9, all of the standard DEFINITY call display information is shown. The information is formatted to fit a variety of display dimensions, based upon an administrable station form field.

Administration   **Administration Forms - Changes**

• Changes to the Station form for XMOBILE type include:

~ Display Module field (previously hidden).

~ Length of Display field (previously read-only) now has four options:

• 12 x 3 (three 12-character lines).

• 16 x 1 (one 16-character lines).

• 16 x 2 (two 16-character lines).

• 39 x 1 (one stand DEFINITY display line).

Administrable RPN

Overview   Administrable RPN (Radio Part Number) is an enhancement to the DWBS Wizard II system.

It enables the administrator to maintain uniqueness of adjacent radio cells in a system.

Description   Prior to DEFINITY R9, the cluster ID was assigned at the time a radio controller (TN789 circuit pack) was added to a system. The user could not (and did not need to) assign a number. The 5-bit RPN allowed for 32 unique IDs. This worked well when the maximum number of radio controllers was 32.

Now the maximum number of radio controllers has been increased to 50, and the RPN is still allowed only 5 bits. Adjacent cells can not have the same RPN identity. Therefore, in order to enable the administrator to maintain geographic uniqueness of the radio controllers, he/she must be able to administer the RPNs.

Note: DWBS enables on-site wireless sets to work exactly the same as wired desk sets. An additional enhancement is DEFINITY Global Cellular Solution (DGCS). DGCS is a software solution that connects calls received by a PBX to any cellular phone—regardless of the cellular standard in use. This is accomplished through Call Bridging rather than the Call Forwarding OFF-NET feature.

Administration   **Administration Forms - New**

The Radio Controller Cluster ID Assignments form will appear at the **change system parameters wireless** command.

Figure 9.   Radio Controller Cluster ID Assignments

```
 change system-parameters wireless                          Page  2 of  2 SPE B

                    RADIO CONTROLLER CLUSTER ID ASSIGNMENTS

    SPE     RPN   SPE     RPN   SPE     RPN   SPE     RPN
     1:            17:           33:           49:
     2:            18:           34:           50:
     3:            19:           35:
     4:            20:           36:
     5:            21:           37:
     6:            22:           38:
     7:            23:           39:
     8:            24:           40:
     9:            25:           41:
    10:            26:           42:
    11:            27:           43:
    12:            28:           44:
    13:            29:           45:
    14:            30:           46:
    15:            31:           47:
    16:            32:           48:
```

Field Values

• SPE - radio control cluster id (display only).

• RPN - radio part number id (administrable).

Note: An RPN is automatically assigned by the system, but may be changed by the administrator if necessary for geographic uniqueness.

DEFINITY Global Cellular Solution

Overview   DEFINITY Global Cellular Solution (DGCS) provides customers the ability to bridge their wireless terminals and/or hard wired terminal (or both) to an existing cell phone of their choice.

Description   DEFINITY Global Cellular Solution is a software solution that connects calls received by the PBX to any cellular phone, regardless of the cellular standard in use.

This is accomplished through call bridging, rather than utilizing call forwarding.

Call control remains with DEFINITY, therefore allowing continued use of existing call messaging systems.

By utilizing the DEFINITY X-Station Mobility feature, calls routed to DEFINITY extensions can be bridged to an external cellular phone or other remote endpoint. The feature provides simultaneous ringing of a wired phone and the user's cell phone.

List Enhancements for TN2401

(Category A and B)

Overview

G3si Processor carriers originally shipped in pre-R7 G3si systems require both the TN2401 Net/Pkt and the TN2400 Net/Pkt BP Conn board for R9.

Carriers originally shipped with R7 and later systems require only the TN2401.

Description

Starting with R9, executing a **list config** on a G3si processor carrier displays the presence or absence of the TN2400 Net/Pkt BP Conn board

Administration

Administration Forms - Changes   The **list configuration** command will display the presence or absence of the TN2400 Net/Pkt BP Conn board.

Administrable Callout on Call Timer

(Category A and B)

Overview

Administrable Timeout on Call Timer enhances the Call Timer feature on the 6400 series telephones, which include 6408D+, 6416D+ and 642D+.

Description

The Call Timer feature measures the duration of a call, starting a timer when the call is answered and stopping the timer when the call is dropped.

Previously, the Call Timer feature displayed the duration of the call for only 5 seconds after the call was dropped.

With Release 9, the Administrable Timeout on Call Timer feature introduces a new system-wide field that allows the user to specify how long to display the duration of the call. The default value is 3 seconds. This value can be incremented by multiples of 3 up to 30 seconds (3, 6, 9, 12...30), which is the limit.

Administration

Administration Forms-Changes There is a new field on page 10 of the System-Parameters Features form, Duration of Call Timer Display which administers the length of time the display remains after the call is terminated.

On the terminal, you will need to administer a call timer button on the Station form. Pressing the button will activate this feature.

Customer Telephone Activation

(Category A and B)

Overview

The Customer Telephone Activation (CTA) feature enables a customer or technician to easily install a phone.

Description

The feature allows a customer or technician to associate a physical telephone with station translations in the switch.

The user connects the phone and uses a fixed-feature access code (#*) to activate the station.

Note: Note: The CTA feature enables activation, but does not allow deactivation.

This feature applies to DCP and analog touch-tone circuit-switched phones.

Administration

The station must be administered without hardware (AWOH) in order to use the CTA feature.

On the Feature-Related System Parameters screen, ensure that the Customer Telephone Activation Access Code Enabled field and the TTI Enabled field are **y**.

Complete the Station screen for the new phone and type **x** in the Port field. The phone type must match the board type. For example, match a two-wire digital phone with a port on a two-wire digital circuit pack. Use this procedure with all circuit-switched phones except BRI (ISDN) and model 7103A.

Administration Forms - Changes   A new field, Customer Telephone Activation appears on the Feature Access Code form when the Customer Telephone Activation is enabled on the System Parameters form.

Step-by-Step   **To activate a station:**

Begin

1 Plug the phone into the wall jack.

2 Lift the receiver and continue if you hear dial tone.

3 Dial **#*nnnn**, where **nnnn** is the extension number of the phone you are installing.

4 Hang up after you receive confirmation tone.

---

5 Dial a test call to confirm that the phone is in service.
   If possible, call a phone with a display so the person answering can confirm that
   you entered the correct extension number.

6 Repeat the process until all new phones have been installed.

7 For security reasons, at the system administration terminal type **change
   system parameters feature** to access the Feature Related System
   Parameters screen.

8 Type **n** in the Customer Telephone Activation Access Code Enabled field.

9 Press ENTER to save your changes.

End

2 Call Center

BSR Available Agent Adjustments

(Category A Only)

Overview

This feature is an enhancement to Best Service Routing (BSR). BSR gives users more control over which agent resource answers a particular call by comparing idle time, occupancy or skill level.

The enhancement provides an additional level of comparison.

Description

This enhancement will cause the system to use the current *consider-step* adjustment value in a new way.

The adjustment value will be applied as either a percentage or an absolute value to adjust either idle time or occupancy. The decision of whether to use percentage or absolute value is dependent on which value is most significant.

Administration

Administration Forms - Changes

The Call Center pages of the Feature-Related System Parameters form have a new field: Available Agent Adjustments for BSR?. It is a y/n field controlling the use of BSR available agent adjustments.

CentreVu Advocate Enhancements

(Category A Only)

Overview

CentreVu Advocate is a collection of five features that provide flexible methods for matching an agent with a call.

The five features are Service Level Supervisor, Percent Allocation, Least Occupied Agent, Predicted Wait Time and Service Objective.

In DEFINITY R9, four of these features have been enhanced. The enhancements are:

- Dynamic Threshold Adjustment is an enhancement to Service Level Supervisor.

- Percent Allocation Distribution, Auto Reserve Agents, and Dynamic Percentage Adjustment are enhancements to Percent Allocation.

- Separate Customer Option is an enhancement to Least Occupied Agent.

- Dynamic Queue Position and Separate Service Objective are enhancements to Service Objective.

Duplicate Agent

(Category A Only)

Overview

This feature enables the user to add several new agents to the system at the same time.

Description

R9 enables administration data of an existing agent (Master Agent) to be duplicated and revised to add several new agents to the system.

Administration

Administration is accomplished using a **duplicate agent** command, which functions similarly to the **duplicate station** command.

Up to 16 new agents can be created with each command.

The **Duplicate Agent** command requires Call Center 9.1 or later and is available only if Expert Agent Selection (EAS) is optioned.

The **Duplicate Agent** command invokes the Agent LOGINID form.

Holiday Vectoring

(Category A and B)

Overview

This feature enables the user to plan and coordinate multiple vectoring decisions up to a year in advance.

Description

R9 allows the user to define up to 10 vectoring patterns for specific date and time ranges.

Each of 10 tables identifies a different holiday vector. Up to 15 date/time entries can be identified on each table.

Note: Entries do not have to be actual holidays. They can be any dates or date ranges where special vector processing is desired.

Administration

Administration Forms - Changes
There is a new field on the Customer Options form: Vectoring (Holidays)?

A **y** in this field indicates that the feature is enabled.

Administration Forms - New
There is a new Holiday Table form, which is used to define individual holidays or holiday ranges for a specific vectoring pattern.

Up to 10 Holiday Tables can be administered.

Figure 10. Holiday Table Form

```
                         HOLIDAY TABLE

    Number: ___              Name: _____

    _____START_____        _____END_____
    Month Day Hour Min       Month Day Hour Min       Description
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
    ___  __ ___  __          ___  __ ___  __          _____
```

Field Values:

• Number—Identifies Holiday Tables 1-10.

• Name—Identifies the name of this table.

- Start—Month (1-12), Day (1-31), Hour (0-23), and Minute (0-59) of holiday start time.

- End—Month (1-12), Day (1-31), Hour (0-23), and Minute (0-59) of holiday range end time.

- Description—A description of the holiday.

Notes: To enter an individual holiday, enter Start Month/Day. DO NOT enter End Month/Day.

To enter a range, complete both Start and End fields.

Date ranges may not extend from one year to another. Two entries are required if a holiday range goes over into the next calendar year.

There are no edits for duplicate or overlapping entries in a table. The system checks the date against the table and stops at the first match.

There is also a new Holiday Tables screen, which is invoked with **list holiday-table** command.

This screen displays a list of the numbers and names of Holiday Tables in use.

Remote Logout of Agent

(Category A and B)

Overview

This feature enables a user to logout an idle ACD (Automatic Call Distribution) or EAS (Expert Agent Selection) agent without being physically present at the agent's station.

Description

This feature allows agent logout using a feature-access-code (FAC). The user may be local or remote.

Administration

The Remote Logout of Agent feature is available only with Call Center Release 9.1 or later.

Administration Forms - Changes

The DAC form has a new field, Remote Logout of Agent Access Code: ___. This field identifies the feature-access-code for remote logout.

The COR form has a new field, Remote Logout of Agent Access Code: _. This is a y/n field. **Y** indicates that the feature is not restricted.

3 Hospitality

Custom Selection of DID Numbers for VIP Guests

(Category A and B)

Overview

This feature allows front desk personnel to choose a specific DID number for assignment to a guest's room. An outside call made to that DID number rings directly in the guest's room, without handling by the hotel operator.

A hotel can give a frequent guest the same DID number each time he/she stays at the hotel.

Description

With Guest Works, Issue 6/ DEFINITY Release 8.2, automatic Selection of DID Numbers to Guest Rooms was introduced. Automatic Selection allowed the system to pick the DID number that was assigned to a guest room at check-in.

R9's Custom Selection of DID Numbers for VIP Guests differs in that Custom Selection prompts the front desk personnel for a desired DID number at check-in.

Two new buttons further simplify the process:

- VIP check-in can be done from a new VIP Check-in button on GuestWorks, DEFINITY ECS, ProLogix and DEFINITY ECS or from a PMS adjunct. The software on the PMS must be changed to use this feature.

- A new DID-Remove button removes assignment of either an automatically assigned DID number or a custom-selected DID number.

Administration

Custom-selected numbers are administered as a new station type (XDIDVIP).

Administration Forms - Changes   A new field has been added to the second page of the System-Parameters Hospitality form. This new field, Custom Selection of VIP DID Numbers?; indicates if the feature is active (**y**) or not active (**n**).

Note: This field can be set to **y** only if the Automatic Selection of DID Numbers? field is also set to **y**.

Notes

An unanswered call to an assigned DID number covers to voice mail, where the caller can leave a message.

A call to an unassigned DID number will normally result in a busy signal. It is recommended that coverage paths be set up so that these calls go to the hotel operator or to a voice mail announcement.

4 **IP Solutions**

Direct IP

(Category A Only)

Overview

Direct IP involves rerouting (shuffling) of the voice channel connecting two IP endpoints. The transmission path goes via LAN or WAN directly from IP endpoint to IP endpoint, avoiding both the TDM bus and the media processor.

Shuffling means rerouting the voice channel connecting two IP endpoints. After shuffling, the voice which previously was carried in a mixed connection if IP signaling and TDM bus signaling, now goes directly through the LAN or WAN between the two IP endpoints. Shuffling also can mean reversing the process if an endpoint requests a feature such as conferencing that requires the TDM bus.

This optimizes facility use and improves the quality of IP audio transmission.

Description

In R9, DEFINITY provides direct IP connections to conserve resources, such as channels on the media processor and timeslots on the TDM bus. Voice quality is also improved because the direct connection eliminates extra coder/decoder functions on the media processor.

After shuffling, the audio transmission, which previously was carried in a mixed connection of IP signaling and TDM bus signaling, now goes directly through the LAN or WAN between the two IP endpoints.

The audio of two IP endpoints will be automatically connected as Direct IP if the following conditions are met:

• Both IP endpoints are administered to allow Direct IP connection, and

• A point-to-point voice connection exists between two endpoints, and no TDM connectivity is required on an active call at either endpoint, and

• The endpoints are in the same network region or are in two regions that are interconnected, and

• There is at least one codec in common in the codec lists of the two endpoints, and the inter-network region connection management codec list, and

• The endpoints have at least one codec in common as shown in their current codec negotiations between the endpoint and the switch.

DEFINITY may undo a Direct IP connection on an existing call if the call architecture changes to require TDM connectivity, for instance:

- A third party is conferenced onto the call.
- DEFINITY wants to insert a tone or announcement into the connection.
- If the connection is put on hold.

Once the cause of undoing the direct connection is gone, the call may be reshuffled to reestablish a Direct IP connection.

If more than one type of connection is possible between two endpoints, the order of preference is:

- IP-IP Direct.
- IP-Media Processor-IP hairpin.
- IP-TDM-IP.

Note: Although any IP endpoint can be an endpoint on a direct connection, system administrators may choose to restrict Direct IP connections to certain endpoints.

Hairpinning Overview

Hairpinning involves rerouting of the voice channel connecting two IP endpoints. The hairpinned transmission path uses the Media Processor board, but avoids the DEFINITY TDM bus.

This optimizes facility use and improves the quality of IP audio transmission, and is automatically turned on if the endpoints can't go IP Direct (shuffling).

Hairpinning Description

Hairpinning means rerouting the voice channel connecting two IP endpoints so that the voice goes through the TN2302 IP Media Processor board in IP format, without having to go through the DEFINITY TDM bus.

In R9, DEFINITY provides audio hairpinning on the media processor to conserve resources on the board and timeslots on the TDM bus. Hairpinning also improves voice quality by eliminating use of codec on the media processor.

The switch automatically invokes audio hairpinning, based on the following conditions:

- A point-to-point connection exists between two endpoints, and

- The endpoints are in the same network region or are in two regions that are interconnected, and

- A single media processor is serving both endpoints, and

- The endpoints are using a single common codec, and

- The endpoints are administered to allow hairpinning, and

- Requirements for audio shuffling are not met.

DEFINITY may undo hairpinning on an existing call if the call architecture changes to require TDM connectivity, for instance:

- A third party is conferenced onto the hairpinned call.

- DEFINITY wants to insert a tone or announcement into the connection.

- If the connection is put on hold.

Once the cause of undoing the hairpinning is gone, the call may be reshuffled and hairpinned again.

If more than one type of connection is possible between two endpoints, the order of preference is:

- IP-IP Direct.

- IP-Media Processor-IP hairpin.

- IP-TDM-IP.

Note: Although any IP endpoint can be an endpoint on a hairpinned connection, system administrators may choose to restrict hairpin connections to certain endpoints.

Administration for Direct IP and Hairpinning

Administration Forms - Changes

Two new fields, Direct IP-IP Audio Connections? and IP Audio Hairpinning? appear on the following forms:

- Station form (page 2).
- Signaling Group form (page 1).
- Network Region form (page 1).
- Feature-Related System Parameters (page 11).

A **y** in the Direct IP-IP Audio Connections? field indicates that Direct IP is enabled.

Maintenance

Ping and tracert sources can now be either a cabinet and slot or a station's virtual ID.

Hardware Requirements

TN2302, terminals that support ip direct connections (e.g., IP telephone, Avaya R300, IP Softphone R2).

IP Media Processor TN2302

(Category A Only)

Overview

The TN2302 IP Media Processor is the next generation H.323 platform. It enhances functionality provided by the MedPro board in DEFINITY R8.

The R9 IP Media Processor provides:

- An interface suitable for H.323 applications.
- Increased voice quality through dynamic jitter buffers.
- Added administration and maintenance support.
- Single slot circuit packs.

Description

The circuit pack includes a 10/100 BaseT ethernet interface to support H.323 DEFINITY IP trunks and endpoints.

TN2302 can perform echo cancellation, silence suppression, DTMF detection and conferencing. It supports the following codecs (including fax detection for them and conversion between them):

- G.711.

- G.723.1.

- G.729A.

TN2302 provides between 32 and 64 voice channels, depending on the types of codecs used.

Unlike previous media processor boards, the TN2302 does not have placement restrictions.

Note: The TN2302 is not a required strict replacement for the MedPro TN802B. It is possible to continue using TN802B if the older IP Trunk Operating Mode is preferred.

Native Support of Avaya IP Telephones

(Category A Only)

Overview

DEFINITY R9 provides the user with the capability to natively administer and maintain telephones that are part of a new Avaya IP telephone product line.

Description

This new line of digital business phones uses the Internet protocol (IP) technology with Ethernet line interfaces and has downloadable firmware.

The product line is called Avaya IP telephones, and includes the following models; 4606, 4612 and 4624.

The 46xx phones emulate the DCP 64xx series of telephones and will provide all of the same features (except for group listen).

The first release of the 46xx IP telephones use the same dual connection architecture as in R8 to register and communicate with the DEFINITY switch.

Administration

The three new station types (4606, 4612, and 4624) are administrable on the Add/Change Station form when the IP Stations field on the System-Parameters Customer-Options form is set to **Y**.

In dual connection architecture two station extensions must be administered:

- Extension type 46xx to carry the signaling channel.

- Extension type H.323 to carry the audio channel.

The appropriate H.323 station extension must be entered into the Media Complex Ext field on the 46xx station form.

Administration Forms - Changes   The Station form will now accept new extension-type values for 46xx products. It is based on the form used for 64xx products, with minor changes. Input of a 46xx extension type causes fields appropriate to the 46xx product line to display.

Field changes include:

- The Port field is display only. When not registered, the field defaults to **x**. When registered, the virtual LAN address is displayed.

- The Expansion Module? and Data Option fields do not appear.

- The Multimedia Mode field defaults to **enhanced**.

- Layouts for Button Assignments and Feature Button Assignments are appropriate to the specific 46xx product.

　　　　　• The Speakerphone field will not allow the grp-listen option.

Quality of Service

(Category A Only)

Overview

The IP Solutions-Quality of Service enhancement is designed to promote improved voice quality when all or part of the audio transmission is carried via packet facilities.

Description

This feature enables the administrator to set parameters that define, prioritize and select the best end-to-end audio experience for a specific station or end point.

Best in this case does not necessarily mean only highest audio quality. This enhancement provides the ability to differentiate levels of service provided to a specific station or end point, based on consideration of needs of the business, resources allocation, cost, etc.

DEFINITY makes its discrimination based on priorities established by the administrator.

Administration

Administration Forms - New

A new form, IP Network Region permits definition of a network region and specification of audio transport parameters to be used when communicating with an end point in that region.

Note: This form, along with the new IP Codec Set form, replaces the old IP Media Parameters form.

This form is accessed using the **change ip-network-region <region number>** command.

Figure 11. IP Network Region

```
change ip-network-region 10                    Page 1 of 2

                      IP Network Region

              Region: 10
                Name: Test
     Audio Parameters
           Codec Set: 4
      UDP Port Range
                 Min: 2048
                 Max: 65535
   DiffServ PHB Value: 0        Direct IP-IP Audio Connections? y
                                       IP Audio Hairpinning? y

      802.1p/Q Enabled? y
       802.1p Priority: 0
          802.1Q VLAN: 0
```

Field Values:

* Name - Name of region.

* Codec Set **-** Specifies the codec set assigned to this region. Codecs are administered on the IP Codec Set form.

- **UDP Port Range** - Specify the range of UDP port numbers to be used for audio port packets.

Note: Caution should be taken to avoid the range of IETF assigned ports.

- **Min** - Specifies the lowest port number to be used.

- **Max** - Specifies the highest port number to be used.

- **DiffServ PHB Value** - The decimal value of the DiffServ PHB value. Suggested PHB values:

  - **28** translates to Flash precedence with low delay.
  - **46** (Expedited Forwarding) translates as Critical with low delay and high throughput.

- **802.1p/Q Enabled?** - Specifies if 802.1p MAC-layer prioritization and 802.1Q Virtual LAN specification are to be enabled.

- **802.1p Priority** - Specifies the 802.1p priority value, if 802.1p/Q is enabled.

- **802.1Q VLAN** - Specifies the 802.1Q virtual LAN value, if 802.1p/Q is enabled.

The command **list ip-network-region** displays the parameters defined for each region as defined by the administrator.

A new form, IP Codec Set permits definition of allowed audio codec(s) and packet size(s) to be used by each IP network region, along with indicators for enabling or disabling silence suppression. The form is accessed using the **change ip-codec-set** command.

Note: This form, along with the new IP Network Region form, replaces the old IP Media Parameters form.

Figure 12. IP Network Region 10

```
change ip-network-region 10                                      Page 2 of 2

                    Inter Network Region Connection Management

Region                              (Group Of 32)
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
001-032                 4
033-064
065-080
```

Figure 13. IP Codec Set

```
  change ip-codec-set n                                      page  1 of  1
                               IP CODEC SET

         Codec Set: n
         Audio Codec           Suppress      Frames       Packet
                               Silence       Per Pkt      Size (ms)
      1. G.711MU               Y             3            30
      2. _____               _             _
      3. _____               _             _
      4. _____               _             _
      5. _____               _             _
```

Field Values:

- Audio Codec - Specifies an audio codec to be used.

- Silence Suppression - Indicates if an RTP-level silence suppression is enabled on the audio stream.

- Frames per Pkt - Specifies the number of frames per packet up to 60ms.

- Packet Size (ms) - Displays packet size resulting from the specified number of frames.

The command **list ip-codec-sets** displays a list of all IP Codec Sets.

Administration Forms - Changes

The following lists the changes to existing administration forms.

- The IP Media Parameters form is obsolete. It has been replaced by the IP Network Regions and IP Codec Set forms.

- The Signalling Group form (page 1) has a new field: Far-end Network Region. This field specifies the network region that is assigned to the far end of the trunk group.

Note: A blank in this field will select the region of the near-end node.

Maintenance

Note: DiffServ and 802.1p/Q parameters will be used to execute ping and tracert commands. Ping will reply with the same QoS value found in the received packet. Therefore, measurements should reflect the behavior of the sent packet.

IP Solutions Serviceability

(Category A and B)

Overview

With R9, enhancements have been made to existing system management tools. These enhancements specifically enable monitoring of inter region IP connectivity.

This allows for continuous analysis of usage and needs.

Description

As in R8, background pinging and trace routes are used as monitoring tools. IP connectivity decisions are made based on the results.

DEFINITY provides automatic testing of 10-50 regions every 10 minutes.

No specific reports are issued, but Maintenance is able to track and retest problem areas.

Administration

Maintenance administration for R9 enhancements is supported by the following functionality.

Administration Forms - New

A new page has been added to the Inter-network Region Connection Management form. This page (page 2) provides status of inter-network region connection management, based on the background maintenance ping test.

Figure 14. Inter Network Region Connection Management

```
change ip-network-region 1                                          page  2 of  2
                    Inter Network region Connection Management

Region                    (Group of 32)
              1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2
 001-032 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 033-064 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 065-096 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 097-128 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 129-160 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 161-192 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 193-224 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 225-256 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 257-288 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 289-320 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 321-352 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 353-384 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 385-416 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 417-448 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 449-480 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 481-500 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```

Field Values:

- _ (blank) means no inter-network region connectivity.

- **1** to **7** (codec set) represents the preferred codec set to be used between two regions. Implies inter-network region connectivity exists between the two regions.

- **f** means that connectivity has failed based on the background ping test.

The display failed **IP Network Region** command displays a new screen, First 100 Worst Network Regions, which will provide a ranked list of network regions with broken connectivity. The regions are listed from the worst to least worse.

Note: Ideally this screen will be blank, indicating no broken paths.

Figure 15. First 100 Worst Network Regions

```
Display failed network-region-connections                    page  1 of  1

                    FIRST 100 WORST NETWORK REGIONS
                 NETWORK REGION: NUMBER OF BROKEN PATHS


  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___   ___:___
  ___:___   ___:___   ___:___   ___:___
```

Field Values:

• __:__ indicates region and number of broken paths
  (5:9 indicates that Region 5 has 9 broken paths)

A new Test Results form provides real-time ping-test results for failed network regions.

This test is performed and the results are displayed using 1 of 2 commands:

- **test failed-ip-network-region** (tests all failed regions), or

- **test failed-ip-network-region xxx** (where xxx is the region).

Figure 16. Test Results

```
                              TEST RESULTS


   Port   Maintenance Name    Alt. Name    Test No       Result       Error Code

              NR-CONN          XXX-YYY        ZZZ       Pass/Fail/Abort
```

Field Values:

- **NR-CONN** represents the maintenance object for this test.

- **XXX-YYY** represents the pair of failed network regions under test.

- **ZZZ** represents the test number.

- **Pass/Fail/Abort** indicates the test results.

Administration Forms - Changes Ping and Trace Route can now be requested using cabinet and slot, or by using a new qualifier "source", or can be requested using a virtual endpoint port ID. The new command, for example, would look like this:

ping ip-address 192.68.3.26 source S00015

trace-route ip-address 106.245.27.205 source S00015

Hardware Requirements

An external adjunct, called DEFINITY Network Management (DNM), is available to receive and deal with alarms from the DEFINITY switch.

Switch Support for IP Softphones

(Category A Only)

Overview

DEFINITY IP Softphone is an application that enables a user to control telephone calls directly from a PC. The Avaya IP Softphone is being enhanced in Release 2 of the product to include multi-GUI interface.

With R9, the DEFINITY switch interface support for IP softphone is exactly the same as that of DEFINITY R8. There are, however, some enhancements to the controlling and monitoring abilities.

Description

DEFINITY R9 enhancements for support of IP softphone are:

- The switch can enforce different IP endpoint capacity limits based on endpoint product types.

- The switch can display information about connection type.

- The switch can list the registered IP stations.

- The switch can indicate to the IP endpoint when a set display update is completed.

Administration

DEFINITY R8 allowed administration of different system limits for H.323 stations and IP Softphones. The DEFINITY R8 limits were based on numbers of simultaneous administered endpoints. DEFINITY R9 limits are based on numbers of simultaneous registrations. R9 also provides finer granularity because the endpoints are being sold at different prices.

IP Softphone R2 can be administered in the same way on the DEFINITY station form as the IP Softphone R1, except that additional IP set types are allowed: 4606IP, 4612IP and 4624IP. As with R8, the R9 switch will allow an IP Softphone R2 to be administered on the switch as a 600 series (Callmaster) terminal. The IP Softphone R2 PC client will not allow an end user to set the PC software to that terminal type.

Administration Forms - New

There is a new form added to System Capacities to display simultaneous registrations, not simultaneous administrations as was done on R8. This form appears as shown below.

Figure 17. System Capacity

```
Display capacity                                                          page ? of ?

                              SYSTEM CAPACITY


                           System                                    System
                Regist.  Avail.  Limit              Regist.  Avail.  Limit
IP_Soft____2__  0         1       1      _____ ___    0       1       1
IP_Phone ___1__ 0         1       1      _____ ___    0       1       1
IP_Agent ___1__ 0         1       1      _____ ___    0       1       1
IP_ROMax__1__   0         1       1      _____ ___    0       1       1
```

The capacity numbers on this form are with respect to simultaneous registrations, not simultaneous administrations as was done on R8.

Administration Forms - Changes

There is a new field on System-Parameters Customer-Options form, "Maximum Concurrently Registered IP Stations" which specifies the maximum number of IP stations which may be simultaneously registered, not the maximum which may be simultaneously administered.

Figure 18. Optional Features

```
Change system-parameters customer-option                    Page    1 of  7

                          OPTIONAL FEATURES

        G3 Version: V1.1                          Maximum Ports: 100
          Location: 1                    Maximum XMOBILE Stations: 0

IP ENDPOINT CAPACITIES (Sum Cannot Exceed 1000)
                        Maximum Administered IP Trunks: 0___
               Maximum Administered Remote Office Trunks: 0___
              Maximum Concurrently Registered IP Stations: 1___
Maximum Concurrently Registered Remote Office Stations: 0___
```

As is true with R8, IP Softphone support does not require any of these customer options: Multimedia Call Handling (Basic), Multimedia Call Handling (Enhanced), Personal Station Access (PSA), or Terminal Trans. Init. (TTI). However, if an R8 customer did buy any of these options, they will stay turned on during an upgrade from R8 to R9.

- If the Logged-In IP Station Agents field on the Call Center Optional Features page of the system-parameters customer-options form is **non-zero**, then an ID field on the upgraded R9 switch will contain a product ID corresponding to the IP Agent and the corresponding Limit field will contain the smaller of the Logged-In IP Station Agent field value, or the Max IP Stations field value.

- If the Max IP Stations field on an R8 switch is non-zero, then an ID field on the upgraded R9 switch will contain a value corresponding to the IP Softphone and the corresponding Limit field will contain the value (Max IP Stations) – Logged-In IP Stations Agents). This rule assumes that the result of this subtraction is 1 or greater. If the result is less than 1, the corresponding Limit field will contain **1**.

- After an upgrade from R8, the Maximum Concurrently Registered IP Stations field will be set to the value that the R8 translations had in the field Max IP Softphone but no lower than 1.

Figure 19. Max Registered IP Stations By Product ID

```
Change system-parameters customer-options                        page  7 of 7

                   MAX REGISTERED IP STAITONS BY PRODUCT ID

Product ID    Rel.  LIMIT    Product ID    Rel.  LIMIT    Product ID    Rel.  LIMIT
IP_Soft____   __:   1____    _____      __:   1____    _____      __:   1____
IP_Phone___   __:   1____    _____      __:   1____    _____      __:   1____
IP_Agent___   __:   1____    _____      __:   1____    _____      __:   1____
IP_ROMax__    __:   1000     _____      __:   1____    _____      __:   1____
_____      __:   1____    _____      __:   1____    _____      __:   1____
_____      __:   1____    _____      __:   1____    _____      __:   1____
_____      __:   1____    _____      __:   1____    _____      __:   1____
_____      __:   1____    _____      __:   1____    _____      __:   1____
_____      __:   1____    _____      __:   1____    _____      __:   1____
_____      __:   1____    _____      __:   1____    _____      __:   1____
```

Field Values:

Product ID
Enter up to 10 characters for IP phone product identification. All but 4 of them

default to blank on new installations and default on upgrades. The 4 non-blank defaults are shown above.

- The R1 IP Softphone endpoint currently reports "Avaya Goodweather" instead of IP_Soft.

- The R1 IP Agent currently reports R1IP_Agent.

- The conversion to the latter for both of these is currently done in registration software on the switch.

Release (Rel:)
The Release fields are 2 characters wide and can take any integer 0 to 99, or blank. They all default to blank.

Limit
The Limit field is 5 characters wide and had the same help and error messages as the Max IP Stations field. This field defaults to **1** for every product except the IP Remote Office Max which defaults to the maximum allowed value for the field Concurrently Registered Remote Office Stations on page 1.

Hardware Requirements

The required hardware is the same as R8.3.

5 Networking

QSIG-DCS

DCS with Rerouting

(Category A Only)

Overview   This feature is similar to QSIG Path Replacement. DCS with Rerouting will use the same messages as QSIG Path Replacement.

Description   All of the trunks used in the original paths must be DCS, and only DCS trunks will be used in the new path.

Administration   DCS with Rerouting after DCS Coverage may not have a bridged appearance; therefore, Maintain SBA at Principal? must be set to **n** (no).

Administration Forms - Changes

The System-Parameter Customer-Options form has a new field, DCS with Rerouting?. This is a y/n (yes/no) field.

QSIG Path Replacement with Path Retention

(Category A Only)

Overview   This R9 enhancement provides a more effective usage of QSIG facilities during an active call by automatically rerouting the call to a path that uses fewer or cheaper trunks.

This rerouting, or path replacement uses desirable QSIG standards supporting a multi-vendor environment.

Description   Path Replacement applies to an established call. If a *best route* (better, less expensive, etc.) connection is found, the call will be automatically rerouted to that path.

In a situation where the call is already on the best route, no change will be made. This is Path Retention.

The feature supports active voice as well as DCS connectivity.

Administration   Path Replacement is administrable on a PBX-wide basis. A PBX without the additional network feature - path replacement (ANF-PR) will not initiate, nor will it cooperate in path replacement.

Note: The correct administration of routing patterns and preferences is crucial for this feature to be useful.

Administration Forms - Changes

The Trunk Group form has 2 new fields:

- Path Replacement with Retention? - enables Path Retention. This is a y/n (yes/no) field.

- Path Replacement Method: - displayed only when Path Replacement with Retention? = **y**. Valid entries are **better route** or **always**.

QSIG Voice Mail

(Category A Only)

Overview   There are 2 enhancements to QSIG Voice Mail in R9:

- Multiple voice mail servers are allowed for each DEFINITY QSIG Served User switch.

- Path Optimization is used for calls covered to a QSIG voice mail server.

Description   Pre-R9 DEFINITY software allowed only one QSIG message center to be administered for each DEFINITY served user switch. With R9, this limit has been relaxed to allow up to six message centers per switch.

R9 also provides path optimization for coverage to voice mail. This means more efficient use of facilities. In addition, for customers using IP routers, path optimization could improve voice quality by reducing the number of times a message is compressed and decompressed.

Administration   The QSIG Voice Mail enhancements are controlled by fields on the QSIG Optional Features page of the System-Parameters Customer-Options form.

- For multiple QSIG Voice Mail servers the following options must be enabled:

  ~ ISDN-PRI or ISDN-BRI.

  ~ QSIG Basic Call Setup.

  ~ QSIG Basic Supplementary Services.

- For path optimization when calls cover to a QSIG Voice Mail server the following additional option must be enabled:

  ~ QSIG Supplementary Services with Rerouting.

6 BCS and Guest Works®

Enhancements

Overview

BCS and Guest Works DEFINITY platforms take advantage of many of the new features associated with R9 software.

The R9 features available include:

- Custom Selection of DID Numbers for VIP Guests
- Avaya Directory Gateway - Administration Change Notification
- UDS1 with Echo Cancellation
- IP Asynchronous Links (for system management applications e.g., DSA)
- Global Power Supply
- Firmware Download
- Mobility Enhancements
- Administrable Callout on Call Timer.

- Call Center

  - ~ Holiday Vectoring
  - ~ Remote Logout of Agent

- Avaya R300 Remote Office Communicator
- Increased Memory Capacity
- Customer Telephone Activation

For detailed descriptions and administration, see appropriate entries in this document.

7 DEFINITY ONE Release 9 Issue 3

DEFINITY ONE Release 9 Issue 3

Overview

The DEFINITY ONE Communications System (DEFINITY ONE) Release 9 Issue 3 provides Avaya customers an integrated set of applications that are administered through an easy-to-use interface. DEFINITY ONE offers sophisticated business features and functionality, such as voice mail, call center, and networking. The system is applicable to a single site or a network within large business satellite offices or worldwide branch offices.

DEFINITY ONE Issue 3.0 includes DEFINITY Release 9, INTUITY AUDIX Release 4.4, and DEFINITY Site Administration (DSA) Release 1.5, loaded on a single NT-based platform. Application integration results in easy administration on the Windows NT 4.0 operating system.

In addition, outside adjuncts and associated connectivity and maintenance costs are eliminated and functionality is consolidated into a single cabinet. This creates a cost-effective platform.

The Application Starter Packages offer an array of prepackaged advanced applications that effectively help manage time and communication processes. DEFINITY ONE starter packages include:

- Automatic Call Distribution (ACD)
- Networking
- Virtual Office

DEFINITY ONE allows for business growth without additional investment. The circuit packs, phones, and cabinet (in some cases) can be reused in a larger DEFINITY system.

Description

DEFINITY ONE with DEFINITY Release 9 is an international release that offers significant new features and improvements to facilitate system administration and enhance call center functions. These include:

- Increased Port Capacity
  Both one- and two-cabinet configurations are supported. The number of ports supported has increased from 168 to 400.

- TN2301 Processor Circuit Pack
  DEFINITY ONE Release 9 Issue 3 supports the new TN2302 IP Media Processor.

- Software Options
  DEFINITY ONE Release 9 Issue 3 is offered as a single hardware module with the following major software options:

- SNMP Agent
  See below for a detailed description.

- Coresident Announcements Capability
  See below for a detailed description.

- BCMS Vu
  First available in Release 2.0, BCMS Vu is offered as a standalone product that connects to the DEFINITY ONE system via the LAN. This option is available at additional cost and is field installable.

- CentreVu CT Server
  First available in Release 2.0, CentreVu CT Server is offered as a standalone product that connects to the DEFINITY ONE system via the LAN. This option is available at additional cost and is field installable.

- Web Enhancements
  The Web interface on DEFINITY ONE Release 9 Issue 3 includes the ability to download call center clients for BCMS Vu and CentreVu CT.

- www.messenger
  DEFINITY ONE Release 9 Issue 3 works with www.messenger and provides quick and easy access to your telephone, fax, and text messages, as well as file attachments, through your Netscape Navigator or Internet Explorer Web browser.

- DLG Enhancement
  A new feature allows adjunct routing to asai/adjlk TCP/IP links.

- Language Support
  Intuity voice prompts are available in new languages with this release.
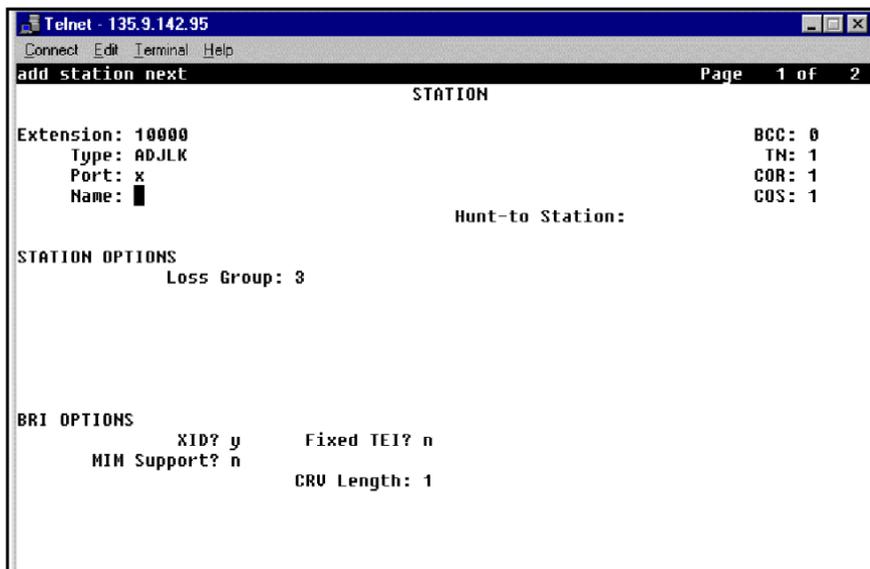
Hardware Requirements

No new DEFINITY ONE specific hardware is being introduced and no hardware support removed with Issue 3 except that two cabinets are supported. Because of changes in disk technology, a different disk drive may be provided with new Issue 3 systems. However, this new disk provides no change in functionality and is not required to upgrade an existing release 1 or 2 customer.

Administration

This release of DEFINITY ONE supports adjunct routing. To administer an adjunct link in this release, an extension number must first be assigned as illustrated in Figure 20. The station type is set to **adjlk** and the port to **x**. This must be done before other administration can be completed.

Figure 20. Adjunct Station Assignment

Then the ip-services for can be administered as shown in Figure 21.
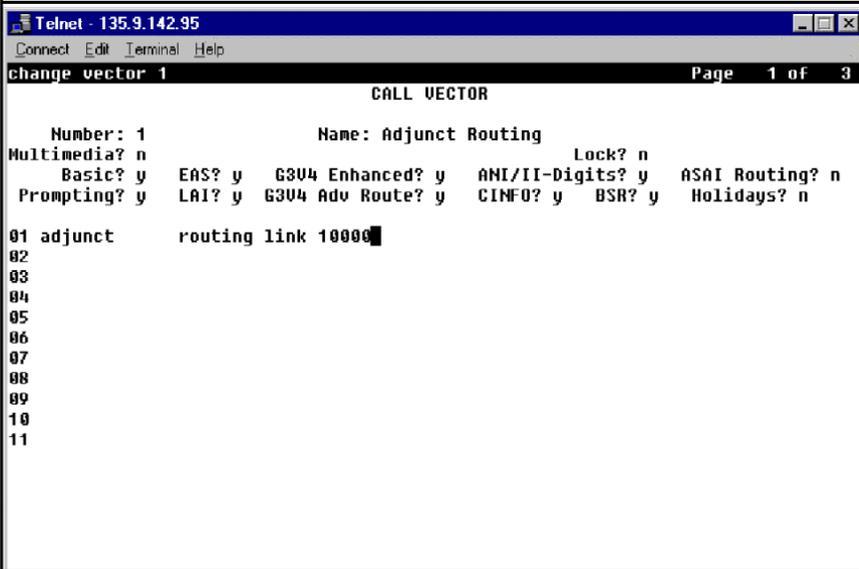
Figure 21. IP-services Form

```
┌─────────────────────────────────────────────────────────────────────┐
│ ▄▌Telnet - albania                                          _ □ �X    │
│ Connect  Edit  Terminal  Help                                         │
│ change ip-services                                        Page  1 of  1│
│                                                                        │
│                              IP SERVICES                               │
│    Service     Enabled    Local      Local     Remote      Remote     │
│     Type                  Node       Port      Node        Port       │
│   ▮DJLK1         procr              5678     procr         0          │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│                                                                        │
│ ████████████████████████████████████████████████████████████████████ │
│ F1=Cancel   F2=Nxt Page   F3=Submit   F4=Help   Esc p=Prv Page   Esc r=Refresh │
└─────────────────────────────────────────────────────────────────────┘
```

To administer adjunct routine, the vector form is used as illustrated in Figure 22. Note that the extension number used in this form must be the same as the extension number used in Figure 20.

Figure 22. Adjunct Routing

SNMP Agent

Simple Network Management Protocol (SNMP) is the de facto standard protocol for managing data network devices. The SNMP agent is a software module loaded on all systems and available at additional cost. The agent provides an SNMP interface to the system's alarm and error tables, select performance measurements, and select configuration data. The agent also supports SNMP traps for DEFINITY alarms and restarts, INTUITY alarms, and Windows NT events.

Figure 23. Network Management Overview
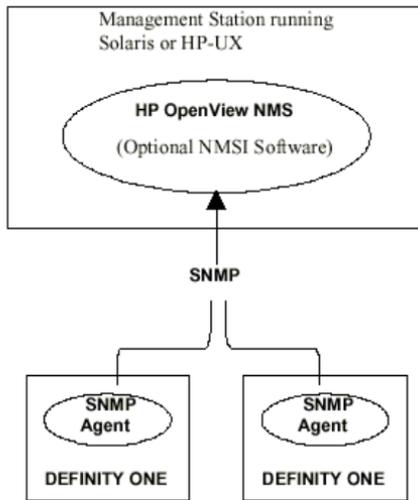
The SNMP agent allows users to monitor their DEFINITY ONE devices from a Network Management System (NMS)— (software used to centrally manage all the devices in a computer network) such as HP OpenView.

Figure 24. HP Open View IP Map
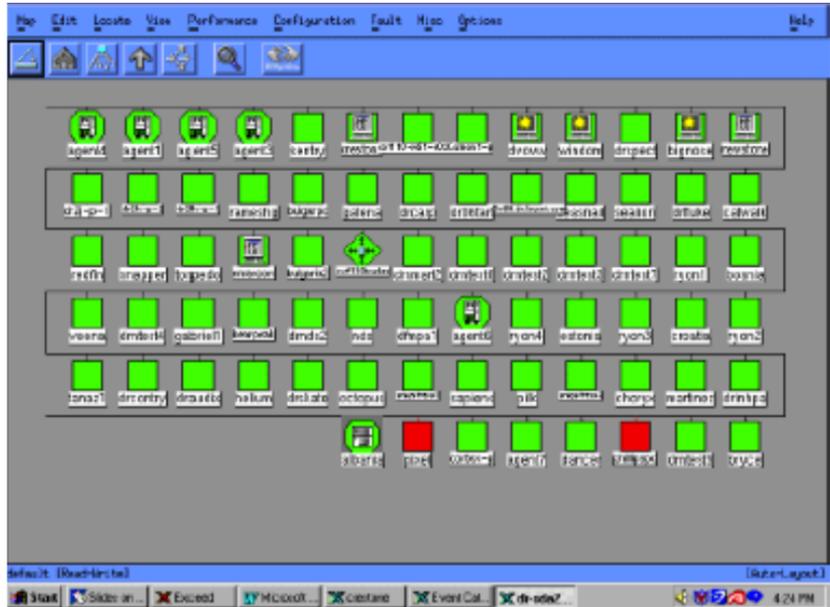
With additional software, the NMS automatically can identify the DEFINITY devices in the network and displays icons for them on an NMS IP map. The DEFINITY ONE's icons are colored according to severity of the problem.

A network manager can use this data to create a variety of reports.

Administration

Issue 3 contains a new capability to support SNMP traps and a limited ability for reads or gets. SNMP traps are a form of alarm notification to a network management system. To enable SNMP enter the command **enable snmp** from a BASH shell. To disable it, enter the command **disable snmp**. The DEFINITY ONE Web interface is used to administer the SNMP agent.

Administration Forms - New

Several new screens have been added to the DEFINITY ONE Web interface to support SNMP administration. If SNMP Subagent Administration is selected from the DEFINITY ONE main administration menu, the menu for SNMP administration appears as in Figure 25. From this menu, the sub-agent for SNMP may be started or stopped, the SNMP security parameters (community string) may be set, and the place where traps are to be sent may be identified.

Figure 25. SNMP Administration Main Menu screen
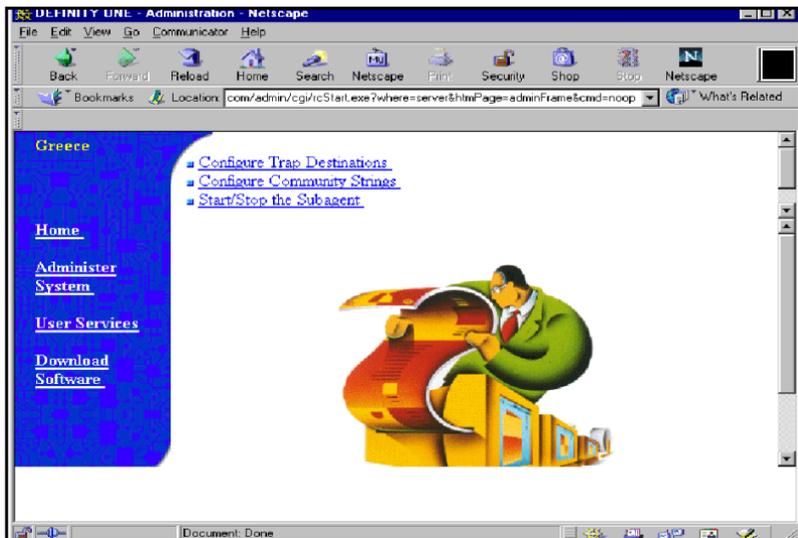
If the **configure trap destinations** item is selected, the Trap Administration screen appears.

Figure 26. Trap Administration

Here the user can list all current trap destinations by selecting **list current entries** and clicking on the submit button. The user can add/delete IP addresses to/from the list of IP addresses to which traps will be sent via the trap destination field. For each trap destination IP address, the SNMP version must be specified as well.

If **list current entries** is selected, the list is displayed as illustrated.

Figure 27. Current Trap Destinations

Community Strings are administered in a similar fashion. The **configure community strings** entry is selected, which results in the Community String Administration screen.

Figure 28. Community String Administration

If **list current entries** is selected, the community string list is displayed.

Figure 29. Community String List

Each community string is associated with read or write permissions to the associated MIB. In this release, the ability to write/set items in the MIB is not supported; access privileges must be set but are essentially ignored.

To start and stop the SNMP service, the **start/stop the subagent** entry is selected and the following screen is displayed.

Figure 30. Starting and Stopping the SNMP Agent
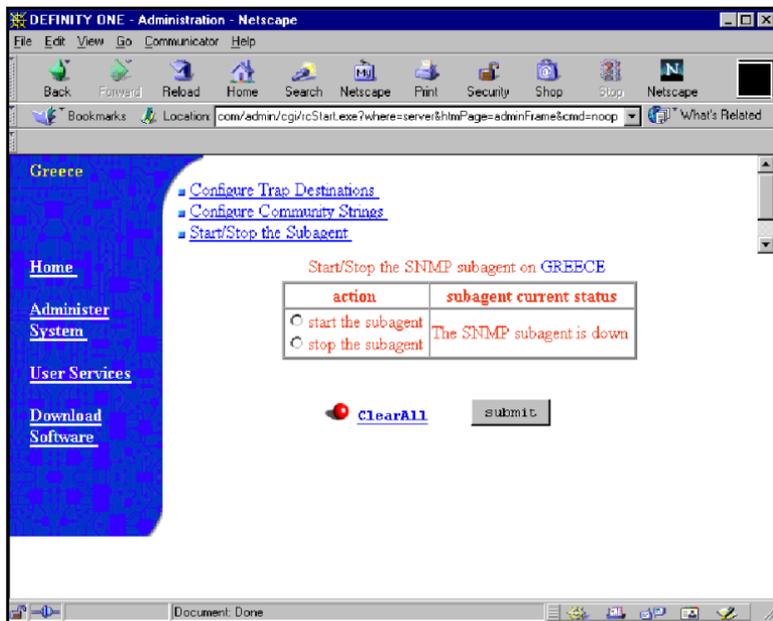
For complete details of SNMP administration, see the DEFINITY ONE
Documentation.

**Administration
Forms - Changes**   A new item for SNMP has been added to the DEFINITY ONE main administration
menu, the SNMP Subagent Administration.

Coresident Announcements Capability

DEFINITY ONE Release 9 Issue 3 supports announcements via the CWY1 board (Integrated SSP Announcements (ISSPA)). The system provides eight announcement ports and announcements are stored on the DEFINITY ONE hard drive. The announcements are recorded via a telephone set.

Input of pre-recorded announcements from other sources is *not* supported unless the recordings can be played into a standard telephone handset.

This new feature eliminates the need for a TN750 board (although one could still be used). Backup of TN750C announcements continues to be unsupported.

Administration

ISSPA is an extra cost optional feature. As such, it must be enabled on the customer options form before it can be used. ISSPA uses a "virtual" board location at 01A13. This location does not exist physically, but is used to signal the presence of this feature to the announcement software.

Administration Forms - Changes

Changes have been made to the following forms:

- Customer Option form has a new field Integrated SSP Announcements.
- List Configuration form includes the virtual ports for ISSPA.

Glossary

A

AAR

See Automatic Alternate Routing (AAR).

Abbreviated Dialing (AD)

A feature that allows callers to place calls by dialing just one or two digits.

AD

See Abbreviated Dialing (AD)

ADU

See Asynchronous data unit (ADU).

adjunct

A processor that does one or more tasks for another processor and that is optional in the configuration of the other processor. Intuity AUDIX and CentreVu CMS are considered adjuncts to the DEFINITY ECS.

Administration Without Hardware (AWOH)

A feature that allows administration of ports without associated terminals or other hardware.

ANSI

American National Standards Institute**.** A United States professional/technical association supporting a variety of standards.

APLT

Advanced Private-Line Termination.

ARP

Address Resolution Protocol.

ARS

See Automatic Route Selection (ARS).

ASCII

American Standard Code for Information Interchange. The standard code for representing characters in digital form. Each character is represented by an 8-bit code (including parity bit).

---

asynchronous data transmission

A method of transmitting data in which each character is preceded by a start bit and followed by a stop bit, thus permitting data characters to be transmitted at irregular intervals. This type transmission is advantageous when transmission is not regular (characters typed at a keyboard). Also called asynchronous transmission.

Asynchronous data unit (ADU)

A device that allows direct connection between RS-232C equipment and a digital switch.

Asynchronous Transfer Mode (ATM)

A connection-oriented, digital service optimized for fiber-optic lines at speeds up to 622.08 mbps. ATM networks set up a virtual circuit (virtual connection) between the transmitter and the receiver before sending any data. Data is then sent in a continuous stream of fixed-length, 58-byte cells, each of which contains a 48-byte payload and a 5-byte header. The header contains the virtual circuit number that identifies the pre-negotiated path through the network.

ATM

See Asynchronous Transfer Mode (ATM)

Audio Information Exchange (AUDIX)

A fully integrated voice-mail system. Can be used with a variety of communications systems to provide call-history data, such as subscriber identification and reason for redirection.

Automatic Alternate Routing (AAR)

A feature that routes calls to other than the first-choice route when facilities are unavailable.

Automatic Route Selection (ARS)

A system for automatically routing telephone calls by the least costly route. A feature of the Lucent DEFINITY Enterprise Communications Server.

auxiliary trunk

A trunk used to connect auxiliary equipment, such as radio-paging equipment, to a communications system.

AWOH

See Administration Without Hardware (AWOH).

B

B8ZS

See Bipolar 8 Zero Substitution (B8ZS).

Basic Rate Interface (BRI)

A standard ISDN frame format that specifies the protocol used between two or more communications systems. As used in North America, BRI provides 23 64-kbps B-channels (voice or data) and one 64-kbps D-channel (signaling). The D-channel is the 24th channel of the interface and contains multiplexed signaling information for the other 23 channels.

bandwidth

The amount of data that a given channel can transmit in a given period of time, measured in bits per second (not bytes per second) on digital networks or in Hertz (cycles per second) on analog networks. For analog transmission, the band width can be measured as the difference, expressed in hertz, between the highest and lowest frequencies transmitted.

baud

A unit of transmission rate equal to the number of signal events per second. See also bit rate.

BCC

See bearer capability class (BCC)

bearer capability class (BCC)

Code that identifies the type of a call (for example, voice and different types of data). Determination of BCC is based on the caller's characteristics for non-ISDN endpoints and on the Bearer Capability and Low-Layer Compatibility Information Elements of an ISDN endpoint. Current BCCs are 0 (voice-grade data and voice), 1 (DMI mode 1, 56 kbps data transmission), 2 (DMI mode 2, synchronous/asynchronous data transmission up to 19.2 kbps) 3 (DMI mode 3, 64 kbps circuit/packet data transmission), 4 (DMI mode 0, 64 kbps synchronous data), 5 (temporary signaling connection, and 6 (wideband call, 128–1984 kbps synchronous data).

BER

Bit error rate.

Bipolar 8 Zero Substitution (B8ZS)

B8ZS line coding substitutes a mix of 1s and 0s for every group of eight consecutive 0s in a stream of AMI-encoded data (see line coding). The encoded string contains consecutive ones with the same polarity. These intentional, bipolar violations of the AMI coding scheme let the receiving end identify, decode, and restore the long zero strings in the original message. B8ZS line coding does not corrupt digital data, so it is commonly used with T-1 lines.

bit (binary digit)

One unit of information in binary notation, having two possible values: 0 or 1.

bit rate

The speed at which bits are transmitted, usually expressed in bits per second. Also called data rate.

bps

Bits per second.

BOS

Bit-oriented signaling.

BRI

See Basic Rate Interface (BRI)

bridge

A device that connects two or more packet-switched networks and directs packets sent from one to the other. See router.

bus bridge

A connection between the TDM bus and the packet bus built into the C-LAN circuit pack for use with DEFINITY ECS R7csi. Bus bridge connectivity is not used with any other DEFINITY switch model.

BX.25

A version of the CCITT X.25 protocol for data communications. BX.25 adds a fourth level to the standard X.25 interface. This uppermost level combines levels 4, 5, and 6 of the ISO reference model.

byte

A sequence of (usually eight) bits processed together.

C

Call Detail Recording (CDR)

A feature that uses software and hardware to record call data. (Same as station message detail recording — SMDR).

Call Detail Recording utility (CDRU)

Software that collects, stores, optionally filters, and outputs call-detail records.

Call Management System (CMS)

An application, running on an adjunct processor, that collects information from an ACD unit. CMS enables customers to monitor and manage telemarketing centers by generating reports on the status of agents, splits, trunks, trunk groups, vectors, and VDNs, and enables customers to partially administer the ACD feature for a communications system.

call redirection

See restricted facilities.

CALLed Party Number IE

The ISDN information element containing the digits sent to the called party.

capture rate

The number of frames contained in a one-second video sample, used as a measure of video quality.

CA-TSC

Call-Associated Temporary Signaling Connection.

CCIS

Common-Channel Interoffice Signaling

CCITT

Comitte Consultatif International Telephonique et Telegraphique. Now called *International Telecommunications Union* (ITU).

CCMS

Control-Channel Message Set.

CDR

See Call Detail Recording (CDR). (Same as SMDR and CMDR).

CDRU

Call Detail Record Unit.

CDRP

Call Detail Record Poller.

CEPT1

European Conference of Postal and Telecommunications Rate 1.

channel

A communication path linking two points for transmitting voice and data. Also:

1. A circuit-switched call.
2. In wideband, all of the time slots (contiguous or noncontiguous) necessary to support a call.   Example: an H0-channel uses six 64-kbps time slots.
3. A DS0 on a T1 or E1 facility not specifically associated with a logical circuit-switched call; analogous to a single trunk.

circuit

1. An arrangement of electrical elements through which electric current flows.
2. A channel or transmission path between two or more points.

circuit pack

A card on which electrical circuits are printed, and IC chips and electrical components are installed. A circuit pack is installed in a switch carrier.

Class of Restriction (COR)

A feature that allows up to 64 classes of call-origination and call-termination restrictions for voice terminals, voice-terminal groups, data modules, and trunk groups.

Class of Service (COS)

A feature that uses a number to specify if voice-terminal users can activate the Automatic Callback, Call Forwarding All Calls, Data Privacy, or Priority Calling features.

circuit-switched network

A network that sets up and maintains a connection for the exclusive use of two or more communicating parties for the duration of their call.   The familiar, voice telephone network is circuit-switched. See packet switching.

clear-channel facility

A digital circuit that requires no in-channel framing or control bits. The whole bandwidth is thus available for data transmission.

client

An application that runs on one processor while drawing on data or other resources that are on a server located elsewhere. **MMCX client:** a workstation capable of making MMCX calls. Such a workstation is a client of one or more MMCX servers. See dial-plan table.

CMDR

Centralized Message Detail Recording. (Same as CDR and SMDR).

CMS

Call Management System.

COR

See Class of Restriction (COR).

COS

See Class of Service (COS).

CP

Circuit pack.

CSN

See circuit-switched network.

CSU

Channel service unit.

cyclic redundancy checking (CRC)

A method for detecting read, transmit, and write errors in data. At the transmission end, the system treats a block of data as a single binary number, divides it by some specified binary number, and appends the remainder (called the CRC character) to the data. At the receiving end, the system recalculates the remainder and compares the result to the CRC character. If the two agree, there are no errors.

D   **data channel**

A communications path between two points used to transmit digital signals.

data-communications equipment (DCE)

The equipment (usually a modem, data module, or packet assembler/disassembler) on the network side of a communications link that makes the binary serial data from the source or transmitter compatible with the communications channel.

datagram

In packet switching, a packet that carries information sufficient for routing from the originating data terminal equipment (DTE) without the necessity of establishing a connection between the DTEs and the network. Connectionless, unreliable.

data link

The configuration of physical facilities enabling end terminals to communicate directly with each other.

data path

The end-to-end connection used for a data communications link. A data path is the combination of all elements of an interprocessor communication in a DCS.

data port

A point of access to a computer that uses trunks or lines for transmitting or receiving data.

data service unit (DSU)

A device that transmits digital data on transmission facilities.

data terminal equipment (DTE)

Equipment consisting of the endpoints in a connection over a data circuit. In a connection between a data terminal and host, the terminal, the host, and their associated modems or data modules make up the DTE.

DCE

Data-communications equipment.

D-channel backup

Type of backup used with Non-Facility Associated Signaling (NFAS). A primary D-channel provides signaling for an NFAS D-channel group (two or more PRI facilities). A second D-channel, on a separate PRI facility of the NFAS D-channel group, is designated as backup for the D-channel. Failure of the primary D-channel causes automatic transfer of call-control signaling to the backup D-channel. The backup becomes the primary D-channel. When the failed channel returns to service, it becomes the backup D-channel.

DCIU

Data communications interface unit.

DCP

Digital Communications Protocol.

DCS

Distributed Communications System.

dial-plan table

A data structure that defines how a switch or server (such as MMCX) interprets dialed digits and routes calls. The dial-plan table performs two tasks. First, it identifies a dial plan rule that applies to the kind of input it has received. Then it applies the rule and translates the dialed input into a corresponding extension or public-network telephone number. (MMCX interserver calls are handled differently; see interserver routing table.)

DID

Direct Inward Dialing.

digital communications protocol (DCP)

A proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two 64-kbps information (I-) channels and one 8-kbps signaling (S-) channel. The DCP protocol supports 2 information-bearing channels, and thus two telephones/data modules.

digital signal level 0 (DS0)

A single 64-kbps voice channel. A DS0 is a single 64-kbps channel in a T1 or E1 facility and consists of eight bits in a T1 or E1 frame every 125 microseconds.

digital signal level 1 (DS1)

A single 1.544-Mbps (United States) or 2.048-Mbps (outside the United States) digital signal carried on a T1 transmission facility. A DS1 converter complex consists of a pair, one at each end, of DS1 converter circuit packs and the associated T1/E1 facilities.

digital terminal data module (DTDM)

An integrated or adjunct data module that shares with a digital telephone the same physical port for connection to a communications system. The function of a DTDM is similar to that of a PDM and MPDM in that it converts RS-232C signals to DCP signals.

distributed application

A computer application that runs on one or more clients and uses shared resources, such as databases. These resources reside on a common server. Distributed design lets multiple users run programs using common, centrally maintained files.

domain

An addressable location on a network, such as a group of computers, single computer, or subdirectory. See Domain Name Server (DNS).

Domain Name Server (DNS)

An Internet computer that maintains a database of domain names.

Provides a mapping of alphanumeric names to IP addresses; for example, xxx.xxx.xxx.xxx --> www.lucent.com.

DNS

See Domain Name Server (DNS).

DSU

Data service unit.

DTDM

Digital-terminal data module.

DTE

Data-terminal equipment.

E

E-1

A digital transmission link with a capacity of 2.048 Mbps (2,048,000 bits per second). The European equivalent of the T-1. It can support 30 multiplexed 64-Kbps voice and data channels plus separate 64-Kbps channels for signalling and framing (synchronization). Also spelled **E1**.

EIA

See Electronics Industries Association (EIA).

EIA-232

A physical interface specified by the EIA. EIA-232 transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of up to 50 feet. EIA-232 replaces RS-232 protocol in some DEFINITY applications.

electronic tandem network (ETN)

A tandem tie-trunk network that has automatic call-routing capabilities based on the number dialed and the most preferred route available. Each switch in the network is assigned a unique private network office code (RNX), and each voice terminal is assigned a unique extension.

Electronics Industries Association (EIA)

A trade association of the electronics industry that establishes electrical and functional standards.

Ethernet

A local area network (LAN) that works over short distances on twisted-pairs or coaxial cables at speeds up to 10 mbps or 100 mbps. One of the two LAN protocols MMCX supports. See ATM, LAN emulation (LANE).

Ethernet Source Address

A 48-bit physical address of the NIC; also called the MAC address.

ETN

Electronic tandem network

F

facility

A telecommunications transmission pathway and associated equipment.

facility-associated signaling (FAS)

Signaling for which a D-channel carries signaling only for those channels on the same physical interface.

FAS

Facility-associated signaling

framing

The data-formatting conventions that allow a receiver to synchronize with the transmitting end of a circuit. For example, T-1 frames contain an 8-bit sample from each of the 24 channels on the interface (192 bits total) plus a framing bit (for a total of 193 bits). Each framing bit marks the end of a timed sample the input at the transmission end.

FRL

Facilities Restriction Level.

FX

Foreign exchange.

G **Gateway**

(1) protocol converter (2) a node between network segments.

H **H.320**

The most common standard for videoconferencing over ISDN BRI circuits. H.320-compatible systems can communicate with each other even when they rely on dissimilar hardware and software.

H.323

A specification that sets standards for multimedia communications between LANs and telephony networks, such as ISDN.

HDB3

See High Density Bipolar 3-Bit Substitution (HDB3).

High Density Bipolar 3-Bit Substitution (HDB3)

HDB3 line coding is similar to Bipolar 8 Zero Substitution (B8ZS) in some ways. It replaces every 4 consecutive zero in a stream of AMI-encoded data (see line coding) with either of two sequences. If there has been an even number of 1s since the last substitution, it substitutes the pattern **1 0 0 *BipolarViolation*, where *BipolarViolation* is a 3-volt pulse (a **1**) of the same polarity as the preceding 3-volt pulse. If there has been an odd number of 1s since the last substitution, HDB3 coding substitutes the pattern **0 0 0 *BipolarViolation*** for the 4-zero string. This system does not corrupt binary data, and is commonly used with E-1 lines.

host

A server.

host name

See server name.

I **IANA**

Internet Assigned Number Authority.

INADS

Initialization and Administration System

Information element (IE)

The data fields in ISDN messages.

in-service state

The condition or state of an MMCX server that is ready to handle calls.

International Standards Organization (ISO)

A body that defines and/or adopts protocols widely used in the computer and telecommunications industries.

International Telecommunications Union (ITU)

Formerly known as International Telegraph and Telephone Consultative Committee (CCITT), ITU is an international organization that sets universal standards for data communications, including ISDN. ITU members are from telecommunications companies and organizations around the world.

Internet

The decentralized network of networks that grew from ARPAnet and supported by TCP/IP.

interserver routing table

A database that keeps track of the interserver routing tables on a multiserver MMCX network. When a server sets up a Point-to-Point Protocol connection with a remote server, the local server looks up the dialed-digit sequences in the interserver routing table. (Calls that involve only one MMCX server are routed using the dial-plan table.)

I/O base address

The place in memory where a given computer peripheral places and picks up messages that travel over a computer's system bus.

IP

Internet Protocol.

IP (Internet Protocol) address

A 32-bit number that uniquely identifies endpoints on the Internet, commonly specified in the form *n1.n2.n3.n4* where each *n$_n$* is a decimal number between **0** and **255**. Part of the IP address represents the address of a local network's gateway to the Internet and part represents the host-machine address within that local network. The available bits are apportioned to the network address or local address using a system of classes. The Class A addresses used by the largest organizations on the Internet reserve the first 8 bits for the network portion of the address and remaining 24 for the host machine. Class B addresses, the most common class, assign 16 bits to the network and 16 to the host machine. The Class C addresses used by small networks reserve the first 24 bits for the network and the remaining 8 bits for the host.

IP user

An H.323 endpoint on an MMCX network. Such users do not have log ins, so the MMCX server identifies them using an extension number and an IP address.

ISDN

Integrated Services Digital Network, a digital, voice and data service. You get ISDN in either of two forms. Primary Rate Interface (PRI) service has a capacity of 1.544 mbps, divided into 23 or 29 B-channels (23 on a North American T-1 connection, 29 on a European E-1) and 1 D-channel, each with a capacity of 64 kbps. Basic Rate Interface (BRI) service has a capacity of 144 kbps, divided into 2 B-channels at 64 kbps each and 1 D-channel at 16 kbps.

ISDN trunk

A trunk administered for use with ISDN-PRI. Also called ISDN facility.

L

LAN

See local area network.

LAN emulation (LANE)

A technique that lets ATM networks communicate with Ethernet LAN cards. ATM service is not widely available at the desktop and ATM interface cards are expensive, so ATM networks usually emulate LANs when communicating with user terminals. Typically, a **LAN-emulation configuration server (LECS)** keeps track of the relationships between ATM-network addresses and IP addresses on the LAN. Each ATM card is then treated as a client of a **LAN-emulation server**, which connects the ATM cards to the LAN cards on the user terminals.

LAP-D

See link-access procedure on the D-channel (LAPD).

LECS (LAN-emulation configuration server)

See LAN emulation (LANE).

LES (LAN-emulation server)

See LAN emulation (LANE).

line coding

Line coding is the data format that lets either end of a communications channel correctly interpret messages from the other. Line coding systems specify the voltage levels and patterns that represent binary digits (1s and 0s), based on the requirements of the transmission network. The AT&T network has two: it demands that the net voltage on the line equal 0 volts DC and it demands a minimum Open System Interconnect (OSI) Model. The T-carrier system meets the first requirement by using a bipolar line-coding scheme called Alternate Mark Inversion (AMI). It meets the second with one of several supplementary coding schemes, including ZCS, Bipolar 8 Zero Substitution (B8ZS), and High Density Bipolar 3-Bit Substitution (HDB3).

line compensation

An allowance for pulse distortions in the cable that connects the MMCX server to the first channel service unit (CSU) on the PRI span. It is proportional to the length of the cable. T1 circuit packs adjust the outgoing signal so that it arrives at the far end without distortion.

link

A transmitter-receiver channel that connects two systems.

link-access procedure on the D-channel (LAPD)

A link-layer protocol on the ISDN-BRI and ISDN-PRI data-link layer (level 2). LAPD provides data transfer between two devices, and error and flow control on multiple logical links. LAPD is used for signaling and low-speed packet data (X.25 and mode 3) on the signaling (D-) channel and for mode-3 data communications on a bearer (B-) channel.

local area network

A short-range data communication network providing high-speed carrier service with low error rates. Generally, a LAN is limited in range to a maximum of 6.2 miles. Ethernet and Token-Ring are common LAN architectures. See wide area network, Ethernet.

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looparound testing

Checking an interface by sending a signal through the output, across a medium (the loop), and back through the input. Internal looparound tests run against the internal circuitry of the card. External looparound tests check the connectors at the edge of the card using a fiber or wire loop. PRI, Ethernet, and ATM cards are tested this way.

M **MAC**

Media Access Control; a sublayer of the OSI Data Link layer, provides an interface with the network adapter.

main-satellite-tributary

A private network configuration that can either stand alone or access an ETN. A main switch provides interconnection, via tie trunks, with one or more subtending switches, called satellites; all attendant positions for the main/satellite configuration; and access to and from the public network. To a user outside the complex, a main/satellite configuration appears as one switch, with one listed directory number (LDN). A tributary switch is connected to the main switch via tie trunks, but has its own attendant positions and LDN.

Management Information Base (MIB)

A virtual database used by the Simple Network Management Protocol (SNMP).

MAPD

Multiapplication platform for DEFINITY.

MA-UUI

Message-Associated User-to-User Signaling.

M-Bus

Memory bus.

MDR

Message detail record.

MIB

See Management Information Base (MIB).

MMCH

Multimedia call handling.

MSA

Message Server Adjunct.

multicasting

A transmission method that promotes efficient bandwidth utilization on a multimedia data network when several parties are transmitting and receiving simultaneously. Normally, each party sends a separate video stream to each of the other parties and receives a separate video stream from each in return (this is called unicasting). Multicasting substitutes a single broadcast transmission (addressed to all parties) for the separate transmissions addressed to each. Each party then continues to receive multiple data streams while sending only one. For best results, multicast messages should be restricted to one or more subnet.

N

National Television Standards Committee (NTSC) standard

The standard format and transmission method for television signals in North America, Central America, and Japan. The NTSC is a division of the Electronic Industries Association (EIA). MMCX video transmissions conform with NTSC requirements.

national number

The full dialed number minus the country code. The national number is composed of office code plus subscriber code. In North America, this means area code plus seven digits. For example, 303-538-1234 is a national number.

NCA/TSC

Noncall-associated/temporary-signaling connection.

NCOSS

Network Control Operations Support Center.

NCSO

National Customer Support Organization.

NEC

National Engineering Center.

NEMA

National Electrical Manufacturer's Association.

NETCON

Network-control circuit pack.

Network

A collection of computer-like devices ("nodes") that are connected by, and can communicate across, a common transmission medium.

Network Adapter

The interface between a node and the network; has a unique physical address.

Network Interface Card (NIC)

A circuit board that can be fitted to a personal computer (PC) to allow the PC to communicate with other machines on a network. MMCX works with Ethernet cards and with asynchronous transfer mode (ATM) cards running Ethernet emulation. Also called a network adapter.

NFAS

See Nonfacility-associated signaling (NFAS).

NIC

See Network Interface Card (NIC).

Node

1. A point on a network that provides an interface to a communications device.

2. A switch or adjunct in a Lucent DCS network.

Nonfacility-associated signaling (NFAS)

A method that allows multiple T1 and/or E1 facilities to share a single D-channel to form an ISDN-PRI. If D-channel backup is not used, one facility is configured with a D-channel, and the other facilities that share the D-channel are configured without D-channels. If D-channel backup is used, two facilities are configured to have D-channels (one D-channel on each facility), and the other facilities that share the D-channels are configured without D-channels.

NTSC

See National Television Standards Committee (NTSC) standard.

O

Open System Interconnect (OSI) Model

An International Standards Organization (ISO) interoperability specification. OSI defines standard services that compliant communications networks and equipment must provide, rather than specific implementations. It divides network operations into 7 steps, called layers, and arranges them hierarchically, in a protocol stack. The rules (protocols) in each layer of the stack specify a service that other parts of a communications system can always get, as long as they make their requests in a standard way. This approach leaves designers free to implement the internal details of the service in whatever way seems best to them. The OSI layers are **1 Physical** (transmission medium), **2 Datalink** (link-level signaling and error control), **3 Network** (computer-to-computer signaling, routing, etc.), **4 Transport** (delivery, end-to-end error control, and flow control), **5 Session** (dialog management), **6 Presentation** (data-format compatibility), and **7 Application** (file-transfer services, virtual terminals, etc.).

OSI

See Open System Interconnect (OSI) Model.

out-of-service state (OOS)

The condition or state of an MMCX server that is operating but not ready to accept or place calls.

P

PACCON

Packet controller.

packet

A group of bits (including a message element, which is the data, and a control information element (IE), which is the header) used in packet switching and transmitted as a discrete unit. In each packet, the message element and control IE are arranged in a specified format.

packet bus

A wide-bandwidth bus that transmits packets.

packet switching

A data-transmission technique whereby user information is segmented and routed in discrete data envelopes called packets, each with its own appended control information, for routing, sequencing, and error checking. The packets can travel to their destinations by varying routes. For data transmissions, a packet switched network can make more efficient use of available bandwidth than a circuit-switched network, because it does not dedicate a channel for the duration of a call. Instead, packets are queued and sent on a standby basis, as channel capacity becomes available. The Internet is a good example of a packet-switching network.

PBX

Private Branch Exchange: a customer-owned telephone switch that connects a company's internal telephone network with the local telephone service provider's central office.   Lucent's DEFINITY PBX is a good example.

PDM

See processor data module (PDM).

PGATE

Packet gateway.

Point-to-Point Protocol

A TCP/IP implementation tailored for use over telephone lines. It supports router-to-router and host-to-network connections over both synchronous and asynchronous circuits. PPP replaces SLIP, the older Serial Line Interface Protocol.

Port

(1) Interface between an application and the TCP/IP network. A port is a predefined internal address (port number) that serves as a pathway from the application to the Transport layer (or from T to A). (2) circuit-pack port.

PPP

See Point-to-Point Protocol.

PRI

Primary Rate Interface. See ISDN.

Primary Rate Interface

See ISDN.

private network

A network used exclusively for the telecommunications needs of a particular customer.

private network office code (RNX)

The first three digits of a 7-digit private network number.

processor data module (PDM)

A device that provides an RS-232C DCE interface for connecting to data terminals, applications processors (APs), and host computers, and provides a DCP interface for connection to a communications system.

protocol

A set of conventions or rules governing the format and timing of message exchanges to control data movement and correction of errors.

PSDN

Packet-switch public data network.

PSTN

See Public Switched Telephone Network (PSTN).

PSN

Packet-switched network.

Public Switched Telephone Network (PSTN)

The worldwide voice telephone system.

Q

QPPCN

Quality Protection Plan Change Notice.

QSIG

A set of open standards for Enterprise Networking. QSIG is a protocol defining message exchanges (signalling) at the "Q" reference point between two PBXs.

R

RBS

Robbed-bit signaling.

RFC

Request for comment.

restricted facilities

PRI spans that use ZCS line coding, the opposite of unrestricted facilities.

RNX

Route-number index (private network office code)

router

An interface between different networks. Routers support network management, including load balancing, route optimization, prioritizing of calls, and troubleshooting. They are thus more capable than bridges.

routing plan

Routing plans direct outgoing voice-interworking and interserver calls to the first available PRI trunk group in a list. This arrangement lets you allow for trunk groups that are busy, out of service, or out of bandwidth. Each routing plan is identified by a routing-plan number in the range **1-32**.

RPN

Routing-plan number.

RTP

Real-time protocol.

S

Socket

An address formed by concatenating the IP address and the port number.

server

1. Any system that maintains and administers files that are used by independent, client applications. 2. the MMCX server, the computer that sets up, maintains, and administers MMCX network communications. See dial-plan table.

server name

The name that identifies the MMCX server on your local area network. You enter the server name in the boot-time administration menu. See server number.

server number

The ISDN international number that uniquely identifies your MMCX server on the PBX and/or the public telephone network. See server name, interserver routing table.

signaling

The control information that a network uses to set up and maintain connections. On-hook and off-hook are, for instance, the familiar voice-telephone signals that tell the central office that you have picked up the telephone handset or hung up at the end of a call.

In-channel signalling reserves part of the available data -communication bandwidth for control information (see restricted facilities). Out-of-channel signalling schemes use a separate channel for signals, so that data transmissions can use all of the bandwidth available to them (see clear-channel facility).

Simple Network Management Protocol (SNMP)

An International Standards Organization (ISO) protocol that sets standards for communications between network components and network management stations. SNMP handles network resources using the information contained in a management information base (MIB), a virtual database resident on the various parts of the network. SNMP supports security, configuration, performance, fault management, and accounting management. SNMP is part of the ISO Open System Interconnect (OSI) Model specification.

SMDR

Station Message Detail Recording. (Same as call detail recording — CDR).

SNMP

See Simple Network Management Protocol (SNMP).

SPE

Switch Processing Element

subnet

A network within a larger network. Subdividing a network into subnets improves the efficiency of routing and makes the best use of the limited number of addresses available with any given addressing scheme. Subnetworks are defined by using part of the host-machine portion of the IP (Internet Protocol) address as an additional layer of network information. Routers can then distinguish between a networking part that is significant for internet/intranet routing and a host-machine part, which is significant only within the local subnet.

subnet mask

A bit pattern that lets a network administrator define subnets using the host-machine portion of the IP (Internet Protocol) address. The subnet mask has binary ones in positions corresponding to the network and subnet parts of the address and zeros in the remaining, host-address positions. During IP-address resolution, zero fields in the mask hide corresponding host-address fields in the address, causing the router to ignore them. The router resolves only the networking part of the address, leaving the host part for the local subnet to resolve. This increases speed and makes multicasting more efficient. Subnet masks are usually written in the decimal notation used for IP addresses.

T

T-1

A 4-wire (2 twisted pair), digital communications link with a capacity of 1.544 Mbps (1,544,000 bits per second). A T-1 provides 24 separate 64-Kbps channels. These can support up to 23 concurrent voice and data channels plus a separate channel for signalling and framing (synchronization). T-1 is the standard for data communications in North America and Japan. Also spelled **T1**. See E-1.

T-carrier

A hierarchy of digital voice- and data-transmission systems used in North America and based on multiples of the capacity of the T-1 line.

tandem switch

A switch within an electronic tandem network (ETN) that provides the logic to determine the best route for a network call, possibly modifies the digits outpulsed, and allows or denies certain calls to certain users.

tandem-through

The switched connection of an incoming trunk to an outgoing trunk without human intervention.

tandem tie-trunk network (TTTN)

A private network that interconnects several customer switching systems.

TCP

Transmission Control Protocol — Transport layer; Connection oriented, reliable.

TCP/IP

Transmission Control Protocol/Internet Protocol. A standard that lets different computer hardware and different operating systems (such as PCs, Apple computers, UNIX workstations, and mainframes) communicate with each other over a network. TCP/IP is the most complete, most widely accepted network protocol currently available.

TDM

See time-division multiplexing.

tie trunk

A telecommunications channel that directly connects two private switching systems.

time-division multiplexing

A way of interleaving digitized voice, video, and/or data so that several calls can be sent concurrently over the same spread of frequencies. TDM systems distribute the available bandwidth across a series of time slots and divide each input stream into a set of samples. They then assign successive time slots to the first sample in each input stream. They repeat the process until all time slots have been assigned or all inputs sent. At the far end, the receiver demultiplexes the transmission and reconstructs the original sequence of samples. Time-division multiplexing is typically used on circuit-switched networks.

time slot

64 kbps of digital information structured as eight bits every 125 microseconds. In the switch, a time slot refers to either a DS0 on a T1 or E1 facility or a 64-kbps unit on the TDM bus or fiber connection between port networks.

trunk

A communication line linking two switches (public-network, PBX, or MMCX-server).

trunk group

A collection of trunks that all terminate at the same public switch, PBX, or MMCX server.

U

UDP

1. User Datagram Protocol — Transport layer; Connectionless, unreliable, fast.

2. Uniform Dial Plan.

UNP

Uniform numbering plan

unrestricted data

Data that has to travel over an unrestricted facilities, because it can be corrupted by Zero Code Suppression (ZCS) line coding. Digital data is unrestricted data.

unrestricted facilities

PRI spans that use non-ZCS line coding, such as B8ZS or HDB3, end-to-end. See Zero Code Suppression (ZCS).

V

VCI

The ATM virtual channel identifier. ATM is a connection-oriented service that sets up a virtual circuit between the transmitter and the receiver. The two endpoints negotiate an agreed route through the network before sending any data. VCI and VPI together constitute the virtual circuit number that identifies this route.

virtual channel identifier

See VCI.

virtual circuit (virtual connection)

The pre-arranged route through the ATM network that all cells in an ATM transmission follow.

virtual circuit number

The route identifier contained in an ATM cell header. A VCI and a VPI together constitute the virtual circuit number.

virtual path identifier

See VPI.

VPI

The ATM virtual path identifier. ATM is a connection-oriented service that sets up a virtual circuit between the transmitter and the receiver. The two endpoints negotiate an agreed route through the network before sending any data. VCI and VPI together constitute the virtual circuit number that identifies this route. The VPI is analogous in some ways to an ISDN trunk group.

W

WAN

See wide area network.

well-known address

The default network address for a given type of network component, as specified by a communications protocol or standards body. For example, the ATM Forum defines well-known addresses for LAN-emulation servers and LAN-emulation configuration servers.

well-known port

port numbers that are assigned to specific applications by IANA. For example, 21 for FTP, 23 for Telnet, 110 for pop3.

wide area network

A data network that connects local area networks (LANs) using common-carrier telephone lines, bridges, and routers.

wideband

A circuit-switched call at a data rate greater than 64 kbps. A circuit-switched call on a single T1 or E1 facility with a bandwidth between 128 and 1536 (T1) or 1984 (E1) kbps in multiples of 64 kbps. H0, H11, H12, and N x DS0 calls are wideband.

Z

ZCS

See Zero Code Suppression (ZCS).

Zero Code Suppression (ZCS)

ZCS line coding substitutes a 1 for the second least-significant bit of every all-zero byte in AMI-encoded data (see line coding). ZCS encoding has no effect on voice communications, but it corrupts digital data (see restricted facilities). In MMCX communications, ZCS corrupts the ISDN D-channel.

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