

# **Cisco Unified ICM ACD Supplement for Avaya Communication Manager**

March 2013

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# Preface

## Purpose

This document contains the specific information you need to maintain an Avaya Peripheral Gateway (PG) in a Unified Intelligent Contact Management (Unified ICM) environment. It is intended to be used as the Avaya-specific companion to the Unified ICM software documentation set.

While the other Unified ICM documents cover general topics such as configuring an overall Unified ICM system and writing scripts to route contact center requests, the *ACD Supplement for Avaya* provides specific information on configuring an Avaya PG and making any necessary adjustments to the Avaya ACD configuration.

## Audience

This document is intended for Unified ICM system managers. The reader should understand Unified ICM functions as described in the following documents:

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

The reader should also have specific knowledge about the Avaya and CMS systems.

## Organization

### Chapter 1, “Overview”

Provides an overview of the ACD interface along with the hardware and software requirements for both CMS and non-CMS environments.

### Chapter 2, “ACD Configuration”

Describes items in the Avaya configuration that must be checked to ensure compatibility with the system software.

### Chapter 3, “Unified ICM Software Configuration”

Describes the relationships between the Avaya database objects and the Unified ICM database objects. This chapter also describes Avaya-specific settings that must be confirmed in Unified ICM configuration.

#### Chapter 4, “Post-Routing”

Describes the features of Unified ICM *Post-Routing* available with the Avaya PG.

#### Chapter 5, “Unified ICM Web Interaction”

Describes the special configuration issues related to Unified ICM Web Option configuration and Avaya.

## 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 drop-down menu.  
For example, the Save command from the File menu is referenced as **File > Save**.

## Other Publications

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

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

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# 1. Overview

The Cisco Unified Intelligent Contact Management (Unified ICM) Peripheral Gateway (PG) supports Avaya ACD using CVLAN Service, running on Avaya Application Enablement Services (AES). This is the preferred method to interface to the Avaya ACD.

CVLAN is an Avaya software option that allows the Unified ICM PG to communicate with the Avaya ACD. CVLAN provides the PG with real-time call events and allows the PG to query the ECS/MultiVantage/Avaya about splits, trunk groups, and agents. For more information about the supported ACD switches, see *Cisco ICM Software Supported Switches (ACDs)* available at [http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod\\_technical\\_reference\\_list.html](http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html).

CVLAN also allows the PG to perform *Post-Routing*, station monitoring, and third-party call control. The CVLAN software can be purchased from Avaya.

The *Call Management System (CMS)* is the Avaya ACD Management Information System (MIS). It provides the PG with real-time agent state data for non-station-monitored agents.

This chapter describes the options for connecting the Avaya ACD to the Unified ICM PG. To work with the system software, the Avaya ACD must meet several hardware and software requirements. This chapter lists the requirements for both CMS and non-CMS environments.

**Note:** Avaya ACD is used across this document to represent the different names used by Avaya for their platform, such as Avaya Aura Communication Manager, Avaya Communication Manager, MultiVantage, and Definity.

## 1.1. Avaya ACD Interface Requirements

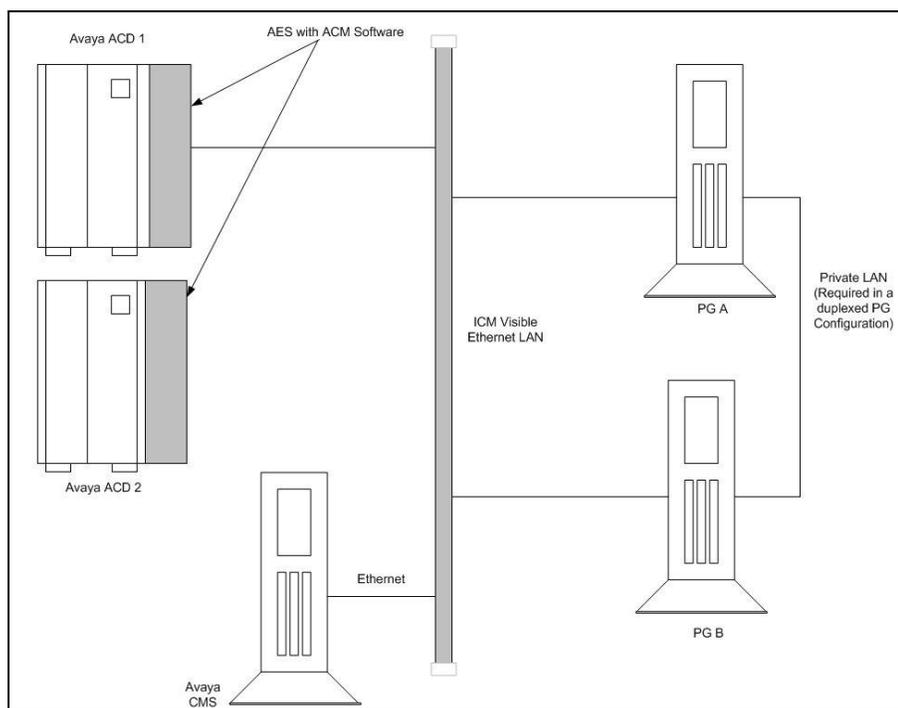
A basic, simplexed Unified ICM PG has the following interface requirements:

- You can have at least one CTI link on the Avaya ACD. Up to eight CTI links can be supported for higher call loads.
- If CMS is used, the PG requires one Ethernet connection to the CMS system that is connected to the Avaya ACD.
- If CMS is used, the PG requires a Unified ICM Real-Time Adherence (RTA) custom report. This report is developed and provided by Avaya for the Unified ICM system.

**Note:** A configuration without the CMS may be possible, subject to the restrictions listed in “Avaya ACD ‘CMS-less’ Interface,” later in this chapter. If a “CMS-less” solution is possible, all references to CMS requirements in this document do not apply.

### 1.1.1. Avaya ACD with CVLAN Service running on Avaya AES

The AES interface allows the PG and Avaya ACD to communicate directly. In this configuration, CVLAN Service is running on Avaya AES software. The PG connects directly to the Avaya ACD via an Ethernet LAN. The PG acts as a client while the Avaya ACD acts as the server. An adjunct processor platform is not required in this configuration. [Figure 1](#) shows an example of AES interface with Avaya ACD.



**Figure 1: Avaya ACD Interface**

The CMS, if used, connects to Unified ICM visible LAN via a single Ethernet connection. A Cisco CMS custom report is installed on the CMS platform (one for each Peripheral Interface Manager).

[Figure 1](#) shows a two-ACD site. Some sites may have a single ACD only.

Avaya and Cisco strongly recommend that the PG and Avaya ACD be on the same LAN.

*See also:* For specifics on AES Server installation and SCO UNIX patch requirements, see the [“Configuring AES”](#) section.

### 1.1.2. Call Management System (CMS)

The Avaya CMS provides snapshots of the real-time agent login/logout and non-ACD related agent state data to the PG via the CMS Ethernet connection<sup>1</sup>. In configurations that use CMS, a custom report is required to ensure that real-time call and agent data is available to the system software.

#### CMS Report Versions

Avaya has Unified ICM RTA custom reports in Expert Agent Selection (EAS) and non-EAS versions. The Avaya CMS Professional Services Group installs the proper Unified ICM custom report (EAS or non-EAS) on the CMS. To support EAS, the custom report must have a major revision of at least 3 (for example: 3.x.x).

<sup>1</sup>A CMS-less version of the PG is available; however, certain restrictions apply. See “Avaya ‘CMS-less’ Interface,” later in this section.

### Single- and Multiple-PIM Configurations

One custom report must be installed on the CMS for each Peripheral Interface Manager (PIM) on the PG. A PIM is a system software module that allows communication between a peripheral and the PG. For example, if you have one Avaya ACD and a duplexed PG, each PG has one PIM. Therefore, the CMS requires two custom reports. If you have two ACDs and a duplexed PG, each PG has two PIMs. The CMS would therefore require four custom reports (two for each PG).

Even though two CMS reports are installed in a single Avaya ACD duplexed PG environment, only **one** of the CMS reports is actively providing agent state data to the PG at any given time. In other words, only one CMS report is running at any given time per Avaya ACD. From a resource utilization perspective on CMS, a single CMS report (when running) is equivalent to one additional Supervisor running a real-time report.

*See also:* For more information on CMS report requirements, see the “[CMS Cisco Real-Time Report](#)” section.

**Note:** Customers who are using CMS with Unified ICM, upgrading to ICM 4.1, and have over 1,000 agents/high call loads, may want to change certain ICM 4.1 ACD PIM default settings. Changing settings may improve agent station visibility but can also result in a possible increase in message traffic to the Avaya ACD, switch CPU load, and network traffic between the PG and Central Controller (CC). Customers should work with the Cisco Content Security and Control (CSC) to evaluate and mitigate any possible issues. Cisco CSC should refer to internal documents on PIM registry configuration.

#### 1.1.3. Avaya “CMS-less” Interface

ICM software Releases 4.1 and greater support Avaya ACD configurations that do not use the Avaya CMS. Typically, this configuration is available only when agent count is less than 1,000 agents. However, the suitability of a CMS-less installation for a site may depend on a number of factors, including agent counts, Busy Hour Call Rate (BHCR), third-party activity, post-routing, and other Avaya CTI applications (if any).

**Note:** If a CMS-less solution is used, all references to CMS requirements in this document do not apply.

In a CMS-less environment, both Unified ICM and Avaya ACD systems must meet several additional configuration requirements:

#### Additional Unified ICM Software Configuration

The following changes are possible using the Configure ICM tools.

- You must configure all agents in Unified ICM database.
- You must map agents to skill groups in Unified ICM database. The agent-to-skill-group mapping must match the Avaya ACD configuration. In addition, the subgroup must correctly map to the agent’s priority.
- You must configure monitored instruments in the Peripheral Monitor table of Unified ICM database. Agent stations should be monitored.
- You must configure Peripheral Targets in Unified ICM database for all Vector Directory Numbers (VDNs) through which monitored calls flow.

### Additional Avaya Requirements

- Third-Party Domain Control (3PDC) must be provided for all skill groups that will be monitored or routed to by the system software. If a skill group is not monitored through 3PDC, no agents will be logged in to that skill group. 3PDC allows the PG to track login and logout events for the skill group. Avaya currently restricts one application to 3PDC of a skill group.
- You must enable Event Minimization for the CTI links used by the PG.
- For optimal performance, external applications that alter agent state on the Avaya ACD ECS should use the *Enterprise CTI* interface. (Contact your Cisco Unified ICM representative for complete and up-to-date information on recommended configurations.)

#### 1.1.4. Busy Hour Call Rates for Ethernet CTI Link

Each Avaya Ethernet CTI link can support a BHCR of approximately 32,000 in normal use by the PG (That is without *Post-Routing* or third-party call control). This value is an approximation and can be affected by the number of agents, anticipated peak busy hour call rate, average number of CTI events/calls, and the number of splits, trunk groups, and VDNs. Cisco recommends provisioning a dedicated Ethernet CTI link for Unified ICM application.

*See also:* For more information on Ethernet BHCRs, see the “[Ethernet Busy Hour Call Rates](#)” section.

## 1.2. Hardware and Software Requirements

In order to work with Unified ICM software, the Avaya ACD must meet the hardware and software requirements listed in [Table 1](#). (Note that this table shows the requirements for a configuration that uses CMS.)

[Table 2](#) shows the requirements for the “CMS-less” configuration.

Table 1: Avaya Requirements—With CMS

<b>Releases Supported</b>	<p>Avaya ACD CVLAN</p> <p>For specific release information on Avaya ACD and CVLAN, see the <i>Cisco ICM Software Supported Switches (ACD)</i> document available at <a href="http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html">http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html</a>.</p>
<b>Features Required</b>	<p>Call Management System (CMS)</p> <p>For specific release information for CMS, see the <i>Cisco ICM Software Supported Switches (ACD)</i> matrix available at <a href="http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html">http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html</a>.</p>
	Call Vectoring
	CTI Monitoring
	CTI Host-Based Routing (only for systems using Unified ICM Post-Routing)
	Cisco Unified ICM real-time adherence custom report (developed and provided by Avaya for Cisco). The CMS requires one report for each PIM in service on the PG.
<b>Performance</b>	CMS minimum refresh rate: 3 seconds

Table 2: Avaya ACD Requirements—"CMS-less"

<b>Releases Supported</b>	Avaya ACD CVLAN  For specific release information for Avaya and CVLAN, see the <i>Cisco ICM Software Supported Switches (ACD)</i> matrix available at <a href="http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html">http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html</a> .
<b>Features Required</b>	Call Vectoring
	CTI Monitoring
	CTI Host-Based Routing (only for systems using Unified ICM Post-Routing)

**Note:** Please Contact Avaya for information regarding the following:

- Latest hardware and software requirements for AES Server
- Avaya ACD to AES Server upgrade

### 1.3. Supported Unified ICM Software Features

The Avaya PG supports the following Unified ICM software features:

- Pre-Routing
- Post-Routing
- Enterprise CTI (includes third-party call control)
- Agent reporting
- Duplexed PG implementation
- Unified ICM Web Option

**Note:**

- The Avaya PG does not support Unified ICM integration with the Avaya ProLogix System.
- PIM supports a maximum of eight CTI links per CVLAN and a maximum of two CVLANs.



## 2. ACD Configuration

No changes are required to the actual Avaya ACD configuration beyond the changes mentioned in the Chapter 1: [Avaya ACD Interface Requirements](#). However, some ACD-specific settings must be confirmed. This chapter describes these settings and provides guidelines that will help you maintain your Avaya ACD and Unified ICM configurations.

## 2.1. Monitored VDNs and Inbound ACD Calls

While it is important that all VDNs involved in ICM call flow are monitored to ensure that there are no stale calls, all inbound ACD calls are initially handled by a monitored VDN. A monitored VDN is equivalent to a configured Unified ICM Peripheral Target. For example, **do not** specify a Hunt Group Extension as the destination for inbound ACD calls. Hunt Groups that are vector-controlled (which is true for all skill groups in an EAS environment) cannot be monitored for calls.

The inability to monitor vector-controlled hunt groups is a restriction imposed by Avaya. An unmonitored call that reaches a Hunt Group or Agent cannot be tracked and will not be accounted for properly in Unified ICM contact or agent statistics.

**Important:** It is extremely important that all VDNs to be monitored are properly configured as **Peripheral Targets** in the Unified ICM database.

## 2.2. Monitored Splits on CMS

The Avaya Hunt Group configuration screen for each monitored split on CMS must have its Measured field set to either “both” or “external,” in order for the CMS to receive Hunt Group (split) data.

## 2.3. Terminal Endpoint Identifier (TEI) Values

When you configure the Avaya ACD, the TEI value for an Avaya LAN or Avaya ACD should be 1.

## 2.4. Configuring AES

Application Enablement Services (AES) software runs on an external server that communicates to Avaya Aura Communication Manager (or Avaya ACD) via TCP/IP, and exposes a set of APIs that allows external applications like Cisco ICM to perform third-party call control and receive event notifications. The ICM PG uses the CVLAN API, which is a client/service software.

To best understand the configuration of the AES switch, begin with the Avaya documentation that shipped with your switch. The information provided here is meant to supplement but not replace the Avaya documentation. We provide a limited amount of information to help you configure the switch to work with Cisco Media Blender.

The following tasks are described:

- Setting Up the CV/LAN Links
- Setting Up the CTI Station
- Setting Up Agents and Hunt Group
- Creating a Station Record for Phantom Lines
- Setting Up Call Routing

### 2.4.1. Setting Up the CTI Links on AES Server

This section describes how to set up the CTI links on an AES Server.

To establish the link:

1. Open the **AES OAM** home page.
2. Choose **Administration > CTI Link Admin > CVLAN Links**.
3. On the CVLAN Link administration screen, click **Add Link** and perform the following:
  - Select the Signal
  - Uncheck the Proprietary check box
  - Select the Switch Connection
  - Select the Switch CTI Link Number
  - Select the CTI link version
  - Check the Heartbeat check box
4. Click **Apply Changes**.

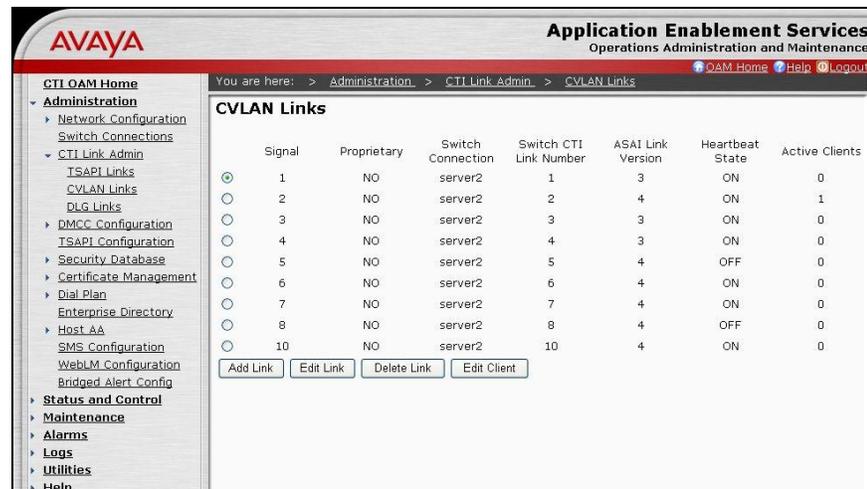


Figure 2: CTI Link Setup Screen

#### Adding CTI Client IP for a CTI Link

1. Open the **AES OAM** home page.
2. Choose **Administration > CTI Link Admin > CVLAN Links**.
3. Select the CVLAN link for which the client IP needs to be added and click **Edit Client**.
4. Enter the IP address and click **Add Client**. (In case of Cisco Media Blender [CMB] application, use the CMB machine address.)



Figure 3: Add CTI Client IP Screen

### 2.4.2. Changing or Displaying a CTI Link

This section describes how to change or display a CTI link to the CMB.

To change or display CTI-link (1-8):

1. Log in to the Avaya system.
2. From the drop-down menu, select:
  - *change cti-link <Link No>*: To change the number of CTI links.
  - *display cti-link<Link No>*: To display the number of CTI links.

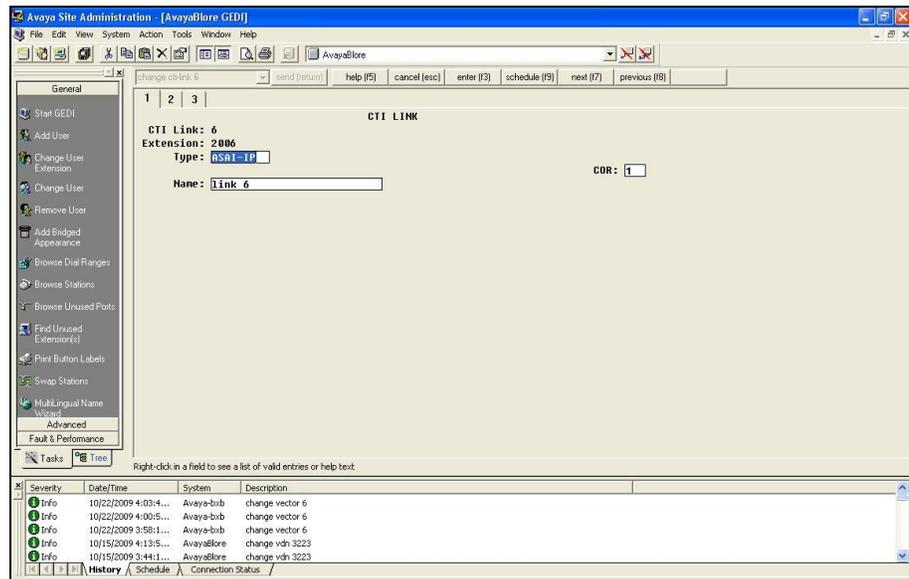


Figure 4: Change or Display a CTI Link (Tab 1)

3. Press Enter.

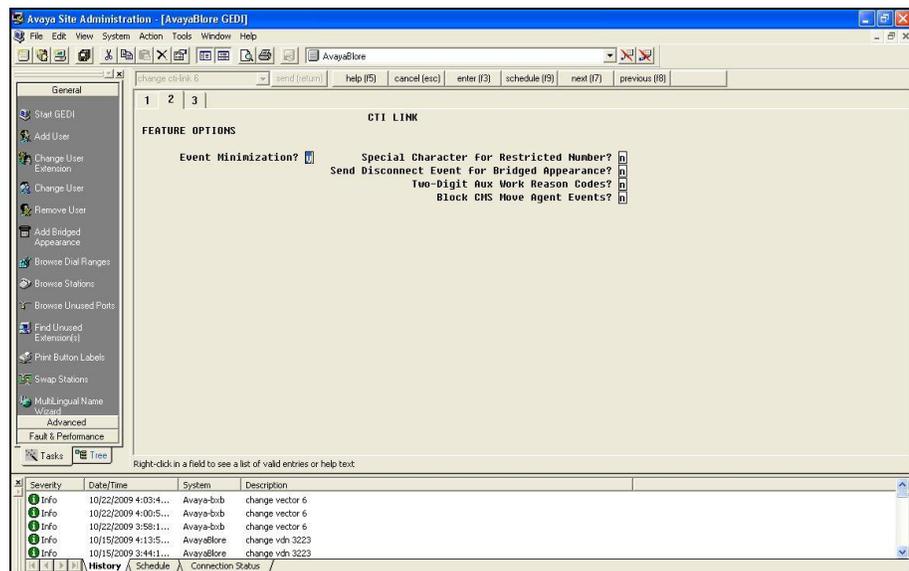


Figure 5: Change or Display a CTI Link (Tab 2)

2.4.3. Setting Up Hunt Groups/Skill Groups

On the Avaya switch, a hunt group is a group of extensions to which similar calls are routed. A hunt group might include all agents who have a particular skill (for example, the ability to speak Spanish) or all agents who cover a geographical territory (for example, Boston sales). A hunt group is sometimes referred to as a skill group.

**Note:** The Avaya PG supports extensions of up to ten digits – the agent can login to a Softphone that has an extension up to ten digits. This ten-digit support applies to Agent Login IDs too.

The Hunt Groups and VDNs will support up to seven digits only.

In order to use a seven-digit, or a ten-digit, the config PIM registry

**EnableTenDigitExtension** must be set to 1 in following path:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Cisco Systems,
Inc.\ICM<cus01>\<PGXX>\PG\CurrentVersion\PIMS\pim1\ATTData\Config\
```

If the registry **EnableTenDigitExtension** is set to 0, then it limits support up to five digits for extension, Agent Login IDs, Hunt Groups, and VDNs.

To ensure proper call routing to agents having access to the Cisco Unified Web Interaction Manager (Unified WIM), establish a hunt group for these agents. You can also use existing hunt groups as long as you establish vectors to ensure that calls are routed to specific agents. If you use existing hunt groups, be sure that there is no other CTI application monitoring that group. To see a list of existing hunt groups, enter the command **list hunt-group**.

Some ACD systems provide a feature called EAS. For a variety of reasons, you might want certain agents to handle specific types of calls. For example, you might want only your most experienced agents to handle your most important customers. You might have multilingual agents who can serve callers in a variety of languages. EAS allows you to classify agents according to their specific skills and then to rank them by ability or experience within each skill. Avaya uses these classifications to match each call with the best available agent.

#### 2.4.4. Defining a Hunt Group/Skill Group for Agents

To set up agents you must define a hunt group by completing the following steps:

1. Enter the command **add hunt-group next** and press **Return**. (You can also enter **add hunt-group xxx**, where *xxx* is the hunt group number.) The first Hunt Group screen appears.

Page 1 of X

HUNT GROUP

Group Number: ___		ACD? _
Group Name: _____		Queue? _
Group Extension: ___		Vector? _
Group Type: _____		Coverage Path: ___
TN: ___	Night Service Destination: ___	
COR: _	MM Early Answer? _	
Security Code: ___		
ISDN Caller Disp: _____		
Queue Length: ___		
Calls Warning Threshold: ___	Port: x___	Extension: ___
Time Warning Threshold: ___	Port: x___	Extension: ___

**Figure 6: Defining Agent Hunt Groups**

2. Complete screens 1 through 2 of the hunt group record as described in the Avaya documentation.
3. Press **Enter**. The hunt group is successfully created.

### 2.4.5. Modifying the Agent Login ID

For each agent using Unified WIM, add the Unified WIM hunt group to the Agent login ID form.

To modify the Agent login ID.

1. Enter the command `change agent-loginID <agent login ID number>`.  
The Agent Login ID screen appears.

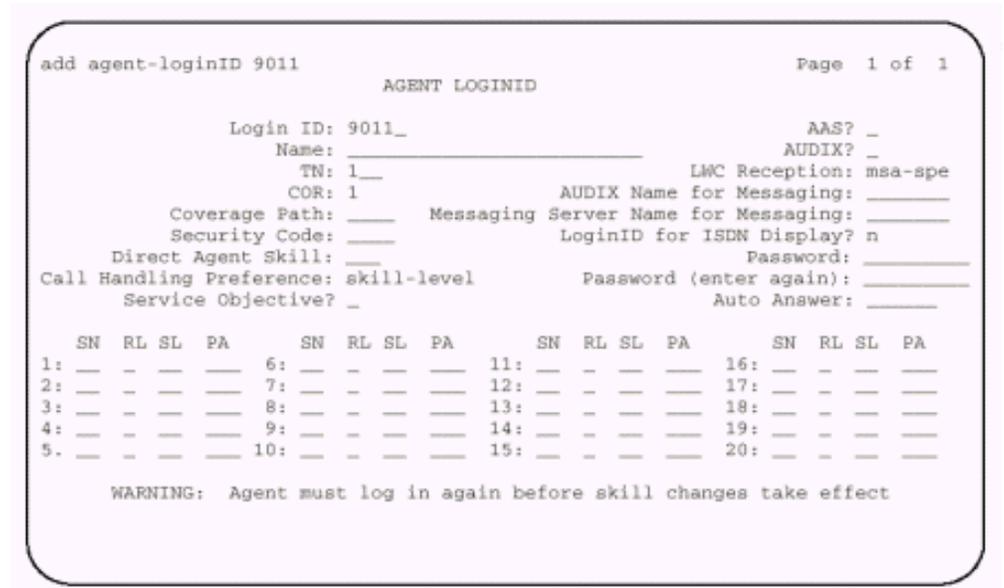


Figure 7: Modifying Agent LoginID

2. If this is a new agent, type the hunt group number that indicates Unified WIM agents in the Direct Agent Skill field. If this is an existing agent, add the hunt group that indicates Unified WIM agents in the SN (Skill Number) field in the table at the bottom of the screen.
3. Complete the remaining fields as described in the Avaya documentation.

### 2.4.6. Creating a Station Record for Phantom Lines

If your site uses any of the phantom line CTI strategies to handle call flows, set up a pool of phantom lines and create a station record for each phantom line. For information on how to create a pool of phantom lines and determine your phantom line requirements, see the *Cisco Media Blender Administration Guide*.

Phantom lines are phone lines that are set aside for use by CMB to make phone calls. The phone lines you use do not need to have actual phones; you must configure them as you would an agent in your contact center. If you have the AES switch Version 6.3 or later, you can set up phantom lines without hardware using the Administration Without Hardware (AWOH) feature. Earlier versions required actual phones for your phantom lines.

To create a station record for a phantom line:

1. Enter the command **add station next**. You can also enter **add station xxx**, where *xxx* is the actual station number you want to assign to the phantom line. The first station screen appears.

```

STATION
Extension: 2145          Lock Messages? _      BCC: _
Type: 8411D           Security Code: _____ TN: 1
Port: _____      Coverage Path 1: _____ COB: 1
Name: _____      Coverage Path 2: _____ COS: 1

STATION OPTIONS
Data Option: none _____ Personalized Ringing Pattern: 1
Speakerphone: 2-way _____ Message Lamp Ext: 2145
Display Language: english _____ Mute Button Enabled? y
PassageWay? n _____ MM Complex Data Ext: _____

```

**Figure 8: Station Record for Phantom Lines**

2. Enter **x** in the *Port* field. This configures the phantom line without hardware.
3. Complete all station screens to configure each phantom line. See the Avaya documentation for information on completing these screens.

#### 2.4.7. Setting Up Call Routing

After you have set up your Unified WIM agents and the phantom lines, ensure that the Avaya switch routes calls to them correctly by:

- Writing a vector to route calls
- Creating a VDN to access the vector

##### Write a Vector to Route Calls

A vector is a set of instructions the switch follows to ensure the right call gets to the right agent. Whether you use predictive or phantom CTI strategies, you must write a vector that routes appropriate incoming calls to a Unified WIM agent hunt group. You must write a vector for each group to which you want to route calls, and you need the hunt group number established for Unified WIM agents when setting up a vector to route calls to those agents.

##### To create a vector:

1. Enter the command **change vector xx** (where *xx* is the vector number) and press **Return**. The Call Vector form appears.

```

                                CALL VECTOR
                                Page 1 of 3
Number: _____ Name: _____ Multimedia? n Lock? n

Basic? y   EAS? n   G3V4 Enhanced? y   ANI/II-Digits? y   ASAI Routing? n
Prompting? y   LAI? n   G3V4 Adv Route? y   CINFO? y   BSR? n

01 _____
02 _____
03 _____
04 _____
05 _____
06 _____
07 _____
08 _____
09 _____
10 _____
11 _____
    
```

**Figure 9: Creating Call Vector**

- Complete the Call Vector screens 1 through 3. Instructions for completing these screens are provided in the Avaya documentation.

If you are using both predictive and phantom CTI strategies, create a separate vector for each strategy.

**Note:** When creating vectors for phantom lines, avoid using prompts or announcements. The caller is not actually on the call when the phantom line calls the vector.

**Example of a Vector for a Phantom Call**

Following is an example of a phantom call vector. No announcements are played. If no agents are available, the vector disconnects the phone call. CMB then serves an error page informing the caller that no agents are available.

```

                                CALL VECTOR
Number: 2 Name Service Lock? n

Basic? y   EAS? y   G3V4 Enhanced? n   ANI/ II-Digits? n   ASAI Routing? y
Prompting? y   LAI? y   G3V4 Adv Route? n   CINFO? n   BSR? r

01 goto          step 3          if staffed-agents      in skill 6          < 1
02 queue-to      skill 6          pri 1
03 goto          step 6          if staffed-agents      in skill 7          < 1
04 queue-to      skill 7          pri 1
05 wait-time     999 secs hearing silence
06 disconnect
    
```

**Figure 10: Example: Phantom Call**

### Example of a Vector for a Predictive Call

Following is an example of a predictive call vector. Note that this vector plays an announcement if no agents are available.

```

CALL VECTOR
Number: 2
Name Service
Lock? n

Basic? y      EAS? y      G3V4 Enhanced? n  ANI/II-Digits? n  ASAI Routing? y
Prompting? y  LAI? y      G3V4 Adv Route? n  CINFO? n          BSR? r

01 goto      step 3      if staffed-agents  in skill 6        < 1
02 queue-to  skill 6     pri 1
03 goto      step 7      if staffed-agents  in skill 7        < 1
04 queue-to  skill 7     pri 1
05 announcement 24282
06 wait-time 999 secs hearing 49763 then music
07 disconnect announcement 49764
    
```

Figure 11: Example: Predictive Call

### 2.4.8. Create a Vector Directory Number

After setting up a vector for Unified WIM calls, set up Vector Directory Numbers (VDNs) to direct incoming calls to that vector. You can create several VDNs that refer to the same vector, ensuring that calls from a variety of sources can be routed to the same skill group.

To create a VDN, complete the following steps:

1. Enter the command **add VDN xxxx** (where *xxxx* indicates the VDN). The Vector Directory Number screen appears.

```

VECTOR DIRECTORY NUMBER
Page 1 of 1

Extension:
Name:
Allow VDN Override?
COR:
TN:
Vector Number:
AUDIX Name:
Messaging Server Name:
Measured:
Acceptable Service Level (sec):
VDN of Origin Annc. Extension:
1st Skill:
2nd Skill:
3rd Skill:

Return Destination:
VDN Timed ACW Interval:
BSR Application:
BSR Available Agent Strategy:
    
```

Figure 12: GUI for Vector Directory Number

2. Complete this form based on the instructions in the Avaya documentation. Make sure you enter the number of the vectors set up for Unified WIM calls in the Vector Number field.

### Identifying Call Classes

You can set up a VDN-of-origin announcement to let the agent know the call class if you are using multiple call classes. For instance, you can create an announcement for chat calls so that the agent knows to start a chat session. You can set up multiple VDNs to the same vector, each identifying an individual call class.

### Reporting

If you choose to use an existing vector, you might want to create a separate VDN for Unified WIM calls. This enables you to create reports based on those calls.

## 2.4.9. Sharing Information

Ensure proper call flow by recording and sharing the following information with the Unified WIM administrator and the CMB administrator:

- The Unified WIM administrator needs switch configuration information in order to set up agents on Unified WIM.
- The Media Blender administrator needs values for the CMB property files.

### Unified WIM Administrator

The switch administrator sets up agents on the ACD and the Unified WIM administrator sets up agents on the Unified WIM Administration desktop. The Unified WIM administrator should enter the Voice Agent ID when setting up an agent. This Voice Agent ID should be the same as the logical ID (agent ID) used on the ACD. For more information, see the *Cisco Unified Web and E-Mail Interaction Manager, Administration Console User Guide - for Unified Contact Center Enterprise, Hosted and ICM* available at: [http://www.cisco.com/en/US/products/ps7233/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps7233/prod_installation_guides_list.html).

For the basic CMB configuration, agents must be set up in two places. The switch administrator sets up agents on the ACD and the Unified WIM administrator sets up agents on the Unified WIM Administration desktop using the **Agents: Create** node. The Unified WIM administrator must enter the Voice Agent ID when setting up an agent. This Voice Agent ID must be the same as the logical ID (agent ID) used on the ACD.

If agents must be able to log in to the ACD and Unified WIM at the same, time, blended login capability must be configured on Unified WIM. How the Unified WIM administrator sets up blended login depends on whether the agent will frequently change phones. The Unified WIM administrator might also need the terminal ID (the identifier of the phone on the ACD system) and the ACD password for each agent.

### Media Blender Administrator

The CMB administrator is responsible for creating a phantom pool file, `phantoms.properties`, which lists the phantom physical ID on the ACD or the

agent’s permanent extension with the phantom line type (**D** is the only phantom line type because CMB supports only digital line types). To set up phantom agents, the administrator must also configure two other files:

- The phantomagents.properties file, which maps a phantom agent’s logical ID to a specific physical phone ID
- The phantompasswords.properties file, which maps a phantom agent’s logical ID to a specific phantom password

See the *Cisco Media Blender Administration Guide* for details about the property files.

For AES, the administrator needs the station IDs for the phantom phones, as well as the link, host-name, and hunt group extension number to configure the ACD.asai.properties file. The Avaya administrator also configures the skills.properties file, which maps routing addresses to ACD routing logic. For example, the AES, the administrator needs the VDN or the hunt group extension number.

### 2.4.10. Recording Avaya ACD Information

The following tables describe the information you need to record when configuring the Avaya switch. Please share the information with the Unified WIM and CMB administrators.

#### For the Unified WIM Administrator

Collect the information in the following table for each agent you configure on the switch and share this information with the Unified WIM administrator:

Agent Name	Logical ID	Password	Station ID

#### For the CMB Administrator

The CMB administrator needs four types of information:

- Phantom phone
- CTI link
- Vector Directory Number
- Hunt Group Extension

### Phantom Phone Information

The CMB administrator needs the Station IDs in order to configure the phantom.properties file and set up phantom phones. Record the information in the following table and share this information with the CMB administrator.

Station ID

## 2.5. Configuring Return Destination VDN on Avaya Switch

The Return Destination automatically redirects a call from one VDN to another VDN for continuous call processing, after an agent disconnects the call.

If the call flow involves two post-route VDNs, the call variables are preserved from the first route request to the second route request when call gets automatically redirected from a post-route VDN to another post-route VDN for continued call processing (after an agent disconnects from the call). (This is according to the return destination feature enabled on Avaya ACD.)

If the call flow involves a first post-route VDN and then a non post-route VDN after return destination, the call variables are still preserved from the first call (post-route request) to the second call after return destination.

After return destination, the last agent also has the call variables which were set in the first call prior to return destination.

The Avaya PIM detects whether the return destination is configured on a VDN, by verifying the parameter string of that VDN in the Peripheral Monitor tab of the PG Explorer. PIM then sends a "NEW\_TRANSACTION\_IND" to OPC, allowing the OPC to preserve the call variables in the second route select.

The Return Destination can be configured on the Avaya Switch. The following example explains the configuration of this feature:

1. Click Tab 1 on the VECTOR DIRECTORY NUMBER screen and set the following field:
  - a. Allow VDN Override: Set this field as "y".

Here, VDN 3606 is the return destination VDN.

change vdn 3606				send (return)	help (F5)	cancel (esc)	enter (F3)	schedule (F9)	next (F7)	previous (F8)		
1	2	3										
VECTOR DIRECTORY NUMBER												
Extension:		3606										
Name*:		vdn3606										
Destination:		Vector Number										32
Attendant Vectoring?		n										
Meet-me Conferencing?		n										
Allow UDN Override?		y										
COR:		1										
TN*:		1										
Measured:		both										
Acceptable Service Level (sec):		20										
UDN of Origin Annc. Extension*:												
1st Skill*:												
2nd Skill*:												
3rd Skill*:												

Figure 13: Return Destination: 3606

- Click Tab 2 on the VECTOR DIRECTORY NUMBER screen to set the return destination VDN for 3606. Set the Return Destination field as 3001. This value is configured as return destination VDN for 3606. When an agent on VDN 3606 drops the call, it is automatically redirected to VDN 3001.

The screenshot shows a web-based configuration interface for a Vector Directory Number. At the top, there is a navigation bar with buttons for 'send (return)', 'help (F5)', 'cancel (esc)', 'enter (F3)', 'schedule (F9)', 'next (F7)', and 'previous (F8)'. Below this is a tabbed interface with three tabs labeled '1', '2', and '3'. The main content area is titled 'VECTOR DIRECTORY NUMBER' and contains the following fields and options:

- AUDIX Name:
- Return Destination\*:
- UDN Timed ACW Interval\*:
- Observe on Agent Answer?
- Display UDN for Route-To DAC\*?
- UDN Override for ISDN Trunk ASAI Messages\*?
- Reporting for PC Predictive Calls?

**Figure 14: Return Destination: 3001**

To configure Return Destination VDN on Unified ICM, see the section [“Configuring the Return Destination on Unified ICM”](#).

See the section [ACD Notes and Restrictions](#) for known caveats for Return Destination VDN.

## 2.6. Ethernet Busy Hour Call Rates

Each Avaya Ethernet CTI link can support a BHCR of approximately 32,000 in normal use by the PG (that is, without *Post-Routing* or third-party call control). This value is an approximation and may be affected by the number of agents, anticipated peak busy hour call rate, average number of CTI events/calls, and the number of splits, trunk groups, and VDNs. Cisco recommends provisioning a dedicated Ethernet CTI link for Unified ICM application.

### 2.6.1. Post-Routing, Station Monitoring, Third-Party Call Control

If *Post-Routing*, station monitoring, or third-party call control is performed on the same Ethernet CTI link, the link supports up to 20,000 BHCR due to additional message traffic. Depending on your configuration, Cisco may recommend provisioning an additional Ethernet CTI link to be used exclusively for *Post-Routing*, station monitoring, or third-party call control.

An Ethernet CTI link dedicated exclusively to *Post-Routing* (that is, no event monitoring) can handle approximately 64,000 BHCR. Calculating throughputs for third-party use is dependent upon the number of stations involved and anticipated usage. In general, third-party usage on the CTI link will use some of the CTI bandwidth.

### 2.6.2. Active Association Limit

Active associations are used for all requests made of the switch. Some of the requests made of the switch remain open for an indefinite period of time (for example, event notification requests, monitoring VDNs). Other requests end when the switch returns the response (e.g., value query for time-of-day). The indefinite requests include VDN event monitoring, station monitoring, and skill group monitoring.

Set the Registries for MDS “bufferlimit” to 16,000 (decimal) in the following paths:

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Clients\pim1
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Clients\opc
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Clients\pgag
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Process
```

Set the dynamic PIM registry “BriMaxOutstandingMessages” to 100 (decimal) in the following path:

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\PG\CurrentVersion\PIMS\pim1\ATTDData\Dynamic
```

#### ASAI\_TEST utility

ASAI\_TEST is a utility that allows you to check the connectivity between Unified ICM<sup>1</sup><sub>TP</sub> PG and the Avaya ACD (Avaya ACD can include either Avaya ACD card or AES Server).

Before running the ASAI\_TEST, ensure the IP connectivity between the PG and the Avaya ACD card. To do so, initiate a ping test from the PG to the Avaya ACD card. If the ping test passes, you can proceed with the ASAI\_TEST.

To run ASAI\_TEST, use this command syntax:

```
<Directory>:\icr\bin>asai_test
usage: asai_test [-m hostname/IP address] node_id
```

**Note:** The node\_id is also referred to as the CTI link number. The maximum number of CTI links can be 8.

### 2.6.3. Maximum Agent and BHCA

Unified ICM software (CC, PG, CTI server) currently supports 3000 Agents and 60000 BHCA.

<sup>1</sup><sub>TP</sub> The ASAI\_TEST utility works on Cisco ICM 4.6.2 and later.

Table 3: Unified ICM Compatibility for Maximum Agent and BHCA

Hardware, Software, and Tools	Software Component and Version
Unified ICM software	5.0 SR11, 6.0 and 7.0
ACD Switch	Avaya 3.0 with CMS RTA 5.0.5 Std
PG, CTI Server Configuration	For complete and current information on the PG Server Configuration, see the <i>Hardware &amp; System Software Specification (Bill of Materials) for Cisco Unified ICM/Contact Center Enterprise &amp; Hosted</i> (for all ICM versions) available at: <a href="http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products_user_guide_list.html">http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products_user_guide_list.html</a> .

To support such configuration, set the Registries in the following paths for MDS “bufferlimit” => to 0x8000 (32768 decimal):

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Clients\pim1
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Clients\opc
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Process
```

To support such configuration, set the Registries in the following paths for MDS “bufferlimit” => to 0x40000 (262144 decimal):

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\MDS\CurrentVersion\Clients\pgag
```

Set the dynamic PIM registry “BriMaxOutstandingMessages” to 100 (decimal) in the following path:

```
HKEY_LOCAL_MACHINE\SOFTWARE\GeoTe\ICR\<cus01>\<PG1A>\PG\CurrentVersion\PIMS\pim1\ATTDData\Dynamic
```

## 2.7. Call Handling Methods to Avoid

Following are the call handling methods you need to avoid:

1. Avoid setting up station coverage paths where all internal calls<sup>1<sub>TP PT</sub></sup> are marked to go to coverage.

<sup>1<sub>TP PT</sub></sup> Normally, an internal call is a call that is ‘on-switch’. An internal call may or may not be related to an ACD call. However, in the case of an Avaya PIM, an internal call can be defined as any on-switch or off-switch call that is ‘non-ACD call related’. In the case of an Avaya PIM, depending on the telephony protocols used, there may be conditions where the PIM does not have sufficient information to determine whether an outbound call is off-switch or not, while in AUX mode. However on the switch side, because the switch has all the relevant call information, it reports call statistics accurately. To avoid such inconsistent reporting between the PIM and the switch, the

2. Avoid having agents transfer calls directly to other agent stations or to other agent IDs. Instead, the calls can be transferred to a hunt group (or split). The calls can also be transferred to a VDN to ensure proper call monitoring.

## 2.8. Universal Call ID

If the Avaya Universal Call ID (UCID) is desired, the field “Send UCID to ASAI” should be set to “Yes.” You can do this through the Feature-Related System Parameters form on the Avaya.

Starting with ICM 7.5(9), the Avaya PIM is enhanced to use UCID information from the Avaya Switch to clean up old calls in the Avaya PIM. To enable the UCID feature on the Avaya Switch you must change the following system-parameters features:

- Create Universal Call ID(UCID) ? y
- UCID Network Node ID ? <any value\_unique to a switch>
- Send UCID to ASAI ? y

## 2.9. CTI Link Configuration

CTI link configuration should be set up to have Event Minimization set to “Yes.” This is especially important if you are using third-party functionality.

To set Event Minimization to **Yes**:

1. Stop the PG.
2. Busy-out and release the CTI link. This will activate this CTI link attribute.
3. Restart the PG.

When Event Minimization is enabled, the Unified ICM PG CTI links must be dedicated to the PG (that is, no other applications should be using those CTI links). In a duplexed environment, both PG sides can use the same CTI links.

## 2.10. CMS Cisco Real-Time Report

The guidelines in this chapter are intended for Avaya installers of the CMS Cisco RTA report:

- **Skillnums argument.** The CMS report should use the skillnums argument. The Unified ICM PG started supporting skillnums in Unified ICM software Release 2.5 (August, 1998). Therefore, any installation of Unified ICM software 2.5 or later should use skillnums. This applies to all the new installations and upgrades to ICM software 2.5 or later.
- **Agent login.** For CMS report version 3.5 or later, the PIM will not log agents into a skill group unless the skill group is monitored by CMS. This is a requirement because CMS will not pass agent state data or logout events for non-monitored skill groups. The lack of this CMS data can cause agent count and agent state mismatches. Conversely, if the CMS

---

Avaya PIM treats the non-ACD call-related on-switch or off-switch calls as internal calls.

report is a pre-3.5 version, the PIM will still log agents into all groups provided in the agent login event, but CMS will not provide logout events for the non-monitored skill groups.

Because no logout record (or any agent state record, for that matter) is provided by CMS for these non-monitored skills, and because the version of the CMS report is pre-3.5, the PIM may leave agents in their last state. For this reason, it is strongly recommended that customers use a CMS report that is version 3.5 or later.

**Note:** The Avaya PG currently supports 20 skills per agent. The enhanced RTA 5.0.5, which supports 60 skills per agent, is not supported by Unified ICM.

- **±Noskillnum flag.** Make sure that the noskillnum flag is set to skillnums (that is, CMS provides the list of monitored skills) in the following list of files. Split/Skill numbers need to be in the CMS startup header provided to the PG. The files affected are:
  - Startrta
  - testrta
  - skills1
  - skills2, and so onThese are files on the CMS machine.
- **±Multiple CMS reports on one PIM.** If multiple CMS reports are configured for a single PIM on a PG, the CMS report must use the timestamp argument. The timestamp argument causes the CMS report to include a UNIX timestamp in each of the CMS records sent to the PG. The PG requires the timestamp to properly order the incoming CMS records from the multiple reports.
- **±Agent-skill pairs.** Cisco strongly recommends that you upgrade to the newest CMS report if you find you need increased agent-skill pairs. The newer CMS reports can be configured to support up to 10,000 agent-skill pairs (default 2,400). Using this single (increased) agent-skill pair capability should eliminate any need for using multiple CMS reports (and therefore not require timestamps in the CMS reports).

**Note:** In later CMS reports, the arguments (for example, noskillnums) described above may have changed. Therefore, Avaya installers should check for the correct arguments to achieve the desired functionality as described above.

### 2.10.1. CMS Minimum Refresh Rate

The CMS report is installed to run as an administrator in order to allow a minimum refresh rate of three seconds. You need to ensure that the refresh rate used for the custom CMS report is allowed for an administrator CMS login. In addition, you should administer the CMS report via the appropriate login (e.g., CMS). Using another login to administer the report will not work. The Avaya Professional Services group can provide the details on which login should be used to administer the report.

If agents are being dynamically re-skilled (logged into and out of skill groups with some frequency), it is possible that the CMS report will not see an agent logout/login sequence for a skill group. For example, if the agent is logged into skill 1 and is logged out of and back into skill 1 within the CMS refresh rate period (that is, in between CMS snapshots of data), then CMS will not see this logout/login transition.

Dynamic re-skilling of agents is not supported by CMS when the agent is on call That is either in “Talking” or “Reserved” state. If you re-skill an agent using CMS, the following logs are displayed:

```
05:41:13 pg7A-pim1 Trace: AgentRecord::HashIn: CMS[0] Record:
301204 80 0 0 0 232 0 1 801326 232 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Where 80 is CMS Work mode for reserved state.

```
05:41:13 pg7A-pim1 Trace: AgentRecord::HashIn: CMS[0] Record:
301204 32 0 0 0 232 0 1 801326 232 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Where 32 is CMS Work mode for talking state.

Dynamic re-skilling is supported only when the agent is in “Available” or “AUX” state. If the re-skilling is attempted for an agent who is on call, the re-skill record is held by CMS until the agent completes the call and changes the state to “Available” or “AUX”.

### 2.10.2. Configuring the CMS Report

When configuring the CMS report the following data items are required:

- **ACD Number**. The ACD number is the Avaya ACD number as known to the CMS system.
- **Refresh Rate**. The refresh rate is the rate at which the report will snapshot the agent data and pass it on to the PG. The minimum refresh rate is 3 seconds. A typical refresh rate is 10 seconds.
- **Splits to Monitor**. The splits to monitor are the ACD skill groups that are to be monitored by the PG. It is mandatory to update the list of CMS monitored splits periodically.
- **Avaya type**. For example, Non-EAS or EAS.
- **PG LAN Information**. This includes IP address, netmask, and hostname. It is recommended (but not necessary) that the CMS and PG be on the same LAN. The PG LAN information is required by the Avaya Professional Services engineer to properly configure the CMS report so it

may connect to the PG. This normally will never be changed after the initial installation.

**Important:** If any of the above CMS information is changed (for example: Monitored splits or the refresh rate), the CMS report and PG **must** be stopped and restarted in order for the changes to take effect.

## 2.11. Avaya Configuration for “CMS-less” PGs

In a PG configuration that does not use CMS, additional configuration is necessary on the Avaya.

- 3PDC must be provided for all skill groups that will be monitored or routed to by the Unified ICM software. If a skill group is not monitored through 3PDC, no agents will be logged into that skill group. Third-Party Domain Control allows the PG to track login and logout events for the skill group. Avaya currently restricts one application to third-party domain control of a skill group.
- You must enable Event Minimization for the CTI links used by the Peripheral Gateway.
- For optimal performance, external applications that alter agent state on the Avaya ECS should use the *Enterprise CTI* interface. Contact your Cisco Unified ICM software representative for complete and up-to-date information on recommended configurations.

## 2.12. ACD Notes and Restrictions

Following are the notes and restrictions applicable to Avaya:

- **Monitoring VDNs.** It is **extremely important** that all VDNs to be monitored are properly configured as Peripheral Targets in the Unified ICM database.
- **CTI links and BHCC.** Each CTI link can support approximately 8,000 BHCC using a BRI CTI link; approximately 32,000 BHCC on a G3r using an Ethernet CTI link; and approximately 20,000 BHCC on a G3i or G3s using an Ethernet CTI link. These link specifications are derived from Avaya-provided data and are subject to change.
- The Avaya PG **supports** Agent IDs, Agent Extensions, Hunt Group Extensions and VDNs that start with a zero. This is supported for both CMS and CMS-less environments.
- The Avaya PG **does not support** Hunt Group Numbers that start with a leading zero.
- **Intermittent Failure of Network Transfer.** There is occasionally a timing issue in the set of events involved in a Network Transfer and, due to this, the NIC Call ID is not populated in the transfer call, resulting in call failure. To avoid this problem, introduce a delay of 1 second in the Vector for the post-route number (VDN); that is,

01	wait-time	1 secs	hearing silence
02	adjunct	routing link 1	

- **Avaya ECS PIM Failure.** The ECS PIM stops functioning when the AES link on the Avaya switch sends a “Busyout” command.
- **VDN Return Destination.**
  - The Return Destination VDN feature does not support the **call conference** before agent drops the call (expecting return destination to set in). That is, the PG will lose track of the VDN to which the call was originally delivered and call variables are not retained post Return Destination. However, this feature supports **call transfer** before agent drops the call (expecting return destination to set in). That is, the PG will keep track of the VDN to which the call was originally delivered and call variables are retained post return destination.
  - Return destination cannot be executed multiple times. That is, Return Destination can occur only once for a call in Avaya.

See sections [Configuring Return Destination VDN on Avaya Switch](#) and [Configuring the Return Destination on Unified ICM](#) for configuring the Return Destination VDN on Avaya and Unified ICM respectively.

## 2.13. Multiple PGs

The Avaya ACD allows connections from multiple PGs. However, while using such a configuration, the resources (like Stations, Agents, VDNs, Splits and any other resources) used by each PG should be maintained as separate configurations.

Multiple PG deployment on a single ACD can be used to split the load on the PG or have a dedicated PG to service a business line in the contact center.

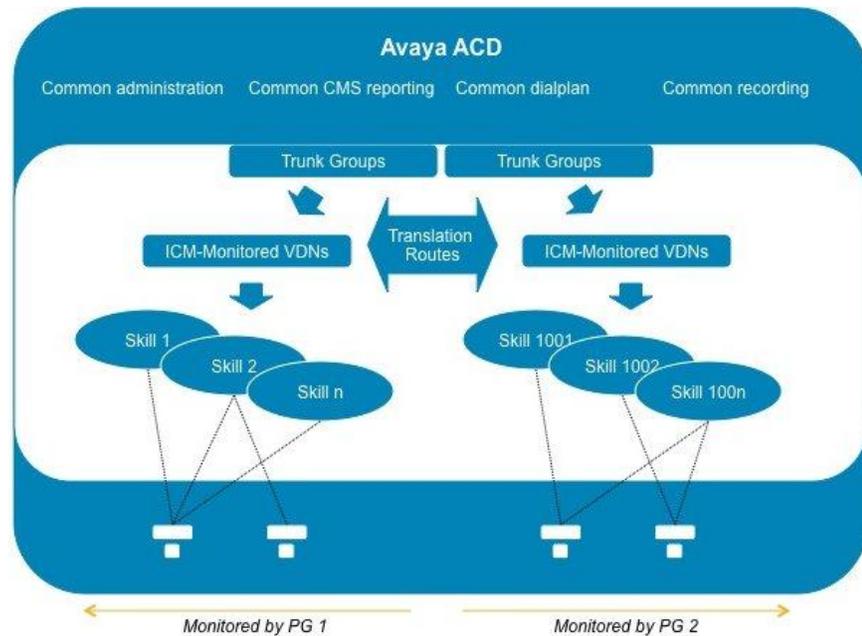
To deploy multiple PGs on a single ACD, you need to have distinct configuration between the PGs. Section 2.13.1 describes the configuration of two PGs on a single ACD. You can follow the same steps to to configure multiple PGs to the same ACD.

**Note:** Please contact the ACD vendor for ACD-related issues or limitations on connecting multiple PGs to a single ACD.

### 2.13.1. Dual PG Setup

**Note:** Ensure that you adhere to the requirements provided in this section while deploying multiple PGs. The performance and functionality of the PG will be impacted if you do not follow the requirements listed in this section.

When two PGs are deployed, ICM routing effectively “sees” the Avaya system as two independent peripherals. As such, there are some specific configuration and operational requirements that need to be put in place. The following figure describes the overview of Dual PG setup.



**Figure 15: Dual PG Overview**

For the same Avaya ACD to behave as an independent peripheral to Unified ICM, you should avoid having one skill group monitored by the two PGs. To achieve this, you will need to determine which Avaya skill numbers will be associated with PG1 and PG2, respectively. For example, skill groups 1-1000 and 1001-2000 would be two separate sets monitored by each instance.

When two PGs share the load of a single PG, it is recommended to have a logical correlation between the skill numbers associated with the different PGs. For example, the “pre-paid sales” skill associated with PG1 might be 500, and the one associated with PG2, 1500 (just added the digit 1 in front). The supervisor needs to look at a report that combines the information from the two corresponding skills to understand the overall skill performance. After the correlation is defined, each agent can be assigned only the skill numbers that belong to the same PG (considering the above example, an agent must not have skills 500 and 1502 at the same time).

Because the PGs also monitor Avaya stations, the agents associated with that PG must log in to the stations monitored by that PG only. All stations and agent-IDs at a given physical site need to be defined at only one PG. You can avoid having one site with entities from two PGs. It is also recommended to assign stations sequentially for every PG.

The VDNs (that are monitored by Unified ICM) should be independent, regardless of whether they are used by calls when they first enter the environment or for translation routes. The CTI links used by these VDNs (through the vectors they point to) should also be separated; there will be CTI links established with PG1 A and B, and with PG2 A and B. You can also define dial-plan ranges for VDNs in each PG to make the configuration simpler (but it is not required).

The calls within the a PG can be dialed directly using normal dial plan numbers such as VDNs, Agent IDs, extensions, and hunt groups. Ideally, the

calls should not cut across two PGs. However, in such scenarios, the call has to be translation routed to the target PG over trunk, which is equivalent to routing to a PG connected to a different switch. To achieve this kind of a routing, loop back trunks need to be provisioned on the switch and used for routing calls to dial plan numbers of another PG.

When the call is routed from PG1 to PG2, the target PG2 will see the call as an inbound call and the ICM reporting will reflect the same. To prevent inappropriate agent behavior, the Avaya system can be programmed to block incorrect call flows (COR and/or tenant settings). It is recommended to design the system to avoid or minimize the call between the two PG groups.

Cisco mandates that trunk groups monitored by each PG be separate. If two PGs are used to monitor the same trunk group, Unified ICM software will not be able to understand that the feeds it gets are duplicated.

Other Avaya resources such as announcements, classes of restriction, CMS reporting, recording, and so on, are not affected with dual PG implementation.

**Note:** Although two PGs can provide scalability from a Cisco Unified ICM perspective, you should also consult Avaya about how the ACDs will handle increased CTI traffic – taking into consideration all other applications currently used, such as recording and virtual hold. These thresholds are associated with a large number of CTI-enabled agents in the Avaya ACDs, not with the fact that two PGs are being used.

## 2.14. Maintaining Your Configuration

Accomplish the changes made to your configuration **first** on the Avaya/CMS, then in the Unified ICM database. This will ensure that the PG sees the configuration updates on the Avaya/CMS systems.

It is imperative that the Avaya, CMS, and Unified ICM database configurations are kept synchronized (that is, up-to-date with each other). Inaccurate or incomplete data could result in inaccurate agent and/or call data.

## 2.15. Configuring High Availability CMS

The high availability CMS configuration minimizes the down time in the event of Avaya CMS failure. If you want to have such configuration in your call center environment, configure the PGs as follows:

- **Duplex PG configuration:** Both CMSs (CMS no.1 and CMS no.2) should use both PG's IP addresses (that is, IP addresses of PG-A and PG-B) for connections exactly the same as they do in a single CMS configuration. However, at any given time, only one CMS can connect to the active PG. The other PG is always in standby mode. So if PG-B is currently active, PG-A will be in standby mode (and vice versa).

When running the Web Setup tool, ensure that the CMS Hostname field in the AvayaPIM Configuration pop-up menu is blank. This allows the PIM to accept a connection from either HA CMS server. If one HA CMS server goes down, the other will initiate a connection to the PIM on the active PG.

**Note:** Irrespective of this being a High Availability CMS configuration or not, a CMS Data Feed failure will result in a failover from one side of a duplexed PG to the other.

- **Simplex PG configuration:** Both CMSs should use the PG's IP address for connection. But only one CMS can connect to the PG at any given time. Also, be sure when running Web Setup tool that the CMS Hostname field in the AvayaPIM Configuration pop-up menu is blank. This allows the PIM to accept a connection from any one CMS server. If one CMS server goes down, the other should initiate a connection to the PIM.

**Note:** The HA CMS server going down will lead to CMS Data Feed failure; this will result in a brief outage on a simplex PG.





## 3. Unified ICM Software Configuration

In order to properly configure and maintain the Unified ICM database, you need to understand the relationships between the Avaya database objects and the Unified ICM database objects. Some Unified ICM objects (for example, Unified ICM Services) do not correspond directly to a specific object on the Avaya. Other Unified ICM objects, such as trunks, correspond directly to objects on the ECS/MultiVantage/Avaya.

By understanding the relationships between the database objects of the Avaya and Unified ICM systems, it will be easier to keep the Avaya ECS/MultiVantage, CMS, and Unified ICM databases synchronized (that is, up-to-date with each other).

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

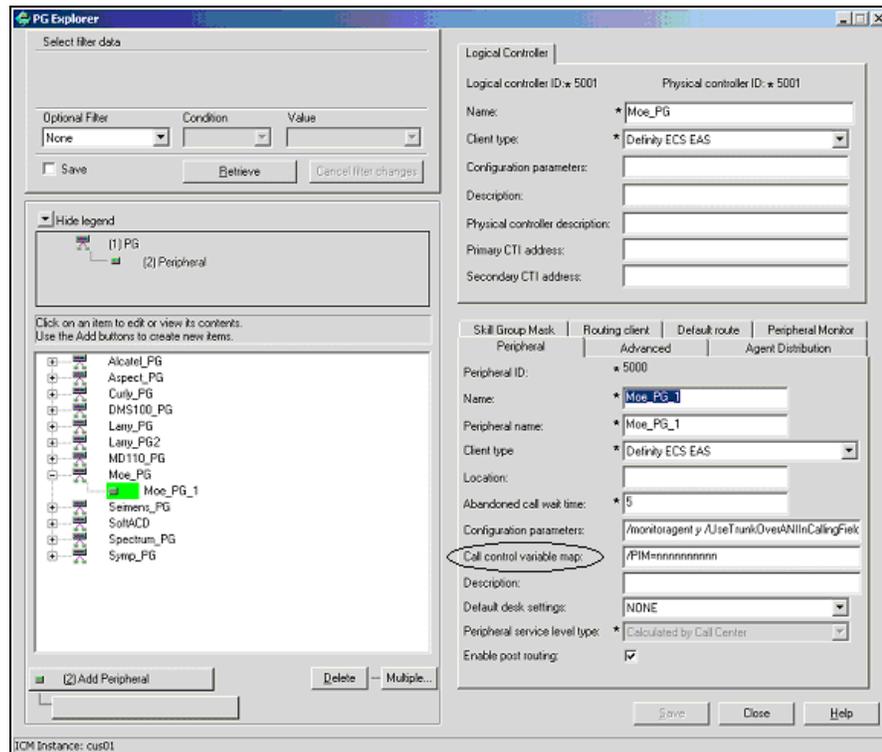
*See also:* For detailed information on the Configuration Manager tool user interface, see the *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise and Hosted* available at:

[http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products_installation_and_configuration_guides_list.html).



### 3.1.2. Peripheral Call Control Variable Map

The mapping of route request elements to Peripheral Variables is controlled by the Call Control Variable Map field, which is found on the PG Explorer tool.



**Figure 17: Call Control Variable Map Field**

The Call Control Variable Map field can be used to configure which peripheral variables should be reserved for a CTI application, and which ones the PG can use. Following are the ways to control variable usage via the CallControlVariableMap:

- Direct the PIM. The PIM can be directed on which call variables can be accessed. For example, the following setting allows the PIM to set call variable 1 and call variables 5 through 10 while preserving the existing values of call variables 2 through 4 (that is, the PIM will not set call variables 2 through 4).

**Note:** This argument is from the perspective of the PIM.

```
/PIM=yynnyyyyyy
```

- **Direct the CTI portion of the PG.** The CTI portion of the PG can be directed to allow the CTI Client to override any PIM Call Variable setting. For example, the following setting allows a CTI Client to set call variable 1 and call variables 5 through 10 while preserving the peripheral-determined values of call variables 2 through 4.

```
/CTI = ynnnyyyyyy
```

See also: For details on Route Request Elements, see Chapter 4, “Post-Routing.” For more details on Unified ICM CTI capabilities and interaction with the PG, see the *ICM Software Enterprise CTI Interface Specification*.

### 3.1.3. Peripheral Configuration Parameters

Several default settings can be entered in the Configuration Parameters field of the PG Explorer tool, including default work-mode, default login skill level, reserved agent preference levels, and station monitoring of logged-in agents.

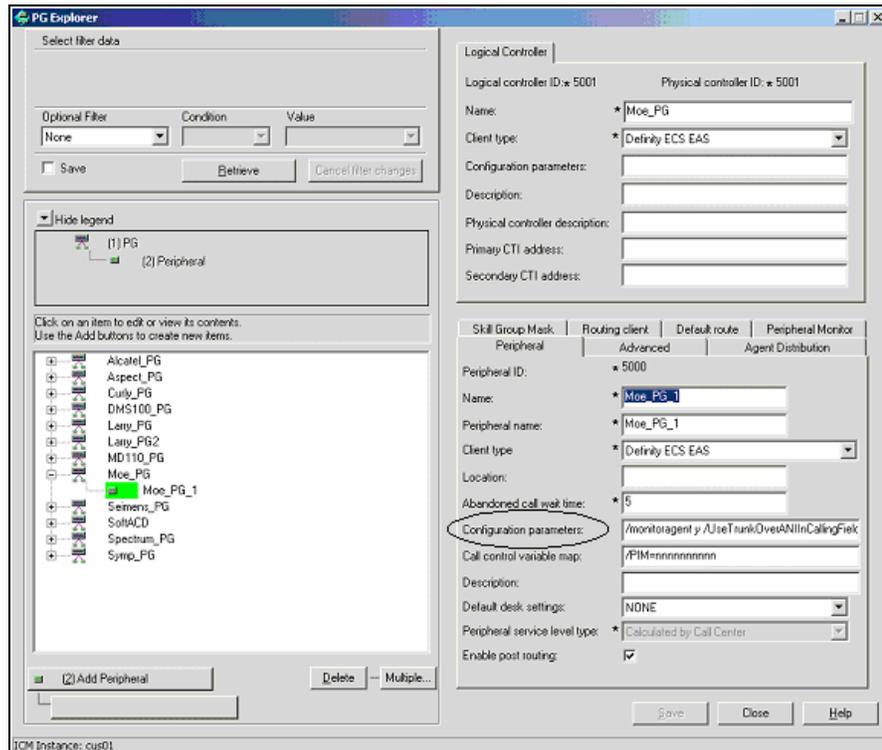


Figure 18: Configuration Parameters Field

#### 1. Default Work-Mode

The default work-mode used by the PIM when setting an agent to the READY state via a CTI application can be configured via the Configuration Parameters field. The keyword /defworkmode, followed by manual or auto, will set the default work-mode to the Avaya equivalent of “Manual-In” and “Auto-In” respectively.

The following example will set the default work-mode to AUTO-IN:

```
/defworkmode auto
```

This default work-mode is used by the PIM in the case where a CTI application does not provide a proper work-mode when setting the agent to the READY state. If unspecified, the PIM default is MANUAL-IN.

## 2. Default Login Skill Level

The default login skill level (that is, priority or skill level) used by the PIM can be configured via the Configuration Parameters field. The default login skill is used when an agent logs in and no agent skill group member can be found for that agent in Unified ICM Configuration. The keyword /defskilllevel followed by a numeric skill level sets the default skill level. The following example sets the default login skill level to 3:

```
/defskilllevel 3
```

If unspecified, the PIM default is 16.

## 3. Reserved Agent Preference Levels

Reserved agent preference levels (in ICM software, Release 4.0 and greater) can be configured via the Configuration Parameters field. The reserved agent 1 and agent 2 preference levels (represented as preference level 51 and 52, respectively, in CMS) can be remapped to a valid preference level. The PIM will default the values to the highest valid preference level. The keywords /r1pref and /r2pref are used to re-map reserve preference level 1 and 2 respectively. The following example will cause the PG to re-map reserve agent 1 and reserve agent 2 preference levels to preference level 15 and 16, respectively.

```
/r1pref 15 /r2pref 16
```

Setting a preference value of zero (0) causes the PIM to ignore that reserve agent skill login and preference level (that is, the agent will not be considered to have logged into that reserved skill and no metrics will be collected for that agent for that skill).

## 4. Station Monitoring of Logged-In Agents

Station monitoring of logged-in agents can be automatically configured via the Configuration Parameters field. The keyword /monitoragent followed by a “y” or “n” causes the PG to automatically monitor or not monitor a logged-in agent. The following example causes the PG to automatically monitor a logged-in agent:

```
/monitoragent y
```

With a setting of y, the PG, at the time of an agent login, will automatically monitor that agent’s station even if that station is not in the Peripheral Monitor list. If station monitoring is enabled, the PG will default to automatically monitoring logged-in agents. If station monitoring is disabled, the PG will not monitor any agent stations.

**Notes:**

- /monitoragent is set to y in PIM by default.  
If you want to monitor only specific extensions on Avaya (For example, if you are using a shared configuration on the ACD and there are other applications monitoring the extensions which are not used by Unified ICM), then you can set /monitoragent to n (use /monitoragent n) and configure the extensions to be monitored by Avaya PG in the Peripheral Monitor Table of the PG Explorer.  
If you do not want to monitor specific extensions and you need to monitor all the logged agents, set /monitoragent to y (use /monitoragent y). Configuring the extensions in the Peripheral Monitor Table of the PG Explorer is not needed. In such configurations, PIM will monitor only those extensions where agents are logged in.
- If you are using CMS with Unified ICM and have over 1000 agents, it is recommended to disable the station monitoring of logged-in agents. Monitoring agent stations (That is providing visibility to all station activity) results in increased message traffic to the A, increased switch CPU load, and increased network traffic between the PG and Central Controller.

**5. Use Encoded Trunk Information over ANI in Calling Field**

With a setting of y, the PIM will report events in the calling field populated with encoded trunk information rather than ANI. The default mode is to populate the calling field with ANI. This argument defaults to n. If the argument is not specified or is specified as /UseTrunkOverANIInCallingField n an example of one event may be:

```
19:31:20 pg1A-pim1 Trace: CSTA DELIVERED,
PrivData=[UU=None Consult[CID 603 Dev 6505 DevType 0] || 0
Alert[Handle -1 Type LT_UNKNOWN] ANI 6505
dnis_chars [] UCID 0x0
TG 7 Tk 5 Mult 1]
LoginDigits [] CallPrompt []
CallID    = 604 DeviceID = 6505 DeviceType = Static
Alerting  = 3501
Calling  = 6505
Called    = 3501
Redirection = 6505
LocalState = INITIATE
Cause     = EC_NEW_CALL
```

If the argument is specified as /UseTrunkOverANIInCallingField y that same event may appear as:

```
19:31:20 pg1A-pim1 Trace: CSTA DELIVERED,
PrivData=[UU=None Consult[CID 603 Dev 6505 DevType 0] || 0
Alert[Handle -1 Type LT_UNKNOWN] ANI 6505
dnis_chars [] UCID 0x0
TG 7 Tk 5 Mult 1]
LoginDigits [] CallPrompt []
CallID    = 604 DeviceID = 6505 DeviceType = Static
Alerting  = 3501
Calling  = 229381 <= decimal equivalent of encoded trunk
Called    = 3501
```

Redirection = 6505  
 LocalState = INITIATE  
 Cause = EC\_NEW\_CALL

**Note:** The scheme for trunk information encoding is such that the upper 17 bits represent the Trunk Group and the lower 15 bits represent the Trunk. From the above example: For a Trunk Group value of 7 and a trunk value of 5, the binary representation for the encoded value is

00000000000000111 000000000000101. The decimal equivalent is 229381.

```
/UseTrunkOverANIInCallingField y
```

#### 6. Use Encoded Trunk Information over ANI in Calling Field for Outbound Calls

To support the selecting of trunk data or ANI in calling device field for outbound calls, use the configuration parameter:

**/UseTrunkOverANIInCallingFieldForOutboundCalls.**

The flag-usage is as follows:

1. Set the configuration parameter to 'y', if the trunk information is required in the calling device field for outbound calls.

```
/UseTrunkOverANIInCallingFieldForOutboundCalls y
```

2. Set the configuration parameter to 'n', if the trunk information is not required in the calling device field for outbound calls.

```
/UseTrunkOverANIInCallingFieldForOutboundCalls n
```

#### Notes:

1. When the value of this flag is n, ANI appears in the calling device field. Also, the default value of this flag is n.
2. This flag controls the value of calling device field in CSTA DELIVERED and CSTA ESTABLISHED messages for outbound calls.
3. This flag is available from Releases ICM 6.0(0) SR9, and ICM 7.1(3) onwards.

## 7. Display the Caller Entered Digits (CEDs) on the Agent Desktop

To ensure that the CEDs are populated on the agent desktop, set the following parameters in the PG Explorer:

In the **Advanced** tab, ensure that the **Agent auto-configuration** check box is checked, as shown in the [Figure 19](#).

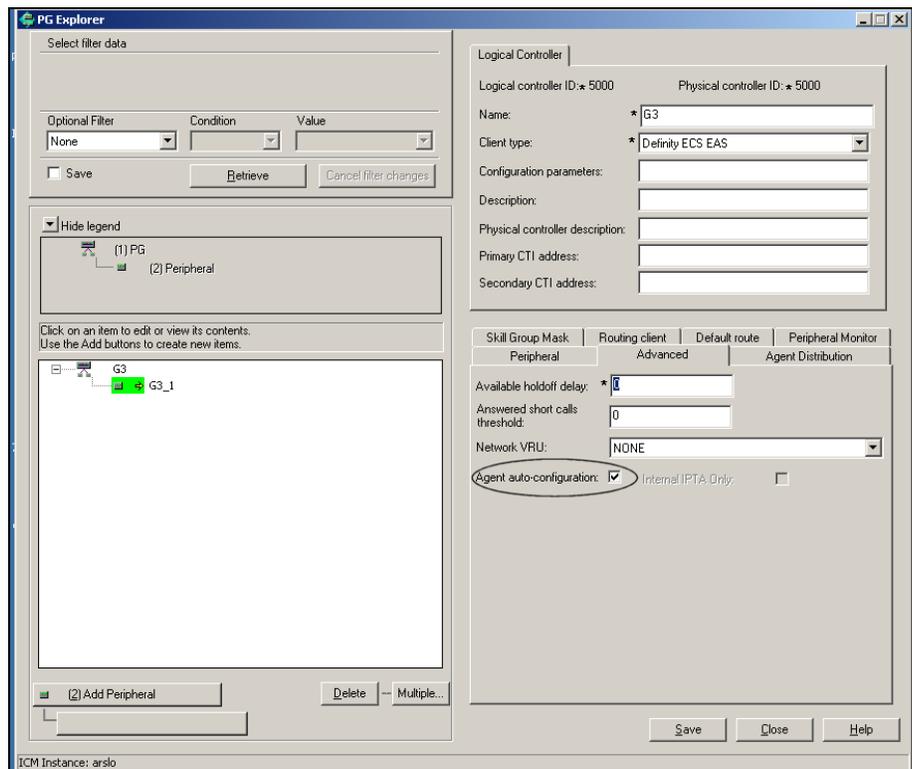
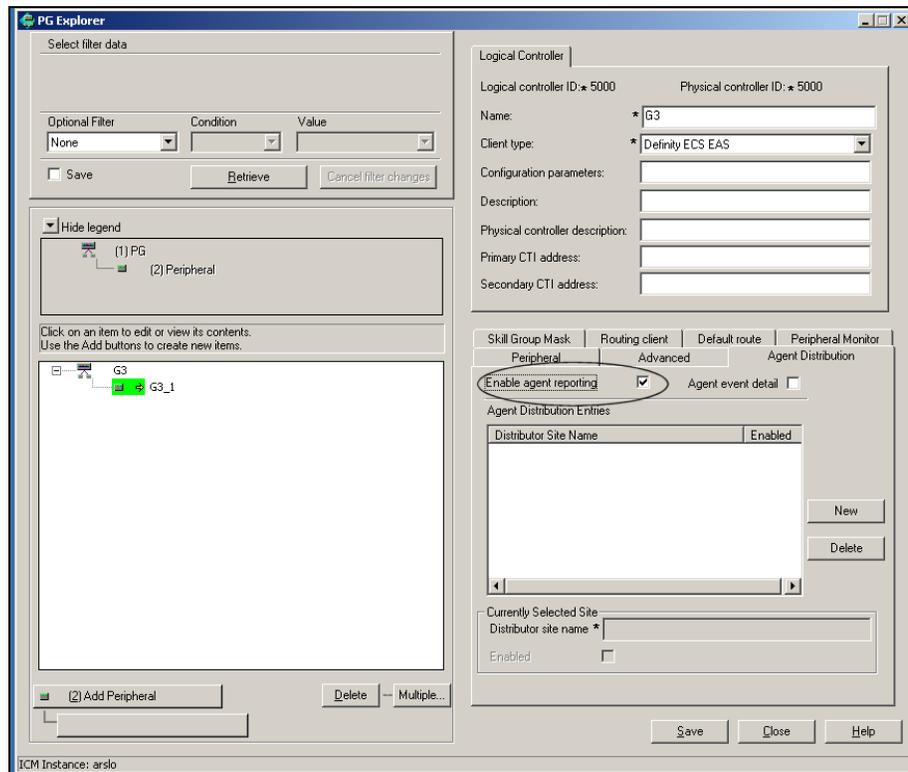


Figure 19: Agent Auto-Configuration

In the **Agent Distribution** tab, ensure that the **Enable agent reporting**, check box is checked, as shown in the [Figure 20](#).



**Figure 20: Enable agent reporting**

If you do not select them together, the CEDs will not be populated on the agent desktop. These settings apply only to the Avaya PG with the CMS mode enabled.

## 3.2. Peripheral Targets

A Unified ICM Peripheral Target is equivalent to the combination of DNIS (VDN extension or Hunt Group Extension) and the trunk groups through which incoming calls arrive. VDNs are equivalent to the DNIS (e.g., VDN 1100 would be DNIS 1100).

A Peripheral Target can be either of the following:

- A Network Target, identified by a Trunk Group and DNIS (VDN) that terminates on the Avaya. A Network Target is a target that Unified ICM software identifies as a termination for calls routed through the network. These trunk group-DNIS pairs are typically associated with labels provisioned by a long distance carrier.
- An Internal Target, identified by the DNIS (VDN) alone. An Internal Target is a VDN or Hunt Group extension used as a destination for internal call transfers, tie lines, and so on.

All Peripheral Targets, both internal (e.g., transfer points) and network, should be configured as Peripheral Targets in Unified ICM database. This is done by using the Configure ICM tool. It is not necessary to enter every TrunkGroup/VDN combination in Unified ICM database unless you require them for call routing. In other words, a VDN needs to be entered only once in the Unified ICM database as a Peripheral Target in order for the PG to monitor the calls on that VDN.

You can configure Peripheral Targets by using the Peripheral Target Configuration window within the Configure ICM tool.

### 3.2.1. Configuring VDN and Hunt Group Extensions as Peripheral Targets

All VDN and Hunt Group extensions that are in **any way** connected with the handling of an incoming call **must be** configured in Unified ICM database as Peripheral Targets. This will ensure complete call monitoring. The PG will monitor only those VDNs and, optionally, Hunt Groups that are configured as Peripheral Targets.

VDNs or Hunt Group Extensions that are not accessed directly via a Trunk Group (that is, ones that are only used internally), should use the default Trunk Group 9999. (See “Trunk Groups” later in this chapter.)

**Note:** The Avaya PG supports extensions of up to ten digits – the agent can login to a Softphone that has an extension up to ten digits. This ten-digit support applies to Agent Login IDs too.

The Hunt Groups and VDNs will support up to seven digits only.

In order to use a seven-digit, or a ten-digit, the config PIM registry **EnableTenDigitExtension** must be set to 1 in following path:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Cisco Systems,
Inc.\ICM\<cus01>\<PGXX>\PG\CurrentVersion\PIMS\pim1\ATTData\Config\
```

If the registry **EnableTenDigitExtension** is set to 0, then it limits support up to five digits for extension, Agent Login IDs, Hunt Groups, and VDNs.

### 3.3. Peripheral Monitor Table

Unified ICM Peripheral Monitor table is used to configure stations for station monitoring and VDNs that have Timed ACW values. A Peripheral Monitor table VDN entry is used only to indicate any Timed ACW value as configured on the switch. This Peripheral Monitor VDN entry **does not** replace a Peripheral Target for VDN monitoring.

**Note:** VDNs must also be configured as Peripheral Targets in order to be monitored for reporting.

You can configure the Peripheral Monitor Table by choosing **Peripherals > Peripheral Monitor** within Configure ICM to display the Peripheral Monitor table.

Click the **Insert** button to add records using the Peripheral Monitor Configuration window.

#### 3.3.1. Monitoring Stations

The Peripheral Monitor table is used to specify which station, or range of stations, should be monitored by the PG. Multiple peripheral monitor entries are allowed. Set the Peripheral Monitor Type to Station. When specifying a single station (e.g., 1100), use the Extension field. When specifying a range of stations (e.g., 1100-1200), use the Param String field.

#### 3.3.2. VDN Timed ACW Settings

VDNs that have a Timed ACW value on the Avaya should be added as a Peripheral Monitor table entry with a Type of VDN. The Peripheral Monitor Param Field should indicate the Timed ACW value, as shown in [Figure 21](#).

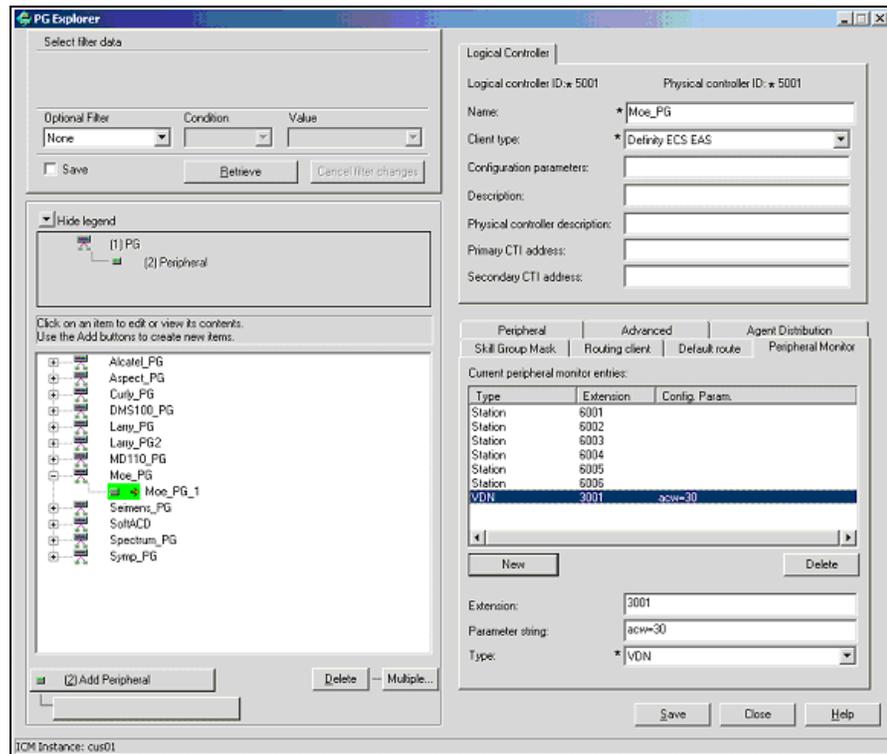


Figure 21: Peripheral Monitor Param Field

For VDNs that **do not** have the VDN override set, specify the Timed ACW value in the Peripheral Monitor table parameter string using the following format:

acw=N

**Notes:**

1. The acw keyword must be in lower-case. Replace the N with the number of Timed ACW seconds. For example, a VDN with a Timed ACW of 30 seconds that does not have VDN override set would specify a Timed ACW value in the Peripheral Monitor table as:

acw=30

For VDNs that **do** have VDN override set, specify the Timed ACW value in the Peripheral Monitor table parameter string using the following format:

ACW=NNNN

2. The ACW keyword must be in upper-case. Replace N with the number of Timed ACW seconds. For example, a VDN with a Timed ACW of 180 seconds which does not have VDN override set would specify a Timed ACW value in the Peripheral Monitor table as:

- Only those VDNs that are monitored **and** for which the Avaya generates call events on their behalf, are considered as being in the “call path” by the PG when determining the correct Timed ACW value. In other words, if the PG is not notified by the switch that the call has passed through a VDN, the PG cannot consider that VDN when determining the Timed ACW value. The PG will endeavor to use the same rule set as documented for the switch in determining the Timed ACW value to use (including VDN override).

### 3.3.3. Configuring the Return Destination VDN on Unified ICM

The Return Destination feature is configured in the PG Explorer Tool for a particular VDN for which the Return Destination is enabled on Avaya Switch.

In **PG Explorer > Peripheral Monitor** tab, set the Parameter string for the return destination VDN as “returndestination” (See [Figure 22](#)).

Here, 3606 is the Return Destination VDN.

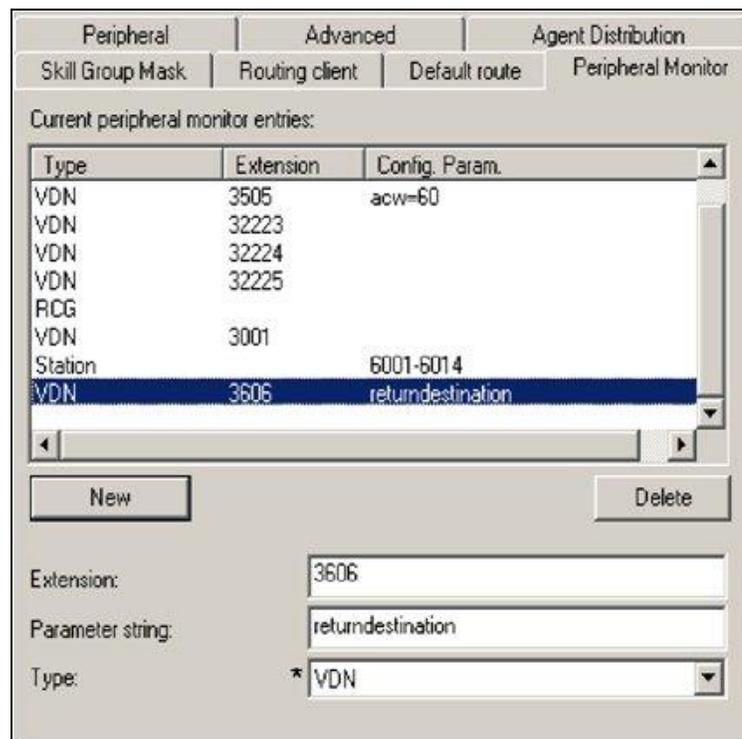


Figure 22: Return Destination feature on ICM

The following figure shows the Return Destination logs:

```

PIM LOGS:

(1) VDN 32222 is the first post route VDN - VDN 32223 is the label returned for 32222 and also it is the Return Destination VDN. The highlighted call variables are set in the first post route .
14:24:39 pg6A-pim1 Trace: [ 6676]RtReq: REQ: Bri/SAOid=0/481 CID=1431 Calling=(NULL) Called=32222 UU=None VDN=32222 DNIS=(NULL) Time=-2147483648:-2147483648:-2147483648
14:24:39 pg6A-pim1 Trace: [ 6676]RtReq: +REQ: PV1=""CP_UNUSED"PV2="IT_UNUSED"PV3="0" PV4="32222"PV5="" PV6="" PV7="" PV8="4 3 0" PV9="" PV10="32222"
14:24:39 pg6A-pim1 Trace: [ 2100]Bri/SAOid=0/481; RtSel: REQ: CID=1431 Clng=(NULL) Cld=32223 UU=None ofac=NUSE ofac_ext=(NULL)
14:24:39 pg6A-pim1 Trace: [ 2100]RtSel: +REQ: pri=F dacd=F User[Type=ADJDIG TOut=0 #Digits=0 ( ) Clct=CLCTD]
14:24:39 pg6A-pim1 Trace: [ 2100]RtSel: +REQ: PV1[9]="CP_UNUSED"PV2[9]="IT_UNUSED" PV3[1]=0" PV4[5]="32222"PV5[0]="
14:24:39 pg6A-pim1 Trace: [ 2100]RtSel: +REQ: PV6[1]="Y" PV7[29]="CALLVARIABLERETURNDESTINATION" PV8[5]="4 3 0" PV9[0]=" PV10[5]="32222"

(2) After Return Destination happens on VDN 32223, the call variables are preserved in the second post route . VDN 32224 is the second Post Route VDN which is configured as Return Destination VDN for VDN 32223 on Avaya Switch
14:25:02 pg6A-pim1 Trace: [ 6676]RtReq: REQ: Bri/SAOid=0/501 CID=1431 Calling=(NULL) Called=32224 UU=None VDN=32224 DNIS=(NULL) Time=-2147483648:-2147483648:-2147483648
14:25:02 pg6A-pim1 Trace: [ 6676]RtReq: +REQ: PV1=""CP_UNUSED"PV2="IT_UNUSED"PV3="0" PV4="32224"PV5="" PV6="" PV7="" PV8="4 3 0" PV9="" PV10="32224"
14:25:02 pg6A-pim1 Trace: [ 2100]Bri/SAOid=0/501; RtSel: REQ: CID=1431 Clng=(NULL) Cld=3001 UU=None ofac=NUSE ofac_ext=(NULL)
14:25:02 pg6A-pim1 Trace: [ 2100]RtSel: +REQ: pri=F dacd=F User[Type=ADJDIG TOut=0 #Digits=0 ( ) Clct=CLCTD]
14:25:02 pg6A-pim1 Trace: [ 2100]RtSel: +REQ: PV1[9]="CP_UNUSED"PV2[9]="IT_UNUSED" PV3[1]=0" PV4[5]="32224"PV5[0]="
14:25:02 pg6A-pim1 Trace: [ 2100]RtSel: +REQ: PV6[1]="Y" PV7[29]="CALLVARIABLERETURNDESTINATION" PV8[5]="4 3 0" PV9[0]=" PV10[5]="32224"

OPC LOGS:

When Agent on VDN 32223 drops the call, Return Destination happens and call is redirected to VDN 32224 and a NEW_TRANSACTION indication is sent to OPC.
14:24:58 pg6A-opc Trace: CSTA_PRIVATE::NEW_TRANSACTION - OldCall (callID=1431 DeviceID=6004 DevType=Static)
NewCall (callID=1431 DeviceID=D3 DevType=Dynamic)

```

Figure 23: Return Destination Logs

To configure Return Destination VDN on Avaya Switch, see the section [Configuring Return Destination VDN on Avaya Switch](#).

See the section [ACD Notes and Restrictions](#) for known caveats for Return Destination VDN.

### 3.4. PIM Configuration

The number of ASAI links supported by the Avaya PG is determined by checking/unchecking the **Using MAPD** check box (as shown in [Figure 24](#)), during the Avaya PG setup process. **Using MAPD** option does not indicate if MAPD is used with the setup or not.

If **Using MAPD** check box is:

- Checked: Avaya PG supports up to eight ASAI links (1 to 8).
- Unchecked: Avaya PG supports up to four links (1 to 4)



**Figure 24: Peripheral Gateway Component Properties**

The Avaya ECS PIM Configuration Setup window is shown in [Figure 25](#). This window is displayed by using the Web Setup tool.

**Definity ECS PIM Configuration (CVLAN on MAPD) (PIM 1)**

Enabled

Peripheral name:  Peripheral ID:

Call Management System (CMS) Configuration:

CMS Enabled (NOTE: DISABLE if CMS-less)

CMS Hostname:  Port number to listen on:

CMS Data Timeout (Typ. 3X Refresh rate) [Millisec]:

Multiple Cisco Reports:

Number of Cisco Reports for this PIM:  Port number delta (typ: 10):

CVLAN/MAPD Configuration:

Host 1:  Enabled

Hostname:

ASAI Link #	1	2	3	4	5	6	7	8
Monitor ASAI links:	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
Post-Route ASAI links:	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
Heartbeat Maintenance:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Host 2:  Enabled (if DUPLEXED)

Hostname:

ASAI Link #	1	2	3	4	5	6	7	8
Monitor ASAI links:	<input type="checkbox"/>							
Post-Route ASAI links:	<input type="checkbox"/>							
Heartbeat Maintenance:	<input type="checkbox"/>							

Minimum number of overall ASAI links before failover:

Default Timed ACW value (Seconds):  CMS-less Smart Agent Timer:

OK Cancel Help

**Figure 25: Avaya ECS PIM Configuration**

The following points describe the Avaya ECS PIM Configuration Setup window:

1. Check the **Enabled** check box to enable the PIM.
2. Check the **CMS Enabled** check box if the Avaya PG is used with CMS Server. If you are using CMS-less configuration, do not check this check box.
3. If the **CMS Enabled** check box is checked:
  - a) Specify the **Port number to listen on** as specified in the CMS Server against the PG entry. This is the port number on which the Avaya PG listens for the CMS connection.
  - b) **CMS Hostname** is optional. If specified, it should be the host name of the CMS Server.
4. For Host1:

- a) Check the **Enabled** check box under **CVLAN/MAPD Configuration**.
  - b) Specify the Avaya ACD hostname/IP address in **Hostname** field.
  - c) Select the CTI link number as configured in the Avaya ACD. "Monitor CTI links" is the CTI link on which Avaya PIM receives all the events except the "post-route requests" and "heartbeat requests". "Post-Route CTI links" is the CTI link on which Avaya PIM receives all the "post-route requests".
  - d) If you are configuring two ASAI links, make sure that both options "Monitor ASAI links" and "Post Route ASAI links" are not checked for both ASAI links. If you are using a single link, select both checkboxes ("Monitor ASAI links" and "Post Route ASAI links"). If two links are required, select one link for "Monitor ASAI links" and select one link for "Post Route ASAI links." Selecting both options for both links causes duplicates events, which can lead to further issues as the report of normal calls is treated as abandoned.
5. **Heartbeat Maintenance** is the CTI link on which Avaya ACD sends heartbeat requests to the Avaya PIM. Select the appropriate link if the heartbeat option is configured in the Avaya ACD. If not, leave this field unchecked.
  6. Specify the details for Host 2 similar to Host 1, if a duplexed Avaya ACD is used.
  7. Leave the rest of the fields with default values.

#### Default Timed ACD Value

The value set here is used as the **default** if a Skill Group or VDN Timed ACW value has not been configured and cannot be found for the call path. Note, however, that the agent must have a work-mode of AUTO-IN in order for the Timed ACW value to apply. Any configured Timed ACW value found that is in the call path will be used.

**Note:** The configuration of Avaya PG for Avaya ACD and AES Server is the same.

### 3.5. Trunk Groups

An Avaya Trunk Group is equivalent to a Unified ICM Trunk Group. The Avaya Trunk Group Number (For example, trunk group 5) is Unified ICM Trunk Group Peripheral Number. The Trunk Group Access Code (TAC) is Unified ICM Trunk Group Extension (For example, 500). TrunkGroupTimer is the value in the Registry that specifies the interval (in seconds) in which the PIM generates trunk group value requests. In other words, the TrunkGroupTimer specifies the timer period at which the PIM will issue a Trunk Group query for each configured ICR trunk group. The default value for TrunkGroupTimer in the Registry should be set to 10 seconds.

The PG uses the Trunk Group Extension to value query the Avaya and monitor Trunk Group trunk utilization. The PG also uses the Trunk Group Extension to properly identify an incoming call on translation route applications. The Trunk Group Extension is set in the Trunk Group Configuration window of Configure ICM.

For example, Trunk Group 11 with Trunk Access Code 111 would be entered in the Unified ICM database as Trunk Group 11 with Trunk Group Extension 111.

Create a default trunk group 9999 for use in those instances where a physical Trunk Group does not exist. For example, Hunt Groups or VDNs that are internal transfer points for agents, and therefore not accessible via an external trunk group, should use the default trunk group 9999 to allow the creation of the Peripheral Target. The default Trunk Group extension (that is, TAC) can either be left blank or specify 9999.

The NT Registry should be configured to allow the PG to “Map Peripheral Targets without Trunk Group.”

**Note:** During a translation route, you need not configure the Network Trunk Group (NTG) if Unified ICM trunk reports are not required. A dummy NTG configuration, with a dummy peripheral number, can be configured and associated with the configured translation routes.

### 3.6. Trunks

Individual trunks may or may not be monitored on the Avaya.

No special configuration information is required on an individual trunk basis. However, you must specify the number of trunks in the Trunk Group in the Trunk Group configuration Trunk Count field. Because the switch provides only the number of trunks-in-use and the trunks-idle, this count allows the Avaya PIM to determine the number of out-of-service trunks.

### 3.7. Services

A Unified ICM Service is the combination of call type (known by the VDN) and call treatment (that is, vector). There is no direct correlation of Unified ICM Service to a specific Avaya object. However, a service does fit with what users typically identify as the “call treatment” on the Avaya.

The Service Peripheral Number is equivalent to the VDN extension number. The Peripheral Service Level is equivalent to the VDN service level.

**Note:** The Avaya PIM does not support the updating of Peripheral Service Level.

Using the Service Explorer tool, set the Peripheral Service Level to “Computed By Call Center.” The Unified ICM Peripheral Service Level corresponds to the VDN Service Level ([XFigure 21](#)).

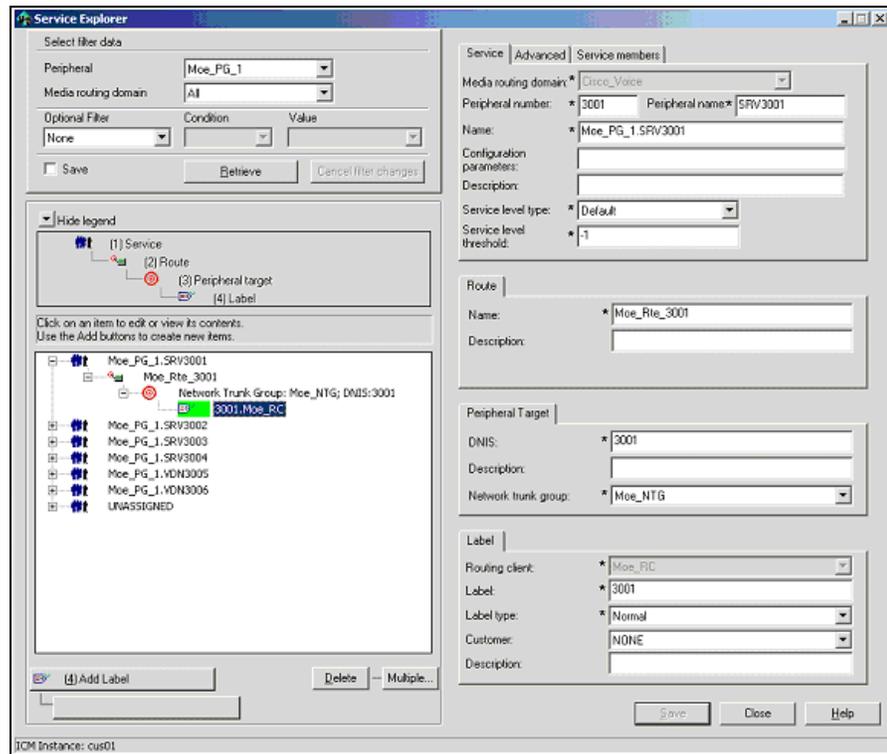


Figure 26: Peripheral Number and Service Fields

### 3.8. Skill Groups

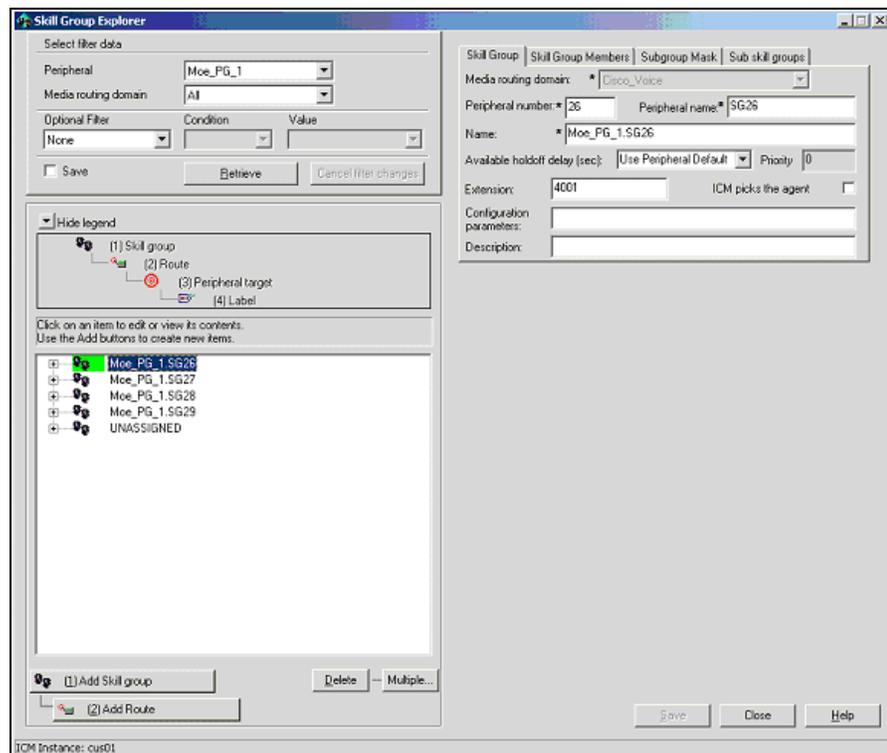
The Avaya-to-Unified ICM Skill Group mapping is as follows:

Table 4: Avaya-to-Unified ICM Skill Group Mapping

Unified ICM Software	Avaya
Skill Group	Skill Group
Skill Group Peripheral Number	Skill Group Number
Skill Group Extension	Skill Group Extension
Subgroups	Skill Group and Skill Levels <sup>1</sup> <sub>TR, RT</sub>

**Note:** Unified ICM Skill Group Peripheral Number is the Avaya Skill Group Number. The Unified ICM Skill Group Extension is the Avaya Skill Group Extension. For example, if the “Spanish” skill group has a group number of 11 and an extension of 1100, then the Unified ICM Skill Group Peripheral Number will be 11 and the Skill Group Extension will be 1100 (see Figure 26).

<sup>1</sup>These are the skill group and skill levels supported for agent login on the DEFINITY ECS in EAS configurations.



**Figure 27: Skill Group Configuration Fields**

**Important:** The Unified ICM Skill Group Peripheral Number and Skill Group Extension are important and must be kept synchronized (that is, up-to-date) with the Avaya skill group configuration. Failure to keep the skill group information synchronized between the Avaya and the Unified ICM database may result in incomplete (or worst case, inaccurate) call and agent statistics.

### 3.8.1. Skill Group Subgroups

When created, a single Unified ICM skill group may cause more than one skill group to be created in the Unified ICM database. These other skill groups are sub-skill groups, or subgroups, for the created “base”<sup>1</sup> (priority 0) skill group. A subgroup has a unique priority and is associated with the base skill group.

**Note:** For every “base” skill group created, at least one sub-group must be created under it.

**Important:** The PGs need to be cycled every time new subgroups are created.

The creation of these subgroups is determined on which subgroup mask is used at the time of the base skill group creation. The subgroup mask can have one of two settings: Peripheral Default or Specified. These settings are specified in the Skill Group Explorer tool.

<sup>1</sup> The “base” skill group is a Unified ICM skill group created by selecting Save in the Skill Group Explorer. Any sub-groups (sub-skills) created by checking the “mask” check box are also created and mapped to the “base” Unified ICM skill group.

If the subgroup mask is Peripheral Default, then the Peripheral's Skill Group Mask is used to determine which subgroups will be created; otherwise, the Sub Group Mask for the Skill Group is used.

A subgroup is created for each checked box in the Sub Group Mask. The subgroups are used by the PG to properly log in the agent to the appropriate subgroup based on the agent's skill group skill level. For example, in an EAS type switch configuration, agents may be logged into a skill group with a PRIMARY or SECONDARY skill level. In order to properly account for agent counts and roll up call statistics properly, the subgroup for the agent's skill group should be configured in the Unified ICM database.

**Note:** In order for AutoLoginBase to work correctly and provide consistent LAA stats for agents in all priorities, at least one agent must be logged in to the base skill group.

#### **For CMS Configurations:**

The Avaya Hunt Group configuration screen for each split **must** have the Measured Field set to either "both" or "external" in order for the CMS to receive Hunt Group (split) data.

Agent configurations on an Avaya EAS switch can use any of the valid skill-types (1-16) if the Cisco CMS report that is installed and running is an EAS report. Likewise, the agent configurations on an Avaya EAS, is limited to 1-2 skill-types.

If you configure agents with a skill type greater than 2 for a Non-EAS or EAS CMS report, the PG will not be able to properly activate.

**Note:** When working with ICM Version 4.5(x) and later, while activating the ACD PIM if you get an error message that contains the term C\_NOENT, do the following:

- Add the name and IP address of the ACD PIM to the host file.
- Restart the PG ICM Services.

#### **For CMS-less Configurations:**

The subgroups are used to associate an agent with the correct skill group **and** skill level. For example, if an agent is configured on the ACD switch to be logged into skill 1 priority 3, then you would configure that agent in Unified ICM database to be a skill group member of skill group 1 subgroup 3.

*See also:* See the section "[CMS Cisco Real-Time Report](#)," for more information on CMS-related skill group issues related to configuration and CMS report revision.

### **3.8.2. Using Skill Group Priorities without Configuring Sub-skill Groups**

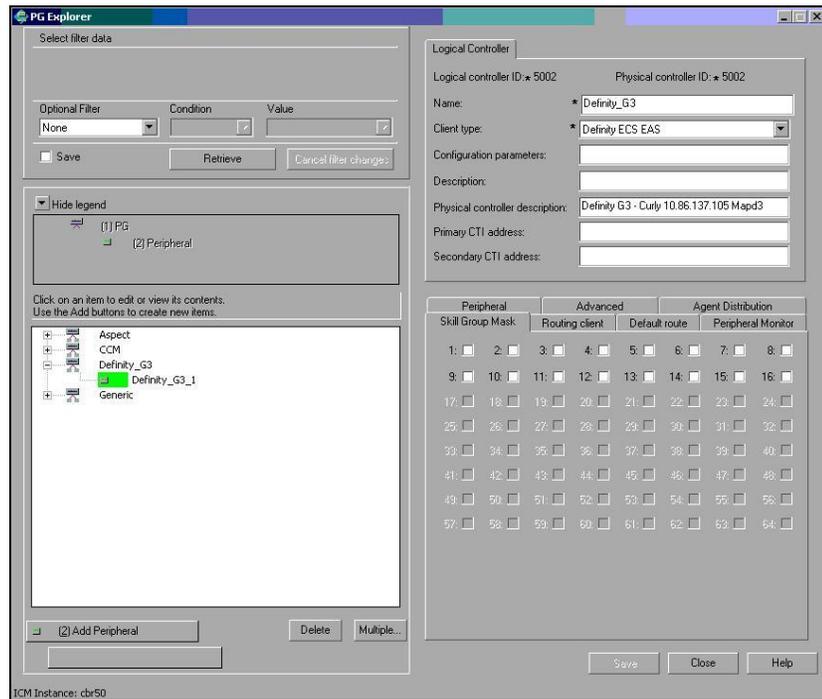
In Unified ICM, sub-skill groups are created when configuring the skill group priority. Each sub-skill group creates a target ID in Unified ICM database. This target ID is used by all Unified ICM processes during the real-time messaging. The PG needs to send constant real-time messages and reports to the Central Controller for each of the configured skill groups. The PG also needs to save the reports on the disk so that they are available to the Central Controller at any time. These operations can be very demanding when a large number of Unified ICM skill groups are configured.

If the number of ACD skill groups and skill group priorities is large, it is not recommended to use sub-skill groups because this causes increased data flow between the PG and the Central Controller. When the sub-skill group is not configured, the PG reports only the skill group peripheral number defined in the ACD to the Central Controller without the skill group priority. In this case, Unified ICM reports contain only the skill group defined by the ACD peripheral number.

**Note:** This feature is applicable from ICM 6.0 SR7 and 7.1(2) with Avaya PG.

### 1. Peripheral Configuration:

To avoid the base and sub-skill groups from being created, you must not have a skill group mask selected (see [Figure 24](#)).



**Figure 28: Peripheral Configuration**

### 2. Skill Group Configuration:

When configuring the skill group, do not select a skill group mask. The peripheral number should match the ACD skill group number without the skill group priority (See [Figure 25](#)).

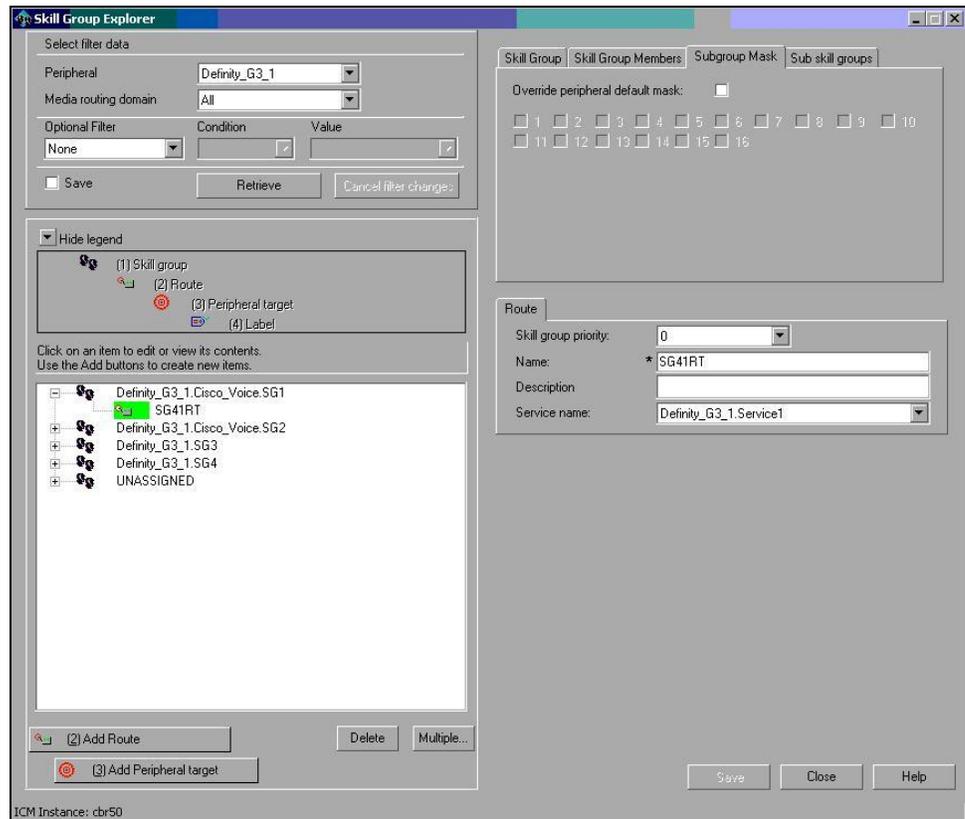


Figure 29: Skill Group Configuration

### 3. Impact on Unified ICM Reports:

Table 5: Impact on Unified ICM Reports

Report Type	Impact
Agent Skill Group Half Hour	<p>When you do not configure a skill group priority in Unified ICM, the Agent Skill Group Half Hour report will add all the statistics of the ACD priorities to a single skill group.</p> <p>If you configure the ACD priority in Unified ICM, the reports will display the statistics for each priority.</p>
Skill Group Half Hour	<p>The reports will display all the configured Unified ICM skill groups. When using ACD priority, the Unified ICM reports display a skill group for each of the priorities configured (called Unified ICM sub-skill group) and one base skill group.</p> <p>When you use a skill group with no priority configured, the reports will display one Unified ICM skill group configured for each ACD skill group.</p>
Termination Call Detail	<p>The Termination Call Detail for calls for the ACD skill groups with priority configured will contain the Unified ICM skill group defined by the ACD peripheral number (base skill group).</p>

#### 4. Migrating from Sub-skill Groups to Skill Groups with no ACD Priority Configured:

To migrate from sub-skill groups to skill groups with no ACD priority configured, you need to remove Unified ICM sub-skill groups. To do this, complete the following steps:

- 1) Remove all references to sub-skill groups in the router scripts and agent skill group membership. (See [Figure 26](#))

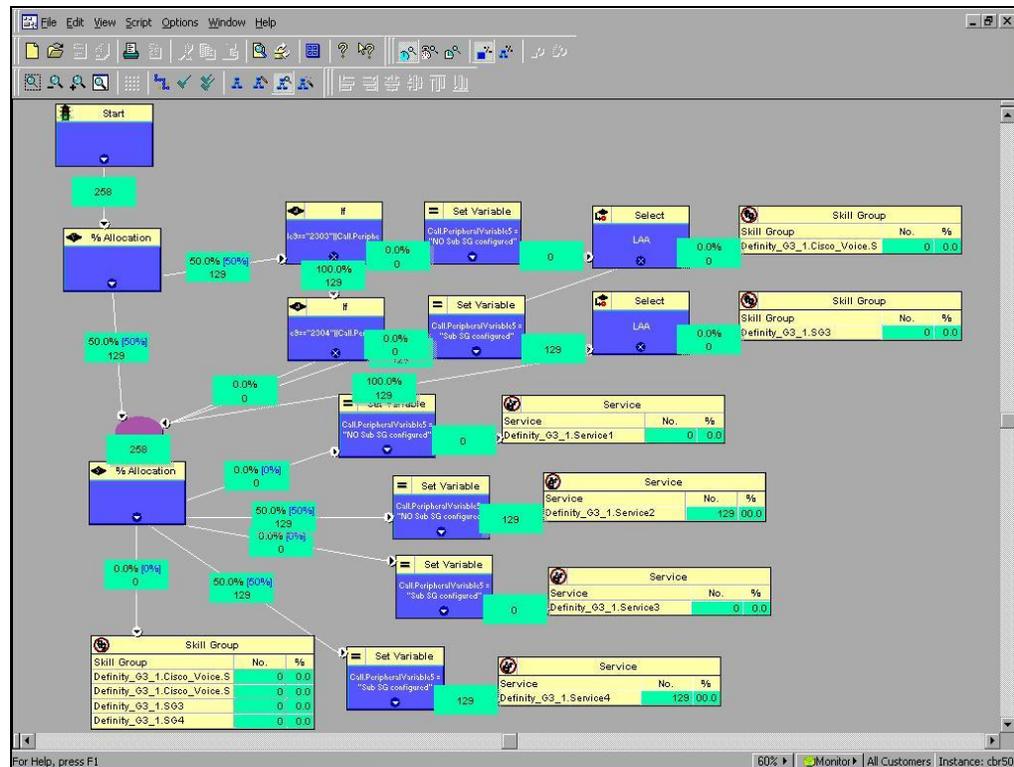


Figure 30: Router Scripts

- 2) Clear the **Override peripheral default mask** check box in the Subgroup Mask tab in the skill group configuration (See [Figure 25](#)).
- 3) Clear all check boxes in the Skill Group Mask tab in the Peripheral Explorer configuration (see [Figure 24](#)).
- 4) Restart the PGs to reflect the change in the peripheral configuration.

### 5. Impact on WebView Reporting:

After the sub-skill group migration, the base skill group reporting continues to work the same way and there is no impact on historical reporting.

Once the migration is complete, the sub-skill groups are **not** permanently deleted from the database and are available for historical reporting until they are permanently deleted. The sub-skill group records before the migration process was completed are available for historical reporting.

### 6. Disabling PIM Configuration Warning Messages:

Add the dynamic PIM registry “DisableSkillGroupConfigWarnings” manually. To disable the skill group configuration warning messages from being written to the PIM logs, set the registry value to one (decimal).

Add the registry to the following path:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Cisco Systems, Inc.\ICM\<ICM Instance >\PG Instance\PG\CurrentVersion\PIMS\pim1\ATTData\Dynamic
```

The default value is 0 (decimal).

### 3.8.3. Available Hold Off Delay

The Available Hold Off Delay configuration parameter in the Skill Group Explorer Tool should be set to the Timed ACW value on the ACD for this skill group.

## 3.9. Service-to-Skill Group Mappings

Since VDNs typically correspond to Unified ICM Services, the service-to-skill group mapping is equivalent to the skill groups used by the vector for the VDN. In order to ensure accurate call and agent reporting, be sure to include **all skill groups** used by the VDN in the service-to-skill group mapping for that VDN. Service-to-skill group mappings are made in the Service Member window of Configure ICM.

### 3.10. Agents

The ACD-to-Unified ICM Agent mapping is as follows:

Table 6: ACD-to-Unified ICM Agent Mapping

Unified ICM Software	ACD
Agent	Agent
Agent Peripheral Number	Agent ID
Agent Extension	Agent's Physical Extension

**Important:** For PGs using CMS, agents are dynamically configured by the PG. They **do not** need to be added individually via the Configure ICM tool. For “CMS-less” PG installations, agents **must** be configured via the Configure ICM tool. Further, agent skill group member assignments must be completed to match the switch configuration.

The Agent Peripheral Number is equivalent to the ACD Agent ID. Note the following considerations for CMS and non-CMS environments:

- For CMS configurations, agent configuration data is **not required** in Unified ICM database.
- For CMS-less configurations, the agents must be configured in Unified ICM database. This is done through the Agent Configuration window of Configure ICM.

**Note:** Reporting and routing issues may be seen in Unified ICM if the agent is not logged into a station before handling (making/receiving) calls.

#### 3.10.1. Agent States

Table 7 lists the Avaya agent states and their definitions. Some agent states have an optional call direction, [IN/OUT], in case a call comes in or is initiated while in that state.

Table 8 shows how Unified ICM agent states are derived from the Avaya states.

Table 7: Agent State Definitions

Avaya Agent State	Definition
ACD IN/OUT	Agent is on an incoming/outgoing ACD call
DACD	Agent is on a direct agent ACD call.
ACW [IN/OUT]	Agent is bookkeeping, doing data entry, or is at any other work related to the previous call, and is not available to receive another ACD call. Includes times an agent is on incoming and outgoing calls during ACW. If on a call, IN/OUT specifies the call direction.
DACW	Agent is in the ACW state for a direct agent ACD call.
AUX [IN/OUT]	Agent is doing non-ACD work, on break, or in a meeting. Agents initially login in AUX mode until they AUTO-IN or MANUAL-IN. Includes times an agent is on incoming and

Avaya Agent State	Definition
	outgoing calls during AUX. Agent is not available to receive an ACD call. If on a call, IN/OUT specifies the call direction.
AVAIL	Agent is available to receive calls.
RINGING	Call is ringing at the agent's extension.
OTHER	Agent is doing other work (e.g., the call is on hold, the agent is dialing to place a call or access a feature, the agent is handling a personal call, or DACD is ringing with no answer.)
UNKNOWN	Agent is in an unknown state (e.g., when CMS link to G3 switch is not operational).

Table 8: Unified ICM-Avaya Agent State Derivation

Unified ICM Agent State	Derivation from Avaya Agent States
Logged_On	Logged_In <sup>1</sup> <sub>TR</sub>
Logged_Off	Logged_Out <sup>1</sup> <sub>TR</sub>
Ready	All states other than AUX and UNKNOWN
Available	AVAIL
WrapUp	ACW, DACW
TalkingIn	ACD-IN, DACD
TalkingOut	ACD-OUT (not in AUX)
TalkingOther	AUX IN/OUT, ACW IN/OUT
Other	OTHER

**Note:** Support for AUX reason code change in Not Ready state is available from ICM 8.5(3) onwards.

### 3.11. Skill Group Members

For CMS-less configurations, the agent skill levels for their logged-in skill groups can only be determined via Unified ICM configuration. That is, Avaya does not yet provide skill level information over the CTI link for agent logins. Therefore, you must preconfigure and associate the agent with the correct subgroup in order to properly identify the agent's skill level.

<sup>1</sup> Logged\_In and Logged\_Out are not CMS agent states

### 3.12. Translation Routes

Translation routes are supported on the Avaya PG. Translation routes can be used to pass caller information to the Avaya (for example, ANI or Network CED).

No special Unified ICM configuration is required for the Avaya.

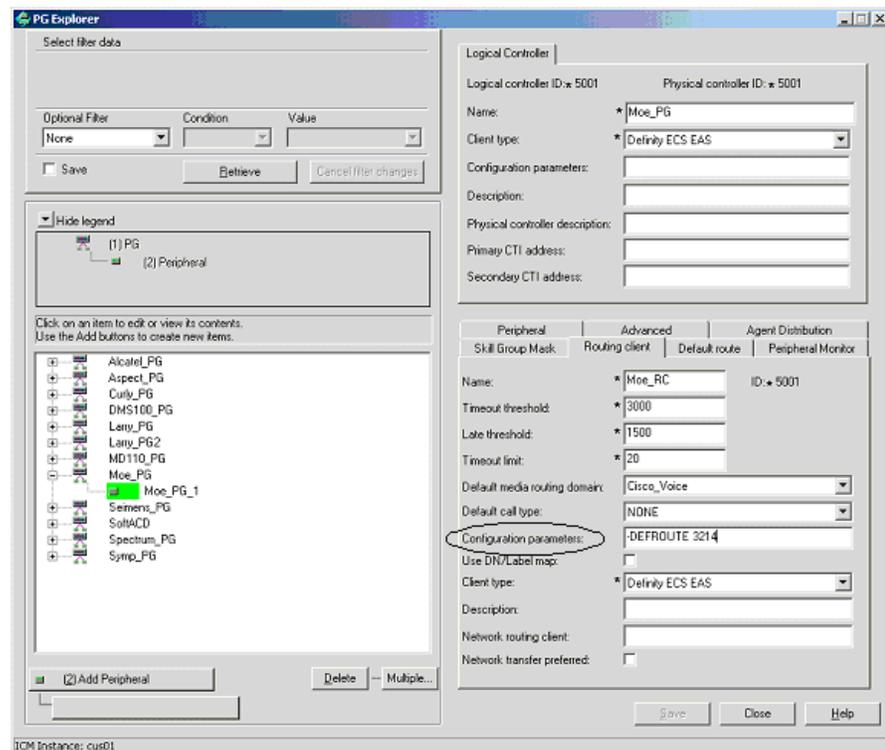
### 3.13. Routes

A Unified ICM Route is one or more Unified ICM Peripheral Targets. A Unified ICM Peripheral Target is a Network Target identified by a trunk group and DNIS that terminate on the Avaya. A Peripheral Target is equivalent to the combination of DNIS (VDN extension or Hunt Group extension) and the trunk groups through which the incoming calls arrive.

No special Unified ICM configuration is required for the Avaya.

### 3.14. Routing Client

The Routing Client Configuration Parameters field should be null-terminated. The field delimiter, -DEFROUTE, must be specified as shown in [Figure 27](#).



**Figure 31: Configuration Parameters Field**

Order and case are not significant. However, all fields must be separated by spaces. The following example shows a default Post-Route (Avaya Extension) to be used if, for any reason, the PG does not get a route response from the Router:

-DEFROUTE 3214
----------------

If a default route is not configured, the PG will give a negative acknowledgement (NAK) to the Avaya causing vector processing to proceed. The NAK may be the desirable action, depending on how the Avaya vectors are written.

### 3.15. Unified ICM Configuration for “CMS-less” PGs

In a PG configuration that does not use CMS, some additional configuration is necessary in Unified ICM software. Each of the following changes can be made by using the Configuration Manager’s PG Explorer tool.

- You must configure **all agents** in Unified ICM database.
- You must map agents to skill groups in Unified ICM database. The agent-to-skill group mapping must match the Avaya configuration. In addition, the subgroup must correctly map to the agent’s priority.
- You must configure monitored instruments in the Peripheral Monitor table of Unified ICM database. Agent stations should be monitored.
- You must configure Peripheral Targets in Unified ICM database for all VDNs through which monitored calls flow.

### 3.16. Maintaining Your Configuration

It is preferred that changes made to your configuration be accomplished *first* on the Avaya/CMS, then in Unified ICM database. This will ensure that the PG sees the configuration updates on the Avaya/CMS systems.

It is imperative that the Avaya, CMS, and Unified ICM Database configurations are kept synchronized (that is, up-to-date with each other). Inaccurate or incomplete data could result in inaccurate agent and/or call data.

### 3.17. Registry Keys

This section provides the recommended values for the PIM dynamic registry keys and PIM config registry keys.

The recommended values for the PIM dynamic registry keys are:

- *BriCheckMeters* = 0 (for CMS), 1 (for CMS-less)

This value indicates whether the PIM should throttle the ASAI/ CTI message rates or not. “1” indicates that it should enable message metering (that is, throttle outgoing messages).

**Note:** The dynamic registry field “*BriMaxOutstandingMessages*” is used along with “*BriCheckMeters*” registry field to indicate the number of outstanding ASAI/ CTI messages (that is, messages waiting for a response from the CVLAN Server). After the PIM has reached the maximum number of outstanding messages, it will not send messages until one pending ASAI/ CTI message has been received.

During the startup of the PIM process, the PIM will send the ASAI/ CTI messages at a faster rate until the limit controlled by the “*BriMaxOutstandingMessages*” field. The high priority outgoing messages take precedence over the normal priority outgoing messages.

The PIM also uses message metering to ensure that it does not exceed the maximum number of active associations per CTI link (see the dynamic registry field, *MaxActiveAssocPerCTILink*).

- *BriMaxOutstandingMsgs* = 100
- *SmartAgentStateTimer* = 1800 (for CMS), 10 (for CMS-less)
- *BriCheckMessageRates* = 0 (for CMS), 1 (for CMS-less)

This value indicated whether the PIM should measure the ASAI/ CTI message rates or not. “1” indicates that the ASAI/ CTI message rates should be measured.

The recommended values for the PIM config registry keys are:

- *MaxActiveAssocPerCTILink* key should be set depending on the version of *CVLAN server*. (The *MaxActiveAssocPerCTILink* refers to the maximum active association per CTI link)

Table 9: MaxActiveAssocPerCTILink Values

CVLAN server	MaxActiveAssocPerCTILink
6.1.0	2048
8.2.1	4096
9.1	8192
AES Server	8192

**Note:** It is not required to cycle (restart) the PG, for the changed dynamic registry values to be effective; however, for the changed config registries to be effective, you need to cycle the PG.



## 4. Post-Routing

The Avaya PG supports *Post-Routing* and can therefore be considered a *routing client*. The PG can route to any valid dialed number.

This chapter describes the features of Unified ICM *Post-Routing* available with the Avaya PG. It also discusses any considerations you should be aware of when using *Post-Routing* or *Translation Routing* on the PG.

## 4.1. Route Request

To initiate a post-route, the Avaya vector that is handling the incoming call must include an “adjunct route request” step with the correct ASAI/CTI extension specified.

A “wait” time should be specified after the adjunct route request to allow for Unified ICM software to route the call. Although Unified ICM post-route destination decision is virtually instantaneous, a typical wait time of four to six seconds in the vector is appropriate. The wait time may need to be adjusted depending on anticipated call volumes.

Vector writers should consider what should happen to the call if the Avaya cannot properly route the post-routed call, or if the CTI link is down. For example, if the label (call destination) returned from the CallRouter is not valid (e.g., incorrect Trunk Access Code, extension destination is busied-out, Class of Restriction (COR) does not allow the call to complete), you should consider how you want the call handled.

### 4.1.1. Route Request Elements

The Avaya sends a route request to the PG containing the following Route Request Elements.

- Calling number (CLID)
- Called number (typically the VDN)
- User-user information (32 bytes maximum, where the data type is (a) user defined or (b) ASCII)
- Last set of Avaya collected digits (CED) (if any)
- Digit collection timeout (seconds)
- Call priority level (values: not\_used, not\_in\_queue, low, medium, high, top)
- Interflow type (that is., cause of interflow; values: all, threshold, vector)
- Time (time the routed call is to spend in the queue before interflow)
- DNIS chars (optional)
- Call ID
- Trunk group number and trunk number (optional; mutually exclusive with calling number)
- II-digits

### 4.1.2. Route Request Peripheral Variable Usage

If the Route Request Peripheral Variable is allowed, the PG will map the Route Request elements (such as CLID and Called Number) into Peripheral Variables. Unified ICM script writer can then use the information in the Peripheral Variables to create scripts that determine which destination best suits the caller’s needs. All Peripheral Variable data types are ASCII.

The mapping of Route Request Elements to Peripheral Variables is controlled by the Call Control Variable Map field, which is found on the Peripheral Configuration window of the Configure ICM tool (Figure 28).

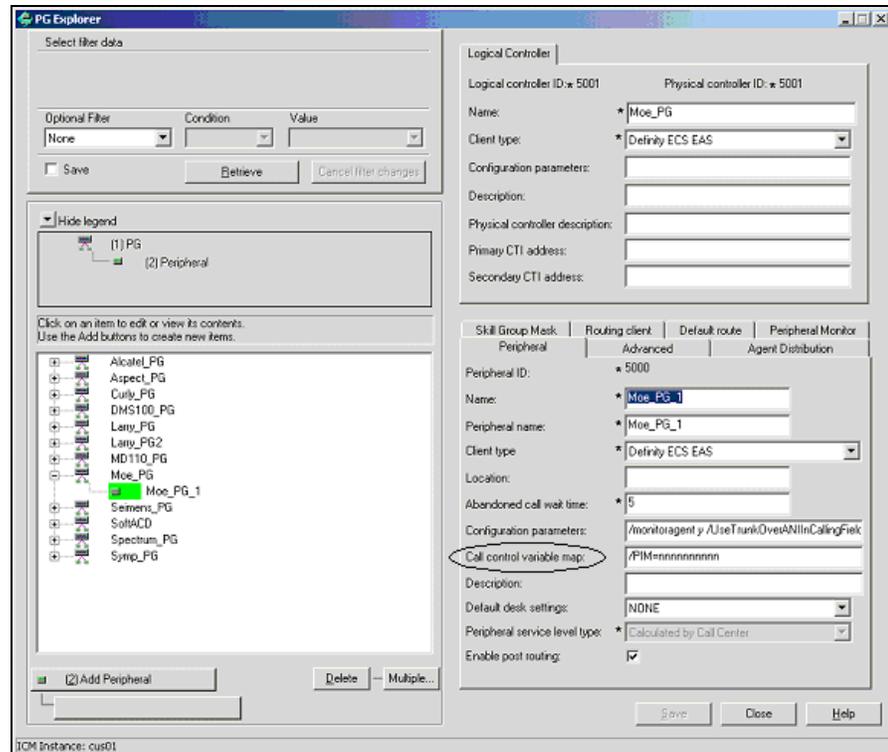


Figure 32: Call Control Variable Map Field

#### 4.1.3. Call Control Variable Map

The Call Control Variable Map field can be used to configure which peripheral variables should be reserved for a CTI application, and which ones can be used by the PG. There are two ways to control variable usage via the Call Control Variable Map field:

- Direct the PIM.** The PIM can be directed on which call variables can be accessed. For example, the following setting (made in the Call Control Variable Map field) allows the PIM to set call variable 1 and call variables 5 through 10 while preserving the existing values of call variables 2 through 4 (That is, the PIM will not set call variables 2 through 4). Note that, this argument is from the perspective of the PIM.

```
/PIM=ynnnnyyyyyy
```

- **Direct the CTI portion of the PG.** The CTI portion of the PG can be directed to allow the CTI Client to override any PIM Call Variable setting. For example, the following setting allows a CTI Client to set call variable 1 and call variables 5 through 10 while preserving the peripheral-determined values of call variables 2 through 4.

```
/CTI = ynnnyyyyyy
```

*See also:* For more details on Unified ICM CTI capabilities and interaction with the PG, see the *ICM Software Enterprise CTI Interface Specification*.

[Table 10](#) shows the Peripheral Variable numbers, the Route Request Elements those numbers represent, and the possible values contained in the Route Request Elements.

**Table 10: Route Request Peripheral Variable Map**

Peripheral Variable	Route Request Element	Possible Values
1	CallPriorityLevel	CP_UNUSED, CP_NOT_IN_QUEUE, CP_LOW, CP_MEDIUM, CP_HIGH, CP_TOP
2	InterflowType	IT_UNUSED, IT_ALL, IT_THRESHOLD, IT_VECTOR
3	TimeInQBeforeInterflow	ASCII char string (empty string if unused), units = Seconds
4	DNIS	ASCII char string (empty string if unused)
5	User-User Information	See Note 1.
6	CED	Caller Entered Digits (empty string if unused)
7	II-digits	II-digits (ASCII form) (empty string if unused)
8	Trunk Information	Format (if provided by switch): TrunkGroup Number, Trunk Number, Trunk Direction
9	Calling Number	If provided by switch (e.g. if on ISDN trunks or on-switch call)
10	VDN	Vector Directory Number

**Note 1:** The UUI will be limited to ASCII characters (null-terminated ASCII character string). That is, any non-ASCII UUI data received will not be stored in the Peripheral Variable. It is anticipated that all UUI data (ASCII and non-ASCII) will be stored in Unified ICM database. Those details are not presented in this document.

## 4.2. Route Select

The PG receives the selected route information from the *CallRouter* and converts it to a Route Select message for the Avaya. The Route Select message can be used to set call attributes, request digit collection from the switch, provide dial-ahead digits to the switch for collection, or specify user-user information to be included in the call.

You can specify the Route Select functionality through the Peripheral Variables or the syntax used in the Label. Unified ICM script can be used to set the Peripheral Variable contents. Where the setting of Route Select functionality overlaps, the Peripheral Variable setting takes precedence. Refer to the Avaya documentation to determine when any of the Route Select features can be used. For example, it may not make sense to have call priority ON if the destination is a VDN or Split. As another example, direct agent calling would not make sense if the destination is a VDN.

### 4.2.1. Route Select Message

The Avaya Route Selection Message has the following elements:

- Destination route select. On-switch or off-switch called number.
- User-user information. This consists of:
  - DataType: (a) UU\_TYPE\_USER (user defined); or (b) UU\_TYPE\_IA5 (ASCII)
  - Length: number of bytes (40 bytes maximum)
  - Data
- Call priority (ON or OFF). If ON, this parameter represents a special type of call that carries three burst distinctive ringing and will not go to the covering point for coverage or send all calls.
- Direct agent call. This consists of:
  - Agent extension.
  - ACD Split extension, which specifies which queue to place the waiting call in. The agent must be logged into this split.
- **User data.** Used for digit collection or to specify dial-ahead digits:
  - **User data type:**
    - a) COLLECT, which specifies digits are to be collected
    - b) COLLECTED, which specifies dial-ahead digits

The PIM default is COLLECTED.

- **Digit collection timeout (0-63 seconds):** Specifies the number of seconds tone detector will continue to collect digits after the first digit is received. The PIM default is no timeout.
- **Data:** If the user data type is COLLECT, this field is interpreted as a binary integer specifying the number of digits to collect. If the user data type is COLLECTED, this field is an ASCII string specifying the dial-ahead digits.

- **Use external trunk identified by Trunk Access Code (TAC).** The TAC can be prefixed in the called\_number field.

#### 4.2.2. Restrictions on Digit Collection

The Avaya restrictions that apply to digit collection include:

- Only incoming trunks of any type, including ISDN, MFC, and R2MFC, are eligible for ASAI/CTI-requested digit collection.
- Incoming disconnect supervision must be administered on the incoming trunk to allow a call prompter/tone detector to connect.

#### 4.2.3. Route Select Peripheral Variable Usage

The PG maps the Peripheral Variables received in the CallRouter's Route Select message as shown in [Table 9](#). All Peripheral Variable data types are ASCII. Peripheral Variables 1-4 and 6-10 are unassigned and can be used for the Route Select elements shown in [Table 11](#).

Table 11: Route Select Peripheral Variable Map

Peripheral Variable	Route Select element	Possible Values
1-4, 6-10	Call Priority	CP_ON, CP_OFF (default)
1-4, 6-10	Digit Collection/Dial Ahead	(See the "Digit Collection/Dial Ahead" section that follows.)
1-4, 6-10	Trunk Access Code	(See the "Trunk Access Code" section that follows.)
5	User-User Information	(See the "User-User Information" section that follows.)

A Peripheral Variable can only be used for one Route Select element at a time. If a Peripheral Variable syntax is invalid or the Peripheral Variable is an empty string, the Peripheral Variable is ignored. The only fixed Peripheral Variable is PV 5, designated for UUI.

#### 4.2.4. Digit Collection/Dial Ahead

The Digit Collection/Dial Ahead peripheral variable string has the following syntax:

```
COLLECT NUMBER_OF_DIGITS_TO_COLLECT TIMEOUT
DIGIT_COLLECTION_TIMEOUT
```

or

```
DIAL DIAL_AHEAD_DIGITS
```

COLLECT, TIMEOUT, and DIAL are keyword delimiters and must be specified as shown (case is not important). The fields NUMBER\_OF\_DIGITS\_TO\_COLLECT, DIGIT\_COLLECTION\_TIMEOUT, and DIAL\_AHEAD\_DIGITS are supplied by the customer. The number of digits to collect must be between one (1) and 24, inclusively. All fields **must** be

separated by spaces. Every # and \* count as one digit each. The digit collection timeout must be between one (1) and 31, inclusively.

The following example indicates that four digits are to be collected with a digit collection timeout of ten seconds:

```
COLLECT 4 TIMEOUT 10
```

The next example indicates that the digits 3, 2, 1 should precede the route selection:

```
DIAL 321
```

With proper configuration using translation routes, the DIAL syntax can allow you to provide the caller's ANI (or any set of digits) to the Avaya and subsequently have it displayed on an agent's console.

#### 4.2.5. Trunk Access Code

The Trunk Access Code Peripheral Variable has the syntax:

```
TAC TRUNK_ACCESS_CODE
```

TAC is a keyword delimiter and must be specified as shown (case is not important). The *TRUNK\_ACCESS\_CODE* field should specify a valid Trunk Access Code extension for the Peripheral. The TAC can also be pre-pended in the Label. All fields **must** be space separated.

The following example indicates a Trunk Access Code of 111 for the route selection:

```
TAC 111
```

#### 4.2.6. User-User Information

This is a null-terminated ASCII character string. The UUI data is stored in Peripheral Variable 5 for both the Route Request and Route Select messages only if the protocol format of the UUI data is C\_UU\_IA5. Therefore, unless modified, all UUI data received for a call will be included when sent to the calls' destination. UUI data is limited to 40 bytes.

Avaya PIM was designed to support the User-to-User information (UUI) up to 32 bytes inline with the older switch version supportability, which was 32 bytes.

Avaya CVLAN Server Release 8, and link version 4 and beyond, ASAI now supports UUI up to 96 bytes.

With this enhancement Avaya PIM supports 40 bytes for the UUI field, but the CTIOS Agent Desktop takes a maximum of only 39 characters of a 40 character string for call variables.

### 4.2.7. Label Syntax

The Unified ICM Label can be used to specify additional Route Select<sup>1</sup><sub>TP PT</sub> functionality. Incorrect or incomplete Route Select data may result in the Avaya denying the Route Selection and proceeding with vector processing.

A special label type to support the incorporation of dial-ahead digits into the label is supported. The string DTMF within the label indicates the presence of these dial-ahead digits. The format of this label type is as follows:

```
XXXXXDTMFYYYYY
```

The XXXXX is required and is the destination where the post-routed call will be directed. YYYYY, maximum 16 digits (can include \* and #), will be included as dial-ahead digits when the route response is sent to the switch for the post-routed call. This label type can be used for post-routed or translation-routed calls. A label using this special label type cannot use any of the other special label formatting capabilities listed in the following table. Peripheral Variables can still be used.

**Table 12: Label Identifiers and Capabilities**

Label Identifiers	Definition	Example
!	An exclamation point (!) at the <b>beginning</b> of the label indicates that Call Priority should be turned ON. The default is Call Priority OFF. (See Note 1.)	“!1234” indicates that the call directed to extension 1234 will have call priority ON.
@	The “at” sign (@) at the beginning of the label indicates that this should be a DACD call. The call destination must be an agent’s extension. The default is No DACD call. (See Note 1.)	“@2345” indicates that the call directed to the agent at extension 2345 should be a DACD call. Since no agent group or agent group extension was specified in this example, the PIM will attempt to select the first known agent group login for the agent. Both the agent and the destination agent group must have been previously known to the PIM for this to be successful.
&	The ampersand (&) used within the Label is used to specify the Agent Group Peripheral Number. The Agent Group Peripheral Number must immediately follow the ampersand and must be configured in Unified ICM software. The PIM will determine the correct Agent Group extension.	“@2345 &11” indicates that the call directed to the agent at extension 2345 should be a DACD call and the agents group number is 11. Using the Agent Group Peripheral number may be convenient if the agent group extension should ever change.

<sup>1</sup><sub>TP PT</sub> ICM 5.0 SR13 supports star (\*) as a valid routing label for translation routing and post-routing in ECS Avaya PIM. For example, \*173001 is a valid routing label where \*17 can be the Trunk Access Code and 3001 indicates the extension/VDN to which the call would be directed. The post-route label containing the star (\*) character should be configured in Service explorer.

#	The pound sign (#) used within the Label is used to specify the Agent Group Extension number. The Agent Group Extension must immediately follow the pound sign. The Agent must be a logged-in member of that agent group.	“@2345 #1000” indicates that the call directed to the agent at extension 2345 should be a DACD call and the agents’ agent group extension is 1000.
% 1 % 2 ... % 10	The percent sign ‘%’ at the <b>beginning</b> of the label indicates that the call destination is contained in the specified Peripheral Variable number. (See Note 2.)	“%1” indicates that the call destination is contained in Peripheral Variable 1 (PVI). This is useful if you want to specify the destination in the PV’s or to place CEDs in a PV as a destination.
<p><b>Note 1:</b> All Label Identifiers can be used together unless otherwise noted. Label Identifiers designated to be at the beginning of the label cannot be preceded by any digits. For example, “!%1” indicates a Priority call to the agent specified in Peripheral Variable 1.</p> <p><b>Note 2:</b> Peripheral Variable 5 is reserved for User-User Information (UUI) only.</p>		





## 5. Unified ICM Web Interaction

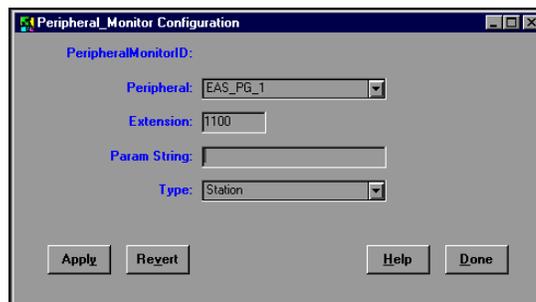
This chapter describes some special configuration issues relating to Trailhead/Unified ICM configurations and the Avaya. Specifically, this chapter covers the following topics:

- Ensuring that Unified ICM software monitors the VDNs used for phantom calls.
- Ensuring that the VDNs used for predictive calls **are not** monitored by Unified ICM software.
- Configuring multiple Cisco Media Blender call types.

## 5.1. Monitoring VDNs Used for Phantom Calls

Unified ICM software must monitor the phantom lines used with Media Blender. If they are not monitored, when the Avaya PG is first started, the first call on each phantom line is not assigned to Media Blender or the Unified WIM. To ensure that Unified ICM software monitors the phantom lines, add the instrument IDs of all phantom lines to Unified ICM Peripheral Monitor table:

1. From the Administration & Data Server, click the **Configure ICM** icon in the Administration & Data Server Group.
2. Choose **Peripherals > Peripheral Monitor**. The Peripheral Monitor window appears.
3. Click the **Insert** button to add the phantom instrument IDs. The Peripheral Monitor Configuration window appears:



**Figure 33: Peripheral Monitor Configuration**

4. Update the Peripheral Monitor Configuration screen as follows:
  - **Peripheral.** Select the appropriate peripheral.
  - **Extension** or **Param String.** To enter one phantom line, type the instrument ID in the Extension field. To add multiple phantoms, enter the range of instrument IDs in the Param String field using a hyphen for a delimiter (for example, 24698-24699).
  - **Type.** Choose Station.
5. Click **Done**. The phantom lines are added to the monitor table.

## 5.2. VDNs Used for Predictive Calls

By default, Unified ICM script monitors all VDNs configured as Peripheral Targets in Unified ICM database. When using phantom calling on the Avaya, this is the desirable behavior. Be aware, however, that on the Avaya, predictive calls cannot be placed by a VDN that is being monitored.

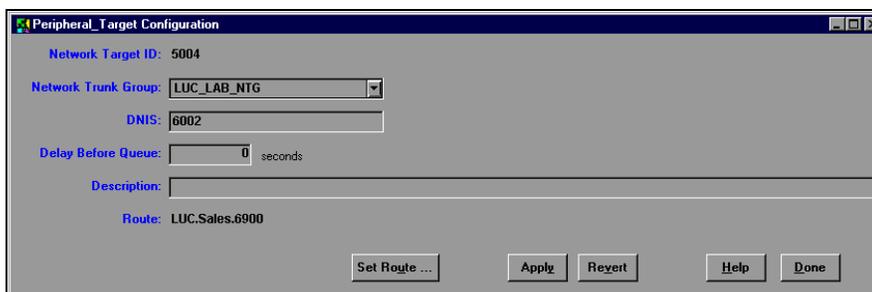
You must therefore ensure that the VDNs set up to place predictive calls are **not monitored** by Unified ICM software. This requires configuration changes in Unified ICM software as well as the Avaya:

### In Unified ICM Software:

When creating Peripheral Targets for predictive calls, ensure that the DNIS entered in the Peripheral Target window is not the actual VDN you want to

place the predictive call. Instead, specify the VDN that will place the call in the label associated with the Peripheral Target.

Consider the following example:



**Figure 34: Peripheral Target Configuration**

The value in the DNIS field here (6002) will be monitored by Unified ICM script. Therefore, this **should not** be the routing address you use when creating labels. Instead, the label should contain the VDN that will be used on the Avaya to place predictive calls, in this case 6900.

#### **On Avaya:**

For predictive calls, you must maintain **two** VDNs: one that can be monitored by Unified ICM script, but will not place the call, and another to actually place the predictive call.

### **5.3. Configuring Multiple CMB Call Types**

You can configure CMB to recognize requests for different *call types*. Based on information from the callback form submitted by the caller, Media Blender can determine the type of call (PSTN, chat ,and so on) placed by the caller. Media Blender uses the call type to determine the CTI strategy that should be used to place a return call to the customer.

**Important:** Do not confuse the CMB call types with the call type used in Unified ICM. Unified ICM call types are simply combinations of the DN, CED, and ANI, used to select scripts.

If you are using only one call type, you need only establish a call back strategy using the `ctistrategy` property in `ACD.ciscocti.properties`.

Using multiple call types, however, requires additional configuration:

#### **On Avaya:**

Maintain separate VDNs for predictive and phantom calls.

**On the Trailhead Server:**

For more information on creating entry points and queues, see the *Cisco Unified Interaction Manager System Administration Guide* available at:

[http://www.cisco.com/en/US/products/ps7233/prod\\_maintenance\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps7233/prod_maintenance_guides_list.html).

**On the Media Blender Server:**

Set up a file called a *call type table* on the Media Blender server. The call type table maps different call types to *predictive* or *phantom* CTI strategies used when placing the outbound call to the caller. (See the *Cisco Media Blender Configuration Handbook* for more information.)

**In Unified ICM Software:**

You must ensure that Unified ICM script evaluates the value entered in the call type field on the callback form. The script should then route the call to the appropriate peripheral target.

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