

Nortel Communication Server 1000

Automatic Call Distribution Fundamentals

NN43001-551

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Revision history

May 2007
Standard 01.01. This document is up-issued to support Communication Server 1000 Release 5.0. This document is renamed Automatic Call Distribution Fundamentals (NN43001-551) and contains information previously contained in the legacy document, Automatic Call Distribution Description (553-3001-351), now retired.

August 2005
Standard 3.00. This document is up-issued for Communication Server 1000 Release 4.5.

September 2004
Standard 2.00. This document is up-issued for Communication Server 1000 Release 4.0.

October 2003
Standard 1.00. This document is a new NTP for Succession 3.0. It was created to support a restructuring of the Documentation Library, which resulted in the merging of multiple legacy NTPs. This new document consolidates information previously contained in the following legacy documents, now retired:

- *Automatic Call Distribution: Feature Description* (553-2671-110)
- *Automatic Call Distribution: Management Commands and Reports* (553-2671-112)
- *Network ACD: Description and Operation* (553-3671-120)

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New in this release

The following sections detail what's new in *Automatic Call Distribution Fundamentals (NN43001-551)* for Release 5.0:

Features

See the following sections for information about feature changes:

- "LD 11" (page 60) and "Unique TN types for IP Phones" (page 62) contain new information from the *New IP Phone Types* feature specification.
- "Meridian 911" (page 360) contains new information from the *Emergency Services M911 Networked Operation* feature specification.

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Overview

This document is a global document. Contact your system supplier or your Nortel representative to verify that the hardware and software described are supported in your area.

Subject

This document describes Automatic Call Distribution (ACD), the ACD Load Management System, and Network Automatic Call Distribution (NACD). It includes feature descriptions, management commands and options, and feature interaction information.

Note on legacy products and releases

This NTP contains information about systems, components, and features that are compatible with Nortel Communication Server 1000 Release 5.0 software. For more information on legacy products and releases, click the **Technical Documentation** link under **Support & Training** on the Nortel home page:

www.nortel.com

Applicable systems

This document applies to the following systems:

- Communication Server 1000M Chassis (CS 1000M Chassis)
- Communication Server 1000M Cabinet (CS 1000M Cabinet)
- Communication Server 1000M Half Group (CS 1000M HG)
- Communication Server 1000M Single Group (CS 1000M SG)
- Communication Server 1000M Multi Group (CS 1000M MG)
- Communication Server 1000E (CS 1000E)
- Meridian 1 PBX 11C Chassis
- Meridian 1 PBX 11C Cabinet
- Meridian 1 PBX 51C
- Meridian 1 PBX 61C

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- Meridian 1 PBX 81
- Meridian 1 PBX 81C

System migration

When particular Meridian 1 systems are upgraded to run CS 1000 Release 5.0 software and configured to include a Signaling Server, they become CS 1000M systems. Table 1 "Meridian 1 systems to CS 1000M systems" (page 14) lists each Meridian 1 system that supports an upgrade path to a CS 1000M system.

Table 1
Meridian 1 systems to CS 1000M systems

This Meridian 1 system…	Maps to this CS 1000M system
Meridian 1 PBX 11C Chassis	CS 1000M Chassis
Meridian 1 PBX 11C Cabinet	CS 1000M Cabinet
Meridian 1 PBX 51C	CS 1000M Half Group
Meridian 1 PBX 61C	CS 1000M Single Group
Meridian 1 PBX 81	CS 1000M Multi Group
Meridian 1 PBX 81C	CS 1000M Multi Group

For more information, see one or more of the following NTPs:

- *Communication Server 1000M and Meridian 1 Small System Software Upgrade (NN43011-459)*
- *Communication Server 1000M and Meridian 1 Large System Upgrades Overview (NN43021-458)*
- *Communication Server 1000E Upgrades (NN43041-458)*

Intended audience

This document is intended for individuals responsible for administering and maintaining an Automatic Call Distribution or Network Automatic Call Distribution System.

Conventions

Terminology

In this document, the following systems are referred to generically as "system":

- Communication Server 1000M (CS 1000M)
- Communication Server 1000E (CS 1000E)
- Meridian 1

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The following systems are referred to generically as "Small System":

- Communication Server 1000M Chassis (CS 1000M Chassis)
- Communication Server 1000M Cabinet (CS 1000M Cabinet)
- Meridian 1 PBX 11C Chassis
- Meridian 1 PBX 11C Cabinet

The following systems are referred to generically as "Large System":

- Communication Server 1000M Half Group (CS 1000M HG)
- Communication Server 1000M Single Group (CS 1000M SG)
- Communication Server 1000M Multi Group (CS 1000M MG)
- Meridian 1 PBX 51C
- Meridian 1 PBX 61C
- Meridian 1 PBX 81
- Meridian 1 PBX 81C

Related information

The following NTPs are referenced in this document:

- *Features and Services (NN43001-106)*
- *Electronic Switched Network – Signaling and Transmission (NN43001-280)*
- *Dialing Plans Reference (NN43001-283)*
- *Telephones and Consoles Fundamentals (NN43001-567)*
- *Basic Network Feature Fundamentals (NN43001-579)*
- *ISDN Basic Rate Interface Fundamentals (NN43001-580)*
- *Software Input/Output Administration (NN43001-611)*
- *Software Input/Output Reference – Maintenance (NN43001-711)*
- *Software Input/Output Reference – System Messages (NN43001-712)*
- *Traffic Measurement: Formats and Outputs Reference (NN43001-750)*
- *Communication Server 1000M and Meridian 1 Large System Planning and Engineering (NN43021-220)*

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ACD description

Contents

This section contains information on the following topics:

"Introduction" (page 17)

"ACD agent telephone types" (page 18)

- "Analog (500/2500-type) telephones" (page 19)
- "M2216ACD" (page 19)
- "ACD display enhancement" (page 20)
- "M3905 Call Center enhanced display telephone" (page 21)
- "M3905 Call Center telephone" (page 22)

"ACD packaging" (page 22)

Introduction

A system with the Automatic Call Distribution (ACD) feature is basically divided into two parts: the ACD system and the switch.

Incoming calls to the ACD portion of the system are compiled in a queue by the switch and answered by a group of assigned ACD telephones. Each ACD telephone, called an agent position, is dedicated to a particular ACD Directory Number (DN) queue.

Each queue is defined by its ACD DN. The ACD DN is a unique number of up to seven digits taken from the customer's numbering plan.

Incoming calls are assigned queue positions based on priority and then first-in order. They are then distributed equally to all active agent positions assigned to that particular queue. The system creates two queues for each ACD DN. They are as follows:

- incoming calls
- agent positions ready to receive calls

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The system matches available agents with incoming calls. System and ACD limits are shown in Table 2 "ACD DN based on machine type" (page 18).

Table 2
ACD DN based on machine type

Machine type	Maximum number		
	ACD DNs and Control DNs per customer	Agents per system (see Note 1)	Agents per ACD DN
Meridian 1 PBX 61C	1000 See Note 2.	9999	1200
Meridian 1 PBX 81C	1000 See Note 2.	9999	1200
MG 1000B	240	9999	120
CS 1000M Chassis	240	9999	120
CS 1000M Cabinet	240	9999	120
CS 1000S	240	9999	120
CS 1000M HG	240	9999	1200
CS 1000M SG	1000 See Note 2.	9,999	1200
CS 1000M MG	1000 See Note 2.	9999	1200
CS 1000E	1000 See Note 2.	9999	1200

Note 1: The maximum number of agents per system is 9999. The number of agents on a system must be within the parameters configured by the Agent ID Lower Bound (IDLB) and Agent ID Upper Bound (IDUB) prompts in LD 23.

Note 2: This limit requires ACD/CDN Expansion (ACDE) package 388 to be installed, and a Pentium processor installed. Otherwise, the limit is 240.

ACD agent telephone types

An ACD agent position is a telephone with an ACD DN assigned to it. Some agent positions can be designated as supervisors; the agent position status can be switched between agent and supervisor. The ACD system supports both digital and analog (500/2500-type) telephones.

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Analog (500/2500-type) telephones

Analog (500/2500-type) telephones can be used as ACD agent positions. The telephone can operate both as an ACD agent position and as a standard telephone with an Individual Directory Number (IDN). The analog (500/2500-type) telephone has the functions of a digital telephone except for the following:

- It cannot be assigned a supervisor status.
- It cannot be a virtual agent position.
- It can have only one DN appearance, acting as both an IDN and the ACD agent position.

Analog (500/2500-type) telephones are not equipped with keys and cannot support features requiring keys or key lamps. For example, these telephones are not supported by the Message Center feature. They can be defined as Message Center ACD agents, but do not support the Message Cancellation (MCK) and Message Indication (MIK) keys. Therefore, Nortel strongly recommends that analog (500/2500-type) agents not be configured in an ACD Message Center. Refer to *Features and Services (NN43001-106)* for more information on analog (500/2500-type) telephones and using Special Service Prefix (SPRE) codes.

M2216ACD

The M2216ACD telephone is available in two versions. Both versions have the following features:

- Fully digital
- Two jacks for headset or handset operations
- 15 programmable keys; 16 programmable keys if display is not enabled
- Independent volume controls
- Message Waiting indicators
- Display options
- Integrated voice-data calling available with a Meridian Programmable Data Adaptor (MPDA)
- On-hook dialing capability
- NT2K22 22-Key Expansion Module for expanded functions (optional)
- Maintenance telephones capability; however, this telephone does not support attendant services and attendant key features

M2216ACD-1

This basic telephone has two RJ-32 jacks for headset operations.

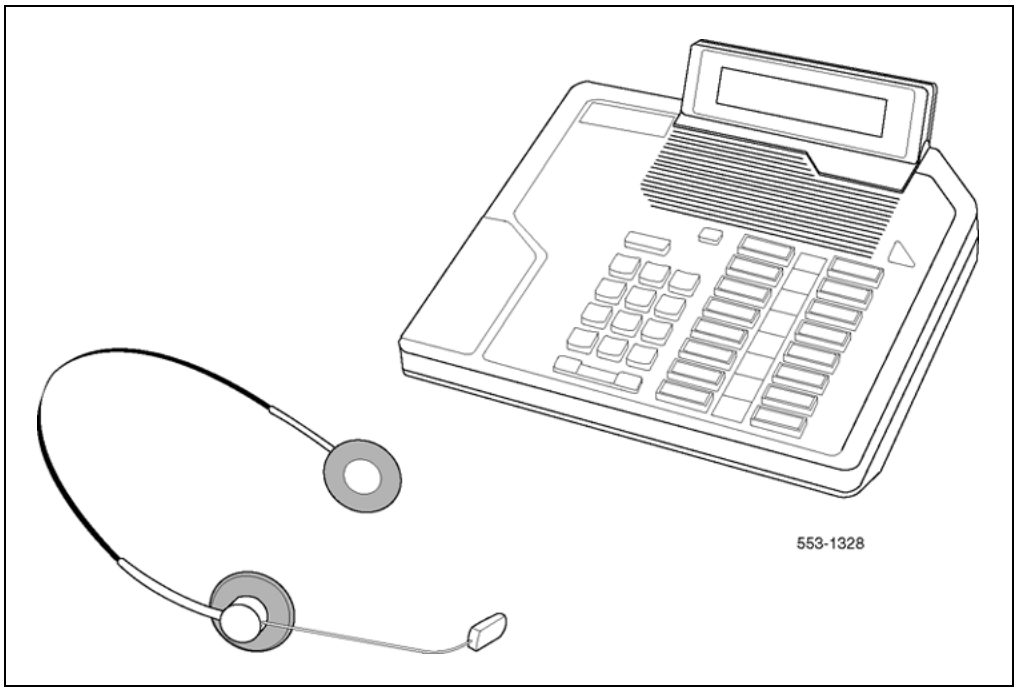
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M2216ACD-2

This telephone has one RJ-32 jack for listen-only headset operation and one PJ-327 jack for a Carbon headset.

Figure 1 "M2216ACD agent position" (page 20) illustrates the M2216ACD telephone with the headset.

Figure 1
M2216ACD agent position



ACD display enhancement

Enhanced displays give more information to ACD agents equipped with the M2216 digital telephones.

This information shows the current status and informs the agent of any required actions. Supervisor telephones provide information for implementing the following services:

ACNT	Activity Code
AAG	Answer Agent
AMG	Answer Emergency
RAG	Call Agent
DAG	Display Agent
DWC	Display Waiting Calls
Log In	Log In by Agent

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MSB	Make Set Busy
OBV	Observe Agent
NSVC	Night Service
TOFQ	Time Overflow Queuing

Refer to *Telephones and Consoles Fundamentals (NN43001-567)* and the *M2216ACD Telephone User Guide* for a more detailed explanation of telephone operations and examples of the display output.

M3905 Call Center enhanced display telephone

The M3905 Call Center telephone is an ACD telephone with a large display area. The M3905 enhanced display has a two-area display screen. The upper portion of the screen has a one-line by 12-character display. The bottom portion of the screen has a two-lines by 24-character display area, located above the four soft programmable feature keys.

Enhanced displays give more information to ACD agents equipped with the M3905 Call Center Meridian Digital telephone.

This information shows the current status and informs the agent of any required actions. Supervisor telephones provide information for implementing the following services:

ACNT	Activity Code
AAG	Answer Agent
AMG	Answer Emergency
RAG	Call Agent
DAG	Display Agent
DWC	Display Waiting Calls
Log In	Log In by Agent
MSB	Make Set Busy
OBV	Observe Agent
NSVC	Night Service
TOFQ	Time Overflow Queuing

Refer to *Telephones and Consoles Fundamentals (NN43001-567)* and the M3905 ACD User Guide for a more detailed explanation of telephone operations and examples of the display output.

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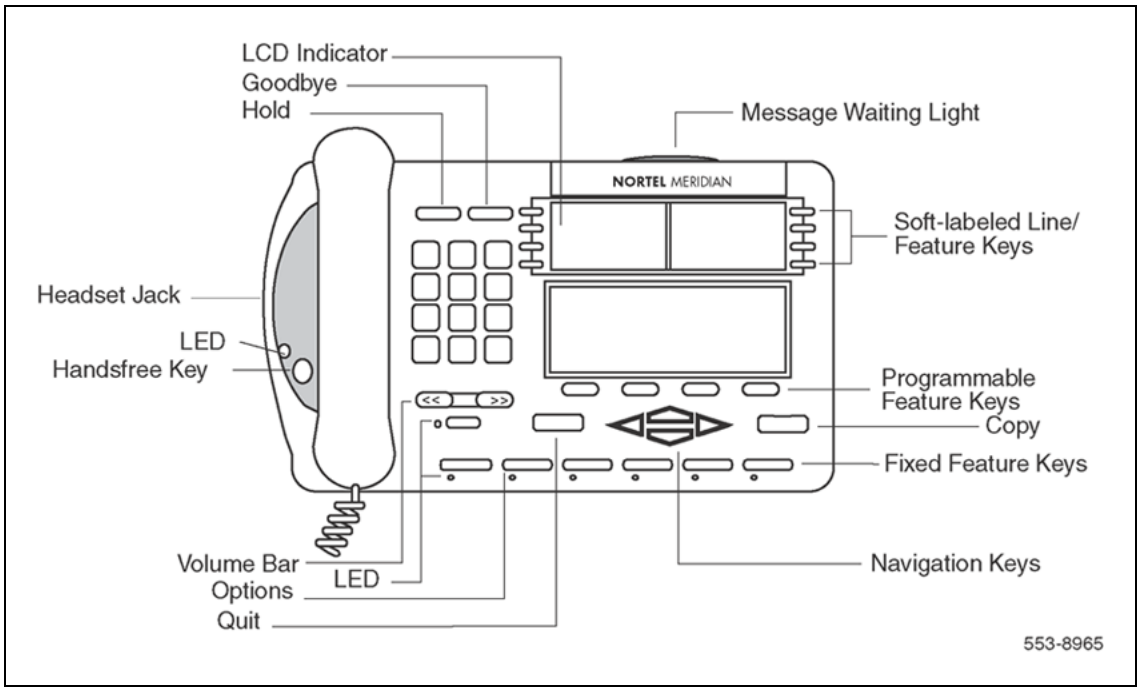
M3905 Call Center telephone

The features of the M3905 Call Center telephone are:

- eight Programmable Line/Feature Keys (self-labeled), giving the user access to eight line/feature keys
- four Programmable Feature Keys (self-labeled) that have three layers each, giving the user access to 12 feature keys
- 6 Fixed Feature Keys that can be configured to suit the business needs of the Call Center user.
- Personal Directory
- Call Log
- five-line by 24-character display
- handset optional
- Supervisor Observe Key with light-emitting diode (LED)
- Supervisor Headset Observe port

This telephone is shown in Figure 2 "M3905" (page 22).

Figure 2
M3905



ACD packaging

The following ACDpackages are available:

- Base ACD (BACD) package 40

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- ACD basic features (ACD-A) package 45
- ACD advanced features (ACD-B) package 41
- ACD management reports (ACD-C1) package 42
- ACD load management commands (ACD-C2) package 43
- ACD auxiliary processor (ACD-D) package 50/51

Supported package combinations are A, A+B, A+B+C1, and A+B+C1+C2. Package D replaces package C1 and provides all the features of packages A, B, and C2.

ACD packaging is divided into basic and advanced. The ACD basic features package includes the following:

— agent features

- Call Source Identification
- Calls Waiting Indication
- Directory Number key
- Display Waiting Calls key
- In-Calls key
- Log In
- Make Set Busy key
- Night Mode
- Not Ready key
- Release key

— supervisor features

- Agent lamps
- Not Ready key
- Display Agents key
- Display Waiting Calls key

— system features

- ACD-Call Detail Recording (CDR) Connection Record
- Alternate Call
- Alternate Call Answer
- In-Band Automatic Number Identification (IANI)
- Incoming Trunk restrictions

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- Music On Hold
- Night Call Forward (NCFW)
- Night Treatment
- Priority Trunks
- Recorded Announcement

The ACD advanced features package includes the following:

— agent features

- Agent and Supervisor communication
- Calls Waiting Indication
- Emergency key
- ACD Threshold Visual Indication

— supervisor features

- Agent key
- Agent lamp
- Agent Observe
- Display Waiting Calls (DWC) key
- Interflow key
- Observe Agent Security
- Supervisor and Agent communication
- Supervisor Control of Night Service (NSVC)

— system features

- ACD Answering Time in Night Service
- ACD Call Waiting Thresholds
- ACD Least Call Queuing
- ACD Night Call Forward without Disconnect Supervision
- Automatic Overflow
- Call Forcing
- Call Interflow
- Customer Controlled Routing (CCR)
- Dialed Number Identification Service (DNIS), including the following:
  - DNIS Across Call Modifications

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  - DNIS on CDR
  - Name Display for DNIS
  - Routing by DNIS number

- Enhanced ACD Routing
- Enhanced Overflow
- Hold in Queue for Interactive Voice Response
- Music on Delay
- Priority Agents
- Secondary DN Call Blocking (SDNB)
- Supervisor Control of Queue Size
- Time Overflow (TOF) queuing

Some of the above features are optional features and depend on certain packages for support and operation. Refer to the features and software options chart in *Features and Services (NN43001-106)*.

Music On Hold is available as a separate option. ACD/CDR Connection is bundled with every basic package.

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ACD agent features

Contents

This section contains information on the following topics:

"Introduction" (page 28)

"ACD Calls on Hold" (page 28)

"ACD Threshold Visual Indication (Advanced)" (page 29)

"Agent and supervisor communication (Advanced)" (page 31)

"Call Source Identification (Basic)" (page 32)

"Calls Waiting Indication key (AWC) (Basic)" (page 32)

"Calls Waiting Indication key (AWC) (Advanced)" (page 32)

"Directory Number key (Basic)" (page 33)

"Display Waiting Calls (DWC) key (Basic)" (page 33)

"Display Waiting Calls (DWC) key (Advanced)" (page 34)

"Emergency key (Advanced)" (page 35)

"In-Calls key (Basic)" (page 37)

"Log In (Basic)" (page 38)

"Log Out (Basic)" (page 38)

"Make Set Busy key (Basic)" (page 39)

"Night Mode (Basic)" (page 40)

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"Not Ready key (Basic)" (page 40)

Introduction

This section lists both basic and advanced agent features of Automatic Call Distribution (ACD) in alphabetical order. Each feature name is followed by *Basic* if the feature is part of ACD basic features (ACD-A, package 45) or *Advanced* if it is part of ACD advanced features (ACD-B, package 41).

ACD Calls on Hold

The ACD Calls on Hold enhancement introduces a modification to the conditions under which an ACD agent can go into Make Set Busy state by operating the Make Set Busy (MSB) key. Prior to the introduction of the ACD Calls on Hold enhancement, the ACD agent could go into Make Set Busy state, by pressing the MSB key, while the agent still had a call on hold. With the introduction of the ACD Calls on Hold enhancement, the system administrator can disable an ACD agent with a call on hold from going into Make Set Busy state.

Whether or not an ACD agent can go into Make Set Busy state while a call is still held by that agent is determined by the response to the HMSB prompt in LD 23. When the response to the HMSB prompt is NO, agents who have calls on hold cannot go into Make Set Busy state.

Operating parameters

There are no feature requirements.

Feature interactions

There are no interactions with other features.

Feature packaging

International Supplementary Features (SUPP) package 131 and Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

Table 3
LD 23 Modify or create data for each ACD queue.

Prompt	Response	Description
REQ:	NEW CHG PRT	Add, change, or print data
TYPE:	ACD	Automatic Call Distribution data block
CUST		Customer number
	0 -99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.

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Prompt	Response	Description
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
ACDN	xxxx	Automatic Call Distribution Directory Number
...		
CWTT	...	
HMSB	(YES) NO	Hold Make Set Busy (allowed) denied Respond YES to enable, NO to deny agents the ability to go into the Make Set Busy state while they have calls on hold.

A printout of the ACD data block includes the HMSB prompt and its response.

Feature operation

If an agent presses the Make Set Busy key when ACD Calls on Hold is enabled, the action is ignored.

ACD Threshold Visual Indication (Advanced)

The ACD Threshold Visual Indication enhancement provides a visual indication, to all agents, to notify them of calls that have been queued for more than a specified amount of time.

The agents are given the visual indication by means of the new ACD Call Waiting Time Indication (ATW) key.

Operating parameters

LD 25 (Move Data Block)

This overlay alters the ATW key information when the data block is moved from one loop to another loop.

LD 80 (Trace Call Diagnostic)

This overlay alters the ATW key information when the Trace Call Diagnostic is used.

LD 81 (Feature and Stations Print)

This overlay alters the ATW key information when the Feature and Stations Print routine is used.

LD 83 (Terminal Number Sort Print)

This overlay alters the ATW key information when printing the TN Block information.

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Feature interactions

There are no interactions with other features.

Feature packaging

International Supplementary Features (SUPP) package 131; Basic Automatic Call Distribution (BACD) package 40; and Automatic Call Distribution Package B (ACDB) package 41.

Feature implementation

Perform the following tasks to implement this feature.

Task summary list

The following is a summary of the tasks in this section:

Table 4 "LD 11 Modify or create a data block for each agent." (page 30)

Table 5 "LD 20 Print the new ATW key type" (page 30)

Table 6 "LD 23 Modify, create, or print the CWTT data for each ACD queue" (page 30)

Table 4
LD 11 Modify or create a data block for each agent.

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	xxxx	Type of data block
...		
LANG	...	
KEY	0-69 ATW	Key number; ACD Call Waiting Time Indication key

Table 5
LD 20 Print the new ATW key type

Prompt	Response	Description
REQ:	PRT	Print data block
TYPE:	xxxx	Type of data block

Table 6
LD 23 Modify, create, or print the CWTT data for each ACD queue

Prompt	Response	Description
REQ:	NEW CHG PRT	Add, change, or print the data block
TYPE:	ACD	Automatic Call Distribution data block

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Prompt	Response	Description
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System, Media Gateway 1000B.
ACDN	xxxx	Automatic Call Distribution Directory Number
...		
FNCF	...	
CWTT	0-(40)-63	ACD Call Waiting Threshold Timer Enter the time, in one second increments, that a call must be in queue to activate the ATW indicator on agent telephones.

A printout of the ACD data block includes the CWTT prompt and its response.

Feature operation

Press the **AWT** key to receive a visual indication when any calls have been queued for more than a defined period of time.

Agent and supervisor communication (Advanced)

When an ACD agent is not active on an ACD call, the agent can press the Supervisor key to call the assigned supervisor. The associated lamp on the agent telephone lights steadily and the ringback tone is heard. When the supervisor answers, the Supervisor lamp on the agent's telephone remains lit, and the agent and supervisor can talk.

When an agent calls the supervisor, tone ringing sounds from the supervisor's terminal speaker and the Answer Agent lamp flashes. The supervisor answers the call by pressing the Answer Agent key, and the display shows the calling agent's ACD Position Identification (POS ID). The supervisor's Not Ready lamp lights steadily. If the Not Ready lamp is already on, it remains on.

Three-party operation

If the ACD agent is active on an ACD call and presses the Supervisor key, the calling party is put on hold (fast flashing In-Calls lamp). The lamp associated with the Supervisor key lights steadily, and the ringback tone is heard. When the supervisor answers, the agent and the supervisor can talk privately.

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When the agent presses the Supervisor key a second time, the calling party (on hold with the In-Calls key) is added to the conversation. The Supervisor lamp on the agent's telephone goes dark, and the conference (agent/caller/supervisor) is established on the agent's In-Calls key. By pressing the RLS key, the agent can leave the conference call, and the caller and supervisor remain connected. Alternatively, the supervisor can press the RLS key and leave the call. The agent and caller are still connected.

Call Source Identification (Basic)

Call Source Identification is an optional feature that uses the Digit Display on the agent's telephone. With the incoming call displayed on the screen, the agent is able to respond appropriately to the caller. For calls coming from incoming trunks, the trunk access code and the member number of the trunk are shown. For internal calls, the display shows the DN of the calling telephone.

The ACD agent position can be equipped with other additional features. These features are described in *Features and Services (NN43001-106)*. Non-ACD features can also be assigned to the DN key of an ACD telephone.

Calls Waiting Indication key (AWC) (Basic)

ACD telephones can be equipped with Light Emitting Diodes (LEDs) or Liquid Crystal Display (LCD) indicators to show the agent status in ACD queues. The indicator states are determined by the threshold values configured in administration programs. Refer to *Software Input/Output Administration (NN43001-611)* for a complete description.

Depending on the threshold values defined for each ACD DN, Call Waiting indicators can display the following states:

- **Dark or blank**. The queue load is light or empty.
- **Steadily lit**. At least one call is waiting, but the load is within normal limits.

500/2500 telephone

If call waiting and warning tones are enabled in the telephone class of service, call waiting for external calls operates. If the agent is busy on an Individual Directory Number (IDN) call and another IDN call comes in, the call waiting treatment is enabled. If the agent is busy on an ACD call, the incoming IDN call receives a busy tone.

Calls Waiting Indication key (AWC) (Advanced)

The call waiting indicator relies on thresholds associated with Automatic Overflow. The Call Waiting Threshold (CWTH), Busy Threshold (BYTH), and Overflow Threshold (OVTH) govern Automatic Overflow and provide steady, flashing, and fast flashing lamps.

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Two prompts enable the lamp states to operate independently of the Automatic Overflow parameters. Call Waiting Lamp Flash (CWLF) and Call Waiting Lamp Fast Flash (CWLW) can be configured to flash and fast flash the lamps even though the Automatic Overflow parameters have not been met or exceeded.

Depending on the threshold values configured for each ACD DN, the LEDs and LCDs display the following states:

- **Dark or blank**. The queue is empty, or the number of calls in the queue is less than the Calls Waiting Threshold (CWTH).
- **Steadily lit**. The CWTH has been met or exceeded. The number of calls in the queue is less than the Call Waiting Lamp Flash (CWLF) threshold.
- **Flash**. The CWLF threshold has been met or exceeded. The number of calls in the queue is less than the CWLW.
- **Slow flash**. (60 ipm) Busy. The number of calls waiting in this queue exceeds the busy threshold configured for this ACD DN.
- **Fast flash**. (120 ipm) Overloaded. New calls to this ACD DN attempt to overflow to another programmed destination.

Directory Number key (Basic)

When an agent presses a DN key to make or receive a call, any other call in progress is automatically released (unless on hold).

When the call on the DN key is released, the agent position is automatically returned to the state it was in before the DN key was pressed. Any call being presented to the In-Calls key, but not yet answered by the agent when the DN key is pressed, is moved back to the head of its priority grouping in the incoming call queue for the ACD DN.

The DN lamp flashes slowly when an incoming call to the DN is connected to the telephone. It is lit steadily while the call is in progress and flashes quickly if the call is placed on hold. Activating the Make Set Busy (MSB) key prevents DN calls from being connected to the agent position. With Alternate Call Answer enabled, the agent can press the Hold key when on a DN call and receive an ACD call. Refer to "Alternate Call Answer (Basic)" (page 162) for more information.

Display Waiting Calls (DWC) key (Basic)

A Display Waiting Calls key can be assigned to ACD agent or supervisor telephones. An ACD DN can be programmed on a DWC key on any number of agent telephones.

The lamp associated with the Display Waiting Calls key provides summary information on the Calls Waiting status for the ACD DN. A lamp that is steadily lit means there is more than one call waiting in the queue.

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When the DWC key is pressed, the Calls Waiting status for the ACD DN is displayed as follows:

aaa bbb ccc dddd

where

aaa = the number of calls currently waiting in the queue
bbb = the number of agent positions occupied for the ACD DN
ccc = the waiting time in seconds of the oldest call in the queue
dddd = always zero (0) with Basic ACD

This information is updated every time the key is pressed and remains visible until an event occurs to modify the display. Typical events include an incoming call or the pressing of the DN or release key.

Operating parameters

The agent telephone can have either the AWC or the DWC key defined, but not both.

The DWC key ACD DN designation must match the agent's In-Call designation.

A Display Waiting Calls key for a particular ACD DN can be assigned to every ACD agent in the queue.

Display Waiting Calls (DWC) key (Advanced)

A Display Waiting Calls key can be assigned to an agent position for each ACD DN. The Display Waiting Calls reflects all calls that are in queue but have not been presented.

The Calls Waiting indicator relies on thresholds associated with Automatic Overflow. The Busy Threshold (BYTH) and Overflow Threshold (OVTH) govern Automatic Overflow and provide steady, flashing, and fast flashing lamps.

Two prompts enable the lamp states to operate independently of the Automatic Overflow parameters. Call Waiting Lamp Flash (CWLF) and Call Waiting Lamp Fast Flash (CWLW) can be configured to flash and fast flash the lamps even though the Automatic Overflow parameters have not been met or exceeded.

Depending on the threshold values configured for each ACD DN, the following states are displayed. The information on the Display Waiting Calls key is updated every time the key is pressed.

- **Dark or blank**. The queue is empty, or the number of calls in the queue is less than the Calls Waiting Threshold (CWTH).

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- **Steadily lit**. The CWTH has been met. The number of calls in the queue is less than the Busy Threshold (BYTH) or the Call Waiting Lamp Flash (CWLF) threshold, or both.
- **Flash**. The BYTH or the CWLF threshold, or both, has been met. The number of calls in the queue is less than the Overflow Threshold (OVTH) or the Call Waiting Lamp Fast Flash (CWLW), or both.
- **Fast flash**. The OVTH or the CWLW, or both, has been met or exceeded.

When the key is pressed, the Calls Waiting status for the ACD DN is displayed as follows:

a a a b b b c c c d d d d

where

a a a	=	calls waiting in queue
b b b	=	agent positions occupied
c c c	=	waiting time for the oldest call in the queue
d d d d	=	sum of all calls in other source TOF queues, call request queues from other network locations targeting this ACD DN, and Customer Controlled Routing (CCR) calls

Emergency key (Advanced)

In the event of threatening or abusive calls, an agent can note the trunk access code and trunk member number shown on the display. The agent presses the Emergency (EMR) key, establishing a no-hold conference with the supervisor (if one is assigned). The agent must remain in the conference for the duration of the call. At the supervisor's telephone, the Answer Emergency lamp flashes and a continuous buzzing sound is emitted. The ACD POS ID of the calling agent is displayed on the display of the supervisor's telephone. If equipped by the customer, a tape recorder can be used to record the call, or an emergency message can be typed on the maintenance TTY, or both.

When the agent presses the Emergency key, the associated lamp indicates the action being taken as follows:

- **Dark**. Neither the supervisor nor the recording trunk is available. The supervisor can be busy on another emergency call, can be unassigned, or the telephone is not equipped with an Answer Emergency key. In addition, the recording trunks can all be busy or unassigned.
- **Flashing**. The supervisor is available but has not yet answered the emergency call.

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- **Steadily lit**. The supervisor or recording trunk, or both, is conferenced into the call.

When answering an emergency call, the supervisor listens through the built-in loudspeaker by leaving the handset on-hook or the headset unplugged. The supervisor can also put the emergency call on hold, without affecting the agent or caller, to make another call or perform another action. The supervisor returns to the emergency call by pressing the Answer Emergency key again. The Answer Emergency lamp fast flashes (120 ipm) while the call is on hold.

The recording device connects to a paging trunk with a Recorder (RCD) defined in software. When the agent presses the Emergency key, the recorder is conferenced into the conversation.

Paging trunk connections

The input impedance of a typical tape recorder is 47 KΩ, but the output impedance of the paging trunk is switch-selectable for 600 or 900 Ω. Therefore, adding a 600 or 900 Ω resistor parallel with the tape recorder input may be required to terminate the paging trunk.

Emergency Teletype messages

When the agent presses the Emergency key, the following messages can be generated on the maintenance teletype:

EMR 100 RC L S C U RR MMM
EMR 100 AG XXXX YYYY
EMR 100 OR L S C U RR MMM

where

RC	= Recording trunk for emergency recorder
L	= Loop for recording trunk
S	= Shelf for recording trunk
C	= Card for recording trunk
U	= Unit for recording trunk
RR	= Route number for recording trunk
MMM	= Member number for recording trunk
AG	= Agent has pressed the Emergency key
XXXX	= the ACD DN assigned to that agent
YYYY	= the Agent Position ID (POS-ID)
OR	= the originator

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The ACD DN and Position ID are displayed literally. For example, ACD DN 301 appears on the printout as 301.

The letters L S C and U denote loop, shelf, card, and unit identifiers of the call origin. If the call is coming into the system, the RR and MMM parameters show the route and member numbers of the trunk. If the originating call is from within the system, these two fields are absent.

In-Calls key (Basic)

Telephones can have the In-Calls key programmed to be associated with an ACD DN. The 500/2500 telephones do not have this capability as they do not have key lamp functions. The Position ID functions apply to all ACD telephones.

Calls within ACD are presented on the In-Calls key at the agent position. The position identifier (POS ID) is a number identified with the In-Calls key. The POS ID is a unique number from the customer's numbering plan. This number identifies the agent position for Automatic Number Identification (ANI), and Call Detail Recording (CDR) purposes. This number cannot be the same as the ACD DN and cannot be used to call the ACD agent position. The In-Calls key is always located on key 0 (bottom key) on the agent position.

When an incoming ACD call is presented to an agent position, the following events occur:

- Tone ringing is heard if the telephone is equipped with a built-in handset and the telephone is not in use.
- A 3-second tone sounds from the telephone loudspeaker if the telephone is equipped with a headset or plug-in handset.
- The In-Calls lamp flashes slowly (60 ipm).

An incoming ACD call can be terminated in the following ways:

- If the caller disconnects first, the call is released and the next call is presented.
- If the agent disconnects first by pressing the In-Calls key, the current call is released and the next call is presented.
- The agent presses the DN key.
- The agent presses the Not Ready key.
- The agent presses the Release key.

Calls can be automatically connected to an agent in the answered state by the advanced Call Force feature. When an agent is available, a call can be presented.

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Calls extended by the attendant to the ACD DN are not automatically returned to the attendant if they remain unanswered past the attendant recall threshold.

Log In (Basic)

Agents must log in before performing any agent functions. Each ACD telephone has a Position ID. To log in with the MSB key, the agent presses the key, and the MSB lamp goes out. The agent position is now in the operative mode.

An ACD agent at an ACD telephone can log in and out by toggling the MSB key between the operative mode and the MSB mode.

Optionally with the ACD-C1 or ACD-D package, each agent who uses an ACD agent position can be assigned an Agent ID or a Position ID. To log in with the Agent ID, go off-hook and dial the Agent ID. Press the **In-Calls** key to begin receiving ACD calls. To log in using the Position ID, go off-hook and press the **In-Calls** key. Press the **In-Calls** key again (or the **Not Ready** key) to begin receiving ACD calls.

Data agents

Data agents can log in using the MSB key if the Data Shift key on the Add-on Data Module (ADM) is lit.

500/2500 telephone

The agent logs in with a SPRE code plus 97 and is notified of the telephone state with a specific tone. However, Call Forward and Message Waiting dial tones take precedence over the ACD Logged In dial tone.

When the telephone is idle and the agent is not logged in, a standard dial tone sounds when the handset is lifted. To log in, the agent lifts the handset and enters the SPRE code plus 97. Replacing the handset places the agent position in the idle agent queue.

The agent can also log in with the Agent ID number by entering the SPRE code plus 97 and the 4-digit Agent ID number. A busy tone indicates that an Agent ID is not unique. If the ID number is invalid, an overflow tone sounds. When the agent goes off-hook again, the Log In tone sounds.

Log Out (Basic)

To log out, the agent enters the SPRE code plus 97 and goes on-hook. The agent is now logged out, and a standard dial tone sounds when the telephone is off-hook.

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M2216, M2008, and M2616 telephones, equipped with display units and ACD package D, display the "LOGGED OUT" message when the Make Set Busy (MSB) key is deactivated by doing the following:

- disconnecting the headset or handset, if HOML (Handset On-Hook Means Log out) is enabled in LD 23
- placing the handset on-hook

When HOML is not enabled in LD 23, the MSB key must be used to log out. The MSB key can be used even if the agent logged in with P=Agent or Position ID. Pressing the MSB key while on a call logs the agent out when the call is completed. If no MSB key is available, the agent must use the headset or handset to log out. The moment an agent logs out, the following occurs:

- The agent position is removed from the ACD idle agent queue.
- All reporting against that position stops.

For ACD package C or D, if customer Load Management commands (SAPA/SAGP/SATS) are issued, the effects of these commands do not take place until the agent logs out.

With ACD packages C or D, if the MSB key is deactivated and the telephone includes a display unit, the display is updated with the "LOGGED OUT" screen.

The Log Out command clears the Not Ready mode. If not logged in, the agent cannot activate the Not Ready mode.

Make Set Busy key (Basic)

ACD digital telephones can have the MSB key programmed, except for the 500/2500 telephone, which does not have this key or lamp function.

The Make Set Busy (MSB) key causes an agent position to appear busy to the system, preventing the agent from receiving any calls. Activating the Make Set Busy (MSB) key removes the agent from the queue and logs out the agent from the system. The MSB lamp is steadily lit, and the DWC key display is cleared.

Calls presented to but not answered by this agent return to the top of the same queue from which they came. Pressing the MSB key does not disconnect an active call, but prevents further calls from being presented to that agent position. Neither IDN nor ACD calls can be received while the MSB key is activated. The agent can, however, originate calls from the DN key.

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When the MSB key is deactivated, the agent receives incoming IDN calls. The agent must log in to receive ACD calls.

If all agent positions assigned to an ACD DN are in the MSB mode, that ACD DN is automatically placed into Night mode. ACD Night mode is independent from the Night Service activated at the attendant console and can be different for each ACD DN. See "Night Mode (Basic)" (page 40).

Night Mode (Basic)

When an ACD DN is in Night Mode, the agent queue does not send new calls to that ACD DN or number. Depending on the customer option, callers can be connected to a recorded announcement or forwarded to another ACD DN. See *Features and Services (NN43001-106)* for more information.

500/2500 telephone

The telephone is automatically placed in Night Mode by the agent entering the SPRE code plus 97. By doing this, the agent performs a logoff from the system.

Not Ready key (Basic)

An agent, after completing an ACD call, can need time to perform tasks before accepting another call. These tasks are post call-processing. When the agent presses the Not Ready (NRD) key, the agent is removed from the agent queue and the NRD lamp is lit steadily. M2216ACD, M2008, and M2616 telephones with display units indicate "NOT READY."

While the agent position is in the NRD state, the agent can receive or originate calls using the DN key, but ACD calls cannot be connected to the In-Calls key. When the agent's post call tasks are finished, the agent presses the NRD key. The NRD lamp goes out, and the agent is placed in the agent queue. The agent can also press the In-Calls key to cancel NRD and reenter the queue. When the NRD key is pressed, any call presented to the In-Calls key (but not yet answered by the agent) is moved back to the head of its priority grouping in the incoming call queue for the ACD DN.

Analog (500/2500-type) telephone

Because analog (500/2500-type) telephones do not have key lamps, the telephone is placed in the Not Ready state by typing SPRE + 98. A specific tone informs the agent that the telephone is in this state. However, Call Forward and Message Waiting dial tones take precedence over the ACD Not Ready dial tone.

When the telephone is idle and logged in, the agent lifts the handset and enters the SPRE code plus 98 to activate the Not Ready feature. Replacing the handset takes the agent out of the queue and completes the Not Ready feature activation.

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When the agent lifts the handset again, the NRD tone sounds. Calls are still received on the telephones DN. To return to the queue, the agent lifts the handset and reenters the SPRE code plus 98. Replacing the handset places the agent back in the idle agent queue, completing the NRD process.

When the agent lifts the handset again, the Log In tone sounds and the telephone is in the Ready mode. The agent must be logged in to activate the Not Ready mode. If the agent logs out, the NRD state is cleared.

Release key (Basic)

The optional Release (RLS) key can be assigned in place of, or as well as, the Not Ready key if no post-call work is required. When an agent disconnects from a call by using the RLS key, the agent position is immediately placed in the agent queue.

500/2500 telephone

The 500/2500 telephone does not have a RLS key. To release a call, the agent hangs up. If the other party disconnects first, the agent must still hang up to release the call connection.

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ACD supervisor features

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Introduction

This chapter lists both basic and advanced supervisor ACD features in alphabetical order. Each feature name is followed by *Basic* if the feature is part of ACD basic features (ACD-A, package 45) or *Advanced* if it is part of ACD advanced features (ACD-B, package 41).

The keys on the supervisor's telephone are configured to provide visual indications of agent and queue status.

Agent key (Advanced)

The Agent keys are used in conjunction with the Observe Agent and Call Agent keys to select the specific agent to be observed or called. The selection of the individual agent can be made anytime the Observe Agent lamp or Call Agent lamp is lit. Otherwise, any operation of the Agent key is ignored.

Agent lamp (Basic)

Up to 40 SL-1 telephone key/lamp pairs can be assigned to agent functions. The M2216 telephone with two add-on modules supports up to 58 keys. The key associated with each lamp is not used unless equipped with ACD advanced features. The lamps show the state of individual agents in the supervisor's group. These lamp states are updated when the status of the agent changes, independent of the supervisor's mode of operation (Agent/Supervisor/Make Set Busy). An agent can be assigned to only one supervisor at a time.

The lamps can be in the following states:

- **Dark**. The agent position is not occupied.
- **Steadily lit**. The agent is busy on an ACD call or is in the Not Ready mode.
- **Slow flash** (60 ipm). The agent is waiting for an ACD call.
- **Fast flash** (120 ipm). The agent is busy on a non-ACD call.

Agent lamp (Advanced)

With the ACD basic features, a steadily lit lamp associated with an Agent key means the agent either is handling an ACD call or is in the post-call processing mode (Not Ready lamp lit). The ACD advanced features provide an option for a Separate Post-Call Processing (SPCP) indication on the Agent lamp. The SPCP option is enabled/disabled through the ACD LD 23. When the SPCP option is enabled, the Agent lamp can assume any one of the following states:

- **Dark**. The agent position is not occupied.
- **Steadily lit**. The agent is handling an ACD call.

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- **Flash**. The agent is waiting for an ACD call (60 ipm).
- **Fast flash**. The agent is busy with post-call work (Not Ready lamp lit) or is engaged in a non-ACD call (120 ipm).

Agent Observe (Advanced)

To observe the quality of service being offered to callers, the supervisor can monitor calls terminating on any key of any ACD agent. During Agent Observe, the supervisor is able to hear both the calling party and the agent, but cannot participate in the conversation. The supervisor can enter the conversation by pressing the Call Agent (RAG) key while in the Observe mode. This creates a conference situation, where the supervisor can participate in the conversation with the agent and the calling party.

If the supervisor presses another Agent key, the supervisor's speech path is disconnected and the Observe mode is restored. If the supervisor presses any key other than the RAG key, the Observe function ends.

A supervisor can observe any agent in the ACD operation by pressing the Observe Agent (OBV) key, then dialing the Position ID or the AGT key assigned to a particular agent.

A supervisor with Allow Observation of Supervisor Class of Service can observe another supervisor in the ACD operation by pressing the Observe Agent (OBV) key and dialing the Position ID of the supervisor observed.

Agent Observe monitors an ACD agent position until the feature is deactivated. The supervisor does not have to reactivate the feature for each incoming call. If the feature is left on, each call presented to that agent is observed by the supervisor.

If a call is presented to a supervisor but not answered, and the supervisor presses the OBV key, the call is presented to another agent if available. Otherwise, the call is placed at the head of the ACD queue. If an Enhanced ACD Routing (EAR) call is presented to an agent and the supervisor presses the OBV key, the call is presented to the agent without being affected by the observe function.

Agent Observe in Handsfree Mode

If a supervisor is in handsfree mode and receives a call while actively observing an agent's call, the supervisor's telephone buzzes when the Individual Directory Number (IDN) call is presented. However, if the supervisor is in continuous observe mode, but is not actively listening to an agent's call because the agent is not active on a call, then the telephone rings when the supervisor receives an IDN call.

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However, when the supervisor is observing using the handset or headset, then the telephone is still considered offhook even though the agent is not active on a call. If a telephone is off-hook, the telephone is buzzed if the supervisor receives a call.

Observe Agent key

When the supervisor presses the Observe Agent (OBV) key and an appropriate Agent key, a periodic warning tone is supplied. This warning tone lasts 256 ms and repeats every 16 seconds. Specify that the tone be heard by the agent (OBTN = AGT), by the caller and the agent (OBTN = ALL), or by neither one (OBTN = NO).

If the Observe Warning Tone is specified in LD 23 (OBTN prompt), the ACD agent being observed hears an intermittent tone.

Silent Observe

There is no indication that an agent is being observed except on the supervisor's telephone. This is the default configuration for the system (OBTN = NO).

Observe Warning tone

This option provides an intermittent tone to the agent's telephone when the agent is being observed. No other parties in the call receive the tone. To select this option, specify OBTN = AGT in LD 23.

Audible tone

Specify OBTN = ALL in LD 23 for all parties in the call to receive the intermittent tone warning that the call is being observed.

Pressing one Agent key after another results in observation of each agent. The agent being observed is identified by POS ID on the supervisor's display. If any monitored agent needs the supervisor's help, the supervisor presses the Call Agent key and is connected into the call. During Agent Observe, any operation of the Hold key on the supervisor's telephone is not enabled. The supervisor can press any other key to terminate the observe.

If the observed agent is establishing, or begins establishing, a conference call at the time of observation, the observation is discontinued until the conference setup is complete. If the agent activates Call Transfer, supervisor observation is suspended.

For a 500/2500-type ACD agent, performing a flashhook switch for transfer, conference, or not ready will cancel the observe feature. The lamp corresponding to the OBV key on the supervisor telephone darkens to indicate cancellation of the Observe Agent feature.

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If a conference loop is not available when the supervisor activates the OBV key, the associated lamp flashes to show that observation is not possible at this time. When a conference loop is available, the lamp is steadily lit and the supervisor can observe an agent.

Intercept treatments

The following intercept treatments occur when a supervisor activates Observe Agent or Call Agent:

- **Busy tone** if the telephone is currently being observed by another supervisor
- **Overflow tone** for non-ACD telephones and invalid POS IDs
- **Overflow tone** if the supervisor does not have Allow Observation of Supervisor Class of Service when trying to observe another ACD supervisor

Feature interactions

Hold

The audible tones for Agent Observe are not presented when an agent presses the Hold key. The tones are returned when the call on hold is restored.

Call Agent

Using the Call Agent (RAG) key, the supervisor's voice path is enabled and a normal conference exists between the supervisor, the agent, and the calling party.

The observed agent does not need to receive a supervisor's signal with the Answer Supervisor (ASP) key. The supervisor is automatically connected into the call and the Observe Tone continues to all call parties. When the supervisor uses the AGT key again, the conference stops and the Observe state is restored.

Conference Calling

An ACD agent must have at least as many conference time slots as possible parties available on each call. If an agent activates a Conference Call while being observed, the tone is suspended while the conference is being set up. The tone returns to all involved parties when the call is active again. Internal callers to an agent being observed cannot activate a Conference Call; only an external caller or the agent can initiate a conference.

Call Transfer

Observe Tone is suspended while a call is being transferred and is restored only if the transfer is not completed (the call remains with the observed agent), or if the transfer telephone is also being observed and has Observe Tone enabled.

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CTI Enhancements: DTMF Tone Generation

If the OBTN option is set to NO, and tones generate on behalf of (a) the agent under silent observe or (b) the connected telephone, the supervisor does not hear Dual Tone Multifrequency (DTMF) tones between the agent and customer. The supervisor does hear a click as the tones are generated; this click is caused by idling the path between the agent and the far-end.

Make Set Busy

An agent cannot log out while active on a call. Observe tone is continuous until the call is complete and the agent logs off.

Emergency (EMR) key

With Audible Tone enabled, the agent does not have to use the EMR key because the agent already knows when the supervisor is listening. However, if the agent does use the EMR key, the supervisor has an active speech path after pressing the Answer Emergency key. Agent Observe is suspended when the supervisor uses the AMG key to accept the agent's EMR signal.

Attendant Barge-In/ Busy Verify

The Barge-In/Busy Verify warning tone is given to all call parties along with the Observe Tone. The Barge-In/Busy Verify tone repeats every 6 seconds, while the Observe Tone repeats every 16 seconds.

End-to-End Signaling

EES is supported for the agent or caller while Silent Observe is operating. EES sends a special feed back tone to the call originator and a DTMF tone to the terminating party. The feedback tone is synchronized with key depression by the call originator.

The EES feature affects only End-to-End Signaling between two telephones. There is no change in the End-to-End Signaling for telephones on a conference call.

Interactive Voice Response (IVR)

Agent Observe does not operate for any ACD agent configured in an ACD queue with the IVR prompt set to YES.

Operating parameters

Data calls or calls to data telephones are not subject to Agent Observe.

Supervisors can observe only an established active call on an ACD telephone with an In-Calls key defined. An ACD telephone cannot be observed during the following call states:

- Idle
- Telephone is already being observed, or the supervisor to be observed is in the observe mode

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- Call is connected to a Release Link Trunk
- Call involves an attendant
- Private line calls
- Conferencing calls
- Transferring calls

The observation connection is retried every 256 ms. When the call state changes so that observation is enabled, an observation conference is established.

With the Silent Observe feature of ACD, End-to-End Signaling generated by an agent or customer cannot be heard by the supervisor. The supervisor hears a click resulting from the path being idled between the agent and the far end as End-to-End Signaling digits are pressed.

Supervisors must have Allow Observation of Supervisor Class of Service to observe other supervisors.

Being able to access a Position ID by dialing can eliminate the need for key lamps on a supervisor's telephone. Eliminating the key/lamps affects other features as follows:

- Agent status information from the agent lamp is no longer available.
- The Display Agents key does not function.

To eliminate the agent key/lamp functions and maintain agent-to-supervisor assignments, the agent's telephone can be associated with a Supervisor Position Identification (SPID). Agent key functions, like call supervisor or emergency, continue to operate normally.

Agent Observe Login (Advanced)

In a call center, the supervisor can monitor the quality of service. However, some call centers do not want their supervisors to have the capability to observe the agents' personal calls. In some countries, there is a legal requirement to maintain the privacy of calls made by agents.

Without this feature, the supervisor can hear the agent's IDN (non-ACD) calls while observing the agent, even when the agent is logged out. This compromises the privacy of calls made by agents.

With this feature, the system administrator can choose three levels of restrictions on the observation of supervisors, as follows:

- No restrictions (RAO = NO)
  The supervisor can observe any agent call. This is the default condition and defines the supervisory function without this feature.
- Restrict Observe of IDN calls when logged out (RAO = YES)

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The supervisor cannot observe agent IDN calls when the agent is logged out.

- Restrict Observe of all IDN calls (RAO = FULL)
  The supervisor cannot observe any IDN calls by any agent regardless of whether the agent is logged in or logged out.

Operating parameters

The feature uses the call processing software and LD 23 database administration program.

This feature does not impact hardware, firmware, or loadware. There are no special limitations.

Feature interactions

In addition to the feature interactions for Agent Observe (Advanced), the following interactions apply to Agent Login Observe.

Hold

The audible tones for Agent Observe are not presented when an agent presses the Hold key. The tones are returned when the call on hold is restored. The supervisor can continue to initiate observation of the agent, but hears nothing as the call is in a transient state.

- ACD Call on Hold

Once the agent retrieves the held call, the supervisor is put in conference irrespective of the value of RAO and agent login status.

- IDN Call on Hold

If RAO = No, the supervisor is put in conference once the agent retrieves the held call (whether or not the agent is logged-in).

If RAO = Yes, the supervisor is put in Observe Blocked state once the agent retrieves the held call in logged-out state. If the agent retrieves the held call in logged-in state, the supervisor is put in conference.

If RAO = Full, the supervisor was already put in Observe Blocked state against the IDN call. The supervisor is again put in Observe Blocked state when the agent retrieves the held call (whether the agent is logged in or logged out).

Return to Queue on no Answer The Return to Queue on no Answer either logs out or puts the agent in NRD state if the agent fails to answer a ringing ACD call within the period entered at the RTQT prompt.

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Agent Logged-out by RQNA when no IDN Call is Active With RAO = Yes/Full, the supervisor enters the Observe Blocked state once the agent establishes an IDN call, if an agent under Continuous Observe establishes an IDN call.

Agent Logged-out by RQNA when an IDN call is on hold If a logged-in agent puts in an IDN call and presses the In-Calls key (that is, when ACAA = Yes), the agent enters the idle agent queue and ACD calls are presented. If the agent fails to answer the ACD call before the RTQT (timer) times out, the agent is either logged out or put in NRD state as configured by the RQNA feature.

If the agent is logged out, the supervisor observing the agent enters the Observe Blocked state when the agent retrieves the held IDN call, when RAO = Yes/Full. If the agent is put in the NRD state, the held call can be retrieved later and the agent can be observed by the supervisor when the call is retrieved, if RAO = Yes.

> ***Note:*** If an IDN call is on hold, for C and D customers, the NRD key press is ignored.

Network Blocking

If the supervisor activates Agent Observe when no conference loops are available, the OBV key on the supervisor's telephone flashes, indicating that the supervisor cannot observe the agent at this time. When a conference loop becomes available, the OBV key lights up, and the supervisor can press the AGT key or can enter the agent's position ID to commence observation.

Multiple Queue Assignment Agents

With Multiple Queue Assignment (MQA), agents serving multiple queues are governed by the setting of the RAO option, depending on which queue is being served. The ACD data block used to obtain these options is the one associated with the call being served. An agent can serve multiple queues with different RAO definitions. For this reason, it is strongly recommended that the Restricted Agent Observe option be configured similarly for all groups of ACD queues that individual agents serve simultaneously.

For an IDN call, the RAO option of the ACD queue for which the agent has most recently been served is applicable while logged in. For example, given that there are three queues A, B, and C with RAO options set to NO, YES, and FULL respectively, the logged-in agent answers an IDN call. If the most recently served ACD call was from

- ACD queue A, the call is observable
- ACD queue B, the call is observable
- ACD queue C, the call cannot be observed

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When the agent has logged out, the RAO option of the ACD queue defined on key zero of the agent is applicable.

Feature packaging

This feature is part of the ACD advanced feature (ACD-B, package 41).

The Basic ACD package (BACD, package 40) is also required to provide this functionality.

Feature implementation

LD 23 is modified to accept the "Restricted Agent Observe" (RAO) prompt.

This prompt accepts "YES", "NO", or "FULL". The default value is "NO". It is not case-sensitive. Any other input to this prompt generates the error code SCH0101 (unable to match fields with stored mnemonics). The RAO prompt appears for ACD DN only.

Table 7
LD 23 Implementing the RAO prompt

Prompt	Response	Description
REQ:	NEW CHG	Add or change data Create or modify parameter(s) for ACD/ADS/CDN/NACD/SCB block
TYPE:	ACD	Type of block
...	...	
SPCP	NO	Separate DCP from PCP indication
OBTN	NO	Observe tone options
RAO	a..a	Where a...a = • NO: Restricted Agent Observe on Logout disabled. In such a case, the current functionality remains effective (default). • YES: Restricted Agent Observe on logout enabled • FULL: Restrict the supervisor from observing IDN calls from any of the agents at any time
CWTH	xxxx	Number of calls waiting in queue before call waiting lamp lights
NCWL	NO	New call waiting lamp settings

Feature operation

No specific operating procedures are required to use this feature.

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Display Agents key (Basic)

A Display Agents key provides a summary of the status of all agents with AGT keys assigned to the supervisor. It gives a count of the number of agents in each of the four states at the moment the key is pressed. The following display is updated every time the Display Agents key is pressed.

aa bb cc dd

where

aa = the number of agents busy on ACD calls or in the Not Ready mode
bb = the number of agents waiting for ACD calls
cc = the number of agents busy on non-ACD calls
dd = the number of agent positions not occupied

If the associated Agent keys have not been configured or the agent position has not been configured, the display shows 00 in each of the fields in the display.

Display Waiting Calls (DWC) key (Basic)

A Display Waiting Calls key can be assigned to a supervisor position for each ACD DN. The Display Waiting Calls key on the supervisor's telephone shows a measure of calls waiting that includes all calls that are in queue but have not been presented to an agent (that is, ringing on the agent's telephone).

The information on the Display Waiting Calls key is updated every time the key is pressed.

When the key is pressed, the Calls Waiting status for the ACD DN is displayed as follows:

aaa bbb ccc dddd

where

aaa = the number of calls currently waiting in the queue
bbb = the number of agent positions occupied for the ACD DN
ccc = the waiting time in seconds of the oldest call in the queue
dddd = always zero (0) with Basic ACD and does not apply

The lamp associated with the Display Waiting Calls key provides summary information on the Calls Waiting status for the ACD DN. When steadily lit, more than one call is waiting in the queue. A Display Waiting Calls key for a particular ACD DN can be assigned to a maximum of eight supervisor positions, regardless of the number of supervisors.

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Display Waiting Calls (DWC) key (Advanced)

A Display Waiting Calls key can be assigned to a supervisor position for each ACD DN. The Display Waiting Calls key on the supervisor's telephone shows a measure of calls waiting that includes all calls that are in queue but have not been presented to an agent. Each ACD DN can be programmed on a DWC key on up to eight supervisor's telephones.

The Calls Waiting indicator relies on thresholds associated with Automatic Overflow. The Busy Threshold (BYTH) and Overflow Threshold (OVTH) govern Automatic Overflow and provide flashing and fast flashing lamps.

Two prompts enable the lamp states to operate independently of the Automatic Overflow parameters. Call Waiting Lamp Flash (CWLF) and Call Waiting Lamp Fast Flash (CWLW) can be configured to flash and fast flash the lamps even though the Automatic Overflow parameters have not been met or exceeded.

Depending on the threshold values configured for each ACD DN, the following states are displayed. The information on the Display Waiting Calls key is updated every time the key is pressed.

- **Dark or blank**. The queue is empty, or the number of calls in the queue is less than the Calls Waiting Threshold (CWTH).
- **Steadily lit**. The CWTH has been met. The number of calls in the queue is less than the Call Waiting Lamp Flash (CWLF) threshold.
- **Flash**. The CWLF threshold has been met. The number of calls in the queue is less than the Call Waiting Lamp Fast Flash (CWLW).
- **Fast flash**. The OVTH has been met or exceeded.

When the key is pressed, the Calls Waiting status for the ACD DN is displayed as follows:

aaa bbb ccc dddd

where

aaa	=	calls waiting in queue
bbb	=	agent positions occupied
ccc	=	waiting time for the oldest call in the queue
dddd	=	sum of all calls in other source TOF queues, call request queue from another network location targeting this ACD DN, and Customer Controlled Routing (CCR) calls

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Interflow key (Advanced)

The Interflow (ENI) key enables the supervisor, during excess traffic periods, to redirect incoming ACD calls to another predesignated DN, either on the same switch or through the external switching network to another telephone. Each Interflow key is associated with two DNs:

- An ACD DN (source queue).
- An Interflow DN (IFDN). The IFDN can consist of up to 23 digits, including any required access code or asterisk (*) to indicate dialing pause. The IFDN can consist of up to 31 digits.

ATTENTION

Pauses are supported on analog and DTI trunks but are not supported on ISDN trunks. The asterisk (*), used to introduce a pause, is supported on analog and DTI trunks but is not supported on ISDN trunks.On ISDN trunks, if OPAO is enabled, the asterisk (*) is outpulsed as a called party digit.

Only one Interflow key can be assigned to each ACD DN. The Interflow key must be accompanied by a DWC key for that ACD DN.

Interflow supplements Automatic Overflow. When a source queue meets or exceeds the threshold configured for Automatic Overflow, the system checks all target queues (OVDNs). If the target queues meet or exceed the BYTH, or are in Night treatment, the incoming calls do not overflow.

When this overload condition exists, the supervisor is alerted by the DWC key fast flashing. The supervisor presses the Interflow key, and incoming calls meeting or exceeding the OVTH are interflowed to the IFDN.

The ENI key lamp flashes when the supervisor presses the key. It continues flashing until the key is pressed again and the feature is turned off. The flashing does not mean that calls are interflowing, simply that the feature is activated.

The Overflow status must be determined by the supervisor because calls should interflow to a destination that is not overloaded. The status of the target DN cannot be determined automatically. After activating Interflow, the supervisor should monitor the status of the call queues to decide when to disable Interflow by pressing the ENI key again.

If the Interflow destination is outside the system, sufficient outgoing trunks should be available to handle the expected volume of outgoing traffic when the Interflow key is activated. Refer to "Enhanced Interflow" (page 175) for a description of automatic interflow from source queues.

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IP Call Recording

IP Call Recording provides the IP address and port information for an IP Phone in Information Elements (IE) over Application Module Link (AML) for Meridian Link Services (MLS). This information correlates the TN of a specific IP Phone with its associated IP address for a call recording application. When enabled in LD 17, IP Call Recording sends a modified AML message for each call. The modified message identifies the call's IP endpoint and makes it possible to correlate the RTP packets for that call to a particular IP Phone

IP Call Recording introduces the IE pair:

- This Party IP IE (monitored party)
- Other Party IP IE (remote party)

The IP IE pair is similar to the existing IE pairs:

- For DNs: This Party DN IE, Other Party DN IE
- For TNs: This Party TN IE, Other Party TN IE

The IP IEs are optional in the Unsolicited Message Status (USM) (Active) and USM (Restore) messages. Note the following:

- If the USM message applies to a monitored key on a digital telephone, then the IP IEs are not sent.
- If the USM message applies to a monitored key on an IP Phone, then the IP IEs are sent: one for the monitored party and one for the remote party.

A call recording application is provided with status update messages for the call keys of any IP Phone it is monitoring. These USM messages contain the IP address and port number information for the monitored IP Phone and the remote party in the active call. By using a Layer 2 switch that supports port mirroring, the call recording device can monitor the media stream for the active call and record it.

Enhanced IP Call Recording

Enhanced IP Call Recording provides a direct method of capturing and recording VoIP calls. A mechanism records the IP media stream to an external media-recording device by instructing the IP Phone to send a duplicate media stream to a third-party call-recording application. The third-party call-recording application provides the recording and playing function for the IP calls.

This feature is supported on the Phase II IP Phone 2001, IP Phone 2002, IP Phone 2004, and IP Softphone 2050.

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The IP Call Recording enhancement enables the following types of recording:

- Bulk Call Recording – All calls are automatically recorded for a particular IP Phone. The Call Recording application issues a Start Recording Request message for the User ID, and all calls are recorded until the Call Recorder application issues a Stop Recording Request.
- Quality Monitor Recording – The Call Recorder records conversation for a particular call. The Call Recording application can monitor the Call Recording application (CR) data such as Calling Line ID (CLID) or Automatic Number Identification (ANI) to determine if it needs to record a specific call. The Call Recording application issues a Start/Stop Recording Request to the User ID for only the duration of the specific call. Quality monitor recording enables manual recording of individual calls with the following options:
  - Call recording can be started or stopped at any time during a call.
  - Call recording can also be paused and restarted repeatedly during a call, enabling excerpts from a conversation to be recorded.
  - Call recording can begin retroactively. At any time during the conversation, the entire call can be saved; it is not necessary to start recording when the call begins.
  - Call recording can be configured to maintain ACD Emergency key functionality.

The IP Call Recording is initiated by the CR. A Start Recording Request message is sent that contains the User ID to be recorded and the IP addresses and port information of where the duplicate media stream is to be sent.

In LD 11, the Class of Service ICRA/ICRD (IP Call Recording Allowed/IP Call Recording Denied) is available for the IP Phones that support IP Call Recording. The default is ICRD. See "LD 11" (page 60).

Warning tones

If Recording Warning Tone is required, this tone can be turned ON/OFF on the Call Server using the existing UNIStim message Stream Based Tone On/Off. The message requires the predefined parameters for the tone, such as tone ID, frequency and volume. However, note that Agent Observe injects a tone that interferes with the Recording Warning tone.

Bandwidth requirements

The use of IP Call Recording doubles the bandwidth requirements of the call.

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For remote users connecting to the IP Call Recorder server through a WAN connection, the impact of the bandwidth usage to the QoS should be considered. In this case, the IP Call Recorder server must provide the QoS parameters when instructing the IP Phone to echo the voice data.

Feature interactions

Mute key

When the Mute key is pressed, the IP Phone keeps both the primary and the duplicate audio stream open. When Mute is pressed, the recording state remains active, but only the incoming conversation is recorded. Pressing the Mute key a second time resumes normal recording.

Hold key

When the Hold key is pressed, a Stop Recording Request message is sent from the Call Server, and the duplicate media stream is closed. A new audio stream is opened for the other active call. When the hold is released, a new Start Recording Request is sent from the Call Server to the IP Phone and recording begins again.

Transfer key

After the Transfer key is pressed and the transfer accepted, the current audio stream is closed. A new audio stream for the new call is opened, followed by a Start Recording Request message. If the IP Phone that accepted the transferred call does not have call recording enabled, the transferred call is not recorded.

Call Forward

When a call is forwarded, the audio stream is opened for the destination IP Phone. If the destination IP Phone does not have call recording enabled, the forwarded call is not recorded.

Conference call

In a conference call, each IP Phone opens a media stream. The IP Phone's duplicate media stream to the CR is maintained as long as that IP Phone is part of the conference.

Identifying the IP Phone

IP Call Recording requires the unique identification of each IP Phone to be recorded.

In a Multiple Appearance Directory Number (MADN) configuration, the Call Server enables the association of two MADN keys on a particular TN. There is a maximum of two associated (AST) keys per TN.

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In a Multiple Appearance DN Redirection Prime (MARP) configuration, the Call Server enables the association of MARP DNs on different TNs. There is a maximum of two associated (AST) keys per TN.

The following table provides an example of AST configuration in LD 11.

Table 8
LD 11 AST configuration

Prompt	Response	Description
...		
AST	ASTKEY1	Key numbers to be associated on this TN.
	ASTKEY2	(ASTKEY1 and ASTKEY2 are the numbers of the keys to be associated. In this example, consider ASTKEY1 = 0 and ASTKEY2 = 1.)
...		
KEY	KEY 0 SCR XXXX	XXXX is the DN that is an MARP and already configured on another TN.
	MARP ON TN L S C U	
	MARP	
	CPND	
	VMB	
	ANIE	
KEY	KEY 1 SCR XXXX	XXXX is the same DN as configured on KEY 0.
	MARP ON TN L S C U	
	MARP	
	CPND	
	VMB	

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Prompt	Response	Description
...	ANIE	

Administration

LD 17

LD 17 provides the Enhanced Unsolicited Status Message (USM) IE enable (IPIE) prompt.

The IPIE prompt enables or disables IP Call Recording on a system-wide basis. The functionality is disabled by default. When enabled, a modified Application Module Link (AML) message that identifies the IP endpoint is sent for each call. The IPIE prompt is in LD 17 under system parameters (PARM).

Table 9
LD 17 IP Call Recording

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	Change system parameters.
LPIB	96 – 7500	Low-priority Input Buffers
...		
NDRG	(NO) YES	New Distinctive Ringing
MARP	(YES) NO	Multiple Appearance Redirection Prime feature allowed.
IPIE	(NO) YES	Enhanced Unsolicited Status Message (USM) IE enable. YES = Allow "This Party IP IE" and "Other Party IE" to send with USM.
FRPT	(NEFR) OLFR	(Deny) or allow access to incoming calls by FRE station.
...		

Telephony Manager (TM) and Element Manager (EM) do not support LD 17 for PARM. However, TM does support the corresponding print overlay, LD 22, which prints the prompt IPIE.

LD 11

Use the CLS ICRA/ICRD responses to configure an IP Phone to allow or deny call recording.

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See Table 11 "Unique TN types for IP Phones" (page 62) for the IP Phone TN type naming convention, updated for Release 5.0.

Table 10
LD 11 Service change request for CLS ICRA/ICRD

Prompt	Response	Description	
REQ	ADD	Add new data.	
	CHG	Change existing data.	
TYPE	aaaa	Supported IP Phone type where aaaa =	
		2001P2	2210
		2002P1	2211
		2002P2	2212
		2004P1	1110
		2004P2	2007
		2033	1120
		2050PC	1140
		2050MC	
TN		Terminal Number of IP Phone	
	lscu cu	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, u = unit	
		Format for Small System and Media Gateway 1000B, where c = card and u = unit	
...			
CLS	ICRA	IP Call Recording allowed	
	(ICRD)	IP Call Recording denied	
...			

If the ICRA class of service is applied to a non-IP Phone, error SCH1599 message is generated.

If the class of service on an IP Phone is changed during an active call, the Call Server tears down the call. As well, if an IP Phone TN is deleted during an active call on that IP Phone, the Call Server tears down that call.

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Unique TN types for IP Phones

The names of IP Phone TN types are updated with the new IP Phone naming convention. The following table lists the unique TN types for IP Phones for Release 5.0.

Table 11
Unique TN types for IP Phones

IP Phone model name	CS 1000 Release 4.5 TN_TYPE	CS 1000 Release 5.0 TN_TYPE
IP Phone 2001	i2001	2001P2
IP Phone 2002 Phase I	i2002	2002P1
IP Phone 2002 Phase II	i2002	2002P2
IP Phone 2004 Phase 0/1	i2004	2004P1
IP Phone 2004 Phase II	i2004	2004P2
IP Audio Conference Phone 2033	i2001	2033
IP Softphone 2050	i2050	2050PC
Mobile Voice Client 2050	i2050	2050MC
WLAN Handset 2210	i2004	2210
WLAN Handset 2211	i2004	2211
WLAN Handset 2212	i2004	2212
IP Phone 1110	i2001	1110
IP Phone 2007	i2004	2007
IP Phone 1120E	i2004	1120
IP Phone 1140E	i2004	1140
IP Phone 1150E	IPACD	1150

LD 20

The CLS options ICRA/ICRD are displayed in LD 20 when requesting a printout for an IP Phone, as shown in the following example.

```
> ld 20
 REQ: PRT
 TYPE: TNB
 CUST: 0
 ......
 CLS CTD FBD ......
   ......
   ICRD (or ICRA)
   ......
```


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LD 80

In LD 80, the output of the call trace command includes IP Call Recording-related information. In the following example, asterisk (*) indicates Call Recording information.

```
trak <TN>
.trak 61 9
ACTIVE  VTN 061 0 00 09
ORIG   VTN 061 0 00 02  KEY 0  SCR MARP  CUST 0
DN 4002  TYPE I2002
  MEDIA ENDPOINT IP: 47.11.215.40  PORT: 5200
TERM   VTN 061 0 00 09  KEY 0  SCR MARP  CUST 0
DN 4009  TYPE I2004
  MEDIA ENDPOINT IP: 47.11.215.47  PORT: 5200
    IPCR Tx MEDIA FAREND ENDPOINT IP: 47.11.181.174
PORT: 5000 *
    IPCR Rx MEDIA FAREND ENDPOINT IP: 47.11.181.174
PORT: 5001 *
MEDIA PROFILE: CODEC G.711 MU-LAW  PAYLOAD 20 ms  VAD OFF
DIAL DN 4009
MAIN_PM  ESTD
TALKSLOT  ORIG  19   TERM  21
EES_DATA:
NONE
QUEU  NONE
CALL ID 500 799
......
```

LD 81

Use the ICRA/ICRD responses to the FEAT prompt in LD 81 to count the number of IP Phones with the class of service ICRA or ICRD.

Table 12
LD 81 Count the IP Phones with CLS ICRA or ICRD

Prompt	Prompt	Description
REQ	LST	List the IP Phones
	CNT	Count the IP Phones
CUST	xx	Customer number
...		
FEAT	ICRA	IP Phones with IP Call Recording allowed
	ICRD	IP Phones with IP Call Recording denied
...		

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LD 83

In LD 83, the ICRA/ICRD class of service is displayed when the IP Phone TNB is printed.

LD 117

In LD 117, the output of the following STIP commands includes IP Call Recording-related status information.

- STIP NODE – Displays the Resource Locator Module information for the specified node
- STIP TN – Displays the Resource Locator Module information for the specified TN or group of TNs
- STIP TYPE – Displays the Resource Locator Module information for the specified TN type
- STIP ZONE – Displays the Resource Locator Module information for the specified zone
- STIP TERMIP – Displays the Resource Locator Module information for the specified IP address

Examples of STIP output Example 1:

```
=> stip termip 47.11.215.101
TN        type  HWID            STATUS    HOSTIP
SIGNALING IP
61  0 0  1  i2001 MAC:               REG       47.11.216.138
47.11.215.101:5000
         18000ae401da5f6602
  CODEC(BW):   G711u noVAD(1904), G711a noVAD(1904),
G729A(784), G723(544)
  MODEL:    IP Phone 2001 Phase 2      FWID:   2
FWVer:  D99  PEC:    NTDU90AA
```

Under Recording: No *Warning Tone: Not Required*

IPCR Tx Path: 47.11.181.174:6000 *IPCR Rx Path: 47.11.181.174:6001*

(Italics indicate the IP Call Recording information)

Example 2:

```
=> stip termip 47.11.215.101
TN      type  HWID                  STATUS          HOSTIP
SIGNALING IP
61  0 0  1  i2001 MAC:               REG      47.11.216.138
47.11.215.101:5000
         18000ae401da5f6602
```


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```
  CODEC(BW):   G711u noVAD(1904)*, G711a noVAD(1904),
 G729A(784), G723(544)
  MODEL:       IP Phone 2001 Phase 2           FWID:   2
    FWVer:  D99   PEC:    NTDU90AA
```

Under Recording: Yes Warning Tone: Not Required

IPCR Tx Path: 47.11.181.174:6000 IPCR Rx Path: 47.11.181.174:6001

(Italics indicate the IP Call Recording information)

Example 3:

```
=> stip tn 61 9
TN        type  HWID             STATUS    HOSTIP
           SIGNALING IP
61  0 0  9  i2004 MAC:           REG       47.11.216.138
    47.11.215.47:5000
         18000ae401ddb26602
  CODEC(BW):   G711u noVAD(1904)*, G711a noVAD(1904),
  G729A(784), G723(544)
  MODEL:       IP Phone 2004 Phase 2           FWID:   2
    FWVer:  D99   PEC:    NTDU92AA
```

Under Recording: Yes Warning Tone: On

IPCR Tx Path: 47.11.181.174:5000 IPCR Rx Path: 47.11.181.174:5001

(Italics indicate the IP Call Recording information)

Malicious Call Trace key

The Malicious Call Trace (TRC) key is supported on supervisor telephones.

Not Ready key (Advanced)

Pressing one of the following supervisor feature keys turns on the NRD key LED. M2216ACD, M2008, and M2616 telephones with displays also show the message "NOT READY."

- Observe Agent
- Call Agent
- Answer Agent
- Answer Emergency

When any of these feature keys is activated, the supervisor does not receive ACD calls on the In-Calls key.

To receive ACD calls, the supervisor presses the NRD key again (the NRD lamp goes dark) and is placed in the agent queue in the normal manner.

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If a call is sent to an agent and the agent activates the NRD key, the EAR call is then placed at the head of its priority grouping call queue (of the agent group to which the call was connected). This ensures that the call is connected to the next available agent.

With the schedule data block (SCB) configured, if the agent is in the Not Ready state prior to answering/making an IDN call, the user should not disconnect from the IDN call using the NRD key. When the IDN call is answered or initiated while the agent is in Not Ready state, the NRD lamp on the agent set goes dark and the agent is put into the Pending Not Ready state for the duration of the IDN call. The NRD lamp remains dark for the entire duration of the IDN call and no ACD calls can be presented to the agent during this period. Once the IDN call is disconnected, the NRD lamp becomes lit and the agent is automatically put back into Not Ready state. Thus it is not recommended that the NRD key be used to disconnect an IDN call under such circumstances. The agent can use the Release key.

Moreover, if the user uses the Not Ready key to release such a call, the ACNT lamp on the agent set (if configured) again flashes (if NRAC=YES for ACD queue). This is not desired, because the Activity codes have already been entered when the agent entered the Not Ready state prior to the IDN call.

The behavior exhibited for the SCB block (NRD key going dark while DN key is active) is used when generating ACD -C reports. This behavior is used to calculate the Post/Pre Call Processing (PCP) time in the reports. If an agent receives a call on a personal DN (IDN) while in Not Ready state, the NRD lamp would go off so that the reports are generated accurately. The duration of DN call cannot be counted in PCP time. This used when generating ACD -C reports and so the SCB block calls for this behavior.

Average or Total Post/Pre Call-Processing Time: Average or total time, in seconds, that this position was in the Not Ready state. This time is measured from the time that the agent activates the Not Ready key until any event that removes the position from Not Ready, for example, pressing the In-Calls key, pressing the Not Ready key again, or going active on any DN key. The average PCP time is the sum of all Not Ready times divided by the number of ACD calls answered at the agent position. The total PCP time is the total of all Not Ready state times.

Observe Agent Security

This feature enhances the Automatic Call Distribution Supervisor feature to provide the following security options:

- A supervisor can observe a call only when logged in (a login control option).

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- A supervisor can observe calls of specified agents only (by association of a list containing specific agent position IDs).
- An unauthorized person cannot observe an agent call (password control option for the observe feature).

This feature offers three levels of security: login control, restricted Observe for supervisor, and password control of the Observe function.

Login control

The login control option is configured at the ACD queue level. When this option is set to YES, supervisors serving the ACD queue can observe only when logged in. Administrators configure the security option for login control for supervisors in LD 23 at the Observe Security Control (OBSC) prompt. When OBSC is set to YES for an ACD DN, all supervisor telephones serving that DN must log in to invoke Observe. If a supervisor is in a logged out or MSB state and presses the Observe key when the OBSC is set to YES, the Observe function is denied and the Observe key lamp remains dark.

Restricted observe for supervisor

A Speed Call List (SCL) containing specific Position IDs is associated with the supervisor position's OBV key. The first 100 entries in the SCL associated with the OBV key can be observed. If this level of security is not chosen, the supervisor need not have any SCL associations with the OBV key. The SCL is configured with the position IDs of agents that a particular supervisor or group of supervisors can observe. This SCL is associated with the supervisor's OBV key.

Two Classes of Service, Observe using SCL Allowed (OUSA) and Observe using SCL Denied (OUSD), have been added to LD 11. The response OUSA is accepted only for supervisor telephones. With Class of Service OUSA configured for the supervisor telephone, the administrator must enter an SCL number while configuring an OBV key.

A service error occurs if the administrator attempts to

- configure SCL with Class of Service OUSD
- configure SCL with OUSA and an attempt is made to configure an OBV key without SCL

With the OUSA Class of Service, a supervisor can observe only specified agents within the same customer. With OUSD, a supervisor can observe any agent in the same customer.

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A Speed Call Controller key can be configured on one supervisor's telephone so that the SCL containing position IDs can be modified. This aids local changes in the SCL; however, for security reasons, the telephone with this capability should be located in a secure area to avoid unauthorized access.

Password control of observe

The administrator configures the supervisor passwords along with supervisor login IDs in LD 23. A one-to-one mapping of IDs and passwords should exist. The password is matched with the login ID of the supervisor for validation.

A timer is used to measure the duration from the completion of observation (the timer starts once an observe is completed). If the timer expires, the supervisor must enter his or her password the next time that he or she presses the observe key. If the timer has not expired, the supervisor need not enter the password. If a supervisor logs out, the timer expires immediately.

A new type of data block is introduced in LD 23 to enable storage of supervisor login IDs and their corresponding passwords in an Observe password table. One table is defined per customer. Each table can contain a maximum of 240 entries. Login IDs can be 16 digits in length and passwords can be 8 digits in length.

The Observe Password Timer (OBPT) prompt follows the OBSC prompt in LD 23 during ACD DN configuration. The OBPT enables the configuration of the Observe password timer, in minutes.

This feature introduces two new Classes of Service in LD 11— Observe Password Allowed (OBPA) and Observe Password Disabled (OBPD). The OBPA Class of Service is accepted only if the telephone has been configured with the SPV Class of Service. A telephone configured with a OBPA Class of Service must enter a password to invoke Observe. However, if the supervisor is not logged in, Observe cannot be invoked.

Operating parameters

This feature applies to the following systems:

- CS 1000M
- CS 1000M Chassis
- CS 1000M Cabinet
- CS 1000M HG
- CS 1000M SG
- Meridian 1 PBX 61C

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- Meridian 1 PBX 81C

Feature interactions

Meridian Link

Meridian Link services do not support the Invoke Observe functionality with Password Control.

Feature packaging

The Observe Agent Security feature introduces Observe Agent Security package (394).

The Observe Agent Security feature requires the following packages:

- Automatic Call Distribution, Package B (ACDB) package 41
- Automatic Call Distribution, Package C (ACDC) package 42
- Automatic Call Distribution, Package A (ACDA) package 45
- Automatic Call Distribution, Package D (ACDD) package 50

Feature implementation

Task summary list

The following is a summary of tasks to configure this feature:

1. Table 13 "LD 23 – Configure the ACD Queue with Observe Agent Security." (page 69)
2. Table 14 "LD 23 – Configure the Observe Password Table." (page 70)
3. Table 15 "LD 11 – Configure the telephone for Observe Agent Security." (page 70)
4. Table 16 "LD 11 – Configure the telephone with the OBV key and SCL number." (page 71)
5. Table 17 "LD 23 – Configure an ACD DN with OBSC = YES and OB = xx." (page 72)

Table 13
LD 23 Configure the ACD Queue with Observe Agent Security.

Prompt	Response	Description
REQ	NEW CHG	Add new data or change existing data.
TYPE	ACD	Automatic Call Distribution DN block
CUST	xx	Customer number as defined in LD 15.
....		
MAXP	x	Maximum number of agents for this Queue
....		

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Prompt	Response	Description
OBSC	(NO) YES	Observe Security Control. Enables login/logout control, where: NO = off YES = on
OBPT	xx	Observe Password Timer Supervisor Inactivity Timer, in minutes (2 - (5) - 99)
....		
OBTN		Observation Tone
	(NO) AGT ALL	No Observation Tone given. Audible Observation Tone to agent only. Audible Observation Tone to all parties.
....		

Table 14
LD 23 Configure the Observe Password Table.

Prompt	Response	Description
REQ	NEW CHG OUT	Create, change, or remove a data block
TYPE	OBVP	Observe Password table
CUST	xx	Customer number as defined in LD 15.
ADPD	xx..xx yy..yy	Supervisor login ID followed by supervisor Observe password (separated by a space)

Table 15
LD 11 Configure telephone for Observe Agent Security.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block
TYPE:	aaaa	Telephone type, where aaaa = 2006, 2008, 2016, 2216, 2317, 2616, 2050, 390X, i2002, i2004
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, u = unit.
	c u	Format for Small System and Media Gateway 1000B, where c = card and u = unit.
....		
CLS		Class of Service, where:

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Prompt	Response	Description
	SPV OUSA (OUSD)	Supervisor Class of Service Observe using SCL Allowed Observe using SCL Denied
	OBPA (OBPD)	Observe Password Allowed Observe Password Disabled
KEY	xx OBV	Observe ACD Agent key (must have CLS = OUSD)
	xx OBV yy..yy	Observe key with Speed Call List Number (must have CLS = OUSD), where: yy..yy = SCL number
KEY	xx AGT zzzz	Agent with Position ID

Table 16
LD 11 Configure telephone with OBV key and SCL number.

Prompt	Response	Description
REQ:	PRT	Print a data block
TYPE:	aaaa	Telephone type, where: aaaa = 2006, 2008, 2016, 2216, 2317, 2616, 2050, 390X, i2002, i2004
	TNB	Terminal Number Block
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, u = unit.
	c u	Format for Small System and Media Gateway 1000B, where c = card and u = unit.
....		
CLS		Class of Service
	SPV OUSA (OUSD)	Supervisor Class of Service Observe using SCL Allowed Observe using SCL Denied
	OBPA (OBPD)	Observe Password Allowed Observe Password Disabled
....		

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Prompt	Response	Description
KEY	xx OBV	Observe ACD Agent key (must have CLS = OUSD)
	xx OBV yy..yy	Observe key with Speed Call List Number (must have CLS = OUSD), where: yy..yy = SCL number
KEY	xx AGT zzzz	Agent key with Position ID

Table 17
LD 23 Configure an ACD DN with OBSC = YES and OB = xx

Prompt	Response	Description
REQ:	a...a	Request
TYPE	ACD	ACD DN block
CUST	xx	Customer number as defined in LD 15.
....	....	....
MAXP	xx	Maximum number of agents for this queue
....	....	....
OBSC	(NO) YES	Observe Security Control. Enables login/logout control, where: NO = off YES = on
OBPT	xx	Observe Password Timer Supervisor Inactivity Timer, in minutes (2 - (5) - 99)
....	....	....
OBTN		Observation Tone
	(NO) AGT ALL	No Observation Tone given. Audible Observation Tone to agent only. Audible Observation Tone to all parties.
....	.....	....

Table 18
LD 18 Configure a Speed Call List - Position IDs as DN entries

Prompt	Response	Description
REQ	NEW CHG	Create or change a data block
TYPE	SCL	Speed Call data block
LSNO	zz	Speed Call List number
DNSZ	4-(16)-31	Maximum number of digits in a list entry
SIZE	1-(256)-1000	Number of CLID entries required.

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Prompt	Response	Description
WRT	(YES) NO	Write Data is correct and list can be updated
STOR	xxx yy...yy	Store where: xxx = list entry number (0-90, 00-99, 000-999) yy = digits stored against entry (must be equal to or less than DNSZ)

Feature operation

To invoke Observe with password control enabled, perform the following steps:

Step	Action
1	Press the **Observe** key. The "Enter Authorization Code" display is shown on the telephone.
2	Enter the Observe password followed by "#". The password is not displayed on the telephone; each digit in the password is represented with a "-".
3	If the password is valid, the telephone displays "Observe Agent, Enter ID". Enter the position ID of the agent and proceed.
4	If the password is invalid, the telephone displays "Release and Try Again" and the Overflow tone sounds.

—End—

Supervisor and agent communication (Advanced)

The supervisor calls an agent by pressing the Call Agent (RAG) key. The Call Agent lamp lights steadily, and the supervisor presses the appropriate Agent key, or dials the agent's Position ID, to complete the call. The display shows the called agent's ACD POS ID. To call another agent, the supervisor presses another Agent key. The call to the previous agent is terminated, and the second call is placed. The dial method requires that the supervisor press the Agent key before any Position ID is dialed.

The Call Agent and Answer Agent functions are separate keys on the supervisor terminal. The supervisor can call an agent without having to answer all the agents attempting to talk to the supervisor. A supervisor can call only one agent at a time.

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When the supervisor calls an agent, the agent's supervisor lamp flashes and the agent hears tone ringing. If the agent is busy or off-hook, the agent hears a 3-second buzz from the receiver. The agent answers the call by pressing the Supervisor key. If the agent is engaged in a call, the call must first be put on hold by pressing the Hold key before the Supervisor key is pressed.

The supervisor answers the agent call by pressing the Agent Answer (AAG) key. The Position ID is displayed on the supervisor's telephone. A supervisor can answer only one agent at a time. All subsequent callers hear a busy tone.

The supervisor can conference with the agent and the calling party in two ways:

- The agent can initiate a conference.
- The supervisor can force a conference as described in "Agent Observe (Advanced)" (page 45).

Supervisor Control of Night Service (NSVC) (Advanced)

This feature enables the supervisor to force the system into Night Mode, instead of waiting for all agents to log out. However, it is recommended that each agent log out with the MSB key, even when the supervisor initiates Night Service (NSVC). If the agents do not log out, and the supervisor deactivates Night Mode, the agents are placed in the available agents queue.

This feature enables three different configurations: transition mode, night mode, and day mode.

Transition mode

Transition mode enables ACD agents to answer calls in the queue, while new incoming calls receive NSVC treatment. To select this mode, press the NSVC key and the letter T (number 8) on the dial pad.

Night mode

Night mode gives all existing calls in the queue NSVC treatment, as well as presenting NSVC treatment to new incoming calls. To select this mode, press the NSVC key and the letter N (number 6) on the dial pad.

Day mode

Day mode returns the queue to normal operation. To select this mode, press the NSVC key and the letter D (number 3) on the dial pad.

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When the NSVC key is used, it must be deactivated to get out of Night Service. If the ACD agent positions are not logged in when the NSVC key is deactivated, the system remains in Night Service until an agent logs in. When not using the NSVC key, the system still goes into Night Mode when all agents log out.

Only one NSVC key can be defined per ACD DN. The status of the NSVC key is not indicated on agent positions. The NSVC key is assigned to a key/lamp on the supervisor's telephone. The NSVC key/lamp displays the following conditions:

- **Dark.** The NSVC key is deactivated. This does not mean the ACD DN is out of Night Service. An agent must be logged in for the system to leave Night Service.
- **Fast flash.** The system is in Transition Mode. Night Service is activated for new calls coming into the queue, but calls in the queue are handled normally. Once the queue is empty, the mode automatically changes to Night Service or Steadily Lit.
- **Steadily lit.** Night Service is in effect. All new calls coming into the queue, and all calls remaining in the queue, now receive the Night Service treatment specified for that ACD DN.

To change the status of the NSVC key, the Supervisor can press the NSVC key and dial a special letter command, as shown in Table 19 "NSVC treatment commands" (page 75). When the letter is dialed, the light state changes as the system starts NSVC treatment. The system ignores incorrect commands.

Table 19
NSVC treatment commands

Press NSVC key and dial letter (#)	Light state before	Light state after	Mode entered
T (8)	dark	flashing	Transition
N (6)	dark or flashing	lit	Night
D (3)	lit	dark	Day

Feature interactions

Call Overflow

When the system is in the Night Mode, no new incoming calls can Automatic or Time Overflow.

Call Park Recall

If an ACD call has already recalled back when the supervisor activates Transition Mode, the call is connected to the next available agent. If the call has already been recalled back when the supervisor activates the

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Night Mode, the call receives NSVC treatment. If an ACD call recalls back to an ACD DN in Night Mode, it receives the NSVC treatment defined for that ACD DN.

Call Transfer

If a call is transferred to an ACD DN that is in the Transition or Night mode, the call is given NSVC treatment. If a call is transferred to an ACD DN and is ringing that ACD DN on an agent telephone when the supervisor puts the system into Night mode, the transferred call continues to ring on the agent's telephone until it is answered or abandoned. If the call is in queue waiting for an agent when the supervisor puts the system into Night mode, the call receives Night treatment.

Calls Waiting Indication (AWC)

When the supervisor activates the Transition mode, the AWC lamp indicates only those calls still waiting in the queue. It does not reflect incoming calls that receive NSVC treatment. In the Night mode, the AWC lamp is dark and all incoming calls receive NSVC treatment.

Display Waiting (DWC)

When the supervisor activates the Transition Mode, the Display Waiting (DWC) lamp indicates only statistics for calls waiting in the queue. The Display Waiting Calls key on the supervisor's telephone shows a measure of calls waiting, including all calls that are in the queue but not yet presented to an agent.

Interflow

When the NSVC key is activated, incoming calls receive Night Service treatment and cannot Interflow.

Time Overflow

Calls remaining in the source high-priority and nonpriority queues, when NSVC is in the Transition mode, can still Time Overflow. However, when in the Night mode, calls remaining in the source queues cannot Time Overflow to target ACD DNs.

Calls in the source Time Overflow (TOF) queue can be answered by agents of the target ACD DN. Target ACD DNs cannot answer other source TOF calls when in the Transition mode. If a call is in the target queue because it overflowed by count, it cannot recall to its source queue if the source queue is in the Night mode. Once a call has overflowed, it cannot Overflow again. The call is not overflowed to the target unless the target can handle it. If it cannot Overflow, the call never leaves the source queue.

Operating parameters

Night Service cannot be changed through attendant administration.

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Only one Night Service key can be defined per ACD DN.

If the supervisor's NSVC key becomes disabled, the feature is disabled in LD 11, or the key is removed while Night Service is active, another NSVC key must be defined on another supervisor's telephone to take the ACD DN out of Night Service.

Night Service does not require that all agents log out at the end of the day and log in again the next day. However, it is recommended that each agent log out with the MSB key even when the supervisor initiates Night Service (NSVC). If the agents do not log out, and the supervisor deactivates Night Mode, the agents are placed in the available agents queue. The supervisor should verify that all agents have logged out when activating the NSVC key.

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ACD load management system

Contents

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"Customer Controlled Routing (CCR)" (page 84)

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"Walkaway/Return" (page 87)

"Agents using DN keys" (page 88)

"Alternate Call Answer" (page 88)

Introduction

This chapter describes the ACD load management commands that supervisors can use to tailor the system to meet changing needs. It also includes descriptions for features such as Enhanced ACD Routing (EAR), Customer Controlled Routing (CCR), and so on that are part of the ACD load management system.

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For more information about ACD load management commands, see "Management reporting commands" (page 81). For more information about ACD management reporting, see "Management command conventions" (page 83).

This chapter also describes the optional Management Report package, listing available management reports and providing the inputs for requesting reports. For LD and system message information, including error codes, refer to *Software Input/Output Reference – System Messages (NN43001-712)*.

Operational overview

Each ACD customer can designate one supervisor position as a Senior Supervisor equipped with a Teletypewriter (TTY) or Video Display Terminal (VDT) for Management Report functions or ACD Management functions.

With the TTY or VDT, the senior supervisor can do the following:

- reassign auto-terminating ACD trunk routes
- reassign ACD agent positions to other ACD DNs
- redefine the ACD Night Forwarding number
- reassign an ACD agent position to another supervisor
- assign priority or nonpriority status to ACD trunks
- configure the timers and routes for first and second Recorded Announcements (RAN)
- specify a Night RAN route
- configure the target answer time T used to calculate the Telephone Service Factor (TSF)
- define the target queues for Automatic Overflow
- define the Overflow thresholds
- define the Interflow digits
- query the existing values for any of the above

Accessing the command mode

Before issuing load management or report commands, the senior supervisor must enter command mode by following these steps:

1. Enter $L from the senior supervisor’s display.

   The system responds with a prompt (>) indicating that it is ready to receive further commands.

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2. Enter new data on the same line as the prompt, and press the carriage return key.
3. To query existing values, enter an ACD Management command.
4. Enter new data if desired, or press the carriage return if no change is necessary.

   If there are any changes in a line, all data must be retyped.
5. To exit the ACD Management command mode, enter $L.

With the proper VDT or TTY equipment, any supervisor can enter the ACD Management command mode to view existing parameters. The system prints the values but does not display the prompt or enable further input.

Management reporting commands

If the ACD has the ACD Management Reports feature, any current report display aborts when the $L command is entered.

After the senior supervisor inputs a management reporting command, the system prints the current parameters associated with the command, followed by a double dash to indicate that the system is ready for input.

Selecting print options

The Select Print (SPRT) command lets the senior supervisor specify which management reports to print. The format for this command is as follows:

SPRT vwxy VWXY

where

v, w, x, and y are the reports to be printed:

1. for the Agent Group Report
2. for the Queue Report
3. for the Trunk Routes Report
4. for the Agent Position Report

Scheduling periodic reports

The Select Schedule (SSCH) command enables the senior supervisor to define a schedule for periodic Management Reports. (LD 23 also enables report scheduling.) The format for the command is as follows:

```
SSCH sd sm ed em   SD SM ED EM
sh eh s  SH EH S
d d d d d d d d  D D D D D D D
```


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where

sd = the starting day (1–31)
ed = the ending day (1–31)
sm = the starting month (1–12)
em = the ending month (1–12)
sh = the starting hour (0–23)
eh = the ending hour (0–23)
s = the schedule code

0	No reports are printed.
1	Reports are printed hourly on the hour.
2	Reports are printed every hour on the half-hour.
3	Reports are printed every half-hour.
4	Report 3 is printed every quarter-hour. No other reports are printed.
5	Report 3 is printed every quarter-hour. Other reports can be printed hourly on the hour.
6	Report 3 is printed every quarter-hour. Other reports can be printed hourly on the half-hour.
7	Report 3 is printed every quarter-hour. Other reports can be printed every half-hour.

where

d = Days of the week when reports are to be printed:

1 = Sunday	5 = Thursday
2 = Monday	6 = Friday
3 = Tuesday	7 = Saturday
4 = Wednesday	

Report Control

The ACD Report Control feature enables every ACD DN or control DN (CDN) to control report generation, including reports generated on the system (ACD-C) or by an auxiliary processor (ACD-D or ACD-MAX). Report Control works only with Meridian Mail SP8.

This option includes Package C reports, ACD-D reports, and ACD-MAX.

For example, Reports 1, 2, 4, and Daily Totals show 10 ACD DNs. If 2 ACD DNs have RPRT = NO, then the total ACD DNs in Reports 1, 2, 4, and Daily Total shows 8 ACD DNs instead of 10 ACD DNs.

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Operating parameters

When making the decision to turn reporting on or off, take into account the interactions among ACD DNs and CDNs through call redirection and load management. *Do not switch the reporting control on and off, as toggling between options generates inaccurate report information*. If it is necessary to change the report status, change the option at the end of a reporting period.

Management command conventions

The following conventions apply to management commands:

- With DN Expansion (DNXP) equipped, ACD DNs can be up to seven digits.
- ACD Position ID (POS ID) identifies an agent position.
- Access code (ACOD) and member number (MEM) identify trunk number routes.
- Queues are identified by ACD DN.
- When a CDN is specified for any of the management commands, the system outputs "** CDN **".

Enhanced ACD Routing (EAR)

Enhanced ACD Routing (EAR) enables the system to treat different calls differently.

A Control DN (CDN) is a special Directory Number not associated with any physical telephone or equipment that specifies a destination ACD DN to which incoming calls are directed. Multiple CDNs can place calls into the same ACD queue. The parameters of the CDN, not those of the ACD queue, determine call treatment.

ATTENTION

Because a CDN is not associated with a physical telephone and is used mainly for call routing purposes, a CDN cannot be configured as the destination mailbox DN for any Interactive Voice Response (IVR) application.

The following ACD Management commands are used for CDN default operation:

— FRRT First RAN route

— FRTT First RAN route time

— SRRT Second RAN route

— SRTO Second RAN route time option

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The following commands are supported for a CDN:

— SRTA	Select Route and Trunk Assignment. This is used to assign the terminating ACD DN for an auto-terminating ACD trunk. A CDN can be used as a valid auto-terminating ACD DN.
— IFDN	Interflow DN assignment. A CDN can be used as a valid Interflow DN of an ACD DN, but the CDN itself cannot have an Interflow DN.
— NITE	Night Forwarding number assignment. A CDN can be used as a valid Night Call Forward DN of an ACD DN, but the CDN itself cannot have a Night Call Forward DN.
— DTOT	Daily Totals. This presents a Daily Totals Report for CDNs based on a schedule block and not on a per-CDN or ACD DN basis.
— STOT	System Totals. This presents a System Totals Report for CDNs based on a schedule block and not on a per-CDN or ACD DN basis.

A set of commands supports the CDNs on the system. The print command is Print CDN Parameters and Options (PCPO). The parameters for the PCPO command are listed below and are covered more thoroughly in the PCPO section.

— DFDN	Local default ACD DN for the CDN
— CEIL	Call ceiling value for the CDN

When the senior supervisor enters the above commands for a CDN, the system appends the term "** CDN **" to the command to tag the entry as a CDN.

For example,

FRRT 8976

appears as

FRRT 8976 ** CDN **

Customer Controlled Routing (CCR)

Customer Controlled Routing (CCR) enables the customer to customize the treatment and routing of incoming calls through a user-friendly interface. Under normal circumstances, calls arriving at a CDN in the controlled mode have their handling determined by a customer-defined script executed by the CCRM application, rather than being handled by the software.

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The following ACD Management commands are supported if CCR is equipped and the CCRM application is controlling the CDN:

— TLDA	Calls Waiting threshold (CWTH)
— TLDB	Busy threshold (BYTH)
— TLDC	Overflow threshold (OVTH)
— TSFT	Telephone Service Factor (This enables the supervisor to change the threshold for calculating the TSF for the CDN.)
— CNTL	Set Controlled mode

CCR Management Reporting

The CCR feature affects customers with Management Reporting capabilities as follows:

Report 1: Agent Group Report. In the ACD-DN report for Report 1, the fields CALLS ANSWD and ASA are affected by the CCR feature only if the CCR calls are answered in the ACD queues, and the queues are responsible only for the time the calls spent in the queues.

Report 2: Queue Report. Calls placed in more than one ACD queue to await an available agent are pegged against the ACD DN in which the call is answered. The wait time includes the time the call waited in the reporting ACD DN, not the accumulated time spent in all queues. For a CDN in Report 2, only three fields are used: CALLS ACCEPT, BUSY, and DEFAULT DN.

Reports for ACD DNs — Multiple-queued calls do not affect the ACD queue statistics *unless* the calls were answered in the queues. The two fields added to the Queue Report for CCR are ROUTE TO and DISC.

Reports for CDNs — All fields described for CDNs apply to CCR.

Ongoing Status Display. If the EAR feature has been implemented, CDNs are not included in the Ongoing Status Display. All calls coming into the CDN route to the default ACD DN immediately. If the CCR feature is used, the Ongoing Status Display reports both ACD DNs and CDNs for the customer. CDNs have values in the TSF, ASA, and # CALLS IN QUEUE fields. All other fields contain asterisks indicating they do not apply to the CDN.

Agent ID option

This feature provides the ACD customer with the option of operating in either an Agent ID mode or a Position ID mode. If the Agent ID option is selected, ACD agents must enter a four-digit Agent ID code (range 0001 to 9999) before access is enabled to ACD features. This is part of the ACD telephone login procedure that must be performed before access to ACD features is

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enabled. Statistical performance data continues to be accumulated on a Position ID-basis. However, the Agent ID code of the agent who used the particular agent position is reflected in the management reports.

ACD telephone login

An agent's or supervisor's telephone cannot receive ACD calls until an agent logs in to that telephone by pressing the In-Calls key on the telephone. The system ignores the key if no headset or handset is connected.

- If the Agent-ID option is not defined, the LED associated with the NOT-READY key LED illuminates and the telephone digit display shows the ACD DN and supervisor position. The telephone is accumulating time and the agent can access all ACD features.
- A special dial tone appears if the Agent-ID option is defined. The agent must key in the four-digit Agent-ID code on the telephone dial pad. The system validates the digits and returns one of the following tones:
  - — Overflow tone if the code is not input before normal digit time-out, or the code is invalid or out of range.
  - — Busy tone if another individual is already logged in with the same Agent-ID code.

A valid code gives the agent access to ACD features.

The configuration record specifies the maximum number of agents who can be logged in to the system at any one time (MAGT prompt in LD 17). An agent who exceeds this threshold by trying to login receives an overflow tone.

500/2500 telephone login protocols

Because the 500/2500 telephones do not have key lamps, the agent logs in and joins the idle agent queue by going off hook and entering the SPRE code plus 97. The agent can also login by entering the SPRE code plus 97 and the four-digit Agent ID number, and then by going off hook. To logout, the agent reenters the SPRE code plus 97, and goes on hook.

A special logged-in tone lets the agent know when the telephone is in the agent queue. Before logging in and after logging out, the agent hears the normal dial tone.

The login and logout commands clear the Not Ready mode. If the agent is not logged in, the Not Ready mode cannot be activated.

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Data Agent login

Data Agents can press the Make Set Busy (MSB) key to log in after ascertaining that the Data Shift key is lit on the Add-on Data Module (ADM) associated with that agent position. The correct CLS must be defined for this feature in LD 11.

ACD telephone logout

Before logging out, the agent should check to see if any calls are active or on hold (see "Walkaway/Return" (page 87)).

Removing the headset/handset from a telephone that is currently logged in to the ACD operation terminates access for agents who have the option of using headset/handset removals or activating the MSB key. Agents who do not have this option can log out using the MSB key, unless this key is unavailable. Pressing the MSB key causes immediate logout unless there is an active call on the In-Call key, in which case logout occurs when the call is disconnected.

After an agent logs out:

- The agent position is removed from the ACD agent queue.
- Systems with a display show a "LOGGED OUT" message if the Make Set Busy key has been deactivated.
- All timing for that position stops.

Data Agent logout

Data Agents can press the MSB key to logout after ascertaining that the Data Shift key is lit on the Add-on Data Module (ADM) associated with that agent position. The correct Class of Service (CLS) must be defined in LD 11.

Walkaway/Return

An agent who is logged in can briefly leave the position, return, and resume normal operation without logging in again. (If the agent disconnects by merely unplugging the headset or handset from the telephone, the Walkway/Return feature is not activated.)

Removing the headset/handset under any condition other than those listed here logs out the agent. The Walkaway procedures are as follows:

- **Direct Call-Processing (DCP) phase (In-Calls LED lit)**. During this operation, the agent is connected with a caller. Before removing the headset/handset, the agent presses the Hold key, causing the In-Calls LED to flash at 120 ipm and initiating Walkaway.
- **Post Call-Processing (PCP) phase (NOT READY LED lit).** During this operation, the agent and the caller are disconnected. When the agent presses the Hold key, the Not Ready LED flashes at 120 ipm. Removal of the headset/handset initiates Walkaway.

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- **Non-ACD call-handling phase (DN LED lit).** A non-ACD call is connected to the agent position. The agent presses the Hold key to keep the call connection, and the DN LED flashes at 120 ipm, enabling Walkaway.

Removing the headset/handset under any conditions other than those listed logs out the agent.

Timing continues during Walkaway, accumulating in the category that was active before Walkaway.

If the supervisor has corresponding agent keys, the keys flash 120 ipm for Walkaway, as follows:

- no lamp for MSB
- steady lamp for Busy on In-Calls
- slow flash for waiting for a call
- fast flash for DN calls

If the incoming caller disconnects from an on-hold In-Calls or DN key, the telephone reverts automatically to the Not Ready state and the Not Ready LED flashes. The timing for the prior state stops, and PCP timing starts.

When an agent or supervisor returns to an agent position that is in the Walkaway mode and plugs the headset/handset into the telephone, the normal operation of ACD features resumes.

Agents using DN keys

Activating any DN key lights the associated LED indicator lamp and gives a dial tone. An incoming call to that DN causes the LED indicator to flash and the agent telephone to ring. This assumes that any and all agents on a queue basis can use DN keys, or the agent is already logged in. If the agent cannot use DN keys when not logged in, the LED for incoming DN calls flashes. However, the agent is not able to answer the calls until logged in to the queue.

Alternate Call Answer

The Alternate Call Answer feature enables the customer to choose, on a per queue basis, if ACD calls should be blocked for an agent telephone with an IDN call on hold.

In Report 1, if an agent answers an ACD call while an IDN call is on hold, the time for the ACD call shows as AVG DCP instead of AVG TIME.

In Report 4, if an agent answers an ACD call while an IDN call is on hold, the time for the ACD call shows as AVG DCP instead of INC TIME or OUT TIME.

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ACD load management commands

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Introduction

This section describes the commands that a senior supervisor can execute to manage and manipulate system traffic. Refer to "Accessing the command mode" (page 80) for information on using the command system.

Configure Controlled mode (CNTL)

The CNTL command operates only if Customer Controlled Routing (CCR) is equipped. The CNTL command determines if the selected Control Directory Number (CDN) is in controlled mode. The CDN operates in the controlled mode when the value is ON. For Enhanced ACD Routing (EAR), the CNTL option is always OFF. This restricts the CDN to using default treatment for EAR.

The command format is as follows:

CNTL CDN -- <Existing mode > -- MODE

Where:

CDN	=	The Directory Number of the CDN
MODE	=	ON for controlled mode and OFF for default mode

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An error is displayed on the supervisor's terminal when a non-CDN is specified for the CDN field or a mode key word other than ON or OFF is given.

Configure Default ACD DN (DFDN)

The DFDN command configures the Default ACD DN for a CDN to operate in the default mode. This DN is the primary target for CDN calls receiving default treatment. This ACD DN must be local. The ACD DN defined for data service access cannot be used as a default ACD DN. The Interactive Voice Response (IVR) ACD DN cannot be configured as the default DN for a CDN.

The command format is as follows:

DFDN CDN -- <Existing DFDN > -- ACD DN

Where:

DFDN CDN	=	Configure the default ACD DN for this CDN
<Existing DFDN>	=	Output by the system, the current DFDN
ACD DN	=	The new default ACD DN to be entered

Query current options (POPT)

The command POPT enables supervisors and the senior supervisor to determine the current options in effect for each ACD DN. For each ACD DN specified, the following information is given:

FRRT	=	First RAN Route Number
FRTT	=	First RAN Route Time
SRRT	=	Second RAN Route Number
SRTO	=	Second RAN Route Time
MURT	=	Music Route
FORC	=	Whether or not Call Forcing is in effect
FCFT	=	Flexible Call Force timer
OBTN	=	Whether or not Observation Tone is given to an agent when being observed by a supervisor CHECK THIS ONE FOR OBSERVE AGENT SECURITY INTERACTIONS
SPCP	=	Whether or not the Separate Post Call-Processing option is in effect
NRRT	=	Night RAN Route
NITE	=	Night Forwarding Number if defined

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The format for this command is as follows:

POPT xxxx xxxx xxxx

Where:

xxxx	=	an ACD DN up to seven digits. "ALL" can be entered here to see the options applicable to *all* ACD DNs in the customer's operation.

Query current parameters (PPAR)

The command PPAR enables the senior supervisor or supervisors to query the current parameters associated with each ACD DN. For each ACD DN specified, the following information is given:

MAXP	=	Maximum number of Positions assigned
TSFT	=	Telephone Service Factor Time, in seconds
TLDA	=	Calls Waiting Threshold
TLDB	=	Busy Threshold
TLDC	=	Overflow Threshold
TLDD	=	Time Overflow Threshold
SQ01	=	First Overflow target queue
SQ02	=	Second Overflow target queue
SQ03	=	Third Overflow target queue
IFDN	=	Interflow number

The format for this command is as follows:

PPAR xxxx xxxx xxxx

Where:

xxxx	=	an ACD DN up to seven digits. "ALL" can be input to see the values in effect for all ACD DNs in the customer's operation.

Select Route and Trunk Assignment (SRTA)

The Select Route and Trunk Assignment (SRTA) command assigns the terminating ACD DN for an auto-terminating ACD trunk. A CDN can be used as a valid auto-terminating ACD DN.

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Changing the terminating ACD DN for a trunk affects only those calls that seize the trunk after the ACD DN is changed. The input format for this command is as follows:

SRTA RAC MEM xxxx XXXX

Where:

RAC	=	Route Access Code (up to seven digits with DNXP)
MEM	=	Trunk Member number (1–126)
xxxx	=	current ACD DN/CDN where the trunk is assigned
XXXX	=	new ACD DN/CDN (up to seven digits with DNXP)

Select trunk Priority Assignment (SPRI)

The senior supervisor can assign individual ACD trunks to priority (1) or nonpriority (0) status with the following command:

SPRI RAC MEM x X

Where:

RAC	=	Trunk Route Access Code
MEM	=	Trunk Route Member number (1–126)
x	=	Current priority assignment (0 or 1)
X	=	New priority assignment (0 or 1)

Select Agent Position Assignment (SAPA)

The Select Agent Position Assignment (SAPA) command changes an individual agent's ACD DN queue assignment. The agent must enter the Make Set Busy (MSB) mode before the new assignment becomes effective.

The transfer does not occur (an error message is transmitted) if there is no room in the ACD position list at the time of execution.

More than one SAPA command can be outstanding at any one time, but only the final command is effective.

The format for this command is as follows:

SAPA XXXX yyyy YYYY

Where:

XXXX	=	Applicable Agent Position-ID
yyyy	=	The ACD DN to which the position is currently assigned
YYYY	=	The new ACD DN assignment

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In the ACD Package D environment, supervisors must not confuse Virtual Agent position functions with Actual Agent position operations.

With ACD Package D, the agent is not required to be in MSB mode to be assigned to another queue as the agent does for ACD Package C. If the ACD Package D agent has a ringing call coming from the Time Overflow (TOF) queue while being moved, that ringing call is returned to the front of the TOF queue where it originated.

When Report Control is active, it is possible that agent moves are not reported for one or another queue.

Select Agent to Supervisor Assignment (SATS)

The Select Agent to Supervisor Assignment command (SATS) enables the senior supervisor to reassign an agent position from the Agent key on one supervisor position to an Agent key on another supervisor position. Agent keys are assigned through LD 11. This command does not operate on CDN queues.

The format for this command is as follows:

SATS XXXX yyyy zz YYYY ZZ

Where:

XXXX	=	Position ID for the agent to be reassigned
yyyy	=	The supervisor Position ID where the agent position is currently assigned
zz	=	The Agent key on the supervisor's telephone where the agent position is currently assigned
YYYY	=	The new supervisor Position ID. A value of **X** removes the agent from the current supervisor without assigning a new supervisor.
ZZ	=	The Agent key on the new supervisor's telephone

A supervisor who lacks telephone Agent keys must press a carriage return instead of a key number when using SATS to assign an agent to a supervisor.

First RAN Route Assignment (FRRT)

The First RAN Route Assignment (FRRT) command specifies (for each ACD DN) the trunk route access code for the first Recorded Announcement (RAN). If a CDN is the command target, "**CDN**" appears on the command line. For example, if 8976 is a CDN, "FRRT 8976 **CDN**" appears.

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The format for this command is as follows:

FRRT XXXX yyyy YYYY

Where:

XXXX	=	Applicable ACD DN/CDN up to seven digits with DNXP. If EAR is equipped, then XXXX can be a CDN.
yyyy	=	Current first RAN route access code
YYYY	=	New first RAN route access code of up to four digits. A value of **X** removes the first RAN feature from the ACD DN.

First RAN Route Time (FRTT)

The First RAN Route Time (FRTT) indicates how many seconds an incoming ACD call can remain unanswered before receiving first RAN. If a CDN is specified as the command target, the command displays "**CDN**" on the command line. For example, if 8976 is a CDN, "FRTT 8976 **CDN**" appears.

The format for this command is as follows:

FRTT XXXX yyyy YYYY

Where:

XXXX	=	Applicable ACD DN/CDN (up to seven digits with DNXP). If EAR is equipped, then XXXX can be a CDN.
yyyy	=	Current first RAN time
YYYY	=	New first RAN time in seconds (0–2044)

Second RAN Route Assignment (SRRT)

The Second RAN Route Assignment (SRRT) command specifies the trunk route access code for the second RAN for each ACD DN. If the target of the command is a CDN, the output "**CDN**" appears on the command line. For example, if 8976 is a CDN, "SRRT 8976 **CDN**" appears.

The format for this command is as follows:

SRRT XXXX yyyy YYYY

Where:

XXXX	=	Applicable ACD DN/CDN up to seven digits with DNXP. If EAR is equipped, then XXXX can be a CDN.
yyyy	=	Current second RAN route access code
YYYY	=	New second RAN route access code. A value of **X** removes the second RAN feature from the ACD DN.

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Second RAN Route Time Option (SRTO)

The Second RAN Route Time Option (SRTO) command indicates how many seconds should elapse between first and second RAN. If the command target is a CDN, the output "**CDN**" appears on the command line. For example, if 8976 is a CDN, "SRTO 8976 **CDN**" appears.

The command format is as follows:

SRTO XXXX yyyy YYYY

Where:

XXXX	=	Applicable ACD DN/CDN up to seven digits with DNXP. If EAR is equipped, then XXXX can be a CDN.
yyyy	=	Current Second RAN time
YYYY	=	New second RAN time in seconds (0–2044)

Night RAN Route Assignment (NRRT)

The Night RAN Route Assignment (NRRT) command specifies the trunk route access code for the night RAN.

The format for this command is as follows:

NRRT XXXX yyyy YYYY

Where:

XXXX	=	Applicable ACD DN up to seven digits
yyyy	=	Current night RAN access code
YYYY	=	New night RAN access code up to four digits. A value of **X** disables Night Forwarding.

Night Forwarding number assignment (NITE)

The NITE command designates a forwarding number to use when the ACD is in Night Service or when all ACD telephones are in the Make Set Busy mode. A CDN cannot have Night Service; it defaults to the default ACD DN.

The command format is as follows:

NITE XXXX yyy ... y YYY ... Y

Where:

XXXX	=	Applicable ACD DN (up to seven digits with DNXP)

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yyy ... y	=	Current Night Forward number
YYY ... Y	=	New Night Forward number, up to 23 digits including the asterisk (*) to indicate dialing pause where required. A value of **X** disables Night Forwarding.

Pauses are supported on analog and DTI trunks but are not supported on ISDN trunks. The asterisk (*) used to introduce a pause is supported on analog and DTI trunks but is not supported on ISDN trunks.On ISDN trunks, if OPAO is enabled, the asterisk (*) is outpulsed as a called-party digit.

If EAR is equipped, use the following:

XXXX	=	Applicable ACD DN; it *cannot* be a CDN
yyy...y	=	It can be a CDN
YYY...Y	=	It can be a CDN

The Average Speed of Answer (ASA) field is not updated when the ACD queue goes into night service or during the 30-second display of ongoing status. ASA is updated when the next report is issued.

Automatic Overflow Target DN (SQ01, SQ02, SQ03)

The following commands define or change up to three target ACD DNs for the Automatic Overflow feature. Specifying **X** for a new target ACD DN deletes it, replacing it with the next choice, if applicable. For instance, if **X** is specified for the target ACD DN for SQ02, the target ACD DN specified for SQ03 becomes the SQ02 target ACD DN. The formats of the commands are as follows:

SQ01 WWWW xxxx XXXX

SQ02 WWWW yyyy YYYY

SQ03 WWWW zzzz ZZZZ

Where:

WWWW	=	ACD DN for the source queue up to seven digits
xxxx	=	Current first target ACD DN
XXXX	=	New first target ACD DN
yyyy	=	Current second target ACD DN
YYYY	=	New second target ACD DN
zzzz	=	Current third target ACD DN
ZZZZ	=	New third target ACD DN

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Automatic Overflow thresholds (TLDA, TLDB, TLDC)

The TLDA, TLDB, and TLDC commands enable adjustments to Calls Waiting (CWTH), Busy (BYTH), and Overflow (OVTH) thresholds, respectively.

- Specifying **X** as the new threshold for TLDA reduces the threshold to 1, thus the Calls Waiting lamp lights when any call is waiting.
- Specifying **X** as the new threshold for TLDB reduces the threshold to 0, preventing acceptance of any calls overflowed from another ACD DN.
- Specifying **X** as the new threshold for TLDC increases the threshold to its maximum value (2047) and prevents any calls from overflowing out of the ACD DN.
- If CCR is equipped and the CDN is in the controlled mode, the CDN is also supported by the TLDA, TLDB, and TLDC commands.

The Overflow threshold command formats are as follows:

TLDA XXXX yyyy YYYY

TLDB XXXX yyyy YYYY

TLDC XXXX yyyy YYYY

Where:

XXXX	=	Applicable ACD DN (up to seven digits with DNXP)
yyyy	=	Current threshold value
YYYY	=	New threshold value (0–2047)

Time Overflow threshold (TLDD)

The TLDD command enables the supervisor to configure, change, or clear the Time Overflow Timer (TOFT) for an ACD DN.

The Time Overflow threshold command format is as follows:

TLDD XXXX NONE YYYY (The TOFT value can be 2–1800 seconds.)

TLDD XXXX yyyy YYYY (change TOFT value)

TLDD XXXX YYYY X (delete TOFT value)

Where:

XXXX	=	ACD DN
NONE	=	TOFT is undefined; calls do not overflow for this DN
yyyy	=	Current threshold timer
YYYY	=	New threshold timer

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After the Time Overflow Timer (TOFT) has been defined, the target ACD DNs of this ACD DN can answer ACD DN calls. If one of the target ACD DNs is already answering the maximum 6 source queues, an error message appears showing the affected target ACD DN (ACD103). The supervisor must remove the affected target ACD DN from one of the source ACD DNs before defining the TLDD value.

Configure the Interflow DN (IFDN)

This command indicates, for each ACD DN, the destination DN for ACD calls when the Interflow feature is active. The command format is as follows:

IFDN XXXX yyy ... y YYY ... Y

Where:

XXXX	=	Applicable ACD DN, up to seven digits if DNXP
yyy ... y	=	Current Interflow DN/ACD can be any Interflow DN
YYY ... Y	=	New Interflow DN, up to 23 digits including the asterisk (*) to indicate a dialing pause. A value of **X** disables the Interflow feature even though an Interflow key might be assigned to a supervisor position.

If equipped with EAR, use the following:

XXXX	=	Applicable ACD DN; it *cannot* be a CDN
yyyy and YYYY	=	Can be a CDN

Pauses are supported on analog and DTI trunks but are not supported on ISDN trunks. The asterisk (*) used to introduce a pause is supported on analog and DTI trunks but is not supported on ISDN trunks.On ISDN trunks, if OPAO is enabled, the asterisk (*) is outpulsed as a called party digit.

Telephone Service Factor time (TSF)

This command configures or changes the value of **T** (in seconds) for the Telephone Service Factor (TSF). The command format is as follows:

TSFT XXXX yyy YYY

Where:

XXXX	=	Applicable ACD DN up to four digits (seven if DN expansion is equipped)
yyy	=	Current value of **T**
YYY	=	New value of **T** in seconds (1–510)

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Configure Agent Priority (SAGP)

The Priority Agent feature enables ACD agents to handle calls based on system-defined priorities for each ACD DN or ACD DN group. The Priority Agents package (116) must be implemented.

The SAGP command enables the manager to configure and change an agent's priority to receive calls based on the Agent's Position ID (POS-ID).

If the Agent's POS-ID is not defined, an error code appears. The command format is as follows:

SAGP ZZZZ pp PP

Where:

ZZZZ	=	POS-ID
pp	=	Old Priority set
PP	=	New Priority set

Ranges for Agent Priorities:

- 1–48 for CS 1000M HG, CS 1000M SG, Meridian 1 PBX 61C, CS 1000M MG, Meridian 1 PBX 81C
- 1–32 for all other machine types

List Agent Position Assignment (LAPA)

This command changes the ACD DN for up to 10 agents at a time. It can be executed only with the ACD-D package. The format to assign the ACD DNs is as follows:

LAPA XXXX yyyy yyyy yyyy. . . yyyy

Where:

XXXX	=	ACD DN; up to seven digits if DNXP
yyyy	=	agent position ID (limited to 10)

List Agent Priority (LAGP)

The Priority Agent feature enables ACD agents to handle calls based on system-defined priorities by an individual ACD DN or a group of ACD DNs. The Priority Agents package (package 116) must be implemented.

The LAGP (List Agent Priority) command defines Priority Agent Groups, enabling up to 10 agents in the same Priority Agent Group. It can be executed only with the ACD-D package.

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This command configures and changes a Priority Agent Group's priority and member list based on Position ID (POS-ID). The command format to change a priority or group list is as follows:

LAGP pp XXXX XXXX XXXX . . . XXXX

Where:

pp	=	Priority for the Group
XXXX	=	Agent POS-IDs for group members (up to 10)

Ranges for Agent Priorities:

- 1–48 for CS 1000M HG, CS 1000M SG, Meridian 1 PBX 61C, CS 1000M MG, Meridian 1 PBX 81C
- 1–32 for all other machine types

Enable Call Force (FORC)

Call Force automatically connects a call with an idle agent and determines the time delay (default is 2 seconds) between call disconnection and placement in the idle agent queue. (See "Enable Flexible Call Force (FCFT)" (page 102).) ACD Package B must be installed and implemented.

The FORC command enables or disables the Call Force feature. To enable the Call Force feature, enter the following:

FORC XXXXXXX no YES

Where:

XXXXXXX	=	The applicable ACD DN (up to seven digits)
no	=	Output by the system meaning Call Force is currently disabled
YES	=	Input by the user to indicate enable Call Force

If a carriage return is entered, the feature remains disabled.

To disable the Call Force feature, enter the following:

FORC XXXXXXX yes NO

Where:

XXXXXXX	=	The applicable ACD DN (up to seven digits)
yes	=	Output by the system indicating Call Force is enabled
NO	=	Input by the user to disable Call Force

If a carriage return is entered, the feature remains enabled.

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Enable Flexible Call Force (FCFT)

Flexible Call Force enables a time delay of 0–30 seconds. (See "Enable Call Force (FORC)" (page 101).) ACD Package B must be enabled to implement the FCFT command.

The FCFT command is as follows:

FCFT XXXXXXX nn NN

Where:

XXXXXXX	=	The applicable ACD DN (up to seven digits)
nn	=	Output by the system indicating the current delay time
NN	=	Input by the user to enter a new delay time

If a carriage return is entered, the current time does not change.

Print CDN Parameters and Options (PCPO)

The PCPO command prints parameters and options for the configured CDNs using this command:

PCPO CDN CDN . . . .CDN

or

PCPO ALL

Where:

CDN	=	The CDN Directory Number to be displayed
ALL	=	All CDN Directory Numbers in the system

The format for this printout from the PCPO command is shown in PCPO printout format.

Figure 3
PCPO printout format

CDN	CNTL	DFDN	CEIL	FRRT	FRTT	SRRT	SRTO	MURT	TLDA	TLDB	TLDC	TSFT
8976	YES	8900	20	3	10	6	16	15	1	0	2047	20

The following are the definitions and sizes of the fields:

CDN	=	CDN Directory Number, up to seven digits
CNTL	=	CDN in Controlled or Default mode (Yes = Controlled mode, No = default mode)
DFDN	=	Default ACD DN (must be a local ACD DN), up to seven digits

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CEIL	=	Call ceiling value, up to four digits
FRRT	=	First RAN route, up to four digits
FRTT	=	First RAN route time, up to four digits
SRRT	=	Second RAN route, up to four digits
SRTO	=	Second RAN route Time option, up to four digits
MURT	=	Music route, up to four digits
TLDA	=	Calls Waiting threshold, up to four digits
TLDB	=	Busy threshold, up to four digits
TLDC	=	Overflow threshold, up to four digits
TSFT	=	Telephone Service Factor, up to four digits

Configure the Call Ceiling (CEIL)

The CEIL command configures the CDN call ceiling value.

The command format is as follows:

CEIL CDN -- <Existing Ceiling value> -- CV

Where:

CEIL CDN	=	Configure the ceiling value for this CDN
<Existing Ceiling value>	=	Output by the system, current call ceiling
CV	=	The new ceiling value to be entered (0–2047)

Display Routing Tables (DSPL)

Use the DSPL command with Enhanced Overflow to review queue Routing Tables.

The command format is as follows:

DSPL (ACD DN)

displays all queue Routing Tables in the ACD system, including the following information:

ACD DN	ACD DN indicated by the DSPL command
Table	Day or Night Enhanced Overflow Table (Table D or N)
Entry	Entry number, from 1 to 20
Target ID	Overflow DN
Timer	Threshold value (in seconds) of this entry

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Status	Queue status, active or inactive (blank)
Registered	Success of last queue request, OK or blank

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ACD management reporting

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Introduction

ACD supervisors and senior supervisors can use the optional Management Reporting package to receive four management reports that describe agent, queue, and trunk activity. This chapter describes those reports, their fields, and other management reporting options available to supervisors.

Obtaining supervisor reports

An ACD supervisor can view statistical data using a terminal or teletypewriter (TTY) device from an ACD supervisor position. The terminal must be EIA RS-232-C-compatible and support the standard ASCII character set.

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The ACD supervisor display reflects the status of ACD queues and is updated every 30 or 60 seconds (specified through a service change). The supervisor can query schedules and printing options in addition to viewing the ACD information.

One senior supervisor position per customer has the ability to define and change report printing schedules and options. The periodic report schedules and options can also be defined through LD 23.

Periodic management reports can be scheduled for regular output on the hour, on the half hour, or less frequently. Report 3 is updated every 15 minutes. The four periodic management reports (REPT) contain statistics accumulated since the previous printing.

The four reports are as follows:

- REPT 1 Agent Group Report
- REPT 2 Queue Report (CDN)
- REPT 3 Trunk Routes Report (RAN)
- REPT 4 Agent Position Report

Before issuing report commands, see "Accessing the command mode" (page 80).

Report Control

Report control enables every ACD directory number (DN) or Control DN (CDN) to customize report generation. The decision to generate reports occurs at the system level, where the report option is set to ON or OFF. The following features apply to report control:

Control Directory Numbers. Control Directory Numbers (CDNs) are special DNs to be used with the Enhanced ACD Routing (EAR) feature. ACD Report Control applies to CDNs and ACD DNs.

Enhanced Overflow. Both the source and the target DNs must have the option turned on for accurate reports. For example, the source ACD DN has the option turned off and the target ACD DN has the option turned on. When a call overflows by count and is answered by the target DN, that call is pegged for the target DN but not for the source DN. For accurate reports, source and target ACD DNs should both be on. To use Enhanced Overflow with ACD-MAX, NACD is required on MAX. It is not possible to use enhanced ACD with ACD-D.

Network ACD. When calling across a network, both the local and remote ACD DNs must have the option turned on for reports to be balanced.

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Overflow by count. The source and target DNs must have the option turned on for accurate reports. For example, the source ACD DN has the option turned off and the target ACD DN has the option turned on. When an overflowed call is answered by the target DN, that call is pegged as answered for the target DN but not for the source DN, resulting in an inaccurate report.

Report commands. If the Daily Total report (DTOT) command or System Total report (STOT) commands are issued for a queue that has the option disabled, reports are not generated for these queues.

Time Overflow. Both the source and the target DNs must have the option turned on for accurate reports. For example, the source ACD DN has the option turned off and the target ACD DN has the option turned on. When a Time Overflowed (TOF) call is answered by the target DN, that call is pegged as answered for the target DN but not for the source DN.

The Report Control feature affects the following reports:

- **Report 1 (ACD DN report)**. When RPRT is yes for the specified ACD DN, this report is printed.
- **Report 2 (ACD queue report)**. When RPRT is yes for the specified ACD queue, this report is printed. For CDN reporting, RPRT is yes for CDNs.
- **Report 3 (trunk report)**. This report is not affected by the RPRT option. RPRT for CDN produces RAN reports for CDNs.
- **Report 4 (Agent report)**. When RPRT is yes for the specified ACD DN, any Agent activity, while belonging to this ACD DN, is printed. For newly created ACD DNs and CDNs, the default configuration is NO.
- **Daily Total report**. The RPRT option must be yes at the end of the reporting period for a report to be printed. If RPRT is set to yes for part of the reporting period but is turned to no for the rest of it, a report is not printed. If the option is set to no for part of the period, then turned to yes at the end of the reporting period, a report for the full day is printed.
- **Ongoing Status**. If RPRT is set to no, ongoing status reports are not printed.
- **Short report**. The short report is affected by the RPRT option. Several conditions are possible for the report to print or not to print. For example, Agent 1 is logged on to ACD DN 5512 and moves to ACD DN 5579. The

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report feature does not follow the agent, but is controlled by the DN. Table 20 "Report control settings" (page 108) shows a report example.

Table 20
Report control settings

ACD DN 5512 report control set to	ACD DN 5579 report control set to	Report printed for agent
YES	YES	YES
YES	NO	YES
NO	YES	YES
NO	NO	NO

Warning messages

Each printed periodic report contains a heading (ACD customer number, date, time) and warning messages (if any), followed by the reports that have been specified. One or more of the following warning messages can appear after the report heading:

SCHED CHG (Schedule Change). This message prints if the periodic reporting schedule has been changed (by the senior supervisor or by service change) since the last reporting period.

INIT (Initialize). This message prints if an initialization has occurred since the last reporting period. The periodic reports do not print because initialization erases all data. The accumulation areas are cleared to ensure accurate statistics for the next reporting period.

PER GT HR (Period Greater Than One Hour). This message prints if the time since the last reporting period exceeds one hour. For example, if the reporting schedule is configured from 0800 to 1600 daily, the 0800 report carries this warning message. This message indicates that data in some of the reported fields can be misleading. For example, the Average Agents Available (AVG AGTS) field is calculated assuming a maximum interval of 60 minutes. Similarly, other fields that involve the elapsed time can overflow and be reported inaccurately. Three fields are affected as follows:

- **AVG BUSY (Average Busy)**. The average time an agent position is busy on a call.
- **AVG MANNED (Average Manned)**. The average time an agent position is in Not Ready (NRD) state.
- **INC CCS (Incoming Centi Call Seconds)**. The number of CCS (Centi Call Seconds) used. See Report 3, Trunk Routes.

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If the calculation of a field requires division and the resulting number is greater than five digits, four asterisks (****) print instead. This also occurs when the calculation requires division by zero. Fields that are not applicable for that category have dots in the line entry.

Report data

This section includes sample management reports. These reports are examples only. The actual reports contain different data.

Table 21 "Periodic management report format" (page 110) shows what typical reports look like with averages. The report can also be printed to show totals.

Table 22 "Report 1: Agent Group Report field descriptions" (page 113) through Table 29 "Report 4: Position Report field descriptions" (page 124) provide a description of the data contained in each field of the Agent Group Report (REPT 1), Queue Report (REPT 2), Trunk Route Report (REPT 3), and Agent Position Report (REPT 4).

Data shown in the Calls Accepted field is based on the following:

- If a call is night forwarded, it is counted in the interflow field for the source ACD DN in the queue report.
- If the night forwarded number is an ACD DN, then calls accepted, answered, and abandoned, among other statistics, are reflected in the count for the terminating ACD DN. The call is not counted as call accepted against the source ACD DN.
- If a call is not night forwarded (whether or not night Recorded Announcement (RAN) is given), it counts as a call accepted or answered, among other things, against the source ACD DN. It does not count under the interflow field in this case.
- If the Time Overflow (TOF) feature is used, the calls accepted value includes answered time overflow calls from another queue. Calls to this ACD DN that another queue answers (by time overflow) are not counted.

Interactive Voice Response (IVR) queues are reported separately in Reports 1, 2, 4, and the Daily Totals Report. The IVR reports do not balance as other reports do.

Fields that are not applicable for a category have dots in the line entry.

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If a report is wider than 80 columns, it truncates on an 80-character printer. Reports wrap around on printers that can autowrap.

Table 21
Periodic management report format

ACD 001 1899 02 01

REPT 1

ACD DN	AVG AGTS	CALLS ANSWD	ASA	AVG DCP	AVG PCP	AVG WORK	AVG WAIT	DN CALLS	AVG TIME	# XFER		AVG TIME POSN	
										IDN	ACD	BUSY	MANNED
8800	2	11	14	47	171	218	37	4	16	1	1	1252	1145
8900	1	12	3	42	17	59	89	1	11	0	1	726	1800
6788	1	3	20	29	0	29	436	0	****	0	0	86	1394
8989	0	0	****	****	****	****	****	0	****	0	0	****	****
4		26	11	43	80	123	107	5	15	1	2	829	1526

IVR DN	AVG AGTS	CALLS ANSWD	ASA	AVG DCP	AVG PCP	AVG WORK	AVG WAIT	DN CALLS	AVG TIME	# XFER		AVG TIME POSN	
										IDN	ACD	BUSY	MANNED
8888	1	3	5	50	0	50	16	0	0	0	1	80	100
1	1	3	5	50	0	50	16	0	0	0	1	80	100

REPT 2

ACD DN	CALLS ACCPTED	RECALL TO SOURCE	ANSWERED LONGEST WT.	ANSWERED AVG. TIME	ABANDONED NO.	ABANDONED AVG. WT	TSF	TOF IN	TOF OUT	OVER FLOW	INTER FLOW BUSY
8800	17	0	48	3	26	64	0	3	5	3B	

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8900	14	4	9	1	14	100	3	0	0	2	
6788	3	0	30	0	****	33	0	0	1	0	
8989	0	0	0	0	****	0	0	0	0	0	
4	34	4	48	4	23	76	3	3	6	2 3B	
CDN	CALLS ACCPTED	CALLS ANSWERED		ABANDONED		TSF	ROUTE TO	DISC	BUSY	DFLT DN	
		NO	ASA	LONG WT	NO.	AVG. WT					
6800	7	0	****	0	0	****	0	0	0	0	7
6801	15	6	27	30	2	10	25	7	0	0	0
6802	3	0	****	0	0	****	0	0	0	3	0
3	25	6	27	30	2	10	25	7	0	3	7
IVR DN	CALLS ACCPTED	RECALL TO SOURCE		ANSWERED LONGEST WT.	TIME	ABANDONED NO.	AVG. WT	TSF	TOF IN	TOF OUT	OVER FLOW	INTER FLOW BUSY
8888	5	0		10		0	****	100	0	0	0	0
8887	2	0		2		1	30	50	0	0	0	0
2	7	0		10		1	30	75	0	0	0	0

REPT 3

ROUTE CODE	NO - OF - TRK		INC CALLS	INC CCS	OUT CALLS	ABANDONED		ANSWERED		ALL TRK BUSY		
	WORK	HPR				BEF-T	AFT-T	BEF-T	AFT-T	PEG	TOTAL	LONG
TIE-721	240	0	448	472	0	8	7	325	23	0	0	0
CO-711	48	0	1051	1244	0	9	0	959	17	0	0	0

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2	288	0	1499	1716	0	17	7	1284	40	0	0	0

INTERFLOW ROUTES

TIE-720	119	0		441	472	213		.....		6	202	68
1	119	0		441	472		213	.....		6	3	1

RAN ROUTES

RAN-789	3	...	22	2	.....	.....	.....	.....	.....	...	.....	.....
RAN-792	2	...	1	0	.....	.....	.....	.....	.....	...	.....	.....
2	5	...	23	2	.....	.....	.....	.....	.....	...	.....	.....

REPT 4

POS ID	CALLS ANSWD	AVG DCP	AVG PCP	AVG WAIT	DN INC	INC IME	DN OUT	OUT TIME	BUSY TIME	MANNED TIME	Q/AGT ID
ACD DN 8900											
433001	7	57	162	30	2	54	0	0	1588	1800	9999
680501	4	30	187	48	2	34	0	8	916	1110	7777
ACD DN 8800											
433504	12	42	17	89	1	14	0	8	726	1800	8888
ACD DN 6788											
681001	3	29	0	436	0	0	0	0	86	1394	6666
ACD DN 8989											
4	26	43	80	107	5	2	0	0	55	102	

POS ID	CALLS ANSWD	AVG DCP	AVG PCP	AVG WAIT	DN INC	INC TIME	DN OUT	OUT TIME	BUSY TIME	MANNED TIME	Q/AGT ID

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IVR DN 8888											
25	10	7	16	73	0	0	0	0	1 55	601	4444
1	10	7	16	73	0	0	1	0	1 55	601	1

Report 1: Agent Group Report

The IVR queue statistics are separated from the regular queue statistics and appended to Report 1.

Report 1 reflects the activity of the ports used for IVR.

- The CALLS ANSWD field increments when an IVR port answers a call queued to its ACD-DN by way of the ITR for IVR command. The ASA field reflects the time the call was queued, not the total duration.
- The # XFER field increments when a call is queued to the IVR queue in Not Customer Controlled Routing (CCR)-Handled mode, and the IVR port transfers or conferences the call. The # XFER field increments when the transfer or conference is complete

In addition, the CALLS ANSWD FIELD in Report 1 displays only the time spent in the ACD queue, not the time spent in the system (CDN). EAR calls are reflected in the CALLS ANSWD field if the calls are answered at the ACD DNs. CDN reports show information from the caller's point of view. For example, a call script could be written such that a call would wait 10 seconds before it is queued to an ACD DN. If the call then waited 10 more seconds before being answered, the wait time in the CDN would show 20 seconds and the wait time in the ACD DN would show 10 seconds.

Table 7 shows the Agent Group Report field descriptions for Report 1.

Table 22
Report 1: Agent Group Report field descriptions

Field title	Description
ACD DN (4 to 7 digits)	**Identification**. The ACD DN (up to seven digits) is given to identify the queue.
IVR DN	**Identification**. The IVR DN (up to seven digits) provides IVR treatment to incoming calls.
AVG AGTS (4 digits)	**Average Agents Available**. The sum of all Position Manned times for this queue, divided by the length of the reporting interval (for example, 1800 or 3600 seconds). This statistic is meaningless in reporting periods that last longer than 1 hour, such as the first report of the day. It is meaningless because the manned time can exceed the length of the reporting interval, thus indicating more agents than the actual number of agents.

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Field title	Description
CALLS ANSWD (5 digits)	**Incoming Calls Answered**. The number of ACD calls answered by an ACD agent position within the ACD DN.
ASA (4 digits)	**Average Speed of Answer**. This is the sum of all waiting times for all calls coming into the ACD queue (and answered), divided by the number of incoming calls answered, including Enhanced Overflow Calls from other queues, but not including Timed Overflow In-Calls from another queue nor Network ACD calls that are answered by a remote target agent. Even though Enhanced Overflow Calls are TOF In-Calls, they are included in the ASA calculation of the target queue in order to account for the time the call waited in the target's queue. (TOF In-Calls are calls answered by an agent of this queue because the call had been put in the TOF queue of another source DN and an agent of the other source DN.) The ASA value is changed because TOF In-Calls represent calls that are answered but not accepted by this ACD DN - which is the target queue of a TOF queue.
AVG DCP (4 digits)	**Average Direct Call-Processing (DCP) Time**. Average time (in seconds) that each agent spent handling ACD calls. Handling time is the time from initial answer of the call to final release of the call (see AVG HDCP). Average DCP time is the sum of all handling times, divided by the number of incoming calls answered by the group.
AVG HDCP (4 digits)	**Average Held Direct Call Processing Time (optional field)**. Average time (in seconds) that each agent spent with an ACD call placed on Hold. Handling time is measured from the time the agent puts the ACD call on Hold to the time the agent becomes active on the call again or the caller abandons the call. Average HDCP time is the sum of all ACD call hold times divided by the number of ACD calls answered by the group. When HDCP appears, AVG DCP time does not include the HDCP time; AVG DCP time is the time that the agents are active on the call, excluding holding time of ACD calls.
TOTAL HDCP (5 digits)	**Total Held Direct Call Processing Time (optional field)**. Total time in seconds spent with an ACD call on hold. The hold time is measured from the time that the agent puts the ACD call on Hold until the agent becomes active again on the ACD call or it is released by the caller. Total HDCP is the sum of all times that this agent position had ACD calls on Hold. When this field is displayed, TOTAL DCP time reflects only the time that the agent position was active on the ACD calls. If no calls are answered at this agent position, a zero is output for totals.
AVG PCP (4 digits)	**Average Post/Pre Call-Processing (PCP) Time**. Average time in seconds that each agent spent Not Ready per ACD incoming call. Average PCP time is measured from the time the agent goes into Not Ready (NRD key activated or the Not Ready SPRE code is entered), until the occurrence of any event that removes the agent from Not Ready. The average PCP time is the total time accumulated against all NRD states divided by the total number of ACD calls answered on this group (see Note).
AVG WORK (4 digits)	**Average Work Time**. Average time (in seconds) that each agent required to serve incoming ACD calls. This includes Direct Call-Processing, Held Direct Call-Processing (if options are selected), and Post/Pre Call-Processing times (see Note).

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Field title	Description
AVG WAIT (4 digits)	**Average Waiting Time**. This is the sum of all time that an agent was available to receive an ACD call divided by the number of incoming ACD calls answered (see Note).
DN CALLS (5 digits)	**Number of DN Call**. A peg count of the number of times that agents initiated or received a call on their individual DN keys. Transfer and conference keys are also included in this category.
AVG TIME (4 digits)	**Average DN Call Time**. This is the sum of all times from the initial selection of the individual DN key, including transfer and conference keys, to the final release of the call, divided by the number of these calls. The system accumulates only call time for one DN call per agent position at a time. It is not possible to add multiple simultaneous events as the total would exceed real clock time. This means that if an agent position has more than one DN key and the agent uses both at once, the reported DN call time is not accurate (cannot track both DN keys). Agent positions should be configured with only one DN key unless the customer is willing to forego the accuracy of DN call statistics.
AVG-TIME- POSN AVG. BUSY (5 digits) AVG MANNED (5 digits)	**Average Position Busy and Manned Time**. This is a two-part field. The AVG BUSY time is the sum of all Position Manned times, minus the sum of all waiting times, divided by the number of positions that had any Position Manned time accumulated against them. AVG BUSY time can also be considered as the sum of all busy time for the group, divided by the number of agent positions that accumulated manned time. AVG MANNED time is the sum of all Position Manned times, divided by the number of agent positions that had manned time accumulated. An agent position is considered manned when one of the following conditions exists: • The MAKE BUSY lamp is dark and the agent is logged in. • The MAKE BUSY lamp becomes lit while the agent is active on any call and the agent is logged in. • The agent position is in the Not Ready state and the agent is logged in. • The agent is logged in and has not entered the Make Set Busy SPRE code (for the 500/2500 agent telephones).

Note: AVG PCP, AVG WORK, and AVG WAIT fields can indicate abnormally high values if the number of calls the group answered is less than the average number of agents available. This tells the supervisor doing load management that the group was over-manned during the reporting period.

Report 2: Queue Report

Report 2 was modified by the Time Overflow feature. The following field types appear in the report:

- Recall to Source
- Answered Longest Wait Time

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- Time Overflow In and Time Overflow Out
- Supervisor Control of Queue Size

The Interflow and Busy reports are mutually exclusive, so a queue can have one or the other listed on the report. If an entry appears because a CCR IVR call abandons while queued to an IVR queue or presented to a busy treatment, the entry has a "B" beside the numbers. For the entry appearing for an interflow treatment, an "I" appears next to the number. The totals line appears split with the "B" and "I" labels indicating the busy and interflow totals independently. It also indicates calls that went to Night treatments if defined in the ACD DN.

If the configuration changes during the period covered by a single report, and calls have been treated with both options, a dual line display appears. The entries are designated with the "B" and "I" indicators. The Interflow or Busy treatment is determined in the service change.

RAN information is included in the RAN report section of Report 3.

CDN report CDN statistics are appended to Report 2. This report applies primarily to EAR and CCR calls. Only the CALLS ACCPTED, BUSY, and DFLT DN fields apply to EAR calls. Some fields apply to CCR only; some are reserved for future use.

Table 8 shows the CDN header format for Report 2.

Table 23
Report 2: CDN header format

CDN	CALLS ACCPTED	CALLS ANSWERED			ABANDONED		TSF	ROUTE BY		DISC	BUSY	DFLDN
		NO	ASA	LONG WT	NO.	AVG. WT		IVR	CCR			
6800	7	0	****	0	0	****	0	0	1	0	0	7
6801	15	6	27	30	2	10	25	1	1	0	0	0

The CALLS ANSWERED field is not incremented by a CCR IVR call if the call is placed in an IVR queue by way of an IVR command and answered at an IVR port. With this feature, the ROUTE TO field is split to include calls routed by IVR and calls routed by CCR. Calls routed by CCR are routed by way of the ITR for IVR command.
The ROUTE BY IVR field is incremented if the call is queued to receive IVR treatment and the IVR device initiates a call modification to another field.

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Table 9 shows the CDN appendix for Report 2.

Table 24
Report 2: CDN appendix

Field title	Description
CDN (4 to 7 digits)	**Control DN** This field shows the directory number (up to 7 digits) of the CDN.
CALLS ACCPTED (6 digits)	**Calls Accepted** The total number of calls entering the CDN and receiving controlled operation or default operation. This field is pegged as soon as a call enters a CDN. CALLS ACCPTED = CALLS ANSWERED NO + ABANDONED NO + ROUTE TO + DISC + BUSY +DFLT DN
CALLS ANSWER ED NO (5 digits)	**Number of Calls Answered** The number of calls that entered the CDN and were answered with the controlled operation.
ASA (4 digits)	**Average Speed of Answer** The average time, in seconds, that each answered ACD call had to wait for an answer. This value is the cumulative total of counts since the last periodic report time. It includes Enhanced Overflow calls, but not Time Overflow (TOF) In-Calls nor Network ACD calls from another queue. (TOF In-Calls are calls answered by an agent of this queue because the call had been put in the TOF queue of another ACD DN and an agent of this ACD DN was available to answer the call before an agent of the source ACD DN.) The ASA value is changed because TOF In-Calls represent calls that are answered but not accepted by this ACD DN—which is the target queue of a TOF queue.
LONG WT (8 digits)	**Longest Wait time** The longest time a call waited before answer in the CALLS ANSWERED NO field.
ABANDONED NO (3 digits)	**Number of Abandoned calls** The total number of calls accepted into the CDN but abandoned before being answered through the controlled operation.
AVG WT (4 digits)	**Average Wait** The total of all waiting times for abandoned calls divided by the number of calls abandoned in the ABANDONED NO field.
TSF (4 digits)	**Telephone Service Factor** The percentage of controlled calls answered or abandoned before the time threshold defined as the TSFT for the CDN.
ROUTE TO (4 digits)	**Routed calls** The number of controlled calls given a Route To command (and no additional processing).
DISC (4 digits)	**Forced Disconnect** The total number of controlled calls that were given forced disconnect by the system.
BUSY (4 digits)	**Forced Busy** The total number of controlled calls given the forced busy treatment by CCRM, including calls busied by the CDN call ceiling.
DFLT DN (4 digits)	**Default DN** The number of CDN calls that were sent to the default ACD DN.

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IVR Queues When a CCR call is queued to an IVR queue by the ITR for IVR command, the call appears in the CALLS ACCPTED report field. (If a CCR call enters the queue by means of a Queue To command, the call appears in the CALLS ACCPTED field only if it is answered by a queue agent.)

Data shown in the CALLS ACCEPTED field is based on the following:

- If a call is Night Forwarded, it is counted in the INTERFLOW field for the source IVR DN in the Queue report. If the Night Forwarded number is an IVR DN, then calls accepted, answered, or abandoned are reflected in the count for the destination IVR DN. The call is not counted as call accepted against the source IVR DN.
- If a call is not Night Forwarded, it counts as call accepted or answered against the source IVR DN. It does not count under Interflow in this case.
- If the Time Overflow feature is used, the Calls Answered value includes answered Time Overflow calls from another queue. Calls to this IVR DN that are answered by another queue (by means of Time Overflow) are not counted.

The ANSWERED LONGEST WT. TIME and TSF times reflect the time the call was queued to the IVR queue, not the total duration of the call.

Table 10 shows the IVR header format for Report 2. Table 11 shows the IVR appendix for Report 2.

Table 25
Report 2: IVR header format

IVR DN	CALLS ACCPTED	RECALL TO SOURCE	ANSWERED LONGEST WT. TIME	ABANDONED		TSF	TOF IN	TOF OUT	OVER FLOW	INTER FLOW BUSY
				NO.	AVG. WT					
8888	5	0	10	0	****	100	0	0	0	0
8887	2	0	2	1	30	50	0	0	0	0

Table 26
Report 2: IVR appendix

Field title	Description
IVR DN (4 to 7 digits)	**IVR Identification** The IVR DN (up to seven digits) provides IVR treatment to incoming calls.
CALLS ACCPTED (6 digits)	**Calls Accepted** The total number of calls placed in this IVR DN call queue, including any Overflow by Number calls from another IVR DN and the EAR calls routed by the default treatment to this IVR DN.

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Field title	Description
RECALL TO SOURCE (6 digits)	**Recall To Source** Increments when a call Time Overflows in the target IVR DN queue (because it previously Overflowed or Interflowed by number) and is recalled back to the source IVR DN to be linked to the source IVR DN's TOF queue. The source IVR DN to which the call is recalled has its Call Accepted value incremented..
ANSWERED LONGEST WT. TIME (8 digits)	**Longest Wait Time for Answered Calls** The longest time a call had to wait before being answered. This value could include Enhanced Overflow calls that were answered by a target agent, but does not include Time Overflow calls nor Network ACD calls answered by a target agent. It does include Recall to Source calls answered by a source agent. The Total line of all reports shows the Longest Wait Time for all ACD DNs. The hourly report shows the Longest Wait Time for that hour per ACD DN. It includes the EAR calls that were sent by the default treatment to this ACD DN.
ABANDONED NO. and AVG. WT (3 digits and 4 digits)	**Number of Calls Abandoned and Average Waiting Time for each call** The sum of all waiting times for caller-disconnected calls divided by the number of calls abandoned in this queue.Calls abandoned while being presented to an agent are included. Calls abandoned in the Time Overflow (TOF) queue are charged against the called IVR DN.
TSF (4 digits)	**Telephone Service Factor** Measures how quickly incoming calls are answered. The customer specifies the time T (in seconds) with a service change or by using the TSF command as described in "Telephone Service Factor time (TSF)" (page 99). The percentage of incoming calls answered or abandoned before T seconds is the TSF. A value of 100 means that all calls were answered or abandoned within T seconds. BT = calls Answered/Abandoned BEFORE T seconds AT = calls Answered/Abandoned AFTER T seconds TO = TOTAL of calls Answered or Abandoned (1) BT + AT = TO (2) BT ÷ TO = TSF Calls Time Overflowed and answered by target agents (TOF In-Calls) are included in these calculations because TOF In-Calls accumulate a Before T (BT) value. However, TOF In-Calls do not last in the target queue long enough to accumulate an After T (AT) value. Calls Time Overflowed from a source IVR DN (TOF-OUT) are not counted in this field because the TSF factor does not apply to calls answered by the source agent. The TSF field is upgraded when the next report is updated. The TSF field is not upgraded when the IVR queue goes into night service or during the 30-second display of ongoing status.

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Field title	Description
TOF IN (3 digits)	**Time Overflow Calls In** The number of calls redirected by the Time Overflow (TOF) feature. The TOF-IN field shows the number of calls that exceed a TOF Timer (TOFT), the number of Enhanced Overflow calls that exceeded the Enhanced Overflow table timer, and Network ACD calls that were answered by a remote target agent that overflowed by time into this ACD DN.
TOF OUT (3 digits)	**Time Overflow Calls Out** The number of calls redirected by the Time Overflow (TOF) feature. The TOF-OUT field shows the number of calls that exceed the TOFT and overflow by time to a target IVR DN.
OVERFLOW (5 digits)	**Calls Overflowed to Another Queue** The total number of calls redirected to another IVR DN with Automatic Overflow, excluding Time Overflow calls.
INTERFLOW BUSY (7 digits)	**Calls given standard Interflow treatment or calls given Busy tone** The number of calls treated as standard Interflow calls and calls given a busy tone by Supervisor Control of Queue Size. Interflow calls are indicated with an I appended to the entry; calls treated with the busy tone are noted with a B next to the entry. The Totals row lists both types of call treatment.

If a CCR IVR call resides in an IVR queue and an ACD queue agent becomes available, the call transfers from the IVR queue to the ACD agent. This is also true for ACD queue CCR IVR calls presented to an IVR port (applies to interruptible mode IVR only). The IVR-queue pegging shows the call as accepted. No other IVR Queue Report statistics are pegged for that call.

Table 12 shows the Queue Report field descriptions for Report 2.

Table 27
Report 2: Queue Report field descriptions

Field title	Description
ACD DN (4 to 7 digits)	**ACD Identification** Shows the ACD DN (up to seven digits) of the queue being reported.
IVR DN (4 to 7 digits)	**IVR Identification** The IVR DN (up to seven digits) provides IVR treatment to incoming calls.
CALLS ACCPTED (6 digits)	**Calls Accepted** The total number of calls placed in this ACD DN call queue, including any Overflow by Number calls from another ACD DN. Time Overflow calls from another ACD DN are not included. It includes the EAR and CCR calls routed by the default treatment to this ACD DN.
RECALL TO SOURCE (6 digits)	**Recall To Source** If a call Time Overflows while in the target ACD DN queue (because it previously Overflowed or Interflowed by number), then it is recalled back to the source ACD DN to be linked to the source ACD DN's TOF queue and the Recall To Source field increments. The source ACD DN Call Accepted value also increments.

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Field title	Description
ANSWERED LONGEST WT. TIME (8 digits)	**Longest Wait Time for Answered Calls** This field shows the longest time a call had to wait before being answered, excluding Time Overflow calls answered by a target agent but including Recall to Source calls answered by a source agent. The total line shows the Longest Wait Time for all ACD DNs. The hourly report shows the Longest Wait Time for that hour per ACD DN, including the EAR and CCR calls sent by default treatment to this ACD DN.
ABANDONED NO. and AVG. WT (3 digits and 4 digits)	**Number of Calls Abandoned and Average Waiting Time for each call** This number is the sum of all waiting times for caller-abandoned calls, divided by the number of abandoned calls. The sum includes calls abandoned while being presented to a target queue agent. Calls abandoned while in the Time Overflow (TOF) queue are charged against the called ACD DN.
TSF (4 digits)	**Telephone Service Factor** The TSF measures how quickly incoming calls are answered. The customer specifies the time T (in seconds) in a service change or by using the TSF command described in "Telephone Service Factor time (TSF)" (page 99). The percentage of incoming calls answered or abandoned before T seconds is the TSF. A value of 100 means that all calls were answered or abandoned within T seconds. BT = calls Answered/Abandoned BEFORE T seconds AT = calls Answered/Abandoned AFTER T seconds TO = TOTAL of calls Answered or Abandoned (1) BT + AT = TO (2) BT ÷ TO = TSF Calls Time Overflowed and answered by target agents (TOF In-Calls) are included in these calculations because TOF In-Calls accumulate a Before T (BT) value. However, TOF In-Calls do not last in the target queue long enough to accumulate an After T (AT) value. Calls Time Overflowed from a source ACD DN (TOF-OUT) are not counted in this field because the TSF factor does not apply to calls answered by the source agent. The TSF field is upgraded when the next report is updated. The TSF field is not upgraded when the IVR queue goes into night service or during the 30-second display of ongoing status.
OVERFLOW (5 digits)	**Calls Overflowed to Another Queue** The total number of calls redirected to another ACD DN by using Automatic Overflow, excluding Time Overflow calls.
INTERFLOW (7 digits)	**Calls Interflowed to Another DN** The total number of calls removed from this queue and directed to another (internal or external) DN by the interflow mechanism. This field does not include Time Overflow calls.

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Field title	Description
INTERFLOW BUSY (7 digits)	**Calls given standard Interflow treatment or calls given Busy tone** This field indicates the number of calls treated as standard Interflow calls and calls given a busy tone by the Supervisor Control of Queue Size feature. Interflow calls are indicated with an I appended to the entry; calls treated with the busy tone are noted with a B next to the entry. The Totals row lists both call types.
TOF IN (3 digits)	**Time Overflow Calls** In The number of calls redirected by the Time Overflow (TOF) feature. The TOF-IN field shows the number of calls that a TOF Timer (TOFT) overflows by time into this ACD DN.
TOF OUT (3 digits)	**Time Overflow Calls Out** The number of calls redirected by the Time Overflow (TOF) feature. The TOF-OUT field shows the number of calls that exceed the TOFT and overflow by time to a target ACD DN.
DELAY-ANN 1ST 2ND (4 digits each)	**First and Second RAN Count** They are reflected as RAN route accesses in the RAN report of Report 3, which also shows RAN access requested by EAR. These two fields show the number of times first and second Recorded Announcement (RAN) treatment was given during the reported period. A call can get only one First RAN treatment and one peg against DELAY-ANN 1ST. Each time that a call receives second RAN treatment, it is pegged against DELAY-ANN-2ND. The DELAY ANN 1ST and 2ND peg count does not necessarily equal the CALLS ACCPTD peg count. It is possible for a caller to hear RAN both before and after a transfer. In this case, the CALLS ACCPTD count would tally only one call while there are two DELAY ANN pegs.
THRESHOLDS CWTH BYTH OVTH	**Automatic Queue Overflow Thresholds** The three thresholds associated with Automatic Call Queue Overflow are: CWTH = Call Waiting Threshold BYTH = Busy Threshold OVTH = Overflow Threshold In newer loads, these threshold fields are replaced by TOF IN/TOF OUT field reports.

Report 3: RAN Report

REPT 3 includes RAN route information in the Interflow routes section. First and second RAN access is not pegged against the ACD DN queue.

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Table 28 "Report 3: Trunk Routes Report field descriptions" (page 123) gives information on the fields of Report 3.

Table 28
Report 3: Trunk Routes Report field descriptions

Field title	Description
ROUTE CODE (up to 7 digits)	**Trunk Route Identification** The trunk route access code and the type, for example, CO, FX, DID, CCSA, TIE, RAN, and WATS trunks. If the DN expansion package has been included, this field is three spaces longer.
NO-OF-TRK WORK HPR (4 digits)	**Number of Trunks** A snapshot of the number of trunks assigned and working, plus priorities, at report generation time. • ASSN The number of trunks (including non-ACD trunks) currently assigned to the trunk route. • WORK The number of trunks (including non-ACD trunks) that are currently enabled. • HPR The number of trunks currently given priority.
INC CALLS (6 digits)	**Total Number of Incoming Calls Offered** The total number of calls that came in on this trunk route (including non-ACD calls) during the report period. The total number of calls per ACD DN equals the total number of INC CALLS for all trunk routes terminating on the ACD DN. INC CALLS equals ABANDONED BEF-T AFT-T plus ANSWERED BEF-T AFT-T. Do not try to relate these fields to those of ACD-C reports 1 and 2 (CALLS ANSWD, CALLS ACCPT, and ABANDONED NO). These fields are auto-terminating trunks and reflect how the trunk was first handled (answered or abandoned).
INC CCS (5 digits)	**Total Incoming Traffic** The total incoming trunk traffic for the trunk route (in CCS) between seizure and disconnect (including non-ACD calls, if any). Only Route Code, No-of-Trunks Working, INC Calls, and INC CCS apply to the RAN report.
OUT CALLS (5 digits)	**Total Outgoing Calls** The total number of calls outgoing on this route. These are non-ACD calls, but could include outgoing calls made from the DN keys of the ACD agent positions.
OUT CCS (5 digits)	**Total Outgoing Traffic** The outgoing call traffic (in CCS) on the trunk route.
ABANDONED BEF-T AFT-T (5 digits) (6 digits)	**ACD Auto-Terminating Trunk Calls Abandoned** Two peg counts of calls abandoned showing how many were abandoned before and after the time T used for TSF. The value used for T depends on the trunk involved and on which queue that trunk terminates.The ABANDONED AFT-T field indicates the number of calls abandoned after a customer-defined Time Threshold.

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Field title	Description
ANSWERED BEF-T AFT-T (6 digits) (5 digits)	**ACD Auto-Terminating Trunk Calls Answered** The number of calls delayed longer than the customer-specified time is shown in the ANSWERED AFT-T field. The value for T is obtained from the ACD DN whose agent answered the call. If a call time overflows and is answered by a target ACD DN, the value of T configured for the target ACD DN is used. When the value of T is set to a minimum value such as 1, all calls encountering any delay are counted as having waited. The definition of calls that have waited too long can be adjusted by changing the T value.
ALL-TRK-BUSY PEG TOTAL LONG (4 digits) (5 digits) (4 digits)	**All Trunks Busy** The All Trunks Busy (ATB) information of the ACD Routes and the Interflow Trunk Routes at the time of report generation. PEG: The ATB peg count of the route TOTAL: The total duration of the ATB condition of the route in seconds LONG: The longest ATB duration of the route If a trunk busy condition exists beyond a single reporting period, that condition can be pegged for both periods. The ATB count can differ slightly from the other peg totals.

Report 4: Agent Position Report

All Report 4 time fields are reported as currently manned (or previously, if not currently manned). If the optional AGENT ID is used along with Short Reports, the Short Report shows all of the time for the agent position during the reported period.

If an agent is involved in a conference call or an IDN call, or is transferring a call when the report is generated, the OUT TIME field includes the call start time minus the current time.

IVR ports statistics are separated from non-IVR agent position statistics as shown in Table 26 "Report 2: IVR appendix" (page 118).
Table 14 shows Position Report field descriptions for Report 4.

Table 29
Report 4: Position Report field descriptions

Field title	Description
POS ID (up to 7 digits)	**Identification** Shows the ACD POS ID of the agent being reported.
CALLS ANSWD (5 digits)	**Incoming Calls Answered at this Position** Total incoming calls, including Time Overflow calls to this agent position (TOF In-Calls).

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Field title	Description
AVG DCP or TOTAL DCP (5 digits)	**Average or Total Direct Call-Processing (DCP) Time** Handling time is the time between initial answer to the final release of the call (see Total HDCP). The Average DCP time is the sum of all handling times (the time between initial answer and the final release of the call) divided by the number of answered calls. The Total DCP time is the total of all the times the In-Calls key lamp was steadily lit, which is handling time minus total HDCP time. If no ACD calls were answered at this agent position, the average field contains asterisks (****); totals contains zeros.
TOTAL HDCP (5 digits)	**Total Held Direct Call-Processing Time** (Optional Field) The sum of all hold times, measured from the time that the agent places the ACD call on Hold until the agent reactivates the call or the caller disconnects. When this field appears, TOTAL DCP reflects only the time that the agent position was active on the ACD calls. If no calls are answered at this agent position, the totals field contains zeros.
AVG PCP or TOTAL PCP (5 digits)	**Average or Total Post/Pre Call-Processing Time** Average or total time, in seconds, that this position was in the Not Ready state, measured from the time that the agent activates the Not Ready key until any event that removes the position from Not Ready: for example, pressing the In-Calls key, pressing the Not Ready key again, or going active on any DN key. The average PCP time is the sum of all Not Ready times divided by the number of ACD calls answered at the agent position. The total PCP time is the total of all Not Ready state times. If no ACD calls were answered at this agent position, the average field displays asterisks (****) and the totals field displays zeros.
AVG WAIT or TOTAL WAIT (5 digits)	**Average or Total Waiting Time** Average or total time that the agent position was available to receive calls. The average wait time is the sum of all waiting time that the agent position was available to receive any call, divided by the number of ACD calls answered at this agent position. Total waiting time sums all waiting times for this agent position. If no ACD calls were answered at this agent position, the fields show asterisks (****); if there was no waiting a zero appears.
DN INC (4 digits)	**Total number of incoming calls** Shows the total number of incoming calls on the agent's DN key(s) during the report period.
INC TIME (4 digits)	**Total duration** The duration (in seconds) of all incoming calls on the agent's DN key(s) during the report period, timed from call answer to final call release. This does not include the time the IDN call was on hold.
DN OUT (4 digits)	**Total number of outgoing calls** The total number of outgoing calls from this agent position using DN, conference, or transfer keys. This field does not increment until the call is released.
OUT TIME (5 digits)	**Total time** Total time (in seconds) of all outgoing calls from this agent position timed from the initial DN activation to final call release. This does not include the time the IDN call was on hold.

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Field title	Description
BUSY TIME (5 digits)	**Total Position Busy Time** Total agent position manned time, minus the total waiting time shown in seconds.
MANNED TIME (6 digits)	**Total Position Manned Time** The sum of all manned time for all agent positions. Time is accumulated when an agent position is considered manned and the agent is logged in under one or more of the following conditions: • The MAKE BUSY lamp is dark and the agent is logged in. • The MAKE BUSY lamp becomes lit while the agent is active on any call and the agent is logged in. • The agent position is Not Ready and the agent is logged in.
AGT ID Q / P (4 digits)	**Agent Identification** (Optional Field) The ACD AGENT ID of the agent being reported. This field appears when Report Control in Service Change LD 23 defines the Short Report and Agent ID options as YES. If a new agent occupies the agent position, the ID of the previous agent appears, accompanied by an asterisk. If an agent is not logged in when the report is generated, the Agent ID does not appear in the report. One or more Short Reports with Agent ID are generated when one or more of the following conditions exist: • A new agent logs into an agent position that was manned by another logged-in agent. In this case the Q/AGT ID field shows the Agent ID of the previous agent. The line of statistics reflects data accumulated for the previously logged-in agent. • The position is moved from one ACD group (ACD DN) to another. In this case, the Q/AGT ID field displays the queue identification of the queue to which the agent was formerly assigned. • The priority of the agent at the time of printing appears under the Agent ID.

Ongoing Status Display

The Ongoing Status Display is presented on the Video Display Terminal (VDT) display, and updated every 30 or 60 seconds, as specified through ACD Service Change. The Ongoing Status Display reports on both ACD DNs and CDNs for the customer.

EAR The TSF, ASA, and #CALLS IN QUEUE fields include EAR calls routed by the *default* treatment to the ACD DN since these calls are treated as if they had entered the queue directly. CDNs do not appear in the status display, as incoming CDN calls are routed to the default ACD DN immediately.

Ongoing Status report control determines if the ongoing status information is printed. If RPRT is no, ongoing status reports are not printed.

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An example of the Ongoing Status Display Output is shown in Table 30 "Ongoing Status Display format" (page 127).

Table 30
Ongoing Status Display format

ACD DN	TSF	ASA	# CALLS IN QUEUE	# POS MANNED	# POS DCP	# POS PCP	# POS WTG	# POS NON ACD	# VIRTUAL CALLS QD
2222	100	2	0	1	0	1	0	0	0
5555	46	120	8	1	1	0	0	0	0
ACD DN	TSF	ASA	# CALLS IN QUEUE	# POS MANNED	# POS DCP	# POS PCP	# POS WTG	# POS NON ACD	# VIRTUAL CALLS QD
2222	100	2	0	1	0	1	0	0	0
5555	45	184	7	2	2	0	0	0	0
ACD DN	TSF	ASA	# CALLS IN QUEUE	# POS MANNED	# POS DCP	# POS PCP	# POS WTG	# POS NON ACD	# VIRTUAL CALLS QD
2222	100	2	0	1	0	1	0	0	0
5555	44	242	6	3	3	0	0	0	0
ACD DN	TSF	ASA	# CALLS IN QUEUE	# POS MANNED	# POS DCP	# POS PCP	# POS WTG	# POS NON ACD	# VIRTUAL CALLS QD
2222	100	2	0	3	1	1	1	0	0
5555	44	296	5	4	4	0	0	0	0
ACD DN	TSF	ASA	# CALLS IN QUEUE	# POS MANNED	# POS DCP	# POS PCP	# POS WTG	# POS NON ACD	# VIRTUAL CALLS QD

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2222	100	2	0	3	1	1	1	0	0
5555	44	296	5	4	4	0	0	0	0

CCR Ongoing Status Display appears for CDNs if it is in the controlled mode.

The Queue To command sends CCR calls to an ACD DN. The ACD DN #CALLS IN QUEUE field does not include the CCR calls. The TSF and ASA fields include only CCR calls answered by agents of this ACD DN.

If the CCR feature is used, the Ongoing Status Display reports on both ACD DNs and CDNs for the customer. CDNs have values only in the TSF, ASA, and #CALLS IN QUEUE fields; all other fields contain asterisks.

The fields are as follows:

- # CALLS IN QUEUE reflects the total controlled calls in the system that originated from this CDN.
- TSF indicates the percentage of controlled calls answered or abandoned before a certain threshold (TSFT).
- ASA displays the average speed of answer for the calls that entered this CDN and were answered through the controlled operation.

If load management or error conditions change the CDN to default mode from controlled mode, the Ongoing Status still appears. The Ongoing Status Display does not show the CDNs if they are always in the default mode. Abnormal conditions that divert new calls to the default ACD DN prevent the CDN #CALLS IN QUEUE field from incrementing until a Start Up message is received, although the CDN continues to appear on the Ongoing Status report.

Table 16 shows Ongoing Status Display field descriptions. An example of the Ongoing Status Display Output for CCR CDNs is shown in Table 32 "CCR Ongoing Status Display field descriptions" (page 130).

Table 31
Ongoing Status Display field descriptions

Field title	Description
ACD DN (4 to 7 digits)	**Identification** The ACD DN of the queue being reported.

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Field title	Description
TSF (3 digits)	**Telephone Service Factor** The percentage of incoming calls answered or abandoned before T seconds. The customer specifies the time T in seconds with a service change or the TSF command as described in "Telephone Service Factor time (TSF)" (page 99). A value of 100 means that all calls were answered or abandoned within T seconds. BT = calls Answered/Abandoned BEFORE T seconds AT = calls Answered/Abandoned AFTER T seconds TO = TOTAL of calls Answered or Abandoned (1) BT + AT = TO (2) BT ÷ TO = TSF Calls Time Overflowed and answered by target agents (TOF In-Calls) are included in these calculations because TOF In-Calls accumulate a Before T (BT) value. However, TOF In-Calls do not last in the target queue long enough to accumulate an After T (AT) value. Calls Time Overflowed from a source ACD DN (TOF-OUT) are not counted in this field because the TSF factor does not apply to calls answered by the source agent.
ASA (3 digits)	**Average Speed of Answer** The average time, in seconds, that each answered ACD call had to wait for an answer, excluding Time Overflow (TOF) In-Calls from another queue that were answered by an agent of this queue because an agent of this ACD DN was available before an agent of the source ACD DN was. The ASA value changes because TOF In-Calls reflect calls that are answered but not accepted by this ACD DN, the target queue of a TOF queue.
# CALLS IN QUEUE (5 digits)	**Number of Calls in Queue** The number of calls awaiting service in this queue, but not yet connected to an agent position. This includes calls in the Time Overflow queue and sent by a CDN with the default treatment.
# POS MANNED	**Number of Manned Positions** The number of agent positions associated with this queue for which the MAKE BUSY lamp is dark.
# POS DCP	**Agents Direct Call-Processing** The number of agent positions currently active on the In-Calls key, including those that have the ACD calls on Hold.
# POS PCP	**Agents Post Call-Processing** The number of agent positions currently in Not Ready state.
# POS WTG	**Positions Waiting** The number of agent positions currently available to receive an incoming ACD call.

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Field title	Description
# POS NON-ACD	**Positions on Non-ACD Calls**The number of agents active on a key other than the In-Calls key.
# VIRTUAL CALLS QD	**Number of Virtual Calls Queued** The number of Source Time Overflow, Call Request Queue, and CCR calls in queue. Virtual calls include Timed Overflow, Enhanced Overflow, and Customer Controlled Routing calls.

Table 32
CCR Ongoing Status Display field

Field title	Description
TSF (3 digits)	**Telephone Service Factor** The percentage of CCR calls in controlled mode that were answered or abandoned before the TSF threshold.
ASA (3 digits)	**Average Speed of Answer** The average speed of answer for the calls that entered this CDN and were answered through the controlled operation.
# CALLS IN QUEUE (5 digits)	**Number of calls in queue** The total controlled CDN calls in the system that originated from this CDN. If an abnormal condition occurs (for example, the link goes down), new calls are diverted to the default ACD DN. If this happens, the CDN still appears on the ongoing status report, but the #CALLS IN QUEUE field for the CDN does not increment until a Start Up message is received from the CCRM application module. The #CALLS IN QUEUE field for the ACD DNs does not include CCR calls. CCR calls are calls that are queued to an ACD DN by a Queue To command from the CCRM application module. The TSF and ASA fields include the CCR calls only if they were answered by agents of this ACD DN. The #CALLS IN QUEUE field for the CDN increments when calls enter the CDN and are controlled by the CCRM application.

Asterisks appear in the # VIRTUAL CALLS QD field because a CDN cannot have virtual calls queued to it. In Table 33 "CCR Ongoing Status Display field description for CCR CDN (5555)" (page 130), all fields shown with asterisks do not apply for CDNs.

Table 33
CCR Ongoing Status Display field for CCR CDN (5555)

ACD DN	TSF	ASA	#CALLS IN QUEUE	#POS MANNED	#POS DCP	#POS PCP	#POS WTG	#POS NON-ACD	#VIRTUAL CALLS QD
2222	100	2	5	1	0	1	0	0	0
5555	46	50	10	****	****	****	****	****	****

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Short reports

A short report prints after an agent logs in to an agent position occupied earlier in the reporting period by another agent. The report contains the statistics accumulated for the old agent before the move. New statistics begin accumulating on the new agent as soon as the move occurs.

Short Reports are also generated when the physical position is moved to another queue by using the SAPA Load Management Command as described in "Select Agent Position Assignment (SAPA)" (page 93).

An Agent Position Report (indicating a Short Report) is shown in Table 34 "Report 4: Short Report" (page 131). The Short Report prints as agent 15 logs into position 3832, which was previously occupied by agent 11. Note that this report reflects the work performed by agent 11 while occupying this position. The next regularly scheduled Report 4 indicates the work performed by agent 15 during the remainder of the reporting period. The system totals line includes the work performed by agent 11. Table 19 shows a Short Report for Report 4.

Table 34
Report 4: Short Report

POS ID	CALLS ANSWD	AVG DCP	AVG PCP	AVG WAIT	DN INC	INC TIME	DN OUT	OUT TIME	# XFER IDN	# XFER ACD	BUSY TIME	MANNED TIME	AGT ID Q/P
3832	8	152	12	20	0	0	0	0	0	2	1865	2403	1 1A

Letters indicate how the agent position was changed:
A = Agent logout/login
P = Agent's priority changed using SAGP/LAGP command
Q = Agent moved to new queue using SAPA/LAPA command

Enhanced daily totals

The customer can schedule cumulative Enhanced Reports 1, 2, 3, and 4 for the end of each daily period. The report format is the same as that for the hourly/half-hourly reports, but the averages and totals reflect a 24-hour period, defined by start and end times. A start and end time of 0 hours enables reports to be printed at midnight. The system total line of statistics is included in each daily report.

For Report 1, the fields DN CALLS, BUSY TIME, and MANNED TIME show the total of all the individual reports (total number of DN calls and total of AVG and MANNED times). The # XFER IDN and ACD fields reflect totals,

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as in other scheduled reports. The other fields are the averages of the information on all the individual reports, except for ABANDONED AVG WT and TSF, that are the averages of all the individual reports.

For Report 3, if the DN Expansion package is included, the ROUTE CODE field is three spaces larger. The result is more than 80 columns in each report. For both situations, the reports are not completely shown if the printer is an 80-character printer. Table 34 "Report 4: Short Report" (page 131) through 17 show typical report formats.

The senior supervisor can issue two commands to see daily and system totals: DTOT and STOT.

DTOT
This command, followed by the desired report number, issues a Daily Totals report on the senior supervisor's terminal. Statistics shown are those accumulated since the beginning of the current daily period to the current time and include system totals for each requested report. If an initialization occurs in the reporting period, an INI00 message is presented preceding the DTOT report. The command format is as follows:

DTOT X

Where X = Report number (1, 2, 3, or 4)

After the ACD report for Report 2 is printed, a new CDN report is appended to the end of the ACD Report 2.

STOT This command, followed by the desired report number, issues a System Totals report on the senior supervisor's terminal. Statistics shown are those accumulated since the last hourly/half-hourly report. If an initialization occurred in the reporting period, a message is presented before the STOT report. The command format is as follows:

STOT X

Where X = Report number (1, 2, 3, or 4)

After the ACD report for Report 2 prints, a new CDN report is appended to the end of the ACD Report 2. For information about the Time Overflow feature, see "Time Overflow threshold (TLDD)" (page 98).

If the ACD Report Control feature is enabled and reports for all ACD DNs are turned off, the only report printed is Report 3, Trunks.

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Table 35 "Enhancements to Report 1: Agent Group Report added field description" (page 133) through Table 37 "Enhancements to Report 4: Position Report added field description" (page 134) provide a description of the new data fields contained in the Enhanced Reports feature.

Table 35
Enhancements to Report 1: Agent Group Report added field description

Field title	Description
# XFER IDN # XFER ACD (4 digits each)	**Number of Calls Transfer/Conference** This is a two-part field. # XFER IDN is the sum of all calls the agent transferred or conferenced while on an active IDN call. # XFER ACD is the sum of all calls the agent transferred or conferenced while on an active ACD call.

Table 36
Enhancements to Report 3: Trunk Routes Report, modified field description

Field title	Description
NO-OF-TRK WORK HPR (4 digits each)	**Number of Trunks** The number of trunks working and the priority setting at the time of report generation: • WORK: The number of trunks, including non-ACD trunks, that are currently enabled • HPR: The number of trunks currently given priority
ALL-TRK-BUSY PEG TOTAL LONG (4 digit) (5 digit) (4 digit)	**All Trunks Busy** The All Trunks Busy (ATB) information of ACD Routes and Interflow Trunk Routes at the time of report generation: • PEG: ATB peg count of the route • TOTAL: Total duration of the ATB condition of the route in seconds • LONG: The longest ATB duration of the route If a trunk busy condition exists beyond a single reporting period, that condition can be pegged for both periods. Therefore, ATB count can differ slightly from other peg totals.

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Field title	Description
INTERFLOW ROUTES	**Interflow Trunk Routes** Interflow route activity. Interflow trunk routes are defined in Service Change LD 14 when RACD = YES.
RAN ROUTES	**RAN Trunk Routes** RAN route activity. To enable RAN reporting for a specific RAN route, the RACD (LD 16) for that RAN route must be set to YES. If it is set to NO, the statistics for that RAN route are not printed.

Table 37
Enhancements to Report 4: Position Report added field description

Field title	Description
# XFER IDN # XFER ACD (4 digits each)	**Number of Calls Transfer/Conference** This is a two-part field. # XFER IDN is the sum of all calls transferred or conferenced that were originated by the agent while on an active IDN call. # XFER ACD is the sum of all calls transferred or conferenced that were originated by the agent while on an active ACD call. When the Total (TOT4) option is enabled, the BUSY TIME field is eliminated to give room for this column. The time associated with the calls is displayed in the OUT TIME field.

The Daily Totals Report separates IVR statistics and CDN reporting changes. The print format is the same as that of the regular reports. The daily report data reflects the totals and averages of the data accumulated over the daily reporting period

Daily system totals

A line of statistics prints at the bottom of each report, showing system totals for all report data for all ACD DN/Pos IDs in a customer's ACD operation.

A few of the report data items do not have system totals or have system totals expressed in different units from those of the individual fields. The discrepancies between individual fields and total fields are listed by report as follows:

Report 1 Agent Group The ACD DN field reflects the total number of ACD DNs. Data for the AVG AGTS field does not appear because it represents a customer decision, not ACD group performance.

Report 2 Call Queue The ACD DN field reflects the total number of ACD DNs.

CDN statistics are appended to the end of Report 2 and have a different header. CDN reports detail the treatment of all calls that enter the CDN. For detailed information on this report, refer to Table 24 "Report 2: CDN appendix" (page 117).

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Report 3 Trunk Routes The numbers reflect the total number of trunks reported on the system. Report fields include the ROUTE CODE that shows all trunks that auto-terminate on all customer ACD DNs, Interflow Routes, and RAN Routes.

Report 4 Agent Position The number shown in the Pos ID field represents the total number of Pos IDs in the customer's operation. Data for the INC TIME, OUT TIME, BUSY TIME, and MANNED TIME fields are expressed in minutes. Other fields are expressed in seconds. System totals for all total fields are expressed in minutes, while system totals for all average fields are expressed in seconds. The AGT ID field is not reported as it would show the same total as the Pos ID.

The maximum total MANNED TIME supported is 18 hours, 12 minutes, and 15 seconds (65535 seconds total).

STOT This command, followed by the desired report number, issues a System Totals report on the senior supervisor's terminal. Statistics in the report(s) are those accumulated since the last hourly/half-hourly report. Table 23 shows the format of typical periodic reports.

Table 38
Format of typical periodic report

ACD 001			1899 02 01										
REPT 1													
ACD DN	AVG AGTS	CALLS ANSWD	ASA	AVG DCP	AVG PCP	AVG WORK	AVG WAIT	DN CALLS	AVG TIME	# XFER		AVG TIME POSN	
										IDN	ACD	BUSY	MANNED
8900	2	11	14	47	171	218	37	4	16	1	1	1252	1455
8900	1	12	3	42	17	59	89	1	11	0	1	726	1800
6788	1	3	20	29	0	29	436	0	****	0	0	86	1394
8989	0	0	****	****	****	****	****	0	****	0	0	*****	*****
4		26	11	43	80	123	107	5	15	1	2	829	1526
REPT 2													

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ACD DN	CALLS ACCPTED	RECALL TO SOURCE	ANSWERED LONGEST WT. TIME	ABANDONED NO.	ABANDONED AVG. WT	TSF	TOF IN	TOF OUT	OVER FLOW	INTER FLOW
8900	17	0	48	3	26	64	0	3	5	3B
8900	14	4	9	1	14	100	3	0	0	2I
6788	3	0	30	0	****	33	0	0	1	0
8989	0	0	0	0	****	0	0	0	0	0
4	34	4	48	4	23	76	3	3	6	2I 3B

CDN	CALLS ACCPTED	CALLS ANSWERED NO	CALLS ANSWERED ASA	CALLS ANSWERED LONGWT	ABANDONED NO	ABANDONED AVGT	TSF	ROUTE TO	DISC	BUSY	DFLT DN
6800	7	0	****	0	0	*****	0	0	0	0	7
6801	15	6	27	30	2	10	25	7	0	0	0
6802	3	0	****	0	0	****	0	0	0	3	0
3	25	6	27	30	2	10	25	7	0	3	7

REPT 3

ROUTE CODE	NO - OF - TRK WORK HPR		INCCALLS	INCCCS	OUTCALLS	ABANDONED BEF-T	ABANDONED AFT-T	ANSWERED BEF-T	ANSWERED AFT-T	ANSWERED PEG	ALL TRK BUSY TOTAL	ALL TRK BUSY LONG
TIE-721	240	0	448	472	0	8	7	325	23	0	0	0
CO-711	48	0	1051	1244	0	9	0	959	17	0	0	0
2	288	0	1499	1716	0	17	7	1284	40	0	0	0

INTERFLOW ROUTES

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TIE-720		119	0	4 41	4 72	213	.....	.....		6	202	68	
1		119	0	4 41	4 72	213	.....	.....		6	3	1	
RAN ROUTES													
R AN-789		3	...	22	2	.....	.....	.....	.....	...	.....	.....	
R AN-792		2	...	1	0	.....	.....	.....	.....	...	.....	.....	
2		5	...	23	2	.....	.....	.....	.....	...	.....	.....	
REPT 4													
POS ID	CALLS ANSWD	AVG DCP	AVG PCP	AVG WAIT	DN INC	INC TIME	DN OUT	OUT TIME	# XFER IDN	# XFER ACD	BUSY TIME	MANNED TIME	AGT ID Q / P
ACD DN 8900													
433 0 01	7	57	1 62	30	2	54	0	0	0	0	1 58 8	180 0	9999
680 5 01	4	3-	1 98	49	2	34	-	9	1	1	9 16	111 0	7777
ACD DM 9900													
433 5 04	12	42	17	89	1	14	0	8	0	1	7 26	180 0	8888
ACD DN 6788													
681 0 01	3	29	0	4 36	0	0	0	0	0	0	86	129 4	6666
ACD DN 8989													
4	26	43	80	1 07	5	2	0	0	1	2	55	102	

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ACD system features

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Introduction

This section lists Automatic Call Distribution (ACD) system features in alphabetical order. Where applicable, feature names are followed by *Basic* if the feature is part of ACD basic features (ACD-A), package 45, or *Advanced* if it is part of ACD advanced features (ACD-B), package 41.

ACD Activity Codes for Not Ready State

Prior to the introduction of the Activity Codes for Not Ready State feature, an agent recorded call-related activities only during an active call. The Activity Codes for the Not Ready State feature enables an agent to use the existing Activity Code key to record activities while in the Not Ready State.

Operating parameters

This feature is designed only for telephones with display. This feature is not supported for analog (500/2500) telephones.

The Not Ready State is automatically invoked if the supervisor uses the following keys:

- Observe Agent
- Call Agent
- Answer Agent
- Answer Emergency

When these keys are used, the Activity Code key lamp does not flash.

The Activity entry key and Activity key lamp is not affected if the Program key, the Display key, volume up/down, and handsfree keys are used.

Activity Codes for Not Ready State cannot be activated during Walkaway, Logged Out, or Make Set Busy States.

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Feature Interactions

Telephone function keys

If any key other than the Activity, Handsfree Mute, Dial Pad, Display key or Volume Control key is pressed while entering an Activity code, the Activity key lamp turns dark and any code entered is lost.

Multiple Queue Assignment

Meridian Max is required to run Multiple Queue Assignment (MQA) in Succession Release 3.0 or before. In CS 1000 Release 4.0 and later, Meridian MAX is not required.

When MQA is in use, the default Activity code sent to Meridian MAX becomes the default code for the queue of the agent's last call answered. The ACD DN defaults back to the last ACD DN by which the telephone was logged in.

Incoming call

An incoming call to the agent's Independent Directory Number (IDN) does not interfere with the Activity Code entered, if the entry is completed before answering the call. If the Activity Code entry is not completed before answering an incoming call, the Activity Code is lost.

Return to Queue on No Answer

If a call is not answered by an agent, the call is sent back to the ACD queue, and the agent's telephone is automatically put into the Not Ready State. The Activity key lamp does not flash.

Feature packaging

There are two minimum package combinations required to operate this feature: one for Meridian MAX and the other for the Symposium Call Center.

Feature package requirements for Meridian MAX are:

- Automatic Call Distribution, Account Code (ACNT) package 155
- Automatic Call Distribution Package D (ACDD) package 50
- ACDD, Auxiliary Link Processor (LNK) package 51
- Automatic Call Distribution Package D, Auxiliary Security (AUXS) package 114

Feature packaging requirements for Symposium are:

- Automatic Call Distribution, Account Code (ACNT) package 155
- Nortel Symposium Call Center (NGCC) package 311

Feature implementation

The following tasks must be performed to implement this feature.

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Task summary list

1. LD 11 - Specify an Activity Code key for the telephone.
2. LD 23 - Enable Activity Codes in the Not Ready State for an ACD queue.

Table 39
LD 11 Specify an Activity Code key for the telephone.

Prompt	Response	Description
REQ:	NEW CHG	Add or change the data block
TYPE:	a...a	Telephone type where a...a = a telephone with display capabilities (2006, 2008, 2016, 2112, 2216, and 2616.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B, where c = card and u = unit.
...	...	
KEY	xx ACNT	xx = Key number (the ACNT key cannot be configured as 0).
KEY	<cr>	KEY is prompted until a carriage return is entered.

Table 40
LD 23 Enable Activity Codes in Not Ready State for ACD queue.

Prompt	Response	Description
REQ:	NEW CHG	Add or change the data block
TYPE:	ACD	Automatic Call Distribution data block Requires Basic Automatic Call Distribution (BACD) package 40.
...	...	
ACNT	x...x	Account (Default activity code) Maximum 4 digits Prompted if the ADS data block is built and the DCUS (maximum number of ACD customers) setting in LD 17 is greater than 1
NRAC	YES	Enable Not Ready Activity Codes (NO) = default.
- NDFL	xxxx	Not Ready Default code Must be equipped with ACDD or NGCC package.

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Feature operation

To enter an Activity Code in the Not Ready State:

1. Press the **Not Ready** key. The Not Ready key lamp lights and the Activity Code key lamp flashes.
2. Press the **Activity** key. The Activity key lamp lights steadily.
3. Enter the activity code. To delete one digit at a time, press *. To delete all digits entered, press #.
4. Press the **Activity** key. The activity code is sent to the system, and the Activity Code key lamp goes out. This completes the activity code entry.
5. An ACD agent can enter multiple activity codes for each activity completed during any Not Ready Session. Repeat steps 2-4 until all tasks are entered.
6. Press the **Not Ready** key. The Not Ready key lamp goes out and the agent is placed back into the ACD queue.

To use the **Display** key in the Not Ready State:

1. Press the **Display** key. The telephone display is cleared.
2. Press the **Activity** key. The previously entered Activity Code appears in the telephone display.
3. Press the **Display** key twice (or presses the RLS key) to display the time and date.

If an activity code is not entered, the code configured in LD 23 (the Not Ready Default code setting) is sent to the system, and the Activity Code Key lamp goes out.

The ACCT message timestamp is configured the first time the Activity key is pressed.

ACD Answering Time in Night Service (Advanced)

ACD Answering Time in Night Service enhances ACD Night Service. If Recorded Announcement (RAN) is defined as an ACD Night Service, this feature enables a customer to define a period of time before incoming calls receive the recorded announcement; during this period of time, the calls receive ringback tone.

Operating parameters

There are no feature requirements.

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Feature interactions

Attendant Extension to Queue A call extended by an attendant or a Centralized Service attendant to an ACD Night DN receives ringback tone for the customer-defined period of time before receiving Night RAN treatment. There is no recall to the attendant after a 30-second period.

First/Second ACD RAN If the ACD DN goes into Night Service while First/Second RAN is being provided, the incoming call receives ringback tone for the customer-defined time at the end of the First/Second RAN announcement, before receiving Night RAN treatment.

Load Management The NRTT command defines or changes the length of time before callers receive Night RAN. However, the NRTT prompt is available only if the International Supplementary Features (SUPP) package 131 is equipped. The existing POPT prompt has been modified to print the value of delay for the Night RAN. If the International Supplementary Features (SUPP) package 131 and Automatic Call Distribution Package D (ACDD) package 50 are both equipped, the prompt POPT skips the value of delay for Night RAN.

MFE/MFC calls An incoming call over an MFE or MFC trunk receives ringback tone only when MFE or MFC signaling has ended.

Feature packaging

International Supplementary Features (SUPP) package 131.

Dependencies: Basic Automatic Call Distribution (BACD) package 40; Recorded Announcement (RAN) package 7; Make Set Busy (MSB) package 17, if used to go into Night Service; and Automatic Call Distribution Package B (ACDB) package 41, if used to go into Night Service.

Feature implementation

Table 41
LD 23 Define the length of time before callers receive Night RAN.

Prompt	Response	Description
...		
NRRT	0-511	RAN route number assigned for ACD Night Service.
NRTT	(0)-2044	Time, in seconds, before callers receive Night RAN. This prompt is available only if International Supplementary Features (SUPP) package 131 is equipped.

Feature operation

No specific operating procedures are required to use this feature.

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ACD Call Delays

The Automatic Call Distribution (ACD) Call Delays enhancement introduces two new overlay programmable delay timers that are used when Call Forcing is activated for an ACD queue. The first delay timer offers an agent a few seconds' break before having to answer the next call. The second delay timer ensures a caller, during forced answer, receives at least one ringback cadence before being connected to an agent.

Operating parameters

There are no feature requirements.

Feature interactions

There are no interactions with other features.

Feature packaging

International Supplementary Features (SUPP) package 131; and Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

Table 42
LD 23 Modify, create, or print data for each ACD queue

Prompt	Response	Description
REQ:	NEW CHG PRT	Add, change, or print a data block
TYPE	ACD	Type of data block: Automatic Call Distribution
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
ACDN	xxxx	Automatic Call Distribution Directory Number
...		
ACPQ	...	
FORC	YES	Call Forcing option
		Enter YES to enable Call Forcing.

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Prompt	Response	Description
- FADT	(0)-15	Force Answer Delay Timer Enter delay time, in increments of one second, between calls when Call Forcing is enabled.
- FADR	(0)-14	Force Answer Delay timer for Ringback cadence Enter delay time, in increments of two seconds, before call is connected to an agent. Odd FADR values are rounded down to the nearest even value.

Printing the ACD data block includes the FADT and FADR prompts and their responses.

Feature operation

No specific operating procedures are required to use this feature.

ACD Call Priority

The Automatic Call Distribution (ACD) Call Priority enhancement changes the way calls transferred by an ACD agent to an ACD queue are handled. Prior to the introduction of ACD Call Priority, calls that were answered by an ACD agent and transferred to any ACD Directory Number (DN) were put at the end of the target queue. With the ACD Call Priority feature, the system administrator can, by means of service change, put calls transferred by an ACD agent to an ACD DN in the priority queue. This capability enables the transferred call to be answered prior to the unanswered calls in the target queue.

Whether or not a call transferred by an ACD agent to another ACD DN is given priority treatment is determined by the response to the new ACPQ prompt in LD 23.

When the response to the ACPQ prompt is YES, any calls that have been answered by an ACD agent and that have been transferred to any ACD queue are given priority treatment.

Operating parameters

There are no feature requirements.

Feature interactions

There are no interactions with other features.

Feature packaging

International Supplementary Features (SUPP) package 131 and Basic Automatic Call Distribution (BACD) package 40.

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Feature implementation

Table 43
LD 23 Modify, create, or print data for each ACD queue

Prompt	Response	Description
REQ:	NEW CHG PRT	Create, modify, or print a data block
TYPE:	ACD	Type of data block: Automatic Call Distribution
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000M, and Media Gateway 1000M.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
ACDN	xxxx	Automatic Call Distribution Directory Number
...		
HMSB	...	
- ACPQ	(NO) YES	ACD Answer Call Priority Queue (denied) allowed Respond with YES to enable, or NO to deny, calls transferred by ACD agents to ACD DNs to be put into the priority queue.

Printing the ACD data block includes the ACPQ prompt and its response.

Feature operation

No specific operating procedures are required to use this feature.

ACD Call Waiting Thresholds (Advanced)

The Automatic Call Distribution Call Waiting Thresholds (ACDCWT) enhancement enables ACD Calls Waiting Threshold (CWTH), Busy Threshold (BYTH), and Overflow Threshold (OVTH) to be defined as a percentage based on the number of calls waiting in queue and the number of manned (logged in, not in Make Set Busy or Not Ready state) agent positions, rather than as a fixed number of calls.

When the number of ACD calls waiting exceeds a specified threshold, subsequent calls to that ACD DN (the source queue) can be diverted to another ACD DN (the target queue).

Three thresholds must be specified for the calls waiting in each ACD DN queue. The operating range boundaries defined by the thresholds are as follows: light, normal, busy, and overloaded. The operating ranges of the three thresholds are:

- Calls Waiting Threshold (CWTH): Upper limit of the light range

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- Busy Threshold (BYTH): Upper limit of the normal range
- Overflow Threshold (OVTH): Upper limit of the busy range

Whether the ACD Call Waiting Threshold, Busy Threshold, and Overflow Threshold are defined as a percentage or number of calls is determined on a customer basis by responding to the OPT (option) prompt in LD 15. The allowable ACDCWT responses to the OPT prompt are THPD (Threshold Percentage Denied) and THPA (Threshold Percentage Allowed). THPD is the default.

The following is an example of the CWTH, BYTH and OVTH being reached if the THPA option is selected:

	Number of calls required in queue to reach threshold		
	CWTH = 100%	**BYTH = 150%**	**OVTH = 200%**
2 manned ACD positions	2	3	4
4 manned ACD positions	4	6	8

If all ACD positions are unmanned or out-of-service, any call in the waiting queue is treated as if OVTH has been exceeded (that is, the call goes to overflow).

An agent in Not Ready status is treated as unmanned when the ACD queue thresholds are calculated.

Operating parameters

There are no feature requirements.

Feature interactions

There are no interactions with other features.

Feature packaging

International Supplementary Features (SUPP) package 131; Basic Automatic Call Distribution (BACD) package 40; and Automatic Call Distribution Package B (ACDB) package 41.

Feature implementation

The Customer Data Block service change accepts the options THPD and THPA to be defined as a customer option. The usage of the CWTH, BYTH, and OVTH thresholds is defined by the option selected. To enable the

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thresholds to be defined as percentages, respond to the OPT prompt with THPA. To enable the thresholds to be defined as number of calls, respond to the OPT prompt with THPD. THPD is the default.

Task summary list

The following is a summary of the tasks in this section:

1. LD 15 - Implement the options THPD and THPA.
2. LD 21 – Print the customer data block.
3. LD 23 – Define the values for the ACD thresholds by responding to the appropriate prompts.

Table 44
LD 15 Implement the options THPD and THPA

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	CDB ATT_DATA	Customer Data Block Attendant Consoles
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
...		
NCOS	...	
- OPT	(THPD) THPA	ACD Threshold Percentage Denied ACD Threshold Percentage Allowed When OPT = THPA, ACD CWTH, BYTH, and OVTH are defined as percentages of manned agent positions

Table 45
LD 21 Print the customer data block

Prompt	Response	Description
REQ:	PRT	Print data block
TYPE:	CDB	Type of data block: Customer Data Block
CUST		Customer number

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Prompt	Response	Description
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.

Table 46
LD 23 Define the values for the ACD thresholds by responding to the appropriate prompts

Prompt	Response	Description
REQ:	NEW CHG PRT	Add, change, or print the data block
TYPE:	ACD	Type of data block: Automatic Call Distribution
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
ACDN	xxxx	Automatic Call Distribution Directory Number: queue to be modified
...		
OBTN	...	
CWTH	0-(1)-2047	Calls Waiting Threshold Default is 1. If OPT in LD 15 is set to THPA, then 0-2047 is the allowable range of percentages. If OPT in LD 15 is set to THPD, then 0-2047 is the allowable range of calls.
...		
NCWL	...	

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Prompt	Response	Description
BYTH	(0)-2047	Busy Threshold Default is 0. If OPT in LD 15 is set to THPA, then 0-2047 is the allowable range of percentages. If OPT in LD 15 is set to THPD, then 0-2047 is the allowable range of calls.
OVTH	0-(2047)	Overflow Threshold. Default is 2047. If OPT in LD 15 is set to THPA, then 0-2047 is the allowable range of percentages. If OPT in LD 15 is set to THPD, then 0-2047 is the allowable range of calls.

Feature operation

No specific operating procedures are required to use this feature.

ACD-CDR Connection Record (Basic)

The Connection Record option enables the customer to build and maintain a call profile that can be automatically transferred from one ACD agent to another.

Refer to *Call Detail Recording Fundamentals (NN43001-550)* for a detailed account of the Connection Record option.

ACD DN/CDN Expansion

Feature description

The Automatic Call Distribution Directory Number/Control Directory Number (ACD DN/CDN) Expansion feature increases the number of ACD DNs and/or CDNs on a system from 240 to a maximum of 1000 for each customer.

The maximum number of configurable ACD DNs and CDNs per system remains at 24 000. The maximum number of configurable customer groups remains at 100 per system. With the ACD DN/CDN feature, the system limits remain the same.

Operating parameters

The ACD DN/CDN Expansion feature is supported on the Meridian 1 PBX 61C, Meridian 1 PBX 81C, CS 1000M SG, and CS 1000M MG.

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The ACD-C reports support a maximum of 240 ACD DNs as well as a maximum of 240 CDNs.

The time required to process the following functions increases with the additional number of configured DNs:

- ACD audit
- ACD data block initialization
- ACD Main audit
- ACD/CDN Queue Maintenance
- Agent Call Waiting Lamp and Display Waiting Call updates
- Auto Login during sysload
- Data Dump
- Enabling the Ring Again feature
- First and Second Recorded Announcements
- Message Waiting Lamp Reset
- Night Call Forward
- Night RAN Route
- Night Treatment
- Restoring ACD calls
- Revert Default of a CDN by Contact Center Manager Server
- Sysload
- Value Added Server and Teletype Terminal interactions

Feature interactions

The following applications continue to support 240 ACD DNs/CDNs:

- CallPilot
- Customer Controlled Routing and Meridian Link
- Meridian Mail
  Because a CDN is not associated with a physical telephone and is used mainly for call routing purposes, a CDN cannot be configured as the destination mailbox DN for any Interactive Voice Response (IVR) application.
- Meridian MAX systems that support reporting on 240 ACD DNs and/or CDNs
- Contact Center Manager Server
- TAPI Service Provider

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Feature packaging

The ACD DN/CDN Expansion feature introduces the Automatic Call Distribution Expansion package 388 (ACDE). The ACD DN/CDN Expansion feature also requires the following existing packages:

- Recorded Announcement (RAN) package 7
- Make Set Busy (MSB) package 17
- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution B (ACDB) package 41
- Automatic Call Distribution C (ACDC) package 42
- Automatic Call Distribution Load Management (LMAN) package 43
- Music (MUS) package 44
- Automatic Call Distribution A (ACDA) package 45
- Automatic Call Distribution D (ACDD) package 45
- Auxiliary Link Process (LNK) package 51

Feature implementation

This feature does not change the procedures for configuring ACD queues in LD 23.

Feature operation

No specific operating procedures are required to use this feature.

ACD Dynamic Queue Threshold

The Automatic Call Distribution (ACD) Dynamic Queue Threshold enhancement modifies the way ACD Call Waiting Thresholds are calculated when the percentage option is selected. Prior to the introduction of ACD Dynamic Queue Threshold enhancement, agents that were in Not Ready status were treated as available (manned) when calculating the ACD queue thresholds. With the introduction of the ACD Dynamic Queue Threshold enhancement, agents in the Not Ready state are treated as unavailable (unmanned) when calculating the ACD queue thresholds.

Operating parameters

There are no feature requirements.

Feature interactions

ACD Call Waiting Threshold

The ACD Dynamic Queue Threshold enhancement modifies the way ACD Call Waiting Thresholds are calculated when the percentage option is selected. The ACD Call Waiting Thresholds as percentages is selected

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when the THPA option is selected as the customer option (OPT) in LD 15 (This option was introduced for the ACD Calls Waiting Threshold feature in Phase 4).

Feature packaging

International Supplementary Features (SUPP) package 131; and Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

No change to existing configuration is required for the ACD Dynamic Queue Threshold feature.

Feature operation

No specific operating procedures are required to use this feature.

ACD in Night Service

This enhancement enables calls to an ACD DN in Night Service and in Position Busy to be routed to the night DN, rather than being returned to the originating queue. This treatment applies even if the ACD DN is in interflow state. This call processing is effected by entering "YES" to the Force Night Call Forward (FNCF) prompt in LD 23.

The interflow treatment supplements the overflow treatment in the way that excessive ACD call volumes are handled. Incoming ACD calls are transferred to the Interflow DN of the target queue if any of the following conditions are met:

- The number of calls to a source queue reaches the overflow threshold (OVTH), or
- The number of calls to target queues designated as overflow queues have reached the busy threshold (BYTH).

Interflow can be invoked manually (by an interflow key), or automatically (by selecting the Automatic Interflow option in LD 23).

The enhanced operation can be explained as follows: ACD1 has ACD2 as its night DN. ACD2 is in interflow state (that is, incoming calls are routed to the interflow DN to receive interflow treatment). A call comes in to ACD1. If FNCP = YES, the call is routed to the Night DN (that is ACD2 is in interflow state, meaning the call receives interflow treatment rather than remaining in the ACD1 queue).

Operating parameters

This product improvement applies only to the standalone night treatment – it does not apply to Network ACD.

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Feature interactions

There are no interactions with other features.

Feature packaging

Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

Table 47
LD 23 Allow/deny incoming calls to be routed to the night DN, even if it is in interflow state

Prompt	Response	Description
...		
FNCF	(NO) YES	Allow (deny) calls to be routed to the night DN

Feature operation

No specific operating procedures are required to use this feature.

ACD Least Call Queuing (Advanced)

In normal handling of ACD calls, incoming calls are distributed to ACD agents based on a priority of which agent has been idle the longest. This ensures that the time spent by the agents in answering calls is balanced among the agents.

In some ACD environments, however, the requirement exists that incoming calls be distributed to agents based on the number of answered calls and not on the time spent being idle. This is done by dynamically modifying the agent priority based on the number of calls that each agent has answered. As a result, an agent that has answered the least number of calls is given the highest priority.

The Least Call Queuing feature enables an ACD supervisor to request, from the Load Management command RACN, an ACD report showing the number of calls that have been answered by each agent, starting from the beginning of the working day. The supervisor can then modify agent priority as required and send the information back to the system. The system then affects the call handling according to the requested priority.

Operating parameters

The International Supplementary Features (SUPP) package 131 and Basic Automatic Call Distribution (BACD) package 40 must be active.

There is no communication protocol between the system and the PC, so that there is no handshaking between the system and the PC. Also, error detection and correction is not provided.

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Feature interactions

There are no interactions with other features.

Feature packaging

Automatic Call Distribution Package B (ACDB) package 41.

Feature implementation

No change to existing configuration is required for the MFC Automatic Call Distribution Least Call Queuing feature.

Feature operation

No specific operating procedures are required to use this feature.

ACD Night Call Forward without Disconnect Supervision (Advanced)

ACD Night Call Forward without Disconnect Supervision enables Central Office (CO) Loop Start trunks terminating to an ACD DN to Night Call Forward or Interflow calls to internal or external telephones. For this feature, a CO Loop Start trunk refers to any trunk without disconnect supervision.

Call Scenarios

The following scenarios (Call Scenarios A-G) apply to calls arriving at an ACD DN from a CO Loop Start Trunk.

Call Scenario A

The following call sequence applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to a local telephone:

1. An external party calls an ACD DN via a CO Loop Start trunk.
2. The call is Night Call Forwarded to the pre-defined local telephone.
3. The telephone answers the call.
4. The originator disconnects. The trunks remain busy until the telephone disconnects.
5. The telephone disconnects. The trunks become idle.

Call Scenario B

The following call sequence applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to an external ACD DN via a route that has the Answer and Disconnect supervision prompt (SUPN) set to YES in LD 14.

1. An external party calls an ACD DN by means of a CO Loop Start trunk.
2. The call is Night Call Forwarded to the pre-defined external ACD DN using a route.
3. The agent answers the call.

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4. The agent disconnects. The trunks become idle.

Call Scenario C

The following call sequence applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to a local ACD DN that is in the Not Ready state.

1. An external party calls ACD DN 1 using the CO Loop Start trunk.
2. The call is Night Call Forwarded to the pre-defined local ACD DN 2 that is in the Not Ready state.
3. The caller abandons the call.
4. The call stays in the ACD DN 2 queue for a couple of seconds and then disappears. The trunks become idle.

Call Scenario D

The following call sequence applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to an external ACD DN with first Recorded Announcement (RAN) defined and the Return Answer Supervision by RAN to originator (ASUP) prompt set to YES in LD 16.

1. An external party calls ACD DN 1 using a CO Loop Start trunk.
2. The call is Night Call Forwarded to pre-defined external ACD DN 2 with first RAN defined and ASUP set to YES. The caller hears the Recorded Announcement.
3. The caller abandons the call before the ACD DN 2 agent answers.
4. The trunks remain busy. The call stays in the ACD DN 2 queue until the agent answers the call.
5. The agent disconnects the call. The trunks become idle.

Call Scenario E

The following call sequence applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to an external ACD DN with first RAN defined and ASUP set to NO.

1. An external party calls ACD DN 1 via the CO Loop Start trunk.
2. The call is Night Call Forwarded to pre-defined external ACD DN 2 with first RAN defined and ASUP set to NO.
3. The caller does not hear the Recorded Announcement and abandons the call before the ACD DN 2 agent answers.
4. After a couple of seconds, the call disappears. The trunks become idle.

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Call Scenario F

The following call sequence applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to an attendant.

1. An external party calls an ACD DN using a loop start trunk.
2. The call is Night Call Forwarded to the attendant.
3. The attendant answers the call.
4. The originator disconnects, but the trunks remain busy until the attendant disconnects.
5. The attendant disconnects. The trunks become idle.

Call Scenario G

The following scenario applies to a call that arrives at an ACD DN from a CO Loop Start trunk and is Night Call Forwarded to a Controlled DN (CDN).

1. An external party calls an ACD DN via the CO Loop Start trunk.
2. A call is Night Call Forwarded to a CDN with a script "ROUTE TO a set."
3. The caller abandons the call before the telephone answers.
4. The call continues to ring on the telephone for a couple of seconds, but the trunks become idle.

Operating parameters

A trunk with SUPN set to NO in LD 14 should not be used as a destination for either a Night Call Forward DN or an Interflow DN. If this is the case and the caller abandons the call, the incoming and outgoing trunks are locked out. The destination telephone rings until the abandoned call is answered and the telephone goes on-hook.

It is not recommended that RAN be provided to calls from CO Loop Start trunks. In the case where RAN is provided to these trunks, the RAN routes should have ASUP set to YES, so that the caller hears the Recorded Announcement (RAN). However, because Answer Supervision is returned when RAN is provided, the trunks hang if not answered by the agent (Refer to Call Scenario D).

An ACD DN should not be Night Call Forwarded to a local telephone that Call Forward No Answers to Meridian Mail. If this is the case and the originator presses the Release key to disconnect the call, Meridian Mail waits until it times out. The time for the trunks to become idle depends on the Meridian Mail timer. If the originator exits "gracefully" from Meridian Mail, the trunks immediately become idle.

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A call arrives from a CO Loop Start trunk to an ACD DN that has Call Force enabled (FORC = YES in LD 23). The call is force answered to an unattended agent telephone that is not in the Not Ready or Make Set Busy modes. In this case, the trunk is hung until the agent returns and disconnects the call, even if the caller disconnects.

Feature interactions

Call Forward No Answer

When an ACD DN Night Call Forwards to a local telephone that Call Forward No Answers to Meridian Mail, two scenarios occur depending on how the originator answers the call. If the originator presses the Release key to disconnect the call, Meridian Mail waits until it times out. The time for the trunks to become idle depends on the Meridian Mail timer. If the originator exits "gracefully" from Meridian Mail, the trunks immediately become idle.

Called Party Disconnect Control

With Automatic Call Distribution without Disconnect Supervision (ADSP) package 289 enabled, calls on routes that have Called Party Disconnect Control enabled can Night Call Forward.

Charge Account/Authorization Code (CAB) in Night Mode

If a caller or trunk without disconnect supervision disconnects from a call while trying to Night Call Forward, a CAB message is not sent. This is because the switch does not know that the caller disconnected.

Federal Communication Commission (FCC) Compliance for Direct Inward Dialing (DID) Answer Supervision

If the FCC package 223 is equipped, answer supervision is automatically returned to the CO when RAN is provided or when the call is answered at the remote node.

Meridian 911

Meridian 911 (M911) calls always have disconnect supervision. The ACD Night Call Forward without Disconnect Supervision feature does not change this.

Meridian Mail

When an ACD DN Night Call Forwards to an internal/external telephone that Call Forward No Answers to Meridian Mail, two scenarios occur depending on how the originator answers the call. If the originator presses the Release key to disconnect the call, Meridian Mail waits until it times out. The time for the trunks to become idle depends on the Meridian Mail timer. If the originator exits "gracefully" from Meridian Mail, the trunks immediately become idle.

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Network Automatic Call Distribution

Network Automatic Call Distribution (NACD) does not enable a call to overflow by means of the NACD night/day table if the call comes from a trunk without disconnect supervision.

Feature packaging

The following package is required for ACD Night Call Forward without Disconnect Supervision:

- Automatic Call Distribution without Disconnect Supervision (ADSP) package 289, which depends on the following packages:

- Automatic Call Distribution Package A (ACD-A) package 45 for Night Call Forward (NCFW)
- Automatic Call Distribution Package B (ACD-B) package 41 for Interflow DN (IFDN)

Feature implementation

All ACD agents and ACD blocks must exist prior to implementing this feature.

Task summary list

The following is a summary of the tasks in this section:

1. LD 23 – Define a Night Call Forward DN for an ACD DN.
2. LD 14 – Define a Night Call Forward Destination trunk.

LD 23 Define a Night Call Forward DN for an ACD DN.

Prompt	Response	Description
REQ:	CHG	Change an existing data block
TYPE:	ACD	Automatic Call Distribution block
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
ACDN	x...x	Automatic Call Distribution Directory Number ACDN can have a maximum of 4 digits or a maximum of 7 digits with DNXP package 150.

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Prompt	Response	Description
...		
NCFW	x...x	Night Call Forward DN for ACD calls The NCFW DN can have a maximum of 31 digits.

Table 48
LD 14 Define a Night Call Forward Destination trunk.

Prompt	Response	Description
REQ:	CHG	Change an existing data block
TYPE:	a...a	Trunk type
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B, where c = card and u = unit.
...		
SUPN	YES	Answer and disconnect supervision required NO = Answer and disconnect supervision not required (default).

Feature operation

No specific operating procedures are required to use this feature.

Alternate Call Answer (Basic)

Alternate Call Answer (ACA) enables the customer to choose, on a per-queue basis, if ACD calls should be blocked for an agent telephone with an Individual Directory Number (IDN) call on hold.

When Alternate Call Answer is enabled, if an agent notices an ACD call waiting through the AWC key or the supervisor terminal while active on an IDN call, the agent can put the IDN call on hold and press the dark In-Calls key to return to the idle agent queue. The In-Calls key stays dark until an ACD call is presented.

When Alternate Call Answer is disabled and an agent is active on an IDN call, putting that call on hold and pressing the dark In-Calls key does not return the agent to the idle agent queue. No ACD calls are presented.

Be sure to evaluate operating procedures before enabling this feature. For example, ACA should not be used if an agent puts an IDN call on hold and walks away. ACD calls could be connected while the agent is gone.

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Feature interactions

Analog (500/2500-type) ACD telephones

Alternate Call Answer does not support analog (500/2500-type) ACD telephones.

Answer/call ACD supervisor

Answer/call ACD supervisor is supported. The agent can press the Supervisor (ASP) key to answer/call the ACD supervisor, if

- the agent uses the Supervisor key to talk to the ACD supervisor and
- an ACD call is waiting in the queue

The Alternate Call Answer option then enables the agent to

- press the Hold key to put the supervisor call on hold
- press the Dark In-Calls key to be ready to answer an incoming ACD call

Call Transfer

Call Transfer is supported. The Alternate Call Answer Option enables the agent to press the

- hold key to put the call on hold after the third party answers the call and before completing the transfer
- dark In-Calls key to be ready to answer an incoming ACD call

Conference

Both 3-party and 6-party conferences are supported. The Alternate Call Answer feature enables the agent to press the

- hold key to put the established call on the Conference key on hold
- dark In-Calls key to be ready to answer an ACD call

No Hold Conference is not supported.

Dial Intercom

Dial Intercom (DIG) is supported. If the agent makes a call using the DIG key and an ACD call is waiting in the queue, the Alternate Call Answer option enables the agent to press the

- hold key to put the DIG call on hold
- dark In-Calls key to be ready to answer an incoming ACD call

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Hot Line

Hot Line (HOT) is supported. If the agent makes a call using the HOT key and an ACD call is waiting in the queue, the Alternate Call Answer option enables the agent to press the

- hold key to put the HOT call on hold
- dark In-Calls key to be ready to answer an incoming ACD call

Multiple Call Ringing/Non-ringing

Multiple Call Ringing/Non-ringing (MCR/MCN) is supported. If the agent makes a call using the MCR/MCN key and an ACD call is waiting in the queue, the Alternate Call Answer option enables the agent to press the

- hold key to put the MCR/MCN call on hold
- dark In-Calls key to be ready to answer an incoming ACD call

Private Line Ringing/Non-ringing

Private Line Ringing/Non-ringing (PVR/PVN) is supported. If the agent makes a call using the PVR/PVN key and an ACD call is waiting in the queue, the Alternate Call Answer option enables the agent to press the

- hold key to put the PVR/PVN call on hold
- dark In-Calls key to be ready to answer an incoming ACD call

Ring Again

Ring Again (RAG) is supported.

Single Call Ringing/Non-ringing

Single Call Ringing/Non-ringing (SCR/SCN) is supported. If the agent makes a call using the SCR/SCN key and an ACD call is waiting in the queue, the Alternate Call Answer option enables the agent to press the

- hold key to put the SCR/SCN call on hold
- dark In-Calls key to be ready to answer an incoming ACD call

Voice Calling

Voice Calling (VCC) is supported. If the agent makes a call using the VCC key and an ACD call is waiting in the queue, the Alternate Call Answer option enables the agent to

- press the Hold key to put the VCC call on hold
- press the Dark In-Calls key to be ready to answer an incoming ACD call

Automatic Overflow (Advanced)

Automatic Overflow enables incoming ACD calls to be diverted from the call queue in which they would normally be placed (source queue) to another queue (target queue) during busy periods. Up to three target queues can

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be designated for each source queue. The target queue that meets the requirements for Overflow (the queue is not handling a volume of calls that exceeds a predefined busy threshold) is selected as the queue to which incoming calls are redirected. Overflow does not occur unless at least one of the Overflow queues meets these requirements. The situation is evaluated for each new incoming call.

Automatic Overflow applies only to new calls attempting to enter a queue; calls already in the queue are not transferred to a target queue. Priority calls that are overflowed to another queue retain their priority status in the target queue. The various treatments (such as RAN and Music) specified for the source queue remain in effect for each call, even though the call is placed in the target queue.

Three threshold levels must be established for each ACD DN involved in Automatic Overflow:

- CWTH = Calls Waiting Threshold
- BYTH = Busy Threshold
- OVTH = Overflow Threshold

The threshold levels are configured for each ACD DN during installation and can be modified by service change or load management.

The first threshold (CWTH) is for lamp status only.

When the second threshold (BYTH) is met or exceeded, the queue is busy. This queue cannot accept any calls attempting to overflow from other queues.

When the third threshold (OVTH) is met or exceeded, the queue is in an Overflow state. The next new call into the queue attempts to overflow.

For a complete discussion of lamp states, see "Calls Waiting Indication key (AWC) (Basic)" (page 32) and "Calls Waiting Indication key (AWC) (Advanced)" (page 32), or "Display Waiting Calls (DWC) key (Basic)" (page 33) and "Display Waiting Calls (DWC) key (Advanced)" (page 34).

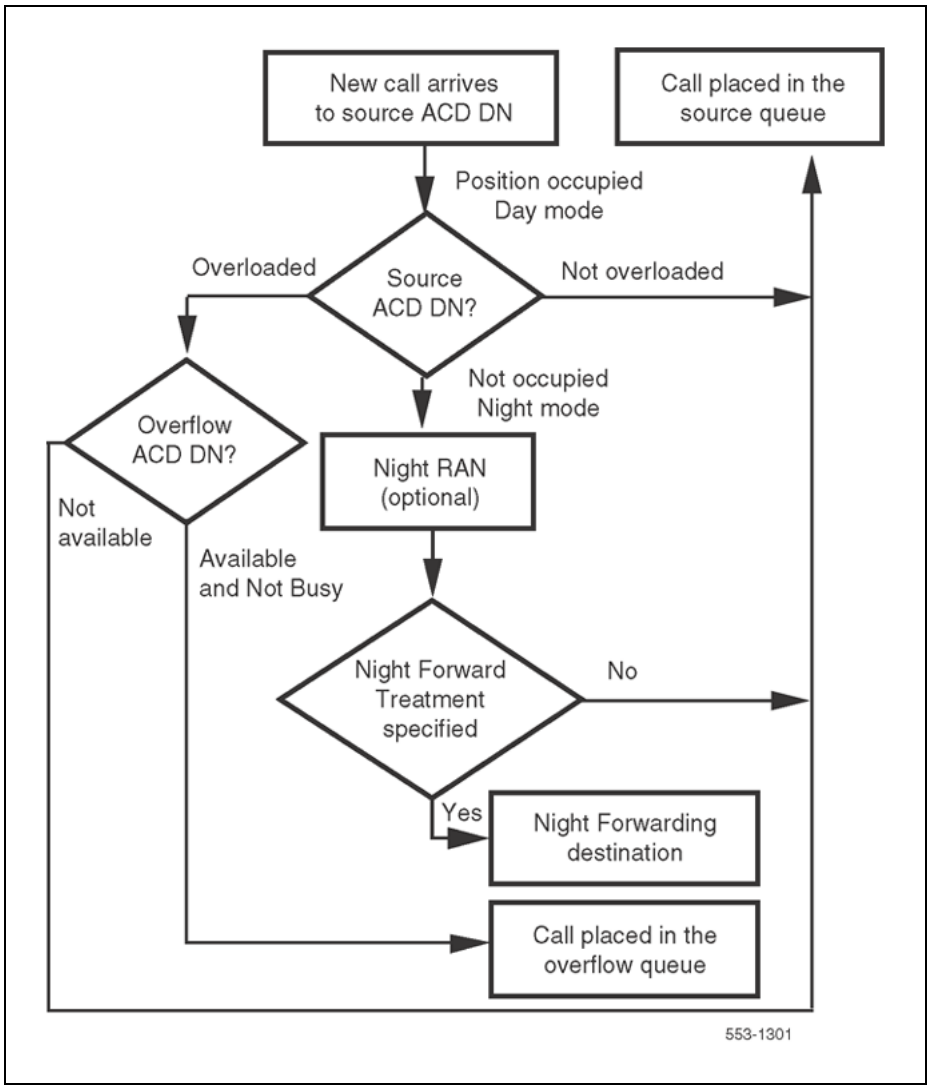
The system checks the Overflow queues one at a time. The first queue operating below the BYTH is selected as the target queue. The call is then placed in the target queue and does not return to the source queue. Selection of a target queue is performed for each new call coming into the source queue. Thus, if a target queue meets or exceeds the BYTH, then another queue is checked as a target queue. If an available target queue is not found, the call is placed in its source queue.

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Source and target queues must be within the same ACD customer, unless Network ACD (NACD) is enabled. NACD uses timed overflow rather than automatic overflow.

A physical telephone must exist and be in the Not Ready state for the Automatic Overflow decision process illustrated in Figure 4 "Automatic Overflow decision process" (page 166).

Figure 4
Automatic Overflow decision process



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Call Center Transfer Connect (UUI)

Feature description

The Call Center Transfer Connect User-to-User Information (UUI) enables the transport of UUI from the AT&T Toll Free Transfer Connect Service over ISDN to the CS 1000 and Meridian 1 systems. Note that UUI and User-to-User Signaling (UUS) are used interchangeably.

Call Center Transfer Connect is an AT&T service that enables AT&T Toll Free subscribers to transfer or redirect a calling party to another location. This service is described in AT&T TR50075.

The party that receives the incoming call (the Toll Free subscriber) and wants to transfer the call is designated as the Redirecting Party. The party that is the recipient of the transferred call is referred to as the Target Party. In addition to call redirection, the service supports data forwarding from the Redirecting Party to the Target Party. Data Forwarding allows the Redirecting Party to send data to the Target Party using the Message-Associated User-to-User Information (MA UUI) signaling procedure that is described in AT&T TR41459.

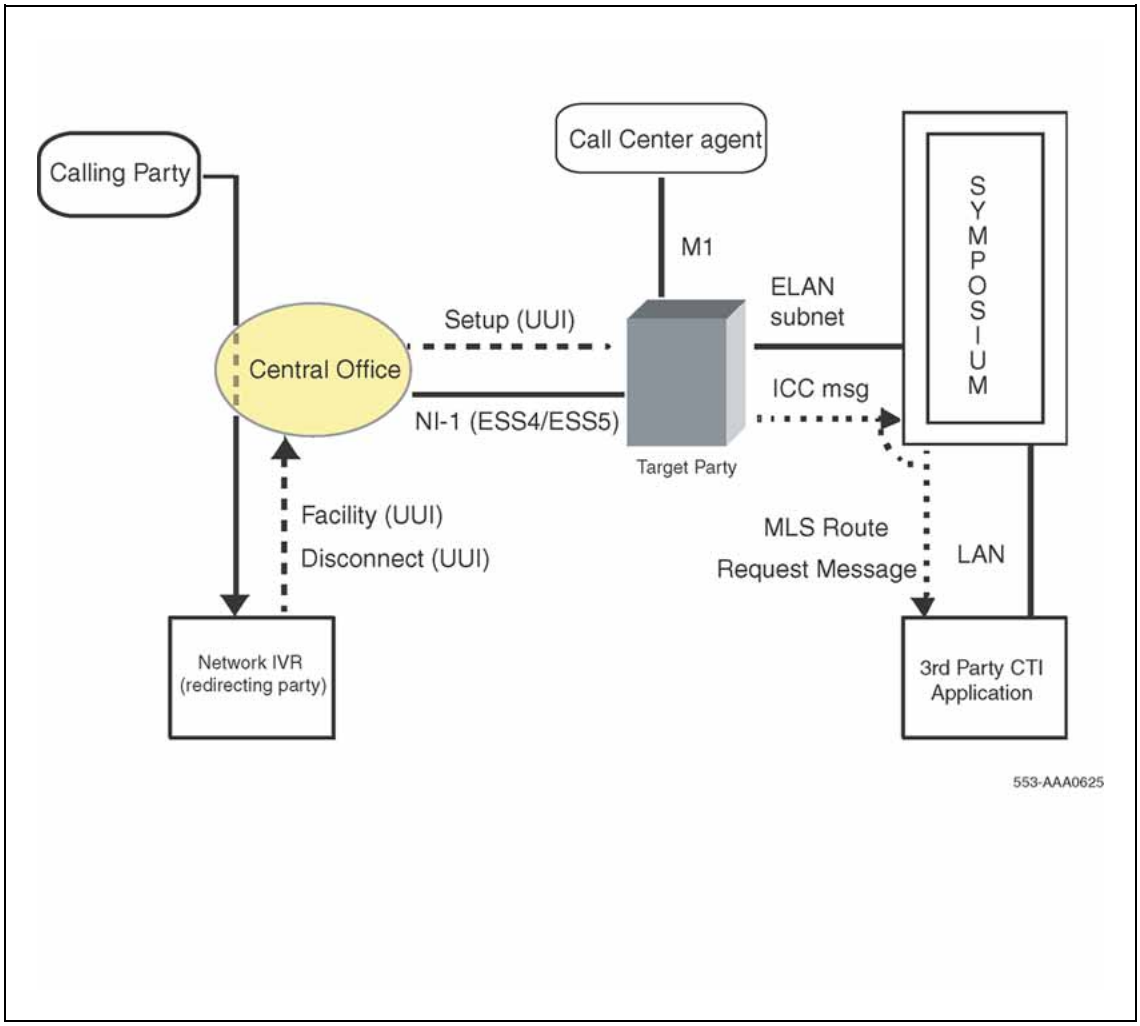
This feature supports the User-to-User Signaling (UUS) information exchange between CS 1000 and Meridian 1 systems and an AT&T Electronic Switching System No 4/5 (ESS4/ESS5) over the Primary Rate Interface (PRI) trunks signaling channel.

The system transports the UUS information over the ELAN subnet to the Contact Center Manager Server (CCMS).

Figure 5 "User-to-User data flow from calling party to third-party application" (page 168) shows the UUI data flow from the calling party to the third-party application. In Figure 5 "User-to-User data flow from calling party to third-party application" (page 168), connectivity is shown with bold lines and message flow is shown with dotted lines.

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Figure 5
User-to-User data flow from calling party to third-party application



The network prompts a user who calls a 1-800 number to enter a credit card number, home phone number, or other essential information. The network then directs the user to a human agent, based on the user's profile. The system makes the essential information available to the human agent.

The following is a UUS call scenario:

1. A customer dials a 1-800 number to a network-based Interactive Voice Response (IVR) unit.
2. The IVR collects the necessary information (credit card information, home phone number, and so on) from the user and passes it to the Central Office (CO).
3. The CO inserts the data into the UUI field within the ISDN call SETUP message and passes it on to the target party's PBX.

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4. The call, with the associated UUI data, arrives at a system CDN.
5. The system extracts the UUI data from the SETUP message and passes it to CCMS over the ELAN Application Module Link (AML) link in the Incoming Call (ICC) message.
6. The CCMS passes the UUI data to the third-party CTI application over MLS.

When User-to-User Information Elements (IEs) are sent over ISDN NI-1 (ESS4 & ESS5) interfaces and received In-Call establishment messages, they are stored without processing. This information is sent to Symposium through the ELAN AML link in an Incoming Call Message (ICC).

The UUS information passes over the ISDN network without modification. The system extracts the UUS information from the ISDN message and sends the UUS information over the ELAN AML link to the CCMS. The CCMS passes the UUS information to the third-party Computer Telephony Integration (CTI) application using Meridian Link Service (MLS). A CTI application notifies the agent. For this feature to work, calls from the ISDN network that contain the UUS information must terminate on a Control DN (CDN). This CDN must be acquired by CCMS and have its UUI prompt set to YES in LD 23.

UUI transport over PRI

This feature supports the transport of UUI over ISDN NI-1 (ESS4 & ESS5). This feature only supports Message Associated User-to-User Information (MA UUI).

The Message Associated User-to-User Information (MA UUI) is the information that comes in the following ISDN messages from the MA UUI to the CS 1000 and Meridian 1 systems:

- SETUP: UUI comes in the SETUP message in either Codeset 0, or Codeset 7, or both. The length of Codeset 0 or Codeset 7 User-User Information Element cannot exceed 103 octets (100 octets of data).The combined length of Codeset 0 and Codeset 7 User-User Information Element cannot exceed 106 octets (100 octets of data).
- ALERTING: UUI IE comes in the ALERT message in Codeset 0.
- CONNECT: UUI IE comes in the CONNECT message in Codeset 0.
- DISCONNECT: UUI IE comes in the DISCONNECT message in Codeset 0.

UUI transport over the ELAN AML link

This feature supports the transport of MA UUI over the ELAN AML link from CS 1000 and Meridian 1 systems to Call Center Server only in an ICC message.

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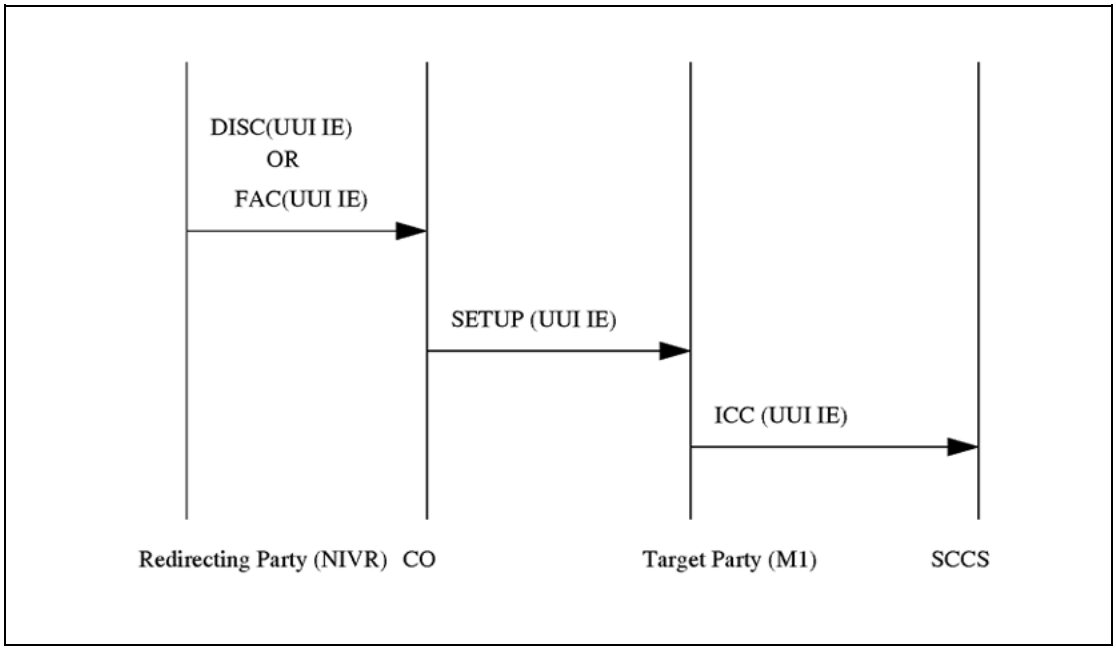
The MA UUI information is not sent in any message over the ELAN AML link to CCMS during call ALERT, call CONNECT, and call DISCONNECT phases.

A new IE in an ICC message is implemented for UUS data. The ICC message is sent during the SETUP phase on an incoming call to the CDN.

The UUI data is embedded in the F9 IE (UUI IE) in the ICC message. The incoming SETUP message from the CO to the system can contain the UUI data in either Codeset 0 or Codeset 7 or both.

Figure 6 "Message flow for UUS call scenario" (page 170) shows the message flow for the UUS call scenario.

Figure 6
Message flow for UUS call scenario



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New and modified Information Elements

Call Center Transfer Connect introduces a User-to-User Information Element (IE). Table 49 "User to User IE Format (CO to the system)" (page 171) shows the IE format:

Table 49
User to User IE Format (CO to the system)

Octet	Field	Bits	Value	Meaning
1	Identifier	1-8	01111110	User-User Information Element
2	Length	1-8	Binary	Length of UUI contents
3	Protocol Discriminator	1-8	Binary	Protocol Disclaimer
4-103	User Data	1-8	Binary	User Data

Protocol Discriminator is not a part of the User data that is sent to Symposium. User data starts with the User-User Application ID as its first octet.

Maintenance and security

This feature supports monitoring of the UUS information in LD 96. Maintenance overlays 96 and 48 enable the user to monitor (print) the messages on the TTY console. This enables the user to capture the UUI data in both SETUP and ICC messages. The User-to-User information contains sensitive data such as user credit card number and account number. Therefore, the system restricts printing UUI data to the TTY console. The content is replaced by phantom characters (XX) before it is transmitted to TTY console. The UUI IE ID and length are printed. For example: 7E 04 XX XX XX XX.

Operating parameters

Call Center Transfer Connect does not support the following:

- Redirecting Party functionality
- Call Associated Temporary Signaling Connection (CA TSC) and Non-Call Associated Temporary Signaling Connection (NCA TSC)
- Sending of the UUI information to Meridian Link / MAX / CCR
- Presentation of UUI data on telset displays.
- UUI in ISDN Facility message
- Transfer of UUI data to a network Contact Center Manager Server (first node in the Meridian Customer Defined Network cannot be a Symposium Network Call Center node.)

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Call Center Transfer Connect supports the following:

- MA-UUI on NI-1 custom AT&T interfaces in the North America and CALA markets.
- Only Target Party functionality of AT&T Transfer Connect service.
- Transfer of UUI data into Symposium Meridian Link Services to enable screen notifications through Nortel, or a third party CTI application. Note that this applies to Symposium Meridian Link Services only. This feature is not implemented in Meridian Link 5 C.

Feature interactions

There are no feature interactions with this feature.

Feature packaging

Call Center Transfer Connect (UUI) is package 393. The following packages are also required:

- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution, Package B (ACDB) package 41
- Command Status Link (CSL) package 77
- Integrated Services Digital Network (ISDN) package 145
- Primary Rate Access (PRA) package 146
- Next Generation Connectivity (NGEN) package 324

Feature implementation

Task summary list

The following is a summary of the tasks in this section.

1. "LD 17 – Configure the RCAP value." (page 172)
2. "LD 23 – Configure a CDN with UUI = YES." (page 173)

LD 17 Configure the RCAP value.

PROMPT	Response	Description
REQ	CHG	Change existing data.
TYPE	ADAN	Action Device And Number
ADAN		Action Device And Number, where
	NEW aaa x	Add I/O device
	CHG aaa x	Change I/O device
IFC		Interface Type for D-Channel
	ESS4	AT&T ESS#4
	ESS5	AT&T ESS#5

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PROMPT	Response	Description
...		
RCAP		Remote capability
	UUI	User-to-User Signaling Supported
	XUUI	User-to-User Signaling Denied

LD 23 Configure a CDN with UUI = YES.

PROMPT	Response	Description
REQ	NEW	Add new data.
	CHG	Change existing data.
TYPE	CDN	Control DN
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
CDN	xxxx	Control Directory Number
...		
...		
DFDN	xxxx	Default DN (Must be an ACD DN)
...		
...		
UUI	(NO)YES	This field is prompted only when the UUI package is enabled.

Feature operation

There are no specific operating procedures required by this feature.

Call Forcing (Advanced)

Call Forcing is an alternative to standard manual answering. This feature automatically presents a call to an agent in an answered state. Consequently, if the Call Forcing option is enabled, the In-Calls key is not pressed to answer the call.

An ACD call answered by Call Forcing can be completed in one of the following ways:

- If the caller releases and disconnect supervision is provided, the agent is returned to the agent queue automatically after a two-second delay.
- If post-call processing is not required, the agent presses the In-Calls key or release key to force a disconnect. The agent is returned automatically to the agent queue after a two-second delay.

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- If post-call processing is required, the Not Ready key is operated. When post-call work is finished, the In-Calls or Not Ready key is pressed, and the agent is inserted immediately into the agent queue.

There is a delay, from 0 to 30 seconds, another call is presented. When an agent disconnects from an ACD call, the agent has from 0 to 30 seconds until the next ACD call can be presented based on the delay time configured in the system software with the FCFT prompt in LD 23. The default is two seconds. See *Software Input/Output Administration (NN43001-611)*.

Feature interactions

Priority Agent Flexible Call Forcing interacts with Priority Agents. If a call comes into a queue while the priority 1 agent is still in a delay state (the Flexible Call Forcing timer has not expired), the priority 2 agent receives the call. The priority 1 agent is not returned to the idle agent queue until the specified time is up.

ACD Call Delays The ACD Call Delays enhancement introduces two new programmable delay timers that are used when Call Forcing is activated for an ACD queue. The first delay timer ensures that a caller, during forced answer, receives at least one ringback cadence before being connected to an agent. This timer is configured at the FADR (Force Answer Delay time for Ringback cadence) prompt in LD 23. The second delay timer offers an agent a few seconds break before having to answer the next call. This delay timer is configured at the FADT (Force Answer Delay Time) prompt in LD 23.

Headset and handset Call Forcing can be used with agent telephones equipped with a headset, a plug-in handset, or a standard handset. When using either a headset or a plug in handset, Call Forcing operates as described. Unplugging the headset or handset activates Make Set Busy. When using a telephone with the standard handset and switchhook, Call Forcing works only when the handset remains off-hook.

Call Interflow (Advanced)

Call Interflow gives the ACD supervisor the ability to redirect excess traffic to another predesignated Interflow DN (IFDN). The Interflow (ENI) key supplements Automatic Overflow. When the Interflow (ENI) key is pressed, the Interflow action occurs only after the following events:

- The number of calls in the source queue equals or exceeds the Overflow Threshold (OVTH).
- All target queues specified for Automatic Overflow are at or past their Busy Thresholds (BYTH), or are in Night service.
- The ENI key has been pressed.

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The number of calls in the Time Overflow (TOF) queue is added to the number of calls in the high-priority and non-priority queues to determine if the OVTH or BYTH has been exceeded.

If the Interflow DN (IFDN) is an internal ACD DN and the source DN has a TOF Timer (TOFT) defined, then the call can recall back to the source ACD DN. Refer to the sections on Overflow configurations for details on call configurations when the IFDN is defined as an internal ACD DN.

If a call routes to an Interflow ACD DN in Night Service, the call is rerouted back to the source queue. It does not forward to the Night Call Forward (NCFW) DN for the target queue.

Enhanced Interflow

Call Interflow is enhanced to provide Interflow mode automatically from source queues without using the Enable Interflow (ENI) key. This enhancement also monitors calls after evaluating the Interflow destination. If a busy condition is encountered, there are two possible treatments. Only one of these treatments is presented to a call: Busy Tone Returned or Link to the Source Queue.

Calls from high-priority trunks are put in the high-priority queue. All other calls are put in the nonpriority queue. Once in a queue, calls can receive RAN, music, and other options as defined for the source queue.

Enhanced Interflow operates in three steps. As long as the Interflow DN (IFDN) for the source queue is another ACD DN, the system can send Interflow calls to another queue for a total of three ACD DNs. However, if all three IFDNs are in the Night mode or Interflow state, the call is placed in the source queue (see Figure 7 "IFDN levels" (page 176)).

Respond to the BUSY prompt in LD 23 to treat the following call types:

- Internal
- Attendant
- CO/Trk
- DID/TIE Trk

Busy or Link to Source is defined for these four call types. CO/trk calls always link to source because they cannot return answer supervision. Table 50 "IFDN treatment by Call Type when the IFDN is unavailable" (page 176) defines the treatments, based on call type, for IFDN destinations available to incoming calls.

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Figure 7
IFDN levels

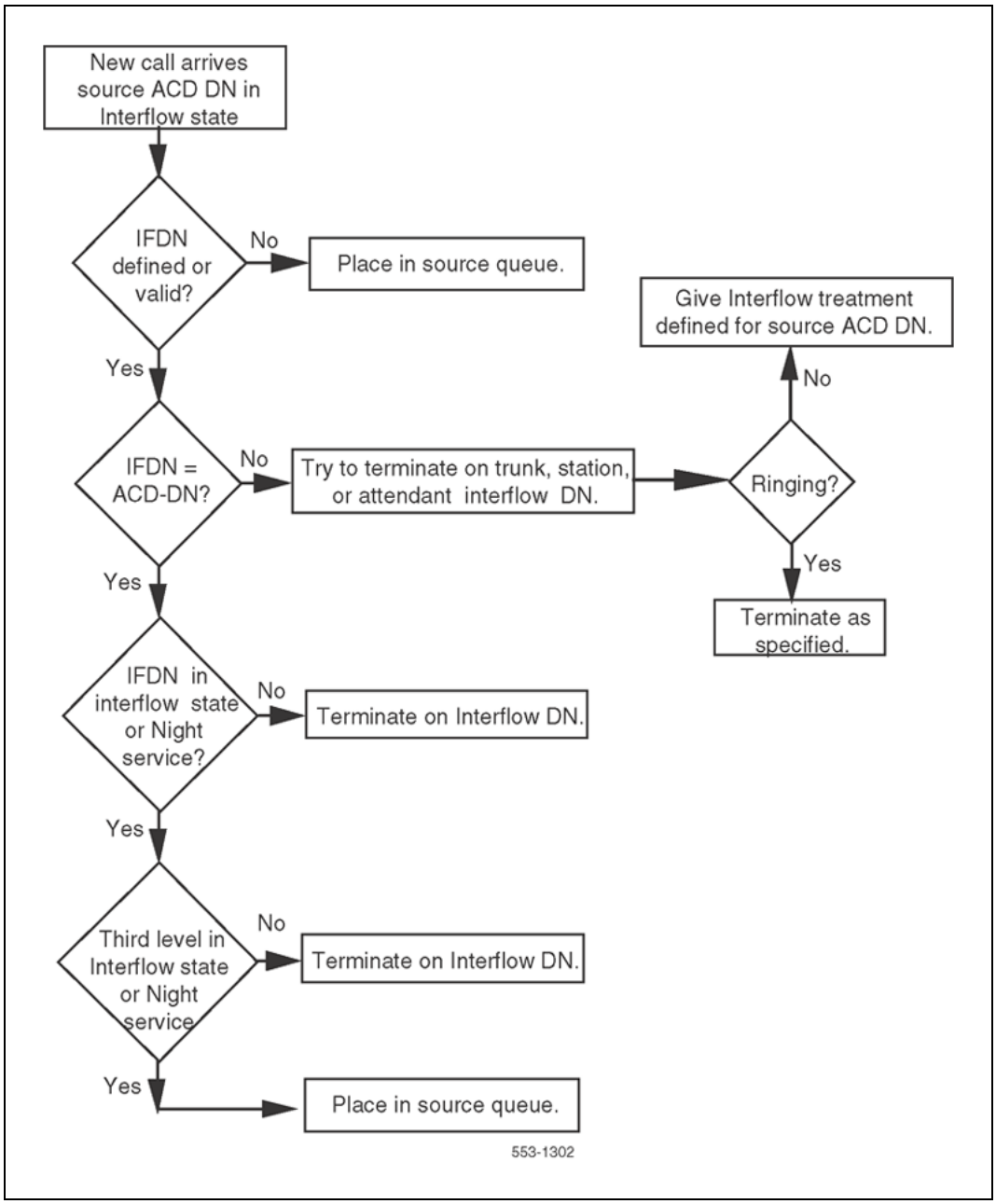


Table 50
IFDN treatment by Call Type when the IFDN is unavailable

		Call type (originating)			
		Telephone	**Attendant**	**CO trunk**	**DID/TIE trunk**
IFDN	**Telephone**	Busy tone	Busy tone, link to source queue	Link to source queue	Busy tone, link to source queue

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		Call type (originating)			
		Telephone	**Attendant**	**CO trunk**	**DID/TIE trunk**
	Attendant	Busy tone	Link to source queue	Link to source queue	Busy tone, link to source queue
	ACD DN	Busy tone, link to source queue	Busy tone, link to source queue	Link to source queue	Busy tone, link to source queue
	Trunk ACOD	Busy tone	Busy tone, link to source queue	Link to source queue	Busy tone, link to source queue
	NARS	Busy tone	Link to source queue	Link to source queue	Busy tone, link to source queue
	Invalid DN	Link to source queue	Busy tone, link to source queue	Relink to source queue	Link to ACD source queue

Feature interactions

ACD Night Call Forward

If the Night Call Forward (NCFW) number is another ACD DN in the Interflow state, the call is sent by Interflow mode to the next level. If the call has already been sent to the third level, it waits until the NCFW DN queue is available. When room is available in the queue, the call is placed in the NCFW queue.

ANI route selection

An Access Code for Automatic Number Identification (ANI) trunks can be configured as an Interflow treatment destination.

Attendant extension

The attendant can extend calls only to a queue in Interflow when the Interflow treatment is linked to the source queue.

Attendant Overflow Position

Calls that are given Interflow or Night Call Forward treatment to an attendant can be answered.

Class of Service restrictions

If the IFDN is trunk restricted from the call originator, the call is returned to the source queue instead of receiving an overflow or busy tone.

Do Not Disturb (DND)

If the attendant has activated DND on the IFDN telephone and its Hunt DNs are busy, the call receives Interflow treatment as if the IFDN were busy.

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InvalidIFDN

If the IFDN for the source queue is invalid, error code ERR4277 is output and the call is linked back into the source queue. For definitions of the error codes that are output, refer to *Software Input/Output Reference – System Messages (NN43001-712)*.

Network Ring Again (NRAG)

If the Interflow treatment defined links calls back to the source queue, the NRAG call cannot ring again.

Automatic Overflow

A call that is subject to the Interflow treatment, but is returned to the source queue instead, cannot be treated with the Automatic Overflow treatment to a target ACD DN.

Ring Again (RGA)

Internal calls treated with the Interflow treatment from an internal telephone can ring again to the IFDN. If the IFDN is an Attendant in Night Service, the internal telephone can ring again to the IFDN.

TGAR restrictions

If the IFDN is subject to TARG/TGAR restrictions, the call is linked to the source queue instead of receiving an overflow tone.

Time Overflow

A call that has interflowed to another ACD queue can be returned to the source queue, based on the source queue's Time Overflow Timer (TOFT). The call is eligible to be answered by an agent in the source queue, or the target queues specified as Overflow DNs (OVDN).

Trunk Group Busy

If the IFDN is a Route Access Code and all trunks in the route are busy, calls transfer to the attendant. If the IFDN is a NARS/BARS access code, and any one route is Attendant Busied, calls transfer to the attendant.

DNIS

DNIS information is passed to the Interflow destination.

Operating parameters

Busy trunk conditions apply only to internal trunks on the same switch as the source ACD DN.

The DNs for DISA calls are not supported by a Call Interflow treatment or its enhancements.

If the programmed IFDN is not an ACD DN, calls that Interflow cannot transfer back to the source queue while it is in interflow state.

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The DN for a Release Link Directory Number (RLDN) is not supported by a Call Interflow treatment or its enhancements.

With ACD DISC SUP PK package, CO loop start trunks terminating to an ACD DN can NCFW or interflow. However, avoid the following situations:

1. An ACD DN Night Call Forwards to a local telephone that Call Forward No Answers to Meridian Mail.
2. Night RAN is defined while NCFW = none.
3. Using an external route with SUPN = NO for either NCFW or interflow.

In cases a and b, trunks become hung-up and must be manually disabled in LD 32. In case c, if the caller abandons the call, the destination telephone rings until the abandoned call is answered and the telephone goes on-hook.

CTI Enhancements - DTMF Tone Generation

Currently, computer telephony interface (CTI) applications such as network routing applications and Symposium agent must connect directly to individual telephones to control the generation of dual-tone multiple frequency (DTMF) digits. These connections enable the installation of Meridian Communication Adaptors (MCA) at each telephone.

The CTI Enhancements - DTMF Tone Generation feature enables host-based applications (such as Windows TAPI applications) to invoke DTMF tones on behalf of any acquired telephone, as if a user pressed digits on the telephone dialpad during an active call. This DTMF tone invocation is accomplished by sending a new Set Feature Invocation (SFI) message from the application.

The SFI message is sent on behalf of the acquired telephone. The message includes DTMF digits and optional fields such as inter-digit delay, tone duration, and pause duration. An SFI response message is sent back to the application to acknowledge receipt of an incoming SFI message (DTMF generation request). A Set Feature Notification (SFN) message is sent from the system to the application only after successfully generating DTMF tones that correspond to digits sent in the SFI message. To support this feature, the acquired telephone must be established on a call.

The application sends a Set Feature Invocation (SFI) DTMF message on behalf of an acquired telephone to the system that contains the digits and the duration (that is, the length of the DTMF tone). On receipt of this message, the system validates the message and the call state of the telephone that requests tone generation. An SFI response message returns indicating whether the request has been accepted or rejected.

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Tone duration is constant for all digits in each SFI message. Actual duration depends on the value of the duration IE tag in the SFI DTMF message. The duration value is configured in multiples of 56 ms. Therefore, if the value is 10, the duration is 560 ms. The value of the duration IE tag can range from 1 to 100, resulting in a maximum tone duration of 5.6 seconds.

The inter-digit timer is constant for all digits in the SFI message. The inter-digit timer depends on the value configured in the inter-digit duration IE tag of the SFI message. The duration value is configured in multiples of 56 ms. Therefore, if the value is 10, the duration is 560 ms. The value of the inter-digit duration IE tag can range from 1 to 100, resulting in a maximum timer value of 5.6 seconds.

When the system receives a message to generate DTMF tones, it checks for an established connection and then generates tones for DTMF digits. The DTMF tones are sent only if there is an End-to-End signaling (EES) connection (established speechpath) between the two parties. The application can send multiple SFI DTMF messages for the same call. However, a subsequent SFI DTMF message can be sent only after the previous SFI DTMF message has been received and acknowledged.

After successful generation of all DTMF tones corresponding to the digits sent in the SFI message, an SFN message is sent to the requesting application. The requesting application awaits this message for a time period based on the number of digits that were sent and for which the system generated tones, multiplied by the tone generation time, plus the inter-digit delay. If a pause generation has also been requested, it is factored into the wait time.

ATTENTION

Pauses are supported on analog and DTI trunks but are not supported on ISDN trunks. The asterisk (*) used to introduce a pause is supported on analog and DTI trunks but is not supported on ISDN trunks. On ISDN trunks, if OPAO is enabled, the asterisk (*) is outpulsed as a called party digit.

The acquired telephone receives feedback tone when the system generates the DTMF tones requested by the application. Administrators can configure the feedback tones in LD 15.

The system does not process a new SFI DTMF message while it generates DTMF tones for the same telephone. If such a request is made, an SFI DTMF response message is issued, which indicates and explains the request failure.

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Operating parameters

This feature applies to the following systems:

- CS 1000M Cabinet
- CS 1000M Chassis
- CS 1000M HG
- CS 1000M SG
- CS 1000M MG
- Meridian 1 PBX 61C
- Meridian 1 PBX 81C
- Meridian 1 PBX 11C Cabinet
- Meridian 1 PBX 11C Chassis

Only acquired telephones support this feature. Phantom PBX telephones and attendant telephones do not support this feature. The DTMF tones are not generated if the telephone is undergoing treatment (for example, if the telephone is receiving Music or a Recorded Announcement (RAN). The application can send up to 31 digits to the telephone. DTMF digits appear in CDR reports only if the DTMF-generating telephone is the originating telephone.

Feature interactions

Call Detail Recording

The DTMF digits are printed in the Call Detail Recording (CDR) record if the telephone is the originating party and if the ECDR prompt in LD 15 is set to YES. DTMF digits print in the CDR record even if tone generation has not completed due to abnormal operation.

Call Modifications

All call modifications are blocked if DTMF tone generation is in progress. The telephone that generates DTMF tones cannot initiate call modifications such as transfer and conference.

Conference

All parties in an established conference hear DTMF tones generated for the acquired telephone. The acquired telephone hears single feedback tones or no tone at all, depending on the EEST setting in LD 15.

Display

Digits received in the SFI DTMF message display on the telephone even if tone generation cannot complete due to abnormal operation. Digits display on the telephone only if the EESD prompt in LD 15 is set to YES.

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Multiple Appearance Directory Number

Only one telephone can be associated with a Multiple Appearance Directory Number (MADN). DTMF tones are generated only for the acquired telephone if it is active on the speechpath. Other telephones receive neither the DTMF tones nor the feedback tones. The display of other telephones is not affected.

No Hold Conference

When a call is placed on No Hold Conference (NHC), DTMF tones cannot be generated. Tones generate after the NHC concludes.

Observe

If the OBTN option is set to NO and tones generate on behalf of (a) the agent under silent observe or (b) the connected telephone, the supervisor does not hear DTMF tones between the agent and the customer. The supervisor does hear a click as tones are generated. This click is caused by idling of the path between the agent and the far end.

If the OBTN option is set to AGT or ALL, the supervisor is in a conference loop with the agent and the customer, and thus hear DTMF tones as the agent and the caller hear them. Tones are provided for conferenced parties by attaching a TDS to the existing conference loop.

Phantom Telephones

DTMF tones can be generated on behalf of the phantom telephone from the application if the telephone is active on a call and is associated (AST). Since phantom telephones do not have a physical appearance, display and feedback tones do not apply.

Since a PBX phantom telephone cannot be associated (AST), tones cannot be generated on behalf of the PBX phantom telephone from the application.

Recorded Announcement and Music

If the acquired telephone is listening to a Recorded Announcement (RAN) or Music, the application cannot generate DTMF tones on behalf of the telephone. An SFI DTMF response message is sent to indicate that the failure resulted from RAN or Music.

Feature packaging

This feature requires the following packages:

- End-to-End Signaling (EES) package 10
- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution, Package B (ACDB) package 41
- Command Status Link (CSL) package 77

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- Meridian Link Module Server (MLM) package 209

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

- LD 17 - Configure ELAN AML link and define associated VAS ID.
- LD 48 - Enable messages on ELAN AML link.
- LD 10 - Configure analog (500/2500-type) telephones.
- LD 11 - Configure digital telephones.
- LD 15 - Configure End-to-End signaling.

LD 17 Configure ELAN AML link and define associated VAS ID

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	CFN	Configuration Record
ADAN	NEW ELAN xx	Add I/O device type ELAN, where xx = 16 to 31.
CTYP	ELAN	Enable the AML messages in LD 48; card type = ELAN.
LCTL	(NO) YES	Modify link control system parameters.
-N1	128 (512)	Maximum octets per one frame (128 or 512 is recommended for ELAN).
...	....	...
VAS	NEW	New Value Added Server
	CHG	Change Value Added Server
VSID	xx	Associate link and VASID so messages can be sent.
ELAN	xx	Associate VASID xx with ELAN xx.
SECU	(NO) YES	YES if Meridian link is connected to ICCM, otherwise NO.
INTL	1 to 12	Time interval for checking Meridian Link for overload for five second increments.
MCNT	5 to 100 000	Message count threshold for number of Meridian Link messages per time interval.

LD 48 Enable messages on ELAN AML link

Command	Description
ENL MSGI xx	Enable incoming messages on ELAN xx.
ENL MSGO xx	Enable outgoing messages on ELAN xx.

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Command	Description
ENXP MSGI xx 1	Disable all incoming polling messages on ELAN xx.
ENXP MSGO xx 1	Disable all outgoing polling messages on ELAN xx.

LD 10 - Configure analog (500/2500-type) telephones

Prompt	Response	Description
REQ:	CHG NEW	Change or Add
TYPE:	500	Telephone type
TN		Terminal number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B, where c = card and u = unit.
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
DN	2022	Directory number
AST	YES	Associate telephone assignment
IAPG	(0)-15	Status Change Group, where: 0 = No Status Change Message 1 = All Status Change Message 2-15 must be defined in LD 15

LD 11 Configure digital telephones

Prompt	Response	Description
REQ:	CHG NEW	Create new data or change existing data.
TYPE:	aaaa	Telephone types, where aaaa = 2006, 2008, 2016, 2216, 2317, 2616, 390x
TN		Terminal number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
AST	xx yy	Associate telephone assignment, where xx, yy = DN key numbers, In-Calls key.

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Prompt	Response	Description
IAPG	(0)-15	Status Change Group, where: 0 = No Status Change Message 1 = All Status Change Message 2 - 15 must be defined in LD 15
KEY	xx SCR yy	Single call ringing DN key, where yyyy = DN

LD 15 - Configure End-to-End signaling

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	FTR	Features and options
CUST		Customer number
	0-99	Range for CS 1000M Large System, Meridian 1 Large System, Call Server 1000E, and Media Gateway 1000E.
	0-31	Range for CS 1000M Small System, Meridian 1 Small System and Media Gateway 1000B.
EEST	(NO) YES	End-to-End signaling, where: NO = Disabled (Do not send feedback tone to the originator) YES = Enabled (Send single feedback tone to the originator)
EESD	(NO) YES	End-to-End signaling display, where: NO = Disabled (DTMF digits do not display) YES = Enabled (DTMF digits display) For YES and NO, Application Request DTMF generation for PBX does not apply.
ECDR	YES	Print End-to-End signaling digits in CDR record.

Feature operation

This feature supports:

- ten digits: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0
- two characters: # and *
- a maximum of 31 digits (sent from the application)
- pause capabilities sent from the application

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Pause is implemented by sending the character ",". Pause duration depends on the value specified in the pause duration IE tag of the SFI DTMF message from the application.

ATTENTION

Pauses are supported on analog and DTI trunks but are not supported on ISDN trunks. The asterisk (*) used to introduce a pause is supported on analog and DTI trunks but is not supported on ISDN trunks. On ISDN trunks, if OPAO is enabled, the asterisk (*) is outpulsed as a called party digit.

This feature functions differently when the acquired telephone is digital than when it is analog (500/2500-type). For a digital telephone, the End-to-End signaling (EES) feature generates the DTMF tones by conferencing a TDS with the connected parties. Pause is implemented by sending the character ",". Pause duration depends on the value specified in the pause duration IE tag of the SFI DTMF message from the application.

The TDS generates DTMF tones for the terminating device while the originator of the EES receives feedback tone. Since analog telephones (500/2500) have the native capability to generate DTMF tones, analog telephones do not use the EES feature to generate tones.

This feature depends on End-to-End Signaling (EES). Therefore, it supports only EES-compatible trunk types, such as Central Office (CO), FEX, Wide Area Telephone Service (WATS), TIE, Common Control Switching Arrangement (CCSA), Direct Inward Dialing (DID), and Centralized Automatic Message Accounting (CAMA) trunks.

CTI Trunk Monitoring and Control

The Computer Telephony Integration (CTI) Trunk Monitoring and Control feature expands the existing functionality of Meridian CTI Interface (Meridian Link). CTI Trunk Monitoring and Control allows the system, in conjunction with the Meridian Link interface, to provide the host application with the capability to monitor and control trunk-to-trunk calls.

The CTI Trunk Monitoring and Control feature introduces the concept of Associated trunks (AST). Previously, only Associated telephones existed. An Associated trunk is configured by setting the AST prompt to YES in the Trunk Data Block. When AST = YES, the trunk can be monitored and controlled from a host CTI application using the AML interface. AST includes both Associated telephones and Associated trunks. The number of AST telephones and trunks that can be configured on one system is subject to license limitations.

The CTI Trunk Monitoring and Control feature includes the following four functionalities:

- Trunk Monitoring

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- Trunk Call Disconnect
- Warning Tone
- Route Member Information Element (IE)

Trunk Monitoring

With the Trunk Monitoring functionality, Unsolicited Status Messages (USM) are generated to report the Associated trunk status to the CTI application using the AML interface. The status of the Associated trunk is reported when the trunk is answered at the far-end and when the trunk is disconnected at the far-end.

Trunk Call Disconnect

With the Trunk Call Disconnect functionality, the Call Disconnect Request (CALLDIS) message is enhanced to disconnect a trunk call. Trunk Call Disconnect allows the CTI application to disconnect a trunk call given either the Disconnect Party TN (in packed format) or the route and member number of the trunk. In order for the trunk call to be disconnected, all of the following conditions must be met:

- Either the Disconnect Party TN or the trunk route and member number must be valid.
- The trunk must belong to the Customer group, as indicated by the Customer number in the CALLDIS message.
- The trunk must be an Associated trunk (AST = YES in Overlay 14).
- The call must be a two-party call, and the call state must be established.

Warning Tone

With the Warning Tone functionality, the Connection Request (CON) message is enhanced so that a short tone is provided to the originating party of a call. The Warning Tone functionality is not limited to trunk calls. This functionality also applies when the originating party is internal to the system. The warning tone is provided if either the originating TN (in packed format) or the trunk route and member number is known. All of the following conditions must be met to receive this tone:

- Either the calling party TN or the trunk route and member number in the calling party DN field must be valid. If the value of the calling party TN field is zero, the trunk route and member number is obtained from the calling party DN field.
- The specified call must belong to the Customer group, as indicated by the Customer number in the CON message.
- The trunk must be an Associated trunk (AST = YES in Overlay 14).
- The call must be a 2-party call, and the call state must be established.

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Route Member Number Information Element (IE)

The Route and Member Number Information Element (IE) contains the trunk route and member number on which a call arrives. The Route and Member Number IE is added to the following two AML messages:

- Present Call Indication (PCI) message: for incoming trunk calls that terminate on ACD telephones
- USM (Ringing) message: for incoming trunk calls that terminate on non-ACD telephones

The Trunk Call Disconnect and Warning Tone functionalities require either the packed TN or the CTI application to identify the trunk by route and member number. The new Route and Member Number IE ensures that the route and member number of the trunk involved in a trunk call is passed to the CTI application.

License limits

With the CTI Trunk Monitoring and Control feature, the AST license limit now includes the count of both Associated telephones and trunks. This limits the total number of AST telephones and trunks allowed on one system. When this limit is reached, no more Associated telephones and trunks can be configured, and an error message is displayed. If a customer requires more Associated telephones or trunks after the limit is reached, an increased AST limit must be ordered and installed.

The existing License header in Overlay 14 is modified to indicate the number of Associated telephones and trunks allowed for the system. AVAIL shows the system's License limits for Associated telephones and trunks. USED shows the number of configured Associated telephones and trunks. TOT shows the maximum number of Associated telephones and trunks that can be supported on one system.

Figure 8 "License header in Overlay 14" (page 188) is an example of the updated header in Overlay 14.

Figure 8
License header in Overlay 14

TNS	AVAIL: xxxxx	USED: xxxxx	TOT: xxxxx
AST	AVAIL: xxxxx	USED: xxxxx	TOT: xxxxx

For further information on licensing, refer to *Features and Services (NN43001-106)*.

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Operating parameters

The CTI Trunk Monitoring and Control functionalities are supported on the following trunk signaling protocols:

- R2MFC
- 2.0 Mbit E1 DTI
- Loop Start Analog
- 1.5 Mbit T1 DTI
- ISDN PRI (for selective Asia Pacific countries)
- ISDN PRI (for SS-7 conversion in China)
- QSIG
- DASS
- DPNSS
- EuroISDN ETSI
- Numeris
- Swissnet
- 1TR6
- MCDN
- UK Analog

The design and operation of the above trunk signaling protocols are not modified by the CTI Trunk Monitoring and Control feature.

Ground Start Analog and ISDN Basic Rate Interface (BRI) trunks are not supported for CTI Trunk Monitoring and Control.

The CTI Trunk Monitoring and Control functionalities are supported on the LAPB AML interface only. They are not supported on the TCP/IP AML interface.

This feature modifies the Connection Request (CON), Connection Request Response (CRS), Unsolicited Status Message (USM), Call Disconnect Request (CALLDIS), and Present Call Indication (PCI) AML messages.

Configuration procedures for CTI Trunk Monitoring and Control are similar to those for Set Monitoring and Control.

For CTI Trunk Monitoring and Control, the Associated trunk for CTI Trunk Monitoring and Control (AST) prompt must be defined in Overlay 14. This prompt designates a trunk as an Associated Trunk. Also, the Event Group

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for USM messages (IAPG) prompt must be configured in Overlay 14. This prompt assigns an event group to a specific trunk, in order to control the USM messages for Trunk Monitoring.

If a Customized Event Group is needed, the GPXX prompt must be defined in Overlay 15.

The existing USM message format is used for the trunk status USM messages.

With Trunk Monitoring, when the AML interface is down, USM messages are not sent. No error messages, other than general maintenance messages, are generated for this condition.

The Trunk Monitoring feature mainly monitors the events of far-end answer and far-end disconnect. It is not intended to be used for monitoring the trunk state transition from idle to active or vice versa.

Trunk status USM messages are sent only when trunk status is detected. That is, when the trunk is equipped with Answer Supervision and Disconnect Supervision.

Trunk Call Disconnect functions on a trunk that is involved in an established two-party call or multi-party conference call, and in cases where the trunk is either active or on hold on an established call or a call which is in a half-disconnect state, due to far-end disconnect control.

The format of the CALLDIS message for disconnecting a trunk is the same as that for disconnecting a telephone.

When Trunk Call Disconnect fails, the call is not disconnected, and a CALLDIS response message is sent to the AML interface.

If more than one failure condition occurs for Trunk Call Disconnect, only one CALLDIS message is sent.

With Warning Tone functionality, when the warning tone fails, a tone is not provided, and a CRS message is sent to the AML interface.

For the Warning Tone functionality, if more than one failure condition occurs, only one Connection Request Response (CRS) message is sent.

Feature interactions

Call Detail Records

Trunk Call Disconnect, performed using the AML interface, generates the same Call Detail Records (CDR) as regular call disconnect.

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Customer Controlled Routing

The modified AML messages are not supported by Customer Controlled Routing (CCR). With the Trunk Disconnect functionality, it is possible to disconnect a trunk call to a CCR Control DN. This operates in the same manner as a disconnect initiated on behalf of an Associated telephone currently supported by Meridian Link.

Meridian 911

The modified AML messages are not supported by Meridian 911 (M911).

Meridian Link

The CTI Trunk Monitoring and Control feature introduces new Trunk Monitoring and Control functionalities for CTI Services. These new Trunk Monitoring and Control features are made available to the host CTI application through Meridian Link. For more information on Meridian Link, refer to the Meridian Link documentation.

The modified AML messages are not supported by Meridian Mail.

Meridian MAX

If ACD is involved, Trunk Call Disconnect could potentially impact the High Speed Link (HSL) interface. However, from the HSL interface there should be no difference between an AML initiated Trunk Call Disconnect and a regular call disconnect.

Feature packaging

The Trunk Monitoring and Control feature requires the following packages:

- Integrated Message System (IMS) package 35
- Command Status Link (CSL) package 77
- Application Module Link (IAP3P) package 153
- Meridian Link Module (MLM) package 209)

The following packages are also required:

- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution Package B (ACDB) package 41
- Automatic Call Distribution Package A (ACDA) package 45
- Automatic Call Distribution Package C (ACDC) package 42
- Automatic Call Distribution Load Management Reports (LMAN) package 43
- Automatic Call Distribution Package D (ACDD) package 50
- Dialed Number Identification Service (DNIS) package 98

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- Integrated Services Digital Network (ISDN) package 145
- 1.5 Mbps Primary Rate Access (PRA) package 146
- Integrated Service Digital Network Signaling Link (ISL) package 147
- Network Automatic Call Distribution (NACD) package 207
- Enhanced Automatic Call Distribution Routing (EAR) package (214)
- Call Identification (CALLID) package 247

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. LD 15 – Define Customized Event Groups
2. LD 14 – Configure the Associated Trunk and Event Group

LD 15 Define Customized Event Groups

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE:	CDB	Customer Data Block.
CUST		Customer number
	0-99	Range for Large System and CS 1000E system.
	0-31	Range for Small System and Media Gateway 1000B.
...		
GPXX	x	Unsolicited status events 1,2,3,4,5, or 6. XX can be 02 to 15, specifying the group. x can be 1 to 15, but only events 3 (Ringing) and 4 (Active) are applicable to Trunk Monitoring.

LD 14 Configure the Associated Trunk and Event Group

Prompt	Response	Description
REQ	CHG	Change.
TYPE	aaaa	Trunk type.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
...		
AST	YES	Associated trunk for CTI Trunk Monitoring and Control. NO = Not an Associated trunk for CTI Trunk Monitoring and Control (default).

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Prompt	Response	Description
IAPG	(0)-15	Event Group for USM messages.
TGAR	(0)-31	Trunk Group Access Restriction.

Feature operation

No specific operating procedures are required to use this feature.

Customer Controlled Routing (CCR) (Advanced)

In addition to EAR basic functionality, Customer Controlled Routing (CCR) enables the customer to customize the treatment and routing of incoming calls through a user-friendly interface. Calls arriving at a CDN in the controlled mode have their handling determined by a customer-defined script executed by the Customer Controlled Routing Module (CCRM) application, rather than being handled by software.

Specifying the controlled option for a CDN enables the CCRM application to control the call treatment of calls arriving at the CDN. This controlled option is called the "controlled mode".

The CCR application module enables customers to write call scripts that specify call routing to one or more destinations within the system. When a call arrives at a CDN in controlled mode, the software informs the CCRM software of this event using communications over an Application Module Link (AML) dedicated to the CCR application.

CCR associates the call with a customer-defined call treatment script, based on the CDN where the call arrived. The software receives instructions to direct the handling of the call based on the script commands. Customers decide how a call is handled based on a variety of parameters, such as CLID, DNIS, time of day, number of calls queued at the destination ACD DN, or number of idle agents. In addition, CCR enables a call to queue simultaneously at up to four ACD DNs. Also, calls in queue to ACD DNs can be removed with the Remove From request.

CCR requires additional hardware and software packages. CCR requires an additional application processing module, the Customer Controlled Routing Module (CCRM), in addition to Enhanced Call Trace (ECT, package 215), EAR (package 214), and Command and Status Link (package 77).

CCR features include all the functionality of EAR features plus the additional features covered in this section. Refer to "Enhanced ACD Routing (Advanced)" (page 238) for the EAR advanced features.

CCR features enable calls arriving through CDNs in the controlled mode to be queued in four ACD DNs simultaneously. CCR calls in controlled mode are considered virtual calls and are not counted as part of the number

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of calls in queue at an ACD DN for features such as Overflow by Count and Interflow. When equipped with CCR, a CDN possesses the following attributes:

- mode of operation (controlled or default)
- association with the Application Module Link (AML) handling CCR messages for this DN (VSID)
- association with TTYs assigned for status display
- CWTH, BYTH, and OVTH thresholds

The mode of operation of an individual CDN can be switched between controlled mode and default mode by changing the mode of operation attribute of the CDN. It can be changed by the following:

- LD 23
- Load management

As calls arrive at a CDN, the operation mode of the CDN is checked to determine the treatment required for the call. If controlled mode is selected, the software notifies the CCRM application. If the CCRM software accepts the call, it is controlled by the CCRM application. If the conditions for controlled treatment are not met, the call is given the default treatment.

The conditions for meeting the controlled treatment requirements are as follows:

- The CDN must be set to controlled mode.
- The AML must be defined and operational for communication with the CCRM application.
- The CCRM application must take control of the call within 4 to 6 seconds for most types of calls and 1.9 seconds for Japan DID trunk calls.

CCR controlled mode operation

In controlled mode operation, an arriving call is queued to the CDN until one of the following actions occur:

- The call is answered.
- The call is abandoned (caller hangs up).
- The call is given busy or disconnect treatment from CCR.
- A Route request is performed.

While it remains in the CDN queue, the only call processing applied to the call is that issued by the CCRM application through command messages.

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CCR script commands and operation

Queue request

The Queue To request command enables a call to be virtually queued to an ACD DN while maintaining its position at other ACD DNs that received a Queue To request. A call can be queued to up to four ACD DNs simultaneously.

A priority is specified in the queue request, which determines the call's placement in the ACD DN queue. If a tone has not yet been given to the call, the call receives ringback until changed by the CCRM application.

All subsequent queue requests place the call in the specified ACD queues simultaneously, without changing the placement of the call queues where it already resides. If a second queue request is attempted for a queue that the call is already in, the call is repositioned in the ACD queue with respect to the new priority.

Call priority

Controlled mode CCR provides four levels (1–4) of call priority with corresponding ACD priorities:

- priority 1: high-priority timed overflow call queue (highest)
- priority 2: nonpriority timed overflow call queue
- priority 3: high-priority call queue
- priority 4: nonpriority call queue (lowest)

Queuing by priority

When the CCRM application issues a Queue Request, the call for which the queue request was made is placed at the end of the ACD priority call queue, corresponding to the requested priority.

By placing a call at the end of its priority, an *ordering by time-in-priority* is maintained. Therefore, calls that have been waiting longer in a specific priority are never positioned behind calls just entering the priority.

Changing call priority

When the software receives a Queue Request for a call already queued at the specified ACD DN, and the priority in the request is different from the call's current priority assignment, the call is repositioned in the ACD queue at the end of its new priority.

If the priority is the same, the request is ignored and the call retains its current position and priority in the specified ACD queue. Changing a CCR call's priority in one ACD queue does not affect its priority (which can be different) in other ACD queues where it can also be placed. Once a call's

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priority has been changed, its time-in-priority is zero in the ACD queue for which its priority was changed. The call's time-in-priority in other ACD queues in which the call is waiting is not affected.

Order of presentation of queued calls

Three different queue priority algorithms can be defined for an ACD queue to determine which call in that queue is selected for presentation to an available agent. The CCR calls are *threaded* into the existing queues based on the priority the CCR module assigns to it. Therefore, the existing call presentation algorithms apply to CCR calls as described in the following options. These algorithms apply to ACD DNs, not to CDNs.

Oldest call in network This option picks the oldest, highest priority call in the network. The first call in the TOF, Call Request, and nodal source TOF queues must be compared. The call with the highest priority that has waited the longest is presented to the available agent. In LD 23, OCN = YES and HPQ = NO.

Own TOF queue first This option picks the oldest, highest priority call within the ACD queue's own TOF queue. In LD 23, OCN = NO and HPQ = NO.

Own TOF and high-priority queues first This option picks calls from the queue's own TOF and high-priority queues before any others. In LD 23, OCN = NO and HPQ = YES.

Determining queue length

Some ACD functions such as Overflow by Count and Interflow operate according to the number of calls in the ACD queues. Since the CCR calls are virtual calls, *they are not counted* when determining the queue length for an ACD DN in the following:

- Overflow Threshold (OVTH), used by Overflow by Count and Interflow
- Busy Threshold (BYTH), used by Overflow by Count
- Call waiting field on the ACD/Meridian MAX real-time displays
- ACD-C Ongoing Status Displays
- Call Waiting lamp updates if the new call waiting option (NCWL) is disabled
- Number of calls currently waiting in queue field (aaa) of the DWC display

CCR calls are counted for the following:

- Apart of the total number of queued calls for CCR call scripts
- The waiting time of the oldest call in the queue field (ccc) of the DWC display

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- Call Waiting lamp updates if the new call waiting option (NCWL) is enabled
- The virtual calls that can be answered field (dddd) of the DWC display
- The age of oldest call intrinsic within CCR call scripts
- The number of calls to be answered when an ACD DN enters the transition mode of Night Service
- In the new ACD-D option, messages that include the number of CCR calls for real-time displays

Remove From Request

The Remove From Request enables the CCRM application to remove a call from a queue where it was previously queued. The removal does not affect the placement of the call in other ACD queues.

A call cannot be removed from a CDN queue. A call can only be removed from ACD DNs where a Queue Request was previously issued.

Give RAN Request

With a Give RAN Request, the CCRM application can request that a certain call be given RAN treatment from the RAN route indicated within the Give RAN request. When a RAN Request is received, the call is given the RAN of a specified route (if trunks are available), or placed in the RAN queue corresponding to that route.

The RAN route parameters defined on the switch determine the type of RAN provided. If different RANs are desired for a call, they must be defined in different routes.

The software cannot connect the call to a route that is not marked for RAN by service change. If RAN is given to a call, the next call script command is not executed until the RAN message is finished.

If a call is presented to an agent while receiving RAN, RAN is interrupted, ringback is given to the caller, and CCRM is notified of the RAN completion. If the agent returns the call to the queue at the time of presentation by pressing the Not Ready or Make Set Busy keys, the caller is given ringback. Since the call was not answered, the CCRM application continues to control the call and issue call control commands for the call.

An attendant cannot receive RAN treatment.

If the first command of a call script is Give-RAN, ringback is provided with connection to RAN. Because of this, the RAN route is no longer required to have answer supervision enabled for an ISDN call to first receive RAN.

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Music Request

The Music Request provides music to the caller. The route specified must be marked as a music route for the command to succeed. Music is persistent; it is given between other call treatments once given to the call. For example, a controlled call receiving Music because of a previous request is given RAN by a RAN request. After completing the RAN, music resumes.

An attendant cannot receive music treatment.

Tone Request

This request provides the caller with a tone option. Silence and ringback are the only supported tones. The tone specified in this command is provided to the caller until it is interrupted (replaced by a RAN or Music request when the call is presented, forced, or routed elsewhere, or the tone is changed by another tone request).

The treatment (such as music) interrupting the tone determines if a tone resumes after completing an interrupting treatment.

Tone transition before and after call event

A ringback tone provided to a call because of a call presentation does not change the previous tone flag. For example, a controlled CCR call receives music before it is connected to an agent. This call receives a ringback tone before the agent answers it. However, if the agent presses the NRDY key to return the call to the queue, the call still receives the ringback tone. If the CCRM application now issues the Give RAN command to this call, after getting RAN, the call receives music instead of the ringback tone.

Table 51 "Tone transitions" (page 198) shows how different call actions affect the tone given to the call before and after the action.

Table 51
Tone transitions

Action	Tone before action	Tone after action
Queue to	No tone	Ringback
Queue to	Silence	Silence
Queue to	Ringback	Ringback
Queue to	Music	Music
Dequeue	No tone	Ringback
Dequeue	Silence	Silence
Dequeue	Ringback	Ringback
Dequeue	Music	Music
Give RAN	No tone	Silence

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Action	Tone before action	Tone after action
Give RAN	Silence	Silence
Give RAN	Ringback	Silence
Give RAN	Music	Music
Give tone (silence)	No tone	Silence
Give tone (silence)	Ringback	Silence
Give tone (silence)	Music	Silence
Give tone (ringback)	No tone	Ringback
Give tone (ringback)	Silence	Ringback
Give tone (ringback)	Music	Ringback
Give music	No tone	Music
Give music	Silence	Music
Give music	Ringback	Music
Force disconnect	No tone	(call is gone)
Force busy	Whatever tone	busy (call is gone)
Route to	Whatever tone	(call is gone)

Force Request

Force Request changes the call state to the one indicated by the request. The supported options are disconnect and busy. This command removes the call from all queues where it resides and gives it the requested treatment. For the disconnect command, trunk calls are answered (if they are not already answered) and then disconnected.

For the busy command, unanswered CO/FX/WATS trunk calls receive default treatment. Unanswered ISDN CO/FX/WATS trunks can receive busy tone. Other trunk types can be given busy tone if previously unanswered (no toll).

When Forced Request is used, it must be the first command given in a script. If it is not, a caller hears ringing before getting a busy tone or being disconnected.

Route Request

Route Request diverts the call to a specific DN as if the call had been dialed directly. The call is removed from the CDN and any other ACD queues, then routed to the specified target DN.

The following DN types are supported:

- Set DNs: any number that terminates on a user telephone

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- Trunk DNs: any number that accesses a trunk (such as trunk access codes)
- Attendant DNs: any number that terminates to an attendant console
- ESN DNs: any number (such as a CDP or UDP number) that accesses the Enhanced Switching Network
- ACD DNs and CDNs: all CDNs and ACD DNs in the customer's system. However, the Route To DN cannot be the CDN that originated the call. If it is, an overflow tone is returned.

Call abandoned

When a call is abandoned while in the controlled mode of operation, the call is removed from all queues in which it resides, and an abandoned message is sent to the CCRM application.

Call presentation

When a controlled call is presented to an ACD agent, the call is removed from all other ACD queues in which it has been placed. If the caller was receiving RAN or a tone, the caller now hears ringback.

If the agent returns the call to the queue, it is returned to all ACD queues in which it was placed before the presentation. A call can be returned to queue only if there are no other idle agents for that queue.

When a controlled CCR call is returned to the queue, it is placed at the head of priority 1 (timed overflow high-call queue) of the ACD queue. This assures that the next available agent receives the call. If this call was also placed in other ACD queues by **`queue`** commands from the CCRM application, it is replaced in each of its other ACD queues at the top of the priority at which the call was previously queued. The call is replaced in the queue in the same position it held before.

The caller hears ringback when the call is placed back in its queue.

Call answered

When a call is answered during controlled mode, the software notifies the CCRM application. The CCRM no longer controls the call.

CCR call handling error detection

Synchronization errors

Four synchronization errors that affect the CDN can occur on a per-call basis. These are the four errors:

- No script is available. Call receives default treatment. Ceiling value is checked. CDN is changed in protected memory to default mode, and a CCR003 message is output on the maintenance TTY.

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- An undefined CDN call. Call receives default treatment. Ceiling value is checked. CDN is changed in protected memory to default mode and a CCR003 message is output on the maintenance TTY.
- An invalid call ID is received. Call receives default treatment. Ceiling value is checked.
- CCR cannot control the call. Call receives default treatment. Ceiling value is checked.

Switching from the controlled to the default mode of operation

The software reverts the calls controlled by the CCRM software to default mode under abnormal conditions such as the link going down. However, if the calls are initially in the default mode, abnormal conditions do not occur.

During abnormal operation, calls already placed in one or more ACD queues remain in these queues until answered or abandoned. A call queued to one or more ACD DNs does not go to the default ACD DN, but stays in its queue and receives no further treatment (based on either the CDN parameters or the destination ACD DN parameters). When a CDN reverts to default, calls that are not queued to ACD DNs are sent to the default ACD DN (regardless of the ceiling level for the CDN) and receive EAR treatment.

When a call in the controlled mode must be redirected back to call processing, the following rules apply:

- If a call is queued to an ACD DN because of the previous execution of a Queue Request, the call remains in the queues where it resides.
- If the call is not queued to any ACD DNs, the call is given the default treatment of the CDN in which it resides. Thus, it is queued at the default ACD DN of the CDN and thereafter governed by the rules regarding the default operation.
- The call ceiling value is not checked when diverting these calls to the default ACD DN. However, they are included in the call ceiling count when a new call is diverted to default mode.

The overflow threshold of the default ACD DN applies to the diverted CCR calls coming into the queue.

The call reverts to default under these circumstances:

- Disabling of the AML in LD 48 or LD 96. The software waits to receive a Start Up message from the CCRM application before returning to controlled mode.
- Polling message timeout. The software waits to receive a Start Up message from the CCRM application before returning to controlled mode.

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- Ten successive timeouts on CCR messages. A CCR001 message prints on the maintenance TTY. The software waits to receive a Restart or Start Up message from the CCRM application before returning to controlled mode. When the Restart message is received, a CCR002 prints out on the maintenance TTY.
- Start Up received from the CCRM application. The software waits for all calls in all CDN queues to revert to default mode as outlined above.
- Shut Down received from the CCRM application. The software waits for the CCRM application to send a Start Up message before returning to controlled mode.
- CCR Died received from the CCRM application. The software waits for the CCRM application to send a start message before returning to controlled mode.
- CCR003 means a CDN was forced into default because there was no association in the CCRM.

Trunk unit fault

If a trunk providing RAN to a CCR-controlled call goes down, the CCRM application receives a treatment-complete message so that the call can continue its treatment as prescribed by the call script.

Operating parameters

Prompts and responses

The following prompts are added to LD 23 equipped with the CCR package:

- CNTL (YES, NO): is the CDN in controlled mode?
- VSID: VAS ID for Application Module Link for CCR.
- HSID: VAS ID for Application Module Link for host.
- CWTH: Call waiting LED threshold.
- BYTH: Busy queue threshold.
- OVTH: Overflow queue threshold.
- STIO: TTYs assigned for status displays.
- TSFT: Telephone Service Factor Threshold.

CNTL prompt

This prompt is given only if the system has the CCR package installed. The CNTL prompt determines whether the CDN is in controlled mode. When set to YES, the CDN operates in controlled operation. When set to NO, the CDN is restricted to using the default mode.

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CCR capacity impacts

The following list describes the CCR impact on capacity:

- Real time - if 100 or more CDNs are defined, the ongoing status display could be affected. Therefore, a single script should be defined and used when possible for many DNIS numbers. For example, rather than defining a CDN for each DNIS number, define a single CDN and call script using IF statements within the script to provide different treatments based on DNIS numbers.
- Memory - each CDN takes up as much memory as an ACD DN.
- 240 ACD DNs/CDNs can be defined per customer.
- Call registers needed for CCR should be added to existing NCR in LD 17.
- LD 17 - CSQI and CSQO should be increased by 25%.
- LD 17 - CSQI + CSQO = 25% of NCR each.
- Number of ACD trunks to CDNs minus the number of logged-in agents equals the number of unanswered calls times 7. This value is dependent on NCR, the MAX being 25% of NCR.

Feature interactions

ACD Ring Again

This feature cannot operate on CDN queues. However, once the call is queued at an ACD DN by default treatment or a route request, this feature is available if configured.

Agent Display

When a CCR call (either controlled or default) is either presented to or answered by the agent, depending on the agent's display class of service, the agent's display shows the following:

- Originator Information
- DNIS number (where applicable)
- Original Called Information

The Original Called Information category covers the CDN. The display of the CDN conforms to current software operation. Therefore, if a call initially dials a CDN, the original called number (the CDN) is displayed when that call is presented to or answered by an agent, depending on the agent's display class of service.

The name of the CDN is displayed instead of the originator's or DNIS name if the following conditions are met:

- A name is defined for the CDN.

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- The agent's telephone has the Calling Party Name Display Allowed class of service.
- The DNAM option is not enabled in the incoming route block.

The redirecting number is the number of the last redirection. It changes as redirections occur within the network.

Under the best circumstances, the original called number and name are displayed on the terminating telephone. However, the redirecting number and name are used if a non-ISDN trunk or a switch that does not support the original called number message is encountered. A CDN can be a redirecting number and name.

Agent/Supervisor keys

If a CCR call is presented to an agent and the agent activates an Agent/Supervisor key, call handling occurs as described in "Not Ready key (Basic)" (page 40).

Alternate Answering Service

A CDN cannot be an AAA DN.

APL Messages

If an AUX Processor is equipped, Auxiliary Processor Link (APL) messages are sent across the APL link when an EAR or CCR call is given to an ACD agent through the default treatment or the Queue To command requested by CCR.

Attendant Extension

Attendant extension to a CDN is supported when the CDN is in controlled or default mode.

An attendant initiating a call extension to a CDN in default is diverted to the default ACD DN. If the attendant completes the extension when the call is in the ACD queue, the call maintains its place in the queue.

An attendant initiating a call extension to a CDN in controlled mode has an incoming message sent for it to the CCRM application module with the attendant as the originator. When the attendant completes the call extension by activating the release key, the call must be removed from all the ACD queues it is currently queued to and a call abandoned message must be sent to the CCRM application module. A new incoming message is sent for the extended call with the new originator information. The extension cannot be completed until the destination lamp on the attendant console is lit/wink.

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Before the extension is complete, if the CCRM application sends the system a treatment request for RAN, the attendant cannot receive RAN. An attendant cannot receive Music treatment in both ACD and CCR operations. The CCRM application determines what treatments are given to calls.

If the attendant extension is completed while the call is ringing on an agent's telephone, a call abandoned message is not sent to the CCRM application because the call should be answered momentarily. If the agent activates NRDY instead of answering the call, the call is handled as described in "Not Ready key (Basic)" (page 40).

If the attendant extension is completed after the call is answered, no interaction occurs because once the call is answered the CCRM application no longer controls the call.

Both ACD-C and ACD-D reports peg attendant extended calls as one call to the CDN.

Attendant Overflow Position

A CDN cannot be an attendant overflow DN.

Attendant Recall

Once a call is extended by the attendant to a CDN, it cannot recall back to the attendant console.

n-band ANI

ANI information, if available, is provided to the CCRM application to use In-Call scripts.

Auto-terminate trunks

Auto-terminate trunks can terminate to a CDN (auto-termination number). If the trunk is designed as a DNIS trunk, the DNIS digits are delivered to the CDN and are carried with the call to ACD queues where it ends up by either default or controlled mode.

Barge-In

The attendant is prevented from barging into the originating trunk of a controlled or default CCR call.

Busy Verify

The attendant is prevented from busy verifying the originating telephone of a controlled or default CCR call.

Call Forward

If the CCRM application issues a Route To command to a telephone that has call forwarded all calls, the call is forwarded to the appropriate destination. If the telephone has First Level Call Forward No Answer enabled, the CFNA

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DN for the Route To DN is obtained when the CFNA timeout occurs, instead of the CFNA DN for the dialed DN (the CDN in this case). The CCR call is forwarded to the next telephone.

Calling Line ID (CLID)

CLID information is provided for use In-Call scripts. It is also available for telephone displays and other applications to which the CDN can pass the call by route requests and default DNs.

Call Party Name Display (CPND)

The CDN can be assigned a name with the CPND feature. The CCRM application can also assign a name to the same DN by the variables feature. These two names are not coordinated and can be different. The name is also available for telephone displays and for other applications to which the CDN can pass the call by route requests and default DNs.

Only M2317, M2008, M2x16, and M2616 telephones can have CPND class of service. Name information can be displayed only on these types of telephones.

Call Park Recall

If a controlled or default CCR call is answered by an agent who subsequently parks it, the call recalls back to the ACD DN of the agent and not the CDN.

Call Transfer

The CCRM application must be informed of the call transfer because the originating information (such as CLID and DNIS number of the transferring party) could differ from that of the transferred party.

Scripts created on the CCRM application can have conditional branching based on the originating information. Therefore, when a transfer is completed while the call is in the CDN queue, it is taken out of all the ACD queues to which it was queued.

If the agent activates NRDY instead of answering the call, the call is placed to the front of the queue so it becomes the next in line to be answered.

If the transfer is completed after the call is answered, no interaction occurs because once the call is answered, the CCRM application no longer handles the call.

The transfer of a call to a controlled CDN cannot be completed until a valid tone or treatment request for the transferring party is received from the CCRM application, and successfully performed by the switch (the tone can be ringback or silence, and the treatment can be Queue To, Route To, or give music or RAN). Both ACD-C and ACD-MAX report peg-transferred calls as one call to the CDN.

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Additional Call Transfers are possible involving network call redirection. If Telephone A at Node A calls Telephone B at Node B, and Telephone B activates the transfer key initiating a transfer to a CDN at Node C, when Telephone B completes the transfer, Telephone A's display is updated according to the mode of the CDN at Node C. If the CDN is in default mode, Telephone A gets the default ACD DN on the display if Telephone A is placed in the default ACD DN queue. Otherwise the display is updated with the number to which the default ACD DN diverts the call.

If the CDN is in controlled mode, Telephone A gets the CDN on the display. The CCRM application is unaware of the transfer for this event because the system does not send the messages when the transfer is complete at Node B.

Call Waiting Indication (AWC)

If the New Call Waiting (NCWL) option is disabled, the number of calls queued to the ACD DN shown by the ACD calls waiting lamp (AWC) does not include controlled CCR calls.

If the New Call Waiting option is enabled, the number of calls queued to the ACD DN shown by the ACD calls waiting lamp (AWC) includes CCR calls.

Once a default CCR call has been placed in the default ACD DN, it is considered a regular ACD call (except that the call gets its RAN and music treatment from its source CDN). Default CCR calls are reflected in the AWC display as regular (nonvirtual) CCR calls. Refer to the Night Mode section for a description of AWC when an ACD queue enters Transition or Night Mode.

Centralized Attendant Service

An attendant at the main site can extend a call to a CDN at a remote location. The extension cannot be completed until the destination lamp is lit/wink.

CO trunks

When a call enters the system by a CO trunk (including FEX and WATS), the Central Office provides ringback. This state is maintained until default or controlled treatment actions change it. Calls arriving on other trunk types receive silence until treatment for the call is decided (default treatment calls receive ringback or other tones as for calls directly dialed into the ACD DN, while treatments given to controlled mode calls are controlled by the CCRM application). Answer supervision must be returned on a CO trunk before the following treatments can be given:

- music
- silence
- RAN
- Force Disconnect

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- Force Busy

Customer Night Number
A CDN cannot be defined as a customer night number.

Display Waiting Calls (DWC) key
The light state of the Display Waiting Calls (DWC) key corresponds to the light state of the Calls Waiting (AWC) key. When the Display Waiting Calls (DWC) key is used at the supervisor's or agent's telephone, the display on the telephone is in the following format:

aaa bbb ccc dddd

where

a a a	=	number of calls in queue (TOF+high and nonpriority)
b b b	=	number of agent positions occupied
c c c	=	waiting time for the oldest call in queue
d d d d	=	virtual calls, which include source TOF, call request queue, and CCR-controlled calls

Distinctive ringing
Ringing is provided to calls originating from a route marked for distinctive ringing that has called or is diverted to a CDN in either controlled or default mode.

DN Expansion
Five- to seven-digit directory numbers are supported for CDNs.

Interactive Voice Response (IVR)
Because a CDN is not associated with a physical telephone and is used mainly for call routing purposes, a CDN cannot be configured as the destination mailbox DN for any Interactive Voice Response (IVR) application.

Dialed Number Identification Service (DNIS)
This feature enables the software to store from 1 to 31 dialed digits of a call arriving on DID or TIE trunks from the external network. This enables customers to identify the purpose of the call when a trunk terminates more than one number on the switch.

The ACD DN to which the call is directed is obtained from the auto-terminate field in the protected trunk block, or it can be obtained through IDC translation tables.

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Calls arriving at an ACD DN by a CDN have the same DNIS information as if they had entering the ACD queue directly.

Enable Interflow (ENI) key

A CDN cannot have an ENI key defined for it.

Enhanced Interflow

Controlled CCR calls cannot interflow. They are not included in the Overflow Threshold (OVTH) count.

Feature Group D (FGD)

This feature provides ANI information (both calling and called party numbers) by FGD trunks. The calling party number (CLID) and the called party number (DNIS) are provided to the CCRM application for use In-Call scripts. Feature Group D supports seven digits of DNIS.

Feature Invocation Messages

This feature enables applications to invoke telephone features on behalf of individual telephones. Because this feature creates new ISDN/AP messages, changes to TFS008, Traffic Measurement, must be made to monitor these new messages. For more information, refer to *Traffic Measurement: Formats and Outputs Reference (NN43001-750)*.

Hunting

Only 500 and CDS, attendant, LDNs, or ACD DNs defined as message centers can be defined as an FDN or a Hunt DN. A CDN cannot be defined as an FDN or a Hunt DN. If a Route To command to a telephone is issued from the CCRM application, the call hunts based on the parameters of that telephone.

Incoming Digit Conversion (IDC)

CDNs can be entered as a valid termination in the IDC tables. A call can be rerouted to a CDN based on entries in the IDC tables.

License limits

CDNs are counted as ACD DNs. For example, the license limit specified for ACD DNs applies to the sum of CDNs and real and virtual ACD DNs.

Individual DN (IDN) keys

An IDN key can be any DN key, such as SCR, MCR, SCN, and PLR. If an IDN key is activated while a CCR call is presented to the agent, call handling occurs as described in "Not Ready key (Basic)" (page 40).

ISDN/AP Enhancements

This feature enhances existing messages and adds new ISDN/AP messages as part of the ISDN/AP enhancement.

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ISDN Signaling trunks (ISL)

If an incoming call to a CDN in controlled mode is from an ISL trunk in which the D-channel is active, then the required ISDN signaling messages are sent to the far end when the first treatment request is received from the CCRM application. However, if the D-channel goes down, ISDN messages are not sent when the first treatment request is received from the CCRM application.

Last Number Redial

In the EAR feature, the stored number that can be redialed is the default ACD DN to which the call is routed by the default treatment instead of the normal dialed DN (which is the CDN in this case).

Make Set Busy

If a CCR call is presented to an agent and the agent activates the MSB queue, call handling occurs as it is described in "Not Ready key (Basic)" (page 40).

Meridian Mail

CCR controlled calls can be placed in a Meridian Mail queue by a Queue To command. The call is removed from all other queues where it resides when it is presented to a Meridian Mail port.

For a route request, CCR relinquishes control of the call when the route request is issued and before it is answered.

Because a CDN is not associated with a physical telephone and is used mainly for call routing purposes, a CDN cannot be configured as the destination mailbox DN for any Interactive Voice Response (IVR) application, including Meridian Mail.

Multi-Tenant

For controlled mode, tenant numbers are not checked when the CCRM application module requests the system to queue a call to a particular ACD DN. If the originator of a controlled CCR call is queued to an ACD DN and has a tenant number that has denied access to that ACD DN's agent's tenant, the agent is unable to answer the call after connecting the CCR call to an agent.

One guideline of the Multi-Tenant feature is that every ACD agent of an ACD DN have the same tenant number. It is recommended that the tenant to which the caller belongs have access to the tenants in which ACD DN queues reside. The ACD DN queues are the queues to which the call can be queued by the Queue To command or default treatment. The system checks the access by looking at the first agent in the agent list. If this agent's tenant number is denied access to the originator of the call, the call receives intercept treatment and is denied access to this ACD DN.

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For default mode, when a CCR call first enters the default ACD queue, it receives intercept treatment if the tenant number of the first agent of the default ACD DN is denied access to the originator of the call.

No Multi-Tenant checking occurs when a call enters a CDN queue because a CDN does not have agents against which it can check tenant numbers.

Network ACD (NACD)

NACD target tables are not provided for CDNs, nor can CDNs be targets for NACD Routing Tables of other ACD DNs. If a remote CDN is specified as a target in an ACD DN routing table, the remote node refuses the request and an error message is issued indicating an invalid DN. Controlled CCR calls can be sent to queue with NACD tables using the Route To command.

CCR calls in default mode can access the NACD routing tables of the destination ACD queue where they reside, while controlled mode calls are not subject to NACD rerouting.

The name of the CDN is sent to the target node if the CDN is the original dialed number. It appears as the original called number.

Network Call Forward No Answer

This enables a person to define a trunk access code or NARS/BARS for an FDN. When the call rings at the remote FDN, the originator's display is updated with the redirection number (and name if defined).

CDNs can be entered as remote FDNs because there is no cross-checking with the terminating node to verify the number entered.

If a CDN in default mode is entered as a remote FDN, the originating telephone is updated with the default ACD DN if the call is put into the default ACD DN queue, or with the number where the default ACD DN diverts the call if the call does not remain in the default ACD DN queue.

If a CDN in controlled mode is entered as a remote FDN, the CDN number is updated on the originator's display as soon as ringback is provided to the caller. (Ringback is provided to the caller when the CCRM application sends as a first command a Queue Request, a RAN request, or a Route To request. Ringback is also provided when a Give Ringback Tone request is received. Ringback is given regardless of whether the Give Ringback Tone was the first command received for the call.)

Network Call Redirection

This enables a person to define a trunk access code or NARS/BARS for a Hunt DN. When the call is ringing at the remote Hunt DN, the originator's display is updated with the redirection number (and name if defined).

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Since the terminating node does not cross-check to verify the number entered, CDNs can be entered as remote Hunt DNs.

If a CDN in default mode is entered as a remote Hunt DN, the originating telephone is updated with the default ACD DN if the call is put into the default ACD DN queue, or the number of wherever the default ACD DN diverts the call if the call does not remain in the default ACD DN queue.

If a CDN in controlled mode is entered as a remote Hunt DN, the CDN number is updated on the originator's display as soon as ringback is provided to the caller. (Ringback is provided to the caller when the CCRM application sends as a first command a Queue Request, a RAN request, or a Route To request. Ringback is also provided when a Give Ringback Tone request is received. Ringback is given regardless of whether the Give Ringback Tone was the first command received for the call.)

This feature also provides terminating number display information for transfer and call pick-up redirections. For example, if Telephone A at Node A calls Telephone B at Node B, and Telephone B transfers Telephone A to a CDN at Node C, after completing the transfer, Telephone A's display shows the following:

- The CDN default ACD DN, if the call is put into the default ACD DN queue
- The number where the default ACD DN diverts the call, if the call does not remain in the default ACD DN queue
- The CDN (if the CDN is controlled)

Network CPND

Network CPND includes a new prompt, RCAP, in the configuration per D-channel to indicate whether to send the name

- when the call is answered (ND1)
- when the call is presented (ND2)

ND1

If the ND1 option is enabled, the originator's telephone is updated with the name at the time that the call is connected. Therefore, if a CDN in default mode is dialed, the originator's telephone is updated with the name of the ACD DN of the agent who answered the call. However, if RAN is given before the call is answered, the originator's display is updated with the name of the ACD DN whose queue the call is in.

If a CDN in controlled mode is dialed, the originator's telephone is updated with the name of the ACD DN of the agent answering the call. However, if RAN or music is given, the originator's display is updated with the name of the CDN when the RAN or music is connected.

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ND2

If the ND2 option is enabled, the originator's telephone is updated with the name when the call is presented. Therefore, if a CDN in default mode is dialed, the originator's display shows the name of the default ACD DN or the name of the ACD DN to which the default ACD DN diverted the call using NCFW, overflow by count, or interflow.

If a CDN in controlled mode is dialed, the name of the CDN appears when the call is given ringback. Ringback is provided to the caller when the CCRM application sends as a first command a Queue Request, a RAN request, or a Route To request. Ringback is also provided when a Give Ringback Tone request is received. Ringback is given regardless of whether the Give Ringback Tone was the first command received for the call.

If a Give RAN or Give Music command is issued before a Give Ringback or a Queue To command, the name of the CDN appears on the originator's telephone at the time the call is connected to the RAN or music. When the call is answered, the name of the ACD DN of the agent answering the call is *not* updated on the originator's telephone.

Network Call Trace

A call within the ISDN network that is calling a CDN can have network call trace performed on it. The Network Call Trace (NCT) information collected for a default or controlled CCR call is discussed in different scenarios:

- Telephone A dials a CDN in controlled mode. The NCT output shows ORIG node and TBD node information with STAT of DIAL. The rest of the output depends on what treatments the call receives.
- Telephone A dials a CDN in default mode and the call is presented to an ACD agent immediately. The NCT output shows ORIG node and TERM node information with STAT of RING.
- Telephone A dials a CDN in default mode and the call is waiting in the default ACD DN. The NCT output shows ORIG node and TBD node information with STAT of ACD.
- Telephone A dials a CDN in controlled mode, CCR response timeout. The call is then routed to the default ACD DN and presented to an ACD agent immediately. The NCT output shows ORIG node and TBD node information with STAT of DIAL.
- Telephone A dials a CDN in controlled mode, CCR response timeout. The call is then sent to the default ACD DN and queued. The NCT output shows ORIG node and TBD node information with STAT of DIAL.

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Network Call Transfer

Network Call Transfer is supported for a CDN. If a caller on Switch A calls a telephone at Switch B and the telephone at Switch B initiates a transfer to a CDN at Switch A, when the transfer is completed the trunks between Switch A and Switch B are shut down.

Night Call Forward

Calls controlled by the CCRM application cannot Night Call Forward.

Night Key Digit Manipulation

This feature enables an IDC route to have two routes defined—one for day and one for night. It also enables a new key (DRC) to toggle between the two routes on a per-route basis.

Because a CDN can be defined as a termination in an IDC table, a call from an IDC trunk can terminate to a CDN through both the day and night tables.

Night Service (NSVC) key

CCR calls in controlled mode cannot be placed by the Queue Request in ACD queues that are in Night Service or Transition Mode. In addition, calls already residing in an ACD queue when the queue goes into Night Service (Night Mode) are removed from that queue. The CCRM application is not notified when calls are removed from a queue because of the ACD queue entering Night Service.

When the default ACD DN of a CDN is in Night Service, all CCR calls entering the ACD queue by default treatment receive the Night Service treatment of the default ACD DN (Night RAN and Night Call Forward).

CDNs are valid destination DNs for the Night Call Forward DN of an ACD DN. A Night Service (NSVC) key cannot be defined for a CDN.

CCR calls do not queue to ACD DNs in Night Service.

Transition Mode: NSVC key If a queue goes into transition mode by the Night Service key, calls already in the queue remain, but no new calls can enter the queue. An ACD queue remains in transition mode until all of the calls that were in queue when the transition mode was entered, including CCR calls that were placed in the queue by the Queue To command from the CCRM application, have been depleted. When no more calls remain to be answered, the queue enters Night Mode.

If a queue that was in transition mode enters Night Mode before all calls that were eligible to be answered were answered (for example, the supervisor manually takes the queue from transition mode to Night Mode by the Night Service key), call processing proceeds as described in Night Service.

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Calls Waiting Indication (AWC) key If the New Call Waiting (NCWL) option is disabled for a queue, the number of CCR calls in that queue is not reflected by the AWC key lamps (the agents have no way of knowing if there are CCR calls in queue).

When a queue enters transition mode, agents do not have a true indication of the number of calls remaining to be answered since CCR calls are not included in the count when the NCWL option is not enabled. Therefore, the New Call Waiting option should be enabled for an ACD DN that receives controlled CCR calls.

If the New Call Waiting option is enabled for a queue, the number of calls that remain to be answered are reflected by the AWC key lamp when the queue enters transition mode. CCR calls are included when the New Call Waiting function is determining the number of calls remaining in queue.

Display Waiting Calls (DWC) key When the ACD DN enters transition mode, the DWC display shows the following information:

- aaa = number of calls waiting in queue
- bbb = number of agent positions available
- ccc = waiting time for the oldest call in the queue
- dddd = the sum of CCR calls

Night Mode by the NSVC key When an ACD queue enters Night Mode by the Night Service key, the CCR calls are treated the same as described in Night Service.

Calls Waiting Indication (AWC) key When the ACD queue enters Night Mode, the AWC key lamp goes dark, indicating that no calls are eligible to be answered because the queue is in Night Service.

Display Waiting Calls (DWC) key When the ACD queue enters Night Mode, all of the fields in the display are zero because calls are not eligible to be answered and the agents are unavailable; the queue is in Night Service.

NightRAN A default CCR call receives the night RAN as it is defined for the ACD DN in which it is currently queued.

Night Call Forward Controlled calls cannot Night Call Forward. Default CCR calls can Night Call Forward.

Not Ready (NRDY) key

If a CCR call in default mode is presented to an agent and the agent activates the NRDY key, call handling occurs according to current software operation.

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If a CCR call in controlled mode is presented to an agent and the agent activates the NRDY key, the software presents the call to another idle agent.

If there are no idle agents, the call is placed at the head of priority 1 (timed overflow high-call queue) of the ACD queue of the agent to whom the call was presented. This assures that the call is presented to the next available agent. If this CCR call was also placed in other ACD queues by queue commands from the CCRM application, it is replaced in each of its other ACD queues at the head of the priority at which it had been previously queued. The CCR caller hears ringback when replaced in the queue.

When a CCR call is replaced in the queue, it is not relinked by time in the queue. This affects the DWC display, as well as the Oldest Call in Queue Statistics for CCR statistics. For example, if a CCR call is the only call in the queue, and it is presented, then requeued because the agent presses the Not Ready key, the DWC display shows one call in the dddd field (the field that displays virtual calls), with a wait time of zero. The wait time is zero even if the caller has been in the queue longer than zero seconds.

Observe

If a CCR call is presented to a supervisor and the supervisor activates the Observe key, call handling occurs as described in "Not Ready key (Basic)" (page 40).

Originator display

The originator of a call receives a display update when the call is terminated or answered only if it is an internal call or within an ISDN network. When the originator places a call, the originator's display shows the originally dialed number (a CDN if that was the originally dialed number).

Assuming the originator dials a CDN, when an agent answers the call the agent's ACD DN appears. This ACD DN is either the default ACD DN of the CDN, the number that the default ACD DN diverted the call to (if the call received default treatment), or the ACD DN in which the call had been placed by a CCRM application command (if the call received controlled treatment).

If the agent's ACD DN has a name defined and the originator has CPND allowed Class of Service on the telephone, the name of the agent's ACD DN appears after the agent's ACD DN as follows:

original dialed DN	agent's ACD DN	Name of agent's ACD DN

Only M2317, M2008, M2x16, and M2216 telephones can have CPND class of service, and these are the only telephones that can display name information.

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Overflow by count

When a call is placed in an ACD queue by default treatment for a CDN, the overflow threshold of that queue is followed. When the threshold is exceeded, any overflow destinations defined for the ACD DN are considered based on the existing rules for this feature.

Controlled CCR calls that are queued by multi-queuing at an ACD queue do not count toward the ACD DN's queue size when calculating whether the overflow (OVTH) and BUSY thresholds are exceeded. Also, controlled CCR calls placed in an ACD queue by the Queue To command are not subject to the overflow threshold. Even if the overflow threshold has been exceeded for an ACD queue, controlled CCR calls can still be placed in that queue and does not go to overflow.

Therefore, a situation could occur where the combined number of ACD calls and controlled CCR calls exceed the overflow threshold. The CCRM application determines the number of CCR calls that are placed in an ACD queue.

CDNs cannot be overflow destinations for Automatic Overflow.

PDP

CCR and PDP hardware are mutually exclusive.

Ringing Number Pickup

A telephone within the same call pickup group as an ACD agent cannot pick up a ringing ACD call. This also applies to CCR calls, both controlled and default.

Set Agent Priority (SAPA) /Select Agent Position (SAGP) commands

If the supervisor issues a SAPA or SAGP command against an agent while the agent is presented with a CCR call, call handling occurs as described in "Not Ready key (Basic)" (page 40) if the customer has installed ACD-C or ACD-D.

Supervisor Control of Queue Size

When calls are routed to an ACD DN or placed in an ACD queue because of default operation, the call can receive busy tone treatment due to this feature (provided this feature is configured at the destination ACD DN and the overflow conditions necessary to activate this feature are met). The decision to provide a busy tone depends on the origination party type (DID calls and CO calls).

Supervisor Control of Queue Size interacts strongly with the CDN call ceiling function, because both use thresholds to control queue size. If the call ceiling threshold is less than or equal to the overflow threshold used by

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Supervisor Control of Queue Size, default CCR calls are not handled by the Supervisor Control of Queue Size feature because the call ceiling is always reached before the overflow threshold. When the call ceiling is reached, any new default CCR calls are not placed in the default ACD DN. They are handled by the call ceiling function.

If the call ceiling for a CDN has not been reached, calls can go to the default ACD DN. When a default CCR call reaches the default ACD DN, it is subject to treatment defined for that ACD DN (except for RAN and music), including Supervisor Control of Queue Size. If a default CCR call reaches the ACD DN and the Supervisor Control of Queue Size is in force (for example, acting on incoming calls), the CCR call receives the treatment this feature applies to it.

For controlled calls, if the CCRM application requests the call to queue to a particular ACD DN that has the Supervisor Control of Queue Size feature activated, then the call is queued at the ACD DN regardless of its overflow conditions. These controlled CCR calls do not count toward the overflow condition of the ACD DN.

Telset Messaging

Telset Messaging enables a caller to leave a message with the Message Center while in an ACD queue without talking to an agent using telephone-based menus. This feature is supported for default CCR calls only.

Timed Overflow and Enhanced Overflow

When a call is placed in an ACD queue by the default mode of operation for a CDN, the call can time overflow by the time overflow timer (TOFT) value (or timer values for Enhanced Overflow) defined for the ACD queue. CCR calls placed in an ACD queue by controlled-mode treatment are not subject to timed overflow or enhanced overflow treatment.

CDNs cannot be overflow destinations for enhanced overflow and timed overflow.

Trunk Night Number

A CDN can be defined as a Trunk Night Number.

Trunk priority

Calls arriving by incoming trunks can have two levels of priority: high and none. If a CCR call receives default treatment, it retains its trunk priority. However, if a CCR call receives controlled treatment, the priority of the call is controlled by the CCRM application, and one of four levels of priority, not associated with the trunk, can be assigned. In controlled mode, the trunk priority of a call is overridden by the CCRM application if it issues a queue request. A trunk priority on a default call cannot be overridden.

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Feature requirements

Enhanced Call Trace is package 215. It requires Enhanced ACD Routing (EAR, package 214), Unique Call ID (CALLID, package 247), and Command and Status Link (CSL, package 77).

As part of ECT, CCR reporting requires either Meridian Max 4.0 or ACD management reports (ACD-C, package 42).

Dialed Number Identification Service (DNIS) (Advanced)

Several optional features make up the ACD Dialed Number Identification Service (DNIS). After a general description of DNIS, each of these features is described in this section.

DNIS overview

The ACD Dialed Number Identification Service (N digit DNIS) displays up to thirty-one digits of the dialed DN received from DID and TIE trunks on the ACD agent's display.

In telemarketing environments, DNIS can reduce the time needed to serve a call. For example, the dialing plan can be configured so the DNIS digits represent product lines or services. The ACD agent can then answer incoming calls with the appropriate response.

DNIS offers these functions:

- Displays the DNIS digits on an agent's display.
- Displays information sent through the Application Module Link (AML) to the host computer on the agent's display.
- Makes DNIS information available across all modifications to Customer Controlled Routing (CCR).
- DNIS information is available across all modifications to
  - — Third Party Vendor Host Application (AML) supports
  - — Third Party Vendor applications by means of the Auxiliary Processor Link (APL)
  - — Network ACD (NACD) calls queued at a remote target
  - — Feature Group D (FGD) trunk calls
  - — Customer Controlled Routing (CCR)
  - — High Speed Link (ACD MAX and Meridian MAX)

With DNIS enabled, the agent's display shows the following information:

ACOD MEM DNIS

where

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ACOD	=	trunk group access code
MEM	=	trunk member number
DNIS	=	pulsed-in DNIS numbers

DNIS Length Flexibility

DNIS Length Flexibility modifies the number of digits supported. The Route Data Block defines a flexible N digit DNIS range of 1 to 31.

- ACD DNIS routing (IDC-DNIS) supports 16 digits of DNIS.
- Name Display for DNIS support seven digits of DNIS.

This feature is supported by both ACD and NACD. The appropriate number of DNIS digits is preserved across call modification, included in Call Detail Recording (CDR) records, and sent across the Applications Module Link (AML).

Table 52
Number of DNIS digits supported by various applications

Application	Number
Applications Module Link (AML)	30
Auxiliary Processor Link (APL)	4
Call Detail Recording (CDR)	1-7
Customer Controlled Routing (CCR)	20
Dialed Number Name Display	1-7
Digit Display	12
Feature Group D (FGD)	1-7
High Speed Link (HSL)	1-9
IDC translation to Internal DN	16
Meridian Mail	1-30
Meridian MAX 9.0	1-9

DNIS operations

The Auto-terminate feature of DNIS works as follows: When a call is received from a DID or TIE trunk, a verification is performed to make sure it belongs to a DNIS trunk group. If it does, the pulsed-in digits are collected and stored. When the proper number of digits are received, the call is auto-terminated at the ACD DN specified for that trunk. The pulsed-in DNIS digits are shown on the agent's display.

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If an ACD DN is not specified for a trunk, a DNIS call defaults to the attendant, the DNIS number is not displayed, and an error message is printed at the maintenance terminal. The DNIS number is not displayed on the attendant console, but is displayed on the agent's display when the call is extended.

Host interface environment

On call presentation, a message is sent across a link to the host computer, if equipped. This link could be the Meridian Link or the Auxiliary Processor Link, depending on the application.

Within host interface environments, DNIS messages are sent across the link for the following applications:

- **DNIS Call Presentation** identifies the agent position for the host computer.
- **DNIS Call Answered** informs the host computer that a DNIS call has been answered. A screen of information is presented to a terminal at the agent position.
- **DNIS Call Disconnects** informs the host computer that the agent who answered the DNIS call is available for other calls.

Messages for the host interface contain the DNIS number and an agent ID number to identify the agent position for the host computer. The host computer needs a "look-up table" in the database to reference agent position numbers and the proper ports. The host computer can then send a screen of appropriate information to a terminal at the agent position when the call is answered. If the DNIS number is less than the number of digits it can accommodate, the number field is filled with leading zeros. These are all one-way messages from the switch to the host computer.

The Auxiliary Processor Link (APL) consists of a hardware driver and a software driver used together to transmit messages and route commands between the host computer and the switch. The software driver sends message packets back and forth between the host computer and the switch. The APL supports four digits of DNIS information.

One end of the link terminates on the Serial Data Interface (SDI) port within the system. The other end terminates on one of the Input/Output ports on the host computer. The physical link between the host computer and the switch is a full-duplex, asynchronous, 4800-baud data link, RS-232-C-compatible. The Meridian Link requires the ESDI QPC-513 G card.

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Feature interactions

DNIS Across Call Modifications preserves the DNIS information across certain call modifications and enhances DNIS operation and functionality. Refer to "DNIS Across Call Modifications (Advanced)" (page 230).

Display

When a target agent answers a call that has overflowed, the source ACD DN is displayed with the DNIS number.

The display is cleared when certain features interact with DNIS. After completing a call using Call on Hold, Call Consultation, Calling Party Number key, or Charge key, the DNIS number is redisplayed after the dialing party is restored.

For the features interacting with DNIS, the display clears during operation. DNIS is not displayed when the following functions are accessed:

- Display Queue key
- Observe Agent key
- ACD Supervisor (ASP)
- ACD Emergency (EMR) key
- Attendant Barge-In
- Attendant Recall (ARC) key
- Conference calling
- Display (DSP) key
- Parked Calls

Digit Insertion

DNIS routes are not eligible for digit insertion.

Operating parameters

Auto-terminating DID trunks, TIE trunks, and FGD-DNIS trunks supports DNIS. The DNIS information is *not* supported on any other trunk type.

Auto-terminating ACD DNs for DNIS are specified at the trunk level.

The DNIS call does not terminate until the proper number of digits are received. If the call terminates on a non-ACD DN, the DNIS number is not displayed and messages are not sent across the link. The DNIS number display is not supported on the Electronic Switched Network (ESN) or for Trunk Digit Insertion (TDI).

If ACD DN is not specified for auto-termination, the call defaults to the attendant. The DNIS number is not displayed on the attendant console.

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DNIS requires DNIS (package 98), ACD advanced features (package 41), and Digit Display (package 19).

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. LD 17 - Define SDI port for Auxiliary Processor Link
2. LD 49 - Define Incoming Digit Conversion table
3. LD 16 - Define IDC-DNIS route

OR

1. LD 14 - Define a trunk that auto-terminates on ACD-DNIS
2. LD 16 - Define a route Auto Terminate Route
3. LD 15 - Define APL Link number, enable the Incoming Digit Conversion (IDC) operation to include DNIS for a customer
4. LD 23 - Define ACD group

LD 17 Define SDI port for Auxiliary Processor Link

Prompt	Response	Description
REQ:	CHG	Change an existing data block
TYPE:	CFN	Configuration Record
ADAN	NEW TTY 0-15	Add an APL port
CTYP	aaaa	Card type aaaa = DCHI, SDI, SDI2, SDI4
USER	APL	APL port connects to data link

LD 49 - Define Incoming Digit Conversion table

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	RDB	Route Data Block
CUST	xx	Customer number as defined in LD 15.
DCNO	0-254	Incoming Data Conversion (IDL) tree number
...	...	...
IDGT	0-9999 0-9999	Incoming digits to be converted to ACD DN

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Prompt	Response	Description
		To delete a DN or a DN from a range of DNs Prompt: Response IDGT: 3440 3440 x
	<CR>	Re-prompt request

LD 16 Define IDC-DNIS route

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	RDB	Route data block
CUST	xx	Customer number as defined in LD 15.
ROUT		Route number
	0-511	Range for Large System and Call Server 1000E
	0-127	Range for Small System and Media Gateway 1000B.
...	...	...
AUTO		Auto-terminate
	No	YES = The route members terminate on DN defined by response to ATDN prompt in LD 14. NO = The route members terminate normally.
DNIS	YES	ACD DNIS route
--NDGT	1-31	Number of DNIS digits expected
--WDGT	(L) F	First or last 4 digits for APL First or last 12 DNIS digits for digit display First or last 9 DNIS digits for MAX First or last 7 DNIS digits for CDR
--IDC	(NO) YES	Incoming DED digit conversion on this route allowed/denied

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Prompt	Response	Description
--DCNO	0-254	IDC translation table for this route in the day mode
--NDNO	0-254	IDC Conversion Table for the night mode

LD 14 Define a trunk that auto-terminates on ACD-DNIS

Prompt	Response	Description
REQ:	NEW	Add a trunk
TYPE:	DID	Direct Inward Dialing trunk type
RTMB	0-511 1-4000	Route member and Member Number Range for Large System and CS 1000E system
	0-127 1-4000	Range for Small System and Media Gateway 1000B
ATDN	xxxx	xxxx = ACD-DN defined in LD 23
CLS	DTN	Digitone signaling

LD 16 Define a route with DNIS feature enabled and auto-terminate.

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	RDB	Route Data Block
CUST	xx	Customer number as defined in LD 15.
ROUT		Route number
	0-511	Range for Large System and CS 1000E system
	0-127	Range for Small System and Media Gateway 1000B.
…	…	
AUTO	YES	Auto-terminate trunk
		YES = Enable Auto-terminate trunk
DNIS		ACD-DNIS route
	(NO) YES	(NO) = Deny ACD-DNIS route
		YES = Allow ACD-DNIS route

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Prompt	Response	Description
NDGT	1-(4)-7 1-(4)-31	Number of DNIS digits required on the route. The extension to 31 digits is available only for DID, TIE, or IDA routes.
WDGT	(L) F	First or last 4 DNIS digits to be sent on APL and HSL link. WDGT has no effect on AML links. All DNIS digits are sent for AML. Prompted if NDGTR is greater than 4. Also used for CDR when the New Format CDR (FCDR) package 234 is disabled. The number of (MFX), MFE or MFC digits takes precedence over the number of DNIS digits that are configured.

LD 15 Define APL Link number, enable the Incoming Digit Conversion (IDC) operation to include DNIS for a customer.

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:		Disable/Enable New flexible code Restriction
	CDB FTR	Customer Data Block Gate opener
CUST:		Customer number,
	0-99	Range for Large System and CS 1000E system.
	0-31	Range for Small System and Media Gateway 1000B.
NFCR		New Flexible Code Restriction.
	(NO) YES	(NO) = Default, disable New Flexible Code Restriction YES = Enable New Flexible Code Restriction To build an Incoming Digit Conversion (IDC) table in LD 49, NFCR and Incoming DID Digit Conversion (IDCA) must be set to YES. NFCR is prompted with New Flexible Code Restriction (NFCD) package 49.
MAXT	1-255	Maximum number of New Flexible Code Restriction (NFCR) tables Once defined, a lower value cannot be entered for MAXT. The sum of the values for MAXT + DCMX < 255 per customer
IDCA		Incoming DID Digit Conversion

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Prompt	Response	Description
	(NO) YES	(NO) = Default. Deny Incoming DID Digit Conversion YES = Allow Incoming DID Digit Conversion NFCR must = YES before IDCA can = YES Prompted with Incoming Digit Conversion (IDL) package 113
DCMS	1-255	Digit conversion maximum number of tables (DCMS) The sum of the values for MAXT and DCMX cannot exceed 255 or MAXT + DCMX = 255.
OPT	DNI	Dialed Number ID Service included
APL	0-15	Auxiliary Processor Link number

LD 23 Define ACD group

Prompt	Response	Description
REQ:	NEW	Add ACD group
TYPE:	ACD	ACD data block
CUST	xx	Customer number as defined in LD 15.
ACDN	xxxx	ACD Directory Number
CALP	(POS) TER	Called party DN sent in PCI message

N Digit DNIS for Meridian MAX

N Digit DNIS for MAX expands Automatic Call Distribution (ACD) Dialed Number Identification Service (DNIS) capabilities. With the N Digit DNIS feature, the Meridian MAX 9.0 displays up to nine digits of DNIS information.

When an ACD call arrives on a DNIS route, the switch sends DNIS information to the Meridian MAX using the High Speed Link (HSL). The Meridian MAX 9.0 supports nine digits of DNIS information.

With the seven-digit DNIS feature, the Meridian MAX version 8.0 supports up to seven digits of DNIS information coming from the system.

Operating parameters

The N Digit DNIS for MAX functions when Meridian MAX 9 or the High Speed Link (HSL) protocol is configured as 12 or above.

Feature Group D supports seven digits of DNIS information.

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The N Digit DNIS for the MAX feature is not supported on an Auxiliary Processor Link (APL).

Applications and features display DNIS in the following ways:

The N Digit DNIS for Meridian MAX feature modifies the ACD-D messages which contain DNIS information. MAX 7 and HSL Protocol 11 or lower, still support the three to four digit DNIS messages.

If system initialization occurs during a call, DNIS information is not retained.

If the Meridian MAX is not functioning, the system is unable to send messages to the Meridian MAX.

Feature interactions

Auto Terminating Trunks

An Auto Terminating Route can be used as a DNIS route. In this case, when a call is received from an Auto Terminating trunk, the call terminates at the Automatic Call Distribution Directory Number (ACD-DN) that is defined for that trunk. The dialed DNIS digits are shown on the agent's display. With the N Digit DNIS for MAX feature, the affected MAX 9.0 messages contain nine digit DNIS numbers.

Call Detail Recording

Call Detail Records contains seven DNIS digits. This larger number of DNIS digits for Meridian MAX does not change the CDR feature operation. The Call Detail Recording displays seven digits, either the first seven or the last seven digits of DNIS information depending on the configuration of the N digit DNIS feature.

Conference Transfer

With the N Digit DNIS for MAX feature, affected messages for Conference and Transfer calls contain the seven digit DNIS number.

Customer Controlled Routing Customer Controlled Routing (CCR) Messages enable1-31 digit DNIS.

Digit Display for DNIS

The telephones display the number of DNIS digits enabled by the telephone's display. If the digits exceed the display capabilities, the last digits entered are displayed. For example, the M2616 display supports 12 characters, if the DNIS digits are 1234567891234567, the M2616 telephone displays 567891234567.

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Feature Group D

When a DNIS trunk call originates from a Feature Group D (FGD) trunk and the terminating agent performs call modifications, the DNIS number appears on the terminating telephone. If the DNIS-CDAR option of the incoming FGD trunk's Route Data Block is enabled, the DNIS number is placed at the end of the CDR record. The DNIS modification supports one to seven DNIS digits.

KD3 Multi-Frequency Signaling for Spain

If a DNIS route uses Multi-Frequency Compelled (MFC) signals, the DNIS route must use the same number of digits as the MFC.

Multi-Frequency Signaling for Socotel Multi-Frequency signaling for Socotel (MFE) trunks use either four or five signals which requires DNIS to use the same number of digits.

Multiple Queue Assignment

Meridian MAX 9 supports nine-digit DNIS messages.

Network Automatic Call Distribution

The system sends DNIS information to the target node which is used for the target agent's telephone display or for ACD-D reporting.

The Network Automatic Call Distribution (NACD) sends and receives DNIS calls to a remote node through an NACD-Call Setup message. The remote node receives a DNIS message. This message is then sent to the target node

Feature packaging

This feature is packaged as part of the existing DNIS package 98 and requires the following packages:

- Dialed Number Identification System (DNIS) package 98
- Automatic Call Distribution (ACDA) package 45
- Digit Display (DDSP) package 19
- Incoming DID Digit Conversion (IDC) package 113
- New Format Call Detail Recording (FCDR) package 234

Feature implementation

No change to the configuration procedure is required for this feature.

Feature operation

No specific operating procedures are required to use this feature.

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DNIS Across Call Modifications (Advanced)

This feature preserves the DNIS name and number display across the following call modifications:

- **Conference and No Hold Conference** redisplays DNIS information when a call returns to a two-party call from a conference call.
- **Transfer** displays the DNIS information on the terminating telephone if an agent transfers a DNIS call.
- **Privacy Release** redisplays DNIS information when the third party releases.
- **Mixed DNs** redisplays DNIS information when a 500/2500 telephone disconnects.
- **End-to-End Signaling** redisplays DNIS information when a call is put on hold and then restored.

DNIS is also preserved after the following modifications:

- **Parked Call** redisplays DNIS information when a parked call is accessed or recalled.
- **Network Automatic Call Distribution (NACD)** enables the DNIS information from a source ACD DN to be used at the remote target agent's telephone or terminal display. The DNIS information can be used to update the display or terminal screen, or in ACD-D reports.
- **Feature Group D (FGD)** supports using the DNIS number of an FGD-DNIS trunk for updating the agent's telephone display or terminal screen, or in ACD-D reports.
- **Third Party Vendor Applications (APL)** support using the DNIS number for telemarketing applications.
- **Third Party Vendor Host Applications (AML)** support host applications that use the DNIS number to bring up the agent's terminal screen.
- **Customer Controlled Routing (CCR)** can use the DNIS number to determine different call processing treatments for a DNIS trunk call.
- **High Speed Link (ACD-D Reporting)** can use DNIS information to generate DNIS reports.

Operating parameters

If a system initialization occurs while doing a call modification, the DNIS number stored in the unprotected Trunk Data Block is cleared and is no longer available.

DNIS Display Across Call Modification supports two-party calls.

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DNIS Display Across Call Modification can be preserved if the call modifications or redirections are performed within the same switch. For example, an agent receiving a call from a DNIS trunk at Site A transfers the call to Site B. The agent answering the call at Site B does not see the DNIS information.

In NACD, to display DNIS information on a remote target agent's telephone does not require the DNIS package at the remote site.

An NACD call that is rerouted to a remote target node displays either the DNIS name or the DNIS number, but not both. The DNIS name appears if it is available; otherwise, the DNIS number appears. Availability of the name depends on enabling the IDC DNAM option and defining the DNIS name of an IDC-DNIS trunk call in the CPND table.

DNIS Display Across Call Modification applies only to DNIS routes.

Feature interactions

ACD Emergency Key (EMR) key

If the ACD Emergency Key is used during a DNIS call, the display is cleared during the operation. The DNIS number and name are displayed when the call is restored following completion of the operation.

ACD Interflow Conditions

For ACD Interflow conditions, the DNIS number and name appear on the Interflow DN Digit Display.

ACD Observe Agent key

When the ACD supervisor uses the Observe Agent key in Silent Observe Mode, that is, OBTN = NO during a DNIS call, the display is not cleared during operation. In other Observe modes, the DNIS number and name are not displayed following completion of the operation.

ACD Overflow

For ACD Overflow, if the DNIS call overflows to the target agent, the DNIS name is displayed after the source DN.

ACD Night Call Forward

During night service, the DNIS number and name appear on the internal Night Service number.

Call Consultation

The DNIS number and name are redisplayed after the dialing party is restored for call consultation.

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Call Forward All Calls
The DNIS number and name are displayed if the call has been forwarded to another station.

Call Forward No Answer
The DNIS number and name are displayed for Call Forward No Answer Calls.

Call Park
When a Parked DNIS call is recalled or retrieved, the DNIS number and name are redisplayed.

Calling Party Number key/Charge key
If the Calling Party Number key or Charge key is used, the DNIS number and name are restored when the operation is completed.

Call Pickup
The DNIS name and number are displayed for call pickup from another station.

Call Transfer
For a transferred call, the DNIS number and name are redisplayed when the call transfer is completed.

Calls on Hold
The digit display is cleared. The DNIS number and name are redisplayed after the held party is removed from hold.

CLID
The calling number (CLID) is displayed if a call comes from the ISDN network. If a DNIS call comes from an ISDN network, the CLID name, if defined, and the DNIS number are appended after the CLID in that order on a telephone. With the development of Name Display for DNIS, the DNIS name replaces the CLID name. If a CLID call is redirected to a telephone due to ACD Overflow, Interflow, Night Call Forward, or non-ACD features such as Hunting or Call Forward No Answer, the source ACD DN or original party called is displayed after the CLID number. The DNIS name and number are appended after the redirected number.

Conference/No-Hold Conference
If the Conference key or No-Hold Conference key is used during a DNIS call, the display is cleared during the operation. When the call is restored back to the original two-party call, the display shows the DNIS number and name.

End-to-End Signaling
If an agent or internal telephone performs End-to-End Signaling, the DNIS information is redisplayed when the call is put on hold and then restored.

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Hunting

The DNIS number and name are displayed for calls configured in a hunt group.

Integrated Service Access (ISA)

The basic IDC feature supports only incoming DID routes. The IDC feature was previously extended to support FEX, WATS, and TIE routes over an ISDN interface, and supports ISA and non-ISA service routes. If DNAM = YES and the name is specified, the name is displayed on any alphanumeric digit display configured with Call Party Name Display Allowed (CNDA).

Meridian Mail

The display remains only through Meridian Mail transferred calls.

Mixed DNs

When an analog (500/2500-type) telephone has the same DN appearance as a Business Communication Set (BCS), and the BCS is active on a DNIS call, the analog (500/2500-type) telephone is bridged into the call when the telephone goes off-hook. The DNIS information is redisplayed when the analog (500/2500-type) telephone disconnects.

Privacy Release

If there is a multiple appearance DN, and the second DN appearance joins a conversation with a call from a DNIS trunk, the DNIS information is redisplayed when the third party releases.

DNIS on CDR (Advanced)

The DNIS number is appended to the end of the existing CDR record when the trunk disconnects. The DNIS number is put into the Start record for all cases. The DNIS number is put into the End record for all cases except when the incoming trunk disconnects first. The DNIS number is put into the Normal record when the call is established.

Operating parameters

The DNIS number is appended to the end of the CDR record following the Feature Group D digits, if the following apply:

- The customer has the DNIS and CDR packages
- The route is a DNIS route
- The new DNIS option in LD 16 is ON

Name Display for DNIS (Advanced)

Name Display for DNIS displays the DNIS number and name for IDC DNIS calls terminating on telephones equipped with a display.

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An option Display IDC Name (DNAM) is provided at the route level for IDC routes to enable the display of the IDC name. This supersedes the display of the route name.

All telephones with display and class of service Automatic Digit Display (ADD) and Called Party Name Display Allowed (CNDA) support Name Display for DNIS.

These telephones include the following:

- M2317
- M3000
- Meridian Modular Terminals (M2008, M2016S, M2616, M2216 ACD-1, and M2216 ACD-2)
- Attendant consoles (M2250)

Name Display for DNIS requires the following packages:

- Call Party Name Display (CPND) package 95
- Dialed Number Identification Service (DNIS) package 98
- Incoming Digit Conversion (IDC) package 113, that requires New Flexible Code Restriction (NFCR) package 49 and NCOS package 32

Prompts in the CPND data block (LD 95) and in the Route data block (LD 16) enable a name to be defined for an IDC number belonging to a particular conversion table. For a description of all the prompts and responses, refer to the *Software Input/Output Reference – System Messages (NN43001-712)*.

DNIS Across Call Modifications preserves the DNIS information across certain call modifications and enhances DNIS operation and functionality. Refer to "DNIS Across Call Modifications (Advanced)" (page 230).

When the following functions are activated, the DNIS on the telephone display screen disappears and redisplays when the function is deactivated:

- Call on Hold
- Call Consultation
- Calling Party Number key
- Charge key

Operating parameters

Name Display for DNIS does not apply to auto-terminated DNIS calls.

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An IDC name can only be associated with an IDC number explicitly specified for IDC translation in LD 49. Partial conversions apply according to the following guidelines:

- Partial IDC conversion to a full DN, only one IDC name can be defined for the entire range of DNs represented by the partial IDC number (for example 33xx to 5006)
- Partial conversion to partial DN when the DN is a valid ACD DN

For instance, if 33 to 5006 is specified, only one ID name can be associated with 33; 3300 to 3399 cannot be individually given a name unless explicitly specified as an IDC conversion. The IDC does not support the asterisk (*) or octothorpe (#) as valid digits to translate.

With DNIS Name enabled (DNAM = YES), the DNIS name overrides all other names, including the following:

- Calling Party name or Redirected Party name
- Route name
- Calling Line Identification (CLID) name

Feature interactions

The feature interactions for Name Display for DNIS are the same as those for the DNIS, except for the following differences.

ACD Interflow

For ACD Interflow conditions, the DNIS number and name appear on the display when the IFDN is internal.

ACD Night Call Forward

During night service conditions, the DNIS number and name are displayed.

ACD Overflow

If the DNIS call overflows to the target agent, the DNIS name is displayed with the source DN.

Conference Calls

If the Conference key is used during the DNIS call, the display is cleared during the conference operation. When the call is restored to the original two-party call, the new display does not show the DNIS number and name. Instead, the display shows the name associated with the route.

Application Module Link (AML)

DNIS Name Display provides the ACD DN, DNIS number, and position ID in the PCI message for the Meridian link. The DNIS name is not provided.

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Network ACD (NACD)

DNIS Name Display is provided for ACD agents within the same switch and for network ACD.

ISDN Calling Line Identification (CLID)

If a DNIS call comes from an ISDN network, the DNIS name replaces the CLID name. Additionally, the DNIS number and name are displayed on an attendant console after the CLID.

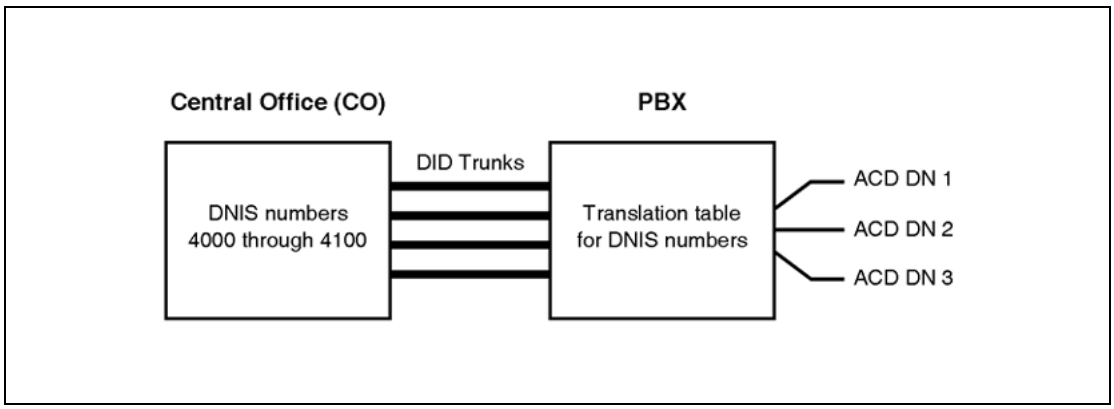
Routing by DNIS number (Advanced)

Routing by DNIS number enhances call distribution within an ACD system. This enhancement enables calls to be routed to a specific ACD DN, based on the DNIS number, instead of auto-terminating as described in the DNIS section.

With Incoming Digit Conversion (IDC), as shown in Figure 9 "Incoming Digit Conversion" (page 236), a set of DID numbers can be matched to existing internal numbering plans. Incoming Digit Conversion (IDC) also enables the conversion of several different DID numbers to a single ACD DN. Complete or partial DNIS numbers can be defined in the IDC translation table using LD 49. Refer to the *Software Input/Output Reference – System Messages (NN43001-712)* for a complete list of prompts and responses.

When the digits received are not in the IDC translation table but are valid for an ACD DN, the digits are passed without changes to the system. The IDC conversion is used only when needed. Invalid calls are routed to the attendant. Figure 9 "Incoming Digit Conversion" (page 236) shows how incoming DNIS numbers are handled by the system.

Figure 9
Incoming Digit Conversion



Feature interactions

The feature interactions for routing by DNIS are the same as those for the DNIS, except for the following differences.

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Digit Insertion
Digit insertion for DNIS routes is not enabled.

New Flexible Code Restrictions
When enabling IDC in LD 15, respond Yes to both NFCR and IDCA. When not using New Flexible Code Restrictions (NFCR), respond No to the NFCR prompt.

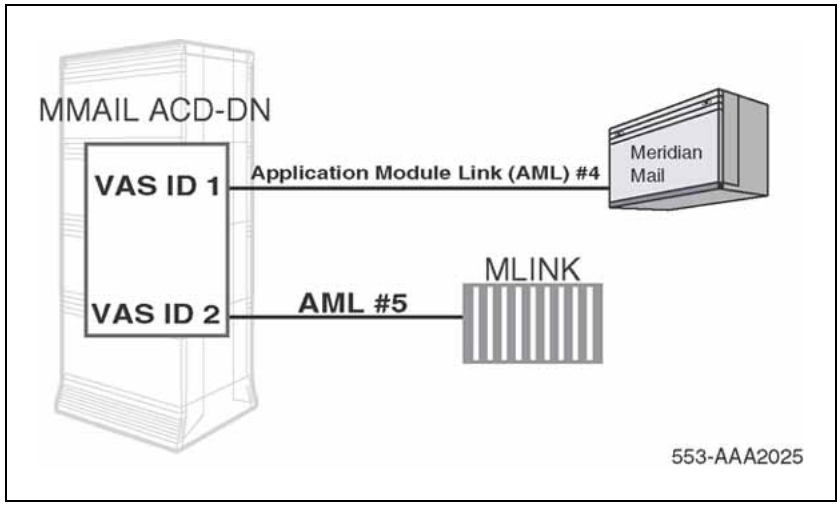
Outpulsing the asterisk and octothorpe
Calls with an asterisk (*) or octothorpe (#) in the DNIS route are sent to the attendant.

Operating parameters
Feature assumptions and feature requirements for routing by DNIS are the same as those for the DNIS, except that in addition to the packaging requirements for DNIS, routing by DNIS requires Incoming Digit Conversion (IDC) package 113.

Dual Value Added Server Identification
Dual Value Added Server Identification (DVASID) enables two applications - Meridian Mail and Meridian Link - to monitor and control the Meridian Mail ports. Two different Application Module Links (AMLs) can be defined on a Meridian Mail Automatic Call Distribution Directory Number (ACD-DN), one link connected to Meridian Mail and the other to the Meridian Link module.

As shown in Figure 10 "Meridian Mail and Meridian Link connectivity to the system" (page 237), Meridian Mail and Meridian Link are connected, by means of the Application Module Link (AML), to the Multi Serial Data Link (MSDL)/Enhanced Serial Data Interface (ESDI) card on the system.

Figure 10
Meridian Mail and Meridian Link connectivity to the system



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To establish communication between the system and Meridian Mail or Meridian Link, an association is established in LD 23 between the ACD-DN and the Value Added Server (VAS) ID of the corresponding AML. Refer to LD 23 in *Software Input/Output Administration (NN43001-611)* for information on how to configure the Dual VAS ID.

Previously, only one AML was associated with a single Meridian Mail ACD-DN. Therefore, AML messages were communicated only to Meridian Mail for any event on the Meridian Mail ports. With the Dual VAS ID feature, however, it is possible for AML messages to flow to both Meridian Mail and Meridian Link. This enables Meridian Link to monitor the activities of the Meridian Mail port. Meridian Mail can control the Meridian Mail ports, while Meridian Link can monitor only the ports.

For further information on Dual Value Added Server Identification, including feature interactions, refer to Meridian Link documentation.

Enhanced ACD Routing (Advanced)

Enhanced ACD Routing (EAR) provides the ability to differentiate the delay treatment given to ACD calls arriving from different sources, but queued to the same ACD DN. The number of calls that are forwarded from each source into the call-answering queue can be limited. EAR also provides flexibility in controlling various ACD treatments.

A Control DN (CDN) is a special Directory Number not associated with any physical telephone or equipment, although it must fit into the numbering plan. It uses a count taken from the number of ACD DNs in a system included in the ACD DN license limits. A CDN is not configured with agents of its own, but specifies a destination ACD DN, known as the default, to which incoming calls are directed.

Multiple CDNs can place calls into the same ACD queue, so different treatments can be given to these calls. The treatment given to the call is determined by the parameters of the CDN, not the ACD queue.

RAN and Music treatments given to the call are defined for each CDN. Any other ACD treatment is applied as if the caller directly dialed the ACD DN. For example, if the default ACD DN is in Night Service, the call to the CDN receives Night treatment specified for the default ACD DN.

Control DNs possess the following parameters in common with ACD DNs:

- First RAN route and time
- Second RAN route and time
- First RAN on arrival control
- Music route number
- Report Control

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In addition, each CDN also has the following distinctive attributes:

- Default ACD DN. This is the ACD DN to which calls to this CDN are directed. It is similar to the NCFW DN except that it must be a local ACD DN. The IVR ACD DN cannot be configured as the default.

- A ceiling value that limits the number of unanswered calls that a CDN can have at its default ACD DN at any one time. New calls receive busy treatment once the ceiling is reached. CO trunk calls do not receive busy treatment; they are placed in the queue.

New calls receive a busy signal until the number of calls queued against the default ACD DN drops below the ceiling value.

Calls arriving at a CDN are queued to the CDN's default ACD DN. The default ACD DN (or queue) must be local. An ACD DN that is defined for data service access cannot be used as a default ACD DN. CDN calls retain their trunk priority when placed in the ACD queue. Calls placed in the ACD queue from a CDN are treated exactly like any other calls in the queue, except for those CDN parameters that differ from the queue's parameters (for example, RAN and Music treatment).

Call ceiling

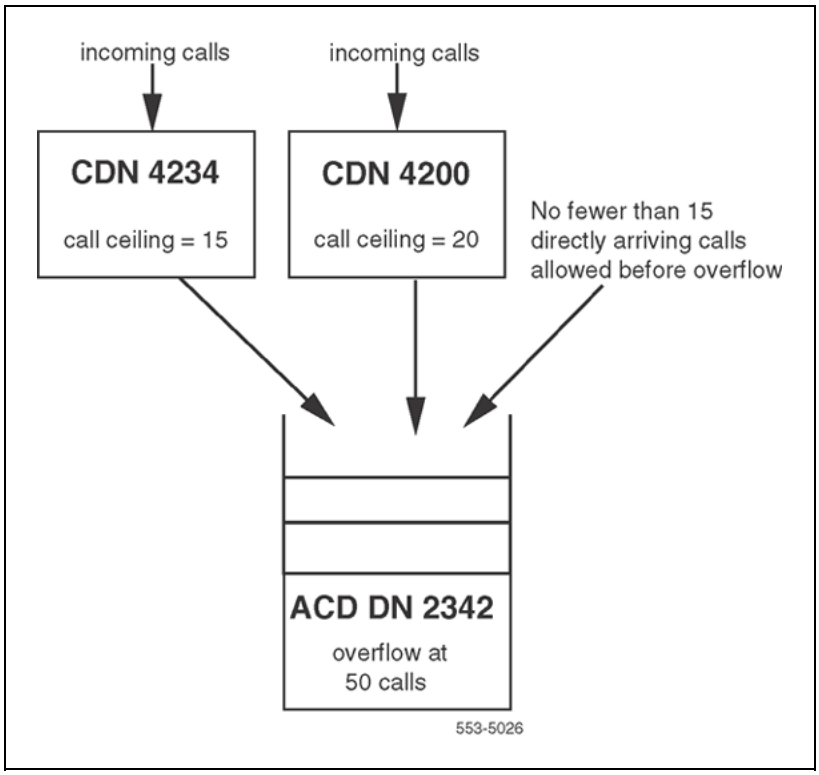
The call ceiling defines the maximum number of calls the CDN can place into its default ACD queue. Once the CDN reaches the call ceiling, any additional calls arriving at the CDN receive a busy tone until the number of unanswered calls from the CDN falls below the call ceiling.

Once a call is answered by an agent in the default queue, it no longer counts against the CDN's call ceiling.

Because several CDNs can feed into the same ACD queue, the call ceiling can be used to control the flow of incoming calls from various sources into an ACD queue. By carefully configuring each CDN's call ceiling, calls from an individual CDN do not overload the default ACD DN. This enables an equitable call answering pattern. Figure 11 "CDN Call Ceiling example" (page 240) shows a CDN call ceiling example.

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Figure 11
CDN Call Ceiling example



Feature interactions

ACD Ring Again

Ring Again cannot operate on CDN queues. However, once the call is queued at an ACD DN, Ring Again is available if configured.

Agent display

When an EAR call is either presented to, or answered by, the agent (depending on the agent's display class of service), the agent's display shows the following:

- originator information
- DNIS number (if applicable)
- Original Called Information

The CDN is covered by the Original Called Information category. The displaying of the CDN conforms to the current software operation. Therefore, if a call initially dials a CDN, when that call is presented to or answered by an agent (depending on the agent's display class of service), the original called number, the CDN, is displayed.

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If the CDN has a name defined for it, and if the agent's telephone has the CPND allowed class of service, and the DNIS Name (DNAM) option is not enabled in the incoming route block, then the name of the CDN is displayed instead of the originator's or DNIS name.

Agent and Supervisor Keys

If an EAR call is presented to an agent, and the agent activates an Agent/Supervisor key, call handing occurs as described in "Agent and supervisor communication (Advanced)" (page 31).

Alternate Answering Service

A CDN cannot be an AAA DN.

APL Messages

If an AUX Processor is equipped, APL messages are sent across the APL link when an EAR call is given to an ACD agent through the default treatment.

Attendant Extension

Attendant extension to a CDN is supported.

Attendant Overflow Position

A CDN cannot be an attendant Overflow DN.

Attendant Recall

Once a call is extended by the attendant to a CDN, it cannot recall back to the attendant console.

Auto-terminate Trunks

Auto-terminate Trunks can terminate to a CDN (auto-termination number). If the trunk is designated as a DNIS trunk, the DNIS digits are delivered to the CDN and are carried with the call to ACD queues where it ends with the EAR treatment.

Busy Verify

The attendant cannot perform a Busy Verify into the originating trunk of an EAR call.

Call Forward

A CDN cannot be defined as an FDN. Further, if a user has a CFW key defined on the telephone and attempts to program the telephone to Call Forward All Calls to a CDN, the request is rejected and the overflow tone sounds.

Call Park Recall

If an EAR call is answered by an agent who subsequently parks it, the call recalls back to the ACD DN of the agent and not the CDN.

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Call Party Name Display (CPND)

The CDN can be assigned a name with CPND as for any other DN. The name is also available for telephone displays and for other applications to which the CDN can pass the call.

This feature operates only for M2317, M2008, M2216, and M2616 telephones with CPND Class of Service. When a target agent answers a call, the agent position DN or Trunk Access Code is displayed.

Call Transfer

Call transfer to a CDN is supported. Call transfer to a CDN automatically puts the call in the default ACD DN queue. If the transfer is completed when there are calls in the ACD queue, the call is removed from the ACD queue and linked into the back of the ACD queue with the new originator information.

Additional Call Transfers are possible, involving network call redirection. If Telephone A at Node A calls Telephone B at Node B, and Telephone B activates the transfer key initiating a transfer to a CDN at Node C, when Telephone B completes the transfer, Telephone A's display is updated according to the mode of the CDN at Node C. If the CDN has the EAR option, Telephone A gets the default ACD DN on the display if Telephone A is placed in the default ACD DN queue. Otherwise, the display is updated with the number to which the default ACD DN diverts the call.

Calls Waiting Indication (AWC)

Once an EAR call has been placed in the default ACD DN, it is considered a regular ACD DN call (except the call gets its RAN and music treatment from its source CDN). Therefore, an EAR call is reflected in the AWC display as a regular ACD call.

Centralized Attendant Service

An attendant at the main site can extend a call to a CDN at a remote location. The extension cannot be completed until the destination lamp is lit/wink.

Customer Night Number

A CDN cannot be defined as a customer night number.

Dialed Number Identification Service (DNIS)

The ACD DN the call goes to can be obtained from the auto-terminate field in the protected trunk block or can be obtained through IDC translation tables.

Calls arriving at an ACD DN by a CDN have the same DNIS information as if they entered the ACD queue directly.

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Display Waiting Calls (DWC)

Once an EAR call has been placed in the default ACD DN, it is considered a regular ACD call (except the call gets its RAN and music treatment from its source CDN). Therefore, EAR calls are counted for the DWC in the "aaa" field.

DN Expansion Five- to seven-digit directory numbers are supported for CDNs.

Enable Interflow (ENI) key

A CDN cannot have an ENI key defined for it.

Hunt

A CDN cannot be defined as an FDN or a Hunt DN.

Incoming Digit Conversion (IDC)

CDNs can be entered as a valid termination in the IDC tables. A call can be rerouted to a CDN based on entries in the IDC tables.

License limits

CDNs are counted as ACD DNs. For example, the license limit specified for ACD DNs applies to the sum of CDNs and real ACD DNs.

Individual DN (IDN) keys

An IDN key can be any DN type key, such as SCR, MCR, SCN, and PLR. If an IDN key is activated while an EAR call is presented to the agent, call handling occurs normally.

Last Number Redial

The stored number that can be redialed is the default ACD DN. The call is routed by the default treatment instead of the normal dialed DN, which is the CDN in this case.

Make Set Busy

If an EAR call is presented to an agent, and the agent activates the MSB key, call handling occurs as described in the MSB section.

Multi-Tenant Services

When an EAR call first enters the default ACD queue, it receives intercept treatment if the tenant number of the first agent of the default ACD DN is denied access to the originator of the call.

Network ACD (NACD)

NACD target tables are not provided for CDNs, nor can CDNs be targets for NACD Routing Tables of other ACD DNs. If a remote CDN is specified as a target in an ACD DN routing table, the request is refused by the remote node and an NACD error message is issued locally indicating an invalid DN.

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EAR calls can access the NACD routing tables of the destination ACD queue where they reside.

The name of the CDN is sent to the target node if the CDN is the originally dialed number.

Network CPND

Network CPND includes a new prompt, RCAP, in the configuration per D-channel to indicate whether to send the name

- when the call is answered (ND1)
- when the call is presented (ND2)

ND1

If the ND1 option is enabled, the originator's telephone is updated with the name at the time the call is connected. Therefore, if a CDN is dialed, the originator's telephone is updated with the name of the ACD DN of the agent who answered the call. However, if RAN is given before the call is answered, the originator's display is updated with the name of the ACD DN whose queue the call is in.

ND2

If the ND2 option is enabled, the originator's telephone is updated with the name at the time the call is presented. Therefore, if a CDN is dialed, the originator's display shows the name of the default ACD DN or the name of the ACD DN that the default ACD DN diverted the call to via NCFW, Automatic Overflow, or Interflow.

Network Call Forward No Answer

Enables a person to define a trunk access code or NARS/BARS for an FDN. When the call is ringing at the remote FDN, the originator's display is updated with the redirection number (and name if defined).

Since there is no cross-checking with the terminating node to verify the number entered, CDNs can be entered as remote FDNs.

If a CDN is entered as a remote FDN, the originating telephone is updated with the default ACD DN if the call is put into the default ACD DN queue, or the number of wherever the default ACD DN diverts the call if the call does not remain in the default ACD DN queue.

Network Call Redirection

Enables a person to define a trunk access code or NARS/BARS for a Hunt DN. When the call is ringing at the remote Hunt DN, the originator's display is updated with the redirection number (and name if defined).

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Since the terminating node does not cross-check to verify the number entered, CDNs can be entered as remote Hunt DNs.

If a CDN is entered as a remote Hunt DN, the originating telephone is updated with the default ACD DN if the call is put into the default ACD DN queue, or the number of wherever the default ACD DN diverts the call if the call does not remain in the default ACD DN queue.

This feature also provides terminating number display information for transfer and call pick-up redirections. For example, if Telephone A at Node A calls Telephone B at Node B, and Telephone B transfers Telephone A to a CDN at Node C, after completing the transfer, Telephone A's display shows the following:

- the CDN's default ACD DN, if the call is put into the default ACD DN queue
- the number to which the default ACD DN diverts the call, if the call does not remain in the default ACD DN queue

The original called number (and name) is displayed on the terminating telephone; but if a non-ISDN trunk or a switch that does not support the original called number message is encountered, then the redirecting number and name is used instead. A CDN can be a redirecting number and name.

Network Call Trace

A call within the ISDN network that is calling a CDN can have Network Call Trace (NCT) performed on it. The Network Call Trace information collected for an EAR call is discussed in different scenarios:

- Telephone A dials a CDN and the call is presented to an ACD agent immediately. The NCT output shows ORIG node and TERM node information with STAT of RING.
- Telephone A dials a CDN and the call is waiting in the default ACD DN. The NCT output shows ORIG node and TBD node information with STAT of ACD.

Network Call Transfer

Network Call Transfer is supported for a CDN. If a caller on Node A calls a telephone at Node B and the telephone at Node B initiates a transfer to a CDN at Node A, when the transfer is completed, the trunks between Node A and B are disconnected. Handling of a call transferred to a CDN by Network Call Transfer is handled as described in "Call Transfer" (page 242).

Night Key Digit Manipulation

This feature enables an IDC route to have two routes defined—one for day and one for night. It also enables a new key (DRC) to toggle between the two routes on a per route basis.

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Since a CDN can be defined as a termination in an IDC table, then a call from an IDC trunk can terminate to a CDN through both the day and night tables.

Night Service Treatment

When the default ACD DN of a CDN is in Night Service, all EAR calls entering the ACD queue receive the Night Service treatment of the default ACD DN (Night RAN, Night Call Forward).

CDNs are valid destination DNs for the Night Call Forward DN of an ACD DN. A Night Service (NSVC) key cannot be defined for a CDN.

Calls Waiting Indication (AWC) key

When the ACD queue enters Night Mode, the AWC key lamp goes dark, indicating calls are not eligible to be answered because the queue is in Night Service.

Display Waiting Calls (DWC) key

When the ACD queue enters Night Mode, all the fields in the display are zero. Since calls are not eligible to be answered and agents are not available, the queue is in Night Service.

Night Call Forward

EAR calls can Night Call Forward.

Night Mode by the NSVC key

When an ACD queue enters Night Mode by the Night Service key, the EAR calls are treated as described in the Night Service section.

Night RAN

An EAR call receives the night RAN as it is defined for the ACD DN in which it is currently queued.

Not Ready key

An EAR call is presented to an agent and the agent activates the NRD key. There are no idle agents available; therefore, the call is placed at the head of priority 1 (Time Overflow high call queue) in the ACD queue of the agent to which the call was presented. This ensures that the call is presented to the next available agent. EAR calls hear ringback when replaced in the queue.

Observe

If an EAR call is presented to a supervisor, and the supervisor activated the Observe key, call handling occurs as it is described in "Agent Observe (Advanced)" (page 45).

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Originator display

The originator of a call receives a display update when the call is terminated or answered only if it is a local call or within an ISDN network. When the originator places a call, the originator's display shows the originally dialed number (a CDN if that was the originally dialed number).

Assuming the originator dials a CDN, when an agent answers the call, the agent's ACD DN appears. This ACD DN is the default ACD DN of the CDN or the number to which the default ACD DN diverted the call.

If the agent's ACD DN has a name defined, and the originator has CPND allowed class of service on the telephone, the name of the agent's ACD DN appears after the agent's ACD DN.

Only M2317, M2008, M2x16, and M2216 telephones can have CPND class of service and these are the only telephones that can display name information.

Automatic Overflow

When a call is placed in an ACD queue by EAR treatment for a CDN, the Overflow Threshold of that queue is enforced. When the threshold is exceeded, any Overflow destinations defined for the ACD DN are considered based on the existing rules for this feature.

CDNs cannot be Overflow destinations for Automatic Overflow.

Report Control

A report can be turned on or off for a CDN. However, if the CDN has the report control option off, ACD-D messages are not sent for calls into the CDN and ACD-C statistics are not printed for the CDN. Therefore, it is recommended that the same reporting option be configured for a CDN and all ACD DNs to which that CDN could have calls queued, so that the reports are accurate.

Ringing Number Pickup

A telephone within the same call pickup group as an ACD agent cannot pick up a ringing ACD call. This also applies to EAR calls.

Set Agent Priority (SAPA) /Select Agent Position (SAGP) commands

If, while an agent is presented with an EAR call, the supervisor issues a SAPA or SAGP command against the agent, call handling occurs normally.

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Supervisor Control of Queue Size

When calls are placed in an ACD queue because of EAR operation, the call can receive busy tone treatment provided this feature is configured at the destination ACD DN and the Overflow conditions necessary to activate this feature are met. The decision to provide a busy tone depends on the origination party type, such as DID calls or CO calls.

Supervisor Control of Queue Size interacts with CDN's call ceiling function because both use thresholds to control queue size. If the call ceiling threshold is less than or equal to the Overflow Threshold used by Supervisor Control of Queue Size, EAR calls are not handled by Supervisor Control of Queue Size because the call ceiling is always reached before the Overflow Threshold. When the call ceiling is reached, any new EAR calls are not placed in the default ACD DN. Instead, they are handled by the call ceiling function, which could be busy if defined in the target ACD DN.

If the call ceiling for a CDN has not been reached, calls can go to the default ACD DN. When an EAR call reaches the default ACD DN, it is subject to treatment defined for that ACD DN (except for RAN and music), including Supervisor Control of Queue Size. If an EAR call reaches the ACD DN and the Supervisor Control of Queue Size is in force (for example, acting on incoming calls), the EAR call receives whatever treatment this feature applies to it.

Telset Messaging

Telset Messaging enables a caller to leave a message with the Message Center while in an ACD queue, without talking to an agent, using telephone-based menus. Telset Messaging is supported for EAR calls.

Time Overflow and Enhanced Overflow

When a call is placed in an ACD queue for a CDN, the call can Time Overflow by the Time Overflow Timer (TOFT) value (or timer values for Enhanced Overflow) defined for the ACD queue. CDNs cannot be Overflow destinations for Enhanced Overflow and Time Overflow.

Trunk Night Number

A CDN can be defined as a trunk night number.

Trunk Priority

Calls arriving by incoming trunks can have two levels of priority: high and none. If a call receives EAR treatment, it retains its trunk priority.

Feature packaging

Enhanced ACD Routing (EAR, package 214) requires ACD Basic features (ACD-A, package 45) and ACD Advanced features (ACD-B, package 41).

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Enhanced Malicious Call Trace

During an established call, the user of a telephone with MCTA class of service can invoke a call trace against the DID call. The feature can be configured so that a special signal (hook flash and optional DTMF digit string) is sent to the Central office. The malicious call can be recorded using a recording trunk. The call trace record can be printed on any SDI port with MCT defined as a user, as well as on maintenance TTYs and in the history file.

The Malicious Call Trace (MCT) feature operates similarly to the ACD Emergency Key (EMR) feature when a recorder is on a conference call. The ACD telephone can activate both the malicious call trace and the EMR feature.

Enhanced Overflow (Advanced)

Enhanced Overflow (EOVF) enhances Time Overflow (TOF) by increasing the number of ACD DNs targeted by an overloaded source ACD DN from 6 to 100. With Enhanced Overflow (EOVF), any particular ACD DN configured as a target can accept calls from up to 100 other ACD DNs on the same switch.

Diverting calls from the source ACD DN to the appropriate target ACD DN is controlled by Routing Tables configured in LD 23. Up to 20 different targets can be defined for each ACD DN. A timer, from 0 to 1800 seconds, can also be defined for each source ACD DN.

Enhanced Overflow (EOVF) can define source and target queues for each ACD DN. EOVF sends incoming calls from an overloaded ACD DN to target ACD DNs (like Time Overflow) that are local to the source ACD DN.

EOVF does not support routing calls between source and target ACD DN over network services. It is, however, a prerequisite for network routing.

Routing tables

Routing Table information is used to determine when and where calls are going from the source to target ACD DNs. There are two types of Routing Tables: Day Tables and Night Tables. The Day Table is used when the source ACD DN is in Day Service. The Night Table is used when the source ACD DN is in Night Service.

Each Routing Table at the source holds up to 20 entries, each consisting of a target ACD DN, an associated timer, and status information for the target. Targets in each table are put in order by the system according to the target timer value, from the lowest value to the highest value. The timer associated with each target is used to decide when to issue a Call Request

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to that target. The table entries can be entered in any order, and the Table is automatically reordered when timer values are changed. If all the timer values are the same, the entries are listed in the order they are entered.

Day Table

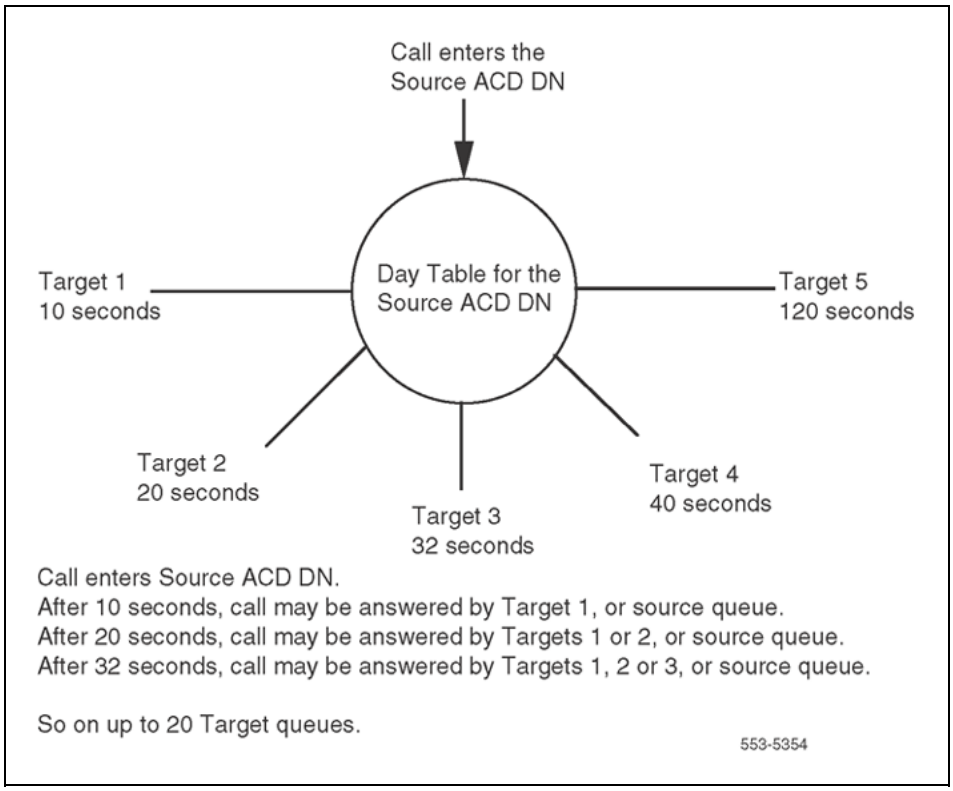
A Day Table is used when the queue is open and operating normally. The targets defined in the table are independent of the Automatic Overflow (OVDN) targets. It is possible to have the same target defined for OVDN and EOVF, if defined in both the routing table and at OVDN in LD 23. If no Day Table is defined, TOF operates as usual, if enabled. Basic TOF does not operate when a Day Table is defined.

When the wait time exceeds the timer for the first target, the call is placed in the source TOF queue. The call can, at this time, be answered by agents in the source ACD DN or in target 1. The system continues to track the wait time. When the timer for the second target expires, it is automatically included in the search. The call can now be answered by agents in the source ACD queue, the first target queue, or the second target queue. Targets continue to be added to the search as the timers expire. See Figure 12 "Day table routing" (page 251) for an example of the search patterns.

Calls do not overflow through the Day or Night Table to a target DN in Night Service.

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Figure 12
Day table routing



Night Table

A Night Table operates when the source queue is in Night Service. When the Night Table is defined, Night Call Forward DNs cannot be configured. There is no priority or TOF in Night Service.

When a call is directed to the source ACD DN, the timer begins. The call rings until the first timer expires. After the timer expires, the calls can be answered by agents in target 1. The system continues to track the wait time. When the timer for the second target expires, it is automatically included in the search. The call can now be answered by agents in the first target queue or the second target queue. Targets continue to be added to the search as the timers expire.

A Night RAN can be provided to callers while they are waiting.

Hold in Queue for Interactive Voice Response (Advanced)

Interactive Voice Response (IVR) units provide an automated method of providing and accepting information from a caller using computer-controlled voice playback to prompt for telephone touch-tone input. Hold in Queue for IVR enhances the existing CCR commands and options. After the IVR session, the IVR port transfers the call to the appropriate queue based on

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caller input to prompts. IVR capability can also be provided while a call is in an ACD queue. While receiving IVR treatment, the Hold in Queue for IVR feature enables the call to maintain its place in any ACD queue where it may reside.

To access this feature, a caller must reach a CDN in controlled mode. An IVR port can be a Meridian Mail agent, an IVMS agent, third-party vendor equipment appearing as a 500/2500 ACD agent telephone, or third-party vendor equipment appearing as a Meridian 1 proprietary telephone.

Feature interactions

Not Ready

If a CCR call is presented to an IVR port and that port enters the Not Ready state, an attempt is made to terminate the call on another idle IVR port. If no idle IVR ports are available, the call is placed at the head of the priority 1 (time overflow high call queue) IVR queue. This ensures that the call is presented to the next available IVR port.

If the call receives Interruptible IVR treatment and is queued to ACD DNs when the call was presented to the IVR port, the call remains in those ACD queues. Therefore, when the call is reinserted in its IVR queue because of the IVR port entering the Not Ready state, the call is not requeued to its ACD queues. (It was never removed from those queues.)

If the call receives Non-Interruptible IVR treatment, and the call is queued to ACD DNs when the call is presented to the IVR port, the call is removed from all of those queues. When the call is reinserted in its IVR queue because of the IVR port entering the Not Ready state, the call is replaced in all of its ACD queues in the same places it occupied before being removed for presentation to the IVR port.

If a CCR IVR call queued to an IVR queue or presented or connected to an IVR port is removed for presentation to a live agent, and the agent presses the Not Ready key, the CCR is not replaced in the IVR queue.

When a CCR call is requeued, the call receives ringback tone.

When a CCR call is presented to an IVR port, the call remains in its CDN (the CDN’s queue length is not decremented).

Make Set Busy

If a CCR call is presented to an IVR port, and that port enters the Make Set Busy state, call handling occurs as described in "Not Ready" (page 252).

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SAPA/ SAGP commands

If a supervisor issues a SAPA or SAGP command against an IVR port while a CCR call is presented to it, the port enters the Not Ready state and the CCR call must be requeued. Requeuing the CCR call occurs as described in "Not Ready" (page 252).

Only ACD-D customer agents enter the Not Ready state immediately following the issuing of a SAPA or SAGP command if the agent is idle or has a ringing call. If the agent is busy on a call, the agent is placed in Not Ready when it disconnects from the active call.

Supervisor Control of Queue Size

If a Give IVR request is received from CCR and the IVR queue in which the call is placed has the Supervisor Control of Queue Size feature activated, the call is queued at that IVR queue regardless of its overflow conditions. CCR calls do not count toward the overflow condition of the IVR queue.

Overflow by Count

CCR calls queued to a given ACD/IVR queue through Queue To requests or Give IVR requests are considered virtual calls in those queues. Therefore, CCR calls queued to IVR queues do not count toward the IVR queue's size when calculating if the Overflow (OVTH) and Busy (BUSY) thresholds are exceeded. Also, CCR calls placed in IVR queues using the Give IVR command are not subject to the Overflow threshold (that is, even if the Overflow threshold is exceeded for a certain IVR queue, CCR calls can still be placed in that queue and does not overflow). Therefore a situation could arise where the combined number of CCR and non-CCR calls exceed the Overflow threshold. The CCR application controls the number of CCR calls placed in an IVR queue.

Network ACD (NACD)

NACD is not supported. CCR calls placed in an IVR queue with the Give IVR request are not subject to NACD rerouting.

Timed Overflow and Enhanced Overflow (TOF, EOVF)

TOF and EOVF are not supported. CCR calls placed in an IVR queue with the Give IVR request cannot overflow.

Enhanced Interflow

Enhanced Interflow is not supported. CCR calls placed in an IVR queue with the Give IVR request cannot interflow.

Calls Waiting Indication key (AWC key)

AWC key for IVR queues AWC key for IVR queues is not supported.

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AWC key for ACD queues CCR calls in an ACD queue count as virtual calls. When the New Call Waiting option is enabled for an ACD queue, the number of CCR calls queued to the ACD DN shown by the ACD Calls Waiting Lamp (AWC) includes CCR calls.

A CCR call to hear non-interruptible IVR is removed from its ACD queues when presented to an IVR port and is returned to those queues upon completing IVR. While out of its ACD queues, the call does not show as part of the count of calls in queue, assuming the New Call Waiting option is enabled for the queues.

Display Waiting Calls (DWC key)

DWC key for IVR queues When the DWC key is pressed to display the number of calls waiting in an IVR queue, CCR calls in that queue are counted for the display as shown:

aaa bbb ccc dddd

where

aaa	=	number of calls waiting in the queue (excludes CCR calls)
bbb	=	number of agent positions available
ccc	=	waiting time for the oldest call in the queue in seconds (includes CCR calls)
dddd	=	virtual calls including source TOF, Call Request Queue, and CCR calls

Calls queued to an IVR queue using the Give IVR request are considered virtual calls within the IVR queue and are counted in the ccc and dddd fields of the display. They also show up as part of the call count for the DWC lamp update if the New Call Waiting option is enabled for the IVR queue.

DWC key for ACD queues A CCR call to hear non-interruptible IVR is removed from its ACD queues when presented to an IVR port and is returned to those queues upon completing IVR. While out of its ACD queues, the call does not show as part of the count of calls in queue in the dddd field of the DWC display, does not count as part of the oldest call in queue field (the ccc field), and does not show as part of the count of calls in queue for the DWC key lamp.

Since CCR calls queued using the Give IVR request are not removed from their CDNs when presented to IVR ports, a DWC key for a CDN reflects the number of CCR calls for that CDN still unanswered by live agents.

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Non-interruptible CCR IVR calls are removed from queue when presented for two reasons. The first is to prevent call interruption if an agent becomes available to take the call. The second is to prevent confusion. For example, one CCR call is queued in an ACD DN.The call is connected to an IVR port to receive non-interruptible IVR treatment. If the call was not removed from queue, it appears to the agents and supervisors that a call is in queue and is ready to be answered. Since the CCR call is non-interruptible, agents are unable to answer the call.

Night Service

CCR calls cannot be placed in ACD or IVR queues in Night or Transition Modes. Calls are removed from an IVR queue when it goes into Night Service (Night Mode). The CCR application is notified of each CCR call removed so that CCR continues executing the call script. Because the CCR calls in queue are removed, they do not receive Night Call Forward or Night RAN treatments.

CCR calls presented to an IVR port or connected to IVR when an IVR queue enters Night Mode are not disconnected from their ports.

Removal of a CCR call from its IVR queue because the queue enters Night Mode does not affect its placement in any other ACD queue where it might reside.

When a call receives non-interruptible IVR, it is removed from any ACD queues where it resided upon presentation to an IVR port. If any ACD queue where the call has its place held enters Night Service during the IVR session, the call is not restored to that queue upon completing IVR.

Transition Mode using the NSVC key If an IVR queue enters Transition Mode with the Night Service key, calls already in the queue remain, but no new calls can enter the queue. An IVR queue remains in Transition Mode until all of the calls that were in queue when Transition Mode was entered have been answered or abandoned, including CCR calls placed in the queue using the Give IVR command from the CCR application. When all calls are answered, the queue enters Night Mode.

If a queue in Transition Mode enters Night Mode before all eligible calls are answered (that is, the supervisor manually takes the queue from Transition Mode using the Night Service key, or all agents log out), call processing proceeds as described in "Night Service" (page 255).

Ongoing Status Display When the IVR queue enters Transition Mode, the ongoing status display is the same as the current operation except for the new #VIRTUAL CALLS QD field. This field displays the number of CCR calls remaining to be answered (CCR calls are eligible to be answered

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when a queue is in Transition Mode). Calls in the source TOF and Network queues are not shown in the new field because they are ineligible to be answered when the queue is in Transition Mode.

Display Waiting Calls key (DWC) When the IVR queue enters Transition mode, the DWC display shows the following information:

aaa bbb ccc dddd

where

aaa	=	number of calls waiting in the queue
bbb	=	number of agent positions available
ccc	=	waiting time for the oldest call in the queue
dddd	=	the sum of CCR calls

The aaa field displays the number of real calls waiting in the TOF, high, and non-priority queues. Since CCR calls are considered virtual calls, they are not included in the aaa field. However, because CCR calls are eligible to be answered when the ACD DN queue enters Transition Mode, they are reflected in the dddd field. Calls in the source TOF and Network queues are not shown in the dddd field because they are ineligible to be answered when a queue is in Transition Mode. IVR calls are considered when determining the oldest call for the ccc field.

Night Mode using the NSVC key When an IVR queue enters the Night Mode using the Night Service key, effects on CCR are as described in "Night Service" (page 255).

Ongoing Status Display When the IVR queue enters Night Mode, the ongoing status display is the same as the current operation except for the new #VIRTUAL CALLS QD field. This field displays no calls because no calls are eligible for answering when the queue is in Night Mode.

Display Waiting Calls key (DWC) When the IVR queue enters Night Mode, all call-related fields in the display are zero because no calls are eligible for answering when a queue is in Night Mode.

Originator Display

A call's originator receives a display update only when the call is terminated or answered if it is a local call or within an ISDN network. When the originator places a call, the originator's display shows the originally dialed number (a CDN if that was the original dialed number).

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Note that only M2317, M2008, M2x16, and M2216 telephones can have CPND class of service. Only these telephones can display name information.

Originator Display for Local Call Assume that as part of CCR treatment defined in a script for a CDN, when the call is answered by the IVR port, neither the IVR DN nor the IVR DN name (if defined) is shown. If the call is eventually answered by a live agent at an ACD DN, the agent's ACD DN and the name of the agent's ACD DN (if the name is defined and the originator has CPND allowed class of service) is shown on the originator display.

Digital telephone screens Upon answer at an IVR port, digital telephone screens display as if the call were still ringing in the queue (that is, the screen displayed when the telephone is connected is not shown).

Originator Display for ISDN Call The display update for an ISDN call depends on the Remove Capabilities (RCAP) specified in LD 17 for the primary D-channel. Acronyms input in response to the RCAP prompts in LD 17 identify ISDN-specific capabilities supported by the far-end node.

Table 53 "Originator display for ISDN call" (page 257) indicates the information shown on the originator display, depending on what is specified for RCAP and if the call is answered by an IVR port or an ACD agent first. Assume that an ISDN call has dialed a CDN and is queued to an IVR queue (using a Give IVR request) and to an ACD DN (using a Queue To request). The information displayed includes the indicated DN and name for the DN (if one has been defined and the originator has CPND allowed class of service). Assume the Give IVR request is the first command executed for the call (when Give IVR is the first request executed for a call, the call receives ringback until it is answered).

Table 53
Originator display for ISDN call

	IVR port answers first	ACD agent answers first	ACD agent answers after IVR given
RCAP = ND1	CDN information given	ACD information given	CDN information was given when IVR port answered. ACD DN information is not given.
RCAP = ND2	As soon as ringback is given, CDN information is given. By the time the port answers, the display has already been updated. No additional information is given.	As soon as ringback is given, CDN information is given. By the time the agent answers, the display has already been updated. ACD DN information is not given.	As soon as ringback is given, CDN information is given. By the time the agent answers, the display has already been updated. ACD DN information is not given.

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Call Transfer to Control Directory Number (CDN) - Completed during IVR

Assume that telephone A calls telephone B, telephone B initiates a transfer to a CDN, and part of the script treatment defined for the CDN involves a Give IVR request. If telephone B completes the transfer during the IVR session, the transferred call's (telephone A) treatments must start from the beginning of the Customer Control Route (CCR) script.

Conference to a CDN - Completing calls during IVR

Assume that telephone A calls telephone B and telephone B initiates a conference to a CDN. Also assume that part of the script treatment defined for the CDN involves a Give IVR request. If telephone B attempts to complete the conference during the IVR session, the attempt is denied. A conference cannot be completed until a third party answers. For this feature, an IVR port is not considered a valid third party to which a conference can be completed. While telephone B is connected to an IVR port, it is considered in queue. Telephone B can complete the conference only when a live agent answers.

Observe

Observing an IVR port is not supported. The Agent Observe feature does not operate for any ACD agent configured in an ACD queue with IVR enabled.

500/2500 Line Disconnect

The 500/2500 Line Disconnect feature is supported.

AML Enhancements

Through analog(500/2500) type telephones, this feature supports the invocation of basic telephone features such as release, conference, and transfer. If the AML Enhancements feature is used to control 500/2500 IVR ports, the AML Enhancements feature interacts with Hold in Queue for IVR. If a release for a 500/2500 IVR port is invoked, it is treated as a normal release - the IVR session is considered complete. Conferenced and transferred calls are treated as if they were invoked manually.

Feature packaging

Hold in Queue for IVR is package 218 (IVR). It also requires the following:

- ACD advanced features (ACD-B, package 45)
- Enhanced ACD Routing (EAR, package 214)
- Enhanced Call Trace (ECT, package 215)

In-Band ANI (IANI) (Basic)

In-Band ANI (IANI) enables a terminating ACD agent telephone to display the CLID number of a call coming in on a DID or TIE trunk.

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When a DID or TIE trunk originates a call, the system checks to see if it belongs to an In-Band ANI (IANI) trunk group. If it does, the system collects the ten ANI digits and displays them on an auto-terminating ACD agent's digit display telephone. The number is not displayed until all ten digits are received.

The desired auto-terminating ACD DN is specified at the trunk level (LD 14). The auto-terminating ACD DN can also serve as a standard ACD DN, but ANI numbers are not displayed unless the incoming call is on an IANI trunk.

If an auto-terminating ACD DN is not available, the call intercepts to the attendant. The attendant can route the call to an ACD DN, and the ANI number is displayed on that ACD telephone display. The ANI number is displayed on both the attendant console and the terminating ACD DN agent's digit display.

The following section describes the interactions between ACD and IANI. For a complete description of the IANI feature, see *Software Input/Output Administration (NN43001-611)*.

Feature interactions (IANI)

ACD Answer/Call Supervisor/Emergency

If the agent presses the Supervisor key (ASP) or the Emergency key (EMR), the digit display is cleared when the supervisor answers the call. The display remains clear while the supervisor is active with the call. If the supervisor releases the call first, the ANI number reappears on the agent's telephone display.

ACD Interflow (not basic)

If an IANI call interflows to another predesignated local ACD DN, the ANI number is displayed on the overflow agent's digit display. The source ACD DN is displayed following the ANI number.

ACD Night Call Forward

If an ANI call is forwarded to an ACD DN, the ANI number is displayed on the ACD agent telephone.

ACD Overflow by Count (not basic)

If an IANI call overflows to another ACD DN, the ANI number is displayed on the overflow agent's digit display. The source ACD DN is displayed following the ANI number.

Activity code

If the ACNT key is activated during an IANI call, the display is cleared. Once the activity code has been entered and the ACNT key pressed again, the ANI number reappears on the agent's display.

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Attendant Recall
If an ACD agent is active on an IANI call and activates the Attendant Recall key (ARC) to call the attendant, the agent's display shows the attendant number when the attendant answers the call. The ANI number reappears when the attendant releases the call.

Call Consultation
If the agent is active on an IANI call and presses the TRN key for call consultation, the display is cleared. When the agent restores the IANI call, the ANI number reappears.

Call Park
If an agent parks an IANI call and it times out and recalls back to the agent, the ANI number is not displayed.

Call Transfer
If an agent transfers an IANI call to another ACD DN, the ANI number is displayed on the terminating telephone display.

Conference
If an agent activates the conference feature while active on an IANI call, the display is cleared. The display remains clear while the conference call is active. If the conferenced party releases first, the ANI number appears on the agent's display.

Display key (DSP)
If the agent is active on an IANI call and presses the DSP key to display another key feature, the ANI number do not reappear when the DSP function is complete.

Hold
If an ACD agent places an IANI call on hold, the ANI number reappears when the call is restored.

NACD (not basic)
If an IANI call diverts to a target node as a result of NACD, the ANI number appears at the target node.

Time and Date
If the agent presses the Time and Date (TAD) key while on an IANI call, the time and date remains displayed throughout the call. To display the ANI number again, place the call on hold and retrieve it. The ANI number reappears.

Time overflow (not basic)
If an ACD agent receives an IANI call due to time overflow, the ANI number is displayed. The source ACD DN follows the ANI number on the display.

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Virtual agents

Virtual agents are not supported for IANI calls.

In-Calls key label

The In-Calls key label for Key 0 (ACD) on ACD IP Phones is configured by the system administrator. The administrator chooses one of the following settings:

- the ACD DN
- the string `In-Calls`
- a user-defined alphanumeric string

The feature is enabled, disabled and configured using LD 23 and applies only to IP Phones configured as ACD sets.

If the feature is disabled, the ACD set will display the ACD DN. If the feature is enabled, the default string, `In-Calls`, is displayed or another string may be configured. The language of the `In-Calls` string is also dependent on the language selected for the ACD set.

Operating Parameters

The In-Calls key label feature works ideally if the lampaudit is turned ON.

The feature is only supported on IP terminals.

The string can be a maximum of 10 alphanumeric characters (upper or lower case). The string cannot contain a space, nor can it be the string "loc", This string is reserved by the system.

When the label is changed in LD 23, a delay in updating the string on the ACD telephones may be noticed.

By default, the feature is turned off.

This feature requires the ACD C (42) or ACD D (50) feature package to be enabled. If neither of these packages is enabled, the label cannot be altered.

Feature interactions

This feature does not affect existent user-defined Feature key labels, because the In-Calls label feature is only for Key 0. The UDFKL feature does not support Key 0.

Feature packaging

The In-Calls key display feature requires either the ACD C (package 42) or ACD D (package 50) to be enabled.

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Feature implementation

The following tasks must be performed to implement this feature.

Task summary list

The following is a summary of the tasks in this section:

1. LD 23 – Configure In-Calls key label for IP phones

LD 23 Configure In-Calls key label for IP Phones.

Prompt	Response	Description
REQ:	NEW	Add or change the data block
TYPE:	ACD	ACD data block
CUST	xx	Customer number as defined in LD 15
ACDN	xxxx	Automatic Call Distribution Number, the queue to be modified
...	...	
LABEL_KEY0	(NO) YES	Disable In-Calls display feature Enable In-Calls display feature
LABEL	<cr>	Select localized In-Calls display
	loc	Select localized In-Calls display
	aaaa	Select user-defined string "aaaa" (maximum 10 characters)

To change the user-defined string to the localized "In-Calls" display, the "loc" string is entered at the LABEL prompt. Pressing <CR> at the LABEL prompt when REQ = CHG does not have any effect on the label display.

Incoming Trunk restrictions (Basic)

Abandoned ACD calls are removed from both incoming call queues and Recorded Announcements (RAN) unless the incoming trunk used for the call is a loop start trunk. Far-end disconnect on loop start trunks is only detected during ringing. If a call is routed to a Recorded Announcement (RAN), answer supervision is returned to the trunk and ringing is stopped. On RAN completion, the call remains in the queue on Silent Hold unless Music On Hold has been specified for the ACD DN.

Trunks without disconnect supervision *should not* be used for ACD systems. Incoming calls on trunks that do not provide for disconnect supervision are not released by the system when the agent ends a call.

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INIT ACD Queue Call Restore

The INIT ACD Queue Call Restore (ACDR) feature enables the system to restore up to 1000 calls, either transient ACD calls in ACD queues or calls which are held by a controlled DN, when the system initializes. Calls not residing in ACD queues during system initialization are not recovered by this feature.

During system initialization, each queued ACD call is scanned and classified as restorable or nonrestorable. Essential data associated with each restorable call is saved. Nonrestorable calls are skipped. This scan-and-copy routine continues until either the 1000 call limit is reached or all queued calls are scanned. When the 1000 call limit has been reached, a system message appears.

All restored calls are presented again as new incoming calls that originated during system initialization. The original start time of a restored call is not recoverable. Call history information is also not recoverable. For example, it cannot be determined that a restored call had been call parked or modified prior to initialization.

ACD queue calls which received ringback, music, or a recorded announcement prior to system initialization receive silence during system initialization. Ringback or a recorded announcement is given again after the call is restored as a new call. Subsequent call treatment continues as expected.

Operating parameters

The INIT ACD Queue Call Restore (ACDR) feature is supported on the following systems:

- Meridian 1 PBX 11C Cabinet
- Meridian 1 PBX 61C
- Meridian 1 PBX 81C
- CS 1000M Cabinet
- CS 1000M SG
- CS 1000M MG

ACDR requires a minimum of 16K of unprotected memory.

To be restorable, a queued ACD call must be trunk originated. However, for non-UIPE PRI trunks, only active calls are restored. Virtual ACD calls such as network queue calls are not restored by ACDR. Restorable calls which are aborted by the caller during a system initialization are forwarded to an ACD DN, where they can then be dropped by an agent.

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If the Application Module Link (AML) to Meridian Mail is not available during system initialization, restorable calls directed to the Meridian Mail ACD DN receive night treatment. Calls restored to a Controlled DN are redirected to the default ACD DN and receive that DN's treatment.

Restorable calls originally in the Time Overflow (TOF) queue are reseated in either the High Priority (HI) queue or the Low Priority (LO) queue on the basis of trunk priority. Therefore, restored calls might not occupy the same priority queues that they did prior to system initialization.

ACDR does not recover certain types of call information. For example, Automatic Number Identification (ANI), Calling Line Identification (CLID), Feature Group D ANI, Dialed Number Identification Service (DNIS), Network Calling Party Name Display (NCPND) and redirection information is not recovered.

Ringback after Call Restoration

To provide ringback tone to a call, the switch uses either Tone and Digit Switch (TDS) or Extended Conference TDS (XCT) cards. Calls restored on a system equipped with a TDS card receive ringback immediately following the completion of system initialization. Calls restored on a system equipped with an XCT card and without a TDS card receive silence until the XCT parameter download is completed. An XCT parameter download is triggered by system initialization.

There is one exception to this rule. If a RAN is available before XCT is in service, RAN is given according to the customer's configuration. If a RAN is not available and XCT is not in service, the caller receives silence.

ACDR provides ringback tone to a restored call after the XCT parameter downloads if all the following conditions are met:

- the call remains in the ACD queue
- RAN/Music/Ringback is not in progress
- RAN treatment has not been given after the call is restored

Feature interactions

ACD-C Management Reports

No statistics are kept for reporting periods in which a system initialization has taken place.

AML/CSL (ISDN/AP)

Restored calls supply no DNIS, CLID, Network Call ID, or ANI information for inclusion in AML messages.

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ACD Call Priority
ACD priority calls lose their call priority when the system initializes. ACDR restores these calls as new calls.

Automatic Number Identification (ANI)
Restored calls do not retain ANI information, unless the call was an incoming call on an M911 trunk.

Call Detail Recording (CDR)
The CDR record does not include ANI, CLID, NCPND and DNIS information lost in the course of restoring a call. When a system initialization takes place, the start time for the CDR record is the time of call restoration. Consequently, the duration for an ACD queue call is calculated from the time of call restoration.

Call ID
All restored calls receive new call IDs.

Call Park
Parked calls are restored by ACDR as new incoming calls to the ACD DN.

Call Redirection
Calling Line ID (CLID)
Dialed Number Identification Service (DNIS)
Digit Display
Feature Group D
Network Attendant Services (NAS)
Network Call ID
Network Call Redirection
Network Call Trace and Call ID Diagnostic
Network Calling Party Name Display (NCPND)
Call information associated with these features is lost after system initialization and call restoration.

Customer Controlled Routing (CCR)
Nortel Symposium Call Center
Calls restored to a Controlled DN are redirected to the default ACD DN and receive that DN's treatment. Auxiliary processor (for example, CCR) links act as though they are unavailable during initialization.

DASS/DPNSS/APNSS
ACDR does not restore network information such as Originating Line Identities (OLI), Called Line Identification (CLI), Calling Line Category (CLC), and Trunk Identity (TID).

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Enhanced ACD Routing
The call control of a restored CCR call shifts from the CCR application to the system. When a CCR call reverts to default, it receives Enhanced ACD Routing treatment for the CDN in which it resides.

Enhanced Network Routing
Network ACD (NACD)
A virtual call queued at a target switch is not restored if the target switch initializes. However, the associated actual queued call receives the treatment programmed for the source switch.

Enhanced Overflow
A call request queued at a target switch is not restored. The associated actual queued call at the source switch is restored as a new call.

Hold in Queue for Interactive Voice Response (IVR)
A Customer Controlled Routing (CCR) IVR call awaiting connection to an IVR at the time of system initialization is restored by ACDR. A restored call of this type reverts to the default ACD DN of the corresponding CDN.

Integrated Service Access (ISA) Enhancement
For each ISA call restored by ACDR, a counter is incremented to record the number of ISA calls on the service route.

Meridian 911 Enhancements: Call Abandon
ACDR restores M911 Abandoned calls waiting in either ACD or CDN queues. M911 ANI information is restored on the telephone display.

Meridian MAX
For Meridian MAX, messages on restored calls are not balanced.

Music on Delay
Calls do not receive Music on Delay when system initialization takes place.

Network Message Services
When system initialization is completed and an AML link is not available, a restored call to a Meridian Mail ACD DN receives night treatment. If system initialization is completed and an AML link is available, a restored call to a Meridian Mail ACD DN does not receive night treatment. Indirect calls to Network Message Services are restored as direct calls.

Primary Rate Access (PRA)
PRA D channels are released during system initialization and reestablished after initialization is complete. Transient calls on the D channel are not restored. Active calls (calls which are answered by a live agent or with RAN treatment) on a PRA D channel are restored.

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Trunk Anti-Tromboning

Trunk anti-tromboning is not supported on a call restored by ACDR.

Universal ISDN protocol engine (UIPE)

ACDR introduces a new capability called call synchronization. Call synchronization is the reconciliation of active and transient call sets between the system and the Universal ISDN protocol engine (UIPE) loadware application. In the call synchronization process, the system sends INIT queue call restored information, in the form of "call rebuild" messages, to UIPE layer 3 loadware located on the Multi-purpose Serial Data Link / Multi-purpose ISDN Signalling Processor (MSDL/MISP) card.

Prior to ACDR, the UIPE loadware application could only restore active calls. When call synchronization operations are complete, identical sets of active (answered by a live agent or with RAN treatment) and transient calls are retained by the system and UIPE application loadware.

UIPE loadware sets a timer running when initialization starts. If UIPE loadware does not receive all of the call rebuild messages from the system before the timer expires, the UIPE loadware restores only active calls. Transient calls are dropped.

Virtual Network Services (VNS)

VNS calls that have not reached active state are not restorable.

Feature packaging

INIT ACD Queue Call Restore requires Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

No administration changes are required to configure this feature.

Feature operation

No specific operating procedures are required to use this feature.

IP Call Recording

IP Call Recording provides the IP address and port information for an IP Phone in new Information Elements (IE) over Meridian Link Services (MLS). This information correlates the TN of a specific IP Phone with its associated IP address for a call recording application.

IP Call Recording introduces a new IE pair:

- This Party IP IE (monitored party)
- Other Party IP IE (remote party)

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The IP IE pair is similar to the existing IE pairs:

- For DNs: This Party DN IE, Other Party DN IE
- For TNs: This Party TN IE, Other Party TN IE

The IP IEs are optional in the Unsolicited Message Status (USM) (Active) and USM (Restore) messages. Note the following:

- If the USM message applies to a monitored key on a digital telephone, then the IP IEs are not sent.
- If the USM message applies to a monitored key on an IP Phone, then the IP IEs are sent: one for the monitored party and one for the remote party.

A call recording application is provided with status update messages for the call keys of any IP Phone it is monitoring. These USM messages contain the IP address and port number information for the monitored IP Phone and the remote party in the active call. By using a Layer 2 switch that supports port mirroring, the call recording device can monitor the media stream for the active call and record it.

Administration

LD 17 introduces the Enhanced Unsolicited Status Message (USM) IE enable (IPIE) prompt.

The IPIE prompt enables or disables IP Call Recording on a system-wide basis. The functionality is disabled by default. When enabled, a modified Application Module Link (AML) message that identifies the IP endpoint is sent for each call. The IPIE prompt is added in LD 17 under system parameters (PARM).

LD 17 IP Call Recording

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	PARM	Change system parameters.
LPIB	96 – 7500	Low priority Input Buffers
...		
NDRG	(NO) YES	New Distinctive Ringing
MARP	(YES) NO	Multiple Appearance Redirection Prime feature allowed.
IPIE	(NO) YES	Enhanced Unsolicited Status Message (USM) IE enable. YES = Allow "This Party IP IE" and "Other Party IE" to send with USM.

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Prompt	Response	Description
FRPT ...	(NEFR) OLFR	(Deny) or allow access to incoming calls by FRE station.

Telephony Manager (TM) and Element Manager (EM) do not support LD 17. However, TM does support the corresponding print overlay, LD 22, which prints the prompt IPIEUFTP firmware download.

Multiple Queue Assignment (MQA)

The Multiple Queue Assignment (MQA) feature enhances the capabilities of Automatic Call Distribution (ACD). This enhancement enables agents to service up to five ACD directory numbers simultaneously and enables agent roaming so agents have the flexibility to use any ACD agent position equipped with an eligible Meridian Set with Special Application Display.

The agent's Individual Directory Number (IDN) can be automatically forwarded to the agent regardless of what telephone they use to login.

MQA enables Call Center customers to achieve a high level of control over the manner in which agents are assigned to calls. This capability gives Call Centre managers the opportunity to direct calls to agents whose skills match the needs of the caller or a specific queue. This functionality enables ACD agents to service one or more queues depending on their skills. Each queue is considered an agent skill thus making this feature a "skills based routing" product.

This feature also enables ACD agents to assign a priority value to queues as well as a supervisor to whom they are to report. If the multiple queues have calls waiting, the agent services the queue for which their assigned priority is the highest. If they are servicing multiple queues with the same assigned priority or are not using the Priority Agent feature, queues are serviced on a round-robin basis.

Operating parameters

Multiple Queue Assignment is supported on the following systems:

- Meridian 1 PBX 11C Cabinet
- Meridian 1 PBX 61C
- Meridian 1 PBX 81C
- CS 1000M Cabinet
- CS 1000M SG
- CS 1000M MG

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It is highly recommended that configuration parameters (for example, Observe Tone, Call Forcing, Flexible Call Forcing Timer) are configured similarly for all groups of ACD queues so that calls are presented to agents in a uniform manner.

The MQA feature is supported only on the following telephones with displays: M2008, M2216, M2616 and Taurus. These displays must contain the "special applications firmware" shipped standard with these telephones. The NT2K25xx and NT2K28xx are the displays containing this "special applications firmware." These telephones can be used in the MQA setting without displays; however, Multiple Queue Assignment does not apply.

The MQA priority option in LD 23 must be provisioned and priority agent package 116 must be equipped if agents are to enter queue priorities at login.

The Maximum Number of Agent Positions (MAXP) prompt in LD 23 defines the maximum number of agents that can login to an ACD group at any one time. MAXP must be configured at a high enough value to account for the secondary agents that may be servicing that ACD group.

The assignment of an agent to an ACD group is not removed when an agent logs out of a queue. It is removed only when the agent logs into a new queue.

For agents to change queues that they are servicing, they must log out and log back in to a different set of queues. Supervisors can change the queues an agent is servicing, but they cannot add or delete queues. This is done through configuration control, and the agent does not have to log out for these changes to take effect.

For Succession Release 3.0 and before, MQA requires the following:

- MQA package enabled
- MQA prompt set to YES in the ADS block
- the system running Meridian MAX version 7 or above
- the RPRT option for ACD queue set to YES

For CS 1000 Release 4.0 and later, MQA requires the following:

- MQA package enabled
- MQA prompt set to YES in the ADS block

Meridian MAX and the RPRT option are not required for CS 1000 Release 4.0 and later.

ACD C Reports are not supported and should not be configured for any customer when the MQA feature is equipped.

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Only the primary ACD DN defined on an agent telephone is saved during a data dump and thus preserved after a system reload (sysload). Any other ACD DNs and associated priority values are lost if a sysload occurs.

MQA provides an option for the automatic forwarding of agents' IDN calls to any MQA-eligible agent position they may choose to use for login, but no Message Waiting Lamp is provided for the agent at the telephone.

For automatic forwarding of calls, if the Single Call Ringing (SCR), Single Call Non-Ringing (SCN), Multiple Call Ringing (MCR), or Multiple Call Non-Ringing (MCN) key is defined on a Multiple Appearance DN (MADN), calls forwarded to this DN ring on all DN appearances as per normal MADN operation.

For automatic IDN call forwarding, an agent must have an SCR, SCN, MCR, or MCN key defined on the telephone used to login. Calls are forwarded to the DN assigned to the lowest key number on the agent telephone. Without one of these keys, automatic forwarding does not occur.

When MQA is enabled all agents using telsets eligible for MQA login are subject to the required change in MQA login process.

Certain types of ACD DNs such as CDNs and Meridian Mail ACD-DNs cannot be specified at login by agents using MQA. If these types are specified at login, they are rejected by the system.

If attempts are made to disable the Report Option in an ACD data block while agents are logged in with the MQA package equipped, the operation is blocked and the system issues an error message at the maintenance console.

"0" (zero) cannot be specified as an ACD DN by agents during login because it is reserved for deleting previous ACD-DNs, Priorities or Supervisors.

Such keys as Speed Call and Autodial keys, are not supported for use as short cut methods during the login process.

Unless modified prior to use with MQA, it is recommended that Predictive Dialing applications not be used with MQA agents.

MQA agents cannot be reassigned to ACD DN's with reports turned off via a Load Management Select Agent Position Assignment (SAPA) command. If an attempt is made to reassign an agent to an ACD DN with reports turned off, an error message is printed and the reassignment does not occur.

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Feature interactions

ACD telephone keys

ACD Answer Agent

ACD Supervisor Call The operation of these keys are independent of calls being taken and operates similarly whether or not an agent is serving one or multiple queues.

Activity Code Key If ACD sets are configured with an Activity Code key, the agents can enter an activity code based on the ACD DN or CPND name that is displayed for each MQA call, identifying the queue that they are currently serving.

Agent Key An ACD agent can reference a Supervisor through the Position ID in the agent's Supervisor's ID (SPID) field. A Supervisor can reference an agent through the Position ID on one of their keys. However, they must reference each other.

If the Supervisor Position ID assignment of an agent has changed at login, then the Supervisor Position ID specified appears in the SPID field for that agent. If the agent's previous Supervisor had an AGT key defined, the agent is no longer associated with that key.

Agent Waiting Calls Key The lamp associated with the Agent Waiting Calls (AWC) key does not change status based on call waiting in multiple queues. The lamp reflects the status of the queue being served, queue most recently served if an agent is idle or the Primary queue assigned to the telephone if an agent's telephone is logged out.

Emergency Key

Answer Emergency Key The Emergency Key enables an agent to be immediately connected to the Supervisor; the call in progress is terminated at the Supervisor's telephone on the Answer Emergency Key (AMG). The Supervisor called is always the one whose Supervisor Position ID is assigned to the ACD telephone.

Call Hold Key If the Call Hold Key is used before an agent has completed the login process, the In-Calls key darkens and the login attempted is aborted.

Display Key If the Display Key is used to view information defined on the ACD DN key of an agent serving multiple queues, then the ACD DN displayed is the current queue being served if the agent is active on a call. The last queue is served if the agent is not serving an ACD call or the Primary ACD DN if the agent is logged out.

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Display Agent Key MQA does not impact the operation of this key because the queue agents are servicing is relevant to the information displayed on this key.

Display Waiting Calls Key MQA changes the operation of this key. Instead of showing statistics for one particular queue, the Display Waiting Calls key steps through the queue statistics for each queue the agent is logged into at approximately two second intervals. For supervisors, the data for one queue associated with the key is still displayed, since supervisors can have multiple Display Waiting Calls (DWC) Keys for multiple queues.

Ring Agent Key The operation of MQA is independent of any calls being processed by an agent. If an agent is serving one or multiple queues it does not impact the operation of the Ring Agent Key.

Not Ready Key When ready to service calls, the agent deactivates the Not Ready Key. The next queue served may not necessarily be the same queue prior to activating the Not Ready Key.

Call Detail Recording

The ACD DN used in CDR records for a given agent can change depending on which queue the an agent is servicing.

Call Forcing

Agents serving multiple queues are governed by the setting of the Call Forcing option depending on which queue is being served.

If using Flexible Call Force Time (FCFT) option, the value of the FCFT from the previously served queue are used.

It is possible that an agent may be serving multiple queues with different Call Forcing definitions. It is recommended that these options be configured similarly for all groups of ACD queues that individual agents may be serving simultaneously.

Call Party Name Display

When an ACD agent makes an outgoing call (for example, Conference, Transfer, and Secondary DN) the Calling Line Identification of the agent depends on the key "0" ACD DN definition. This changes depending on which queue the agent is serving or has served. The CLID can change for an agent as the queues they serve change.

Customer Controlled Routing

The Customer Controlled Routing (CCR) receives statistics from the system and uses this information to make decisions regarding the number of idle agents in a queue and the number of logged in agents in a queue. CCR users must realize that because agents can be available in multiple

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queues, the total number of available agents as viewed by CCR may not match the actual number. Thus, the CCR script intrinsics *idle_agents* and *logged_agents* must be interpreted differently depending on how many queues agents service.

Meridian Link

Meridian Link Set Feature Invocation (SFI) messages can be used to login and logout ACD agent telephones. The SFI login message can be used in an MQA environment. An enhancement to the MQA feature enables the Meridian Link SFI login message to perform "default" login. This is equivalent to an agent logging in by dialing: **Agent ID** # #.

Agents can manually login to multiple queues at the start of each shift from their telephones. When logging out, they can use Meridian Link-enabled computer applications to relog themselves into the same queue assignments. If an agent logs into multiple queues and then logs out of their telephone, the next agent who logs into that telephone does not need to re-enter the multiple queues if the same queues are desired. The agent is automatically logged into the same queues as the previous user of the telephone. The priorities of the queues remain the same. The MQA Enhancement functionality is the same regardless of the agent ID that is logged into the telephone.

As an example, Agent X logs into ACD queues A and B from telephone 1. Agent X then presses the MSB key (or uses a computer) to log out. Agent X (or a different agent: Agent Y) then uses a computer application to login to telephone 1. Meridian Link sends an SFI login message to the system. Agent X (or Y) is automatically logged into ACD queues A and B.

"INVALID ENTRY" is displayed on the telephone's display screen and in the SFI LOGIN response message if any of the following occur:

- The SFI_LOGIN request message from the application has an invalid agent ID.
- Another agent is presently logged in.
- The agent is presently logged in and attempts to log in again.

The ACD queues being serviced, queue priorities, and the supervisor for the position cannot be changed using the Meridian Link SFI message. These can only be changed by the agent logging out and then going through a new login sequence through the telset.

The MQA Enhancement feature does not change any Meridian Link messages, nor does it require changes to computer applications. This feature does not enable CTI applications to log agents into multiple queues.

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Night Service

When agents in a particular queue logout, the queue goes into Night Service. With MQA activated, agents can service up to five queues. If an agent is serving multiple queues and logs out, any queues for which they are the last active agent go into Night Service.

Network ACD

MQA impacts the choice of agents to service calls. Network ACD calls are treated the same in the MQA environment as a single queue environment. If an attempt is made to route a call across the network to an ACD queue being served by agents assigned to multiple queues, then the call is presented to the first available agent in that queue.

Observe

Agents serving multiple queues are governed by the Observe Tone (OBTN) setting for the queue they are currently serving. Thus, it is possible that an agent may be serving multiple queues with different OBTN definitions. For this reason, it is recommended that the Observe Tone option is configured similarly for all groups of ACD queues that agents may be servicing simultaneously.

Supervisor Control of Night Service If an agent is serving multiple queues and the Supervisor puts a queue into Night Service, the agent does not receive calls from this queue unless the queue goes through Transition mode initially.

Feature packaging

The Multiple Queue Assignment (MQA) is package 297 and requires M2000 Digital Sets (DSET) package 88 and Aries Digital Sets (ARIES) package 170.

If the option to enable ACD agents to enter Priorities at login is desired, the Automatic Call Distribution Priority Agent (PGAT) package 116 must be active.

If automatic forwarding of agents' non-ACD calls is desired, Phantom TN (PHTN) package 254 must be active.

Feature implementation

Disable HSL before changing MQA-related prompts. Configure MQA parameters in LD 23 under ADS data administration.

Enable only one Meridian MAX customer per system. That customer must use the Agent ID login mode.

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Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. LD 48 - Disable the High Speed Link.
2. LD 23 - Enable Multiple Queue Assignment.
3. LD 23 – Configure MAXP value.
4. LD 48 – Enable the high-speed link.

LD 48 Disable the High Speed Link

Command	Description
DIS SDI HIGH	Disable the SDI port for high-speed link
DIS HSL	Disable the high-speed link

LD 23 Enable Multiple Queue Assignment

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	ADS	Auxiliary Data System data block
CUST	xx	Customer number as defined in LD 15
AID	YES	Do the ACD agents on this customer operate in Agent ID mode?
- IDLB	(0001) - 9999	Agent ID Lower Bound
- IDUB	(9999) - IDLB	Agent ID Upper Bound
- LOG	1-1000	Maximum number of agents that can be logged in at any one time
MQA	YES	MQA logins enabled for agents serving this customer MQA is only prompted if AID = YES and the MQA package 297 is equipped.
- MQAS	YES	Agents allowed to enter Supervisor ID at login
- MQAP	YES	Agents allowed to enter Priority values at login Priority Agent package 116 must be active.
- MQCF	YES	Allow Automatic Call Forwarding of Phantom TN to agent telephones at login. Phantom TN (PHTN) package 254 must be active.

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Prompt	Response	Description
- MCFD	DDD	0, 1, 2 or 3 digit attached to Agent IDs This associates Phantom TNs to specific ACD call agents. X= 0 digits.
The RPRT prompt must be enabled for all queues served by an agent to have MAX messages sent.		

LD 23 Configure MAXP value

Prompt	Response	Description
REQ:	CHG	Change an existing data block
TYPE:	ACD	Automatic Call Distribution data block
CUST	xx	Customer number as defined in LD 15.
ACDN	x…x	ACD Directory Number
…		
MAXP	1-1000	Maximum Number of Agent Positions Ensure that MAXP is assigned a high enough value to account for secondary agents.

LD 48 Enable the High Speed Link

Command	Description
ENL SDI HIGH	Enable SDI port for high-speed link
ENL HSL	Enable the high-speed link

Feature operation

Login Procedure

The ACD agent login procedure using Agent ID mode without Multiple Queue Assignment requires the agent to press the In-Calls key and enter their Agent ID digits. If these digits are valid, the agent is logged in and services the ACD DN defined on the In-Calls key. With Multiple Queue Assignment, an agent can serve up to five ACD queues simultaneously and has the opportunity to specify those queues at login time.

Where previously an agent would specify their Agent ID, they must now specify their Agent ID as well as all ACD DNs they wish to service. Additionally, there are two options under the ADS administration prompts in LD 23 which, when enabled, enable agents to specify at login individual Priority levels for each ACD DN they are to service as well as the Supervisor ID of the Supervisor to whom they are to report.

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There is an option available to have an agent's IDN calls automatically forwarded to whatever MQA telephone they log in to. To have this functionality requires the Phantom TN package (option 254) to be equipped on the PBX, and the prompt MQCF must be enabled in LD 23.

Login Without Priorities or Supervisor ID

To login using the MQA feature, agents must enter their agent ID digits and all the ACD DNs (to a maximum of five) they want to service. Each field must be separated by an octothorpe or "#". The entire digit string must be terminated with another octothorpe or "#" to indicate to the system that all the desired ACD DNs have been entered. The following string of characters is an example of what the agent must enter for MQA login with no Priorities or Supervisor ID:

Agent ID#ACD DN 1#ACD DN 2#ACD DN 3#ACD DN 4#ACD DN 5##

An agent often services the same ACD queues time after time. In such cases, the ACD DNs (up to five) do not need to be re-entered. When no ACD DNs are specified during login, the ones assigned to the telephone from the previous login are used. Enter the agent ID followed by a double # sign. If the agent ID is "1234", the login would be "1234##".

Login in With Priorities and Supervisor IDs

The standard login process is the same, but the agent must specify priority values and a supervisor ID along with the ACD DNs. A priority value can be specified for each ACD DN entered at login and the priority value to be associated with a particular ACD DN must appear immediately after that ACD DN, with the field separated by an octothorpe or "#". Priorities can only be specified by agents at login if the MQAP prompt in LD 23 is enabled. Supervisors can only be specified by agents at login if the MQA prompt in LD 23 is enabled.

The priority field for an ACD DN can be left blank by entering "##" with no Priority value in the field. If the priority field is left blank, the Priority value from the set data block (the Priority value is entered at the PRI prompt in LD 11) are substituted.

Entering a Supervisor ID at login is optional. The Supervisor ID field can be left blank by entering a "##" with no Supervisor in the field. If the field is left blank, the Supervisor ID defined on the telephone previously are used. However, if the Supervisor ID field is left blank, do not enter 0 to remove the Supervisor ID value. Instead, log in again and re-enter the Supervisor ID.

The following string of characters is an example of what the agent must enter for MQA login with Priorities and Supervisor ID:

Agent ID#SUPV ID#ACD DN 1#PRI 1#ACD DN 2#PRI 2 #ACD DN3#3PRI 3#ACD DN 4PRI 4#ACD DN 5#PRI 5##

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The following string of characters is an example of what the supervisor must enter for MQA login with Priorities and Supervisor ID. Note that supervisors need not enter their supervisor ID:

Agent ID#ACD DN 1#PRI 1#ACD DN 2#PRI 2 #ACD DN3#3PRI 3#ACD DN 4PRI 4#ACD DN 5#PRI 5##

If an invalid entry is made for the ACD DN, Supervisor ID or Priority, the agent is notified immediately on the display. The agent may then reenter the field. An valid entry which has been accepted can be removed by entering a 0 followed by a "#". The field can then be re-entered. The removed entry displayed is proceeded by an "X". The agent ID cannot be deleted during login.

Music Broadcast

The Music Broadcast feature expands Music functionality and enables the system to broadcast music to several parties at one time over a single Music Broadcast trunk port. This feature supports Music on Hold (MOH). With Music Broadcast, Music is delivered using software; hence, Conference hardware is not required. It is not necessary to share Conference resources with Conference features, such as Conference and Group Call. Music Broadcast supports both intra-group and inter-group music. Therefore, a Music trunk in each network group is not required.

A Music Broadcast call consists of several one-way connections from the Music trunk to each caller. The Music Broadcast feature reduces the number of timeslots required for callers to listen to music while on call hold or call waiting in an Automatic Call Distribution (ACD) environment. One timeslot is required to enable Music trunk broadcasts. In addition, each party listening to music through the broadcasting music trunk requires one broadcast connection. The extra speech path resources that are needed for the existing Conference-based Music are unnecessary for Music Broadcast.

The Music Broadcast feature also introduces the following enhancements:

- Incremental Software Management limit
- Traffic Study Option

For further information on the Music Broadcast feature, refer to *Features and Services (NN43001-106)* Music On Delay (Advanced) .

Music is heard by callers in an ACD queue who are not hearing the Recorded Announcement (RAN) or ringback tone, but are waiting in the queue for service. Music On Delay is triggered by the end of each RAN. The music continues until a subsequent RAN is provided, or the call is either answered or abandoned.

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ACD calls do not receive Music On Delay if RAN is not also specified. Music On Delay is provided after the first or second RAN, and between subsequent RANs, until the call is answered or abandoned.

The music for Music On Delay is obtained from a music source by a music trunk specified in Service Change and connected to a conference circuit card. Callers experiencing ACD delay are bridged into the conference circuit by a listen-only path. Each music trunk is assigned to a specific conference loop (not necessarily dedicated to music), and each ACD DN can be programmed for a different music source (if available).

Music On Hold (Basic)

Music On Hold (MUS) is provided to trunks specified for music to terminating calls that have been placed on hold.

The music is taken from a music source by a music trunk specified in Service Change and connected to a conference loop. Callers put on hold are bridged into the conference card by software through a listen-only path. Each music trunk is assigned to a specific conference loop, not necessarily dedicated to music. Each ACD DN can be programmed for a different music source. See the *Software Input/Output Administration (NN43001-611)* for Service Change information.

Night Call Forward (NCFW) (Basic)

The Night Call Forward feature enables calls to be forwarded out of the ACD queue to another destination. The Night Call Forward (NCFW) feature holds the call while verifying that the destination is available. If the destination is busy, the call is returned to the ACD queue where it originated. The system attempts to connect the call to the NCFW number until the call is either answered or abandoned.

If the source queue is in Night Mode and the Night DN is another ACD DN, the call can Night Call Forward. The call is forwarded if *any* of the following states exist for the Destination ACD DN:

- It has agents available.
- It is not in Interflow state.
- It is an available DN for NCFW.

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The caller hears ringback when held at the queue awaiting a free trunk or DN. Table 54 "NCFW treatment by call type" (page 281) defines the treatments for NCFW destinations that are available for incoming calls based on the call type.

Table 54
NCFW treatment by call type

		Call Type (Origin)			
		Telephone	**Attendant**	**CO Trunk**	**DID/TIE Trunks**
NCFW Destination	**Telephone**	Busy Tone	Re-Link to ACD queue	Re-Link to ACD queue	Re-Link unless eligible for CCBQ, CBQCM, or OHQ
	Attendant	Busy Tone	Overflow Tone	Re-Link to ACD queue	Re-Link unless eligible for CCBQ, CBQCM, or OHQ
	ACD DN	Re-Link to ACD queue	Re-Link to ACD queue	Re-Link to ACD queue	Re-Link to ACD queue
	Trk ACOD	Busy Tone	Re-Link	Re-Link	Re-Link unless eligible for CCBQ, CBQCM, or OHQ
	NARS	Busy Tone	Re-Link	Re-Link	Re-Link unless eligible for CCBQ, CBQCM, or OHQ
	Invalid DN	Overflow Tone	Overflow Tone	Overflow Tone	Overflow Tone is returned
Calls cannot be re-linked to the ACD queue if the originator of the call is eligible for Coordinated Call Back Queuing (CCBQ), Call Back Queuing to Conventional Main (CBQCM), or Off-Hook Queue (OHQ) tones. Also, calls cannot be returned to the ACD queue if the originator is an internal station and the NCFW destination is outside the ACD environment.					

Feature interactions

ACD Ring Again

Internal telephones with Ring Again applied against the ACD queue cannot Night Call Forward (NCFW). However, if the NCFW destination is an ACD DN with ACD Ring Again defined, an internal telephone can activate ACD Ring Again against the call.

Attendant Extended Calls

The attendant cannot extend NCFW calls under invalid conditions. However, the attendant can extend NCFW calls after they have been returned to the ACD DN queue. The attendant as the originator decides if the call can be returned to the ACD DN queue or not.

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Call Transfer
Call Transfers and Network Call Transfers cannot be completed when the NCFW treatment defined is a Busy or Overflow tone. Transfers can only be completed if the NCFW call has been returned to the ACD DN queue. Network Calls use trunk numbers (ACOD numbers defined) instead of DNs for call identification.

CLID Route Selection
Access codes for ANI trunks can be defined as valid NCFW destinations.

Message Center
When the NCFW destination defined is a Message Center telephone, the call receives an Overflow tone instead of messaging, and is *not* returned to the ACD DN queue.

Network Ring Again (NRAG)
Calls from trunks in the ISDN environment that are connected to a busy NCFW destination are returned to the ACD queue and cannot Network Ring Again.

Overflow by Number
Calls linked to an internal ACD DN through NCFW treatment are eligible to Overflow by Number to the target queue of the Interflow DN (IFDN).

Ring Again (RGA)
Only internal telephones and trunks on the same trunk can activate RGA against an NCFW call.

Trunk Group Busy
If the NCFW number defined is a trunk access code, and the trunk has been busied out using the Trunk Group Busy key, the NCFW call is transferred to the attendant.

Time Overflow
If the source ACD DN is in Night Service, NCFW calls are not eligible for Time Overflow unless the call was in the TOF queue when the ACD DN was placed into Night Service. Then the NCFW feature is used to present calls from the TOF queue to the NCFW destination. No new NCFW calls can TOF.

A call is eligible for time overflow if:

- it is not already in the TOF queue.
- its source ACD DN is valid.
- its source ACD DN is not in Night Service.
- its source ACD DN has TOFT defined.
- it has waited longer than the TOFT time.

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Operating parameters

The call in NCFW is not returned to the source DN if the call originates from a trunk eligible for the following treatments:

CCBQ	= Coordinated Call Back Queuing
CBQCM	= Call Back Queuing to Conventional Mains Off-Hook queue offer tone

Loop start signaling trunks cannot be diverted to the NCFW DN. If the Night Treatment defined is Recorded Announcement (RAN), there is no way to determine when the call is abandoned.

With ACD DISC SUP PK package, CO loop start trunks terminating to an ACD DN can NCFW or interflow. However, avoid the following situations:

1. An ACD DN forwards (using NCFW) a local telephone that terminates (using CFNA) to Meridian Mail.
2. Night RAN is defined while NCFW = none.
3. Using an external route with SUPN = NO for either NCFW or interflow.

In cases a and b, trunks become hung-up and must be manually disabled in LD 32. In case c, if the caller abandons the call, the destination telephone rings until the abandoned call is answered and the telephone goes on-hook.

NCFW can forward a call many times as long as the NCFW DNs are ACD DNs that are not in the Interflow state. If the NCFW DN is not an ACD DN, then the call cannot return to an ACD DN through Hunting, Call Forward No Answer (CFNA), or Call Forward All Calls.

Calls on trunks without answer supervision cannot Night Call Forward.

When a Night Call Forward destination is busy, the caller may receive silence or unpredictable ringing until the destination is free. To alleviate this condition and to inform the caller of the status of the call, define a Night RAN route.

Night Call Forwarding is not supported by the following features and services:

- Direct Inward System Access (DISA)
- Data Services
- Call Park Recall

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Night Treatment (Basic)

This optional feature can be used to inform ACD callers that the ACD location is not in service for after-business-hours calls. These calls can be handled in three ways:

- RAN can be provided as part of the Night Treatment for after-hours ACD calls indicating that the ACD location is closed.
- Whether or not it receives RAN, the ACD call can be forwarded to another ACD location or to a Night Service number. Only internal calls or calls from trunks that provide disconnect supervision can be call forwarded for Night Treatment.
- No treatment at all can be given. Callers receive ringback tone until the call is abandoned. No answer supervision is given to the Central Office (CO) from the switch.

The Night Treatment feature requires all agent positions to be equipped with a Make Set Busy (MSB) key. The feature is activated automatically when all agent positions assigned to an ACD DN operate the MSB key. On the 500/2500 telephone, the MSB feature is activated when the agent performs a log out by entering the SPRE code plus 97.

Priority Agents (Advanced)

Priority Agents enables ACD supervisors to assign priorities to agents on an individual or group basis. Calls to an ACD DN are presented to the highest priority agent.

Priority Agents enables more experienced agents to receive more calls or enables a supervisor to assist during high-volume times. When an agent is not available, calls are placed in the Call Waiting queue. Calls are routed to the agent of the highest priority who has been idle the longest. Priority 1 is the highest priority.

Priority Agents requires ACD-B to support the feature.

Different machine types enable different capacities:

- 32 priorities possible
- Meridian 1 PBX 61C
- Meridian 1 PBX 81C
- CS 1000M HG
- CS 1000M SG
- CS 1000M MG

An agent can have only one priority at a time. Virtual agents are not supported by priority assignments. When the agent logs in, the priority assigned to that agent is displayed on the telephone.

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The default priority is 1. Setting the priority at 1 gives all agents the same priority. Assigning agents to different priorities presents the first call to the *agent of the highest priority* who has been idle the longest. Priority 1 is the first priority level agent to receive calls.

Using the following features, calls are presented to the next available agent of the highest priority who is idle the longest. If there are no agents available, the call is queued to the high-priority or non-priority queue for that ACD DN.

- Call Forwarding
- Call Park/Recall
- Conference calls
- Interflow calls (IFDN)
- Night Call Forward DNs (NCFW)
- Ring Again (RGA)
- Transferred calls

Priority Agent Groups

A Priority Agent Group can include only one agent, or all the agents for a single ACD DN. Calls are routed to the highest priority group until all agents in that group are servicing a call. Subsequent calls are then be routed to the next priority level.

Not Ready (NRD) Key

If an agent presses the NRD key while a call is ringing, the call is routed to the next agent of the highest priority who has remained idle the longest. Calls are routed to the highest priority group until all the agents of that group are on a call. Calls are then routed to the next highest priority group, until all those agents are active on a call. If there are no agents available, the call is linked to the front of the queue from where it originated.

If a target agent presses the NRD key when presented with a Time Overflow (TOF) call from its source queue, then the call is presented to the highest priority agent who has waited the longest. If there are no idle agents, the call is returned to the TOF queue for the source ACD DN.

Time Overflow

When incoming calls Time Overflow, the system searches for an idle agent in the source and target queues. The call is presented to the highest priority agent who has been idle the longest. When more than one target is defined, the system searches according to the order defined in LD 23.

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Agent Reservation

After an agent reservation timer has expired, the newly idled priority agent is inserted into the proper place in the idle agent queue. If there are already agents in the idle agent queue who have the same priority, then the agent is inserted into the queue after the last agent who has the same priority.

Priority trunks (Basic)

This optional feature enables the customer to designate certain incoming ACD trunks as having priority. When implemented through Service Change programs, calls to ACD DNs on priority trunks move directly to the front of any non-priority calls in the call queue. Any non-priority ACD calls in the queue maintain their position in relation to each other but are placed behind priority calls in the queue. Although ACD calls are not dropped or lost by the system, long waiting times for non-priority calls can be avoided by using Automatic Overflow.

Recorded Announcement (Basic)

Recorded Announcements are specified for each ACD DN independently of the other ACD DNs. When the system determines that an ACD caller is ready to receive a recorded announcement (RAN), the caller is connected to a recording trunk at the beginning of the RAN cycle on a one-to-one basis. If an agent becomes available to serve a caller who is currently receiving a RAN, the RAN is interrupted and the call is presented to the agent.

An attendant does not receive RAN treatment when extending a call. After an attendant completes the call extension to an ACD DN, the extended caller can receive first and second RAN or Music as defined for the ACD queue. The ACD RAN is not given to calls waiting in the attendant queue.

If an attendant originates a call to an ACD DN, it receives ringback only.

A customer may want to give recorded announcements (RAN) and Music to all calls except those coming in on WATS trunks, yet have only one ACD DN for answering all calls. This can be done in two ways through the use of a "dummy" queue.

Overflow

This method is useful when caller information is required. For example ISDN and CLID information is carried along with the overflowed call.

1. Send the incoming WATS calls to the dummy queue.
2. To Overflow calls, a telephone must be logged in to the dummy queue.
3. Put the telephone in Not Ready.
4. Set the Overflow threshold to zero (0).

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5. Assign the desired ACD DN as the OVDN and the calls overflow to the actual ACD queue.

Night Call Forward

1. Send the incoming WATS calls to the dummy queue.
2. Put the dummy queue in Night mode.
3. Assign the desired ACD DN as the Night Call Forward DN, and the calls are forwarded to the Night Call Forward DN.

When the number of calls in a call queue exceeds the number of available agents, calls are delayed before being answered. RAN can be used to advise the caller of the delay. ACD enables a choice of two RANs per ACD DN, which operate independently of each other. Unlike the Music On Hold feature, RAN does not use the conference loops.

First RAN

The system keeps track of how long each call receives a ringback tone before being answered and evaluates each incoming call on the basis of how long the most recently answered call had to wait. If the time expected to answer an incoming call exceeds a customer-defined time (t1), the call receives RAN at the beginning of the next RAN cycle. Delay Start must be defined in LD 16, the Route Data Block (RDB).

A call that arrives in the queue when the Delay Threshold (t1) has not been exceeded receives the first RAN after the second customer-specified time of t2. After RAN, the call is placed on Silent Hold or else it receives Music On Delay, until answered or abandoned. A caller dialing the ACD DN hears an audible message describing a delay possibility and can disconnect, decreasing the holding time on the trunk under busy conditions.

First RAN On Arrival

If the response to FROA is NO in LD 23, all calls must wait for the duration of the first RAN timer (t1 as specified) before receiving the First RAN. If the response is YES, a call that is eligible for first RAN treatment receives it immediately after entering the ACD queue.

Second RAN

On completion of first RAN, a customer-specified timer for a Second RAN (t2) is started. Each call that has been in the queue longer than t2 seconds gets Second RAN. Second RAN is repeated every t2 seconds until the call is answered or abandoned.

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RAN summary

In summary, first RAN is given either immediately upon being queued or at t1 seconds later. Second RAN is presented t2 seconds following First RAN and repeated at t2-second intervals. The two RANs operate independently of each other. Both are optional and the customer can have just the first announcement or both consecutively.

The two timers, t1 and t2, have no fixed relationship to each other. This gives the customer the flexibility to specify the RAN treatment to suit the requirements of the installation. Factors such as the time enabled for the announcement and the waiting time between announcements depend on the type of recorded announcement equipment used. The system is compatible with Audichron, CODE-A-PHONE, Cook Electric, and Interalia announcement machines.

Recorded Announcement Broadcast

The Recorded Announcement Broadcast (RANBRD) feature expands the existing functionality of the Recorded Announcement (RAN) feature. The Recorded Announcement Broadcast feature eliminates the need for multiple cross-connections to provide recorded announcement. With this feature, multiple calling parties receive RAN treatment from one RAN trunk, thus enabling a RAN trunk to simultaneously broadcast announcements to maximum of 48 calling parties per RAN trunk. This expansion maximizes the usage of available RAN trunks.

This feature also introduces the following enhancements:

- Incremental Software Management limits
- RAN signalling capabilities
- Multi-Channel RAN Machine Types and Modes
- Message Staging Through Queuing Thresholds for Delay Dial Start/Stop RAN machines
- Music on Waiting
- Traffic Study Option

For further information on the RAN Broadcast feature, refer to *Features and Services (NN43001-106)* Return to Queue After No Answer.

Prior to the introduction of the Return to Queue After No Answer (RTQNA) feature, an incoming Automatic Call Distribution (ACD) call rang until the agent answered the call or the caller terminated the call.

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The RTQNA feature forwards an unanswered (within a defined number of rings) ACD call from one agent telephone to the next idle ACD agent telephone. If the call is not answered, the call is sent back to the original queue. The following details how the feature works:

- A call is presented to an ACD agent; the telephone rings.
- When the ACD agent does not answer the ACD call, the RTQNA feature automatically places the agent into the Make Set Busy (MSB) or the Not Ready (NRD) state.
- The call is presented to an idle ACD agent.
- If there is not an idle ACD agent, the call is returned to the front of the original queue. The call is sent to the first available ACD agent.

The NACD feature enables ACD agents at different locations (nodes) to service calls over the network at remote targets. When an unanswered ACD call is routed via NACD to a remote ACD DN node and the call is not answered by an ACD agent, the call is placed in a time overflow queue (TOQ) of the remote ACD node, the call is not returned to the original ACD DN target node queue.

The RTQNA feature enables the Call Center system administrator to define the maximum number of rings for each ACD incoming call (0-50 ringing cycles) before it is transferred to another ACD agent.

In addition to ACD environments with agent telephones, the RTQNA feature is applicable to third-party Interactive Voice Response (IVR) systems.

Operating parameters

The RTQNA feature functions at full capacity only when a telephone has a MSB key and a NRD key defined.

The RTQNA feature is supported for analog (500/2500-type) telephones. However, a MSB or NRD key cannot be defined on an analog (500/2500-type) telephone. If the RTQNA feature automatically puts the analog (500/2500-type) agent telephone into the MSB or NRD state, the only notification is a distinctive tone when the agent lifts the handset.

The RTQNA feature does not apply to voice mail Directory Numbers (DNs).

An incoming ACD call can be sent to an idle agent and continue to ring without going back to queue in the following four scenarios:

- If the ACD agent telephone does not have a MSB/NRD key defined on the telephone the RTQNA feature cannot be activated and the call continues to ring on the agent telephone.
- If a Customer Controlled Routing (CCR) call is presented to the only available ACD agent and the call is unanswered, the RTQNA feature

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places the agent into the MSB state and the queue into night service mode. This action causes the CCR call to ring until the customer hangs up.

- For ACD package A or B: if the MSB or NRD key for an ACD agent telephone is not defined and the RTQNA feature is enabled, the call rings on the agent telephone until the agent answers or the caller terminates the call.
- For ACD package C and D: if the ACD agent telephone is a proprietary telephone, the ACD agent can log in by pressing the In-Calls key and log out by unplugging the headset or by toggling the MSB key. If the last agent is logged off, the call keeps ringing on the agent telephone.

If an agent with ACD package C and D has an Independent Directory Number (IDN) call on hold and ACAA = Yes, the RTQNA feature cannot put the agent into the NRD state. However, the agent can press the In-Calls Key to return to the idle agent queue.

The ACD C reports do not indicate that an ACD agent has been logged out by the RTQNA feature. A short report is generated with the letter "R" indicating when an ACD agent is logged out by the RTQNG feature.

Feature interactions

Time Overflow

When a call is not answered in a predefined time limit, the call is forwarded to the Time Overflow (TOF) queue. The TOF queue distributes the ACD call as described in the following:

- The TOF queue forwards an ACD call to an idle ACD agent.
- If the call is presented to the source ACD agent, the queue timer for the source ACD DN is used.
- If the call is presented to the target ACD agent, the queue timer for the target ACD DN is used.
- If there is no idle ACD agent within the number of specified ring cycles, the call is returned to the front of the TOF queue of the source ACD DN.

Hold in Queue for Interactive Voice Response

With the RTQNA feature, an unanswered call is returned to its original position in the queue.

When a call is queued to an Interactive Voice Response (IVR) port and the call is presented to an ACD agent, the call is removed from the IVR queue. If the ACD agent is automatically put into the MSB or NRD state by the RTQNA feature, the call is not returned to the IVR queue.

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ACD Call Waiting Indication Key

The ACD Call Waiting Indication key reflects a decrease by one when a call is answered, and an increase of one when the RTQNA feature returns a call to queue.

Status Display

The Status Display reading on the supervisor's telephone shows when a call is sent to an agent and when an unanswered call is sent back to the original queue.

When an agent's telephone is automatically put into the MSB state by the RTQNA feature, the ACD supervisor's corresponding AGT key lamp turns dark. The supervisors key lamp flashes when the agent is put into the NRD state.

Agent Login Observe

There are two possible interactions between Agent Login Observe and the RTQNA feature:

- If RAO = Yes, the RTQNA feature automatically puts the agent into MSB. the Supervisor cannot observe the agent's Individual Directory Number (IDN) calls.
- If RAO = Full, the RTQNA feature automatically puts the agent into MSB or NRD.

In either of these cases, the Supervisor cannot observe the agent's IDN calls.

Multiple Queue Assignment

Agents can receive an ACD call from up to five queues. If the agent does not answer a call within the specified number of rings, the agent is automatically placed in the MSB or NRD state and removed from the five queues. The agent must log back into the queues to receive calls.

Contact Center Manager Server

The Contact Center Manager Server has a RTQNA feature that takes precedence over the RTQNA feature. If the Contact Center Manager Server is down and default routing is in effect, the RTQNA feature directs incoming calls as defined in the RTQNA feature configuration in LD 23.

Feature interactions

Meridian MAX

Meridian MAX 9.0 supports the messages sent by system for the RTQNA feature. When the agent is put into the MSB or NRD state, the High Speed Link (HSL) sends a message to Meridian MAX indicating that the state is due to the activation of the RTQNA feature.

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Set Feature Notification message

The ACD agent must have an MSB and/or an NRD key defined for the Set Feature Notification message to be sent to Meridian Link.

Feature packaging

The RTQNA feature requires the Basic Automatic Call Distribution (BACD) package 40.

Feature implementation

The following information is needed to configure the RTQNA feature.

The Call Force feature and the RTQNA feature are mutually exclusive. Therefore, the Call Force Option (FORC) prompt must be set to NO in LD 23, for RTQNA to function.

LD 23 Configure the RTQNA feature without Call Force feature

Prompt	Response	Description
REQ:	NEW CHG	Add or change a data block
TYPE:	ACD	Automatic Call Distribution data block
CUST	xx	Customer number as defined in LD 15.
ACDN	x..x	Automatic Call Distribution Directory Number
..		
FORC	NO	Call Forcing Option Calls are forced to arrive in answered state.
RTQT	(0)-50	Return to Queue After no Answer Timer Define number of ring cycles before call is returned to queue.
- RTQO	(NRD)	(NRD) = Agent goes to Not Ready state
	MSB	MSB = Agent goes to Make Set Busy state

The normal ring cycle for each ring or buzz is 6 seconds. If the Flexible Tone and Cadence package is enabled, the length of time for each ring or buzz is defined in LD 56.

Feature operations

No specific operating procedures are required to use this feature.

Secondary DN Call Blocking (SDNB) (Advanced)

Secondary DN Call Blocking (SDNB) blocks out new incoming calls to the Secondary DN on an agent's telephone, so the agent can handle current ACD calls without interruption. An agent telephone is considered ACD active when a call is presented or connected to the agent's ACD In-Calls key.

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With Secondary DN Call Blocking enabled (SDNB = Yes), an incoming call to the Secondary DN of an ACD active agent telephone receives a busy tone.

When Hunting is enabled and the secondary DN is called, the incoming call hunts to the Hunt DN specified.

When Hunting is denied and the secondary DN is called, the caller hears a busy tone.

Calls cannot Camp-On or use Call Waiting but Ring Again is available. When the ACD In-Calls key is idle, incoming calls to the Secondary DN terminate normally.

Multiple Appearance DNs

Calls to Multiple Appearance Directory Numbers as secondary DNs are connected normally, unless the agent is active with an ACD call. If there is at least one telephone within the multiple appearance group not active, the call connects to that telephone. The appearances that are ACD active are ignored.

Single Call Arrangements (SCR)

When the incoming ACD call is answered, the Secondary DN lamp lights on all telephones with that DN. Another agent cannot enter this call unless the following occurs:

- the first terminating telephone releases privacy, or
- the new agent telephone has Privacy Override Class of Service

While a call is active on a Multiple Appearance Secondary DN, no other calls can be originated from that DN from any other appearance.

Multiple Call Arrangements (MCR)

When an incoming call is directed to the Secondary DN, the SDN rings on idle telephones only. If an agent is active on an ACD call and becomes idle while a call is ringing on the MCR SDN, the call is not presented to the newly idled telephone.

While a call is active on a Multiple Appearance Secondary DN, other calls can be received on and originated on that DN from any other appearance.

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Configure service options to block calls in LD 23. Refer to *Software Input/Output Administration (NN43001-611)* for a complete description of the service change programs. When the options are configured as shown in Table 55 "Service options for SDNB" (page 294), calls to the Secondary DN are either blocked or not blocked.

Table 55
Service options for SDNB

SDNB	Idle	Ringing	DCP	PCP
YES	Not blocked	Blocked	Blocked	Not blocked
NO	Not blocked	Not blocked	Not blocked	Not blocked

Feature interactions

ACD Not Ready

When an agent is doing post-call processing (PCP) while using the Not Ready (NRD) key, incoming calls to the Secondary DN are not blocked by SDNB.

Blocked Calls

Calls using the following features are blocked by SDNB:

- Auto-Terminating Trunks
  - The call is never presented, but the caller hears ringback tone.
- Calls Transferred
- Conference calls
- Dial Intercom Group calls
- Group calls
- Hot Line and Hot Line List calls addressed to the Secondary DN
- Manual Trunk Terminations
  - The call is never presented, but the caller hears ringback tone.
- Overriding calls
- Private Lines
  - The call is never presented, but the caller hears ringback tone.
- Speed calls and System Speed calls

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Calls Not Blocked

With SDNB enabled, the following calls to the Secondary DN are enabled to terminate normally:

- Calls Parked may Recall
- Manual signaling, or "buzzing" a Secondary DN

Calls Not Supported

The following call services are not supported:

- Calls Waiting
- Camp-On calls
- Telephone to telephone Call Waiting

Supervisor Control of Queue Size (Advanced)

Supervisor Control of Queue Size enables ACD DNs to return a busy tone to selected call types. With this feature, an ACD DN can return a busy tone to new calls when all of the following conditions are met:

- No Interflow DN is designated.
- The number of calls in the queue meets or exceeds the Overflow Threshold.
- No Overflow destinations are configured, or the Overflow destinations are busy, or the Overflow destinations are in Night Service.
- The busy tone is configured for Supervisor Control of Queue Size (OVBU).
- The call has not arrived on a two-wire or CO/WATS/FX type trunk.

Supervisor Control of Queue Size enables busy tone treatment for calls from three possible origins:

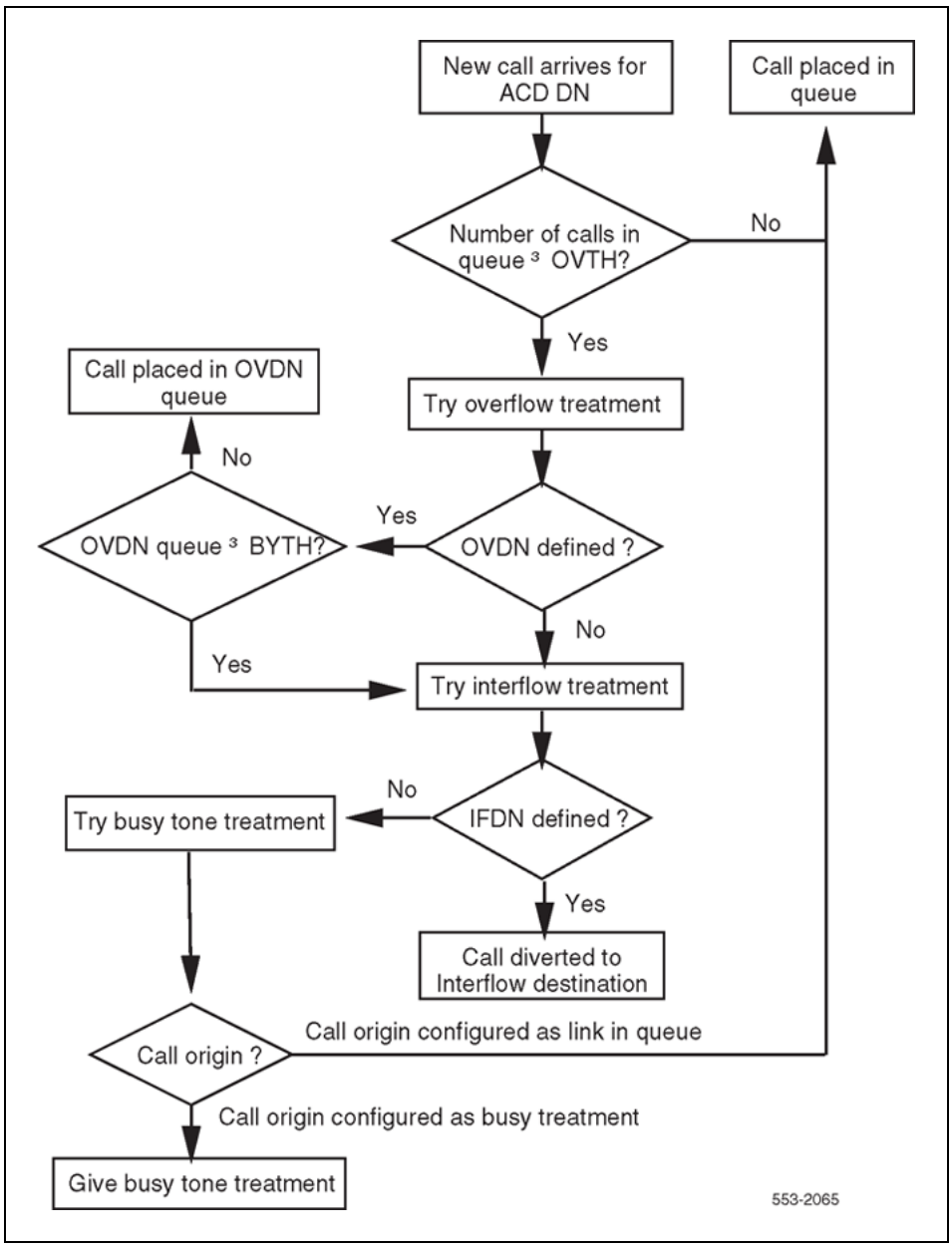
- internal calls (including transferred and conference calls)
- attendant calls
- DID or TIE trunks

The treatment can be defined for each call type as busy tone or link in queue. The default for all call origins is link in queue. See LD 23 in the *Software Input/Output Administration (NN43001-611)* to configure call treatment.

Figure 13 "Flowchart for call treated with Supervisor Control of Queue Size" (page 296) provides a flowchart explaining how the supervisor can control calls.

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Figure 13
Flowchart for call treated with Supervisor Control of Queue Size



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Table 56 "Supervisor Control of Queue Size impact on ACD operations" (page 297) illustrates this feature's impact on ACD operations.

Table 56
Supervisor Control of Queue Size impact on ACD operations

Number of calls meets or exceeds Overflow Thresholds	Interflow DN defined	Overflow destination defined and available	Call origin	ACD functionality
no	n/a	n/a	n/a	unchanged
yes	yes	n/a	n/a	unchanged
yes	no	yes	n/a	unchanged
yes	no	no	internal	busy tone or link in queue
yes	no	no	attendant	busy tone or link in queue
yes	no	no	CO (WATS/FEX)	link in queue
yes	no	no	DID or TIE	busy tone or link in queue

Feature interactions

CAS

If a call is extended to an ACD DN by the Centralized Attendant Service (CAS), the call is treated like an attendant type call.

Call Transfer

When an ACD DN receives a call from a transfer, the call is considered internal.

Conference

When an ACD DN receives a conference call, the call is considered internal.

Interflow

If an Interflow DN is configured, this feature is inactive. Conversely, if an Interflow DN is not configured, this feature is activated.

Night Service

If Night Call Forward (NCFW) diverts a call to a DN that operates with Supervisor Control of Queue Size, a caller may hear the night RAN first, then receive a busy tone. It is recommended that a call not be forwarded to a Night DN with this feature enabled because it is possible that the RAN is heard before the busy tone.

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Operating parameters

Supervisor Control of Queue Size is configured on an ACD DN basis. This feature and Interflow treatment are mutually exclusive.

Busy tone cannot be configured for CO trunk calls. Calls received from CO trunks are linked in queue. Central Office trunk calls Night Call Forwarded across TIE lines to an ACD DN can receive a busy tone under the following conditions:

- if the call is answered at the local switch, then transferred to the remote one
- if the call is presented to an ACD DN that is Night Call Forwarded to a non-ACD telephone and that telephone is Night Call Forwarded to the Night DN

Time Overflow (TOF) queuing (Advanced)

Time Overflow (TOF) provides a way to give special handling to calls that have been waiting too long. Time Overflow (TOF) overflows unanswered calls to other queues based on a customer-defined time threshold. Once a call has Time Overflowed it can be answered by either the source ACD DN or target ACD DN agents. The source ACD DN queue and the target ACD DN queues are monitored to collect Time Overflowed calls and present them to the first available agent.

The advantage of Time Overflow (TOF) is that it enables calls that have waited the longest to be answered first. Calls from the TOF queue can be answered by the first available agent of the source ACD DN or target ACD DN.

TOF operation

The high-priority and non-priority queues for each ACD DN are continuously monitored to find calls that exceed the Time Overflow Timer (TOFT) in LD 23. Calls that exceed the TOFT value are put in the TOF queue for the source ACD DN.

There is one TOF queue for each ACD DN. Call priorities are maintained when a call is placed in the TOF queue. Priorities are maintained by inserting high-priority calls in the TOF queue before inserting non-priority calls.

For each queue, there are three levels of priority: non-priority, high-priority, and TOF.

Non-priority queues are for calls on trunks with ACD priority not required (CLS = APN in LD 14) and the Time Overflow Timer (TOFT in LD 23) has not expired. This also includes internal calls.

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High-priority queues contain calls on trunks with ACD priority required (CLS = APY in LD 14) and the TOFT has not expired.

TOF queue contains calls with the TOFT expired. Calls in the TOF queue can be either APN or APY trunk calls, or both.

TOF operation by time

1. A call enters the source ACD DN high-priority or non-priority queue.
2. The calls remains in the source queue until the call waiting time meets the TOFT value. The call is placed in the source TOF queue.
3. The call can be answered by any agent in the source ACD DN or by a target agent.

TOF operation with Automatic Overflow

1. A call attempts to enter a source ACD DN high-priority or non-priority queue. The OVTH for the source ACD DN has been met or exceeded, but the BYTH for the target ACD DN has not been met.
2. The call overflows by number to the target queue. It remains there until answered, abandoned, or the TOFT from the source expires.
3. When the timer expires, the call is recalled to the source TOF queue.
4. The call can be answered by any agent in the source ACD DN or target ACD DN.

TOF operation with Interflow

1. A call attempts to enter a source ACD DN high-priority or non-priority queue that is in Interflow state.
2. The Interflow destination is an ACD DN and the incoming call interflows to it. The call remains there until answered, abandoned, or the TOFT from the source expires.
3. When the timer expires, the call is recalled to the source TOF queue.
4. The call can be answered by an agent in the source ACD DN or target ACD DN.
5. If the Interflow destination is not an ACD DN, the call is never recalled to the source TOF queue.

As agents become available, calls are presented based on call priority and the HPQ prompt in LD 23.

When HPQ = YES, the agent is presented with calls in this order:

1. calls in the agent's own TOF queue
   (These are both high-priority and non-priority calls.)

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2. calls waiting in the agent's own high-priority queue
3. calls from other TOF queues targeted to this agent's queue
4. calls waiting in the non-priority queue

When HPQ = No, the agent is presented with calls in this order:

1. calls in the agent's own TOF queue
   (These are both high-priority and non-priority calls.)
2. calls from other TOF queues targeted to this agent's queue
3. calls waiting in the agent's own high-priority queue
4. calls waiting in the non-priority queue

Empty queues Only when the source TOF queue, high-priority queues, and target TOF queues are empty is the agent presented with a call from the non-priority queue.

If the non-priority queue is empty, the agent is linked to the available agent queue.

Source TOF queues are searched first by priority then by time to find the next call to be served. All high-priority calls are answered before non-priority calls regardless of how long they have waited. If the priorities are equal, the oldest calls are serviced first. Refer to the flow chart in Figure 14 "Call presentation to available agent" (page 301).

Time Overflow does not occur during the following conditions:

- ACD Ring Again calls
- Call Park Recall calls
- callers active in Telset Messaging
- calls to a source ACD DN in night service
- when the target queue is in night service

Time Overflow Timer Incoming calls can Time Overflow only if the source ACD DN has a TOFT defined in LD 23. However, an agent can still answer TOF calls as the target DN for another ACD DN. If the TOFT is not defined, the source ACD DN calls have high priority and get answered first. If the target ACD DN has the TOFT programmed in LD 23, its own TOF calls have priority over any calls sent by TOF.

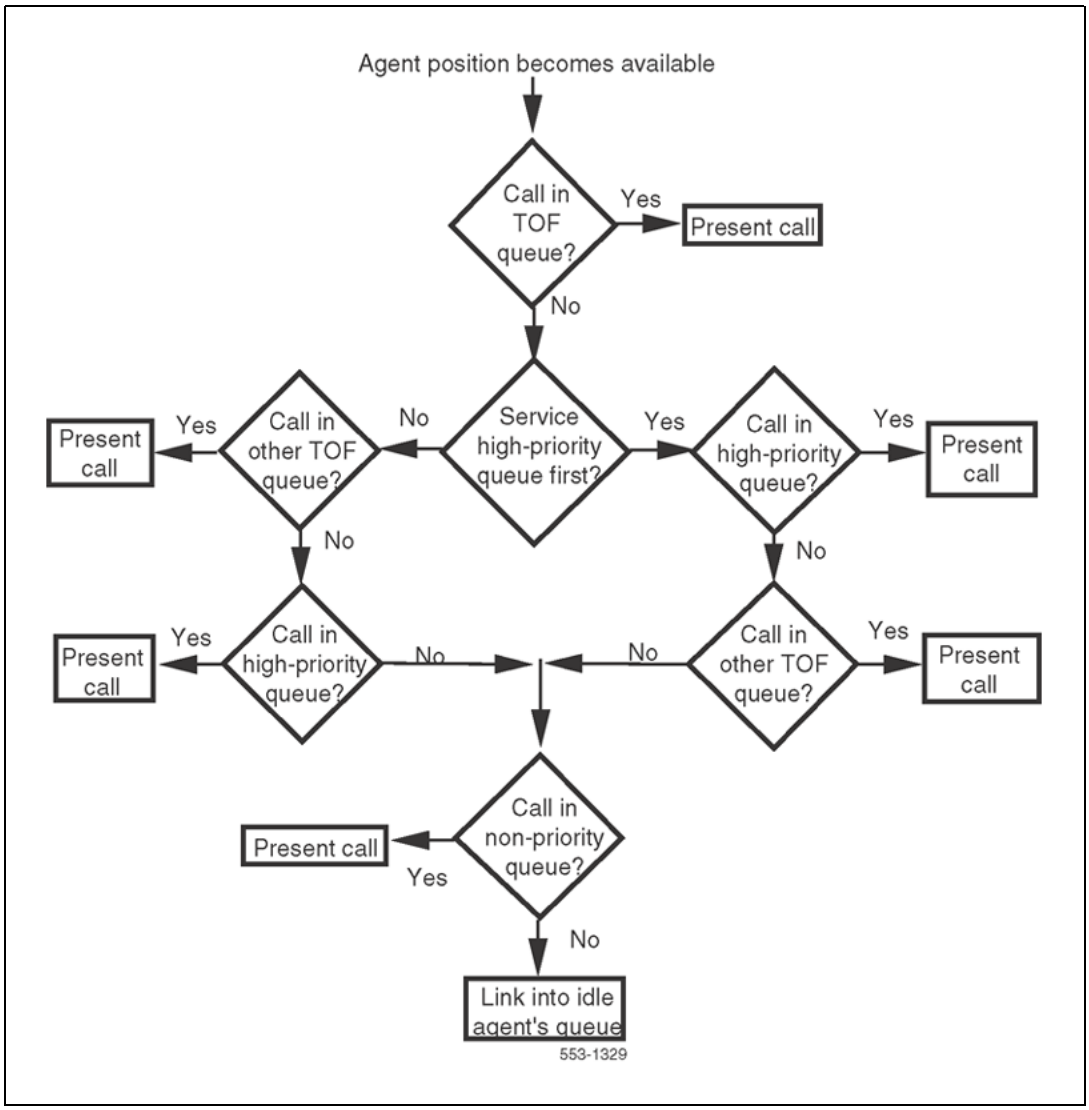
If the TOFT is defined, but the ACD DN is not configured as the target DN for any other source DN, the agents can only answer TOF calls from their own TOF queue.

- Each target ACD DN can answer TOF calls for up to 6 source ACD DNs.

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- Each target ACD DN can answer TOF calls for up to 100 source ACD DNs when Enhanced Overflow is enabled.
- Usually, it is not feasible to enable calls from a source ACD DN in one application to be answered by target ACD DN in another application.

Figure 14
Call presentation to available agent



Compare with Automatic Overflow

Automatic Overflow diverts a call to a target ACD DN when the number of calls in the source queue meets or exceeds the Overflow Threshold (OVTH). The next call entering the queue attempts to overflow. For Automatic Overflow, the number of calls in the TOF queue must be added to the total number of calls waiting for service when a new call comes in.

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Table 57 "Overflow comparison" (page 302) shows a comparison between Automatic Overflow and Time Overflow.

Table 57
Overflow comparison

	Automatic Overflow	Time Overflow
Condition	The number of calls waiting is greater than the OVTH for the source queue.	The time the call waited is greater than the TOFT for the source queue.
Action	Put the call into the high-priority queue, or non-priority queues for a target ACD DN, if available.	Put the call in the TOF queue for the source ACD.
Result	The call is answered by an agent in the queue where the call terminates. Only looks once at targets and if none are available, the call is linked to the source ACD DN.	The call may be answered by an agent of the source ACD DN or a target ACD DN.

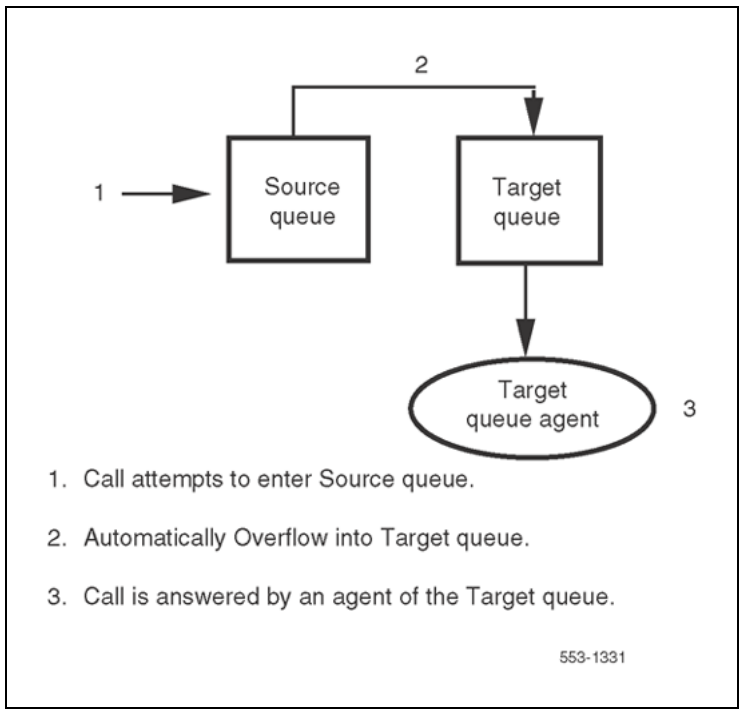
Automatic Overflow only

In this configuration (see Figure 15 "Automatic Overflow only" (page 303)), a call automatically overflows to a target ACD DN based on the number of calls in the source and target queues. It can only be answered by an available agent of the target DN. To Automatically Overflow, the following conditions are required:

- A TOFT value for this ACD DN is not defined.
- An Overflow destination must be specified.
- The OVTH has been met or exceeded.

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Figure 15
Automatic Overflow only



Time Overflow only

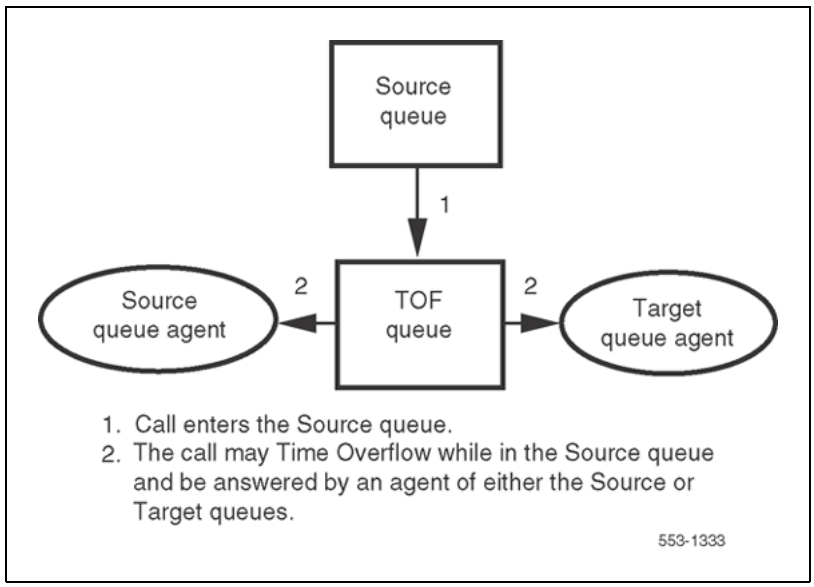
In this configuration (see Figure 16 "Time Overflow only" (page 304)), the call overflows by time to the source queue and is answered by any available agent in the source ACD DN or any one of the three target queues. For a source queue to Time Overflow only, the following conditions must be met:

- The TOFT value must be configured between 2 and 1800 seconds.
- The OVTH must be configured to a value of 1 to 2047. If OVTH is configured as 2047, the source queue does not Automatically Overflow.
- The Overflow destinations must be specified.

If an ACD queue is a TOF target but does not Overflow its own calls, the TOFT should be configured as a low value to ensure its own incoming calls are answered.

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Figure 16
Time Overflow only



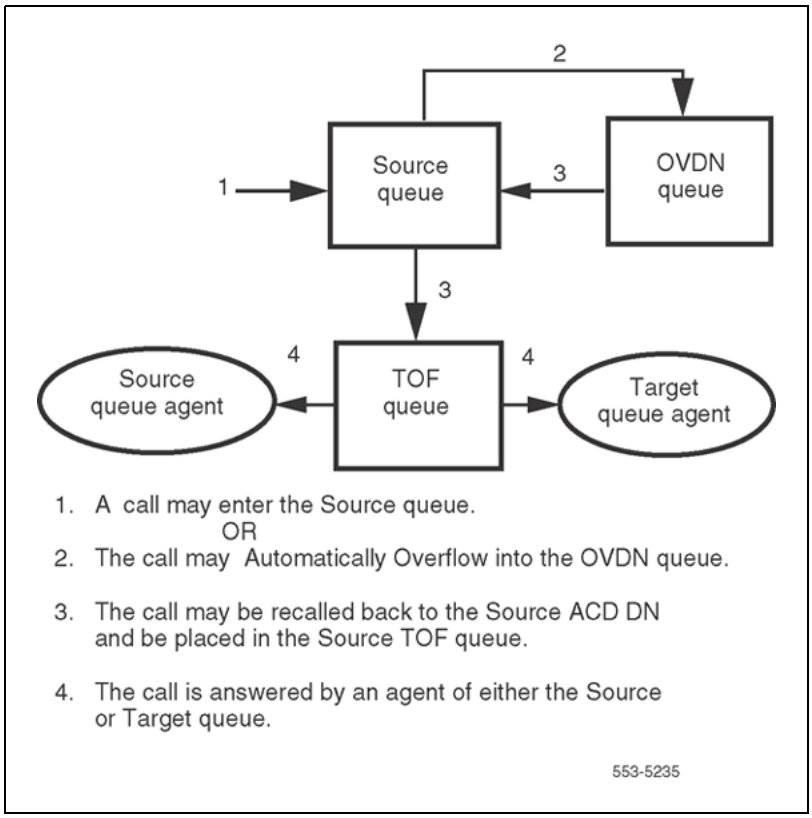
Automatic Overflow and Time Overflow

This configuration is shown in Figure 17 "Automatic Overflow and Time Overflow" (page 305). When the source ACD DN is configured to Automatically Overflow and Time Overflow, a call could Overflow to a target queue and be recalled back to the source queue. This same call is then placed in the source TOF queue, and is answered by an agent of either the source or target queue. To Automatically Overflow and Time Overflow, the following conditions must be met:

- TOFT must be configured between 2 and 1800 seconds.
- Specify the Overflow destinations.
- OVTH value must be met or exceeded for the source ACD DN.
- The BYTH of the target queue has not been met.

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Figure 17
Automatic Overflow and Time Overflow



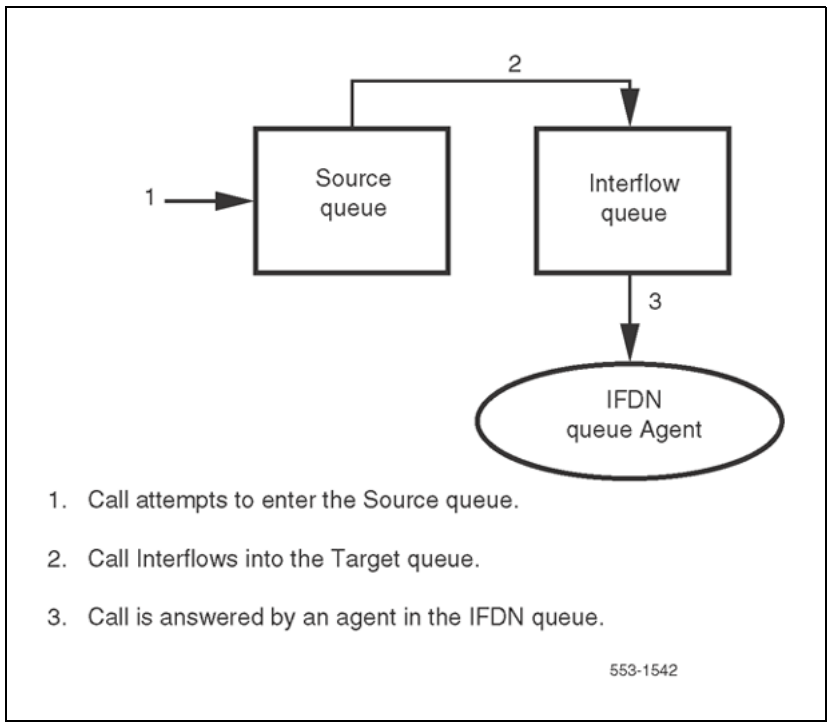
Interflow only

Figure 18 "Interflow by count only, answered by IFDN" (page 306) shows Interflow by count only. In this configuration a call interflows by count to an IFDN that is an internal ACD DN. The call can only be answered by an available agent of that ACD DN. For Interflow to occur, the following conditions must be met:

- IFDN destinations must be specified.
- Interflow must be enabled either automatically (AENI) or by the supervisor's ENI key.
- The OVTH must be met or exceeded.
- No Overflow destinations are available.
- The TOFT is not defined.
- The IFDN queue is in day service.

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Figure 18
Interflow by count only, answered by IFDN



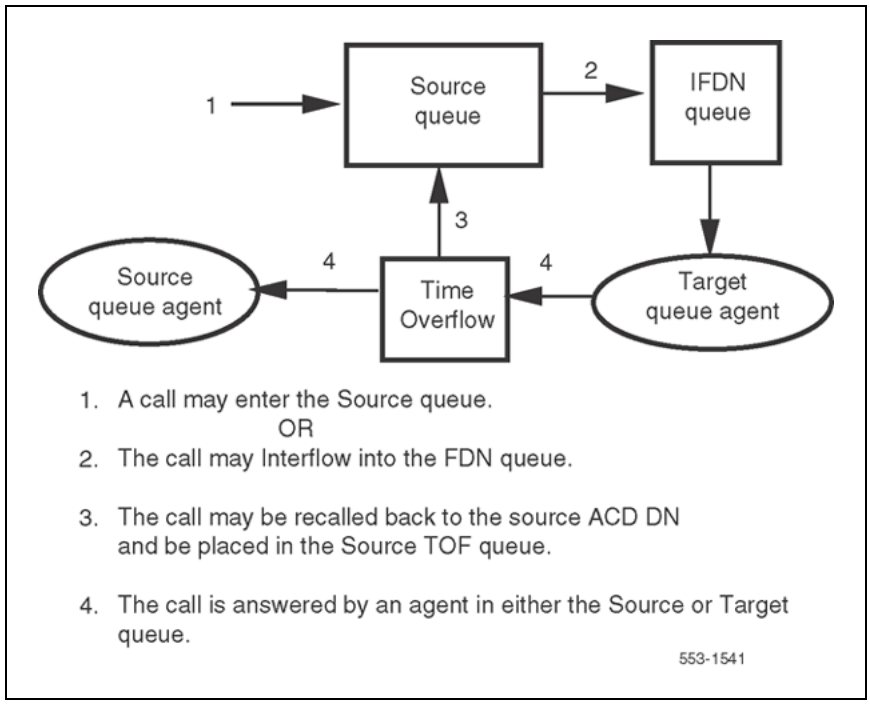
Interflow and Time Overflow

Figure 19 "Interflow and Time Overflow" (page 307) illustrates Interflow and Time Overflow. A source ACD DN can be configured to Interflow as well as recalling to source by time. The IFDN must be an ACD DN. The call is eventually answered by an agent of the source ACD DN or target queues. For this to occur, the following conditions must be met:

- The IFDN must be defined as an ACD DN.
- Interflow must be enabled either automatically (AENI) or by the supervisor's ENI key.
- The OVDNs must be defined.
- The OVTH must be met or exceeded.
- The BYTH must be met or exceeded.
- The TOFT must be defined.

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Figure 19
Interflow and Time Overflow



Feature interactions

Display Waiting Calls (DWC) key

A Display Waiting Calls key can be assigned to a supervisor position for each ACD DN. The lamp state of the Display Waiting Calls (DWC) key corresponds to the lamp state of the Calls Waiting (AWC) key. This gives the supervisor an indication of when to use the Interflow (ENI) key. A maximum of eight DWC key appearances per queue are enabled. The Display Waiting Calls key shows a count of calls waiting that includes all calls in queue that have not been presented to an agent.

The information on the Display Waiting Calls key is updated every time the key is pressed.

When the DWC key is used, the display on the telephone follows this format:

aaa bbb ccc ddd

where

aaa = all calls in queue

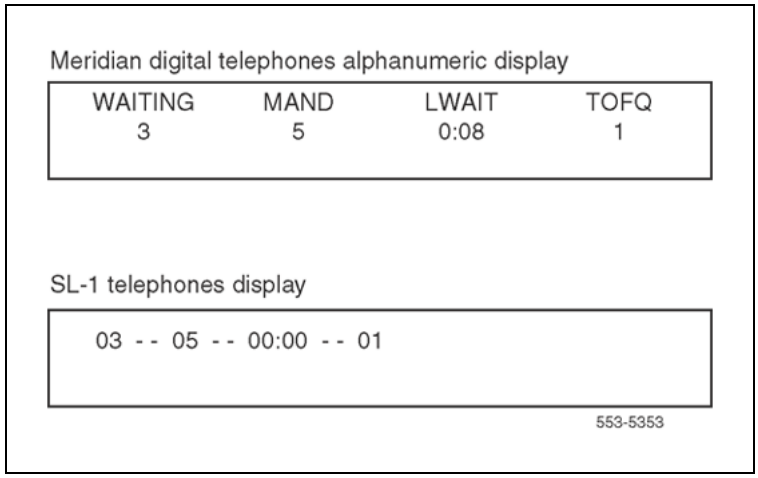
bbb = number of positions occupied for that ACD DN

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ccc	=	waiting time for the oldest call in queue
ddd	=	number of TOF calls aimed at the source ACD DN queue, the sum of all calls that *could* flow into that source queue

The ddd field indicates how many calls are in other TOF queues that target this ACD DN. The ddd field does not include the number of TOF calls in its own queue because that amount is already included in the aaa field. Figure 20 "DWC display examples" (page 308) shows DWC display examples. A ddd of zeros indicates one TOF call is aimed at this ACD DN from another queue.

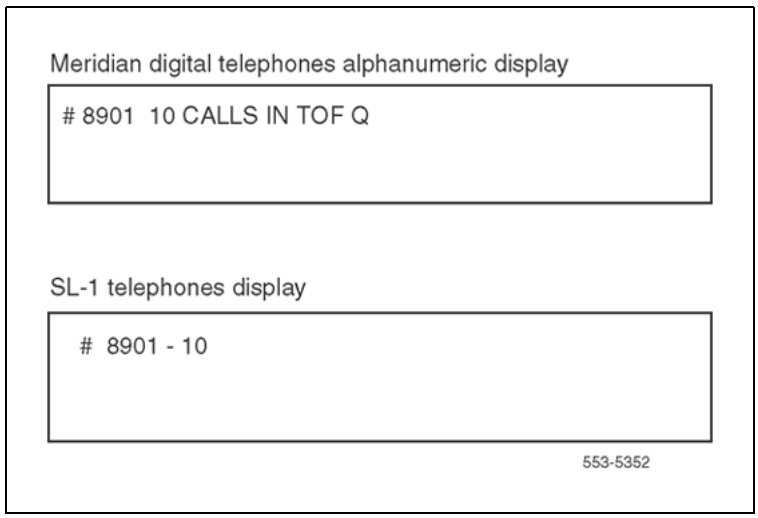
Figure 20
DWC display examples



To determine the actual number of TOF calls in any source queue, the supervisor presses the Display key, octothorpe (#), followed by an ACD DN. The system displays how many calls that ACD DN has in its TOF queue. Supervisors can see how many calls are in their own TOF queue by entering their own ACD DN. Figure 21 "Display comparison" (page 309) shows the display comparisons.

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Figure 21
Display comparison



Calls Waiting Indication

The Calls Waiting Indication (AWC) lamp on the agent position informs the agent that the number of calls in the queue meets or exceeds a threshold value, and the call handling rate should be increased. The light states on these keys are used to indicate different conditions relating to Automatic Overflow.

With TOF, the lamp states include this ACD DN's TOF queue when counting the number of calls waiting. These lamps have four states:

- **Dark** The calls waiting in this ACD DNs high-priority, non-priority, and TOF queues are less than the Call Waiting Threshold (CWTH).
- **Steadily lit** The number of calls waiting in the high-priority, non-priority, and TOF queues equals or exceeds the Call Waiting Threshold (CWTH) or the Call Waiting Lamp Flash (CWLF), but is less than the Busy Threshold (BYTH). This ACD DN can receive Automatic Overflow calls, as in normal operation.
- **Fast flash** Some calls are waiting and may be overflowing to another ACD DN. The total number of calls waiting meets or exceeds the Overflow Threshold (OVTH) or the Call Waiting Lamp Wink. When an ACD DN is in this Overflow state, all new incoming calls are diverted to a target queue, if one is available.
- **Flash** The number of calls waiting in the high-priority, non-priority, and TOF queues meets or exceeds the Busy Threshold (BYTH) or the Call Waiting Lamp Flash (CWLF), but is less than the Overflow threshold (OVTH). The ACD DN cannot receive Automatic Overflow calls from other queues.

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ACD Ring Again

Ring Again enables an internal telephone call originator to have on-hook queuing. A special ring-back tone is returned before RAN or Music is played. When the Ring Again key is activated, the call is placed in the queue and the originating telephone is then free to make and receive other calls. Only internal calls can activate Ring Again.

When Ring Again is applied to a call, that call is not eligible for Time Overflow.

Call Park

Calls parked by agents are not eligible for Time Overflow. However, if a target agent parks a call after Automatic or Time Overflow, it recalls back to the target agent who parked it, if available. If the parking agent is not available, it recalls to the source queue.

Call Party Name Display (CPND)

This feature operates on telephones with alphanumeric display with CNDA Class of Service only. When a target agent answers a TOF call, the originating DN or Trunk Access Code displays, as well as the source DN and name. The originating telephone display shows the CPND name associated with the terminating telephone.

ACD Call Supervisor

If an agent answers a TOF call and then presses the ACD Call Supervisor key, the agent is connected with the assigned supervisor, and not the supervisor of the overflowed queue from which the TOF call was directed.

Dialed Number Identification Service (DNIS)

When a DNIS call is presented to an agent with display, the source ACD DN and DNIS number are displayed with the trunk Access Code (ACOD) and member number of the originating party.

Display

When a target agent answers a TOF call, the source ACD DN is displayed following the originating DN or Trunk Access Code. If the originating telephone has display, it shows the dialed (source) DN, the ACD DN, and the agent for the terminating agent position.

When Call Forwarding All Calls, a call is forwarded automatically and can still Time Overflow to a target ACD DN. The originating display shows the dialed DN and the final terminating DN.

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ACD Message Center

An ACD Message Center is an ACD agent specially equipped with Message Indication (MIK) and Message Cancellation (MCK) indicators. When a call comes into the ACD Message Center it lights the MIK lamp. The agent answers the call and writes down the message.

By pressing the MIK key while on the call, the Message Center agent activates the Message Waiting (MWK) lamp on the originally dialed telephone. When that telephone user presses the MWK key, it lights the Message Center agent's MCK indicator. After delivering the message, while still on the call, the Message Center agent presses the MCK key to turn off the telephone user's Message Waiting indicator. When a call to the Message Center agent time overflows, it can be answered by any of the target queues defined for that telephone.

- An Integrated Message Center (IMS) is similar to the ACD Message Center in the operation and function of the MIK, MCK, and MWK key/lamp pairs. When a call going to an ACD DN with IMS applications time overflows, the call can be answered by any agent in the target queues.
- The Integrated Voice Message System (IVMS) operates much the same as IMS. Within the IVMS environment, if a call to an ACD DN time overflows, it can be answered by any agent in the target queues. It is recommended that IVMS ACD DNs also have target DNs within the IVMS environment.
- Telset messaging is supported by IMS/IVMS applications. While a call is active in Telset Messaging, it remains in the queue working up to the front of the queue. However, that call is not eligible for answering by an agent even if it is in the front of the queue. When Telset messaging is complete, the queue timer for that call is reset because the call was unavailable for ACD service.
- A call in the low-priority queue active in Telset messaging is not eligible for Time Overflow treatment until after Telset Messaging is complete. The TOF Timer is reset when the caller dials "0" to signal the caller is now available for ACD service. Calls in the high-priority queue are not eligible for Telset Messaging. Calls in the TOF queue are not eligible for Telset Messaging.

Multi-Tenant Services

Sites with Multi-Tenant services and Overflow must have source and target agents assigned the same tenant number. If they are not, an agent may be presented with an unanswerable call. Because Time Overflow calls are not put into target queues but can be presented to target agents, an agent can be presented with an unanswerable call. The call is unanswerable because target agents cannot answer a call arriving on another tenant's trunks.

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Night Service Treatment

When all agents for a particular ACD DN activate the Make Set Busy (MSB) key, or the supervisor activates the Night Service (NSVC) key, that ACD DN is in the Night Service Mode. When a queue is in Night Service, the following interactions apply:

- Calls in the TOF queue:
  A TOF call can be answered by one of the target ACD DNs or routed for regular Night Service treatment, whichever comes first.
- Calls in high-priority or non-priority queues:
  Waiting calls that are not in the TOF queue receive Night Service treatment defined for the source ACD DN. If a call overflows by count into the target queue, and the source ACD DN goes into Night Service, the call does not Time Overflow back to the source ACD DN.
- New calls to the queue:
  New incoming calls are redirected for Night Service treatment. If Night Service is not defined, the calls are not eligible for Time Overflow.

Recorded Announcement (RAN)

When a call overflows by time or count to a target ACD DN, the RAN or Music specified for the source ACD DN remains in effect for all overflowed calls. With First RAN On Arrival enabled (FROA = YES), the RAN is connected when the call enters the queue. When FROA = NO, the RAN is not sent out until the First RAN Timeout (FRRT) has expired. Refer to *Features and Services (NN43001-106)* for additional information on RAN.

Operating parameters

The Time Overflow Timer (TOFT) must be defined to give calls overflow treatment into the timed queue. However, an agent can still answer TOF calls as the target DN for another ACD DN. Incoming calls can be given Time Overflow treatment only if the source ACD DN has a defined TOFT.

If the TOFT is defined but the ACD DN is not configured as the target DN for any other source DN, agents can only answer TOF calls from their own TOF queue.

- Each target ACD DN can answer TOF calls for up to 6 source ACD DNs.
- With Enhanced Overflow, each target ACD DN can answer TOF calls for up to 100 source ACD DNs if NACD is enabled. See *Automatic Call Distribution Fundamentals (NN43001-551)*.
- It is not recommended to enable calls from a source ACD DN in one application to be answered by target ACD DNs in another application.

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Engineering guidelines

The following guidelines are recommended for database configuration and should be followed to make this feature operate as effectively as possible.

- All agents should have a Class of Service that enables the agent to receive incoming calls (UNR, TLD, CTD, CUN, SRE).
- All agents within the same ACD DN should have the same tenant number.
- All agents belonging to the same target ACD DN should have the same tenant number as the source ACD DN.

Data administration for TOF is provided in the *Software Input/Output Administration (NN43001-611)*.

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ACD testing basic features

Contents

This section contains information on the following topics:

"Introduction" (page 315)

"Testing requirements" (page 315)

"Basic agent features" (page 316)

"Basic supervisor features test" (page 319)

Introduction

This section describes how to operate and test the Basic ACD Features.

Testing requirements

The following requirements must be met before attempting the tests in this section:

- Agent telephone installation must be completed as described in *Telephones and Consoles Fundamentals (NN43001-567)*. See also the NTP associated with the specific ACD agent telephones.
- If certain incoming call types (routes) are to receive priority treatment in the call queue, calls to the ACD DN can be modified by the priority assignments. This should be taken into account during testing.
- Configure the system so that at least three or four simultaneous incoming calls to the ACD DN can be readily made by the testing personnel. This can be accomplished by the temporary assignment of TIE lines from the CO or another PBX, or by other methods deemed suitable for that particular installation.
- Some tests require large numbers of calls to be placed in the ACD DN queue unless the office data is modified. To make these tests more manageable, the Service Changeable thresholds must be set to very low values. The thresholds can be reset after testing. Refer to *Software Input/Output Administration (NN43001-611)*.

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Basic agent features

The following procedures explain how to test a basic feature on ACD telephones after the system has been installed. Follow the steps here to ensure the features work properly. If any problems occur, contact technical support personnel.

Note that tone ringing is replaced by a 3-second buzz tone when agent telephones are equipped for headset or plug-in handset operation.

Procedure 1
Testing the Not Ready key

Step	Action	Response
1	Press the Not Ready key on all agent telephones associated with the ACD DN.	The Not Ready key lamp lights steadily at all agent telephones.
2	Originate a call to the ACD DN.	The calling party hears ringback tone. The call is not presented to any agent telephone.
3	Press the Not Ready key (deactivating the feature) on one agent telephone.	The Not Ready key lamp goes dark. Tone ringing is heard at the agent telephone. The In-Calls key lamp flashes.
4	Press the Not Ready key (deactivating the feature) on another ACD telephone.	The Not Ready key lamp goes dark.
5	Operate Not Ready key released in step 3, reactivating the Not Ready feature.	Tone ringing stops. The In-Calls key lamp goes out. The Not Ready key lamp lights steadily. Tone ringing is heard at agent idled in step 4. The In-Calls key lamp flashes at agent telephone (step 4).
6	Answer the call presented to the ACD telephone.	Ringing stops. The In-Calls key lamp lights steadily. Voice connection between caller and ACD position is established.
7	Press the Not Ready key to disconnect the call.	Voice connection is broken. The In-Calls key lamp is dark. Not Ready key lamp lights steadily.
8	Release Not Ready key at all telephones, and idle all ACD telephones.	All Not Ready key lamps go out. All agent telephone lamps go out. All agent telephone keys are deactivated.

Procedure 2
Testing the digit display

Step	Action	Response
1	Originate a call to the ACD DN.	The In-Calls key lamp flashes. One agent telephone hears tone ringing. Digit display shows

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Step	Action	Response
		— calls within the system • DN of the calling party — calls external to the system • trunk access code number (trunk route member number of the incoming call allowing the agent to give proper answer treatment) • trunk member number identifying a specific trunk within the group of trunks (may be used for identifying faulty trunks)
2	Agent answers the call.	The In-Calls key lamp lights steadily. Ringing tone stops. A two-way voice connection is established. Display remains lit, showing the trunk access code number and trunk member number, or the DN of the calling party.
3	Both parties disconnect.	The In-Calls key lamp goes out. Display goes out.
4	Repeat steps 1 through 3 until a call has been presented to each ACD telephone.	

Procedure 3
Testing the Make Set Busy key

Step	Action	Response
1	Press the Make Set Busy key at all agent telephones except one.	Make Set Busy lamp lights steadily at agent telephones with Make Set Busy key activated.
2	Originate a call to the ACD DN.	The In-Calls key lamp flashes. The agent telephone without the lit Make Set Busy lamp hears ringing tone. The call is not presented to any agent telephone with Make Set Busy activated.
3	Press Make Set Busy key at the agent telephone presented with the call from step 2.	The Make Set Busy key lamp lights steadily. Tone ringing stops. In-Calls lamp goes out. Call is directed to night service. (See step 6.)

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Step	Action	Response
4	Abandon call originated in step 2. (Calling party hangs up.)	Night Service on ACD DN.
5	Be sure that all telephones assigned to the ACD DN have a Make Set Busy key assigned and that it is activated.	The Make Set Busy key lamp lights steadily.
6	Originate a call to the ACD DN.	One or both of the following can occur, depending on equipped features: If night recorded announcement (RAN) equipped, the calling party hears recorded announcement. If call forward for Night Service equipped, the call is forwarded to a night number assigned for ACD.
7	Abandon the call.	
8	Deactivate all Make Set Busy keys.	The Make Set Busy key lamp on each telephone goes out.

Before using the individual agent DN key, be sure at least three agent telephones for the ACD DN concerned are available (for example, Make Set Busy and Not Ready lamps dark with no other features activated).

Procedure 4
Testing the agent DN key

Step	Action	Response
1	Originate a call to the ACD DN. (Do not answer the call at the agent telephone.)	Call is presented to the first agent, and the In-Calls key lamp flashes. The first agent telephone hears ringing tone.
2	Press the agent DN key at the first agent telephone.	At the first agent telephone — In-Calls lamp is extinguished — DN lamp lights steadily — Dial tone is heard. The call originated in step 1 is presented to the second agent terminal where • In-Calls lamp flashes • Ringing or buzz tone is heard from speaker

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Step	Action	Response
3	At the first agent telephone, dial the agent DN associated with the second agent telephone.	Lamp associated with DN of the second agent flashes. Ringing or buzz tone is heard at the second agent telephone.
4	At the second agent telephone, press the individual agent DN key next to flashing DN lamp. The ACD call of step 1 is now presented to a third agent telephone.	At the second agent telephone — In-Calls lamp extinguished — Ringing tone ceases At third agent telephone — In-Calls lamp flashes — Ringing or buzz tone heard
5	Disconnect all calls in progress. (Release DN key at the first and second agent telephones and abandon call originated in step 1.)	All agent lamps go out. All agent telephones are idle.

Basic supervisor features test

These procedures explain how to use and test basic Supervisor procedures. If any problems occur during the testing, contact technical support personnel.

Operating the Agent key has no effect on its associated lamp. All Agent lamps are active simultaneously and are updated when an agent's status changes.

Procedure 5
Testing basic supervisor features

Step	Action	Response
1	Make a call to the ACD DN for the agent telephone concerned.	The agent hears ringing tone.
2	At ringing agent telephone, either go off-hook or press In-Calls key.	Ringing stops. At the ACD supervisor telephone, the Agent lamp associated with the answering agent is steadily lit (indicating busy on ACD call).
3	At agent telephone, press the Not Ready key.	At the agent telephone, the In-Calls lamp goes dark, and the Not Ready key lights. At supervisor telephone, the Agent lamp is still steadily lit (indicating busy on ACD call).

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Step	Action	Response
4	At agent telephone, press the Not Ready or the In-Calls key. Do not make any calls to the ACD DN.	At the agent telephone, the Not Ready lamp goes out. At the supervisor telephone, the Agent lamp flashes (indicating waiting for ACD call).
5	At the agent telephone, press the agent DN key.	At the agent telephone, dial tone is heard. At the supervisor telephone, the Agent lamp flashes (indicating busy on non-ACD call).
6	Put the agent in unstaffed state by going on-hook, and pressing the Make Set Busy key.	At the agent telephone, the Make Set Busy lamp lights. At the supervisor telephone, the Agent lamp is dark (indicating agent telephone not staffed).

Procedure 6
Testing the Display Agent key

Step	Action	Response
1	Make various telephones in the ACD queue busy on ACD calls, waiting for ACD calls, busy non-ACD calls, and unstaffed (see "Procedure 4 Testing the agent DN key" (page 318)).	
2	Press the Display Agents key on the supervisor telephone.	The digit display shows the number of agents reporting to this supervisor in each of 4 reported states when the Display Agents key is pressed. The display looks like AA-BB-CC-DD AA = number of agents busy on ACD calls (including the agents in post-call work time and the supervisor). BB = number of agents waiting for ACD calls off-hook, or In-Calls key pressed. CC = number of agents busy on non-ACD Calls. DD = number of unstaffed agent telephones. The sum of these numbers equals the number of Agent keys assigned to this supervisor telephone. It also includes the supervisor in the total count.

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Pressing the Display Queue key activates only the Digit Display. It has no effect on the associated lamp, which is constantly updated by the system.

Procedure 7
Testing the Display Queue key/lamp

Step	Action	Response
1	Add calls to the queue, one at a time, while periodically observing the Queue lamp. Press the Display Queue key and observe the digit display.	The lamp can assume any one of the following states: — unlit • no calls in the queue are waiting for agents — lit • one or more calls are waiting for agents
2	Press Display Queue key associated with queue under test.	The digit display shows the status of the queue. The display looks like aaa = the number of calls waiting for a free agent bbb = the number of agents assigned to this queue and staffed (regardless of which supervisor they are assigned to) ccc = the length of time (in seconds) the oldest call in the queue has been waiting The Digit Display is updated each time the Display Queue key is pressed.

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Basic system features

These procedures explain how to use and test ACD system features. If any problems occur during testing, contact technical support personnel.

Procedure 8
Testing the Agent Queue indication

Step	Action	Response
1	Be sure each agent telephone assigned to the ACD DN is idle.	No keys or lamps on the agent telephone are activated.
2	Originate a call to the ACD DN from an incoming trunk.	
3	Press the In-Calls key to answer the call at the called agent telephone.	The In-Calls key lamp lights steadily. Ringing stops. Voice connection is set up between the calling party and the agent.
4	Calling party and agent disconnect.	The In-Calls key lamp goes out. Voice connection is broken.

Procedure 9 Testing the Call Queue indication

Step	Action	Response
1	Make all agent telephones assigned to the ACD DN busy for ACD calls:	The Not Ready key lamp lights steadily.
	— press Not Ready key at each telephone	
	— make calls to ACD DN until each telephone is busy	The In-Calls key lamp lights steadily. (See "Procedure 7 Testing the Display Queue key/lamp" (page 321), step 2.)
	— busy each agent telephone by completing calls to, or originating calls from, each agent DN	The DN key lamp lights steadily.
2	Originate a call to the ACD DN.	The calling party hears ringback tone.
3	Make another call to the ACD DN.	The calling party hears ringback tone. (If equipped with RAN, calls may receive announcement.)
4	Make one agent available to receive ACD calls (see step 1).	Lamp lit in step 1 goes dark. The agent telephone hears ringing tone. The In-Calls key lamp flashes.
5	Press the In-Calls key to answer the call.	The In-Calls key lamp lights steadily. Ringing stops. Two-way voice connection established.
6	Press the Release key to disconnect from the call. Do not answer the next call at this time.	The In-Calls key lamp goes out, then flashes again. The agent telephone hears ringing tone.

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Step	Action	Response
7	Originate a call to the ACD DN.	The caller hears ringback tone.
8	At the agent telephone with the In-Calls key lamp flashing, press	The In-Calls key lamp goes out, and in addition:
	— the Not Ready key	The Not Ready key lamp lights steadily.
	— the Make Set Busy key	The Make Set Busy key lamp lights steadily.
	— the DN key	The DN key lamp lights steadily.
9	Allow an ACD to another agent telephone.	Lamp lit in step 1 goes out. The In-Calls key lamp flashes. The agent hears ringing tone.
10	Answer the new call at agent telephone.	The In-Calls key lamp lights steadily. Ringing stops. A two-way voice connection is established.
11	Disconnect all calls, and make all agents idle.	No keys or lamps are activated at any agent telephone.

Before using Recorded Announcements (RAN), take note of the first and second RAN times in effect for the ACD DN under test. Put all the agent telephones on the ACD DN into the Not Ready state. Make sure that at least one agent telephone is not in the Make Set Busy state.

Procedure 10
Testing the Recorded Announcement

Step	Action	Response
1	Make a call to the ACD DN. Caller hears ringback.	After the first RAN time has elapsed, the caller hears the first RAN. After the second RAN time has elapsed, the caller hears the second RAN. The second RAN is repeated at each "second RAN time" interval.
2	Press the Not Ready key on one agent telephone.	The call is presented on the In-Calls key of the terminal.
3	Answer the call at the agent terminal. (Go off-hook, and press the In-Calls key.)	A two-way conversation is established.
4	Without terminating the call in step 3, make a second call to the ACD DN.	Caller hears ringback, then first RAN, then second RAN as in step 1.

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Step	Action	Response
5	Release both calls.	Both agent telephones are idle.
RAN delays are greater than the thresholds assigned in LD 23 (FRT, SRT) if the "delayed start" option is in effect. See *Software Input/Output Administration (NN43001-611)*.		

Procedure 11
Testing the Priority trunks

Step	Action	Response
1	Make all agent telephones assigned to the ACD DN busy to ACD calls — Operate the Not Ready key at each telephone. (Ensure that at least one agent telephone has the Make Set Busy key deactivated.) — Complete non-priority calls to ACD DN until each telephone is busy. The In-Calls key lamp lights steadily. — Busy each agent by completing calls to each agent DN.	The Not Ready key lamp lights steadily. The DN key lamp lights steadily.
2	Make a non-priority call to the ACD DN.	The calling party hears ringback (or RAN, if equipped).
3	Make a priority call to the ACD DN.	The calling party hears ringback (or RAN, if equipped).
4	Make one agent available to receive ACD calls (see step 1).	Lamp lit in step 1 is extinguished. Tone ringing is heard at the agent telephone. The lamp associated with In-Calls lamp flashes (60 ipm).
5	Answer the call ringing at the agent telephone.	The In-Calls key lamp lights steadily. Ringing stops. A two-way voice connection is established.
6	Release the priority call.	The non-priority call is presented to the same agent telephone. Ringing is heard at the agent telephone, and the In-Calls lamp flashes.
7	Answer the call.	A two-way conversation. The In-Calls lamp lights steadily.
8	Make all agent positions idle.	

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ACD testing advanced features

Contents

This section contains information on the following topics:

"Introduction" (page 325)

"Testing requirements" (page 325)

"Advanced agent features" (page 326)

"Advanced supervisor features" (page 328)

"Advanced system features" (page 332)

Introduction

This section describes how to operate and test Advanced ACD Features. It is assumed that the operation of ACD Basic Features, described in the preceding chapter, has been successfully completed.

Testing requirements

The following requirements must be met before attempting the tests in this section:

- Agent telephone installation must be completed as described in *Telephones and Consoles Fundamentals (NN43001-567)*. See also the Nortel Publication associated with your specific ACD agent telephones.
- If certain incoming call types (routes) are to receive priority treatment in the call queue, calls to the ACD DN can be modified by the priority assignments. This should be taken into account during testing.
- Configure the system so that at least three or four simultaneous incoming calls to the ACD DN can be readily made by the testing personnel. This can be accomplished by the temporary assignment of TIE lines from the CO or another PBX, or by other methods deemed suitable for that particular installation.

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- Some tests require large numbers of calls to be placed in the ACD DN queue unless the office data is modified. To make these tests more manageable, the Service Changeable thresholds may be configured as very low values. The thresholds can be reset after testing. See *Software Input/Output Administration (NN43001-611)*.

Advanced agent features

The following procedures explain how to test an advanced feature on agent telephones after the system has been installed. Follow the steps below to ensure that the features work properly. If any problems occur, contact the technical support group.

Procedure 12
Using the Call Supervisor key

Step	Action	Response
1	If there is no call currently active on the In-Calls key, lift the handset or plug in the headset and press the Call Supervisor key.	The Call Supervisor key lamp lights steadily. Ringback tone is heard if the supervisor is idle; busy tone is heard if the supervisor is busy.
	If there is a call on the In-Calls key, press the Call Supervisor key.	The calling party is put on hold and the In-Calls lamp flashes. The Call Supervisor key lamp lights steadily. Ringback or busy tone is heard.
2	The supervisor answers the call ("Procedure 5 Testing basic supervisor features" (page 319)).	Two-way conversation between the ACD agent and supervisor.
3	When the conversation is complete, the agent can either go on-hook or press the Release (RLS) key.	The Call Supervisor key lamp goes dark.
4	To add the calling party to the agent/supervisor conversation, press the Call Supervisor key again.	The calling party is bridged into the conversation; the Call Supervisor lamp goes dark, and the In-Calls lamp lights steadily.
5	To transfer the calling party to the supervisor, press the Release (RLS) key.	The agent is removed from the conversation, and the In-Calls lamp goes dark.
The agent also uses the Call Supervisor key to answer a call from the supervisor.		

Procedure 13
Using the Emergency key

Step	Action	Response
1	A call established on the In-Calls key is deemed an emergency call.	The In-Calls lamp lights steadily and a two-way conversation with the calling party is established.

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Step	Action	Response
2	Press the Emergency key.	Ringback tone is heard over the two-way conversation. The Emergency lamp — remains dark if neither the assigned supervisor nor recording device is available — flashes if either the assigned supervisor or recording device is available
3	The assigned supervisor and/or recording device is bridged into the conversation.	The Emergency lamp lights steadily.
4	If a recorder and/or teletype is equipped, the following occurs:	
	— the recorder records the conversation	The conversation is heard when the recorder is played back.
	— the teletype prints the call data	One or more of the following messages is printed: EMR100 RC L S C U RR MMM EMR100 AG XXXX YYYY EMR100 OR LSCU RR MMM (See the Note following this procedure.)

Note: EMR100 messages are interpreted as follows:

RC =	the recording trunk used for the emergency recorder L S C U = loop, shelf, card, and unit used for the recording trunk. RR and MMM = route and member numbers of the recording trunk.
AG =	shows that an agent pressed the Emergency key XXXX = ACD DN to which the agent is assigned. YYYY = agent POS-ID. The ACD DN and the POS-ID digits, for software programming reasons, are listed backward; the character "A" signifies a "0" and the digit "0" signifies the end of the number. For example, the ACD DN "01A4" would denote "401" and POS-ID "5412" would denote "2145."
OR =	the originator of the call L S C U = loop, shelf, card, and unit of the call origin. RR and MMM = route and member numbers of the trunk. If the call is originating from within the system, these two fields are absent.

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Advanced supervisor features

The following procedures explain how to test an advanced supervisor feature on agent telephones after the system has been installed. Follow the steps below to ensure that the features work properly. If any problems occur, contact the technical support group.

Procedure 14
Using the Observe Agent key

Step	Action	Response
1	Press the Not Ready key.	The Not Ready lamp lights steadily.
2	Press the Observe Agent key.	The associated lamp lights steadily.
3	Press an Agent key associated with the lit lamp (indicating the agent is involved with an ACD call).	The conversation between the selected agent and calling party is heard. The digit display shows the POS-ID of the selected agent. The supervisor can monitor selected agents, one at a time, by pressing different Agent keys.
4	Press the Call Agent key to enter the conversation between the agent and calling party.	The Call Agent lamp lights steadily. A 3-way conversation between supervisor, agent, and calling party is established.
	To leave the observation mode, press the Observe Agent (or Not Ready) key.	Conversation between the agent and calling party can no longer be heard. The Observe agent (or Not Ready) lamp goes dark.

Procedure 15
Using the Call Agent key

Step	Action	Response
1	Press the Not Ready key.	The Not Ready lamp lights steadily.
2	Press the Call Agent key.	The associated lamp lights steadily.
3	Press the Agent key associated with the agent to be called.	The digit display shows the POS-ID of the selected agent; ringback tone is heard. When the called agent answers, a two-way conversation is established. The supervisor can call selected agents, one at a time, by pressing different agent keys.
4	To end the call, press the Call Agent (or Not Ready) key.	Conversation is ended, and the Call Agent (or Not Ready) lamp goes dark.

Procedure 16
Using the Answer Agent key

Step	Action	Response
1	An ACD agent has pressed the Call Supervisor key.	The associated supervisor telephone hears ringing, and the Answer Agent lamp flashes.

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Step	Action	Response
2	Press the Answer Agent key.	Ringing stops, and the Answer Agent lamp goes dark. A two-way conversation between the calling agent and supervisor is established.
3	To end the call, press the RLS key.	The associated lamp goes dark.

Procedure 17
Using the Answer Emergency key

Step	Action	Response
1	An agent has received a call and pressed the Emergency key.	The associated supervisor telephone hears continuous ringing. The Answer Emergency lamp flashes.
2	Press the Answer Emergency key. If engaged with a call, press Hold key first.	Continuous tone ringing stops, and Answer Emergency lamp lights steadily. A 3-way conversation between supervisor, agent, and calling party is established. Digit display shows POS-ID of involved agent. A "Listen-only" connection can be established by unplugging the headset/handset before pressing Answer Emergency.
3	To end the call, press the RLS key.	Call ended, and the Answer Emergency lamp goes dark. After releasing the call, the supervisor cannot return to it. However, an emergency call can be placed on hold. Also, when the supervisor has released the call, the agent cannot reinitiate emergency status for the same call.

Procedure 18
Using the Interflow key

Step	Action	Response
1	Use the Display Queue key/lamp to determine when Interflow should be used and for which ACD DN. With Interflow enabled, calls are only forwarded to the Interflow destination when the number of calls waiting in the ACD DN queue exceeds the overflow threshold and no other target queue is specified or available through automatic overflow.	
2	Call the Interflow destination to ensure it is ready and able to accept additional calls.	

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Step	Action	Response
3	Press the appropriate Interflow key.	The associated lamp flashes.
4	Press the Interflow key again to disable the interflow feature.	The associated lamp goes dark.

Procedure 19
Observing an ACD Agent

Step	Action	Response
1	Press the Not Ready key.	The Not Ready lamp lights steadily.
2	Press the Observe Agent key.	The Observe Agent lamp lights steadily.
3	Dial the Position-ID (POS-ID) of the agent to be observed.	The conversation between the selected agent and calling/called party is heard. The digit display shows the POS-ID of the agent. If the agent is already being observed by another supervisor, busy tone is heard. If the dialed POS-ID is invalid or the telephone is not an ACD telephone, overflow tone is heard.
4	To enter the conversation between the agent and caller, press the Call Agent key.	The Observe Agent lamp flashes. A conference between supervisor, agent, and caller is established.
5	Press the Observe Agent key to exit the observation mode.	The conference ends. Observe agent lamp goes dark.
6	Press the Not Ready key to resume normal ACD operation.	The Not Ready lamp goes dark. The telephone can now receive ACD calls.

Procedure 20
Observing an ACD Supervisor

Step	Action	Response
1	Press the Not Ready key.	The Not Ready lamp lights steadily.
2	Press the Observe Agent key.	The Observe Agent lamp lights steadily.

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Step	Action	Response
3	Dial the POS-ID of the supervisor to be observed.	The conversation between the selected supervisor and calling/called party is heard. The digit display shows the POS-ID of the supervisor. Busy tone is heard if the selected supervisor is observing another agent or supervisor. If the POS-ID is invalid or if the telephone is not an ACD telephone, overflow tone is heard. If the telephone attempting to observe a supervisor is not assigned an Allow Observation of Supervisor class of service, overflow tone is heard.
4	Press the Call Agent key to enter the conversation between the supervisor and connected party.	The Observe Agent lamp flashes. A conference between observing supervisor, observed supervisor, and connected party is established.
5	Press the Observe Agent key.	The conference ends. Observe Agent lamp goes dark.
6	Press the Not Ready key to resume normal ACD operation.	The Not Ready lamp goes dark. The telephone can now receive ACD calls.

Procedure 21
Calling an ACD Agent

Step	Action	Response
1	Press the Not Ready key.	The Not Ready lamp lights steadily.
2	Press the Call Agent key.	The associated lamp lights steadily.
3	Dial the POS-ID of the agent to be called.	If agent is idle, the agent's telephone rings, and the Supervisor lamp flashes. If the agent is conversing with another supervisor by the Supervisor key, busy tone is heard. If the agent is conversing on a key other than the In-Calls or Supervisor key, the agent hears buzz.
4	Agent presses Supervisor key to answer the call.	The Supervisor lamp at the agent's telephone lights steadily. Conversation between agent and supervisor is established.
5	Press the Call Agent (or RLS) key to terminate the call.	Conversation ends. Call Agent lamp goes dark.

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Advanced system features

The following procedures explain how to test an advanced system feature on agent telephones after the system has been installed. Follow the steps below to ensure that the features work properly. If any problems occur, contact the technical support personnel.

Procedure 22
Logging on an ACD telephone with the Agent ID option defined

Step	Action	Response
1	Occupy an unstaffed ACD position. Be sure the headset/handset is unplugged from the telephone, then press the In-Calls key.	
2	Plug in the headset/handset.	Access to all features, except receiving calls on the In-Calls key, is enabled from the telephone.
3	Press the In-Calls key of the telephone.	The In-Calls key lamp remains unlit. The Not Ready key lamp lights. The Make Set Busy key lamp goes out if it was previously lit. The ACD DN and supervisor position to which the agent position is assigned are shown on the telephone's digit display. The position is now logged in and can access all ACD features.

Procedure 23
Logging on an ACD telephone without the Agent ID option defined

Step	Action	Response
1	Occupy an unstaffed ACD position. Be sure the headset/handset is unplugged from the telephone, then press the In-Calls key.	
2	Plug in the headset/handset.	Access to all features, except receiving calls on the In-Calls key, is enabled from the telephone.
3	Press the In-Calls key of the telephone.	The In-Calls key lamp lights and a special (interrupted) dial tone is heard.

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Step	Action	Response
4	Key in the assigned 4-digit Agent ID code on the dial pad of the telephone. Note the following:	
	The Agent ID code is within range, and no one else is already logged in with that code.	The In-Calls (and MSB, if previously lit) key goes out, the NRD key lights, and the ACD DN and supervisor positions are shown in the Digit Display. The telephone is now logged on and can access all the ACD features.
	The Agent ID code is out of range, or the normal time-out elapsed before all four digits have been keyed in.	Overflow Tone is heard and, after normal time-out of overflow tone, the In-Calls key lamp goes blank. Repeat the log on procedure.
	Someone else is currently logged on with that Agent ID code.	Busy tone is heard, and the In-Calls lamp goes out after the normal busy tone time-out.

Procedure 24
Logging out from an ACD telephone

Step	Action	Response
1	Occupy an agent position that is currently logged in but	
	has no call active on the telephone	All the feature keys are unlit.
	has no calls held on the telephone	The In-Calls or DN key lamp is dark.
2	If Make Set Busy is not equipped, unplug the headset from the telephone or place the handset on-hook.	The telephone is now logged out. This assumes that agents are allowed to log out by unplugging the headset/handset.
	If Make Set Busy is equipped, press the Make Set Busy key.	Make Set Busy key lamp lights, and the telephone is logged out.

Procedure 25
Walkaway/Return ACD telephone

Step	Action	Response
	Walkaway from the telephone	
1	Using "Procedure 11 Testing the Priority trunks" (page 324), log on to an unoccupied agent position.	The Not Ready key lamp lights.
2	Press the Not Ready key to allow ACD calls to be presented to the position.	The Not Ready key lamp goes out.

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Step	Action	Response
3	With Manual-answer, when an ACD call is presented to the position, press the In-Calls key to answer the call.	Ringing stops, the In-Calls key lamp lights steadily, and a voice path is established between you and the calling party.
	With Call Forcing, when an ACD call is presented to the position, you hear a 500 millisecond buzz and then you are connected to the calling party.	The In-Calls key lamp lights steadily, and a voice path is established between you and the calling party.
4	Inform the calling party that you are about to leave the line momentarily, then press the Hold key.	The In-Calls key lamp flashes indicating the calling party is on hold.
5	Unplug the headset/handset from the telephone.	The In-Calls key lamp on the telephone continues to fast flash.
	Return to the telephone	
6	Plug the headset/handset into the telephone.	The In-Calls key lamp continues to fast flash.
7	Press the In-Calls key.	The In-Calls key lamp lights steadily. Voice communication is reestablished between you and the calling party.

This procedure also applies:

- to calls originated from or received on the DN key of the telephone
- when the telephone is in the Not Ready state

In either case, the DN key lamp or Not Ready key lamp changes from steadily lit to flashing when the Hold key is pressed, and the headset/handset is unplugged from the telephone.

If the calling party disconnects while the agent is in walkaway, the In-Calls key lamp goes dark and the Not Ready key lamp flashes. When the agent returns from the walkaway and plugs the headset/handset into the telephone, the Not Ready key lamp lights steadily. The agent must press the In-Calls or Not Ready key to reenter the queue.

Procedure 26
DN key activation for ACD telephones

Step	Action	Response
1	Occupy an agent position that is logged in. **or** Occupy an agent position that is not restricted from using DN keys when logged in or out.	All active features operate as usual.
2	Press a DN key (not an ACD DN key) to:	
	• initiate a call	The associated lamp indicator is lit and you hear dial tone.
	• answer a non-ACD call	Ringing stops, and the lamp lights steadily.

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Network ACD description

Contents

This section contains information on the following topics:

"Introduction" (page 335)

"Enhanced Overflow" (page 336)

"Meridian Link Predictive Dialing Support" (page 348)

"Meridian 911" (page 360)

"ISDN overview" (page 393)

"Supporting documents" (page 395)

Introduction

A Network ACD system distributes ACD activities among several sites. Connected by Integrated Services Digital Network (ISDN) voice and data services, different sites can be physically or geographically separated within the network.

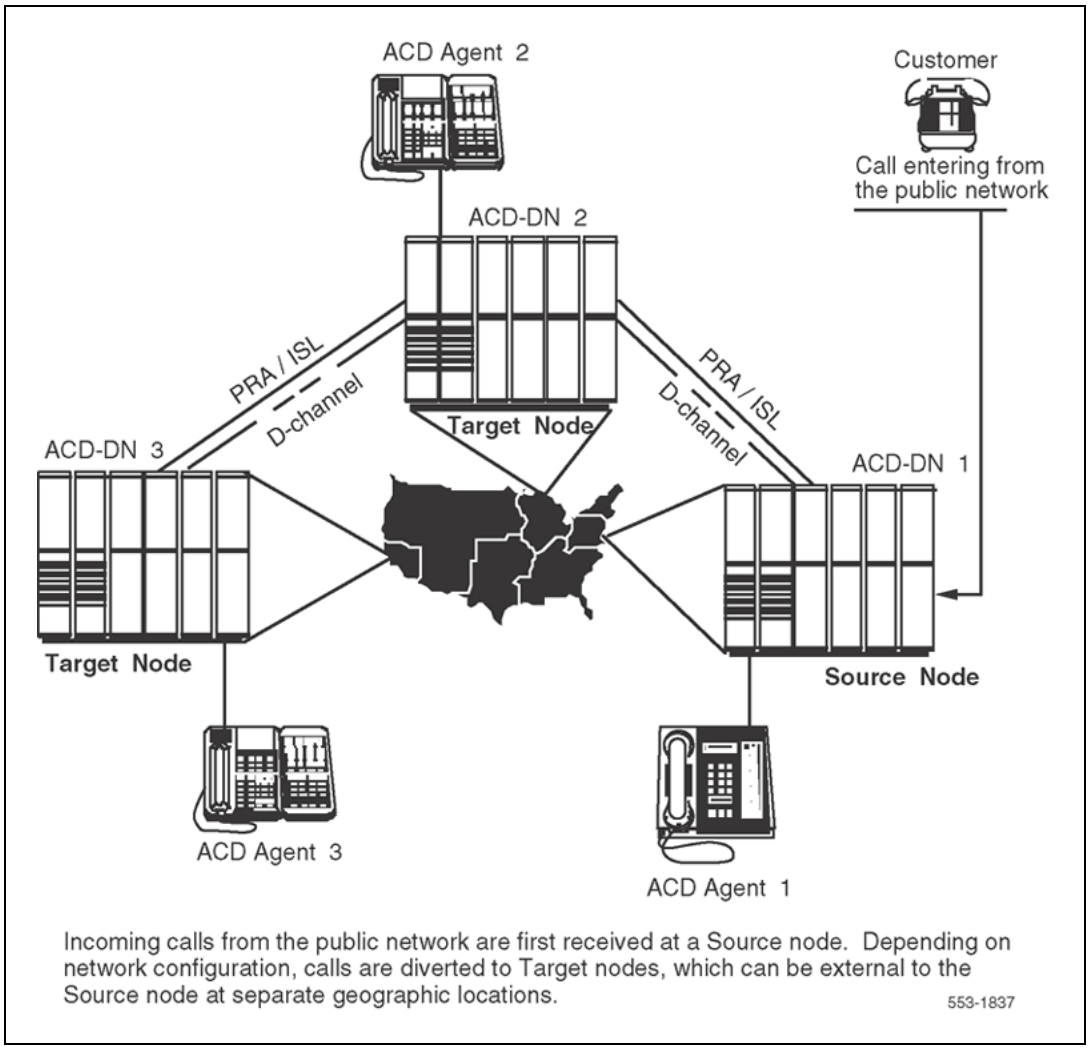
The source node is a queue that has target queues assigned, and makes outgoing calls. The target node is the queue into which the calls come.

System operations and call overflows are transparent to the caller. The ACD agents notice some display changes; however, ACD supervisors and system technicians must be aware of the configuration and operation of NACD to properly support the application for a customer.

Figure 22 "High-level overview of Network ACD" (page 336) shows a high-level overview of Network ACD.

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Figure 22
High-level overview of Network ACD



This section is an introduction to Network ACD features. Details for the administration and operation of the features are covered later in this document.

Enhanced Overflow

Enhanced Overflow (EOVF) enables a maximum of 20 target queues for each source ACD DN. It is supported on CS 1000 and Meridian 1 systems.

Enhanced Overflow defines local target queues for each source ACD DN. EOVF diverts incoming calls from an overloaded ACD DN to target ACD DNs (like Time Overflow) that are local to the source ACD DN.

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Enhanced Overflow enhances Time Overflow (TOF) operation to increase the number of ACD DNs serviced by a target from 6 to 100. That is, with the EOVF package, any particular ACD DN configured as a target can accept calls from up to 100 other ACD DNs on the same switch.

Diverting calls from the source ACD DN to the appropriate target ACD DN is controlled by Routing Tables configured in LD 23, with related timers and threshold values. Engineering for these tables is described later in this document.

Enhanced Overflow (EOVF) vastly expands the operations for overflow queues and target queues within an existing Automatic Call Distribution (ACD) switch. The Enhanced Overflow package can operate in any existing ACD application.

The following features are also available:

- Collect Call Blocking (Brazil) provides a mechanism for special treatment of incoming DID and CO collect calls on 2 Mbit/sec digital trunks and analog trunks. This feature is provided on a route and individual user basis.
- Meridian Link Predictive Dialing Support
- M911 Enhancements include Call Abandon and MADN Display Coordination. Call Abandon provides the ability to treat an abandoned call as though the calling party remained online. MADN Display Coordination adds the Application Module Link, Meridian Link, and Application Module Base Application Program Interface (API) messages that enable Meridian 911 and ML applications to provide display coordination for a call taker that holds/receives multiple active calls across a MADN.
- Multiple Queue Assignments enables ACD agents to service calls from multiple ACD queues simultaneously, and choose the queues they wish to service at login.

Enhanced Overflow (EOVF) increases the number of target ACD Directory Numbers (DNs) from 6 to 100 within the existing Time Overflow (TOF) feature application. As a stand-alone feature, it works only in local applications. EOVF alone does not provide network services, but is prerequisite for NACD. For more information, see Table 58 "Time Overflow versus Enhanced Overflow" (page 338).

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A source can define 20 targets. A target can have an unlimited number of targets. The range is

- TOF 2 to 1800 seconds
- EOVF 0 to 1800 seconds

Table 58
Time Overflow versus Enhanced Overflow

	Timers	Number of targets	Number of sources	Night mode supported
Time Overflow (TOF)	2 to 1800 seconds	3 Must be the same targets as overflow by count	6	no
Enhanced Overflow (EOVF)	0 to 1800 seconds	20 Does not have to be the same targets as overflow by count	no limit	yes

NACD on a 911 application

If the incoming route is configured with CPDC = YES and it uses CDP to direct the call to queue 2 without using NACD, the call goes to queue 2. For an NACD application, CPDC must be set to NO.

Call Processing

Like EOVF, Network ACD enables target queues to be defined for source ACD DNs. Network ACD can define source and target queues for each ACD DN. NACD diverts incoming calls from an overloaded ACD DN to target ACD DNs (like EOVF), which can be local or remote to the source ACD DN. Local targets are on the same node as the source ACD DN, and remote targets are at a different node.

Diverting calls in NACD is controlled by Routing Tables with timers. Calls diverted by NACD can be answered by the source ACD DN or any one of up to 20 target ACD DNs. By using ISDN D-channel messaging to queue Call Requests at remote target ACD DNs, voice calls are not physically diverted until an idle agent is reserved for that call at the remote target node. If no trunks are available, a call does not go across the network. If trunks are available, the agent is reserved until the timer expires.

Refer to "Designing the NACD routing table" (page 428).

When the target timer expires and there are no idle agents available at the source node, NACD software sends a Call Request over the ISDN D-channel to a defined target ACD DN. An idle target agent is matched with an individual Call Request. That target agent is reserved for that call,

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and the target node responds through the D-channel with an Agent Free notification. When the Agent Free notification is sent, the agent is reserved and a customer-defined Reserve Agent Timer starts. Only after receiving the Agent Free notification does the NACD source node physically divert the voice call to the target ACD DN. When reserved, an agent is not available to receive ACD calls from any other queue.

The Reserve Agent Timer (RAGT), as configured in LD 23, prevents an agent from being reserved indefinitely and unavailable for calls. A timer countdown is shown on the agent's Digit Display if desired. If the call is not presented before the timer expires, the agent is returned to the Idle Agent queue and the call remains in place in the source node.

Call Request queue

The Call Request Queue handles incoming NACD traffic for target ACD DNs. Logical Call Requests are queued for the target ACD DN until an agent is available.

Engineering

Operating parameters for NACD must be engineered for proper functioning. To interact with supporting systems, this feature requires certain configurations. To protect other feature operations, appropriate precautions are outlined in "Network ACD engineering" (page 415).

The NACD engineering section also contains a list of all hardware and software requirements for Networking ACD applications. Read this section before starting to implement NACD.

The NACD feature requires ISDN to be active between the sites and enabled for NACD. Take special note of the sections in this document that address package requirements, feature engineering, and feature interactions.

Network ACD is a package that is separate from ACD packages. Refer to the "Engineering" (page 339) for a complete list of the package dependencies involved.

Dialing plan configuration is critical to NACD operation. "Network ACD engineering" (page 415)

Management reports

Package C for ACD provides reports to assist ACD supervisors with agent and traffic statistics. Calls are presented or received at potentially diverse locations. Supervisors must be aware of network operations, because the values presented in the supervisor's display are affected by NACD.

Management reports are covered in the section on operations in this document. "Management reports" (page 439)

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Collect Call Blocking (Brazil)

In Brazil, an automatic long distance collect call service called DDC is available. The collect Call Blocking feature enables a system administrator to block DDC calls on incoming Direct Inward dialing (DID) and Public Exchange/Control Office trunks (analog or DT12). Under the following conditions, the system sends a special answer signal to the Central Office indicating that collect calls cannot be accepted:

- The Collect Call Blocking (CCB) package 290 is enabled.
- The incoming route has CCB enabled using the CCB prompt in the Route Data Block.
- The call is answered by a CCB user (that is Collect Call Blocking Allowed Class of Service or option).

Classes of Service and prompts inhibit specific users for receiving collect DID and Central Office calls. These can be configured for the following:

- Analog (500/2500-type) and digital telephones, through the Collect Call Blocking Allowed/Denied (CCBA/CCBD) Class of Service.
- Attendant and Network Alternate Route Selection calls on a per customer basis through CCBA/CCBD option.
- Automatic Call Distribution (ACD) queues through the CCBA prompt.
- Direct Inward system Access (DISA) through the CCBA prompt.
- Tandem calls dialed with Coordinated Dialing Plan (CDP) (Trunk Steering Code, Distant Steering Code) through the CCBA prompt.
- Tandem non-CDP calls through the CCBA prompt in the Route Data Block from the outgoing trunk route.

The system sends the CCB answer signal in place of the regular signal for incoming DID/CO calls from routes with CCB enabled, when a call is answered by a CCB user. If the call is a collect call, the CO disconnects the call.

Operating parameters

The Collect Call Blocking feature supports both analog and DT12 trunks, and the following Intelligent Peripheral Equipment (IPE) cards:

- The NTCK 16BB Extended Flexible COT Trunk Card (XFCOT) with firmware flash timing
- The NT8D14BA Enhanced Extended Universal Trunk Card (EXUT) containing the Centrex Switchhook Flash function in the firmware
- The NT8K14AK Extended Universal Trunk Card (XUT) that can be used if the Centrex Switchhook Flash is configured with software timing.

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- The Collect Call Blocking answer signal can be sent only in cases where answer supervision is provided by the system.

Once the modified answer signal is sent to the CO, the system has no control over how the call is handled by the CO.

If a CCB user answers a call from a CO/DID route with Collect Call Blocking activated, the CCB answer signal is sent to the CO for all incoming DID and CO calls. For analog trunks, the user experiences clicking on the line and a temporary break-in speechpath (0.5 to 2.5 seconds) while the CCB answer signal is being sent.

If the XFCOT and EXUT cards do not have flexible firmware timing, the CCB flash portion of the CCB answer signal is returned to the CO. However, software controlled signaling can be done with EXUT cards.

In a standalone environment, all input from a telephone (except from the Release key) is ignored while the Collect Call Blocking answer signal is being sent.

Collect Call Blocking is applied to attendants on a customer basis only; it cannot be applied on a tenant basis.

The answer signal returned for a call from a route with CCB enabled and that is Network Attendant Service (NAS) routed is determined by the customer option on the source node. Thus, NAS routing can be configured across any Meridian Customer Defined Network environment, but the source node determines the answer supervision sent to the CO.

Call Detail Recording (CDR) record timing begins on the first answer of the CCB answer sequence. For this reason, CDR records are generated for incoming calls to CCB users across routes on which CCB is enabled. If the call is collect, and is dropped, a CDR record of approximately CCB1 + CCB2 length is generated.

For data calls all calls are answered with the CCB answer signal, if CCB is enabled. This can have an effect on data protocols, while CCB signaling is taking place.

If firmware timing is used (FWTM = YES in LD 14) for sending the CCB flash, the CCB2 timer is downloaded to the card before sending the firmware flash. If the CCB2 timer is changed in the Route Data Block, either the card has to be enabled or the switch has to be initialized to get the new CCB2 timer downloaded to the card.

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Feature interactions

Automatic Answerback The Automatic Answerback (AAB) feature, when assigned to a telephone, enables any incoming DN to be answered automatically. If an incoming DID or CO call terminates on a telephone with the AAB feature enabled, the call is automatically answered after one ring. If the telephone has a CCBA Class of Service, the CCB answer signal is provided in the place of the regular answer signal.

Automatic Call Distribution Collect Call Blocking can be enabled on an ACD queue basis. Hence, if an incoming CO or DID call is answered by an ACD agent, the answer supervision signal that is returned to the CO is determined by the value of the CCBA prompt in LD 23. While the CCB answer signal is being sent, the same limitations apply to ACD as apply to telephones with CCBA Class of Service.

Automatic Call Distribution Interflow If an ACD call from a route with CCB enabled is diverted to an interflow DN, and answer supervision has not already been provided, the answer signal returned to the CO depends on the source ACD queue. The CCB answer signal is returned to the CO if the source ACD queue has CCB enabled.

Automatic Call Distribution Night Call Forward If an ACD call from a route with CCB enabled is diverted to a Night Call Forward DN, and answer supervision has not already been provided, the answer supervision signal returned to the CO depends on the source ACD queue. The CCB answer signal is returned to the CO if the source ACD queue has CCB enabled.

Automatic Call Distribution Night RAN Route Announcement If an ACD call from a route with CCB enabled is diverted to a Night RAN route (defined by NRRT in the ACD block), the CCB signal returned to the CO depends on the source ACD queue. If the source ACD queue has CCB enabled, the CCB answer signal is sent to the CO.

Autoterminate If an incoming DID or CO call from an autoterminate trunk terminates on a telephone or ACD queue with a CCBA Class of Service, the CCB answer signal is provided in place of the regular answer signal.

Basic Rate Interface (BRI) telephones For BRI telephones, CCBA/CCBD Class of Service cannot be programmed. Therefore, it is not possible to prevent BRI telephones from accepting DDC collect calls.

Central Answering Position (CAP) The answer signal returned to the CO for calls that get answered by a Central Answering Position (CAP) is determined by the source ACD configuration and not the customer option (CCBA/CCBD in LD 15) on the source node.

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Centralized Attendant Service The answer signal returned to the CO for calls that get answered by a Centralized Attendant Service is determined by the customer option (CCBA/CCDB in LD 15) on the source node.

Centrex Switchhook Flash A Centrex Switchhook Flash cannot be invoked by another feature while the CCB answer signal is being sent.

Enhanced Malicious Call Trace If a station activates Malicious Call Trace (MCT) while the CCB answer signal is being sent, MCT activation is ignored. This also applies to the case when MCT is activated from a remote node.

Meridian Mail Because Meridian Mail is configured using ACD queues, the same interactions exist as in the ACD case. When Meridian Mail sends a call answer message to the system, the CCB configuration in the source ACD queue is used to determine if a CCB answer signal should be sent to the Central Office. All mail boxes using the same ACD queue to access Meridian Mail get the same CCB treatment.

If some mail boxes can receive collect calls, this can be a problem. A possible solution is to configure two ACD queues on the system to access Meridian Mail. One queue would have collect calls enabled (that is, CCBA = NO) and the second queue would have collect calls denied (that is, CCBA = YES).

Network Automatic Call Distribution The answer signal returned to the CO for a network ACD call from a route with CCB enabled is determined by the source ACD queue. If the source ACD queue has CCB enabled, the CCB answer signal is returned in place of the regular answer signal.

Pilot DN If an incoming DID or CO call has CCB enabled and is routed to a pilot DN, the answer signal returned to the CO is determined by the CCB configuration of the terminating station.

Private Line Service If an incoming DID or CO call from a private line trunk terminates on a telephone with a CCBA Class of Service, the CCB answer signal is provided in place of the regular answer signal.

Recorded Announcement (RAN) A RAN route is defined as having CCBA YES or NO, which is used if Coordinated Dialing Plan (CDP) or ACD queues were not used to get to the RAN route. If the call is routed through ACD/CDP to terminate on RAN, the CCB treatment depends on the CCB data of the ACD/CDP, and not the RAN route.

Tandem to Unsupervised Trunk If an incoming DID or CO call tandems to an unsupervised trunk before it terminates, the answer signal is sent by time-out. Therefore, any CCB tandem calls made to unsupervised trunks do not have the CCB answer signal sent until the time-out occurs.

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Trunk Hook Flash (THF) If a station activates THF while the CCB answer signal is being sent, THF activation is ignored.

Feature packaging

Collect Call Blocking (CCB) package 290 must be provisioned to activate this feature.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. "LD 16 – Enable Collect Call Blocking on a route and configure timers." (page 344)
2. "LD 14 – Configure the firmware timing for XFCOT and EXUT cards." (page 345)
3. "LD 15 – Add or change Collect Call Blocking for attendants." (page 346)
4. "LD 10 – Add or change Collect Call Blocking for analog (500/2500-type) telephones" (page 346)
5. "LD 11 – Add or change Collect Call Blocking for telephones." (page 346)
6. "LD 23 – Enable Collect Call Blocking on ACD queues." (page 347)
7. "LD 24 – Enable Collect Call Blocking on DISA blocks." (page 347)
8. "LD 87 – Enable Collect Call Blocking on CDP Steering codes." (page 347)

LD 16 Enable Collect Call Blocking on a route and configure timers.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block
TYPE	RDB	Route Data Block
CUST	xx	Customer number as defined in LD 15.
ROUT		Route Number
	0-511	Range for Large System and CS 1000E system.
	0-127	Range for Small System and Media Gateway 1000B.
TKTP	aaa	Trunk type. Must be COT,DID,FEX, or WAT for CCB.
...		
M911_ANI	NO	M911 route. Must be set to NO to enable CCB.
ISDN	NO	ISDN route. Must be set to NO to enable CCB.
...		

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Prompt	Response	Description
ICOD	aaa	Incoming and outgoing, incoming, or outgoing, where aaa = IAO,ICT,OGT. Must be either IAO or ICT to enable CCB. Must be either IAO or OGT to get the CCBA prompt for outgoing calls.
...		
CNTL	(NO) YES	Collect Call Blocking enabled or disabled on incoming route. CCB package 290 is required. Enter YES to obtain CCB timer prompts.
CCB1	512-(1536)-4992	Collect Call Blocking delay timer 1 in milliseconds. Input rounded to the next multiple of 128 milliseconds.
CCB2	500-(1520)-2550	Collect Call Blocking delay timer 2 in milliseconds. Input rounded to the next multiple of 10 milliseconds. If any CCB route members (trunks) are using firmware timing (FWTM = YES in LD 14), changes to the CCB2 timer value do not take effect until the new timer value is downloaded to the card. This can be done by enabling the card or initializing the switch.
CCBA	(NO) YES	Collect Call Blocking allowed or denied for outgoing route.

LD 14 Configure the firmware timing for XFCOT and EXUT cards.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	a...a	Trunk Type where a...a = DID,COT,FEX,WAT
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit
XTRK		Type of card where a...a = EXUT or XCOT
FWTM	(NO) YES	Firmware timing for flash. Enter YES to enable firmware timing.
CUST	xx	Customer number as defined in LD 15.
RTMB		Route number and Member Number
	0-511 1-4000	Range for Large System and CS 1000E system

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Prompt	Response	Description
	0-127 1-4000	Range for Small System and Media Gateway 1000B.
SUPN	YES	Answer supervision required.

LD 15 Add or change Collect Call Blocking for attendants.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	CAS_DATA	Centralized Attendant Service
CUST		Customer number
	0-99	Range for Large System and CS 1000E system.
	0-31	Range for Small System and Media Gateway 1000B.
...		
OPT	(CCBD) CCBA	(Deny) Allow Collect Call Blocking.

LD 10 Add or change Collect Call Blocking for analog (500/2500-type) telephones

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	500	Telephone type
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
...		
CLS	(CCBD) CCBA	(Deny) allow Collect Call Blocking.

LD 11 Add or change Collect Call Blocking for telephones.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	aaaa	Telephone type, where: aaaa = 2006, 2008, 2016, 2112, 2216. 2317, or 2616.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.

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Prompt	Response	Description
...		
CLS	(CCBD), CCBA	(Deny) allow Collect Call Blocking.

LD 23 Enable Collect Call Blocking on ACD queues.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	ACD	ACD data block
CUST	xx	Customer number as defined in LD 15.
ACDN	xxxx	ACD Directory Number.
...		
CCBA	(NO) YES	(Deny) allow Collect Call Blocking.

LD 24 Enable Collect Call Blocking on DISA blocks.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	DIS	DISA data block
CUST	xx	Customer number as defined in LD 15.
...		
DN	xxxxxxx	DISA Director Number
...		
CCBA	(NO) YES	(Deny) allow CCB answer signal to be sent.

LD 87 Enable Collect Call Blocking on CDP Steering codes.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
CUST	xx	Customer number as defined in LD 15.
FEAT	CDP	Coordinated Dialing Plan
TYPE	TSC DSC	Steering code type
...		
CCBA	(NO) YES	(Deny) allow CCB answer signal to be sent.

Feature operation

No specific operating procedures are required to use this feature.

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Meridian Link Predictive Dialing Support

With Predictive Dialing, the process of making outgoing calls to customers is automated for Automatic Call Distribution (ACD) agents. Host applications can request the system to make calls using autodialers or phantom TNs. When a call is answered, the application sends a request to the switch to transfer the call to a live agent. The call needs to be transferred before, or while, the customer speaks in order to prevent customers from abandoning the call because they think no one has called them. This transfer was previously performed by Meridian Link in two steps by sending two separate Application Module Link (AML) messages to initiate and then complete the transfer. This operation takes a minimum of 400 to 500 milliseconds for the system to process.

The Fast Transfer feature enables applications residing on the application Module (AM) or host computers to transfer a call in one step, a blind transfer, by sending only one AML message (Fast Transfer) to the switch, thereby saving approximately 200 to 250 milliseconds of transfer time. This Fast Transfer feature is useful for predictive applications to make outbound calls and then quickly transfer them when the customer answers (that is, live voice is detected). Fast Transfer can also be used in a non-predictive dialing environment. Applications that want to perform a blind transfer can now execute it more quickly.

The Predictive Dialing feature enables applications residing on the AM or host computers to send a combined Make Call and Transfer request on behalf of an autodialer or Phantom TN. As soon as live voice is detected by third-party equipment, or notification is sent to the switch indicating the call has been answered (for example, answer supervision), the application can send the Fast Transfer request to the switch, immediately transferring the call to an ACD agent.

Operating parameters

The Predictive Dialing operation is not supported on Option 11C systems when Phantom TNs/DNs are used to originate calls as part of a predictive dialing operation.

Attendant Consoles and Basic Rate Interface telephones cannot initiate Fast Transfer or predictive calls.

The system does not support live voice answer detection. Live voice answer detection is currently achieved through third-party vendor equipment.

If Phantom TNs/DNs are used, this development supports only calls and Fast Transfers originated by Phantom TNs/DNs that are defined as Associate telephones (AST) on a phantom loop.

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Data calls are not supported.

For outbound trunk calls, if no third-party equipment is used to detect live voice answer, the switch has to depend on receiving answer supervision before transferring the call to the target DN.

If voice detection is used, the application is not able to Fast Transfer the call before the call is established (that is, answer notification is received).

The application is not able to complete the transfer when Fast Transferring over a trunk.

Not all trunks (either analog or digital) support answer supervision. For trunks that do not support answer supervision, the End-of-Dialing (EOD) timer is used to trigger the transfer.

Receiving answer supervision depends on the accuracy of signals returned by the external network. Answer supervision can be received before an EOD timeout, fake answer supervision can also be received due to an EOD timeout, and a pseudo answer supervision can be received if the far-end has an EOD timeout even though the local switch has answer supervision configured.

The AML requires an Enhanced Serial Data Interface (EDSI) card or Multi-purpose Serial Data Link (MSDL) card (NT6D80AA) on the switch. If a CS 1000M Cabinet or a Meridian 1 PBX 11C Cabinet is used, a Serial Data Interface/D-Channel (SDI/DCH) card (NTAK02AA) is required to configure the EDSI port.

The AML connection requires an RS232 cable.

Meridian Link software is required for host application to utilize this feature.

Feature interactions

Call Transfer by telephone The application sends the Fast Transfer request on behalf of a telephone and the switch immediately initiates and completes the transfer, which is similar to a normal call transfer from a telephone.

In a Predictive Dialing scenario where the autodialer (origination DN) is a telephone, the Make Call message sent by the application to the switch to make a call on behalf of the telephone, and then the call transfer call, interacts with the telephone's Call Transfer feature. The autodialer is configured with the TRN key so that the switch can transfer the call to the target destination.

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Call Transfer by analog (500/2500-type) telephone The application sends the Fast Transfer request on behalf of an analog (500/2500-type) telephone. The switch then initiates and completes the transfer in one step.

In a predictive dialing scenario, the application sends the Make Call request on behalf of the autodialer (analog [500/2500-type] telephone) to have the switch make the call, and then transfers the call when the switch receives the Fast Transfer message. The autodialer needs to be configured with Classes of Service Dial Pulse (DIP) and Transfer Allowed (XFA) for 500 telephones, or with Classes of Service Digitone (DTN) and XFA for 2500 telephones.

Command and Status Link The Command and Status Link, also known as the AML, is the link on which the messages for the Predictive Dialing feature flow between the switch and an Application Module. The CON/Fast Transfer is an AML message.

Trunks Only certain trunks support answer supervision. The End-of-Dialing timer is used for trunks that do not support answer supervision.

Call Hold If an established call is put on hold by the telephone initiating the Fast Transfer, the switch is not able to transfer the call. The switch can transfer a call only if it is in the established state.

Feature packaging

There are no new software packages required for the Predictive Dialing feature. However, the following packages are required to utilize the feature:

- ISDN AP for 3rd party (IAP3P) package 153
- Meridian Link Module (MLM) package 209 if the Meridian Link Module is involved.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. "LD 17 – Configure the ESDI port to the Meridian Link Module." (page 351)
2. "LD 17 – Value added server ID." (page 352)
3. "LD 17 – Configure the MSDL port to the Meridian Link Module." (page 352)
4. "LD 10 – Configure non-ACD analog (500/2500-type) telephones as autodialers." (page 353)
5. "LD 11 – Configure non-ACD telephones as autodialers." (page 353)
6. "LD 23 – Configure ACD groups." (page 354)

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7. "LD 10 – Configure ACD analog (2500/500 type) telephones as autodialers." (page 354)
8. "LD 11 – Configure ACD telephones as autodialers." (page 355)
9. "LD 23 – Configure a Control DN (CDN - default mode). If the application wants to transfer a call to " (page 356)
10. "LD 23 – Configure a Control DN (CDN - controlled mode). When a CDN is in controlled mode, the applic" (page 356)
11. "LD 14 – Define answer supervision for trunks. If the application wants to transfer outgoing calls ba" (page 357)
12. "LD 16 – If the application is using the End-of-Dialing timer to transfer outbound calls, the timer m" (page 357)
13. "LD 17 – In order to originate calls from phantom TNs/DNs, a phantom loop must first be configured. A" (page 358)
14. "LD 97 – If a superloop is used, the phantom loop is configured in this overlay." (page 358)
15. "LD 11 – After configuring the phantom loop, an AST telephone can be designated to a specific device " (page 359)

This feature does not require any changes to the overlays. The following illustrates the configuration requirements to set up this feature. Most of these requirements are used by existing Meridian Link and Application Module application.

LD 17 Configure the ESDI port to the Meridian Link Module.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	ADAN	Action Device and Number
ADAN	NEW AML x	Add I/O device type AML to TTY port x. x is the port number.
- CTYP	EDSI	Card Type. EDSI card.
- DNUM	x	Device number is x.
- DES	NEWTTY	Description of this I/O device.
- BPS	19200	Baud rate is 19,200 bits per second.
- CLOK	INT	Internal clocking
- IADR	3	HDLC protocol individual address.
- RADR	1	HDLC protocol remote address.
...		

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Prompt	Response	Description
- CSQI	(20)	Maximum call registers for Command and Status Link (CSL) input queues (use the default, unless the system requires otherwise).
- CSQO	(20)	Maximum call registers for CSL output queues (use the default, unless the system requires otherwise).
...		

LD 17 Value added server ID.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	VAS	Enter the type.
VAS	NEW	New value added server ID.
- VSID	y	Server ID y
- AML	x	Port used by AML defined earlier in this overlay.
- - SECU	YES	Security on for Meridian Link.
- - INTL	x	Length of time interval (five-second increments) (for example, 2).
- - MCNT	x	Threshold for number of messages per time interval (for example, 100).
- - CONF	DIR	Direct link configuration.

LD 17 Configure the MSDL port to the Meridian Link Module.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	ADAN	Action Device and Number.
ADAN	NEW AML x	Add I/O device type AML to TTY port x. x is the port number.
- CTYP	MSDL	Card Type. MSDL card.
- DNUM	y	Device number is y. Refers to the device number on the MSDL card.
- DES	MERIDIAN_LINK	Description of this I/O device.
- BPS	19200	Baud rate is 19,200 bits per second.
- PARM	RS232 DCE	Parameters for interface and transmission mode. DTE/DCE setting.
- IADR	3	HDLC protocol individual address.
- RADR	1	HDLC protocol remote address.
...		

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Prompt	Response	Description
- CSQI	(20)	Maximum call registers for Command and Status Link (CSL) input queues (use the default, unless the system requires otherwise).
- CSQO	(20)	Maximum call registers for CSL output queues (use the default, unless the system requires otherwise).

LD 10 Configure non-ACD analog (500/2500-type) telephones as autodialers.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	500	Telephone type
...		
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
...		
CUST	xx	Customer number as defined in LD 15.
...		
DN	x...x	Internal Director Number
AST	YES	Associate telephone assignment. The internal DN is at AST.
CLS	XFA	Transfer enabled.
CLS	DIP/DTN	Dial Pulse Class of Service for 500 telephones (use DTN for 2500 telephones).

LD 11 Configure non-ACD telephones as autodialers.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	aaaa	Telephone type, where: aaaa = 2006, 2008, 2016, 2216, 2317, or 2616.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
...		
CUST	xx	Customer number as defined in LD 15.
...		

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Prompt	Response	Description
AST	xx yy	Key number for Associate telephone DN assignment.
...		
KEY	xx SCR yyyy	Key number, Single Call Ringing, DN.
KEY	xx TRN	Key number, Call Transfer.
KEY	xxx AO6	Key number, 6-party conference.
KEY	xxx SCR yyyy	Key number, Single Call Ringing, second DN.

LD 23 Configure ACD groups.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	ACD	Automatic Call Distribution data block.
CUST	xx	Customer number as defined in LD 15.
ACDN	xxxx	ACD Directory Number
xxx		
ISAP	YES	Integrated Services Application Protocol. ACD DN uses Meridian Link (ISDN/AP) messaging.
- VSID	0-15	Value Added Server ID. This Server ID used for Meridian Link messaging must match the VSID defined in LD 17.

LD 10 Configure ACD analog (2500/500 type) telephones as autodialers.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	500	Telephone type
...		
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
...		
CUST	xx	Customer number as defined in LD 15.
...		
DN	x...x	Internal Directory Number.
AST	YES	Associate telephone assignment. The internal DN is an AST

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Prompt	Response	Description
CLS	AGTA	ACD agent allowed Class of Service.
CLS	DIP	Dial Pulse class of Service for 500 telephones (use DTN for 2500 telephones).
...		
AACD	YES	ACD telephone is an Associate telephone.
FTR	ACD xxxx C yyyy	ACD DN and the ACD position ID.

LD 11 Configure ACD telephones as autodialers.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	aaaa	Telephone type, where: aaaa = 2006, 2008, 2016, 2216, 2317, or 2616.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
...		
CUST	xx	Customer number as defined in LD 15.
...		
AST	xx yy	Key numbers for Associate telephone DN assignment.
...		
KEY	0 ACD xxxx C yyyy	Key 0, ACD, ACD DN, and agent's Position ID.
KEY	xx MSB	Key number, Make Set Busy.
KEY	xx NRD	Key number, Not Ready.

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Prompt	Response	Description
KEY	xx TRN	Key number, Call Transfer.
KEY	xx AO6	Key number, 6-party conference.
KEY	xx SCR yyyy	Key number, Single Call Ringing, second DN

LD 23 Configure a Control DN (Default Mode)

To transfer a call to a target CDN, a CDN must be configured. CDNs can be in default or controlled mode.		
Prompt	**Response**	**Description**
REQ:	NEW	Create a new data block.
TYPE	CDN	Control Directory Number data block.
CUST	xx	Customer number as defined in LD 15.
CDN	xxxx	DN of the Control DN (counts as an ACD DN).
...		
DFDN	xxx...x	Default destination ACD DN.
CEIL	0-(2047)	CDN ceiling value. CEIL limits the number of unanswered calls a CDN can have as its default ACD DN at a time. Enter a maximum value (the default).
...		
RPRT	(NO) YES	Report Control
CNTL	NO	NO sends CDN calls to the Default ACD DN.

LD 23 Configure a Control DN (Controlled Mode).

When a CDN is in controlled mode, the application can have control of the call once it enters the CDN.		
Prompt	**Response**	**Description**
REQ:	NEW	Create a new data block.
TYPE	CDN	Control Director Number data block.
CUST	xx	Customer number as defined in LD 15.
CDN	xxxx	DN of the Control DN (counts as an ACD DN).
...		
DFDN	xxx...x	Default destination ACD DN.
CEIL	0-(2047)	CDN ceiling value. CEIL limits the number of unanswered calls a CDN can have as its default ACD DN at a time. Enter the maximum value (the default).
...		

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When a CDN is in controlled mode, the application can have control of the call once it enters the CDN.		
Prompt	**Response**	**Description**
RPRT	(NO) YES	Report Control
CNTL	YES	Control DN is in control (the default).
VSID	0-15	Value Added Server ID. Server ID used for Meridian Link messaging (defined in LD 17).
HSID	0-15	Host Line ID used when Customer Controlled Routing and Meridian Link applications are both running.

LD 14 Define answer supervision for trunks.

To transfer outgoing calls based on answer supervision, answer supervision must be configured. Otherwise, the End-of-Dialing timer is used as a trigger for the system to transfer the call.		
Prompt	**Response**	**Description**
REQ:	CHG	Change existing data.
TYPE	aaa	Trunk type where: aaa = CAA, CAM, COT, CSA, DID, FEX, FGDT, IDA, TIE, or WAT.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
…		
SUPN	YES	Answer and disconnect supervision are required.

LD 16 Configure End-of-Dialing timer in the Route Data Block.

If the application is using the End-of-Dialing timer to transfer outbound calls, the timer must be configured in the Route Data Block.		
Prompt	**Response**	**Description**
REQ:	CHG	Change existing data.
TYPE	RDB	Route Data Block.
…		

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If the application is using the End-of-Dialing timer to transfer outbound calls, the timer must be configured in the Route Data Block.		
Prompt	**Response**	**Description**
CNTL	YES	Change controls or timers.
- TIMR	EOD 1281-(13952)-32640	End-of-Dialing timer in milliseconds. The default is 13952 milliseconds.

LD 17 Configure a phantom loop.

In order to originate calls from phantom TNs/DNs, a phantom loop must first be configured. A Phantom DN can then be configured as part of a specific device group.		
Prompt	**Response**	**Description**
REQ:	CHG	Change existing data.
TYPE	CEQU	Change to Common Equipment parameters.
…		
- TERM	0-159	Single density local terminal loops.
	(X) 0-159	Precede loop number with X to remove.
	(N) 0-159	Precede loop number with N to create a phantom loop.
- TERD	0-159	Double density local terminal loops.
	(X) 0-159	Precede loop number with X to remove.
	(N) 0-159	Precede loop number with N to create a phantom loop.
- TERQ	0-159	Quad density local terminal loops
	(X) 0-159	Precede loop number with X to remove.
	(N) 0-159	Precede loop number with N to create a phantom loop.

LD 97 Configure a phantom loop when using a superloop.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	SUPL	Superloop parameters
SUPL	0-156	Superloop number in multiples of 4.
	0-252	Superloop number in multiples of 4 for systems with Fiber Network Fabric.

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Prompt	Response	Description
	(X) 0-252	Precede superloop number with X to remove.
	(N) 0-252	Precede superloop number with N to create a phantom superloop. • N0-N156 — Phantom superloop in multiples of 4 • N0-N252 — Phantom superloop in multiples of 4 for systems with Fiber Network Fabric • N0-N252 — Phantom superloop in multiples of 4 for CS 1000E • N96-N112 — Phantom superloop in multiples of 4 for Small Systems. These loops translate to cards 61-99 for phantom TN mapping on a small system.

LD 11 Define an AST telephone on a phantom loop.

After you configure the phantom loop, you can designate an AST telephone to a specific device group that applications can control. Then, if an application must originate a call on behalf of an idle TN, the application can use a phantom TN. This idle TN is an AST telephone that is defined on a phantom loop. Configure the ITNA and DGRP prompts as follows.

Prompt	Response	Description
REQ:	NEW	Add new data.
TYPE	aaaa	Telephone type, where: aaaa = 2006, 2008, 2009, 2016, 2018, 2112, 2216, 2317, 2616, or 3000.
TN		Terminal Number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit.
…		
CDEN		Card density
	SD	Single density
	DD	Double density
	4D	Quad density
DES	phanDN	One-to-six character Office Data Administration system (ODAS) Station Designator.
CUST	xx	Customer number as defined in LD 15.
…		
CLS	NDD	No digit display is recommended if configuring phantom devices.

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After you configure the phantom loop, you can designate an AST telephone to a specific device group that applications can control. Then, if an application must originate a call on behalf of an idle TN, the application can use a phantom TN. This idle TN is an AST telephone that is defined on a phantom loop. Configure the ITNA and DGRP prompts as follows.		
Prompt	**Response**	**Description**
CLS	(DNDD)	Nortel recommends that you use Dialed Name Display Denied if you configure phantom devices.
…		
AST	00	Key 0 is AST.
IAPG	(0)-15	Meridian Link Unsolicited Status Message (USM) group. These groups determine which status messages are sent for an AST telephone. The default 0 sends no messages, whereas Group 1 sends all messages.
ITNA	(NO) YES	Idle TN for third-party application.
DGRP	(1)-5	Device Group with which phantom TNs are associated.
…		
KEY	xx SCR yyyy	Key number, Single Call Ringing, DN.
	xx TRN	Key number, Transfer.
	xx RLS	Key number, Release.

Feature operation

Applications invoke the Fast Transfer feature by sending the application a Fast Transfer request message to the switch. This feature requires no specific operating instructions.

Meridian 911

ATTENTION

This section from "Meridian 911" (page 360) to "ISDN overview" (page 393) is only for North America.

The number 911 has been adopted to report emergencies and to request emergency services. For localities with 911 systems, the number:

- is the same in all communities
- is easily remembered, even under adverse conditions
- provides direct telephone access to emergency services regardless of the time of day, the caller's familiarity with an area, or the caller's ability to identify the type of emergency

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A 911 system is planned, implemented, and operated under the auspices of local governments. In most communities, 911 provides access to police, fire, and emergency medical services. In some locations, access is available to additional services. For example, dialing 911 in certain locations provides access to Coast Guard services. Approximately 80 percent of all 911 calls are intended for the police, with the balance split between fire and ambulance.

Because the overwhelming majority of 911 calls require police attention, local police departments generally maintain, manage, and staff the center to which emergency calls are first directed. These centers are referred to as primary answering centers. A police, fire, or ambulance station is a secondary answering center. For example, fire-related 911 calls can be transferred to a secondary answering center that handles incoming fire-related calls. In many instances, the fire department also determines the degree of urgency for emergency medical services.

If the primary or secondary answering center is busy or is out of service, the 911 call is directed to a backup, or alternate, answering center.

The public network routes a 911 call to the appropriate primary answering center based on the caller's telephone number. For this reason, callers dialing 911 give up their right to privacy regarding:

- the telephone number of the station from which they call
- the billing address associated with that telephone number

To protect a caller's right to privacy, some communities still use seven-digit emergency numbers which are routed either to an answering center or directly to the responding agency.

Basic 911 service

Basic 911 service routes emergency calls to an answering center based on the location of the Central Office (CO) that serves the calling station. CO boundaries determine the jurisdiction of an answering center. The most basic 911 system can be a single answering center which involves only one Central Office and one exchange service area. Force Disconnect, and Idle Tone Application are examples of basic 911 features.

Enhanced 911 service

In areas where telephone company Central Office boundaries do not match jurisdictional boundaries, a problem occurs in identifying which emergency agency receives the emergency call. A complicated situation can arise if the 911 network includes two or more primary answering centers, and each serves areas that do not match the Central Office serving areas.

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Enhanced 911 (E911) service ensures that an emergency call originating in any particular jurisdiction covered by the 911 system is recognized and forwarded to the appropriate responding agency in the same political jurisdiction as the originating call.

Enhanced 911 service uses more sophisticated equipment and features than basic 911 service. Specialized features include

- Automatic Number Identification (ANI)
- Automatic Location Identifier (ALI)
- Selective Routing (SR)

The ANI of a 911 call consists of eight digits: a Numbering Plan Digit (NPD) or Information Digit (ID) followed by the seven digits of the calling party number. Whether the first digit of the ANI is interpreted as an NPD or an ID depends on the trunk interface and system configuration.

The Automatic Location Identifier (ALI) host computer uses the ANI to locate the ALI record for the calling party number. This includes the name and address, and whether the line is a business or a residence. An enhanced 911 system creates ALI information from the ALI record and automatically routes the ALI information to an optional data terminal display at the answering center.

An enhanced 911 system routes all emergency calls from the originating Central Offices through an E911 tandem, sometimes called a 911 control office (or Selective Router), to the primary answering center. There, using Selective Routing features, a call taker can transfer the call to another Public Safety Answering Point (PSAP) hosted on the same E911 tandem. The Autodial Tandem transfer feature can handle the transfer. For example, the primary answering center uses only one button to transfer calls to several fire departments. The option automatically

- identifies the fire department associated with caller's location
- transfers the call to that department

Meridian 911 system

The Meridian 911 system

- gives priority to emergency calls
- routes priority calls, without interrupting service, to answering positions that can identify and dispatch the assistance required with minimum delay
- displays the calling party's number
- provides external notification that an emergency call is in the queue

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When a call arrives at the switch over an M911 trunk, the trunk software in the switch communicates with the serving CO (either the local CO or the M911 Tandem Office) to receive the ANI information using multifrequency (MF) signaling. After the CO receives all ANI digits, call processing begins.

Emergency Services M911 Networked Operation feature

Before CS 1000 Release 5.0, the Communication Server 1000 used the M911 feature to provide specialized treatment for 911 emergency calls that arrived from the 911 End Office (911E) or 911 Tandem Office (911T). All 911 calls from the PSTN network over 911E or 911T trunks terminated on available agents.

In CS 1000 Release 5.0, the Emergency Services M911 Networked Operation feature supports the routing of 911 calls from one CS 1000 to another CS 1000 in a Meridian Customer Defined Network (MCDN) environment.

In a typical 911 call environment, a subscriber dials 911 and the 911 End/Tandem Office routes this call over 911E/T trunks to the tandem node on CS 1000. With the Emergency Services M911 Networked Operation feature, this type of call can be redirected to another CS 1000, the target node, over tie trunks. The redirections allowed are Network ACD (NACD), Network Skill Based Routing (NSBR), and Manual Call Transfer. To identify the call as 911 and to provide emergency treatment to the call at Node B, a trunk subtype exclusively for tie trunks is used: the Meridian 911 Private Network (M911P). If all outgoing M911P trunks at the tandem node are busy, an error message appears on the Terminal (TTY).

Meridian 911 Call Abandon

The system considers a 911 call abandoned if the call terminates on a 911 trunk route, and if the calling party disconnects after trunk seizure but before the call is answered. This can occur while the call waits in an ACD or a CDN queue, or when the agent receives, but has not yet answered, the call.

The system uses the Call Abandon feature to treat an abandoned call as though the calling party is still connected. The call maintains its place in the ACD queue and is presented to an agent. When the agent answers, the agent receives a continuous, cadenced 6-second tone. The agent's telephone displays ANI information as well as an indication that the call is an abandoned call. The agent can then determine the originator's location and call back.

If the agent answers the abandoned call in speaker mode, the agent does not receive the cadenced 6-second tone.

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After the call is abandoned, the trunk is released for other 911 calls. Information about abandoned calls can be included in CDR records if the system is equipped with FCDR package 234.

Operating parameters

Meridian 911

Meridian 911 routes are restricted to incoming traffic only.

Incoming M911 Trunks use MF signaling only. Support is unavailable for Dial Pulse (DP) and Dual-Tone Multifrequency (DTMF) on M911 routes.

The interface to the Public Network does not support 911 Calls on ISDN trunks.

The software considers a call a 911 call if it arrives on a trunk that belongs to an M911 route. Calls that internally dial 911 can, through configuration of the Electronic Switched Network (ESN) digit manipulation tables, terminate locally (for example, to a Controlled DN), but the software recognizes these calls as internal calls, not 911 calls.

ANI is expected for every call. Meridian 911 does not support 911 calls from an E911 tandem that does not send ANI.

The priority of incoming trunk calls internally transferred to an ACD DN queue (a secondary answering center) can be preserved by using blind transfer only. All other types of call modification (for example, consultation transfer or conference) are internal calls and the calls link to the low-priority queue of the ACD DN.

The No Hold Conference feature, the recommended feature to transfer calls between answering positions, is not available on analog (500/2500-type) telephones.

The Call Prioritization (911 calls supersede non-911 calls in priority) and Call Waiting Notification features apply to ACD answering centers only. Multiple Appearance Directory Number (MADN) answering centers cannot support these calls.

The first answering center must be an ACD DN.

M911 trunk calls must terminate on a CDN. If a specified autoterminate DN is not a CDN, an SCH system message prints. If a CDN is used as the autoterminate destination of at least one M911 trunk, the CDN cannot be removed using LD 23. The system issues a message. To remove the CDN, all M911 trunks terminating to it must be removed, or they must be changed to terminate to a different CDN.

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CDNs and ACD DNs are normal dialable numbers. A non-911 call can direct dial either a CDN or any ACD DN functioning as an answering center. A CDN uses its default ACD DN for non-911 calls; an ACD DN treats non-911 calls as normal calls.

The Call Waiting Notification (CWNT) package 225 is a separate package. You can install an M911 system without it. However, without this package, an external alert does not occur for 911 calls that arrive at an ACD queue.

The CWNT software is available for 911 calls in ACD queues only. No provision exists to alert MADN call takers of arriving 911 calls.

911 calls in an ACD queue are treated like other ACD calls. If Recorded Announcement (RAN) is configured for the ACD queue, 911 calls are given RAN treatment. The same interactions between RAN and Central Office loopstart trunks exist for M911 as for general ACD operation.

Emergency Services M911 Networked Operation feature

In CS 1000 Release 5.0, you can configure 911E/T trunks on a Digital Trunk Interface (DTI) card.

The Emergency Services M911 Networked Operation Feature supports 911 calls

- on PRI/PRI2 and IP Peer facilities
- over an MCDN Peer to Peer TIE trunk network (MCDN TIE network) between two CS 1000 systems only.

Support for cascading CS 1000 systems is not part of this feature. The path between two CS 1000 systems is direct, with no intermediate hops. MCDN network refers to SL1 interface between the two systems.

In an MCDN network, 911 calls route through M911P trunks only. Non-911 calls route through non-M911P trunks.

If a 911 call arrives at the target node on a non-M911P trunk, the call enters a high-priority ACD queue, but receives no other emergency treatment. An error message appears on the TTY with the details of the call.

A non-911 call that arrives on an M911P trunk does not receive emergency treatment. An error message appears on the TTY with the details of the call.

This feature does not support the T301 timer.

To provide the number and name display at the target node, assign yes to the NCRD and NCNA prompts in LD 16 for M911P routes.

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Assign yes to the NASA prompt in LD 17 to allow Network Attendant Service. Assign ND2/ND3 to RCAP to activate Network Name Display.

The Emergency Services M911 Networked Operation feature does not change the basic NACD queuing operations such as registration with a remote queue and periodic updates. The capability change supplied with this feature is exclusively used when the emergency call is processed.

To ensure that calls in the Emergency queue terminate properly at agent positions, do not configure RAN/IVR/MUSIC/FORCE DISCONNECT/FORCE BUSY/SILENCE at the target node. Apply RAN/IVR/MUSIC/FORCE DISCONNECT/FORCE BUSY/SILENCE at the tandem node only.

If call redirections terminate the 911 call on a CCMS-controlled CDN at the target node, then the CCMS request on the target node for IVR/RAN/MUSIC/FORCE DISCONNECT/FORCE BUSY/SILENCE returns an appropriate error (911 calls do not receive RAN/ IVR/Music).

An agent can manually transfer 911 calls from the tandem node.

Route Data Block prompt The M911P prompt is available in the Route Data Block for tie trunks only. When you assign yes to M911P, the trunks associated with these routes are M911P trunks. All incoming 911 calls to the tandem CS 1000 are redirected to the target CS 1000 over M911P trunks. At the target node, the treatment of these calls is the same as incoming calls on 911E/911T trunks.

Network ACD over M911P To allow Network ACD of 911 calls over M911P trunks, configure the source ACD DN at the tandem node with Day/Night Tables. All incoming 911 calls to this source ACD DN are put into the high-priority ACD queue.

Because 911 calls route through M911P trunks only, the NACD of 911 calls happens only over M911P trunks. When you select a trunk for an outgoing call to the target node it is important to ensure the following:

- Configure NACD day/night tables with remote targets associated with M911P routes only. If you configure the NACD table with targets associated with non-M911P routes, 911 calls can try to seize non-M911P routes. If a 911 call tries to seize non-M911P routes, the NACD of the call is blocked at the tandem node and the call remains queued to the source ACD DN. Error messages appear on the agent's telephone.
- The source ACD DN employed for NACD remains a dedicated ACD DN equipped to handle 911 calls only.

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For optimal use of M911P trunks, manage these conditions when you configure NACD for the Emergency Services M911 Networked Operation feature.

During NACD/NSBR, if a 911 caller is listening to any form of IVR at the tandem node when the target agent becomes available, the IVR is removed and the 911 call is queued to the agent's telephone.

Call transfer and conference calls over M911P An agent can transfer or conference 911 calls answered at the tandem node to the target node. In such cases, the agent must be aware of the dialing plans and DNs to transfer the call over M911P trunks. Nortel recommends that you configure autodial numbers on the agent set so it is convenient for the agent to transfer the call appropriately. All 911 calls transferred and conferenced over M911P trunks retain trunk priority.

The agent can transfer or conference a 911 call over non-M911P trunks as well. In such cases, the calls are treated as normal calls at the target node. If a non-911 call is transferred or conferenced over M911P trunks, it is blocked and an appropriate error message prints.

A transferred or conferenced 911 call receives emergency treatment at the target node only if the call is transferred or conferenced over M911P trunks to an ACD DN at the target node.

If a 911 call arrives on a non-M911P trunk at the target node, the call enters a high-priority ACD queue, but no other emergency treatments are provided. To indicate this type of call is in the queue, an error message prints on the TTY.

Call redirections for networked 911 The following list summarizes the various call redirection scenarios that can occur in the operation of Networked 911:

- If an emergency call is routed from the tandem node over a non-M911P route, the NACD of the call is blocked at the tandem node and the call remains queued in the source ACD DN.
- Nortel does not recommend the transfer or conference of a 911 call over non-M911P routes because the target node then treats the emergency call as a normal call.
- You cannot use NACD for non-emergency calls to the target node over M911P routes. ACD redirection of the call is blocked. Similarly, you cannot redirect non-emergency calls to the target node over M911P routes by using Call Transfer or Call Conference . The transfer or conference of the 911 call is blocked.

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Transport and Display of ANI over M911P trunks

- **Eight-digit ANI on M911P trunks**

  Networked 911 redirects the ANI of an emergency call to the target node using M911P trunks in the same format as received from 911E or 911T trunks (KP + NPD/ID + ANI + ST). KP, ST, and STP tones sent from the 911 End Office or Tandem Office are converted on the tandem node to their respective hexadecimal formats and then propagated over M911P trunks.

  Unlike 911E and 911T routes, M911_NPID_FORM and NPID_TBL_NUM (in the Route Data Block) are not prompted for M911P routes. The ANI translation from 8-digit to 10-digit, accomplished by accessing the NPID table, occurs at the tandem node for 911T routes. With Networked 911, the target node always receives the ANI of an emergency call, which eliminates the need for these prompts.

  The ANI is decoded and stored at the target node. The length of the ANI is then determined and the telephone display of the target agent is handled accordingly. The trunk name that appears on the telephone is the name configured for incoming trunk group (911E or 911T) at the tandem node for all 911 calls.

- **10/20-digit ANI on M911P Trunks**

  All ANI information received for an incoming emergency call over a 911E or 911T trunk propagates to the target node over M911P trunks.

  As with eight-digit ANIs, the KP, ST, and STP tones sent from the 911 End Office or Tandem Office propagate over M911P trunks.

  The trunk name that appears on the telephone is the name configured for 911E or 911T trunks at the tandem node where the 911 call arrived.

  M911_NPID_FORM and NPID_TBL_NUM are not prompted in the RDB.

  ANI display is based on the length of the digits received on the M911P trunks.

  At the target node, the M911_PANI prompt in the Customer Data Block determines whether to display PSEUDO ANI on the answering digital set. A PSEUDO ANI is loosely defined as the cell site or sector information of a wireless caller.

  The M911_PANI prompt appears only if the M911E Enhanced M911 10/20 Digit package 249 is available, and you assign NO to the default value. Even when the M911E Enhanced M911 10/20 Digit package 249 is available, and you assign NO to the default value, the PSEUDO ANI still appears for a moment before it is replaced with meaningful CPND information. If no CPND information is available, then the line that contains the PSUEDO ANI information remains blank.

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If the M911E Enhanced M911 10/20 Digit package 249 is unavailable, then the PSEUDO ANI is not displayed. Therefore, no indication is given when an emergency call originates from a wireless telephone.

- **CCMS interactions**

  When an emergency call is redirected to a CDN controlled by a Contact Center Manager Server (CCMS), 10/20-digit ANI information is sent over the Application Module Link (AML).

- **Network Skill-Based Routing for 911 calls:**

  As part of the regular NSBR setup on the Call Servers, the CCMS at each node connects to the CS 1000 using an ELAN connection. Therefore, the CCMS of one node can connect to a CCMS of a different node by using its data network. CS 1000 Call Servers themselves connect by using the CS 1000 MCDN network, so that an incoming 911 call from the tandem node can be routed to the target node and answered by a reserved agent.

  The following sections use these definitions:

  — Tandem CCMS refers to the CCMS at the tandem node.

  — Target CCMS refers to the CCMS at the target node,

  — **Remote agent** refers to the agent at the target node.

  The tandem CCMS can issue the Network Skill Routing Call request to reserve an agent (in idle state) from the target node. When the agent is reserved, the tandem node routes the 911 call to the target node over the CS 1000 MCDN network using 911P trunks to the remote agent. When the remote agent answers the Network Skill Based Routing call, ***USM Offhook*** and ***USM Active AML*** messages are sent to the target CCMS and an ***ISDN Connect*** message is returned to the tandem node.

  When the tandem node receives the ISDN CONNECT message, it sends an ***AML Call Answer*** message to the tandem CCMS to indicate that the remote agent answered the NSBR call. If the remote agent releases the NSBR call, the target node sends an ***ISDN DISCONNECT*** message to the tandem node. In addition, the target CCMS receives ***USM Onhook*** and ***USM Disconnect AML*** messages that indicate release of the call by the remote agent. When the tandem node receives the ISDN DISCONNECT message, the tandem node sends an ***AML Call Disconnect*** message to the tandem CCMS.

  If a 911 caller abandons a call, the call receives Call Abandon Treatment. See "Call abandon treatment for 911 calls connecting to M911P trunks" (page 370).

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Do not apply RAN/IVR/MUSIC/FORCE DISCONNECT/FORCE BUSY/SILENCE at the target node, because Emergency Queue calls will terminate improperly at agent positions. Apply RAN/IVR/MUSIC/FORCE DISCONNECT/FORCE BUSY/SILENCE only at the tandem node.

If call redirections terminate the 911 call on a CCMS-controlled CDN at the target node, then the CCMS request on the target node for IVR/RAN/MUSIC/FORCE DISCONNECT/FORCE BUSY/SILENCE returns an appropriate error (911 calls do not receive RAN/ IVR/Music).

- **ANI failure**

  In 911E or 911T configurations, the answering set indicates ANI failure with 0000000.

  Reasons for ANI failure include the following:

  — The NPID table interprets a single-digit ANI as invalid.

  — A timeout occurs on the trunk signaling protocol while it waits for ANI receipt.

  — MF tones are unrecognizable at the tandem node.

  — The tandem node receives an eight-digit ANI with a normal NPD, followed by 911-0YYY. In this case, the display at the target node is the same as the display at the tandem node.

  Refer to *Features and Services (NN43001-106)*, section ANI Failure for more information.

Call abandon treatment for 911 calls connecting to M911P trunks When a 911 caller abandons the call, the tandem node receives a disconnect notice. For NACD or NSBR, the target node receives an indication that the call is abandoned. However, the 911P trunk remains busy. The 911P trunk is released when either the remote agent releases the call or does not answer the call in a specified amount of time. The ABTR timer, configured in LD 16 (RDB), limits the time that an agent is given to answer the call. If the timer expires before the remote agent answers the call, the 911P trunk is released and the call is lost. The ABTR timer has a default value of 15 minutes, but you can configure a range of 0 to 30 minutes in increments of 1 minute.

Support of Centrex Hook Switch Flash over M911P The Trunk Hook Flash (THF) sent by the CS 1000 over certain non-ISDN trunks is used to initiate Call Transfer, Malicious Call Trace (MCT), and features on the E911 Tandem Office. The THF can be accessed through tandem MCDN TIE trunks for MCT by the CS 1000. The Emergency Services M911 Networked Operation feature provides the CS 1000 station users the ability to generate a switchhook flash signal towards E911 Tandem Office when they are on a call established through that office. This signal is interpreted by the E911

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Tandem Office as a request for the activation of one of the services offered by the E911 Tandem Office itself (conference or call transfer, for example). The user can operate on these services by sending further information (digits) directly from the telephone set (End-to-End Signaling).

Support of Malicious Call Trace over M911P Malicious Call Trace (MCT) allows users of selected telephones to activate a call trace that results in a printed report of the calling and called parties. The report is generated on all system TTYs designated as maintenance terminals. If the caller has to be traced, while a 911 call is in progress, the agent can activate this feature (if an appropriate key is defined on the selected telephone), and identify the offending trunk.

End to End Signalling is allowed on a M911P trunk during talk state to support MCT.

Support for network time synchronization over M911P The Network Time Synchronization functionality ensures that all time stamps in a network are synchronized from one source. One switch becomes the master for this purpose.

In a private network environment, each switch in the network has an individual system clock. These system clocks can, under certain conditions, lose or gain time, causing inaccurate timestamps for different features. The issue of inaccurate timestamps is made more pronounced by the fact that, in a private network, it is possible for several switches to be located in different time zones. As features become more centralized in a network environment; it is useful to have time stamps based on one time zone. To provide Time Synchronization on a network-wide basis, MCDN nodes can request Time Synchronization from another node, using D-channel messages.

The Network Time Protocol is widely used to synchronize computer clocks in the global network. The NTP client (that is, the CS 1000 system) gets its time from an authoritative NTP server using its ELAN connectivity, and then distributes the time across its different components like Signalling Server, Symposium, CallPilot. NTP allows the system to synchronize with a customer's own NTP Server not only for the purpose of accuracy between the two nodes but also for security reasons. The Emergency Services M911 Networked Operation feature ensures that the time on two separate CS 1000 Call Servers (connected by M911P trunks) are synchronized.

Support of Emergency Services M911 Networked Operation feature on IP Peer facilities To support this feature on IP Peer facilities (H.323 and SIP), each node (tandem and target) requires a minimum of two signaling servers. Current IP Peer does not have the intelligence to route calls based on the trunk type. If a 911 call arrives on an M911P trunk at the tandem signaling server and switches to a non-M911P trunk at the target signaling

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server, this can result in the 911 call being treated as a normal call. To avoid such scenarios, the system requires a dedicated signaling server for M911P trunks, a fixed dialing plan, and dedicated ACD DNs at both the tandem and target nodes.

UDP or CDP configuration in an IP Peer network requires a unique ACD DN, defined exclusively for 911 calls at the target and tandem nodes. When defining remote targets in the NACD table or configuring ADL keys on the agent telephone, use these unique ACD DNs for routing of 911 calls. At the NRS, configure the ACD DN to terminate only on a signaling server dedicated to M911P trunks. For non-911 calls, another ACD DN must be defined.

An M911P trunk must never be configured on the NRS as the default route.

Modification of CPDC feature Called Party Disconnect Control (CPDC) controls the disconnection of calls on any supervised trunk type. An incoming trunk call answered on a CS 1000 Call Server is not disconnected until the agent goes onhook. If the calling party goes onhook, the connection is held, allowing the call to be traced in emergency situations.

The CPDC feature is applicable only for 911 calls which are established to an ACD agent.

The Emergency Services M911 Networked Operation feature provides support for use of the CPDC feature over TIE trunks with trunk subtype M911P.

Meridian 911 Call Abandon

Calls released by the originator after the call has been answered are not abandoned calls by the definition used for the M911 Call Abandon feature and do not receive abandon treatment.

Abandoned calls waiting in the ACD queue activate the Call Waiting Notification Terminal Number.

If ANI is not received, the abandoned call is not presented to the agent. However, a Call Detail Recording (CDR) N record, if configured, can be printed to indicate an abandoned call.

Only external 911 calls abandoned before answer are supported.

When the call is abandoned, the speech path is dropped, and the trunk is released.

If Flexible Tone and Cadences (FTC) package 125 is equipped, it is possible to configure a tone other than the one provided by default.

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Call Abandon is configured on a per-route basis and is supported on 911 trunks only.

No B record is generated by CDR for an M911 abandoned call, because the B record is package-dependent and applies only to an established call with internal CDR.

Wireless telephones are not supported at the Public Safety Answering Point (PSAP) or Secondary Safety Answering Point (SSAP) for Call Abandon.

An MF tone receiver (NTAG20AA) is required.

Feature interactions (Meridian 911)

Automatic Call Distribution Interactions ACD-C Reports—The Meridian 911 product does not change the ACD-C reports. M911 uses the ACD-C reports for CDNs as introduced for Customer Controlled Routing CCR.

Because M911 uses the Route-to AML message instead of the Queue-to message, only "Route To", "Default DN", "Abandoned", and "Calls Accepted" are meaningful. Those calls that are successfully routed count towards the "Route To" category. Those calls that get default treatment count towards the "Default DN" category. Those calls that abandon while they are in the CDN queue count towards the "Abandoned" category. The "Calls Accepted" category is the sum of the "Route To", "Default DN", and "Abandoned" categories.

The "# of Calls in the Queue" category represents those calls that are sitting in the CDN queue. This should always be zero, because calls waiting for a Route-to request from the Application Module are sitting in a timing queue as opposed to the CDN queue.

M911 calls routed to an ACD answering center show up in the normal ACD Queue and agent reports for that queue. Calls routed to MADN answering centers show up only in the CDN report.

ACD-D Auxiliary Message No changes to the ACD-D reports are needed for Meridian 911.

Controlled Directory Number (CDN) Ceiling The CDN ceiling feature returns busy tone to calls arriving at the CDN while it is in default mode. If a 911 call arrives while these conditions are true, the 911 call does not hear a busy tone, but is linked into the default destination ACD DN queue. Therefore, the setting of the ceiling value is irrelevant if only 911 calls are expected at the CDN. The ceiling value is, however, still applied to non-911 calls arriving at the CDN.

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Controlled Directory Number (CDN) Ringback 911 Calls get ringback immediately upon arrival at a CDN, whereas CCR calls do not.

Custom Call Routing (CCR) Call Abandoned Message (ICAB) This message is sent for controlled calls that were abandoned before being answered.

Custom Call Routing (CCR) Call Enters Queue Message (ICEQ) This message is sent to ACD-CCR each time a default call is placed in the default ACD DN (default mode).

Custom Call Routing (CCR) Call Modification Message (ICCM) This message is sent to ACD-CCR when a call modification request (route to, disconnect, busy) is successfully executed upon a CDN controlled call.

Because the Route To, Disconnect and Busy treatments remove CDN control from the call, ICCM messages are sent for the call for each of the queues from where it must be removed. The ICCM message also applies to Enhanced ACD Routing calls or CDN default calls which were busied by the call ceiling value while trying to route to the default ACD-DN.

Custom Call Routing (CCR)* Route To *Command The Route to destination for 911 calls are restricted to ACD DNs only. If the routing destination is not an ACD DN, the call is routed to the CDN's default destination ACD DN. CCR calls can be routed to any dialable number.

Enhanced ACD Routing/Customer Controlled Routing The Enhanced ACD Routing/Customer Controlled Routing (EAR/CCR) features introduce CDNs. EAR package 214 makes CDNs configurable and is a prerequisite for the M911 package 224.

Interflow 911 Calls interflow just like any other ACD calls. If the interflow feature is configured so that a call gets busy tone, the 911 call does not get busy tone, but instead is linked back into the source ACD queue.

If the interflow destination is a number outside the system, the software has no control over the treatment the call gets, so this configuration is not a recommended operation for 911 sites.

Night Service

Night Call Forward If possible, do not put the primary ACD DN in Night Service. If the primary ACD DN is put in Night Service, calls are sent to the Night Call Forward (NCFW) destination. Even if a 911 call arrives on a trunk with CPDC defined, the call can still go to NCFW, unlike non-911 ACD calls.

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This restriction is lifted for 911 calls only. The CWNT telephone does not ring for calls entering the queue while in Night Service when the queue has a NCFW destination specified.

Overflow 911 Calls overflow by count and by time, like other ACD calls.

Supervisor Control of Queue Size This feature causes calls to receive a busy tone when the overflow threshold (OVTH) of the ACD queue is exceeded. This feature is bypassed for 911 calls.

Call Detail Recording (CDR) Records ANI for 911 calls is included as the Calling Line Identification (CLID) in CDR Records pertaining to 911-trunk calls. CDR Records affected are Normal Records, Start/End Records, Authorization Code Records, Connection Records (Q, R, and F records), and Charge Account Records.

Called Party Disconnect Control The Called Party Disconnect (CPDC) feature is used to retain a 911 trunk when a 911 call is disconnected by the caller. No modification to the feature is required for Meridian 911, except lifting the CPDC and ACD NCFW limitation. 911 Calls, arriving by means of trunks with CPDC defined, can NCFW, unlike non-911 ACD calls.

Calling Party Name Display The Calling Party Name Display feature can be used to configure and display the incoming 911 route name.

Conference A conference consultation call is an internal call and treated as low priority. Therefore, when a call is answered and then conferenced, the trunk priority is lost. This operation is the same for normal calls and 911 calls.

Dialed Number Identification Service (DNIS) DNIS is not supported on 911 trunks.

Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) Answering Positions are not supported on BRI telephones.

Integrated Services Digital Network (ISDN) Primary Rate Interface 911 trunks are not supported on ISDN PRI trunks or Integrated Service Link (ISL) trunks.

Japan Direct Inward Dialing (DID) Trunks Japan DID trunks are not supported.

Malicious Call Trace The Malicious Call Trace (MCT) feature supports ACD telephones. ACD telephones can have the MCTA Class of Service and a TRC key defined. The feature is activated by pressing the MCT key or dialing a MCT access code.

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No Hold Conference No Hold Conference calls are treated as internal calls and are linked to the low-priority queue of the ACD DN.

Single and Multiple Call Ringing for MADNs The DN keys for multiple-appearance telephones can be defined as an SCR (single call ringing) key or as an MCR (multiple call ringing) key. For those DNs (keys on MADN telephones) that are SCR, only one call can be answered at a time: when a call taker has answered a call, future calls to that DN receive busy tone until the current call is disconnected.

For DNs that are MCR, calls receive burst tone only when every call taker is busy answering a call. If one call taker is answering a call and there are other call takers available, a new call to that DN causes the telephones of the available call takers to ring. Any available call taker can then answer the new call.

Transfer Trunk priority associated with an incoming 911 call is only preserved if blind transfer is used.

Feature interaction (Meridian 911 Call Abandon)

Attendant Break-In Because a speech path has not been established for an abandoned call, the attendant receives Break-In deny treatment so that Break-In cannot occur.

Automatic Call Distribution (ACD) When a call is abandoned, the call remains in its current state (in an ACD or CDN queue, or ringing on an ACD agent telephone).

Automatic Call Distribution Reports ACD-C and ACD-D packages are not modified for M911 Call Abandon. However, some report fields must be interpreted differently for abandoned calls. The incoming call is pegged as an abandoned call when the caller abandons. However, it is not repeatedly pegged as an answered call when the call taker answers the abandoned call.

For ACD-C package, the CALLS ANSWD field accounts only for real calls; the ABANDONED field accounts for abandoned calls that are answered, assuming all abandoned calls are eventually answered by an agent. Consequently, the CALLS ACCPTD field is equal to the CALLS ANSWD field plus the ABANDONED field (number of calls entering queue = number of real calls + number of abandoned ones). This way the Average or Total Call Processing (DCP) Time accurately reflects the amount of time an agent spent on real calls, because answering an abandoned call requires little time. The work an agent does for an abandoned call is more accurately reflected in the DN OUT and OUT TIME fields, which mean total number of

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outgoing calls and total time of all outgoing calls respectively. Because the agent must hang up the abandoned call and call back, the outgoing call is more useful for reporting purposes.

For the ACD-D package, the reports also need to be interpreted in this way. When the caller abandons, CAB message is sent to Meridian MAX; however, when the agent answers the abandoned call later, no CAA message is sent to Meridian MAX.

Call Force M911 abandoned calls cannot be call forced.

Called Party Disconnect Control There is no interaction with M911 Call Abandon and Called Party Disconnect Control.

Conference M911 abandoned calls cannot be conferenced.

Display Calls Waiting Key Abandoned calls contribute to the queue count.

ACD Calls Waiting Key Abandoned calls contribute to the queue count.

Ongoing Status Display Abandoned calls contribute to the queue count.

Real-time Display Abandoned calls contribute to the queue count.

Hold M911 abandoned calls cannot be put on hold.

Initialization Unanswered abandoned calls are lost if the system initializes.

Interflow Abandoned calls contribute to the queue count. An abandoned call can interflow only the ACD DNs.

Network ACD Network ACD is not supported.

Night Call Forward (NCFW) Abandoned calls can be forwarded to the Night Call Forward DN if the Night Forward DN is an ACD DN. If a primary answering center goes into Night Service while there are abandoned calls in the queue, those abandoned calls are dropped. A CDR N record is printed if CDR is configured.

Night Service Key Abandoned calls are part of the transition mode when agents go to Night Service and the supervisor selects transition mode.

No Hold Conference M911 abandoned calls cannot be No Hold conferenced.

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Not Ready Key When an abandoned call is presented to an agent and the agent presses the Not Ready Key, the call is put back into the queue. If an agent is established on an abandoned call and presses the Not Ready Key, the call is dropped.

Overflow by Count Abandoned calls contribute to the queue count. An abandoned call can overflow.

Supervisor Observe Because there is no speech path between the ACD agent and the caller, the supervisor observe feature is blocked. If the supervisor presses the observe key to observe an agent active on an abandoned call, the supervisor hears silence.

Transfer M911 abandoned calls cannot be transferred.

Feature interactions (Emergency Services M911 Networked Operation feature)

Calling Party Privacy

If an incoming call with a Privacy Indicator terminates on a system switch configured with M911, the ANI information (if it exists) is still sent to the Meridian 911 application. The Privacy Indicator is ignored on all 911 calls propagated over M911P trunks.

Called Party Disconnect Control

The Called Party Disconnect Control feature allows called party disconnect control over tandem connections for trunks identified as M911, 911T, or 911E and trunk sub-type M911P. This allows the call taker to hold the tandem trunk connection until the call taker releases the call. This applies to calls that are established to an ACD agent.

Transfer/Conference

Emergency treatment is provided to all 911 calls transferred or conferenced by means of M911P trunks. The same applies to No Hold conference calls. Abandoned 911 calls cannot be transferred or conferenced.

Trunk priority is maintained for all 911 calls transferred or conferenced by means of M911P trunks.

Display of Calling Party Denied

An incoming M911 call with ANI information always displays ANI digits on the terminating set regardless of the calling party's DPD Class of Service.

Malicious Call Trace

Malicious Call Trace feature is supported over tandem trunk connection by means of MCDN M911P trunks.

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Basic Rate Interface (BRI)
Answering positions are not supported on BRI sets.

Dialed Number Identification Service
Dialed Number Identification Service is not supported on M911P trunks.

Incoming Digit Conversion
IDC name, if configured, is overridden by the name configured for the 911E/T trunks at the tandem node.

VNS
VNS over MCDN is not supported.

Calling Party Name Display
The Calling Party Name Display feature can be used to configure and display the incoming 911 route name.

Night Call Forward
If the ACD DN at the tandem node defines NCFW as a valid destination at the target node, the 911 call is sent to the NCFW destination. The NCFW destination must be a valid ACD DN which is defined at the target node. This feature supports M911P trunks.

Interflow
911 calls can interflow to a valid ACD DN defined at the target node. This feature supports M911P trunks.

Overflow
911 calls can overflow like other ACD calls within the tandem node. Overflow DN is always an ACD DN.

Call Force
Abandoned 911 calls can be call forced.

Not Ready
Abandoned calls presented to an agent at the target node are put back into the queue when the NRD key is pressed, but no RAN or music is provided. This is consistent with existing 911 operation. If an agent is established on an abandoned call and presses the Not Ready Key, the call is dropped.

Supervisor Observe
On abandoned 911 calls, because there is no speech path between the ACD agent and the caller, the supervisor observe feature is blocked. The supervisor can still press the OBV key on his set to observe an agent active on an abandoned call, but he hears silence.

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Night Service Key (NSVC)

If calls reach the target node by way of NSVC key operation at the tandem node, Emergency Treatment for 911 calls is provided at the target node. However, if the 911 call is redirected to another node from the target node, emergency treatment is not supported.

ACD-C Reports

ACD-C reports printed at the target node remain consistent with the existing format of reports printed at the tandem node.

In ACD-C reports, the CALLS ANSWD field accounts only for real calls; the ABANDONED field accounts for abandoned calls that are answered, assuming that all abandoned calls are eventually answered by an agent. Consequently the CALLS ACCPTD field is equal to the CALLS ANSWD field plus the ABANDONED field (number of calls entering queue = number of real calls + number of abandoned ones). As a result, the Average or Total Call-Processing (DCP) Time accurately reflects the amount of time an agent spent on real calls, because answering an abandoned call requires little time. The work that the agent does for an abandoned call is more accurately reflected in the DN OUT and OUT TIME fields, which mean total number of outgoing calls and total time of all outgoing calls respectively. Because the agent must hang up the abandoned call and call back, the outgoing call is more useful for reporting purposes.

Controlled Directory Number Ceiling

The CDN ceiling feature returns busy tone to calls arriving at the CDN while it is in default mode. If a 911 call arrives while these conditions are true, the 911 call does not hear a busy tone, but is linked into the default destination ACD DN queue. Therefore, the setting of the ceiling value is irrelevant if only 911 calls are expected at the CDN. The ceiling value is, however, still applied to non-911 calls arriving at the CDN. The CDN ceiling feature is supported for M911P trunks.

Delay Night RAN

Delay Night RAN is not given to a 911 call in the case of NACD/NSBR because all 911 calls are emergency calls.

IP Trunks

H.323 trunks over ITG are not supported as part of this feature.

Trunk Anti Tromboning (TAT)

There are no interactions with this feature. However, if the call returns to the tandem node because of call modification or call redirection, it is not treated as an emergency call.

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Trunk Optimization Before Answer (TRO-BA)

Because this feature operates between two nodes, there are no interactions with TRO-BA (no intermediate hops).

Trunk Optimization Call Modification (TRO-CM)

Because this feature operates between two nodes, there are no interactions with TRO-CM (no intermediate hops).

Feature packaging

The following packages are required:

- Digits Automatic Call Distribution (DDSP) package 19
- Basic Automatic Call Distribution (BACD) package 40
- Automatic Call Distribution Package B (ACDB) package 41
- Automatic Call Distribution Package A (ACDA) package 45
- Enhanced Automatic Call Distribution Routing (EAR) package 214
- Meridian 911 (M911) package 224
- Call Waiting Notification (CWNT) package 225
- The Emergency Services M911 Networked Operation feature requires Meridian Link package (MLM) package 209

The following additional packages are not required, but are recommended:

- At least one of either Call Detail Recording (CDR) package 4, or Call Detail Recording on Teletype Machine (CTY) package 5
- Automatic Call Distribution Package C (ACDC) package 42 (not needed if packages 51 and 52 are enabled)
- Automatic Call Distribution Load Management Reports (LMAN) package 43
- Automatic Call distribution Package D (ACDD) package 50
- Automatic Call Distribution Package D, Auxiliary Link Processor (LNK) package 51
- Call Party Name Display (CPND) package 95
- Malicious Call Trace (MCT) package 107
- Calling Line Identification in Call Detail Recording (CCDR) package 118

The M911 Call Abandon feature is included in Meridian 911 (M911) package 224, and required Call Identification (CALL ID) package 247.

If an application also involves Meridian Link, Meridian Link Module (MLM) package 209 is required.

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Call Identification (CALL ID), package 247 is recommended for the Emergency Services M911 Networked Operation feature.

Feature implementation

Task summary list

This section provides an example of how to configure Meridian 911. The order in which all items must be configured, in order for M911 to run, is outlined. In addition, the implementation procedures for M911 Call Abandon are shown.

1. "LD 10 Configure a TN for an analog telephone with Call Waiting Notification Allowed (CWNA)." (page 382)
2. "LD 23 Configure ACD DNs." (page 383)
3. "LD 23 Configure CDNs." (page 384)
4. "LD 16 Configure NPID tables." (page 384)
5. "LD 16 Configure an M911 route." (page 384)
6. "LD 14 Configure M911 trunks." (page 385)
7. "LD 16 Configure Call Detail Recording (CDR)." (page 386)
8. "LD 17 Configure the insertion of ANI digits into the CDR record." (page 386)
9. "LD 16 Enable M911 Call Abandon (optional)." (page 386)
10. "LD 56 Configure the flexible tone for M911 abandoned calls, if desired." (page 387)
11. "LD 10 Configure non-ACD telephones to answer M911 calls." (page 387)
12. "LD 11 Configure non-ACD telephones." (page 388)
13. "LD 11 Configure telephones to function as ACD telephones." (page 388)

LD 10 Configure a TN for an analog telephone with Call Waiting Notification Allowed (CWNA).

Configure a TN for an analog (500/2500-type) telephone with a Class of Service of Call Waiting Notification Allowed (CWNA).		
Prompt	**Response**	**Description**
REQ:	NEW	Create a new data block.
TYPE	500	Type of telephone
TN		Terminal Number
	l s c u	Large System and CS 1000E format, where: l = loop, s = shelf, c = card, and u = unit.
	c u	Small System and Media Gateway 1000B format, where: c = card and u = unit.

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Configure a TN for an analog (500/2500-type) telephone with a Class of Service of Call Waiting Notification Allowed (CWNA).		
Prompt	**Response**	**Description**
DES	xxx	Office Data Administration System (ODAS) package designator.
CUST	xx	Customer number as defined in LD 15.
…		
DN	nn…n	Internal Directory Number.
…		
CLS	CWNA	Call Waiting Notification Allowed Class of Service (DTN or DIP)

LD 23 Configure ACD DNs.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	ACD	ACD Data Block.
CUST	xx	Customer number as defined in LD 15.
ACDN	nn…n	ACD Directory Number
…		
MAXP	nn	Maximum number of agent positions
…		
ISPA	YES	ACD DN uses Meridian Link messaging.
VSID	n	Servicer ID used for Meridian Link messaging (defined in LD 17).
…		
OVTH	2047	Recommended overflow threshold
…		
CWNT	l s c u	Call Waiting Notification TN (as configured in previous step)

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Prompt	Response	Description
CWNC	YES	Call Waiting Notification control
	Nortel recommends that you assign YES to the CWNC control for primary answering centers (rings for priority calls only) and NO for secondary answering centers (rings for all calls).	

LD 23 Configure CDNs.

The ceiling value is irrelevant for 911 calls terminating at the CDN, but it does apply to non-911 type calls. When the ceiling value is exceeded, new non-911 calls receive busy tone.		
Prompt	**Response**	**Description**
REQ:	NEW	Create a new data block.
TYPE	CDN	Controlled Directory Number Data Block.
CUST	xx	Customer number as defined in LD 15.
CDN	nn…n	Controlled DN number.
…		
DFDN	nn…n	Default ACD DN.
CEIL	2047	Recommended Ceiling Value.
RPRT	(NO) YES	Report control
CNTL	YES	Controlled mode (controlled = YES).
VSID	n	Server ID used for Meridian Link messaging (defined in LD 17)

LD 16 Configure NPID tables.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	NPID	Numbering Plan or Information Digit data block.
IDTB	0-7	ID table index. ID table index to be used by this M911 route.
NPID	0-9	NPID for M911 routes.
TRMT	(NONE, NPA, FAIL, TEST	Numbering Plan Digit or Information Digit treatment.
NPA	nnn	Numbering Plan Area. Prompted if TRMT = NPA.

LD 16 Configure an M911 route.

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block.
TYPE	RDB	Route data block
CUST	xx	Customer number as defined in LD 15.
ROUT	nnn	Route number

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Prompt	Response	Description
TKTP	DID	Meridian 911 routes use Direct Inward Dialing trunks.
M911_ANI	YES	Enter YES for 911 route.
K_TYPE	(911T) 911E	911T = 911 Tandem connection 911E = 911 End office connection
TRK_TYPE	(911T) 911E 911P	911T = 911 Tandem connection 911E = 911 End office connection 911P = 911 Private network connection
NPID_TBL_NUM	0-7	NPID Table Index (You must create the NPID table in LD 16 before you can use it here.)

LD 14 Configure M911 trunks.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	DID	Meridian 911 trunks must be DID.
TN		Terminal number
	l s c u	Large System and CS 1000E format, where: l = loop, s = shelf, c = card, and u = unit.
	c u	Small System and Media Gateway 1000B format, where: c = card and u = unit.
…		
XTRK	XUT XEM	Universal or Enhanced EM trunk card.
CUST	xx	Customer number as defined in LD 15.
NCOS	xx	Network Class of Service Group Number
RTMB		Route number and Member Number
	0-511 1-4000	Ranges for Large System and CS 1000E system
	0-127 1-4000	Ranges for Small System and Media Gateway 1000B.
MNDN	xxxx	Manual Directory Number
ATDN	xxxxxxx	Autoterminate DN
TGAR	xx	Trunk Group Access Restriction
SIGL	a…a	Trunk signaling where a...a = EAM, EM4, LDR
…		
STRI	WNK	Incoming start arrangement.

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Prompt	Response	Description
SUPN	YES	Answer and disconnect required.
CLS	MFR APY	Meridian 911 trunks must have MFR and APY Classes of Service.

LD 16 Configure Call Detail Recording (CDR).

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	RDB	Route data block
CUST	xx	Customer number as defined in LD 15.
ROUT	xxx	Route number
TKTP	DID	Meridian 911 routes use DID trunks.
…		
CDR	YES	CDR trunk route.
INC	YES	CDR records generated on incoming calls.
QREC	NO	CDR ACD Q initial records to be generated.

LD 17 Configure the insertion of ANI digits into the CDR record.

Prompt	Response	Description
REQ:	CHG	Change existing data.
TYPE	CFN	Configuration record
…		
CLID	YES	Calling Line ID (ANI for M911) in CDR.

LD 16 Enable M911 Call Abandon (optional).

Prompt	Response	Description
REQ:	NEW CHG	Create or change a data block
TYPE	RDB	Route Data Block
CUST	xx	Customer number as defined in LD 15
ROUT		Route number
	0-511	Range for Large System and CS 1000E system
	0-127	Range for Small System and Media Gateway 1000B.
TKTP	DID	M911 trunks are DID trunk type
…		
M911_ANI	(NO) YES	Set to YES to receive ANI for M911 routes.

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Prompt	Response	Description
M911_TRK_TYPE	(911T) 911E	Meridian 911 ANI trunk types, where: 911T = 911 Tandem connection 911E = 911 End office connection
TRK_TYPE	(911T) 911E 911P	911T = 911 Tandem connection 911E = 911 End office connection 911P = 911 Private network connection
M911_ABAN	(NO) YES	Optional call abandon treatment, where: YES = abandoned call treatment for this route NO = no abandoned call treatment for this route
M911_TONE	(YES) NO	Optional call abandon tone, where: YES = tone given on answer NO = silence given on answer

LD 56 Configure the flexible tone for M911 abandoned calls, if desired.

Prompt	Response	Description
REQ:	NEW CHG PRT	Create, change, or print a data block.
TYPE	FTC	Flexible Tone and Cadence data block.
TABL	0-31	FTC table number
DFLT	0-31	Default table number
RING	<CR>	
…		
CAB	YES	M911 Call Abandon upon Answer Tone.
TDSH	i bb cc tt	TDS external, burst, cadence, and tone.
XTON	0-255	NT8D17 TDS Tone code.
XCAD	0-255	NT8D17 cadence code for FCAD.

LD 10 Configure non-ACD telephones to answer M911 calls.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	500	Type of telephone
TN		Terminal Number
	l s c u	Large System and CS 1000E format, where: l = loop, s = shelf, c = card, and u = unit.
	c u	Small System and Media Gateway 1000B format, where: where c = card and u = unit.

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Prompt	Response	Description
CUST	xx	Customer number as defined in LD 15.
DIG	xx yy	Dial Intercom Group number and Member number.
DN	NN…N	Directory Number
…		
IAPG	2	ISDN/AP status message group
…		
CLS	USMA	M911 position

LD 11 Configure non-ACD telephones.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	aaaa	Telephone type, where: aaaa = 2006, 2008, 2216, 2317, and 2616.
TN		Terminal Number
	l s c u	Large System and CS 1000E system format, where: l= loop, s = shelf, c = card, and u = unit
	c u	Small System and Media Gateway 1000B format, where: c = card and u = unit
DES	x…x	ODAS telephone designator
CUST	xx	Customer number as defined in LD 15.
…		
CLS	USMA MCTA	M911 position; Malicious Call Trace enabled.
…		
IAPG	2	ISDN/AP status message group
…		
KEY	xx SCR yyyy	Defines a Single Call Ringing DN key.
KEY	xx TRC	Malicious Call Trace key

LD 11 Configure telephones to function as ACD telephones.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	aaaa	Telephone type, where: aaaa = 2006, 2008, 2216, 2317, and 2616.
TN		Terminal Number
	l s c u	Large System and CS 1000E format, where: l = loop, s = shelf, c = card, and u = unit.

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Prompt	Response	Description
	c u	Small System and Media Gateway 1000B format, where: c = card and u = unit.
DES	x…x	ODAS telephone designator
…		
CLS	ADD AGN USMA MCTA	AGN is for agent; SPV is for supervisor. USMA = 911 position, and MCTA = Malicious Call Trace enabled.
…		
IAPG	2	ISDN/AP status message group.
…		
KEY	xx ACD yyyy (cccc or D) zzz	Automatic Call Distribution key where **xxx** = key number (must be key 0) **yyyy** = ACD DN or Message Center DN **cccc** = CLID table entry of (0)-N, where N = the value entered at the SIZE prompt in LD 15 minus 1 **D** = "D". The system searches the DN keys, starting with key 0, until it finds a DN key with a CLID table entry. The CLID associated with the found DN key is then used. **zzzz** = agent's position ID ***Note:*** yyyy and zzzz can be up to 4 digits without the Directory Number Expansion (DNXP) package 150. With the DNXP package 150, yyyy and zzzz can be up to 7 digits. This applies only to ACD DNs for the Small System and CS 1000S model set.
KEY	xx TRC	Malicious Call Trace key where **xx** = key number

Emergency Services M911 Networked Operation feature implementation

The Emergency Services M911 Networked Operation feature applies to two CS 1000 systems.

LD 16: Modified prompts and responses

The M911P trunk subtype is introduced in the Route Data Block exclusively for TIE trunks. All prompts specific to 911 in the RDB now apply when the TKTP prompt value is TIE. When the trunk type is TIE, the M911_TRK_TYPE prompt does not appear. It is replaced by a new prompt: M911P. The M911_ANI, M911_NPID_FORM and NPID_TBL_NUM prompts do not appear.

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If the M911P prompt is set to YES:

- A new prompt, ABTR, appears with a default value of 15 minutes.
- DTRK prompt is set to YES and is non-configurable.
- IFC prompt is set to SL1 and is non-configurable.

Table 59
LD 16: NEW/CHG/OUT

Prompt	Response	Description
REQ	NEW/CHG/OUT	
TYPE	RDB	Route Data Block
CUST	0-99	
.....		
TKTP	TIE	Trunk Type
M911P	(NO)/YES	M911 Trunk Type (Private Network)
M911_ABAN	(NO)/YES	Optional call abandon treatment YES = abandoned call treatment for route NO = no abandoned call treatment for route
M911_TONE	YES/(NO)	Optional call abandon tone YES = tone given on answer NO = silence given on answer
ABTR	(15) Range 0-30	Timer (in minutes) to block disconnect. 15-minute default. You can increase this value by increments of 1 minute.
.....	.....	.....
DTRK	YES	Set to YES by default if M911P is set to YES. This prompt is not configurable.
BRIP	NO	Set to NO by default. Does not apply to M911P routes.
DGTP	PRI/PRI2	Only if M911P prompt is set to YES.
.....	.....	.....

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Prompt	Response	Description
MODE	PRA	If M911P prompt is set to YES and VTRK is set to NO.
IFC	SL1	Set to SL1 by default if M911P is set to YES. This prompt is not configurable.

Table 60
LD 16: NEW/CHG/OUT for VTRK

Prompt	Response	Description
REQ	NEW/CHG/OUT	
TYPE	RDB	Route Data Block
CUST	0-99	
.....	.....	.....
TKTP	TIE	Trunk Type
M911P	(NO)/YES	M911 Trunk Type (Private Network)
M911_ABAN	(NO)/YES	Optional call abandon treatment YES = abandoned call treatment for route NO = no abandoned call treatment for route
M911_TONE	YES/(NO)	Optional call abandon tone YES = tone is given on answer NO = silence given on answer
ABTR	(15) Range 0-30	Timer (in minutes) to block disconnect. 15-minute default. You can increase this value by increments of 1 minute.
.....	.....	.....
VTRK	(NO)/YES	YES = Supports IP Peer facilities
NODE	<Node ID>	NODE ID associated with the signaling server dedicated to M911P trunks.
IFC	SL1	Set to SL1 by default if M911P is set to YES. This prompt is not configurable.

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LD 14: Modified prompts and responses

A new Class of Service NHFA/NHFD (Network Hook Flash Allowed/Denied) is introduced in LD 14 to allow or deny the support Trunk Hook Switch Flash feature over M911P trunks.

Table 61
LD 14: NEW/CHG/OUT

Prompt	Response	Description
REQ	NEW/CHG/OUT	
TYPE	TIE	
TN	xx xx	
.....	.....	.....
CLS	(NHFD)/NHFA	(Deny)/Allow the Trunk Hook Flash feature over M911P trunks

LD 15: Modified prompts and responses

There are no changes to LD 15. As in the 10/20-digit ANI feature, M911_PANI is prompted in the Customer Data Block if M911E Enhanced M911 10/20 Digit package 249 is activated.

LD 23: Modified prompts and responses

Configure the source ACD DN at the tandem node such that it is a dedicated ACD queue serving 911 calls only.

When configuring the NACD table, ensure that remote targets use M911P routes only, by associating the Route List Index (RLI) with M911P routes.

The Network ACD of 911 calls over M911P trunks is illustrated in the following example.

Target	Status	Timer
2300 (local)	active	0
63003200 (remote)	active	2
64004200 (remote)	closed	4

In the preceding table, all remote targets use M911P trunks only. To configure this, associate the RLI for each remote target with M911P routes. Then, when an active remote target is found, only M911P trunks reach the target node. This ensures that 911 calls always use M911P trunks, which is the basis for the Emergency Services M911 Networked Operation feature.

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System and alarm messages

Existing error message SCH0765 indicates an invalid response for the M911P prompt. In addition, CS 1000 Release 5.0 introduces two new errors:

- SCH1980 indicates that a value other than PRI/PRI2 has been assigned to the DGTP prompt in the Route Data Block.
- SCH2160 indicates that the DTI and PRI2 packages are restricted and the VTRK prompt is set to NO.

Feature operation

Meridian 911 operation To answer a call at a primary, secondary, or alternate answering center that is configured with ACD positions, the 911 call taker presses the ACD DN key. The DN of the incoming call is displayed on the call taker's telephone.

Meridian 911 Call abandon operation When the call is abandoned it remains in its current state (that is, in CDN or ACD queue or ringing a call taker). Once the call taker answers, a continuous cadenced tone is heard for 6 seconds, followed by silence. This tone is programmable with the FTC package; otherwise, a default is given. The call taker must hang up and dial the ANI that is shown on the terminal display if call back is required.

Upon answer, the telephone display is updated with the 911 call taker's ANI and the trunk group name if the Call Party Name Display feature is used. Since the call has been abandoned, the telephone display flags the abandoned call by appending "ABAND" to the ANI.

The following example shows what is displayed on a telephone with a Numbering Plan Digit (NPD) call with an NPD of 2 and with the Call Party Name Display feature enabled. The trunk group name is displayed on the first line of the telephone display; the ANI appears on the second line.

911 CALL
2 493-6002 ABAND

DP of 1 that was translated to 415 and has the Call Party Name Display feature enabled. The trunk group name (for example, Palo Alto) is displayed on the first line of the telephone display. The Automatic Number Identification (ANI) appears on the second line.

Palo Alto
415 493-6002 ABAND

ISDN overview

Integrated Service Digital Networks (ISDN) use a standard protocol to transport both call-related and non-call-related messages to other nodes.

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Network ACD uses ISDN D-channel messages to transport call information between the source node and the remote target queues. ISDN services enable the messaging between nodes required for Call Requests, cancellation, and set-up messaging described later in this document. Source and target nodes can be connected through tandem switches; they do not need to be connected point-to-point.

Primary Rate Interface (PRI)

The ISDN PRI architecture is composed of protocol layers providing different services. There are three supporting layers:

Layer 1	Physical layer
Layer 2	Link layer
Layer 3	Network layer

These layers provide a standard interface for voice and data communication. Each layer uses the services provided by the layer below, and builds on these services to perform functions for the layer above. This layered approach splits complex protocols into easily managed blocks. Each layer or block can be modified without affecting the protocols in another layer.

D-channel

Within an ISDN environment, call control is supported out-of-band over the D-channel. The D-channel transports call control information.

Each D-channel can support up to 383 B-channels for voice transmission. Each system can support up to eight D-channels. For installation and engineering details, refer to "ISDN" (page 395).

ISDN Signaling Link (ISL)

ISDN Signaling Link (ISL) provides the capability to replace both digital and analog conventional trunk signaling with out-of-band ISDN D-channel signaling. ISL supports TIE and ISA trunk types with system to system connectivity.

There are two modes of ISL operation:

- **Shared mode** This configuration is basically the same as the PRI D-channel also supporting ISL trunks.
- **Dedicated mode** The D-channel interface is reserved for ISL use.

An ISA route must be established and identified with the dedicated or shared ISL interface. For a complete description of the ISL operating parameters, refer to *ISDN Primary Rate Interface Fundamentals (NN43001-569)* or *ISDN Basic Rate Interface Fundamentals (NN43001-580)*.

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Supporting documents

Network ACD (NACD) uses more than one special feature from the software packages. Have handy all the ISDN and ACD publications relative to the application environment.

ACD

Automatic Call Distribution (ACD) enables a large number of incoming calls to the same directory number (called the ACD DN) to be answered at agent positions that share the influx of calls equally.

ISDN

Network ACD is dependent on the network services and transport provided by ISDN. The ISDN network should already be up and running before the NACD package is loaded. Therefore, you already have the following publications on hand:

- ISDN Primary Rate Interface Feature description and administration
- ISDN Primary Rate Interface Installation
- ISDN Primary Rate Interface Maintenance

System support documents

NACD requires that the system have a specific configuration. The documents listed here provide background information supporting that configuration.

Dialing Plans

- Automatic Number Identification feature module in *Features and Services (NN43001-106)*
- *Basic Network Feature Fundamentals (NN43001-579)*
- *Dialing Plans Reference (NN43001-283)*

Electronic Switched Networks (ESN)

- *Electronic Switched Network – Signaling and Transmission (NN43001-280)*

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Network ACD functional description

Contents

This section contains information on the following topics:

"Network environment" (page 397)

"Incoming calls" (page 404)

"Feature interactions" (page 407)

Network environment

NACD employs ISDN D-channel as the vehicle for transport to send NACD call-related messages between sites. Refer to the ISDN NTPs listed under "Supporting documents" (page 395) for a complete description of channeling speech paths.

Only PRI/ISL and TIE trunks can be used for Network ACD.

Proper routing requires the dialing plan to identify ACD DNs on different nodes. This function is handled by the Electronic Switched Network (ESN). All nodes on the network must use the same dialing plan: either CDP or UDP. Both plans cannot be used within a single network.

The D-channel is also used to update the databases at the source and target nodes. Making new entries in the database triggers a D-channel message to query the far end for verification, before the entry can be registered. When updating the Routing Tables, the system checks the ACD DN address at both ends before the entry can be registered.

D-channel messages also keep the system updated on the operating status of different ACD DNs at separate locations. Source and target ACD DNs can be local or remote, and Active or Closed. Local targets are on the same node as the source ACD DN, and remote targets are at a different node. An Active status enables the remote target ACD DN to receive NACD calls. Closed means the remote target ACD DN is not available to receive NACD calls.

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Routing Tables

The ACD DN at a source node is called the source ACD DN. The source ACD DN is always used for routing ISDN messages over the D-channel.

Targets in each table are put in order by the system according to the target timer value, from the lowest value to the highest value. The timer associated with each target is used to decide when to issue a Call Request to that target. The table entries can be entered in any order, and the table is automatically reordered when timer values are changed. If all timer values are the same, the entries are listed in the order they are entered.

Network ACD uses Routing Tables for the source ACD DN to direct calls to potential target ACD DNs. Up to 20 different targets can be defined for each source ACD DN. Each target can have an individual timer defined, from 0 to 1800 seconds. Each entry in the Routing Tables includes the target ACD DN, an associated timer, and status information for the target. The targets in each routing table can be either local or remote.

The Routing Table information is used to determine when and where calls are diverted from the source ACD DN to target ACD DNs. There are two types of Routing Tables: Day Tables and Night Tables. The Day Table is used when the source ACD DN is in Day mode. The Night Table is used when the source ACD DN is in Night mode.

Calls that cannot be diverted by NACD are

- calls with ACD Ring Again activated
- Call Park Recall calls
- calls active in Teleset Messaging
- calls without Disconnect Supervision

Day Tables The Day Table is used when the source ACD DN is in Day mode. Targets in the Day Table are used independent of the Overflow by Number (OVDN) targets. They can be the same targets, but they must be redefined in the Routing Table. If no Day Table is defined, then TOF (if enabled) operates as usual.

When a call exceeds the defined timer for a target in the Day Table, the call remains in the originating queue, and a Call Request is sent to the target TOF queue. If the call has overflowed by number to a target node, and the target timer expires, the call is returned to the source TOF queue.

These calls cannot access the Day Table:

- Call Park Recalls
- ACD Ring Again calls
- virtual calls (CCR, Interactive Voice Response (IVR))

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While the ACD DN with a call is in Day Service, the call is monitored to see if it exceeds any other related timers.

Night Table The Night Table provides another night treatment that can be defined for the system. The Night Table is accessed only when an ACD DN is in Night mode.

When the source ACD DN is in Night mode, the call accesses the Night Table for that ACD DN queue. If there is no Night Table defined, then the Night Call Forward (NCFW) DN is used, if it is enabled.

These calls cannot access the Night Table:

- calls with outstanding Call Requests in the Day Table
- Call Park Recalls
- ACD Ring Again calls
- callers active in Teleset Messaging

If the Night Table is defined, then Night Call Forward (NCFW) does not apply. An error message is output if anyone uses the NITE command in Load Management. Also, the NCFW prompt does not appear in LD 23 if a Night Table is defined.

When a call exceeds the defined timer for a target in the Night Table, the call remains in the source ACD DN queue, and a Call Request is sent to that target. While the source ACD DN with this call is in Night mode, the call is monitored to see if it exceeds any other target timers. The call is not routed to its TOF queue, but remains in the incoming call queue. See Table 62 "Example routing table (UDP)" (page 399).

Table 62
Example routing table (UDP)

Target ID	Timer value	Registered	Status
66552152	0	OK	Active
2108	250	Local	Active
64342998	1800	<blank>	Closed

Target ID This number shows the actual digits dialed. For remote target ACD DNs, the dialing plans are as follows:

UDP = <AC> <LOC> <ACD DN>
CDP = <DSC> <ACD DN>

where

AC = Access Code

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LOC = Location Code
DSC = Distant Steering Code

Refer to "Engineering" (page 339) for more details on dialing plans.

Timer value This is the timer value associated with each target ACD DN. This value is rounded off to an even number, and gives the amount of time (in seconds) that a call is queued by the source ACD DN before a Call Request for this call is sent to the target associated with this timer.

Registered When a target ACD DN is entered into the Routing Table, the source node attempts to register itself with the target ACD DN. Receiving a positive response from the target node indicates that the target ACD DN is registered. A source is registered when the target ACD DN has been queried and responds to the request.

OK indicates that the source is registered with this target.
Local indicates that the target defined is local to the source node. Registration is not required.
<blank> indicates that if this field is blank, the target has not accepted the Table entry. There has been either no reply or a negative reply from the target node: the system is down, the network is down, or the DN is not valid.

Status This field describes whether the target ACD DN is currently able to answer calls or not able to take NACD calls from the source.

Active indicates that the target is active or available to accept NACD calls.

Closed indicates that the target is closed to incoming NACD calls. This occurs for different reasons:

- current number of Call Requests at the target exceeds its Call Request Queue size (heavy traffic)
- currently in Night mode

Source Table Viewer

When an entry in a Routing Table is configured, an NACD facility message is sent to the target node. When this message is received at the target node, an ACD Source Table entry is created at the target ACD queue. When the target ACD queue changes state, the target node can send a message to the source node to inform it of the state change. Once the source node receives this message, it changes the state of the entry in the associated Routing Table.

The customer can use the Source Table Viewer to determine which ACD queues are targeting a particular ACD queue at a particular node. Also, printing the Source Table can help determine if NACD Source tables have become corrupted, or out-of-sync with their associated Routing Tables.

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The Source Table can be printed in LD 23.

Note: The NACD source table cannot be edited using this feature.

LD 23 Print source table

Prompt	Response	Description
REQ:	PRT	Print a data block.
TYPE:	NACD	Network ACD
CUST	xx	Customer number as defined in LD 15.
ACDN	x...x	ACD Directory Number
TABL	S	Source Table

Table 63 "Print source table example" (page 401) shows print source table examples.

Table 63
Print source table example

```
REQ prt
TYPE nacd
CUST 1
ACDN 3901
TABL s

ACD DN # :  3901
TABLE NAME: S
CURRENT STATUS: INACTIVE
ENTRY NO            SOURCE ID          LAST_ACK            OUTST_MSG
1                   2901               INACTIVE SENT       NOT SENDING
2                   2902               INACTIVE SENT       NOT SENDING
3                   2903               INACTIVE SENT       NOT SENDING
4                   2904               INACTIVE SENT       NOT SENDING
5                   2905               INACTIVE SENT       NOT SENDING
```

Where:

CURRENT STATUS indicates the status of the local ACDN. This field shows either ACTIVE or INACTIVE.

SOURCE ID indicates the remote ACDN targeting this local ACDN.

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LAST_ACK is the last MCDN message sent to the source node that has been acknowledged. This field shows either ACTIVE SENT or INACTIVE SENT.

OUTST_MSG indicates if an MCDN message of INACTIVE SENT or ACTIVE SENT is currently being transmitted. This field shows either SENDING MSG or NOT SENDING.

Cascade routing

A Call Request from the source ACD DN is the first message sent to a target node to queue the call waiting for the next available agent. The call stays at the source node receiving the treatments defined for that ACD DN (Music, RAN, and so on).

Network ACD sends out Call Requests to search for an available agent within the system. Only one Call Request is sent at a time, but the system continues to search until an agent is found. That is, while the first Call Request is pending at a target, the system can send another Call Request for the same call to another target. Up to 20 Call Requests can be pending at any one time.

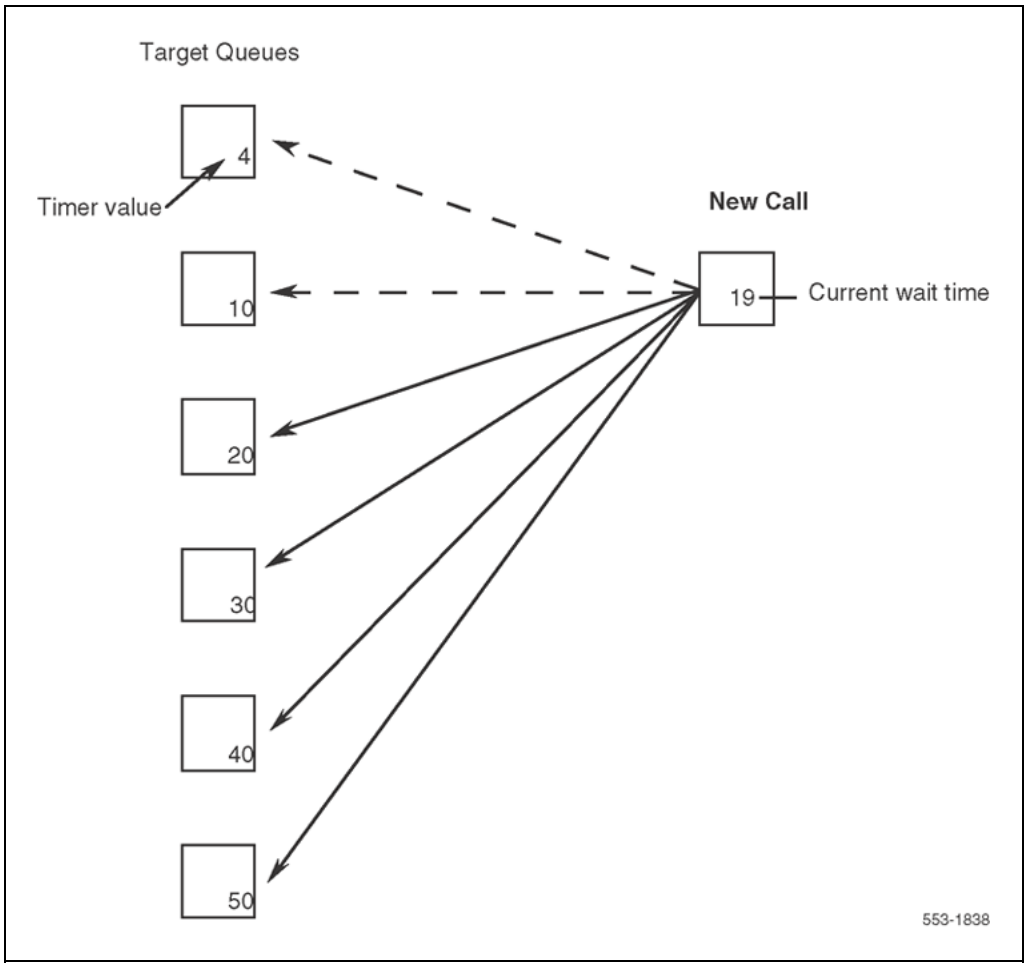
If the duration timer (DURT) for a particular target expires before the call is answered, there can be only 19 Call Requests pending. Then, the system resends the Call Requests to maintain the 20 pending. The Cascade occurs as the Call Requests are issued individually, and the system works through the Routing Table issuing Call Requests to targets with successively longer timers as illustrated in Figure 23 "Cascade routing" (page 403).

Targets are arranged automatically according to increasing timer values. The longer a call waits, the farther down the routing table it goes. That is, Call Requests cascade through the listed targets looking for an available agent. If the timers for each target are the same value, then the targets are listed in the order they are entered into the database.

As soon as the call is answered, or abandoned, all pending Call Requests are canceled. That is, the system must follow through the process—Call Request, Free Agent notification, Agent Reserve, and Call Presentation (or abandoned)—and then cancel all outstanding Call Requests for that call.

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Figure 23
Cascade routing



Dynamic status change

Certain events and conditions within the system enable the status for a particular queue to change automatically—a dynamic status change. Conditions that cause the status of a target ACD DN to change are as follows:

- Night Service

  (NSVC):When the target ACD DN goes into Night Service, the status automatically changes to Closed at all its source ACD DNs. As soon as one agent or supervisor logs in, the ACD DN is taken out of NSVC, and the status is automatically changed to Active.

- Traffic volume:

  When calls in the Call Request queue exceed the Call Request Queue Size (CRQS) threshold, the status changes to Closed. The target ACD

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DN remains Closed to further network call requests until the calls in the queue fall by the Flow Control Threshold (FCTH) *difference*.

CRQS – FCTH = *difference*

Example:

Configure these parameters in service change:

CRQS = 80

FCTH = 20

When the queue = 80, the target is Closed (CRQS = 80)
When the queue = 60, the target is Active (CRQS – FCTH = 60)

- Manual Close:

  CRQS = 0

  CRQS can never be lower than the flow control threshold. Setting the CRQS to zero in service change or Load Management closes the queue. The Call Request queue shuts down. When the CRQS is changed to a positive value again, the target becomes active. The CRQS must be at least the FCTH + 1 or 20, whichever is greater. The maximum value is 255 with a default of 100.

  Alternatively, remove or close the queue by removing that ACD DN from the Routing Table for that time frame (Day or Night).

Incoming calls

Incoming calls to a Network ACD site are initially handled as any other ACD application. That is, incoming calls are queued for presentation to the first available agent.

Call Requests

When calls have waited longer than the timer values in the Routing Table, calls can be diverted to target agents for call presentation. Targets can be local or remote. Calls that are to be diverted to a remote target remain in the queue of the source ACD DN, and the software sends a Call Request over the ISDN D-channel to queue Call Requests at the target node.

When an agent becomes available at the target node, that agent is reserved for that particular call. The target node responds to the source node with an Agent Free notification over the D-channel. Only after receiving the Agent Free notification is the voice call physically diverted from the source node to the target node and presented to the reserved agent.

Reserve Agent Timer (RAGT) The Reserve Agent Timer keeps the agent reserved until call presentation or timeout. The timer also prevents a situation where an agent is reserved indefinitely.

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The Reserve Agent Timer is customer defined in service change LD 23 (2 – (4) – 30) and Load Management (RAGT). When an agent is reserved with Countdown Allowed (CNTA) Class of Service defined in LD 11, the RAGT countdown is shown on the agent's Digit Display.

The agent being reserved has a Reserve Agent Timer with countdown display. The countdown display starts when the Reserve Agent Timer (RAGT) starts, and counts down by increments of 2 seconds, to zero. If the call is not presented to the target agent before the Reserve Agent Timer (RAGT) expires, that call remains at the originating source queue. The target agent is returned to the idle agent queue.

When a call is presented or answered (depending on the display CLS enabled), the Digit Display shows the appropriate call information—dialed DN, DNIS number, CLID, and so on. Diverting the call and system functions show the agent's display to the caller.



CAUTION
Call modification information can be lost.
If the call is transported over a node that does not support the same release or features, certain call information is lost and is not displayed on the terminating telephone.

When a target agent becomes available, the target node sends an Agent Free notification message to the source ACD DN. The agent is removed from the idle agent queue and reserved until the network call is presented. If the timer expires before the call is presented, the agent is returned to the proper place in the idle agent queue. If there are already agents in the idle agent queue who have the same priority, then the agent is inserted after the last agent who has the same priority.

Canceling Call Requests

There are some situations that can change an agent's reserved status or cancel a Call Request, affecting the timer. Agent telephone key operations can change the status of a station to unreserved. Cancellations for other reasons can be initiated by the source or target ACD DNs also.

Source node The source node cancels Call Requests on the following events:

- call is answered by any agent or supervisor
- call is abandoned

Cancellation messages are sent to all remote target ACD DNs with Call Requests pending for that ACD call.

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Target node A target ACD DN cancels Call Requests on the following events:

- Duration Timer (DURT) expires
- Reserve Agent Timer (RAGT) expires
- Key Operation: An agent activates keys or logs out before the Call Set-up message is received (as in using the NRD/MSB keys)
- Night Service: If a target ACD DN goes into Night Service, all pending calls in its Call Request queue are cancelled

Queue priorities

Each agent answers incoming calls based on the priorities established for that ACD DN. There are three different queue configurations that can be defined for Network ACD.

Oldest Call in Network (OCN) This option takes the oldest call in the network overall. This option requires the Oldest Call in Network (OCN) be enabled, and the High-Priority Queue (HPQ) be disabled in LD 23:

OCN = YES
HPQ = NO

The system compares calls from queues for that target ACD DN. The highest priority call that has waited the longest is the call presented to the next available agent.

Own TOF Queue First This option selects the oldest call from the ACD DN's own TOF queue. With this preference, both the Oldest Call in Network option and the High-Priority Queue option should be disabled in LD 23:

OCN = NO
HPQ = NO

If there are no calls in the Source Timed Overflow queue, the system looks at calls in the Call Request queue and Source Timed Local Flow-in queue. If there are no calls in either of those queues, then calls in the High-Priority queue and nonpriority queues are routed next. Calls for a target ACD DN are best answered by the agents for *that* ACD DN. With this configuration, calls are selected in the following order:

1. the oldest call in the agent's own TOF
2. the oldest High-Priority call in the Call Request queue or Local Flow-in queue
3. High-Priority calls
4. nonpriority calls

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Own TOF and High-Priority Queue over the network This option presents calls from the agent's own TOF queue and High-Priority queues before presenting calls from source TOF queues and Call Request queues.

With this preference, the Oldest Call in Network option should be disabled and the High-Priority Queue option should be enabled in LD 23:

OCN = NO
HPQ = YES

With this configuration, calls are selected in the following priority:

1. the oldest call in the agent's own TOF queue
2. the oldest call in the agent's High-Priority queue
3. the oldest call from the Call Request queue or Local Flow-in queue
4. the oldest call in the agent's nonpriority queue

Call presentation

The customer must first define call processing priorities for the system, as described in the previous section. Then, the system follows this procedure to present a call to the next available agent. Calls diverted by NACD are placed in the queue for the source ACD DN, until an agent becomes available for the call.

When an agent becomes available, that agent is reserved by the system for the NACD call. The Reserve Agent Timer starts, to prevent the agent from being reserved indefinitely. During the countdown, the system sends an Agent Free notification over the D-channel to the source ACD DN.

Receiving the Agent Free notification, the source ACD DN then diverts the physical voice call to the target agent reserved for that call. On call presentation the display shows the appropriate information—dialed DN, DNIS number, CLID, for example. Diverting the call and system functions are completely transparent to the caller.

If the Reserve Agent Timer expires before the call can be presented, the call remains at the source ACD DN.

Feature interactions

Features and services listed here are described in detail in other publications as ACD features or as software features compatible with software.

Only calls eligible for TOF treatment are eligible for NACD treatment. The following calls are *not* eligible:

- **ACD Ring Again** If RGA is applied to a call, it is not eligible for NACD.

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- **Call Park Recall** Parked calls that time out and recall back to the ACD agent are not eligible for NACD.
- **Non-ACD Interact** Digit translation is not supported on target IDs within any Routing Table.
- **Teleset Messaging** Calls actively in Teleset Messaging are not supported by NACD.

Network ACD interacts with ACD and basic features of the system. These interactions are described in the following section.

ACD interactions

Agent (AGT) Lamps An AGT lamp shows the ACD supervisor the status for every agent in the group. The lamp states are updated every time an agent's status changes.

When an agent is reserved for network calls, the AGT key/lamp on the supervisor's station is in the slow flash state.

ACD Calls Waiting (AWC) The ACD Calls Waiting key uses lamp states to show the agent when the number of calls waiting in the queue has exceeded the customer-defined threshold values. The lamp states work in conjunction with the normal Overflow by Number and Interflow features. However, by an optional command in LD 23, the AWC lamp states are enhanced in the NACD environment.

With the new lamp state option (NCWL) enabled, the Busy Threshold (BYTH) and Overflow Threshold (OVTH) apply only to Overflow by Number and Interflow conditions, but do not change the lamp states. Calls in the Call Request and Local Flow-in queues are included when adding up the calls in queue for lamp state updates.

The new lamp state settings separated from BYTH and OVTH are available to all ACD Package B users. Independent of NACD, thresholds that now update lamps are defined by the customer in service change LD 23 and Load Management.

These lamp states are based on the sum of all calls in the following queues:

- the agent's TOF queue
- the agent's High-Priority queue
- the agent's nonpriority queue
- the Local Flow-in queue
- the Call Request queue

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The Calls Waiting lamp states are as follows:

Dark	The sum of all calls in these queues is less than the Call Waiting Threshold (CWTH).
Steadily Lit	The sum of all calls in these queues is equal to or greater than the CWTH, but less than the Call Waiting Lamp Flash (CWLF) threshold.
Slow Flash	The sum of all calls in these queues is equal to or greater than the CWLF threshold, but less than the Call Waiting Lamp Fast Flash (CWLW) threshold.
Fast Flash	The sum of all calls in these queues is equal to or greater than the CWLW threshold.

Dialed Number Identification Service (DNIS) The DNIS information is propagated to remote target nodes. On call presentation, it is displayed on the Digit Display.

If the call is incoming on a non-ISDN trunk, the displayed information includes only the trunk access code, to show that it is an ACD call.

Display Queue (DWC) key The lamp states for the Display Queue (DWC) key are updated for NACD enhancements, as explained above in the Calls Waiting (AWC) description. The DWC display shows queue status in the following format:

a a a b b b c c c d d d d

where

a a a = sum of calls waiting in queue:
source TOF, High-Priority, nonpriority
b b b = agent positions available
c c c = waiting time for the oldest call in these queues:
source TOF, High-Priority, nonpriority
d d d d = sum of all calls in the following queues:
nodal CCR, Flow-in, and Call Request queues

The supervisor can monitor the nodal Flow-in queue separately using the Display (DSP) key. Push the DSP key and dial the source ACD DN. The display then shows the sum of calls in the source TOF queue and Call Request queue.

Headset or MSB Logout (HOML) The HOML option enables an agent to log out by removing the headset or going on hook without using the Make Set Busy (MSB) key. Logout while on Agent Reserve causes a cancellation message.

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Individual DN (IDN) key The IDN key can be any one of the following key types:

DIG	Dial Intercom Group
HOT	Hot Line
MCN	Multiple Call, Nonringing
MCR	Multiple Call, Ringing
PLN	Private Line, Nonringing
PLR	Private Line, Ringing
SCN	Single Call, Nonringing
SCR	Single Call, Ringing
VCC	Voice Call

When an agent or supervisor activates any IDN key while reserved, a cancellation message is sent to the source node.

If any IDN key is used by a remote target agent when being presented with a call from the Call Request queue, the call is terminated to another idle agent. If there are no idle target agents available, the call remains at the front of the target TOF queue and is the first one to be answered.

Call Interflow (IFDN) Call Interflow takes precedence over Network ACD routing. That is, calls diverted to the IFDN are not routed by NACD. Network calls diverted to an IFDN lose all the network information, so that information cannot be displayed on the terminating telephone.

If the target ACD DN is a local ACD DN, Interflow and recall to source can be used. If the target ACD DN is a remote ACD DN or a non-ACD DN, Interflow is not supported.

Disabling Interflow is recommended. Configure the timer value as zero (0) in the routing table for those ACD DNs that need calls immediately diverted.

Key features When an agent is reserved, activation of the following keys removes the position from reserved status:

AAG	Answer Agent key
ACNT	Activity Code key
AMG	Answer Emergency key
ASP	Answer Supervisor key
ADL	Auto Dial key
CFN	Call Forward key

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MSB	Make Set Busy key
NRD	Not Ready key
OBV	Observe Agent key
RAG	Ring Agent key
SCC and SSC	Speed Call key

If these keys are used by a remote target agent when being presented with a call from the Call Request queue, the call is terminated to another idle agent. If there are no idle target agents available, the call remains in the front of the target TOF queue.

Night Call Forward (NCFW) Night Call Forward is used only if there is no Night Table defined for an ACD DN.

Night Service (NSVC) With NACD, there are three Night Service treatments that can be defined:

- Night RAN Route with Night Tables

  Callers receive Night RAN, while the call is monitored for the timers defined for target nodes.

- Night Tables only

  No Night RAN is given, while the call is monitored for the timers defined for targets.

- Night Tables with Delay Night RAN Treatment (DNRT)

  With active entries in Night Tables (DNRT) on, callers get Day treatment. The FRT must be 4 seconds greater than the timer value of the last entry in the Night Table for this to work. When all entries in the Night Table are inactive, then a Night RAN is returned to inform the caller that the network is closed.

When a caller accesses the queue in Night Service and uses the NACD Night Table (the Night Table has open targets), the caller hears first and second RAN.

Transition mode:
When the source ACD DN goes into Night Service via the NSVC key (dialing T [8]), calls already in queue still access the Day Table, but all new calls access the Night Table. If there is no Night Table defined, traditional Night Treatment is given.

Night mode:

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The source ACD DN goes into the Night mode using the NSVC key (dialing N [6]), when all agents log out. Then all calls access the Night Table, unless they have outstanding Call Requests from the Day Table.

- source node in Night Service
  - transition mode:
    - new calls access the Night Table
    - existing calls access the Day Table
  - Night mode:
    - new calls access the Night Table
    - existing calls that have pending Call Requests from the Day Table are honored, but there is no more searching of the Day Table
- Target goes into Night Service
  - Transition and Night mode:
    - new Call Requests are denied
    - existing Call Requests are canceled

When the source ACD DN comes out of Night Service, only current Call Requests accessing the Night Table still apply. All new calls access the Day Table. Only calls without outstanding Call Requests can access the Day Table.

Overflow by Number (OVDN) Overflow DNs defined at the OVDN prompt in LD 23 are not used by NACD. They are used by Overflow by Number only. The same ACD DNs can be defined in the NACD Routing Tables as local targets. OVDN then recalls to source when the call waits longer than the timer.

Secondary DN call blocking (SDNB) Secondary DN call blocking prohibits call presentation to an agent's secondary DN while that agent is active on an ACD call.

Secondary DN calls are blocked when an agent is reserved.

If the agent is no longer reserved, and IDN is MADN SCR, the light for that DN flashes.

Time Overflow (TOF) If Routing Tables are not defined, then TOF operates as usual. Refer to the publications listed in "Supporting documents" (page 395) for a complete description of TOF.

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Feature interactions

Calling Line Identification (CLID) CLID numbers are sent across the link on call presentation to target agents. With CLID enabled, the originator's name is sent across the network and displayed on the target agent's telephone only if each route has Network CPND enabled. Refer to the *ISDN Basic Rate Interface Fundamentals (NN43001-580)* for more details on Network CPND.

Call Party Name Display (CPND) CPND displays preprogrammed names associated with incoming calls only on M2317, M3000, and Meridian Modular telephones (M2216ACD-1 and M2216ACD-2). Names associated with this feature are sent across nodes only when the CPND package (95) is equipped. More complete details on Network CPND are in *ISDN Basic Rate Interface Fundamentals (NN43001-580)*.

Without CLID, a call from outside the network displays the name associated with the incoming route, if the source node has a name defined for that route.

Call Forcing (FORC) After an ACD call is disconnected (by either party), there is a 2-second delay before the next call is accepted. If the next call is from the Call Request queue, there is an additional delay from 0 to the Reserve Agent Time before the call is presented to the agent.

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Network ACD engineering

Content

This section contains information on the following topics:

"Dependencies" (page 415)

"Feature limitations" (page 417)

"Feature requirements" (page 417)

"Recommendations" (page 419)

"Engineering guidelines" (page 420)

"Target table definition" (page 421)

"Parameter definition" (page 423)

"Network requirements" (page 425)

"Designing the NACD routing table" (page 428)

"Incremental impact engineering" (page 434)

Dependencies

A Network ACD system requires that all nodes in the system have the same configuration. Networking parameters for ISDN and ESN *must be* consistent throughout all nodes or switches in the system with respect to NACD. Significant feature interactions can result unless all switches have the appropriate feature packages and classes of service enabled for NACD.

For the proper supporting software, consult your Nortel representative.

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MSDL Engineering Guidelines

When configurations include a tandem system, ensure that the D-channel link speeds are engineered to meet required response and performance objectives. Refer to the MSDL Engineering Guidelines in the *Communication Server 1000M and Meridian 1 Large System Planning and Engineering (NN43021-220)*.

Package dependencies

Expanded target capabilities are introduced with the ACD Enhanced Overflow (EOVF) package 178, which is also a prerequisite for the Network Automatic Call Distribution (NACD) package 207. Table 64 "Minimum package requirements" (page 416) shows the minimum package requirements for NACD.

An error code is sent for every package requirement not supported on the machine. For a complete definition of all error codes and system messages, refer to *Software Input/Output Administration (NN43001-611)*. Also, a list of the available feature packages and package requirements is included in *Features and Services (NN43001-106)*

Table 64
Minimum package requirements

Package name	Mnemonic	Package number
Basic Routing	BRTE	14
Digit Display	DDSP	19
Basic Queuing	BQUE	28
Network Class Of Service	NCOS	32
Basic ACD	BACD	40
ACD Package B	ACDB	41
Network Alternate Route Selection	NARS	58
Coordinated Dial Pan	CDP	59
PBX Interface for DTI/CPI	PBXI	75
ISDN Signaling	ISDN	145
Primary Rate Access (CO)	PRA	146
ISDN Signaling Link	ISL	147
Advanced ISDN Network Services — tandem nodes	NTWK	148
ACD Enhanced Overflow	EOVF	178
Network ACD	NACD	207

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Feature limitations

Calls from trunks without Disconnect Supervision are not able to initiate Call Requests.

Automatic Trunk Maintenance (ATM) is not supported on ISDN PRA or ISL trunks.

Network CPND is supported only on nodes within the network.

The NACD feature enables ACD agents at different locations (nodes) to service call over the network at remote targets. When an unanswered ACD call is routed by means of NACD to a remote ACD DN node and the call is not answered by an ACD agent, the call is placed in a time overflow queue (TOQ) of the remote ACD node. The call is not returned to the original ACD DN target node queue.

Tandem TIE Trunk Networks (TTTN) are not supported by NACD.

Only one location per NACD node can be used with HLOC in LD 15.

Pretranslation is not supported on target IDs in the Routing Tables.

Calls ineligible for NACD treatment are:

- ACD Ring Again calls
- Call Park Recall calls
- An active Teleset Messaging call

There should be one home location code per node.

There can be no more than 20 Call Requests pending for any one call.

Feature requirements

The following are the feature requirements.

Private Network Identifier (PNI)

A Private Network Identifier (PNI) relates to the customer number. It is required for interworking between switches. Within one network, use the same PNI value in both the Customer Data Block (LD 15) and the Route Data Block (LD 16). When operating between different networks, the Customer Data Block PNI is the PNI for the switch and the Route Data Block PNI is the PNI for the remote switch where the route terminates.

ESN requirements

The Electronic Switched Network (ESN) provides least cost routing between locations in a private network with a consistent dialing plan. Consistent dialing plans for each node in the network are provided by the Coordinated

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Dialing Plan (CDP) or the Uniform Dialing Plan (UDP). If MAX is equipped, a 7-digit dialing plan is required. For a complete description, refer to "Electronic Switched Networks (ESN)" (page 395).

Each NACD node within the network must have a unique address that is known throughout the network. NACD requires that all nodes within the network have *either* a Coordinated Dialing Plan (CDP) *or* a Uniform Dialing Plan (UDP). The system with NACD cannot have *both* CDP and UDP.

These dialing plans are needed to identify each node within the network. All nodes within the network must be able to recognize every other node in the network. Identification is provided by the Local Steering Code (LSC) for CDP or the Home Location Code (HLOC) for UDP. When signaling messages are sent between nodes, each node is identified along with the return route for that node in response.

The source identifier is put in the source ACD DN field of the AUX messages at the target node, and shown on the agent's Digit Display on call presentation.

Coordinated Dialing Plan (CDP)

A Coordinated Dialing Plan (CDP) consists of the CDP code and the Directory Number (DN). This dialing plan does not need an access code because the CDP code is part of the internal dialing plan.

The CDP code is one of the following:

- Distant Steering Code (DSC)
- Local Steering Code (LSC)

The complete CDP can be from 3 to 7 digits long, or 3 to 10 digits with the DN Expansion package (DNXP, Package 150) enabled for Distant and Local Steering Codes. The DN length is defined in the ESN service change LD 86 at the NCDP prompt.

The target ACD DN identifier is the remote ACD DN defined in the Routing Table, and can only use the Distant Steering Code (DSC).

Source ACD DN identifiers are composed of the Local Steering Code (LSC) followed by the source ACD DN. Every node in the network must recognize the LSC used for source identifiers as a Distant Steering Code (DSC). Trunk Steering Codes (TSCs) are not supported by ISDN; and therefore, are not supported by NACD.

Define 7-Digit CDP If no CDP is defined or if the existing CDP is 7 digits long, then the CDP can be used for the NACD application.

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LD 86 ESN data block must have the number of digits in the CDP (NCDP) code prompt equal 7. LD 87 defines the 3-digit LSC. The LSC must have a DMI that deletes 3. A 3-digit DSC is required for each node on the network. LD 15, Customer Data Block, must also define LSC as the already defined LSC from LD 87. This programming must be done at all the nodes in the network.

In LD 86, when defining Route List Entries that are associated with either DSCs or LOCs used with the NACD applications:

- The routes (ROUT) must be only ISDN routes. Also, the ISDN routes cannot step to non-ISDN routes.
- The PNI defined for the routes must be equal to the PNI defined in LD 15, Customer Data Block, of the node that it is directly connected to.
- No digit manipulation (DMI) can be defined; in other words, DMI = 0.

Uniform Dialing Plan (UDP)

The Uniform Dialing Plan has an access code, a UDP code, and a DN. If the Network Alternate Route Selection (NARS, package 58) is enabled, there are two access codes that can be used, AC1 or AC2, and the location code. With the Basic Alternate Route Selection (BARS, package 57), use only AC1. Access codes for either AC1 or AC2 can be 1 or 2 digits long. The UDP must be 7 digits without the AC.

The UDP code can be any one of the following:

- Location Code (LOC)
- Home Location Code (HLOC)

If the target node has a 5- to 7-digit ACD DN defined, only the last 4 digits are used as an identifier. When the terminating telephone answers the call, only the last 4 digits are shown as the CLID. The CLID can be used as a call back number.

Source ACD DN identifications are built from the Home Location Code (HLOC) and the source ACD DN. The HLOC must be included in the AC2 translation table. Every node on the network must define the location code used for target DNs as part of the AC2 translation table. Target identifiers are defined in the routing tables.

Recommendations

The following recommendations should be followed.

Customer configurations

Network ACD can function in three basic configurations: similar service, special service, and a hybrid of the two. A combination of these NACD configurations can exist within the same network.

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Similar Service Network This configuration is used when there is only one service handled by NACD, and all ACD agents are equally capable of handling any incoming call.

Every ACD DN within the network must be defined in all the other ACD DN's Routing Tables. Only the Oldest Call in Network (OCN) option is enabled, and all incoming trunks should be defined with the same priority.

OCN = YES
HPQ = NO

Special service network Here, there can be different services being offered by agents throughout the network. Each agent is specially trained for a particular product or service, but is still able to answer any incoming call. The ACD user can define specialized services among groups of agents and still enable calls to be evenly dispersed among all available agents during peak traffic times.

Only the ACD DNs with similar functions should be defined as targets for each other. Every ACD DN should have OCN disabled (NO) and HPQ enabled (YES). All incoming trunks should be defined as High-Priority trunks.

OCN = NO
HPQ = YES

Hybrid network A hybrid network is a union of the two configurations mentioned above. Different services or products are being offered, but they are closely related. A TOF call for one ACD DN should have precedence over other calls overflowing to the same ACD DN. Still, it is best to answer the oldest calls first. After answering all TOF calls, agents return to answering calls in their own High-Priority queue.

Every ACD DN within the network must have all the other ACD DNs defined in the Routing Tables. Then, both OCN and HPQ are disabled (OFF).

OCN = NO
HPQ = NO

Engineering guidelines

When independent Automatic Call Distribution (ACD) nodes are properly networked using the Network Automatic Call Distribution (NACD) package, the overall performance of the network can improve in three areas:

- Reducing Average Speed of Answer (ASA)
- Increasing total ACD calls handled by the network
- Reducing ACD agents required to maintain the same service level

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NACD is designed to enable the call distribution centers to function as one virtual queue based on the length of time calls have waited for available agents and on the work loads at each location.

Do not forward calls to centers that are overloaded or understaffed. Use care when provisioning trunks between locations. Underprovisioning can result in agents being reserved for calls, but with no facility available for presenting the overflowed network call.

If a call is presented to a remote target ACD agent, and is not answered by the remote target ACD agent, the call is returned to the front of the TOF queue of the remote target ACD DN. It is not routed back to the original ACD target node.

It is necessary to look at the call registers and the real-time effect of adding NACD to new or existing switches.

The following are guidelines for establishing NACD, including

- Target table definition
- Parameter definition
- Network requirements
- Design of the NACD Routing Table
- Incremental impact engineering

Target table definition

NACD automatically routes calls to available agents. For maximum efficiency, define the order of remote targets in the NACD Routing Table according to the guidelines below.

Real-time impact

CPU real-time engineering is always required at the source node. The CPU of a tandem or remote target node needs engineering only when its busy hours coincide with those of the source node.

Noncoincidence busy hour (time zone difference)

Busy hours in a Media Gateway 1000B (MG 1000B) s are often similar for large organizations spread over a wide geographical area. NACD improves the utilization of facilities by overflowing calls arriving at the source node to target nodes in a different time zone so that idle resources at target nodes with different busy hours can be fully utilized. This enables a better balance of agents across the network. It can also reduce the need to provide extra staff at the source location during peak times as the traffic is now distributed across the network.

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ACD DN load at each node (spare capacity)

The relative ACD DN load between the source node and a target node is one of the most important considerations in determining where to overflow the waiting call. If the average loading per ACD DN is known, then the ACD DN with the lowest loading receives the highest priority for receiving networked overflow calls.

To calculate the ACD DN with the lowest loading (or the highest spare capacity), use the following formula:

$$S = (33–A) \times N$$

where

S = spare capacity
A = agents load in CCS (Calls Accepted × Avg. Work Sec.) / 100
N = number of agents in the queue

Once the network is installed, it can be necessary to recalculate the spare capacity to provide better balance on the network.

The spare capacity is calculated only for the target location because it receives the extra traffic.

If S is negative, the target ACD DN is overloaded and cannot accept any overflow traffic.

Agent group size in an ACD DN

Because of the higher traffic carrying capacity of a larger service group, when two ACD DNs have the same average agent loading per ACD DN, the ACD DN with the most agents receives a higher priority in the routing table.

Number of hops

In general, a call with a number of switches involved in the call setup requires more resources than a network call involving only two switches. As a general rule, the ACD DNs co-located in the source node receive the highest priority in the routing table.

The next consideration is for locations with only one hop or point-to-point connections. If possible, nodes requiring tandem connections should receive a lower priority depending on how many tandem points are involved.

The real-time impact of each NACD call is 56 ms at the source location, while tandem calls require 215 ms of real time. Each NACD call requires 194 ms to set up, while a non-network ACD call requires 138 ms. Each time a Call Request is sent over the network, one call register is required at the

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source node and one call register is required at the target nodes. These call registers are required in addition to those necessary to establish the call. They are required only with Call Request messaging for NACD calls.

Parameter definition

The parameters used to control NACD are defined in the following sections.

Flow Control (LD 23: FCTH)

The Flow Control option opens and closes the ACD DN for network calls. Once the number of Call Requests received over the network meets the call request queue size CRQS defined in LD 23, the queue is shut down (INACTIVE) for network calls. The pending queue request size must be decreased by a value at least equal to the flow calls control threshold.

For example, a call request queue size of 50 with a flow control of 10 enables the queue to become inactive after 50 call requests are pending. After 10 calls or 10 Call Requests have been answered or removed, leaving 40 remaining in queue, the queue reopens.

Call Request Queue Size (LD 23: CRQS)

The Call Request Queue Size option (CRQS) determines the maximum number of Call Requests accepted by a target Queue over the network, before the queue is declared closed for network calls.

It is recommended that the Call Request Queue Size be approximately 20% higher than the number of trunks available for networking. If the customer selects the Oldest Call in Network option (OCN), configure this value at 5% over trunking capacity. This avoids reserving agents for calls on the network when trunking facilities are unavailable. Flow Control (FCTH) is typically configured at 25% of the call request queue size.

The CRQS must be defined for each ACD DN in the network.

Resend Timer (LD 23: RSND)

This is the length of time the source node waits for a response from the target node after sending a Call Request message. When the Resend Timer expires, another message is sent. If the second Call Request message expires without a response, the Call Request is removed from the network queue. The Resend Timer is configured as a 4-second default and should be changed only if the network uses multiple hops and ISL with lower baud rates.

A single hop typically requires 100 ms of real time to set up the call. When the Resend Timer is too large, the control function of the timer to limit traffic to busy nodes is lost. If the Resend Timer is too small, the access of calls to nodes can be limited unnecessarily.

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The Resend Timer must be defined for the source node and the target nodes.

Reserve Agent Timer (LD 23: RAGT)

The Reserve Agent Timer indicates the maximum amount of time an agent is reserved for a network call. The range is 2–30 seconds with the default configured at 16 seconds. The Reserve Agent Timer can be changed using 2-second increments.

If the Reserve Agent Timer is configured too high, the agent is reserved waiting for calls. If the Reserve Agent Timer is configured too low, the agent can be freed before the network facility can set up the call. Different timer settings can be tried through Load Management. Subsequent calls are presented to agents only after the Reserve Agent Timer has expired.

The RAGT must be defined only for target queues.

Oldest Call in Network (LD 23: OCN)

This feature determines if the oldest call in the network is answered ahead of calls to the source location. Use caution with this feature. Because agents are reserved for network calls, agents can remain idle while calls wait in the local queue.

To avoid reserving all the agents for network calls, split the ACD group into two areas: one area for all calls and the second area for a group of agents equal to the number of TIE lines between the network locations. This solution enables local calls to overflow by time into the area for all calls.

The OCN option must be defined only for target queues.

ACD agents requirement at each node

The current method of calculating ACD agents inflates ACD calls by 30% to enable peak traffic during busy hours. The provisioning of agents requires 30% spare capacity to cover traffic peaks. When NACD is applied normally, this 30% spare capacity is not necessary because queued calls are offered to other nodes in the network after the designation overflow timer expires. However, if all nodes peak at the same busy hour, the 30% spare capacity is still required.

Trunking requirements at the source and target nodes

Each node on the network must have a connection to the source node, either directly or through one or more tandem nodes. It is assumed that the trunking requirements have been satisfied to handle existing traffic. For NACD, estimate the incremental requirement for carrying overflow calls to each target node.

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In the current engineering procedure, there is an adjustment similar to agent traffic on the trunking requirement for traffic peaking of 30%. Waiting calls are eventually handled by other nodes with less average waiting and do not occupy the trunks.

Keep the peak load adjustment, but reduce the Average Speed of Answer (ASA) by half in the trunk calculation to enable the potential reduction in waiting time. Modify trunk traffic calculations to the source node by multiplying Average Busy Season Busy Hour (ABSBH) traffic by 1.3 to account for trunk traffic peak load. If the level of given traffic in calls already reflects the peaking factor, then replace 1.3 with 1.0 in the following calculation.

Trunk Traffic = (Offered Calls × 1.3 × DCP/100) + (Offered Calls × 1.3 × 0.5 × ASA/100) CCS

Direct Call Processing (DCP) is the time in seconds that is spent handling incoming ACD calls.

Where the objective of networking is to reduce the number of agents in the source node while maintaining the same level of service, perform the same calculation but reduce the number of agents at the source node and calculate trunk traffic without the 50% reduction of ASA in the above formula.

Duration Timer (LD 23: DURT)

The Duration Timer indicates how long a target node honors a call request from the source node. If the timer expires, the call is removed from the call request queue. The range of the Duration Timer is 15–45 minutes with the default configured at 30 minutes. If this timer is too large, the network call request queues can become overcrowded. If the timer is too small, waiting customers can be cut off from receiving services.

This timer must be defined only for target queues.

Network requirements

The requirements for establishing NACD on a network are outlined in the sections that follow.

Signaling link requirements between source and target nodes

If the signaling message for NACD applications is carried by a PRAD-channel between two nodes, the PRA D-channel's signaling capacity is so large that engineering of the link is not required. If the signaling link is ISL, the data rate of the signaling link must be determined. Use care in multiple hops to ensure recalculation of all the traffic on the ISL link. For multiple hops, engineer all links to the same baud rate. Avoid using ISL links at different speeds because this can block messages at the tandem location.

The formula to calculate the ISL/PRA rate is

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Number of NACD calls × .63 = BPS
or Numbering NACD calls = BPS/0.63
where BPS = bytes per second Baud rate

Table 65
Data Link capacity for NACD and ISL calls

Link Data rate (D) in kbps	64	19.2	9.6	4.8	2.4	1.2
NACD Calls	54,064	27,563	15,303	7,655	3,827	1,908
ISL Calls	77,582	39,553	21,960	10,985	5,492	2,738

Overflow traffic estimation

Since removing the high day traffic adjustment is recommended when engineering agent positions, consider 30% of source traffic as potential overflow traffic. Use this rule when the average agent load at the source node is unknown. Otherwise, traffic exceeding a loading of 33 CCS per agent is overflowed.

To calculate the number of overflowed calls from the source node to target nodes, use the average holding time of 180 seconds.

OT0 = A0 – 33 × N0
OT0 = Overflow traffic from source node in CCS
A0 = ACD traffic in CCS calculated from (Calls Accept × AVG Work Sec)/100
N0 = number of agents at the source node
The number of overflow calls = OT0/180

If OT0 is a negative number, the traffic is too low or too many agents are assigned to this location and no calls overflow onto the network from this node.

Average CCS loading per agent at each ACD DN

The relative ACD DN load between the source and a target node is one of the most important considerations in determining where to overflow a waiting call. If the average loading per agent is known, then the node with the lowest average load becomes the highest node in priority to receive overflow calls.

Average Agent Loading in CCS can be calculated from the ACD DN performance report. The equation is as follows:

Avg. Agent Loading in CCS = Average Work/Manned % × 36/100

The value of Work/Manned % from a target ACD DN performance report is the average traffic level of the target ACD DN during the busy hour of the source ACD DN.

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Call register requirements

The incremental requirements for call registers between ACD and NACD are the additional call registers required at the source node to hold calls waiting to be overflowed to target nodes. The recommended procedure is

X = Calls/hours overflowed to all target ACD DNs

This is OT0 ×100 /HT

Y = Calls/hours overflowed to the local target ACD DNs

This is (OT1+...+OTk) × 100/HT, where k is the number of target ACD DNs co-located in the source node.

ASA = Average Speed of Answer in seconds required at the source node
HT = Average holding time of an NACD call (default is 180 seconds)
Q = Average number of NACD timers expired before the call is answered (Default is 1.5 queues)
W = Number of calls overflowed from other nodes to the source node during the busy hour (should be 0 for an efficient network)
t = The first timer value in the NACD table
CRQ = Call Request Queue size

Incremental CR Traffic at source node

Snacd = (X+W) × ASA × Q/100 + (X–Y) × HT/100 ccs

Incremental CR Traffic at target node

Tnacd = CRQ × (ASA–t)/100 ccs

Incremental CR traffic at a combined source and target node

Snacd + Tnacd

Refer to Table 66 "Poisson table at P.01 grade of service" (page 427) to find the number of incremental CRs required for NACD. Add the incremental CRs to the CR requirement for ACD based on the procedure in the next subsection.

Table 66
Poisson table at P.01 grade of service

CRs	1	2	3	4	5	6	7	9	10	15	20	25	30	35	40
CCS	.4	5 .4	1 5.7	2 9.6	46	64	84	1 05	1 26	2 69	3 99	5 35	6 75	8 18	9 64

This procedure applies when NACD is engineered as an add-on to existing ACD nodes. To completely engineer an ACD network, use the equation in the next section, ""CR for new NACD engineering" (page 428)".

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CR for new NACD engineering

Modify the CR engineering equations to include the incremental CR requirement of the NACD feature. The result of this equation equals the number of CRs required.

(T + Snacd +Tnacd + 815)/33.8 + M

where

T = (A/2 × C × 1.42) – M × L.

A = the total voice loop (system) traffic in CCS

Snacd = 0, if the system is not an NACD source node

Tnacd = 0, if the system is not an NACD target node

M = the number of ACD incoming trunks

L = average CCS per ACD traffic

C = the call register traffic factor

= 1 + 0.037 if CDR Charge Account is equipped

+ 0.074 if Authorization Code

+ 0.037 if Parallel CDR ports per customer

+ 0.150 if NARS/BARS/CDP

+ 0.150 if FCBQ and OHQ

+ 0.033 if ACD RAN

+ 0.019 if Teleset Messaging

+ 0.140 if Integrated Messaging System

+ 0.083 if Ring Again

+ 0.033 if Music Trunk

+ 0.067 if Call Park

+ 0.003 if New Flexible Code Restriction

+ 0.039 if ESN Signaling

The accuracy of the above CR equation proves accurate for larger groups, for example, 100 CRs or more. It is not recommended for incremental estimations, which are usually smaller compared with the original ACD CR calculation.

Designing the NACD routing table

The objective of designing an overflow Routing Table is to minimize the waiting time of calls in the network without creating excessive internodal traffic.

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A point system is used to rank the potential of success if the waiting call at the source node is put into the Call Request Queue of a target node. The target ACD DN with the highest points indicates the best candidate to handle the overflow calls. The point system provides an objective way to evaluate the spare capacity of a potential target node.

When the same numbers are assigned to multiple ACD DNs because of equal value, the next number continues, but the total in the set remains the same.

ACD agent group size (P1)

All target ACD DNs are ranked according to the agent group size. The ACD DN with the largest agent group is assigned P1 = 5, the next one 4, and so on. If there are more than five target ACD DNs, the rest are assigned zero P1, which means that no more preference is given to agent size after five groups. This variable should not be greater than five in weight. If any two ACD DNs have the same number of agents, they should be assigned the same value. No more than five ACD DNs can be assigned points in this category. In summary:

P1 = 5 for the ACD DN with the largest agent group
P1 = 4 for the next size group
P1 = 3 for the next
P1 = 2 for the next
P1 = 1 for the next
P1 = 0 for the 6th largest or less

Average agent load at each target ACD DN (P2)

Assign the highest priority to the target node with the lowest average agent load during the source node busy hour. If any two nodes have the same average DN loading, assign the same points to each of them. The proposed point assignment is as follows:

P2 = 5 for the target node with the lowest average agent loading per ACD DN
P2 = 4 for the next lowest agent loading per ACD DN
P2 = 3 for the third lowest agent loading per ACD DN
P2 = 2 for the fourth lowest agent loading per ACD DN
P2 = 1 for the fifth lowest agent loading per ACD DN
P2 = 0 for agent loading higher than above

Number of hops (P3)

Multihop routes can require longer message delay, more CPUs to handle the same call, and more tandem trunks; can experience higher blocking; and can cost more because of the charges associated with the distance of the call. Multiple hops require a longer Reserve Agent Timer to wait for the call to set up. Therefore, multihop routes are not encouraged.

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The weight of this variable is more than for the other categories listed above.

P3 = 5 if target is co-located with source node
P3 = 0 if target ACD DN is the next node
P3 = –5 if one hop in the route (one tandem connection)
P3 = –7 if two hops in the route
P3 = –9 if three hops in the route

If sufficient trunking is available in an existing tandem route so that blocking and cost penalties are of little concern, the user can change the negative weighting factor assigned to this parameter. One example is

P3 = –1 for one hop; P3 = –2 for two hops; P3 = –3 for three hops.

No limitation exists (except for a satellite, which enables only one hop) on the number of hops permitted in an NACD. In a private network, any tandem call requiring more than three hops is unusual.

Noncoincidence busy hour and time zone difference (P4)

P4 is the point allocated to the target node with a different busy hour from the source node. Assign four points for each hour's difference in busy hour. For example, if the source node experiences a busy hour at 9 a.m., and the target node has a busy hour at 11 a.m., then assign P4 = 8 points (= 4 × [11–9]) to the target node.

This allocation of points is based on the absolute difference of busy hour between the source and target node. For example, if the source node is in Toronto and the target node is Vancouver, the time zone difference of three hours brings 8 a.m. in Vancouver and 11 a.m. in Toronto into the same real-time hour. Since only an absolute difference in hours is allocated points, no points for nodes are allocated in the example involving Toronto and Vancouver.

If the busy hour of the source node and a target node are not known or cannot be located (inconsistency), let P4 = 0. In summary:

P4 = The points allocated to the target node with different busy hours from the source node. Each hour difference is assigned 4 points.
P4 = 4 × the number of absolute hours difference between the source and target node busy hours
P4 = 0 if there is no consistent busy hour at the source and target nodes

Ranking of target nodes on NACD routing table

Every target node is assigned points according to its relationship to the source node based on the above four categories. All points are summed for each node. The node with the highest point total receives the top priority in the routing tables. nodes are ranked from Q1 to Q20, from the highest to the lowest point total. The Routing Table enables a maximum of 20 DNs.

Q = P1 + P2 + P3 + P4

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Negative values are ranked behind nodes with zero points.

Q1 > Q2 > Q3 > É Q20

If Qi equals Q (i + 1), choose the node closer to the source node.

When an NACD has more than five nodes, several nodes after the first five have zero Qi values. This is expected because they are far down the NACD table. The preference of one node over the other is negligible, because their chances of being offered overflow calls are diminishing.

Timer value in NACD routing table

The timer value should enable calls to queue on as many virtual queues as possible, but not congest call request queues. The length of a wait for a call is closely associated with the Average Speed of Answer (ASA) that a customer specifies and which the system is configured to meet. Therefore, the overflow timer (Ti) should be a function of ASA. If the customer does not have an objective ASA, then use the default time interval of 10 seconds. Recommended settings are as follows:

T1 = 10 seconds or ASA/n, whichever is smaller. The value of n is the number of target DNs.
T2 = 20 seconds or 2 × ASA/n, whichever is smaller.
T3 = 30 seconds or 3 × ASA/n, whichever is smaller.
T4 = 40 seconds or 4 × ASA/n, whichever is smaller.
.
.
T20 = 200 seconds or 20 × ASA/n, whichever is smaller.

When the timer value calculation results in an odd number, round it to the smaller even number, because the timer interval in NACD operates in 2-second increments. Also, timer values for several DNs can be the same so that when the NACD table contains many entries, a large timer for lower entries is not necessary.

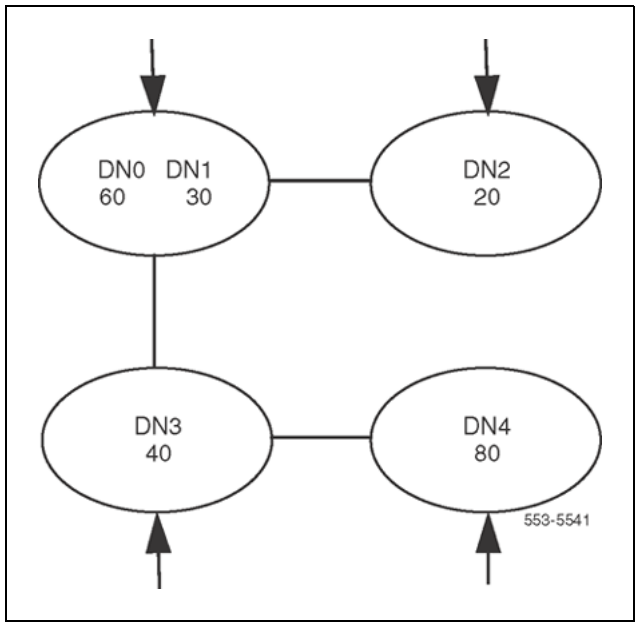
Engineering example: A 5 ACD DN and 4-node NACD

The network consists of five ACD DNs and four nodes across three time zones with different busy hours. ACD DN1 is co-located with the source node ACD DN0. ACD DN3 is a tandem node between the source node and ACD DN4.

Figure 24 "A 5-ACD DN and 4-node NACD network" (page 432) shows a simplified block diagram of the NACD. All DNs denote the ACD DN.

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Figure 24
A 5-ACD DN and 4-node NACD network



- 1200 calls Average Busy Season Busy Hour (ABSBH) traffic are offered to the source node (ACD DN0). The average agent service time, a total of direct call processing and post call processing time, is 180 seconds. The ASA is 60 seconds.
- The number of agents (Ni) is shown under each ACD DN.
- ACD DN0, ACD DN1, and ACD DN2 are within the same time zone.
- ACD DN3 is one hour ahead of ACD DN0.
- ACD DN4 is one hour ahead of ACD DN3 and two hours ahead of ACD DN0.
- CCS per agent was estimated at 33 CCS/agent for ACD DN0, 30 CCS for ACD DN1, 28 CCS for ACD DN2, 25 CCS for ACD DN3, and 25 CCS for ACD DN4 at the busy hour of ACD DN0. The number of agents at ACD DN0 was engineered to handle ABSBH calls. When High Day Busy Hour (HDBH) traffic is offered to ACD DN0, approximately 30% of calls overflow.

  Use the following formula to calculate CCS per agent from the ACD report:

  — CCS per agent = 36 CCS × Total Work/Total Manned Time

  — Work Time = direct call processing time + post call processing time

  — Manned time = the time consoles are manned by agents

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All time units are expressed in total minutes within the busy hour per an ACD DN.

- The busy hour for ACD DN0 is 11 a.m., ACD DN1 is 12 p.m., ACD DN2 is 11 a.m., ACD DN3 is 12 p.m., and ACD DN4 is 1 p.m. All times are expressed relative to the time zone of ACD DN0.

Design of NACD routing table The NACD configuration statistics are summarized in the following table. The shaded rows represent points assigned to the parameters above them. The total points for each node are tallied in the last row of Table 67 "NACD configuration data and timer priority assignment" (page 433).

Table 67
NACD configuration data and timer priority assignment

Source ACD DN		Target ACD DNs				
Assigned Pts.	**Node**	**DN0**	**DN1**	**DN2**	**DN3**	**DN4**
No. of Agents	NI	60	30	20	40	80
Assigned Points	PI		3	2	4	5
Avg CCS/Agent	ai	33	30	28	25	25
Assigned Points	P2		3	4	5	5
No. of Hops			co-locate	0	0	1
Assigned Points	P3		5	0	0	–5
Bush Hour in DN0 Time		11 a.m.	12 p.m.	11 a.m.	12 p.m.	1 p.m.
Assigned Points	P4		4	0	4	8
Sum of Assigned Points			15	6	13	13

The sum of total points for target nodes uses the following sequence:

Q1 > Q3 = Q4 > Q2

Since ACD DN3 is closer to ACD DN0 than ACD DN4, it receives a higher priority than ACD DN4 in the NACD routing table. The sequence of the timer should be ACD DN1 first, ACD DN3 next, ACD DN4 next, and ACD DN2 at the bottom of the list.

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The desired ASA for this network is 60 seconds, which yields a timer interval of 14 seconds (= 60/4–1). Since it is larger than the default timer value of 10 seconds, use 10 seconds as the timer interval. Table 68 "An NACD Routing Table" (page 434) shows the NACD routing table:

Table 68
An NACD Routing Table

Target DN	Time in Seconds
ACD DN1	10
ACD DN3	20
ACD DN4	30
ACD DN2	40

ACD DN1 in this example is a 4-digit directory number, because it is located with the source ACD DN. The other ACD DNs are likely to have more digits, which are defined according to a Uniform Dialing Plan or a Coordinated Dialing Plan.

Incremental impact engineering

To determine the incremental requirements when the five nodes change from serving individual nodes to NACD, consider the factors discussed in the sections below.

Trunking requirement

Estimate the amount of trunk traffic to be overflowed to other nodes from the source.

Trunk traffic to source ACD DN

Trunk CCS = (1200 × 1.3 × 180/100) + (1.3 × [0.5 × 60] / 100) = 2808 + 468 = 3276

Where the 1200 offered calls to the source node is the Average Busy Season Busy Hour (ABSBH) traffic, an additional 30% of traffic reflecting High Day Busy Hour (HDBH) peak level is added as recommended in *Communication Server 1000M and Meridian 1 Large System Planning and Engineering (NN43021-220)*. If the customer defines the input traffic as an HDBH value, then the 30% adjustment is not required.

The ASA is reduced by half to reflect the effect on queuing time and trunk loading. This incoming traffic (3276 CCS) requires 115 trunks to carry it (based on Poisson P.01).

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The incoming trunk requirement is estimated from 3276 CCS. However, for calculating actual overflow traffic, the portion associated with waiting (468 CCS) should be discounted, because it is an overhead in addition to the normal call service time (180 seconds per call), which should not be used for estimating overflow calls.

Overflow traffic from source ACD DN

OT0 = 2808 – (33 × 60) = 828 CCS or 460 calls (with 180 seconds HT)

Where 2808 CCS is the offered traffic to the ACD DN0 agents, the maximum loading per agent is configured at 33 CCS or 92%. The CCS is converted to calls by multiplying 100/180 (= 828 × 100/180 = 460).

Calls handled by the source node agents

33 × 60 × 100/180 = 1100 calls handled by ACD DN0.

Agent loading is configured at 33 CCS and the average holding time is 180 seconds.

Incremental traffic to each target node

1. The first ACD DN to accept overflow traffic: ACD DN1

   The spare capacity at ACD DN1: S1, 1 = (33 – 30) × 30 = 90 CCS

   OT1 = the smaller of OT0 (828 CCS) or S1,1 = 90 CCS or 50 calls

   Since ACD DN1 is co-located with the source ACD DN, no trunk is required to handle the overflow traffic.

2. The second DN to accept overflow traffic: DN3

   The spare capacity at DN3: S3,2 = (33 – 25) × 80 = 640 CCS

   OTC = the smaller of (828 – 90 – 320) or 640 = 418 CCS

   At Poisson P.01 (a customer-designated value; blocking could be higher for a private network), the incremental trunks are 33. This traffic corresponds to 410 (= 178 + 232) overflowed calls.

3. The third DN to accept overflow traffic: DN4

   The spare capacity at DN4: S4,3 = (33 – 25) × 80 = 640 CCS

   OT3 = the smaller of (828 – 90 – 320) or 640 = 418 CCS

   At Poisson P.01 (a customer-designated value; blocking could be higher for a private network), the incremental number of trunks required to handle 418 CCS is 21. The number of calls on this route is 232.

   The traffic between the source node and node 3 is 738 (= 320 + 418) CCS. The required incremental trunks are 33. This traffic corresponds to 410 (= 178 + 232) overflowed calls.

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4. The fourth DN to accept overflow traffic: DN2

   ACD – DN4: 232 × 0.63 = 147 bps. This is the data rate for the link between ACD DNs and ACD DN4.

Real-time requirement

Incremental real time is the extra processing time required of the source node CPU to handle NACD overflow calls to all target nodes. The target node CPU does not require special engineering, because it is not in its busy hour and handles calls only when it has spare capacity.

Calls to all target ACD DNs

Incremental real time of NACD overflow calls: 460 × 1.38 = 635 EBC.

Where: 460 is the total number of overflow calls from the source ACD DN.

Incremental real time of NACD/ACD calls handled at the source node over the basic incoming trunk to SL-1 telephone calls = 1100 × 0.60 EBC, where 1100 is the total number of calls handled by the source ACD DN agents. This EBC should be taken care of if the NACD configuration is evolved from an existing ACD node. If the source ACD DN is a new NACD node converted from a non-ACD switch, then the real-time impact is 1295 EBC (= 635 + 660).

When a target node becomes a source node during its busy hour, the rest of the nodes in the network are treated as target nodes. When two or more nodes are source nodes in the same busy hour, design the NACD routes tables one at a time and treat the rest of the nodes as target nodes.

Call register requirement

From the "Overflow traffic from source ACD DN" (page 435) and "Incremental traffic to each Target node" (page 435), calls from ACD DN0 and to ACD DN1 can be calculated:

X = 460 calls (total overflow calls from ACD DN0)
Y = 50 calls (calls overflowed to ACD DN1)

Incremental source node CR traffic: Snacd = (460 × 30 × 1.5/100) + (460 – 50) ×(180/100) = 945 CCS, where an ASA of 30 seconds is assumed. Referring to a Poisson table with P.01 Grade of Service, the additional number of CRs required for the NACD application is 40.

Since none of the target ACD DNs accepting overflow traffic has the same busy hour as the source node, assume that all Tnacd traffic (CR traffic for each target ACD DN) can be absorbed by the spare CRs available because of non-busy-hour traffic overflowing to that target ACD DN.

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Although the number of calls offered to the NACD is 1200, the network is engineered for 1560 calls because of the ABSBH versus HDBH considerations.

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Network ACD operations

Content

This section contains information on the following topics:

"Agent telephone displays" (page 439)

"Management reports" (page 439)

"Administration and operational measurements" (page 440)

"Feature implementation" (page 440)

Agent telephone displays

Agent telephones equipped with display show information relating to call presentation and certain key functions. These displays are supported by Network Automatic Call Distribution (NACD).

Network ACD functions also add information to the displays that is pertinent to the network functions involved with a particular call. The display is dependent on the conditions for each call presented.

Displays for different telephones are significantly different. Please consult the appropriate user guide for the telephones.

Specific telephone displays are addressed in the *Meridian Digital Telephones: M2006, M2008/M2008HF, M2616 UserGuide*.

Management reports

Package C for ACD provides traffic reports on a regular basis to assist supervisors. There are ongoing status displays, and four types of periodic reports and daily totals reports. These reports are essentially unchanged by NACD operation; but, the values generated in the output fields are changed according to the NACD traffic for the application.

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Calls are diverted for different reasons, and Network ACD diverts calls over widely separated locations. Some calls overflowed by Network ACD can end up in queues that are reported under Management. Package C reports do not differentiate between Network calls and regular ACD calls (local). ACD supervisors can use the following calculations to interpret their Management reports. Network ACD impacts Report 2 (REPT 2), the Queue report, in Package C.

Administration and operational measurements

Certain administrative works must be performed before users can benefit from this feature.

Service change

Several service change programs need to be modified for this feature. The list includes LD 11, LD 12, and LD 95.

Feature implementation

Task summary list

The following is a summary of the tasks in this section:

1. "LD 11 – Configure telephone for CPND" (page 440)
2. "LD 12 – Configure Attendant console for CPND." (page 441)
3. "LD 95 – Configure system for Call Party Name Display (CPND) on a per-customer basis." (page 442)

LD 11 Configure telephone for CPND.

Prompt	Response	Description
REQ:	a...a	Request
TYPE:	a...a	Type of data block
...		
KEY	29 LNG	M2317 Language Toggle key (no language)
TKTP	aaa	Trunk type. Must be COT, DID, FEX, or WAT for CCB. where: • xx = key 29 • LNG = Language Toggle enable • NUL = Remove Language option

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Prompt	Response	Description
		This feature enables a telephone operator to set and reset language display, toggling between French and English versions on the alphanumeric display.

LD 12 Configure Attendant console for CPND.

Prompt	Response	Description
REQ:	CHG END MOV	Change, end, or move a data block.
TYPE	a...a	Type of data block (a...a = 2250 or PWR)
TN		Terminal number
	l s c u	Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, and u = unit.
	c u	Format for Small System and Media Gateway 1000B where c = card and u = unit
...		
LANG	(00)-15	Language to download to M2250 on Sysload Language choices: • (00) - English • 01 - French • 02 - Spanish • 03 - German • 04 - Italian • 05 - Norwegian • 06 - Gaelic • 07 - Turkish • 08 - Katakana • 09 - People's Republic of China • 10 - Taiwan • 11 - Korean • 12 - Polish • 13 - Czech/Slovak • 14 - Hungarian

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Prompt	Response	Description
		• 15 - No language assigned

LD 95 Configure system for Call Party Name Display (CPND) on a per-customer basis.

Prompt	Response	Description
REQ:	NEW	Create a new data block.
TYPE	NAME	Type = NAME (CPND Name)
CUST	xx	Customer number as defined in LD 15.
CPND_LANG	aaa	CPND Language (aaa = (ROM) or KAT)
DIG	0-253 0-99	Dial Intercom Group/Member
-LANG	aaa	Language (aaa = (ROM), KAT or ALL)
-NAME	a...a	CPND Name in ASCII characters
-XPLN	xx	Expected Length
DISPLAY_FMT	aaaa	Display Format (aaaa = (LAST) or FIRST)
DN	x...x	Directory Number
-LANG	aaa	Language (aaa = (ROM), KAT or ALL)
-NAME	a...a	CPND Name in ASCII characters
-XPLN	xx	Expected Length
DCNO	0-254	Digit Conversion Table Number
-IDC	0-254	Incoming DID Digit Conversion Number
-NAME	a...a	CPND Name in ASCII characters

Traffic measurements

When the English CPND is generated from the Roman CPND, the resulting English CPND string can be longer than the Roman CPND that it is generated from (some Roman language characters translate to two English characters) and results in a slight increase in traffic.

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Nortel Communication Server 1000

Automatic Call Distribution Fundamentals

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