Cisco Unified ICM ACD Supplement for Nortel DMS-100/SL-100

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Preface

Purpose

This document contains the specific information you need to maintain a Nortel DMS-100/SL-100 Switch with CompuCALL Interface in a Cisco Unified Intelligent Contact Management (Unified ICM) environment. It is intended to be used as the Nortel DMS-100/SL-100 Switch-specific companion to the Unified ICM documentation set.

While the other Unified ICM documents cover general topics such as configuring an overall system and writing scripts to route contact center requests, the *Cisco Unified ICM ACD Supplement for Nortel DMS-100/SL-100* provides specific information on configuring a DMS-100/SL-100 Switch and making any necessary adjustments to the DMS-100/SL-100 Switch configuration.

Audience

This document is intended for system managers. The reader should understand Unified ICM functions as described in the *Installation and Setup Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted,*

Configuration Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted, and Scripting and Media Routing Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted. The reader should also have specific knowledge of the DMS-100/SL-100 Switch.

Organization

Chapter 1, "Overview"

Provides an overview of ACD interface and hardware and software requirements for the DMS-100/SL-100 Switch.

Chapter 2, "Unified ICM Configuration"

Describes the relationships between the DMS-100/SL-100 Switch database objects and the Unified ICM database objects. This chapter also describes DMS-100/SL-100 Switch -specific settings that must be confirmed in the Unified ICM configuration.

Chapter 3, "ACD Configuration – Operation Interface"

Describes items in the DMS-100/SL-100 Switch configuration that must be checked to ensure compatibility with the Unified ICM.

Chapter 4, "Eicon Card Configuration"

Describes the specifics of the Eicon Card Configuration.

Appendix A, "DMS100 Switch Datafill Example"

Provides a Datafill Example on the DMS100 Switch.

Typographic Conventions

This manual uses the following conventions:

- Boldface type is used for emphasis; for example:

  Real-time information **is not** stored in the central database.

- Italic type indicates one of the following:

  - A newly introduced term; for example:

    A *skill group* is a collection of agents who share similar skills.

  - A generic syntax item that you must replace with a specific value; for example:

    IF (*condition, true-value, false-value*)

  - A title of a publication; for example:

    For more information see the *Database Schema Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*.

- Sans serif type with small caps is used to represent keys on your keyboard; for example:

  Press the SHIFT key to select a range of items.

- An arrow (→) indicates an item from a pull-down menu. For example, the Save command from the File menu is referenced as File→Save.

Other Publications

For more information on Unified ICM, see the following documents:

- *Administration Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*

- *Installation and Setup Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*

- *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*

- *Scripting and Media Routing Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*

For information on Cisco Network Applications Manager (NAM), see the following documents:

- *Product Description Guide for Cisco Unified ICM Hosted*

- *Setup and Configuration Guide for Cisco Unified ICM Hosted Edition*

- *Multiple-NAM Setup and Configuration Guide for Cisco Unified ICM Hosted*

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:
http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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1. Overview

The DMS100 Peripheral Gateway (PG) monitors agent and call activity on the DMS100 ACD through the CompuCALL Interface.

For more information about the supported ACD switches, see the document *Cisco Unified ICM Supported Switches (ACDs).*

This chapter describes the hardware and software requirements to connect the Nortel DMS-100/SL-100 Switch to the Unified ICM PG.

1.1. DMS100 PG with CompuCALL Link

The DMS100 PG can run in simplex or duplex configurations. In a duplex configuration, only one side of the PG will maintain CompuCALLF[1]F X.25 Link or a TCP/IP connection at any given time.
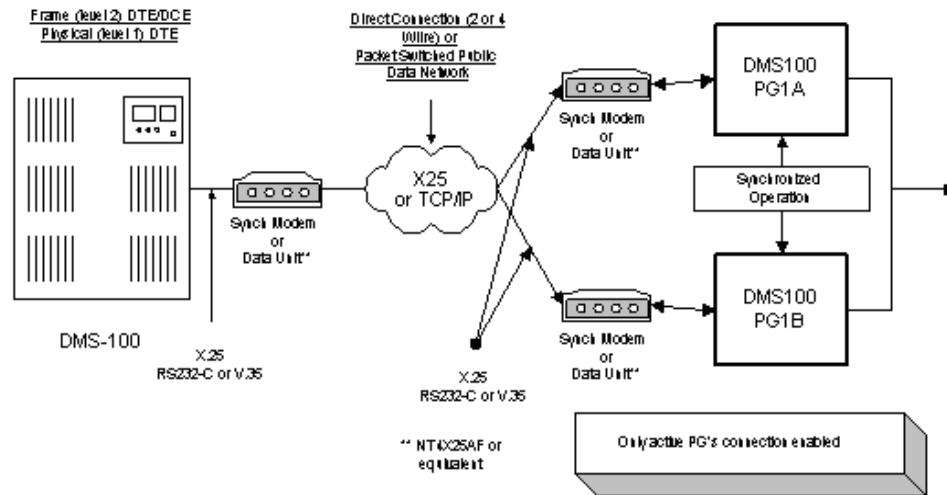
Figure 1: CompuCALL Interface with DMS100

The DMS100 PG can invoke the ANSWER, RELEASE, HOLD and UNHOLD of incoming calls to ACD agent, Centrex line or Residential line. The CompuCALLF[2]F messages, DV-ANSWER-CALL, DV-RELEASE-CALL, DV-HOLD-CALL and DV-UNHOLD-CALL allow the DMS-100 PG to provide third-party call control service to third-party voice application vendors.

CallsF[3]F like Three-way Call (3WC) or Call Transfer (CXR) call event message, DV-Consult-Originated-U, DV-Call-Conferenced-U and DV-Call-Transferred that are sent from the DMS-100 switch to allow the DMS-100 PG to build call conference/transfer model, when the 3WC or CXR key option, is data-filled on the telephone set.

Note: Since the CompuCALL interface in the release 08.01 does not support Call Conference (CNF) key, it is required that CNF key not be data-filled on the telephone set.

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[1] CompuCALL is a protocol that provides a data communications channel between a computer and a switch that allows an operating company to provide coordinated switch-based services, to applications residing on a customer's host computer in a cost efficient manner.

[2] These messages are supported with the CompuCALL interface from release 07.01 onwards.

[3] These messages are supported with CompuCALL software release 08.01 onwards.

Configure the ServiceVersion parameter in the DMS-100 PG session configuration to receive a correct stream of CompuCALL messages. The DMS-100 PG uses the configured parameter to pass on to the ServiceVersion field in the DV-Application-Log-On message, which will be sent during the application logged on session. The ServiceVersion value uniquely identifies the stream of messages which are corresponding to the appropriate CompuCALL software release.

For example, the ServiceVersion value for the stream of Switch Computer Application Interface (SCAI) of the CompuCALL release 08.01 is: SCAI10.

1.1.1. CCM Matrix Support

Since the DMS-100 PG supports up to CCM10, use the following CCM[1] (Common CM) Matrix tables to find out which PLC and PCL the DMS-100 PG supports.

Table 1: CCM Matrix_1

PLC	NA100		APC100		
PCL	LEC	CDN	ABSK	ABSL	ABSM
CCM02	02	02			
CCM03	03	03			
CCM04	04	04	04	00	03
CCM05	05	05	02		04
CCM06	06	Note 1	03	01	05
CCM07	07		04		06
CCM08	08		05	02	07
CCM09	09		06	TBD	08/09
CCM10	10		07/08	TBD	10/11
CCM11	11		TBD	TBD	TBD

Table 2: CCM Matrix_2

PLC	EUR100	MSL100	DMS500	
PCL	EUR	MSLIVD	LLT	LLDB
CCM02				
CCM03		03		
CCM04	03	04	04/05	04/05
CCM05	04	05		

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[1] A CCM is one of several types of Development Release Unit (DRU).

CCM06	05	06		
CCM07	06		07	06
CCM08		07	08	TBD
CCM09	08	08	09	TBD
CCM10	09	09	10	TBD
CCM11	10	10	11	TBD

Note: **1.** Beginning CCM06 CDN & LEC were combined into a single PCL (Product CM Load) stream.
2. Shaded area indicates that the DRU was not implemented for the PCL.

Examples of PCL (Product CM Load) include:

```
CDN is Canada
LEC is DMS-100/200
MSLDIVD is MS-100 Commercial Market
ABSK is Japan IDC
ABSL is Japan NTT
ABSM is Others (Australia, Philippines, CALA)
LLT is DMS-500 Local/Long Distance/TOPS
LLDB is DMS-500 Local/Long Distance
```

Examples of PLC (Product Line Center) include:

```
EUR is Europe
NA is North America
MSL is SL-100
APC is Asian Pacific
DMS-500
```

1.2. CompuCALL Interface Requirements and Limitations

For optimized performance and utilization of the Cisco Enterprise Computer telephony Integration (CTI) solution, the CompuCALL software release 09.01 or above has to been loaded on the DMS-100 Switch.

The CompuCALL software load NA09 allows the DMS100 PIM to know the Agent Skill Group reassignment when the Call Center supervisor re-assigns an Agent from one Skill Group to another Skill Group.

Please see the Section, *"Monitoring Agent Skill Group Assignment Change"*UH, for detailed information about the ability of the DMS100 to monitor Agent Skill Group assignment change.

Note: Install the appropriate patch for CompuCALL software load NA09 or above on the DMS100 Switch to enable it to work properly with DMS100 PG.

1.2.1. CompuCALL Interface Limitations

Any CompuCALL software load below NA09 on the DMS100 Switch does not support the DMS100 PIM ability to monitor Agent Skill Group assignment change.

1.3. Nortel DMS100 Switch Limitations

If the PIM receives an out of order sequence message in the LOGOUT or NOT_READY state, it is due to the inter-working of the DMS100 PIM and the Nortel DMS100 switch.

2. Unified ICM Configuration

In order to properly configure and maintain the database, you need to understand the relationship between the DMS100 switch database objects and the database objects.

This chapter describes how objects map between the DMS100 ACD and the Unified ICM. It also provides DMS100 switch-specific information that may assist you in configuring the PG through the Configuration Manager tools.

For detailed information on the Unified ICM Configuration Manager tools' user interface, see the *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise and Hosted*.

2.1. Configuring the DMS-100 ACD

To best understand the configuration of the DMS-100 ACD, begin with the DMS-100 documentation shipped with your switch. The information provided here is meant to supplement and not to replace the Nortel DMS-100 documentation.

2.1.1. Configuring the Peripheral

The "Configure a PG" option in Configure ICM automatically creates a peripheral object with the appropriate defaults for a DMS-100 peripheral. If desired, these values can be modified through the peripheral screen in Configure ICM.

The "Available Holdoff Delay" setting will be used by all Skill Groups for this peripheral that do not explicitly specify a value for the "Available Holdoff Delay" at the Skill Group level.

2.1.2. Configuring the Peripheral Targets

A peripheral target should be configured for each combination of Network Trunk Group and DNIS that can receive ACD calls. Peripheral targets must also be configured for translation routing

2.1.3. Attributing Calls to Unified ICM Routes

For route statistics, the PG attributes calls to the routes by looking for a peripheral target that matches the Trunk Group and DNIS for the call and using the route associated with that peripheral target. If no matching peripheral target is found, then the call is attributed to the default route for the peripheral (if one is configured).

2.2. Services

See the *Services* section X2.12.5X, for specifics about when to configure the Unified ICM services.

2.3. Skill Groups

See the *Skill Groups* section X2.12.7X, for a discussion of when to configure Unified ICM Skill Groups.

The "Available Holdoff Delay" should be set to the value of the Variable WrapUp for this ACD DN. This value is left as "Use Peripheral Default," then the default value configured for this peripheral will be used.

The DMS-100 switch does not strictly associate call WrapUp time with individual calls. The DMS-100 tracks the total time spent by an Agent in the NotReady state. The Average Work Time is calculated as (ACD TalkTime + NotReady Time) / Calls Answered.

The Agent can enter the NotReady state at any time and begin accumulating NotReady Time.

There are two methods Agents can associate WrapUp time with individual calls:

- When the Agent issues the NotReady feature (manually or via CompuCALL SetFeature) while active on a call. When the call is completed, the Agent will be placed in the NotReady state.

- Through Variable WrapUp feature available on the DMS-100. The Unified ICM does not receive an indication that the Agent is in the NotReady State when the call terminates**.**

The PIM uses the AvailableHoldoffDelay setting to determine when to place the Agent in the **Ready State** once the call is released. It is applicable to all calls for the Peripheral or Skill Group. The AvailableHoldoffDelay timer on the DMS100 PG must match the Variable WrapUp for the ACD DN that the agents belong to. If the timer configuration is incorrect, an agent state mismatch occurs between the DMS100 PG and the DMS100 ACD.

2.4. Configuring the Agents

See the *Agent* section X2.12.8X, for a discussion of configuring DMS-100 agents in the Unified ICM.

2.5. Dialed Numbers

See the *Dialed Numbers* section X2.12.10X, for a discussion of configuring dialed numbers for DMS-100 Peripherals in the Unified ICM.

2.6. Labels

Each destination to which Post Routed calls should be routed should have a label configured with the label string set to the destination as it would be dialed from a phone set. For example, labels may be configured to route calls to a Primary ACD DN, Supplementary ACD DN, or Secondary DN. You can assign dynamic call-related information, hostCallData in the Unified ICM label configuration. The DMS-100 PG will send hostCallData to the switch; the switch saves the hostCallData, and sends it to another host application in any subsequent switch-host messages. A HostCallData is an octet string of a maximum 10 bytes.

The "Label" filed in **Label Configuration** dialog under the **Configure ICM** application has the following two formats:

Table 3: DMS-100 PG Label Format

Label Format	Example	Meaning
DnnnHnnn	D9136243685H333	DialedDigits for redirectDestination is 9136245686. HostcallData is 333.
DN	9136245686	DialedDigits for redirectDestination is 9136245686. HostcallData is of null content.

2.7. PG CompuCALL Session Configuration

This section describes how the PG must be configured through the Setup program to logon DMS-100 PG on DMS-100 Switch as a host application.

Table 4: CompuCALL Session Parameters

Session Parameter	Example	Description
ApplicationID	1	Integer that identifies the software as the application that is initiating the logon request
BusinessGroupID	6	Integer that identifies your company. Your Interexchange Carrier defines this ID
NetworkNodeID	40	Integer identifier that specifies the switch that the software will use to communicate. This is the switch the host computer connects to via the CompuCALL link. Your Interexchange Carrier defines this ID
Password	BLAZER	Is provided by the system administrator for security purposes. The password corresponds to the BusinessGroupID
ServiceID	1	Integer that identifies the application context to be set for the session (i.e., a service profile containing Application Service Options or subsets, as defined by your Interexchange Carrier)
ServiceVersion	10 for SCAI10	Integer that specifies the application level or the signaling version that the host application is using

If you configure the PG to connect at SCAI-11F[1]F, irrespective of the SCAI level set on the DMS100 switch, the PG will function with the switch.

There is **no** specific configuration required on the DMS100 switch to ensure that PG connects with a lower SCAI level set at the PG. The DMS100 switch handles the configuration transparently and auto-negotiates the SCAI version (ServiceVersion) with the PG.

2.8. PG CompuCALL X.25 Link Configuration

This section describes how the PG must be configured through the Setup program to talk to the CompuCALL X.25 Link.

Table 5: CompuCALL Link Parameters

X.25 Link Parameter	Example	Description
X25 Port	1	Integer identifier for the X25 card install on the local computer
X25 User Data	0 0 0 0	Four octets of data (each octet ranging from 0 to 255, expressed in hexadecimal). These data are provided by the Interexchange Carrier as the PROTOCOL subfield. Each octet is separated by a white space
X25 Local Address	02402027	Is X.25 DTE address of the local computer provided by the system administrator
X25 Remote Address	00000555	X.25 DTE address of the remote switch provided by the system administrator

2.9. Peripheral Monitor Configuration of ACD Positions

To be able to monitor the CompuCALL event messages, you must configure all of your Primary ACD or Secondary DN positions in the peripheral monitor table. The DMS-100 Peripheral Gateway will perform a DV_DN_ASSOCIATION for each of the Primary ACD DNs configured in the Peripheral Monitor TableF[2]F. If the DMS-100 PG specifies a Primary ACD DN to be associated with the current session, the DMS-100

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[1] The PG continues to support SCAI-11 and no new features that are part of SCAI versions higher than SCAI-11 are supported by the PG.

[2] All the devices associated in the call need to be monitored by the DMS100 PG, in order to avoid any missing events being missed from the DMS100 to the system. These events could impact system functionalities like call routing, reporting etc.

PG is informed by the switch of all call and Agent events to that ACD Group. Furthermore, if the ACD Group has one or more Supplementary ACD-DNs associated with it, then all these Supplementary ACD DNs are automatically associated with the current session. If the DMS-100 PG specifies a Secondary DN to be associated with the current session, the DMS-100 PG is informed by the switch of all coordinated voice and data delivery events to that Centrex or Residential line.

You may specify the configured CompuCALL session number for a Primary ACD DN or Secondary DN in the Unified ICM peripheral monitor table. The configured CompuCALL session number indicates DV-DN-ASSOCIATE OPERATION for the Primary ACD DN, or Secondary DN in the "Extension" field will be performed by the CompuCALL session n. The assignment of the configured CompuCALL session number is optional. If you fail to specify session number n for a Primary ACD DN or Secondary DN, the DMS-100 PG will evenly distribute DNs over the configured the CompuCALL sessions

You can specify whether a Primary ACD DN is CDN in the peripheral monitor table. The DMS-100 PG uses this information to call DV-Set-CDN-State during the initialization procedure.

Since an Agent device can be assigned to two lines, ACD and Secondary lines, you need to provide the mapping relationship between the Secondary DN, agent DN, and Agent positionID CDN in the peripheral monitor table.

If an Agent device has only one ACD line, you need to mark the "Extension" field with a non-digital letter (e.g., &), and specify the address mapping relationship between the Agent DN and the Agent PositionID in the corresponding "Param String" field in the peripheral monitor table.

The peripheral monitor screens for a Primary ACD DN and a Secondary DN from Configure ICM are shown below.
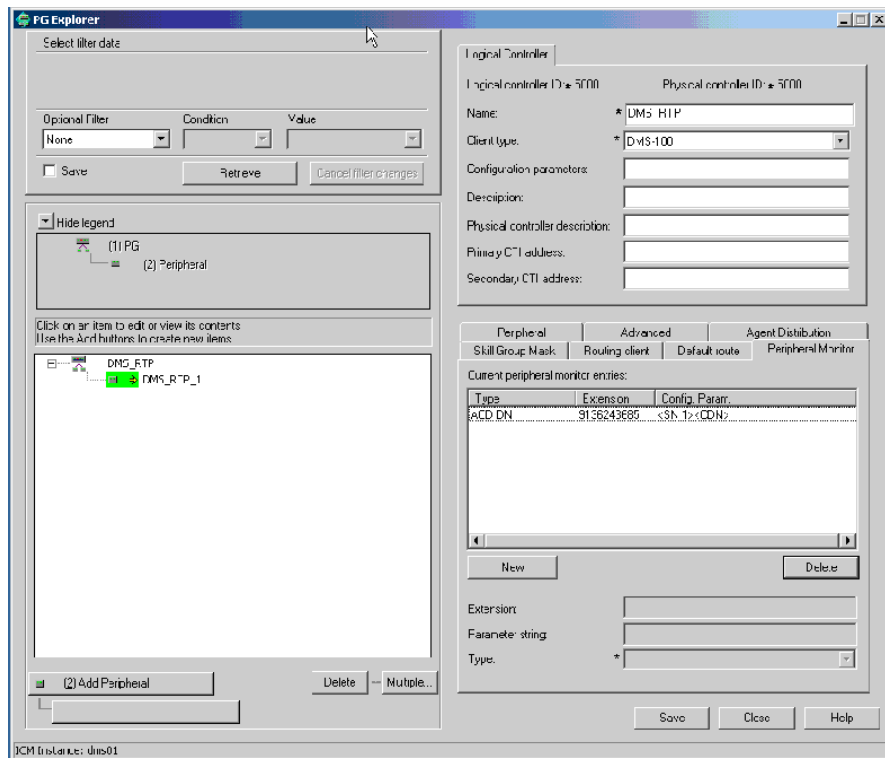
Figure 2: Peripheral Monitor Configuration Window
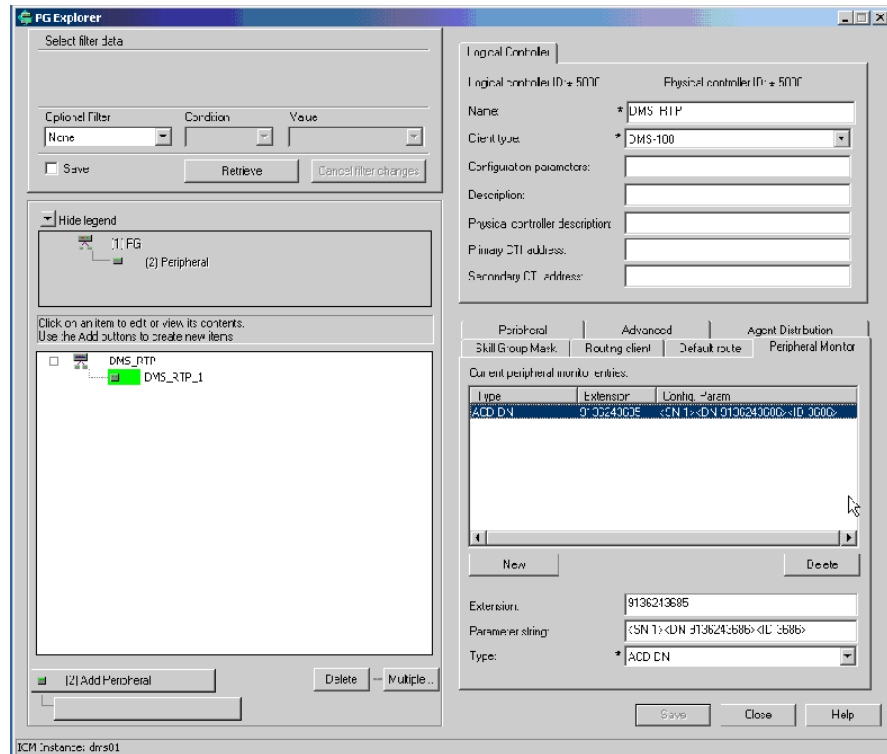
Figure 3: Peripheral Monitor Configuration with Parameter String

The "Extension" field is of your Primary ACD DN, Secondary DN, or non-digit character.

Table 6: Extension Formats

Extension Format	Example	Meaning
Primary ACD DN	9136243685	Dial Plan Directory Number of the Primary ACD-DN assigned to the ACD Group.
Secondary DN	9136245686	Dial Plan Directory Number of the Secondary DN assigned to the Centrex or Residential line.
Non-digit character	&	Any ASCII character other than digit character (0 – 9) indicates it is either a Primary ACD-DN or a Secondary DN.

The "Param String" field allows several different types of input that can be used to specify the CDN, CompuCALL session number, and the address mapping relationship between the Agent DN and the Agent positionID (see below).

The Type field should be set to "ACD DN."

Several tags in the "Param String" field can be used to specify the CDN, CompuCALL session number, and the address mapping relationship between the Agent DN and the Agent positionID.

Table 7: Param String Formats

Param String Format	Example	Meaning
<SN n>	<SN 1>	The configured CompuCALL sessions n to be associated to the Primary ACD DN, or Secondary DN in the "Extension" field
<CDN>	<CDN>	Indicates the Primary ACD DN in the "Extension" filed is a CDN
<DN dn> <ID posID>	<DN 9136243686> <ID 3686>	Indicates that an Agent device has an ACD line with the Agent DN dn, and the agent PositionID posID.

2.9.1. Transferring Calls to Non-monitored Devices

If queued calls are transferred to a party that is not a CompuCALL monitored device, the DMS100 does not send a DV-CALL-OFFERED-U, DV-CALL-ANSWERED-U message to the system. Without this message from the DMS100, the PIM does not know when the consulted call got offered and answered.

Therefore, when the conference controller releases the call, the system also thinks that the consulted call is still in the QUEUED state regardless of whether the call has actually been transferred and answered.

2.10. CompuCALL Server

The CompuCALL Server (CCS) allows a new or existing third-party application to share the DMS-100 CompuCALL interface with the software for the purpose of monitoring and/or controlling Agents and calls for the same Agent positions that the software is monitoring and/or controlling. Although both the third-party application and software can monitor, only one of them should attempt to control the same Agents or calls.

The CCS is a process typically running on the PG, although it may run on a separate host accessible to the PG via the network. All configurations for the CCS are done during setup—no special CCS configuration is needed in configuring the system. The DMS-100 PIM must be configured during its setup to connect to CCS rather than directly to the DMS-100. The third-party application must physically connect to CCS (via X.25 or TCP), but otherwise no change needs be made – to all appearance, CCS will be the DMS-100. (TCP support is included in ICM release 3.0 and later.)

2.10.1. Simple Case

In the simplest case, only one CompuCALL Session is configured in the DMS PIM, in the third-party application, in CCS, and at the DMS-100 (see diagram below).In this simple case, exactly one connection will be used:

1. Between CCS and the third-party application (X.25 or TCP)
2. Between CCS and the DMS PIM (Cisco proprietary EMT interface)
3. Between CCS and the DMS-100 (X.25 or TCP).
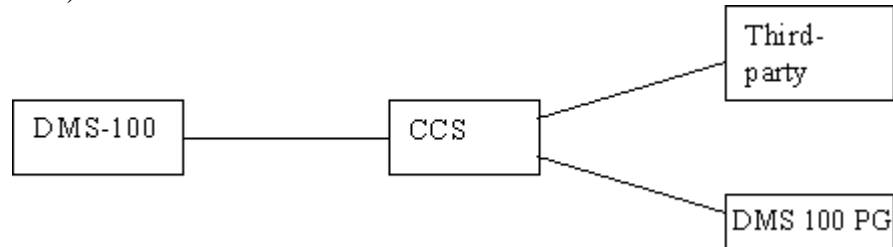
Figure 4: CompuCALL Session: Simple Case

In this simple case, which will likely also be the typical case, the CCS setup requires the configuration of the following:

1. One ACD Link of type X.25 or TCP (from CCS to the DMS-100)
2. One application Link of type X.25 or TCP (from CCS to the third-party application)
3. One Session – which includes which ACD Links are used by the Session (from item 1 above)
4. Two applications for the Session:

    •   One for the third-party application -- which includes which application Links are used by the third-party application (from item 2 above)

    •   One for the DMS PIM

Once the CCS is configured and running, the third-party application and the DMS PIM can execute the following steps (just as they would if connected directly to the DMS-100):

1. Create a connection (either X.25 SVC or TCP for the application, EMT for the PIM)
2. Send a Session Logon message on the connection
3. DN Associate those Agents or Agent groups to be monitored

When the PIM or the third-party application logon, whichever is first, CCS will establish a connection to the DMS-100 and send the logon message to establish a CompuCALL Session with the DMS-100. This Session will be shared by both the third-party application and the DMS PIM, once both have logged on. The DMS-100 Session will be maintained as long as either the third-party application or the DMS PIM remains logged on to the CCS. (Generally, either the third-party application or the PIM can log on first; however, the third-party application and the PIM can be assigned a

priority, and an option exists to block any logon until the highest priority application [or PIM] has logged on, and to force the logout of the lower priority application [or PIM] when the highest priority application [or PIM] logs out).

Once the DMS-100 Session is established, the PIM and the third-party application may send DN Association messages. CCS keeps track of which DNs have been associated so only new associations are sent to the DMS-100.

At this point, CCS knows which DNs have been associated by the third-party application and the PIM; and as monitor messages are sent by the DMS-100, CCS forwards them to either or both, depending on which has associated the DN for the message. CCS also keeps track of the InvokeIDs for any control messages or queries sent by the third-party application or the PIM, so that the response will be sent back to the right place.

2.10.2. Complex Cases

A few complexities of various kinds can be introduced to the simple case:

1. More than one X.25 Link can be configured to the ACD or to the third-party application, and a single CompuCALL Session can span those X.25 Links.

    *   The DMS-100 allows multiple connections and logons for the same Session over multiple X.25 Links, both for increased bandwidth and redundancy purposes. The DMS-100 applies DN Associations done by any of the connections to the Session as a whole. Monitor messages are split across all of the connections by call (all messages for the same call use the same connection), so if there are two connections, each receives approximately half of all the messages.

    *   This introduces the concept of a link group. In the simple case (see 6.1), messages sent from the DMS-100 to CCS are forwarded on one or both of the connections to the third-party application or the DMS PIM. The three connections are related, in that they share the same messages. These three connections are called a link group. When multiple X.25 Links are configured to the DMS-100 for the same Session, multiple link groups are created in CCS. (See diagram below.) Each link group sees a different set of messages. There is no fixed mapping at configuration time as to which Link from the DMS-100 corresponds to which connection to the third-party application or PIM, but the total number must match (or must be greater than or equal to the desired number of active links—the desired number of active links for a third-party application is configurable in the CCS setup). For each X.25 Link to the DMS-100, an X.25 Link must be configured to the third-party application, and an EMT connection must be configured in the DMS PIM. (Actually, multiple connections can be established over a single high-speed X.25 Link from the third-party

application if desired. Each such connection would use a different X.25 Link to the DMS-100).
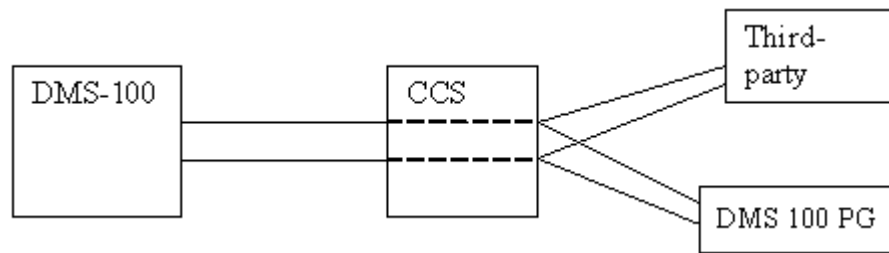
Figure 5: CompuCALL Session: Complex Case

2. More than one third-party application can be configured for a Session. Each must have a unique ProxyApplicationID configured in CCS to differentiate them. The ServiceID in the CompuCALL session has to be configured in the third-party application or DMS-100 PIM. When they make connections to the CCS, the CCS checks the value of ServerID in the DV_APPL_LOGON message to identify the application by comparing the ServiceID with ProxyApplicationID. There is no need to configure the ProxyApplicationID for a primary CompuCALL application (third-party application or DMS-100 PIM).

    Note: Although CompuCALL protocol supports a multiple sessions per Compucall Link, neither the PIM nor the CCSG supports this configuration.

3. Third-party application connections to the CCS, and CCS connections to the DMS-100 can be any combination of X.25 and TCP. In other words, the CCS connection to the DMS-100 can be X.25 at the same time third-party application #1 uses TCP, while third-party application #2 uses X.25. However, the number of connections must match for each Session (as described in 1 above). The DMS-100 switch permits only one TCP connection for the same Session.

2.10.3. Setup Details
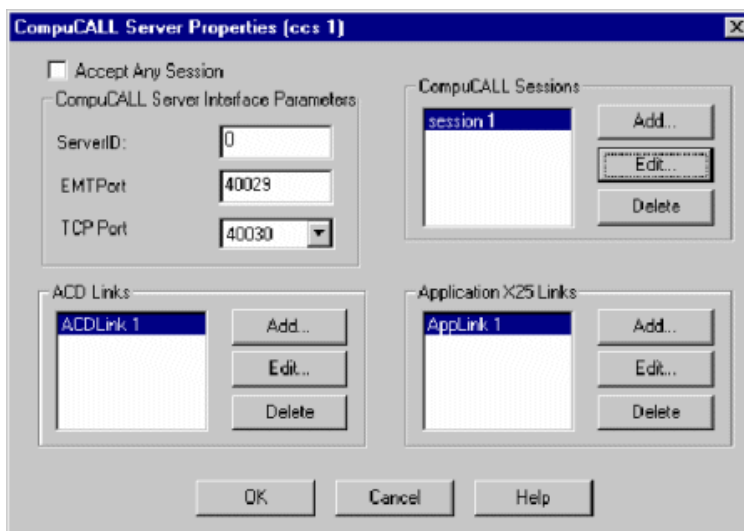
Figure 6: CompuCALL Server Setup

There are four CompuCALL Servers that may be configured on a single host. Each must use a unique EMT and TCP Socket address. No two CompuCALL Servers can share the same X.25 Port for applications. Two CompuCALL Servers can share the same X.25 Port for access to the ACD (and at most one can ALSO use this X.25 port for applications). Sharing one X.25 Link by two applications is not advised unless connecting to the ACD via an X.25 Packet Switch, and via a high-speed link.

Table 8: CompuCALL Server Setup Options

Option Name	Option Description	Value		Default
		Min	Max	
Accept Any Session	**Not implemented currently.** Accept Sessions which are accepted by the DMS-100 even if not configured in CCS.	Yes/No		Displayed
ServerID	**Not used.**	0	0	0

EMT Port	CCS EMT Port Number that is used by DMS PIM to communicate to CCS. CompuCALL Server EMT port assignments follow the following convention: Port numbers are of the form 4SFFF where S = 0-4 corresponds to CCS1 – CCS5 on side A (only CCS1-CCS4 currently supported) = 5-9 corresponds to CCS1 – CCS5 on side B (only CCS1-CCS4 currently supported) FFF = customer number * 40 + 029	40029	49769	Displayed
TCP Port	CCS TCP Port Number that is used by third-party application and DMS PIM to communicate to CCS. CompuCALL Server TCP port assignments follow the following convention: Port numbers are of the form 4SFFF where S = 0-4 corresponds to CCS1 – CCS5 on side A (only CCS1-CCS4 currently supported) = 5-9 corresponds to CCS1 – CCS5 on side B (only CCS1-CCS4 currently supported) FFF = customer number * 40 + 030	40030	49770	Displayed
ACD Links	See Table 9: ACD Link Setup Options.			
Application X25 Links	See Table 11: Application Link Setup Options.			
CompuCALL Sessions	It is recommended that ACD Links and Application Links are set up prior to setting up CompuCALL Sessions.			
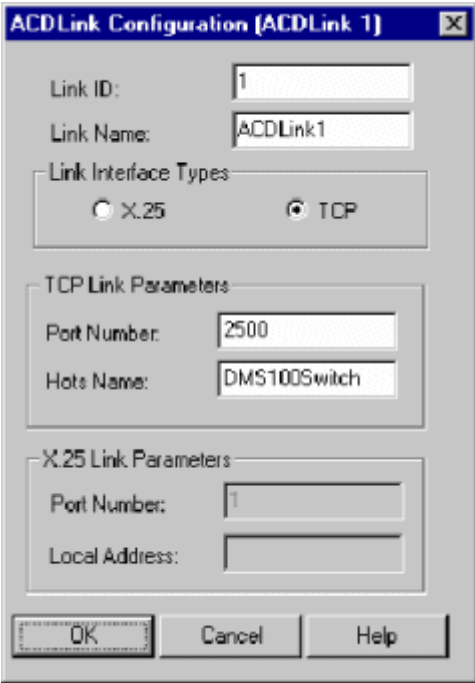
Figure 7: ACD Link Setup

Table 9: ACD Link Setup Options

Option Name	Option Description	Value		Default
		Min	**Max**	
Link ID	ID used in error/status messages which reference the link. When default is used (recommended) this corresponds to labels used in the "Session Configuration" dialog box's "ACD Link IDs" check boxes.	1	8	Displayed
Link Name	Link name used in error/status messages which reference the link.	Up to 40 ASCII characters.		**None**
X25 Port Number	EICON X.25 Port number.	1	8	**None**
X25 Local Address	**Not used.**	Up to 14 decimal digits.		**None**
TCP Port Number	DMS-100 switch TCP well-known port number	2500.		2500
TCP Host Name	DMS-100 switch Host Name	N/A		**None**
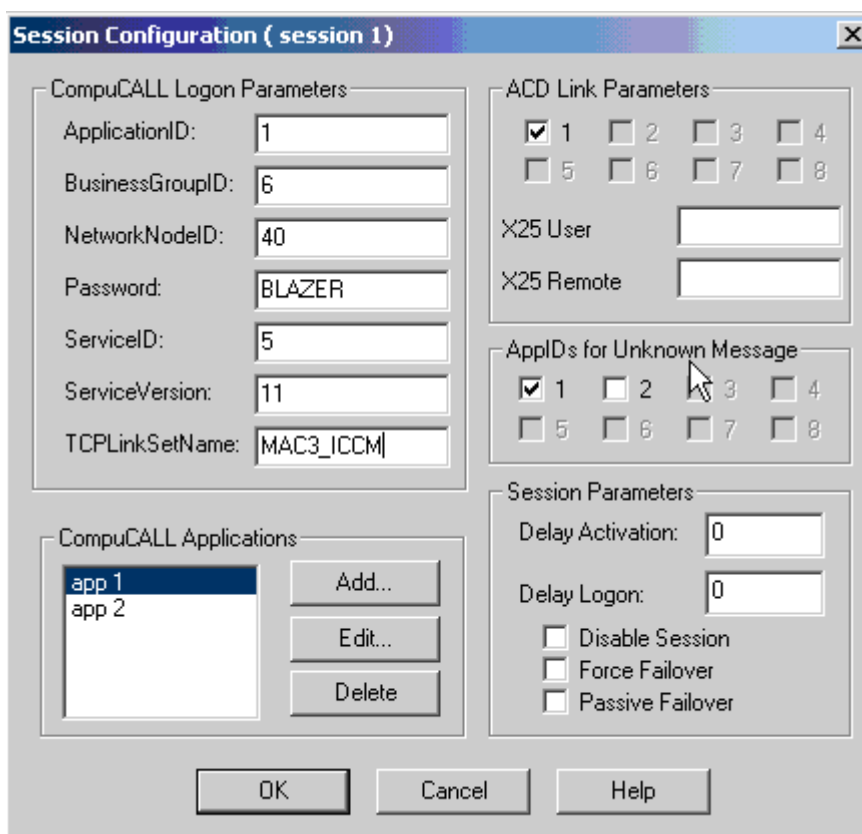
Figure 8: Session Object Setup

Table 10: Session Object Setup Options

Option Name	Option Description	Value		Default
		Min	**Max**	
CompuCALL Logon Parameters	See Table 10: Session Object Setup Options.			
User Data	X.25 SVC call parameter – as configured at DMS-100.	Four octets (each 0-255) separated by spaces.		**None**
Remote Addr	X.25 SVC call parameter – destination DTE address as configured at DMS-100.	Decimal digits		**None**

App IDs for Unknown Message	Select those applications that will receive "unknown messages". Unknown messages are those messages that may be introduced in future versions of the CompuCALL interface. The application ID as it appears in the "CompuCALL Applications" list box of the "Session Configuration" dialog box.	Yes/No		No
Delay Activation	**Not implemented currently.**	0	255	No
Delay Logon	**Not implemented currently.**	0	255	0
Disable Session	No lower priority applications allowed to logon, or to remain logged on, unless highest priority configured application is logged on.	Yes/No		No
Force Failover	Not implemented currently. Enable/disable the system's ability to force Host application failover.	Yes/No		No
PassiveFailover	Not implemented currently. Enable/disable duplex CCS Passive Failover.	Yes/No		No

ACD Link IDs	Select those ACD Links that will be used by this Session. The ID is as it appears in the "ACD Links" list box of the "CompuCALL Server Properties" dialog box. This is the same as the "ACD Link ID" of the ACD Link Configuration dialog box **ONLY IF** the default value is used.		
CompuCALL Applications	See Table 12: Application Configuration Options.		
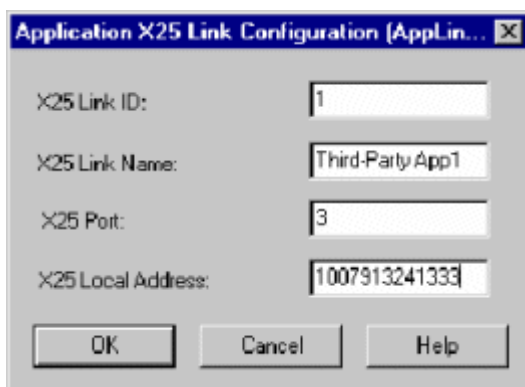
Figure 9: Application X.25 Link Setup

Table 11: Application Link Setup Options

Option Name	Option Description	Value		Default
		Min	Max	
X25 Link ID	ID used in error/status messages which reference the link. When default is used (recommended) this corresponds to labels used in the "Application Configuration" dialog box's "X25 Link Ids" check boxes.	1	8	Displayed.
X25 Link Name	Name used in all error/status messages referencing the link.	ASCII text (up to 40 chars)		0

X25 Port	EICON X.25 port number.	1	8	1
X25 Local Address	X.25 DTE address assigned to the X.25 Link. Used only for documentation purposes when X.25 Link is attached to X.25 Packet switch.	Up to 14 decimal digits.		
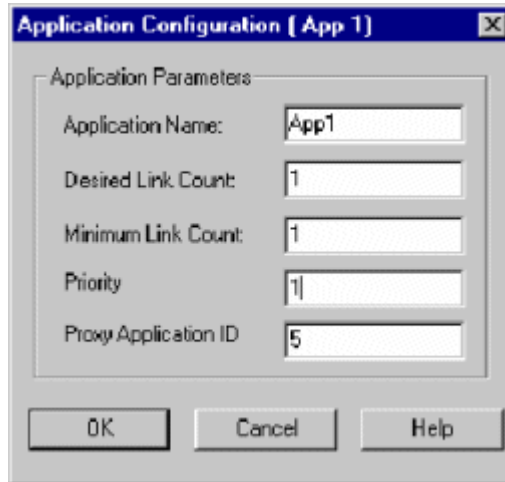
Figure 10: Application Configuration

Table 12: Application Configuration Options

Option Name	Option Description	Value		Default
		Min	Max	
Application Name	Name of application for documentation purposes and as it will appear in error/status messages	ASCII Text		none
Desired Link Count	Desired number of active links. The desired number for the Session is the desired number for the active application with the highest priority.	1	8	1
Minimum Link Count	Minimum number of active links. In future duplex CCS configurations, this value defines a threshold for failover to duplex CCS.	1	8	1

| Priority | Application Priority (lower number is higher priority). | 0 | 255 | 0 |
| Proxy Application ID | Application ID of third-party application and DMS-100 PIM. It equals to the ServerID in the CompuCALL application logon message. | 0 | 255 | 0 |

2.11. Support for Walk-Away Reason Codes

When an ACD Agent hits the NotReady button on an Agent device, the NotReady light will be blinking to indicate that the Agent can enter a walk-away code. If the system timer expires, the DMS100 switch sends a DV-Agent-NotReady-U message without walk-away code.

Some Agent activities indicated by the walk-away codes need to be included into the Average Handled Time computation. The approach is provided to allow use to configure database to support the feature.

XTable 13X is one example of walk-away codes. The system configuration is also shown how the walk-away codes marked with an "X" to be included in call-handle time.

Table 13: Example of Walk-Away Codes

Walk-Away Codes	Definition	Include in Call-handle time
000	Default (No code)	X
105	Personal Need	
115	Break	
130	30 min. lunch	
145	45 min. lunch	
160	60 min. lunch	
190	Approved Leave	
201	Training	
202	Administration	
203	Meeting	
204	Supervisor	
301	Wrap-up	X
302	Claim Follow-up	

303	Special Claim Follow-up	
304	Down Mode	
401	Exceptions	
402	Determinations	
403	Special Projects	
501	Child Support Intercept	
502	Teletypwriter	
503	Interpreting	
-1	Not defined. (wrong code used)	

2.12. Object Mapping

It is very important to understand the Call Distribution Mode for the DMS100 switch in order to configure the PeripheralTarget, Route and Service and their association.

The Peripheral Gateway performs a DV_DN_ASSOCIATION for each of the Primary ACD DNs configured in the Unified ICM Peripheral Monitor Table. If the PIM specifies a Primary ACD DN to be associated with the current session, the host application is informed by the switch of all calls to that ACD Group. Furthermore, if the ACD Group has one or more Supplementary ACD-DNs associated with it, then all of the Supplementary ACD DNs are automatically associated with the current session.

2.12.1. Peripheral

The Peripheral corresponds to the collection of CompuCALL sessions associated with a BusinessGroupID.

2.12.2. Peripheral Targets and Routes

Peripheral Targets are the means that the software maps/directs calls to Services, Skill Groups or Agents. A Peripheral Target is specified by a Network Trunk Group and a DNIS pair. Each Peripheral Target is associated with a single Route. A Route is associated with a Target Type (Service, Skill Group, Agent, Translation Route). For accounting purposes, each Route is associated with a Service. It is this mapping that will allow the Peripheral Gateway to define the CallType (Service) when a new call arrives on the DMS-100.

The DNIS configured in the Peripheral Targets must correspond to the Primary or Supplementary ACD DN defined on the DMS-100. The DNIS configured in the Peripheral Targets for the Primary ACD DN is the dialed number of Primary ACD DN, and for the Supplementary ACD DN, it is the dialed number of Supplementary ACD DN.

The configuration of Peripheral Targets for calls associated with Supplementary DNs is required to define the proper call type when the call is offered to the DMS-100.

2.12.3. Trunk Groups

The CTI Links utilized by the DMS-100 Peripheral Gateway offer no Trunk level statistics to the customer. Trunk configurations on the DMS-100 are treated as a POOL of inbound/outbound resources that are accessible by all Call Types.

2.12.4. Trunks

No trunk information is provided by the CompuCALL Interface. As a result, Trunks need not be entered in the Unified ICM configuration.

2.12.5. Services

The Cisco Service abstraction is defined as "a type of caller need that the peripheral handles" (i.e., Quotes, Sales, Brokerage). The Unified ICM will choose a Service based on the current Routing Script that is scheduled for the dialed number being requested. The Router responds to the Routing Client with the Label, which is specific to the Routing Client Type, which defines how the call is to be treated. For Network Routing Clients, the Call is directed to an ACD on a particular Trunk Group with a specific DNIS and/or ANI. For ACD Routing Clients, the Label defines a target on the ACD that performs specific call treatment. This could include on or off switch processing of the call.

The DMS-100 ACD will follow either of these call delivery models. When the call arrives to the ACD, it is offered to the ACD Group associated with the Primary/Supplementary ACD-DN of the call. In both the DMS-100 and Unified ICM models, Agent/Skill Groups may be associated with one or more services.

A Service Object has to be configured for each Primary ACD-DN and each Supplementary ACD-DN.

The "Extension" configured in the Service Object must correspond to the Primary or Supplementary ACD DN defined on the DMS-100. The "Extension" configured in the Peripheral Targets for the Primary ACD DN is the dialed number of Primary ACD DN; and for the Supplementary ACD DN, it is the dialed number of Supplementary ACD DN.

The configuration of Service Objects for calls associated with Supplementary DNs are required to define the proper call type when the call is offered to the DMS-100.

Each Service Object has to be associated with a PeripheralTarget and Route object in the system configuration.

The following table defines the Service Object member mapping used when configuring a Service in the software.

Table 14: Unified ICM to DMS-100 Service Mapping

Unified ICM Service	DMS-100 Service	Description
SkillTargetID	none	Unified ICM SkillTargetID defined by Cisco
PeripheralNumber	Last four to six digits of Primary ACD-DN or the Supplementary ACD-DN**	Last four to six digits of Dial Plan Directory Number of the Primary or Supplementary ACD-DN assigned to the ACD Group.
Extension	Dial Plan Directory Number of Primary ACD-DN if configuring for a Primary ACD-DN or Dial Plan Directory Number of Supplementary ACD-DN if configuring for a Supplementary ACD-DN	Dial Plan Directory Number of the Primary or Supplementary ACD-DN assigned to the ACD Group.

Note: In some customer configurations, the Supplementary ACD-DN could be associated with the service of the Primary ACD-DN.

** The selection of last four to six digits of the Primary ACD-DN or the Supplementary ACD-DN has to be unique within "Service All" in the **Configure ICM** dialog.

2.12.6. Default Peripheral Route

If the PG is informed of a call for which there is no Peripheral Configuration (PeripheralTarget/Route and/or Service not configured), the call is not tracked. This is likely to occur when the configuration does not match the configuration defined on the DMS-100. An example of this would be when a customer is not routing all call types handled by the switch, but the CTI Link provides events on all Call Types.

To allow some type of monitoring of calls that have no definitive Route/Service mapping, the software provides the Peripheral Default Route. The Peripheral Default Route provides a place holder to gather statistics on calls that are monitored by the CompuCALL Link, which do not map to the configuration. The software will gather Route/Service statistics associated with these unknown calls along with their Termination Call Details.

From the Termination Call Details of the call associated with the Peripheral Default Route, the customer can track down the unknown call types. The Termination Call Detail will provide the ACD-DN associated with the call. The Customer can then update the configuration to include the non-configured call types.

2.12.7. Skill Groups

The Cisco Skill Group abstraction is defined as "a collection of Agents that share a common set of skills." The DMS-100 ACD Groups are consistent with the Cisco definition of a Skill Group. The Cisco Skill Group contains the following fields: a SkillTargetID, a Peripheral Number, a Peripheral Name and an Extension Number. The SkillTargetID is utilized by the Router to target Skill Groups in the Scripting Language. The following table defines the SkillGroup/DMS-100 ACD Group Object member mapping used when configuring a Skill Group in the software.

Table 15: Unified ICM to DMS-100 Skill Group Mapping

Unified ICM Skill Group	DMS-100 Skill Group	Description
SkillTargetID	None	Unified ICM SkillTargetID defined by Cisco
PeripheralNumber	Last four to six digits of Primary ACD-DN of the ACD Group	Last four to six digits of Dial Plan Directory Number of the Primary ACD-DN assigned to the ACD Group.
Extension	Primary ACD-DN of the ACD Group	Dial Plan Directory Number of the Primary ACD-DN assigned to the ACD Group.
Peripheral Name	ACD Group Name	Name associated with an ACD DN of an ACD Group.

** The selection of last four to six digits of Primary ACD-DN has to be unique within "Skill_Group All" in the **Configure ICM** dialog.

On the DMS-100, an ACD Group can be assigned one Primary ACD-DN and up to 16 Supplementary ACD-DNs. Calls arriving with the Primary ACD-DN are queued to the ACD Group at priority 0 (Highest priority). The Supplementary ACD-DNs assigned to the ACD Groups are given a priority in the range of 0-3 where 3 is the lowest priority. Calls are answered by Agents assigned to the ACD Group based on the arrival and priority of the call. A call waiting longer in the Priority 1 queue will not be serviced if a call is pending in the Priority 0 queue. Calls offered to an ACD Group that have available Agents are assigned to the MOST IDLE Agent.

2.12.8. Agent

The Agent Object is made up of the following fields: a SkillTargetID, a Peripheral Number, an Extension Number, a State, a list of active Skill Group assignments, and a First and Last Name. From the Unified ICM perspective, the Agent Object is uniquely identified by the SkillTargetID. The SkillTargetID allows for the Router to target a specific call to an Agent (Not Currently Implemented). The following table defines the Agent object components used when configuring an Agent in the software.

Table 16: Unified ICM to DMS-100 Agent Mapping

Unified ICM Agent	DMS-100 Agent	Description
SkillTargetID	None	Unified ICM SkillTargetID defined by Cisco
PeripheralNumber	PositionID	DMS-100 Identifier for the position the agent logged onto. The Position Identifier is assigned to the ACD set where an Agent login occurs.
Extension	PositionID	Same.
FirstName	Not available.	First Name of Agent.
LastName	Not available	Last Name of Agent.

The Agent Position Identifier to Agent mapping is dynamic and occurs when an Agent logs onto an ACD set on the DMS-100.

The DMS-100 Agents will be configured dynamically by the DMS-100 PIM based on the Call and Agent events received from the DMS-100 CTI events. For those Agents configured in the database, the PIM will report to OPC the state transitions with the Agent's configured PeripheralNumber. The DMS-100 PIM does not restrict Agents from being configured in the database. The Skill Group association for Agents is dynamically assigned from the DMS-100 CTI Link events. The DMS-100 supports a single Skill Group assignment per Agent. DMS-100 System Administrators have the ability to re-assign an Agent position to another Skill Group while an Agent session is active on an ACD position. The software will be capable of migrating the Agent's Skill Group assignment when this occurs. This will be accomplished by logging the Agent out of the OLD Skill Group assignment and then logging the Agent back in under the new Skill Group assignment.

2.12.9. DMS-100 Agent State to Cisco Agent State Mapping

The following table defines the CompuCALL Agent State Event mapping to the Cisco Agent States. The PIM will transition an Agent's state based on these ACD Position events.

Table 17: CompuCALL Events to Cisco Agent State Mapping

DMS-100 CompuCALL State	Cisco State
DV_AGENT_LOGIN	AS_LOG_IN
DV_AGENT_LOGOUT	AS_LOG_OUT
DV_AGENT_READY	AS_AVAILABLE
DV_AGENT_NOT_READY	AS_WORK_READY if Walkaway is not specified and AS_NOT_READY not ready if Walkaway is specified.
DV_CALL_ANSWERED	AS_TALKING
DV_SET_OFFHOOK-U	AS_TALKING
DV_CALL_RELEASED	AS_WORK_READY if Variable Wrap-up is configured for this active Skill Group. AS_ AVAILABLE if Variable Wrap-up is not configured for this active Skill Group.

2.12.10. Dialed Numbers

Dialed numbers for the peripheral's routing client correspond to the Primary or Supplementary DN's on the DMS-100 switch that are to be Post Routed.

2.12.11. Labels

Labels for the peripheral's routing client correspond to destinations to which calls can be routed. Labels can be configured for any number that can be dialed on the switch. For example, you can configure a label to a Primary ACD DN, Supplementary ACD DN, or a Secondary DN. You can also configure the hostCallData information in labels. The DMS-100 PG will send the hostCallData information to the switch. The switch sends the hostCallData information to another host application during the one call procedure with the same CallID.

2.12.12. Peripheral Monitor Table Entries

See the section *Peripheral Monitor Configuration of ACD Positions* XXXfor relevant details.

2.13. Monitoring Agent Skill Group Assignment Change

In the call center, there is a need for supervisor to reassign an ACD Agent to another ACD group. When the Agent group reassignment happens, the DMS100 switch will not send out any CompuCALL messages to the host

application to indicate the event. The DMS100 PG uses the DV-Appl-Stat-QryF[1]F interface to periodically interrogate the DMS100 switch for the all monitored ACD groups to examine whether the Agents have been re-assigned from one Skill Group to another Skill Group.

The DV-Appl-Stat-Qry interface is supported in the CompuCALL software version NA09 or above.

Because of periodical interrogation, the DMS100 PG will not know any Agent Skill Group re-assignment until the next time it interrogates the ACP1000 switch. The interval is controlled by the Windows NT Registry entry, "..\DMS100Data\ Dynamic\AgentGroupChangeTimerResolution".

The default value for "..\DMS100Data\ Dynamic\AgentGroupChangeTimerResolution" is 0 that virtually disables the DMS100 PG option to periodically interrogate the DMS100 switch.

There is CompuCALL link bandwidth consideration when applying the approach to deal with the Agent Skill Group re-assignment. When the DMS100 PG used the DV-Appl-Stat-Qry interface, the DMS100 will acknowledge with a DV-Agent-Status-U message for each Agent. The DMS100 switch CompuCALL X.25 link with 19.2 kbps can deliver messages for 5 calls/second, assuming 4 messages per call statistically. If the DMS100 PG interrogates the switch with 240 ACD agents configured for Agent Skill Group re-assignment every minute, the DMS100 switch can only deliver the CompuCALL message for 4 calls/second. This is because there are extra 240 DV-Agent-Status-U messages in every minute.

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[1] When a new DN is added in the PMT of the PG explorer, the PIM sends a request to associate with the DMS100 switch. If the DN is successfully associated with the DMS100 switch for the first time, PIM sends the "DV-Appl-Stat-Qry" message to the DMS100 switch. If the switch responds with the error "ACD DN missing," the PIM tries to associate the DN 8504889080 for a second time. As a result, the DMS100 switch responds with an error "DN Already In Set." Due to this, the DMS100 PIM cycles. This issue is caused due to the incorrect error message sent by the Nortel DMS100 switch.

3. ACD Configuration – Operation Interface

The CTI interface supported from the DMS-100 is the DMS-100 CompuCALL Interface. The CompuCALL Interface was developed to support an applications integration of Voice and Data (i.e., Screen Pop CTI Application). The CompuCALL Interface provides an application the capability to monitor call and Agent State transitions along with Post Routing capabilities. This chapter describes the operation specifics of the DMS-100 CompuCALL interface.

3.1. DMS-100 CompuCALL Interface Specification (Q218)

The DMS-100 provides several software options to provide different call processing features. The Automatic Call Distribution (ACD) is a feature package on the DMS-100 system that provides an equal distribution of calls to a configured set of answering positions.

The ACD feature allows Agents assigned to positions to answer calls assigned to specific queues. Incoming calls are routed to the relevant queue based on the number dialed. The calls are then answered in priority; First In First Out (FIFO) order by the most idle Agent.

There are two CompuCALL Application Service Options available from the DMS-100: the Meridian ACD CompuCALL Options and the Meridian Digital Centrex (MDC) CompuCALL Option. The Meridian ACD CompuCALL Options relate to DMS-100 Centrex lines configured with ACD features (Centrex ACD lines and the voice set support by ACD). The Meridian Digital Centrex (MDC) CompuCALL Options relate to DMS-100 lines configured with Meridian Digital Centrex business features.

The Meridian ACD CompuCALL with the Meridian ACD Option allows customers to develop incoming and outgoing ACD call handling systems. The primary purpose of the Meridian ACD CompuCALL service is to provide the DeskTop CTI Application support of coordinate voice with data (CVD).

The CompuCALL Interface support for coordinated voice and data is accomplished with a set of application services. An application service is a group of options for a specific customer application. CompuCALL Options are a set of options offered by the telephone company to a CompuCALL customer. The options available on the DMS-100 are the Meridian ACD CompuCALL Option and the Meridian Digital Centrex (MDC) CompuCALL Option.

The MDC CompuCALL Option provides application services to non-ACD lines. The main application of the MDC CompuCALL option is the coordinated voice and data delivery to an end user work station for handling incoming calls.

3.1.1. CompuCALL Bandwidth Requirements

The X.25 bandwidth requirements for the CompuCALL Interface are dependent upon a number of factors. This includes, the Meridian ACD CompuCALL options selected, selected message(s) and their size, Busy Hour Call Rate, number of Agents and their activities, and the number of administrative commands utilized. The following is the bandwidth calculation which can help determine the physical connections required when configuring the DMS-100 PG.

Formula 1:
BandWidth (bit/sec) = CallsPH / 3600 * TotalBytesPC * ByteToBit *
Occu
Where: CallsPH   - average calls per hour (call/hour),

TotalBytesPC   - total bytes per call (byte/call),
ByteToBit   - bits in one byte (= 8),
Occu   - planed CompuCALL message occupancy of
X.25 link (e.g. 60%).

Formula 2:
BandWidth (bit/sec) = CallsPS * TotalBytesPC * ByteToBit * Occu
Where: CallsPS - average calls per second (call/sec).

Table 18: DMS-100 Switch Capacity

Parameter	Maximum Value	Meaning
SN_{max}	96	Maximum active CompuCALL sessions per switch
SVC_{max}	8	Maximum SVCs per CompuCALL session
$ACDDN_{max}$	20	Maximum ACD Groups associated to one CompuCALL session
DN_{max}	20000	Maximum non-ACD DNs associated to one CompuCALL session
LinkBD	19.2 (kbps)	CompuCALL link bandwidth (kbits/sec)
$AcSVC_{max}$	96	Maximum active SVCs per DMS-100 switch
Cus_{max}	81	Maximum customer number per DMS-100 switch

Note: Nortel recommends only one SVC per CompuCALL link.

Table 19: DMS-100 Switch Statistics Provided by Nortel

Parameter	Maximum Value	Meaning
CSL_{sta}	5	Statistically estimated maximum calls per second on one active CompuCALL link (Calls/Sec/Link).
MSL_{sta}	20	Statistically estimated maximum messages per second on one active CompuCALL link (Messages/Sec/Link).
BM_{sta}	90	Statistically estimated average bytes per CompuCALL messages (Bytes/Message).

Table 20: DMS-100 CompuCALL Message Size

Message Type	Bytes
DV_CALL_OFFERED_U	98
DV_CALL_QUEUED_U	75
DV_CALL_RELEASED_U	70
DV_CALL_ANSERED_U	64
DV_CALL_RECEIVED_U	72
DV_CALL_REDIRECT	85
DV_SET-FEATURE	70
DV_AGENT_READY_U	45
DV_AGENT_NOT_READY_U	45
DV_CALL_CONSULT_ORIGINATED_U	60
DV_CALL_CONFERENCED_U	73
DV_CALL_TRANSFER_U	59
DV_SET_OFFHOOK_U	44
DV_MAKE_CALL	90
DV_ANSWER_CALL	69
DV_HOLD_CALL	69
DV_RELEASE_CALL	69
DV_UNHOLD_CALL	69
DV_ADD_PARTY	76
DV_CONFERENCE_PARTY	72
DV_TRANSFER_PARTY	60
DV_DROP_PARTY	67

Note: The size of each CompuCALL message sent from the switch includes 12 bytes of overhead for X.25. The size of each CompuCALL message sent to the switch by the DMS-100 PG includes 24 bytes of overhead for X.25.

There are two ways to calculate TotalBytesPC. The first is to do a calculation based on the statistics data from the XTable 20: DMS-100 CompuCALL Message SizeX.

Formula 3:
TotalBytesPC = MsgPC * Bmsta
Where: MsgPC - average CompuCALL messages per call
(message/call).

The other is to identify typical call scenarios and the most frequently used CompuCALL messages, and obtain the size of these messages from the Table 20: DMS-100 CompuCALL Message Size.

Formula 4:
TotalBytesPC = MsgLen1 + MsgLen2 ¬ + …… + MsgLenn
Where: MsgLeni - is the message length of i-th CompuCALL message in one call (bytes/call).

For example, when a SoftPhone application uses Third Party Call Control (TPCC) and Third Party Agent Control (TPAC) to answer an incoming ACD call, the CompuCALL message sequence is:
DV_CALL_OFFERED_U, DV_ANSWER_CALL ,
DV_CALL_ANSERED_U, DV_RELEASE_CALL,
DV_CALL_RELEASED_U, DV_SET-FEATURE,
DV_AGENT_NOT_READY_U, DV_SET-FEATURE,
DV_AGENT_READY_U.

By looking up the message length for each CompuCALL message in the XTable 20: DMS-100 CompuCALL Message SizeX.

TotalBytesPC = 98 + 69 +64 + 69 + 70 + 70 + 45 + 70 + 45 = 600 (byte/call)

The designed capacity of the DMS-100 PG is listed as the following:

Table 21: DMS-100 Peripheral Gateway Capacity

Parameter	Maximum Value	Meaning
$PGSN_{max}$	8	Maximum configured CompuCALL sessions per switch.
$PGLN_{max}$	8	Maximum configured CompuCALL links per CompuCALL session.

The following formula can help you calculate the required number of the CompuCALL links.

Formula 5:
TotalLinks = (nSVC * BandWidth) / LinkBD
Where: TotalLinks - is the required number of CompuCALL links based on call rate, call scenarios, occupancy of link, and etc.

nSVC - the number of SVCs on one link. It is recommended that nSVC = 1 be used in most situations. If nSVC > 1, it is quite more complicated situation so that you have to take many factors into consideration.

3.2. Post-Routing

Following are the steps to support Post-Routing using the DMS-100 Switch:

1. Set up one ACD Group on the DMS100 switch that can have either ACD Agents or no ACD Agent. If no ACD Agent configured in the ACD Group, overflow to another ACD Group has to be configured for the ACD Group.

2. Activate the DV-CALL-RECEIVED-C message and enable the Call Redirect capability for that ACD Group in the Service Profile for the session of the associated environment.

3. The DMS100 switch datafill for post routing support is shown as follow:

4. In the "SCAISSRV" TABLE, add "ROUTING35$ ROUTING (CALLRECDC Y Y Y Y Y Y Y Y Y Y) (CALLREDIR Y Y Y)$".

5. In the "SCAIPROF" TABLE, add "(ROUTING35$)".

6. In the "ACDGRP" TABLE, add "(SCAIREDIR 10 0 N)" for the ACD group.

7. Configured the time out that the DMS-100 allows the PIM to response to DV-CALL-RECEIVED-C message. The time out value is 1 to 30 seconds. Two seconds is recommended.

8. Add primary ACD DN for the ACD Group in the Peripheral Monitor Table of the Configure Unified ICM application. The ACD Group DN is the dialed number in the Unified ICM configuration. The label returned to the PIM identifies the destination

See, *Appendix A* for the DMS100 Switch Datafill example.

4. Eicon Card Configuration

This chapter describes the Eicon Card Configuration.

4.1. **Eicon Card Configuration Details**

1.   Select the High-Level Protocols node. The High Level Protocol selected should be Transport ISO and left as no choice.

2.   Select the Port 1 node. Enter the following values:

Port Name	P1
Number	1
Protocol	X.25
Dialer	Direct

3.   Select the X.25 node. Enter the following values:

Node type	DTE
Packet format	Extended
X.25 Version	1984
Window size	Maximum = 7, Default = 2
Packet Size	Maximum = 128, Default = 128

4.   Select the VC Tab to check entitled Sequential assignment of virtual circuits.

Number of PVC	0
Number of IVC	0
Number of TVC	4
Number of OVC	0

Note the Value in the Number of TVC must match x in the (SVC2WAY x) in the DMS100 datafill MPCLINK table, if when the DMS100 PIM sends open connection request, the DMS100 switch rejects the connection request with a DIAGONISTC code.

In the Timer Tab	
T20	180
T21	200
T22	180
T23	180
Idle	0
Acknowledge	10z

Note the T20, T21, T22 and T23 in the Eicon WAN Service configuration usually match the corresponding ones in the DMS100 datafill MPCLINK table.

    a.   In the Advanced Tab

    b.   Max retry count N3 3

    c.   Data link layer HDLC

5.   Select the HDLC node. Enter the following values:

    a.   Check the box entitled FRMR to RRC/RNRC/REJC with P=0

    b.   Leave the Disable Automatic DTE/DCE Settings for Dialup Link box unchecked

Max Size Frame N1 (octets)   144

Window K   7

In the Advanced Tab, the values displayed should be the following:

Link Setup	Active
Sequence	Normal
Max retry count (N2)	10
Check Point T1	5000
Ack Delay T2	1200
Idle Probe T3	25000
HDLC X.32 Service Sel.	NONE
Leave GOSIP box unchecked	

6.   Select the Direct node. Enter the following values:

R1(on) -> DTR(on) delay	0
DSR(on)->RTS(on) delay	0
DSR de-bouncing delay	100
Max delays for a connection establish.	15

7.   Select the Sync icon. Enter the following values:

Line interface	Leased
Duplex	Full
Type	Point-to-Point
Modem interface	V35/RS232
Clocking	External
Data encoding	NRZ

Note:

If the WAN Services parameters are changed, the WAN Services must be restarted for the changes to take effect. The following commands are used to restart the WAN Services:

Eccard stop

Eccard start.

The ECMODULE TRACE function can be a useful tool for the X.25 data communications analysis. Here are some examples of ECMODULE TRACE with different command line parameters:

Displays trace information on the X.25 protocol on port #1:

ECMODULE TRACE X25 /P 1

Displays trace information on the HDLC protocol on port #1:

ECMODULE TRACE HDLC /P 1

Enable the X25 trace option on port #1, with a trace buffer size of 4096 bytes:

ECMODULE TRACE X25 /P 1 /S 4096

Clears and resets the X25 trace buffer on port #1:

ECMODULE TRACE X25 /P 1 /S 0

5. Appendix A: DMS100 Switch Datafill Example

The datafills on DMS100 needs to be configured in order to work with the Unified ICM. The following example depicts the datafill on a DMS100 Switch:

A.1. TABLE: MPC

```
MPCNO MPCIOC IOCCCT EQ DLDFILE
3 0 28 1X89BB MPC403AC **** CompuCALL Link to Cisco Peripheral
Gateway (PG)

5 2 12 1X89BB MPC403AC **** CompuCALL Back-up Link to Cisco PG
```

Notes:

1. MPCIOC is actual DMS IOC Number (i.e. 0 or 1 or 2 or 3, etc)

2. IOCCCT is in reference to actual IOC Card Number of 1X89 card on IOC Shelf (i.e. card 0 = ioccct 0, card 1 = iocct 4, …..card 8 = ioccct 32)

3. 1X89 must be 1X89BA or BB if running 56K and must match actual card installed)

4. DLDFILE can be MPC403AC or MPC003AC (Nortel recommends MPC403AC)

A.2. TABLE: MPCLINK

```
LINKKEY LINKALM PRTCLDAT
3 3 Y X2580 0 0 (CLKSRCE EXTERNAL) (L2WINDOW 7) (L3WINDOW 7)
(NODETYPE DTE) (ELECSPEC V35) (L3DATA P128) (N2 10)
(SVCS2WAY 1) $ (SVCDNA 19092502500) $
5 3 Y X2580 0 0 (CLKSRCE EXTERNAL) (L2WINDOW 7) (L3WINDOW 7)
(NODETYPE DTE) (ELECSPEC V35) (L3DATA P128) (N2 10)
(SVCS2WAY 1) $ (SVCDNA 29092502500) $
```

Notes:

1. MPCNO must match MPCNO assigned in table MPC

2. LINKNO must be set to 3 when configuration is running 56K

3. Even though the LINKNO is 3 for 56K the cable connected to the back of the IOC Shelf must be physically connected to Link 1. Link 1 is the V35 Link.

4. ELECSPEC V35 is required when running 56K

5. L2WINDOW= 7, L3WINDOW=7, and N2=10, must be matched in the Cisco PG

6. SVCDNA is a 1-15 digit number, and must match the X25 Remote Address in Cisco PG

7. Additional Parameters ---These Parameters are all DMS defaults and DO NOT have to be assigned in table MPCLINK.
 (L2MODULO = MOD8) (L3MODULO = MOD8) (T1_S = 5)
(T2_S = 3) (T3_S = 25) (T4_S = 10) (T20 = 180) (T21 = 200) (T22 = 180) (T23 = 180) (T25 = 0)
(T26 = 180) (R20 = 1) (R22 = 1) (R23 = 1) (R25 = 0)

A.3. TABLE: SCAICOMS
LINKSET SCAILNKS
LINKSET1 X25 (MPC (3 3 10079132410709 0 0 0 0 SVC) (5 3 10079132410707 0 0 0 0 SVC) $) $ MN CR

Notes:

1. LINKSET name is 1-16.

2. MPCNO and MPCLINKNO must match table MPCLINK.

3. REMDNA is a 1-15 digit number, and must match the X25 Local Address in the Cisco PG

A.4. TABLE: BGDATA
BGID BGXLA OPTIONS
LOCAL 624 $ (CUSTGRP CORPCTX N 486 Y 0 0) $

Notes:

1. BGID is Local and a unique number (i.e. LOCAL 624, for 1st BGID is this DMS). This must match the Business Group ID assigned in the Cisco PG.

2. CUSTGRP name is unique name.

3. MBG is Meridian Business Group. Set to N if this feature is not turned on.

4. NUMLINES is 486. Specify the number of primary directory numbers in the customer group. (The DMS will override this field automatically with the actual number).

5. INTRAGRP is Y. This means that this customer group is associated with any other customer groups in this DMS. (See feature Customer Group Family)

6. LSCFN is 0. This is a default and means that there is no Line Screening associated with these customer group lines.

7. LSCINCPT is 0. This is a DMS translations pointer to the table IBNTREAT for this customer group and determines where calls would route if blocked via Line Screening. Because Line Screening is not used in this application, this should point to an IBN Treatment that sends the call to Fast Busy (T120).

A.5. TABLE: SCAIGRP

SCAIGNAM PASSWORD NETNODID BGID OPTIONS
COMPUCALL_GRP BLAZER 1 LOCAL 624
(LINKSET (LINKSET1) $) $

Notes:

1. PASSWORD is a unique 1-8 characters. This must match the password assigned in the Cisco PG.

2. NETNODID is a unique number that must match the Network Node ID assigned in the Cisco PG.

3. BGID is LOCAL 624 and must match the assignment is table BGDATA, and also match the Business Group ID assigned in the Cisco PG.

4. OPTIONS is LINKSET with a list of up to 8 LINKSETS, must match the LINKSET(s) assigned in table SCAICOMS.

A.6. TABLE: SCAISSRV

SUBSERV SPROFILE
CTXEVENT34$ CTXEVENT (CALLOFFR Y Y N N Y Y Y N N Y Y Y Y)
(CALLANSWR Y Y Y N N Y Y Y N N Y Y Y) (CALLREL Y Y Y) $

ACDEVENT34$ ACDEVENT (CALLQUED Y Y Y Y Y Y Y Y Y N)
(CALLOFFR Y Y Y Y Y Y Y Y Y Y Y N) (CALLANSWR Y Y Y Y Y Y Y Y Y Y Y
N) (CALLREL Y Y Y Y Y) $

ROUTING34$ ROUTING (CALLRECDC Y Y Y Y Y Y Y Y Y N)
(CALLREDIR Y Y Y)$

TPCC34$ TPCC (ADDPTY Y Y Y N) (CONFPTY Y) (DROPPTY Y Y)
(TRANPTY Y) (MAKECALL Y Y) $

CTXEVENT35$ CTXEVENT (CALLOFFR Y Y N N Y Y Y N N Y Y Y Y)
(CALLANSWR Y Y Y N N Y Y Y N N Y Y Y) (CALLREL Y Y Y) $

ACDEVENT35$ ACDEVENT (CALLQUED Y Y Y Y Y Y Y Y Y Y Y)
(CALLOFFR Y Y Y Y Y Y Y Y Y Y Y Y) (CALLANSWR Y Y Y Y Y Y Y Y Y Y Y
Y) (CALLREL Y Y Y Y Y) $

ROUTING35$ ROUTING (CALLRECDC Y Y Y Y Y Y Y Y Y Y Y)
(CALLREDIR Y Y Y)$

TPCC35$ TPCC (ADDPTY Y Y Y N) (CONFPTY Y) (DROPPTY Y Y)
(TRANPTY Y) (MAKECALL Y Y) $

RESOURCE35$ RESOURCE (ACDQUERY)$

ACDEVENT36$ ACDEVENT (CALLQUED Y Y Y Y Y Y Y Y Y)
(CALLOFFR Y Y Y Y Y Y Y Y Y Y) (CALLANSWR Y Y Y Y Y Y Y Y Y Y
Y) (CALLREL Y Y Y Y Y) (AGTLGDIN Y Y Y) (AGTLGDOUT Y Y)
(AGTREADY Y Y) (AGTNREADY Y Y N) $

TPAC36$ TPAC (LOGINAGT Y Y N) (LOGOUTAGT Y) (READYAGT Y)
(NREADYAGT Y N) $

CTXEVENT07$ CTXEVENT (SETOFFHK Y Y) (CALLOFFR Y Y Y Y Y Y
Y Y Y Y Y Y)
(CALLANSWR Y Y Y Y Y Y Y Y Y Y Y Y Y) (CALLREL Y Y Y) $

RESEVENT07$ RESEVENT (SETOFFHK Y Y) (CALLOFFR Y Y Y Y Y Y
Y Y Y Y Y Y)
(CALLANSWR Y Y Y Y Y Y Y Y Y Y Y Y Y) (CALLREL Y Y Y) $

CALLINIT07$ CALLINIT (MAKECALL Y Y)$

SCAI3WC07$ SCAI3WC (ADDPTY Y Y Y) (CONFPTY Y) (DROPPTY Y
Y) (TRANPTY Y) $

SCAIMWTI07$ SCAIMWTI (MSGWAIT Y Y Y)$

DNQUERY07$ DNQUERY (DNQUERY Y)$

 SCAICC08$ SCAICC (ANSWCALL) (RELSCALL Y) (HOLDCALL)
(UNHOLDCALL) (CALLUNHELD Y) $

TPCC08$ TPCC (ANSWCALL) (RELSCALL Y) (HOLDCALL)
(UNHOLDCALL) (CALLUNHELD Y) (ADDPTY Y Y Y N) (CONFPTY Y)
(DROPPTY Y Y) (TRANPTY Y) (MAKECALL Y Y) $

TPCC09$ TPCC (CONSULTEV Y) (CONFEVNT Y) (TRANSFEREV Y)
(ANSWCALL) (RELSCALL Y) (HOLDCALL) (UNHOLDCALL)
(CALLUNHELD Y) (ADDPTY Y Y Y N) (CONFPTY Y)
(DROPPTY Y Y) (TRANPTY Y) (MAKECALL Y Y) $

SCAI3WC09$ SCAI3WC (CONSULTEV Y) (CONFEVNT Y)
(TRANSFEREV Y) (ADDPTY Y Y Y) (CONFPTY Y) (DROPPTY Y Y)
(TRANPTY Y) $

TPQC10$ TPQC (ROUTECALL) (GIVETRMT) (TRMTCOMP)$

ICCM10$ ICCM (SETCDNST)$

CTXEVENT10$ CTXEVENT (SETOFFHK Y Y) (CALLOFFR Y Y Y Y Y Y
Y Y Y Y Y Y)
(CALLANSWR Y Y Y Y Y Y Y Y Y Y Y Y Y) (CALLREL Y Y Y)
(CALLNAME Y Y Y Y Y) $

RESEVENT10$ RESEVENT (SETOFFHK Y Y) (CALLOFFR Y Y Y Y Y Y
Y Y Y Y Y Y)

(CALLANSWR Y Y Y Y Y Y Y Y Y Y Y Y) (CALLREL Y Y Y)
(CALLNAME Y Y Y Y) $

ACDEVENT11$ ACDEVENT (CALLQUED Y Y Y Y Y Y Y Y Y Y)
(CALLOFFR Y Y Y Y Y Y Y Y Y Y Y) (CALLANSWR Y Y Y Y Y Y Y Y Y Y
Y) (CALLREL Y Y Y Y Y) (AGTLGDIN Y Y Y)
(AGTLGDOUT Y Y) (AGTREADY Y Y) (AGTNREADY Y Y N) (LOBEVENT
Y Y Y)
(EMKEVENT Y Y Y Y Y Y) $

 TPCC11$ TPCC (CONSULTEV Y) (CONFEVNT Y) (TRANSFEREV Y)
(ANSWCALL) (RELSCALL Y) (HOLDCALL) (UNHOLDCALL)
(CALLUNHELD Y) (ADDPTY Y Y Y Y) (CONFPTY Y)
(DROPPTY Y Y) (TRANPTY Y) (MAKECALL Y Y) $

RESOURCE11$ RESOURCE   (ACDQUERY) (APPSTQRY Y Y Y Y Y)$

ACDEVENT_ALL ACDEVENT (CALLQUED Y Y Y Y Y Y Y Y Y Y)
(CALLOFFR Y Y Y Y Y Y Y Y Y Y Y) (CALLANSWR Y Y Y Y Y Y Y Y Y Y
Y) (CALLREL Y Y Y Y Y) (AGTLGDIN Y Y Y)
(AGTLGDOUT Y Y) (AGTREADY Y Y) (AGTNREADY Y Y N) $

TPAC36_ALL TPAC (LOGINAGT Y Y N) (LOGOUTAGT Y) (READYAGT
Y) (NREADYAGT Y Y) $

A.7. TABLE: SCAIPROF

PROFKEY PROFILE
LINKSET1 1 (CTXEVENT10$) (ACDEVENT36$) (ROUTING35$)
(TPCC09$) (RESOURCE11$) (TPAC36$) (CALLINIT07$) (SCAI3WC09$)
(SCAIMWTI07$) (DNQUERY07$) (SCAICC08$) (TPQC10$) (ICCM10$) $

Notes:

1. PROFKEY must match LINKSET assigned in table SCAICOMS.
    Also assign a unique SERVICE ID in the range of 0-255. If this is the
    1st SCAI Profile us 1. The Service ID must match the Service ID
    assigned in the Cisco PG.

2. PROFILE is a list of valid Sub-Service Profile Names from those
    defined in table SCAISSRV. Enter as many Sub-Service Names as
    required by the Cisco PG, provided each belongs to a different Unified
    ICM Category. (i.e. cannot assign CTXEVENT07 and CTXEVENT10
    to the same PROFKEY.) The Sub-Service Profile Names determine
    what messages are associated with the LINKSET and CompuCALL
    Link.

A.8. TABLE: CUSTNTWK

CUSTNAME NETNAME NETGID DNREVXLA OPTIONS
CORPCTX PUBLIC 10 $ (CLID OFFNET) (ECM) $

Notes:

1. This table associates the ECM option with the Customer Group Name.

2. The CUSTNAME must match the name assigned in table BGDATA.

3. The NETGID is a unique number from 1-4096. This number should match is all DMS's that are associated with this Customer. This must match the Network Note ID assigned in the Cisco PG.

4. The CLID option can be configured based on the needs of Pacific Bell and the Customer.

5. The ECM option must be defined.

A.9. TABLE: ACDGRP

```
ACDNAME CUSTGRP ACDRNGTH THROUTE NSROUTE PRIOPRO
DBG MAXCQSIZ MAXWAIT ACDMIS MSQS DISTRING OBSWTONE
FRCNGTSV OPTIONS

COMPUCALL1 CORPCTX 24 IBNRTE 50 IBNRTE 81 0 N 30 1800 Y
PERIFR22 PERIKRDC N $
N NONE N N $

COMPUCALL2 CORPCTX 24 IBNRTE 79 IBNRTE 79 0 N 0 1800 Y
PERIFR22 PERIKRDC N
$ N NONE N N (ACDDISP 10) (SCAIREDIR 10 0 N) $
```

Note:

ACD Groups that need option SCAI Redirect must have SCAIREDIR option assigned. This option is associated with CompuCALL Messages DV_CALL_RECEIVED_C and DV_CALL_REDIRECT.

6. Index