

Cisco Unified ICM ACD Supplement for Aspect Contact Server

May 2014

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Preface

Purpose

This document discusses maintenance of an Aspect Peripheral Gateway (PG) in a Cisco Unified Intelligent Contact Management (Unified ICM) environment. Use this document as the Aspect-specific companion to the Cisco Unified ICM documentation set.

The *ACD Supplement for Aspect* provides specific information on configuring an Aspect PG.

Audience

This document is for system managers. The reader must understand Unified ICM installation, configuration, and scripting. The reader also requires a specific knowledge of the Aspect Call Center ACD.

Organization

Chapter 1, “Overview”

Provides an overview of ACD interface and hardware and software requirements.

Chapter 2, “ACD Configuration”

Describes items in the Aspect configuration that must be checked to ensure compatibility with Unified ICM.

Chapter 3, “Unified ICM Configuration”

Describes the relationships between the Aspect ACD objects and Unified ICM database objects. This chapter also describes Aspect-specific settings to confirm in Unified ICM configuration.

Chapter 4, “Post-Routing”

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

Chapter 5, “Redundant CMI Support for Aspect Contact Server”

Describes the redundant CMI Server support by the Aspect Contact Server PG.

Appendix A, “Outstanding Event Link Issues”

Highlights several outstanding issues with the Aspect Event Link in Call Center Release 6.0.

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 *Database Schema Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted.*
- Sans serif type with small caps is used to represent keys on your keyboard; for example:
Press the SHIFT key to select a range of items.
- An arrow (>) indicates an item from a pull-down menu. For example, the Save command from the File menu is referenced as File > Save.

Other Publications

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

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

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

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

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on documentation, technical support, and security guidelines, see the monthly *What's New in Cisco Product Documentation*. This guide lists all new and revised Cisco technical documentation:
<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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1. Overview

Unified ICM Peripheral Gateway interacts with two Aspect software packages on the Aspect Call Center ACD: the Application Bridge Event Link Interface and the Real-Time Bridge. The PG uses the *Application Bridge Event Link interface* to monitor agent status and call states. The Event Link interface consists of a set of unsolicited messages that indicate transitions in agent and call state.

The Peripheral Gateway uses the Aspect *Real-Time Bridge* to access real-time agent group, trunk group, and application statistics. The PG requires this data from the Aspect ACD for use in call routing and real-time reporting.

This chapter describes the options for connecting the Aspect Call Center ACD to the Cisco Unified ICM PG. This chapter also lists the hardware and software required for the Aspect Call Center to work with Unified ICM.

1.1. ACD Interface Requirements

A basic, simplex Aspect PG has the following interface requirements:

- One Real-Time Bridge Client.
- Application Bridge Software (TCP/IP version).
- An extra Application Bridge Data Link required for redundant PG installations.
- If more than one application uses the Application Bridge, the Cisco Application Bridge Server software is required.

1.1.1. General Network Requirements

The Aspect ACD connects to the Peripheral Gateway (PG) through a single Ethernet thin-net cable. The termination points for the thin-net cable can be a HUB port on Unified ICM visible LAN or directly to the Aspect PG (50-ohm terminator required). The exact network requirements depend on the customer's needs for access to other applications on the Aspect Call Center. The PG connects to Unified ICM visible LAN through an Ethernet cable. Figure 1 shows the Aspect Call Center-PG interface in a redundant PG environment.

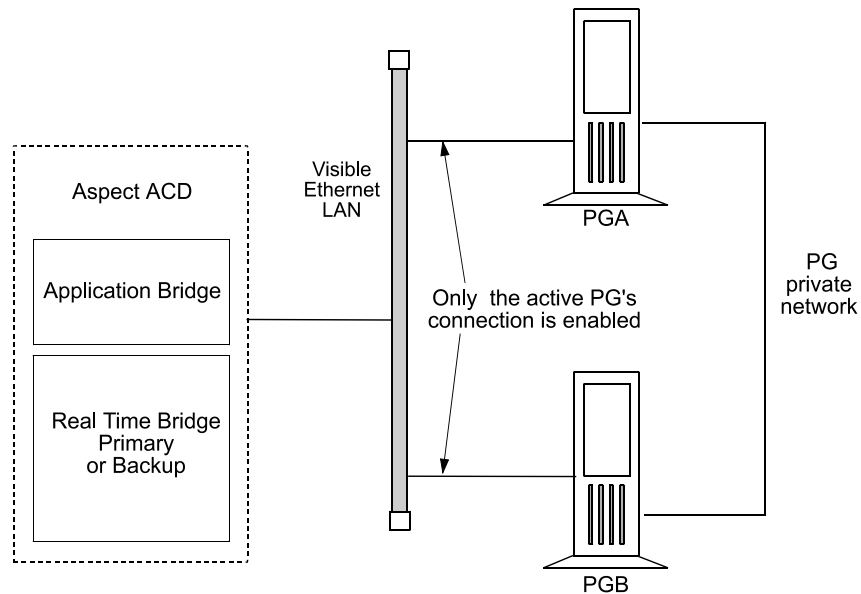


Figure 1: Aspect PG Interface (Redundant PGs)

1.1.2. Network Addresses

On the Aspect ACD, configure both Off-Board Processor (OBP) and Application Bridge (AB) TCP/IP network addresses for the PG. These addresses provide the PG with access to the Real-Time Bridge and Application Bridge, respectively.

The redundant PG configuration for the Aspect ACD, as shown in Figure 1, requires another PG, another Ethernet connection to the visible LAN,

and another set of addresses (OBP and AB) on the ACD. In redundant PG configurations, both PGs must use the same OBP and AB network addresses on the ACD. Only one side of the redundant PG pair can have an active Application Bridge and Real-Time Bridge connection.

1.1.3. Application Bridge

The PG monitors agent and call activity on the Aspect ACD through the Application Bridge Event Link Interfaces. This connection also supports Unified ICM *Post-Routing* capabilities.

Note:

- Unified ICM supports only the TCP/IP version of the Application Bridge.

The Application Bridge Event Link Interface is an Aspect software package. The Event Link provides a set of unsolicited messages from the Application Bridge that indicate changes in agent “can call” state. The Application Bridge must be installed and enabled in order for Unified ICM to run.

- The Aspect Application Bridge Interface and the Contact Server (CMI) Interface does not support device status query. So, call survivability does not exist at Unified ICM during PIM failures.

1.1.4. Real-Time Bridge

Unified ICM requires that you install and enable the Real-Time Bridge software option. The Aspect Real-Time Bridge is an Aspect software package that provides access to miscellaneous aggregated data on the Aspect ACD about calls and agents. The PG retrieves data from the Real-Time Bridge through Aspect-proprietary, SQL-like queries. The PG receives responses to its queries every three seconds. That rate is the minimum refresh rate supported by Aspect. The data retrieved through the Real-Time Bridge supports Unified ICM call routing and real-time reporting.

1.1.5. Optional Application Bridge Server

The Aspect Application Bridge provides a Call Disconnect Message (CDM) or Call Transfer Message (CTM) *only* to the last Application Bridge data link that handled the call. This behavior can cause other monitoring applications to miss a CDM or CTM. The loss of a CDM or CTM can leave call states hanging until certain recovery checks are enabled.

To avoid the loss of CDM and CTM messages, Cisco provides the *Application Bridge Server (ABS)* option. The Cisco Application Bridge Server ensures that all applications that track a call receive a CDM or CTM for disconnected or transferred calls.

For example, assume that one data link informs an application of a call. The Aspect Call Center ACD performs a Unified ICM post-route request to the PG over another data link. Without the ABS, the monitoring application misses the Call Transfer Message or Call Disconnect Message.

Note: Cisco PGs that use the Application Bridge Event Link interface rely on event messages from the Application Bridge. They do not use Call Disconnect and Call Transfer messages. In most cases, these PGs do not require the ABS option.

Consult with your Cisco Unified ICM project manager to determine if your specific Unified ICM application requires the ABS software.

See also: For more information on the Application Bridge Server software, see Chapter 3, “Unified ICM Configuration.”

1.1.6. Multiple ACDs

A simplex or redundant PG can connect to up to five Aspect ACDs simultaneously. Before connecting multiple ACDs to a single PG, ensure that the data link between the PG and Unified ICM Central Controller has the necessary bandwidth. To handle multiple ACDs, you might require a high-end PG platform with more processing capability and memory.

1.1.7. Multiple PGs

The Aspect ACD (and Contact Server) allows connection from multiple PGs. However, in that configuration, maintain the resources (like Agents, Applications, CCTs, dial plans, Trunk, and Trunk Groups) that each PG uses as separate configurations.

Even when you follow these configuration guidelines, there are some known limitations and risks in using such systems:

- Aspect sends all the call and agent events for a PG to all the other PGs as well. Problems related to reporting of calls for other PGs can exist.
- When such configurations are servicing two different customers, the call statistics and agent statistics can be shared across customers.

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

1.1.8. Remote PG Configuration

The Aspect Event Link PG supports a remote TCP/IP connection to the ACD as long as enough network bandwidth is provided. For ACDs that implement *Post-Routing*, a three-second response time is required.

1.2. Hardware and Software Requirements

In order to work with Unified ICM, configure the Aspect Call Center ACD with the hardware and software listed in Table 1.

Table 1: Aspect Call Center System Requirements

Releases Supported	For specific release information for Aspect, see the <i>Cisco Unified ICM Supported Switches (ACDs) document</i> . This document can be found on www.cisco.com . Unified ICM 8.x requires Aspect v9.2 and CMI v5.2 minimum. Unified ICM 9.x does not support Aspect. Unified ICM 10.0 requires Aspect v9.3 and CMI v6.4.
Features Required	One Real-Time Bridge client for the PG.
	Application Bridge software (TCP/IP version) with the Event Link interface option.
	An extra Application Bridge data link in a redundant PG configuration.
	Event monitoring must be enabled on the Application Bridge.
Optional	You might require Application Bridge Server software if a Call Center CTI application affects Unified ICM monitoring of call events. (See “ Optional Application Bridge Server ” for more information.)
Performance	Real-Time Bridge minimum refresh rate: 3 seconds.
ACD Processor Requirements	68040, 33 MHz or faster, 32-MB RAM Administrative Processor
	Administrative Processor must be an MVE167 class processor card. ¹

¹ The faster class processor board is required because of the additional load Unified ICM places on the Aspect Call Center ACD.

1.2.1. Supported Unified ICM Features

The Aspect Call Center ACD supports the following Unified ICM features:

- Pre-Routing
- Post-Routing
- Enterprise CTI (includes third-party call control)¹
- Agent reporting
- Redundant PG implementation
- Unified ICM Web Option
- Redundant CMI Server implementation²

1.2.2. Multiple Application Support

Multiple applications applying treatment to a call can require Unified ICM Application Bridge Server to distribute the Call Disconnect and Call Transfer Messages (CDM/CTM). The Application Bridge Server allows multiple applications to share the Aspect Application Bridge.

See also: For more information, see “[Optional Application Bridge Server](#),” earlier in this chapter.

1.2.3. ACD Restrictions

The Aspect ACD limits agents to one skill group assignment per agent.

¹ For third-party call control, the Aspect Call Center ACD must be running the Application Bridge Event Link interface.

² The Redundant CMI Server support is available from ICM 7.0 SR1 onwards

2. ACD Configuration

Proper operation with Unified ICM requires some configuration setting changes on the Aspect Call Center ACD. For example, modify the Aspect Call Center Call Control Tables (CCTs) to include SEND DATA steps to notify Unified ICM of call state transitions. You must also set certain elements properly in the Aspect Data Interlink Configuration Table.

This chapter describes these settings. It also provides guidelines to maintain your Aspect and Unified ICM configurations.

2.1. Data Link Configuration

2.1.1. Aspect Administrator

Figure 2 shows the settings required for Unified ICM in the Aspect Data Interlink Configuration Table. This table can be displayed by choosing DataBase > Resources > DataInterlink > Update at the Aspect Call Center Workstation.

Note: The current configuration requires that you do not use the redundant link option. Using this option invalidates the data received by the PGs. This redundant link option could change in the future given the Aspect or PG code updates.

Data InterLink Number > 12	
Description: CISCOPG1A	
Version Number > 4 Release 6.0	
Backup Link >	
Physical Protocol > 2	Port: 6101
Link Protocol > 3	
CallCenter Address: CallCenter	Data Sys Address > Ciscopg1a
Message Format > V	
Field Separator > 10	
Send Type > Y	
Disconnect Notices > N	Subtype:
Transfer Notices > N	Subtype:
Character Set > A	
Receive Data Timeout: 6	Monitor Host > Y Interval: 10
Port - Port number configured for the data link that corresponds to the <i>PortNumber</i> configured during setup installation of the PG software.	
FieldSeparator - Defines the character used to separate fields within the Application Bridge Message. Value specified must match the <i>FieldSeparator</i> element configured during setup installation of the PG software.	
ReceiveDataTimeout - 3 or greater <if network requires > and should match the configured Routing Client timeout value.	

Figure 2: Aspect Data Interlink Configuration Table

Aspect includes an integrated set of applications. These applications, the Aspect System Management Suite, provide a GUI to directly access all the Aspect system resources and features. Once installed, you can access the Hardware Administrator, Agent Administrator, Route Administrator, System Administrator, Aspect Alert Manager, and the Aspect Architect Program.

The new Data Link Configuration Utility (accessed through the Hardware Administrator) is shown in Figure 3.

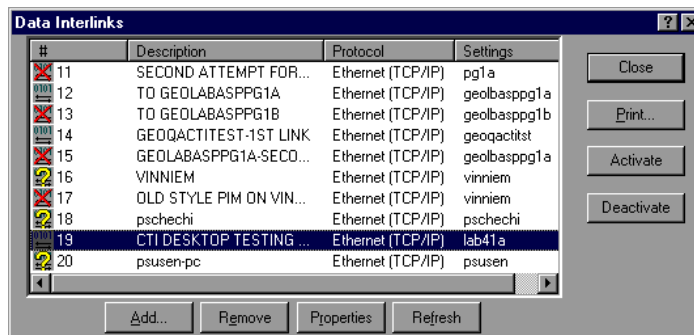


Figure 3: Data Link Configuration Utility

The Properties Page for the selected Interlink contains several tabs. The General tab is shown in Figure 4.

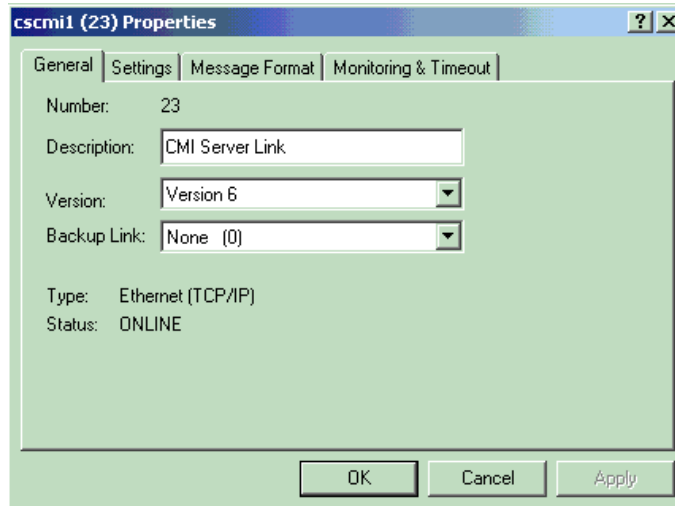


Figure 4: General Tab

The “Backup Link” parameter **MUST** be set to “None (0)”. This setting eliminates duplicate messaging and link alarms. Link alarms are generated when the PIM for the “backup” link is the active side. (The Application has logic to try the primary link before the backup. When the primary link fails, a warning is generated even though the call is handled correctly).

WARNING: Use of the “Backup Link” parameter causes an unacceptable PIM behavior. **DO NOT** configure a link for the “Backup Link”.

The Settings tab is shown in Figure 5.

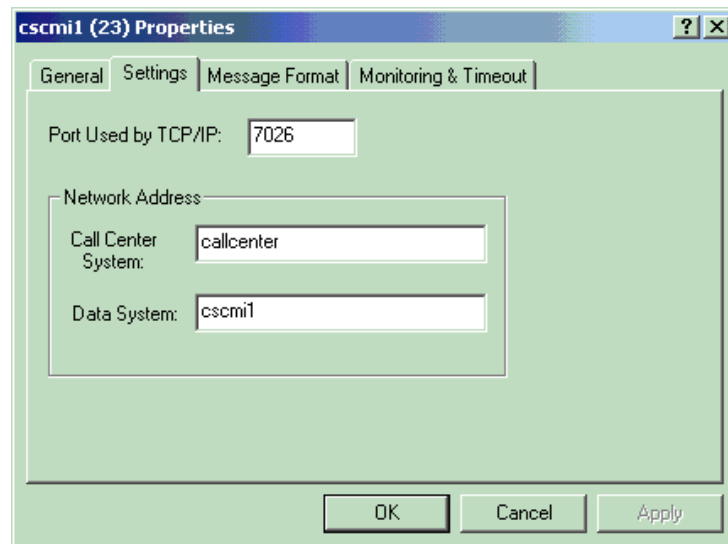


Figure 5: Settings Tab

The Message Format tab is shown in Figure 6.

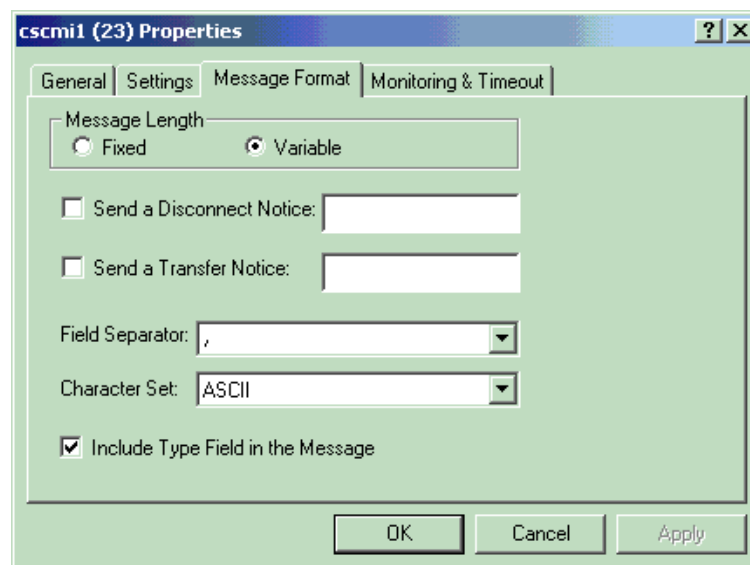


Figure 6: Message Format Tab

On the **Message Format** tab of the Aspect device interlink window, do not check either **Send a Disconnect Notice** or **Send a Transfer Notice**. If checked, duplicate messages are sent to the Event.

Set the field separator to a comma (not a slash). The comma is the only message field separator that the Aspect CMI Server recognizes. If you configure this setting incorrectly, the CMI Server does not forward messages from the ACD to the PIM.

The Monitoring and Timeout tab is shown in Figure 7.

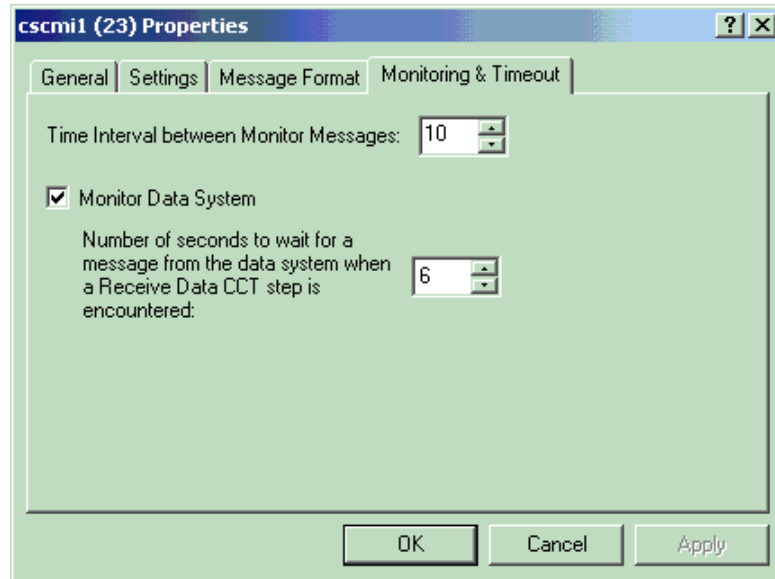
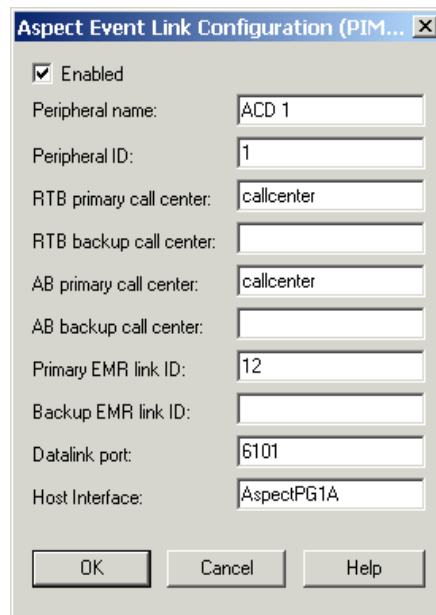


Figure 7: Monitoring and Timeout Tab

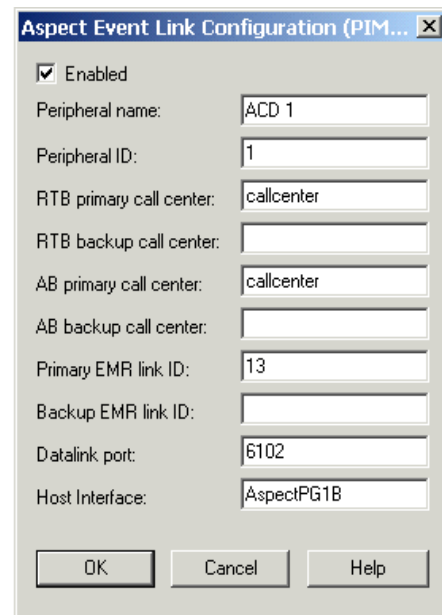
2.1.2. Web Setup Tool

The “backup” configuration parameters on the *Aspect Event Link Configuration* dialog in WEB SETUP TOOL are no longer supported.

Configure the Side A and Side B PIM without these “backup” parameters. Ensure that each PG has just **one** unique data link associated with it. For example, assume that the Aspect Hardware Administrator configured data link #12 for the Side A PG (host name “AspectPG1A”) and data link #13 for the Side B PG (host name “AspectPG1B”). You see the following PIM:



PG Side A Configuration



PG Side B Configuration

Figure 8: PIM Configuration for Side A and Side B

As shown in Figure 8, “callcenter” is the ACD host name. The Datalink Port is the port that was configured through the Aspect Hardware Administrator for the associated data link ID. Leave **AB backup call center** and **Backup EMR link ID** blank.

2.2. Application Bridge Configuration

Typically, an Aspect Field Engineer performs the configuration setup for the Application Bridge connection to the PG.

2.3. Real-Time Bridge Configuration

Before you can configure the Real-Time Bridge access to the Aspect Call Center, an Aspect Field Engineer must configure an Off-Board Processor Workstation.

2.3.1. Real-Time Bridge Data Timeout Configuration

There is a timeout value in the registry in the following key:

```
Cisco\ICM\Custome\NodeName\PG\CurrentVersion\PIMS\ProcessName\
AspPIMData\Dynamic
```

The key has the following entries:

- **SwitchDataWaitTimeout.** Real-Time Bridge default timeout value for determining if the socket connection from the PIM to the Real-Time Bridge is unable to process data messages. The PIM checks during switch events if the switch data is not received for the timeout period. If the PIM receives no data messages during this period, the socket connection aborts and restarts. If this failure occurs a second time, the PIM restarts if the `RestartPIMOnSecondRTBFailure` is set to true (1) in the registry. The default value for this parameter is 30 seconds.
- **RestartPIMOnSecondRTBFailure.** Real-Time Bridge value (Boolean) used to determine if the PIM restarts on a second consecutive failure to read from the Real-Time Bridge. Use this option to prevent the socket connection to the Real-Time Bridge from hanging during a read attempt. The default value is zero (0). With the default value, the PIM does not restart on a second consecutive failure.

2.4. Unified ICM-Required CCT Programming

The following sections describe the modifications to the Call Center CCTs to enable the Aspect Call Center to function with Unified ICM.

Note: Aspect Call Center provides support for a Redundant Data Link configuration. When implementing CCT modifications for a redundant PG, keep the following points in mind:

- The CCT targets only a single Data Link.
- The Call Center targets the message to and from the Primary Data Link if it is ONLINE.
- The Call Center targets the message to and from the Backup Data Link if the Primary Data Link is OFFLINE and the Backup Data Link is ONLINE.

This setup enables redundant PG configurations to only invoke a single CCT step to target MESSAGES to and from the Primary and Backup PGs.

2.4.1. Call Event Notifications

The Aspect Event Link interface informs a monitoring application of transitions in Agent and Call states for actively monitored Trunk Groups and Agent Groups. The monitoring application enables Event Notifications for the required Trunk Groups and Agent Groups.

The following sections define cases where you need enhancements to CCTs to properly track the transition in Call States. These steps are required to track calls in Unified ICM where call transitions are missing on the Aspect Event Link Interface.

The Aspect PG decodes the Application Bridge Call Information Message subtype to determine a call state change.

Note: The Aspect Call Center's Application Bridge Link provides a Call Disconnect Message and a Call Transfer Message implicitly over the last Data Link that provide call treatment on the disconnected or transferred call.

Call Offered Public (COP)

Unified ICM requires that transition in call targets be noticed when they occur. Transition in call targets is a CALL CONTROL TABLE CCT step to a CCT that is associated with a different Call Center Application. The Event Link Interfaces inform the monitoring application of the new Call Center Application if the call CONNECTS to a resource or the call QUEUES to a NEW Agent Group. If the re-targeted call does neither of these actions, modify the CCT to include a SEND DATA step to inform Unified ICM of the new Call Center Application association.

The Call Offered Public (COP) message defines when a call is offered to an application on the Aspect Call Center. A SEND DATA subtype set to COPxxx defines the Call Offered Public, where xxx is the Application Number (Unified ICM Service Peripheral Number) for the Call, as shown in Figure 9. Optionally, an A-E variable can contain the DNIS for the call. You configure the variable in the Call Control Variable Map field within the Unified ICM configuration tools.

1	MOVE	CONTENTS OF VARIABLE [#] TO VARIABLE [D]
2	SEND DATA	LINK # >12 SUBTYPE COP34 VAR LIST A-E ON ERROR, EXECUTE STEP # 3

Figure 9: Call Offered Public SEND DATA Message

Call Service Map (CSM)

The CSM is similar to the COP message. However, the CSM enables the script developers to override the Call Center Application (Unified ICM Service Peripheral Number) for the call. A SEND DATA subtype set to CSMxxxxx defines the Call Service Map, where xxxxx is the Application Number (Unified ICM Service Peripheral Number) for the Call, as shown in Figure 10. Optionally, an A-E variable can contain the DNIS for the call. You configure the variable in the Call Control Variable Map field within the Unified ICM configuration tools.

The Call Service Map (CSM) SEND DATA step informs Unified ICM to disregard the Application Number reported over the Event Bridge while processing events. For example, in Figure 10, the SEND DATA step with the CSM12345 subtype associates the call to Unified ICM Service with the Peripheral Number of 12345. The Peripheral Number specified in the SUBTYPE field can be up to five digits. Unified ICM associates the call with Service Peripheral Number 12345 regardless of what the Application Bridge and Event Bridge report as the application mapping on the switch. To change the Service Mapping of a call that executed a CSM SEND DATA step, the call must execute another Send Data Step with a new CSM Service Peripheral Number.

1	MOVE	CONTENTS OF VARIABLE [#] TO VARIABLE [D]
2	SEND DATA	LINK # >12 SUBTYPE CSM12345 VAR LIST A-E ON ERROR, EXECUTE STEP # 3

Figure 10: Call Service Map SEND DATA Message

New Transaction (NEW)

The Aspect Event Link interface provides no indication of when the Call Center CCT has invoked the NEW TRANSACTION CCT step. The NEW TRANSACTION CCT step causes the Call Center to terminate the call as defined by its current CallID and create a new Call instance (CallID).

To inform Unified ICM of calls passing through a NEW TRANSACTION CCT step, modify the CCT to include a SEND DATA step with a subtype set to NEWxxx, where xxx is the Application Number (Unified ICM Service Peripheral Number) for the call, as shown in Figure 11. Optionally, an A-E variable can contain the DNIS for the call. You configure the variable in the Call Control Variable Map field within the Unified ICM configuration tools.

4	SEND DATA	LINK # >12 SUBTYPE NEW37 VAR LIST A-E ON ERROR, EXECUTE STEP # 5
---	-----------	--

Figure 11: New Transaction CCT Step

Call Disconnect Message (CDM)

The Aspect Call Center Call implicitly sends the Disconnect Message (CDM) when a call disconnects from a device. The Aspect Call Center only sends the CDM message to the last Data Link that handled the call. If multiple applications are managing calls, use the Unified ICM Application Bridge Server to protect against lost disconnect messages.

Call Transfer Message (CTM)

The Aspect Call Center Call implicitly sends the Call Transfer Message (CTM) when a call is transferred from a device. The Aspect Call Center only sends the CTM message to the last Data Link that handled the call. If multiple applications are managing calls, use the Unified ICM Application Bridge Server to protect against lost transfer messages.

Example CCT—Selecting Agents

The CCT in Figure 12 illustrates the steps required to support Unified ICM monitoring of calls directed to agents. Refer to the COP definition sections to determine if SEND DATA with a subtype COP34 is required.

1	SEND DATA	LINK # >12	SUBTYPE	COP34	VAR LIST A-E
					ON ERROR, EXECUTE STEP # 2
2	PRIORITY	EQUAL TO:5	OR EQUAL TO	VALUE FROM	VARIABLE []
3	SELECT	AGENT	BY >	GROUP NUMBER >	22
4	IF	AVAIL AG	21	LT	2
					EXECUTE STEP # 6
5	SELECT	AGENT	BY >	GROUP NUMBER >	21
6	ANNOUNCEMENT	NUMBER:			5
7	QUEUE				30 SECONDS
8	ANNOUNCEMENT	NUMBER:			8
9	GOTO				STEP NUMBER: 7

Figure 12: Example CCT—Selecting Agents

Example CCT for NEW TRANSACTION Step

Figure 13 illustrates the steps required to support Unified ICM monitoring of calls passing through the NEW TRANSACTION CCT step.

1	NEW TRANSACTION				
2	SEND DATA	LINK # >12	SUBTYPE	NEW51	VAR LIST A-E
					ON ERROR, EXECUTE STEP # 3
3	ANNOUNCEMENT	NUMBER >			1
4	CALL CONTROL TABLE	NUMBER >			52

Figure 13: Example CCT for NEW TRANSACTION Step

Call Connected to Voice Msg (MSG)

The Call Connected to Voice message is defined by a SEND DATA subtype set to MSGxxx, where xxx is the Application Number (Unified ICM Service Peripheral Number) for the Call, as shown in Figure 14. An A-E variable contains

the DNIS associated with the call. The Variable Map Configuration string configures the variable.

4	SEND DATA	LINK # >12 SUBTYPE	MSG37 VAR LIST A-E ON ERROR, EXECUTE STEP # 5
---	-----------	--------------------	---

Figure 14: Call Connected to Voice Msg (MSG)

2.5. Changes to Support Post-Routing

To support *Post-Routing* on the Aspect Call Center, program a CCT to perform a Route SEND DATA step followed by a RECEIVE DATA step. The Route SEND DATA step contains one of these subtypes:

- RTE<xxxxxxxx >
- XFR<xxxxxxxx >
- ARR<xxxxxxxx >

Where <xxxxxxxx > can specify more routing information about the dialed number or the Aspect Application ID. The Call Control Variable Map field defines the Aspect variable that specifies the dialed number within the Unified ICM configuration tools.

Post-Routing on the Aspect PG is broken into two types of Routing Client Dialogs. The RTE and XFR SEND DATA Steps define a two-step Routing Client Dialog. The ACD makes the route request and receives a response. The ARR SEND DATA Step defines a three-step Routing Client Dialog. The ACD makes the route request, receives a response, and then informs the PG when the route selected by Unified ICM is used.

2.5.1. Route Call Request Message (CIM)

In Figure 15, the Call Center variable D contains the DNIS. The CallRouter uses that variable as the called number.

1	SEND DATA	LINK # >12 SUBTYPE	RTE191 VAR LIST A-E ON ERROR, EXECUTE STEP # 3
---	-----------	--------------------	--

Figure 15: Route Call Request Example

2.5.2. Transfer Call Request Message (CIM)

In Figure 16, Unified ICM dialed number for the transfer request is extracted from the SUBTYPE field of the SEND DATA request (XFRSALES).

1	SEND DATA	LINK # >12 SUBTYPE	XFRSALES VAR LIST A-E ON ERROR, EXECUTE STEP # 3
---	-----------	--------------------	--

Figure 16: Transfer Call Request Example

2.5.3. Adjunct Route Request Message (ARR)

In Figure 17, the Unified ICM dialed number for the transfer request is extracted from the SUBTYPE field of the SEND DATA request (ARRSALES).

1	SEND DATA	LINK # >12 SUBTYPE	ARRSALES VAR LIST A-E
ON ERROR, EXECUTE STEP # 3			

Figure 17: Adjunct Route Request Example

2.5.4. Example CCT for Two-Step RC Dialog

Figure 18 illustrates the steps required to invoke a post-route request using RTE with dialed number from DNIS.

1	CONTENTS OF VARIABLE [#] TO VARIABLE [D]		
2	SEND DATA	LINK # >12 SUBTYPE	RTE37 VAR LIST A-E
ON ERROR, EXECUTE STEP # 5			
3	RECEIVE DATA	LINK # >12 ON NAK, EXECUTE STEP 6	
ON ERROR, EXECUTE STEP 7			
4	CALL CONTROL TABLE	CCT 12	// CCT to handle timeouts
5	CALL CONTROL TABLE	CCT 13	// CCT SEND DATA ERROR.
6	CALL CONTROL TABLE	CCT 14	// CCT to handle NAKs
7	CALL CONTROL TABLE	CCT 15	// CCT to handle ERRORS

Figure 18: CCT for Two-Step RC Dialog—RTE, Dialed Number from DNIS

Figure 19 represents the above CCT (Figure 18) in the Aspect 7 Architect Program:

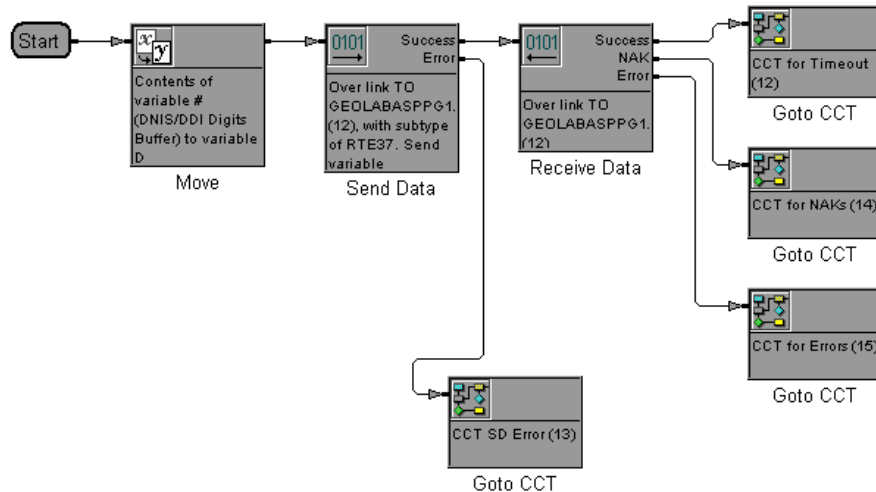


Figure 19: CCT for Two-Step RC Dialog—RTE, Dialed Number from DNIS (Aspect Architect Version)

Figure 20 illustrates the steps required to invoke a post-route request using XFE with dialed number XFRTOALES from SUBTYPE.

1	SEND DATA	LINK # >12 SUBTYPE	XFRTOSALES VAR LIST A-E ON ERROR, EXECUTE STEP # 4
2	RECEIVE DATA	LINK # >12 ON NAK, EXECUTE STEP 5	ON ERROR, EXECUTE STEP 6
3	CALL CONTROL TABLE	CCT 12	// CCT to handle timeouts
4	CALL CONTROL TABLE	CCT 13	// CCT SEND DATA ERROR.
5	CALL CONTROL TABLE	CCT 14	// CCT to handle NAKs
5	CALL CONTROL TABLE	CCT 15	// CCT to handle ERRORS

Figure 20: CCT for Two-Step RC Dialog—XFE, Dialed Number from XFRTOSALES

2.5.5. Example CCT for Three-Step RC Dialog

Figure 21 illustrates the steps to implement a three-step post-route request between the Call Center and the PG. The Adjunct Route Request uses the ARR37 to define the dialed number that is associated with the post-route request.

1	CONTENTS OF VARIABLE [#] TO VARIABLE [D]		
2	SEND DATA	LINK # >12 SUBTYPE	ARR37 VAR LIST A-E ON ERROR, EXECUTE STEP # 5
3	RECEIVE DATA	LINK # >12 ON NAK, EXECUTE STEP 4	ON ERROR, EXECUTE STEP 4
4	SEND DATA	LINK # >12 SUBTYPE	ART37 VAR LIST A-E ON ERROR, EXECUTE STEP # 5
5	...		
6	... SOME TYPE OF RECOVER MECHANISM on the CallCenter.		

Figure 21: CCT for Three-Step RC Dialog

If Step 3, RECEIVE DATA, fails or a time-out occurs, the SEND DATA STEP that follows the RECEIVE DATA step (ART) informs the PG that the Routing dialog has terminated. The PG response is ignored. The PG frees any Unified ICM resources associated with the original Adjunct Route Request. Use the steps following the ART to provide backup recover conditions for handling the call.

Put the following CCT step in the target CCT that is associated with a route request when the ACD has completed the required steps to perform a translation route (that is, directed the call to go off-switch).

1	SEND DATA	LINK # >12 SUBTYPE	ARE110 VAR LIST A-E
		ON ERROR, EXECUTE STEP # 2	

Figure 22: CCT Step for Target CCT

2.6. Maintaining Your Configuration

In general, perform changes to your configuration first on the Aspect ACD, then in Unified ICM. This order ensures that the PG sees the configuration updates on the Aspect ACD systems.

2.7. Aspect Contact Server Integration

The Aspect Contact Server PIM includes modifications to the Aspect Event Link PIM (which uses the Aspect Call Center Application Bridge, Event Bridge, and Real-Time Bridge interfaces) that support the new Aspect Contact Server Computer Media Integration (CMI) Server interface.

The Aspect Contact Server CMI Server API replaces the Aspect Application Bridge and Event Bridge interfaces. The Aspect Contact Server PIM communicates with the CMI Server.

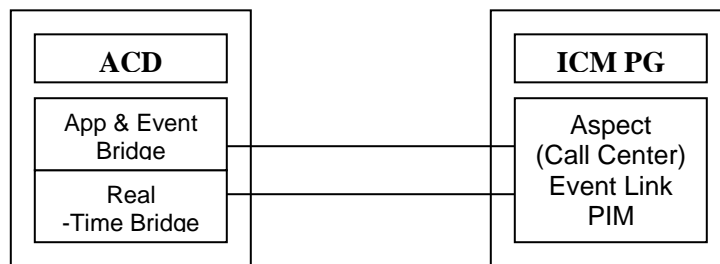


Figure 23: Aspect Event Link PIM Lines of Communication

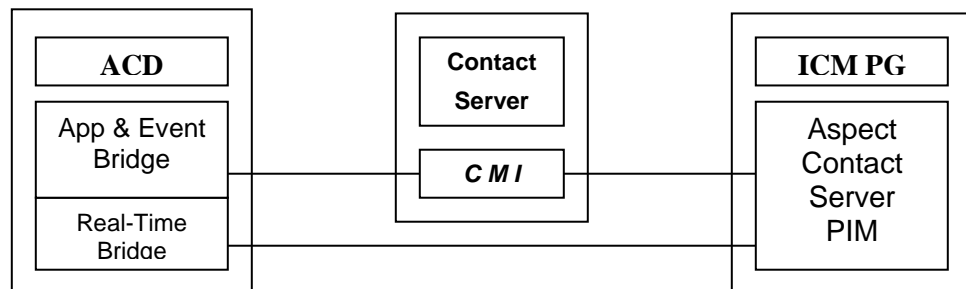


Figure 24: Aspect Contact Server PIM Lines of Communication

As illustrated in Figure 24, all Application and Event Bridge messages travel through the CMI Server. The CMI Server process is a Windows service. You install this service separately from the Aspect Contact Server PIM from the Aspect install media in the Aspect Contact Server package. This package offers

several more applications; however, Unified ICM Aspect Contact Server PIM needs only the CMI Server.

The Aspect Call Center ACD exposes the Aspect Real-Time Bridge interface. So, the Aspect Contact Server PIM connects to the ACD just like the Aspect Call Center Event Link PIM communicates with the Real-Time Bridge to acquire real-time data.

2.7.1. Installing the Aspect Contact Server CMI Server

You install the Aspect Contact Server CMI Server from the install media in the Aspect Contact Server package. Install the CMI Server from the “Aspect Edition” CD as instructed by the Aspect Contact Server documentation.

Install the CMI Server on its **own** server. Do not install the CMI Server on the Unified ICM PG.

2.7.2. Installing the Aspect CMI Server Sample Application

Install the CMI Software Development Tools on either the CMI Server or on the Unified ICM PG server. The Aspect Windows Sample Application tests bi-directional communications between a client application and the ACD through the CMI Server. You only install the test application on **one** system – it simply tests your CMI Server and ACD data link configuration.

1. Browse to the following folder on the Aspect Contact Server “Aspect Edition” CD:

```
\cti\aspect\ctiapi\win32\disk1
```

and launch **SETUP.EXE**.

2. Select the desired destination folder when prompted.
3. Select the components shown in Figure 25. You do not need the development API files. Complete the installation and restart the server when prompted.

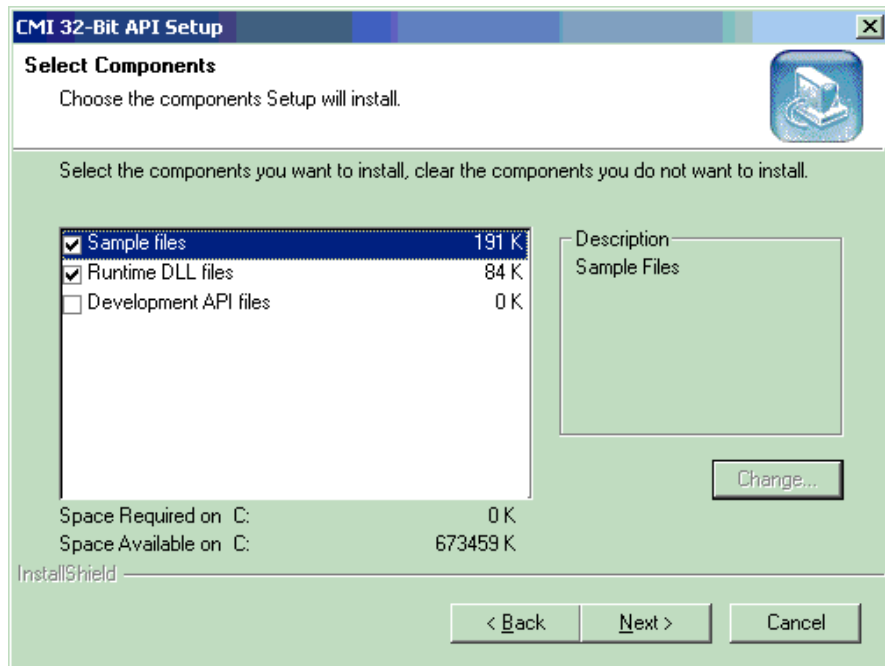


Figure 25: CMI Server Installation Components

2.7.3. CMI Server Data Link Configuration

Configure a data link for the CMI Server. Create a new data link for the CMI Server as described in Section 2.1.

IMPORTANT: The Data System host name **MUST EXACTLY MATCH** the host name configured on the CMI Server configuration page (“Address” field of the ACD Configuration Section). The host name is case-sensitive in both places. If the host names do not match, you receive NO messages from the ACD.

2.7.4. Aspect CMI Server Configuration

Chapter 4 of the Aspect Contact Server Installation and Configuration Guide describes the CMI Server configuration switches and options. The following information focuses on the critical configuration parameters and switches for successful operation of the Unified ICM Aspect Contact Server PIM. Keep the Aspect Guide handy as a reference while configuring the CMI Server.

The following screen shots show an example of a working CMI Server configuration. The parameters vary between installations. Open the CMI Administration web page that is created during the CMI Server installation in your web browser.

When the top-level page appears, click the link to administer the “*Aspect CMI Server*”.

ASPECT

Aspect CMI Server Configuration File

ACD Configuration Section

Port number

Service

Address

Native Client Configuration Section

Port number

Service

Versit Client Configuration Section

Port number

Service

Repository Server Configuration Info

[Repository server table](#)

	Name	Host	Port	Service	Restart frequency
0	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 26: Aspect CMI Server Configuration Form

ACD Configuration Section

Port number: The port number that the data link uses, which was configured with the Aspect Administrator - Hardware Administrator utility. This setting is located on the “*Settings*” tab and labeled “*Port Used by TCP/IP*”. **These two port numbers MUST match.**

Service: Leave blank (unless you have configured a TCP/IP service on the CMI Server node).

Address: Host name of the CMI Server node.

Note: The host name that you enter in this field must **exactly match** with the entry that you make in the ‘Data System’ field on the Settings tab of the Properties Page of the data link configuration dialog shown in Figure 5.

Native Client Configuration Section

Port Number: The port number that the CMI Server listens on for client connections. This port number **MUST** match the port number configured for the PIM in the “*Datalink Port*” field of the Web Setup Tool on the *Aspect Event Link Configuration* dialog. The default value is 9001.

Service: Leave blank (unless you have configured a TCP/IP service on the CMI Server node – not likely and not necessary).

Versit Client Configuration Section

Not used. Leave these two fields set to the defaults of 9002 and blank, respectively.

Repository Server Configuration Info

Not used. Leave blank.

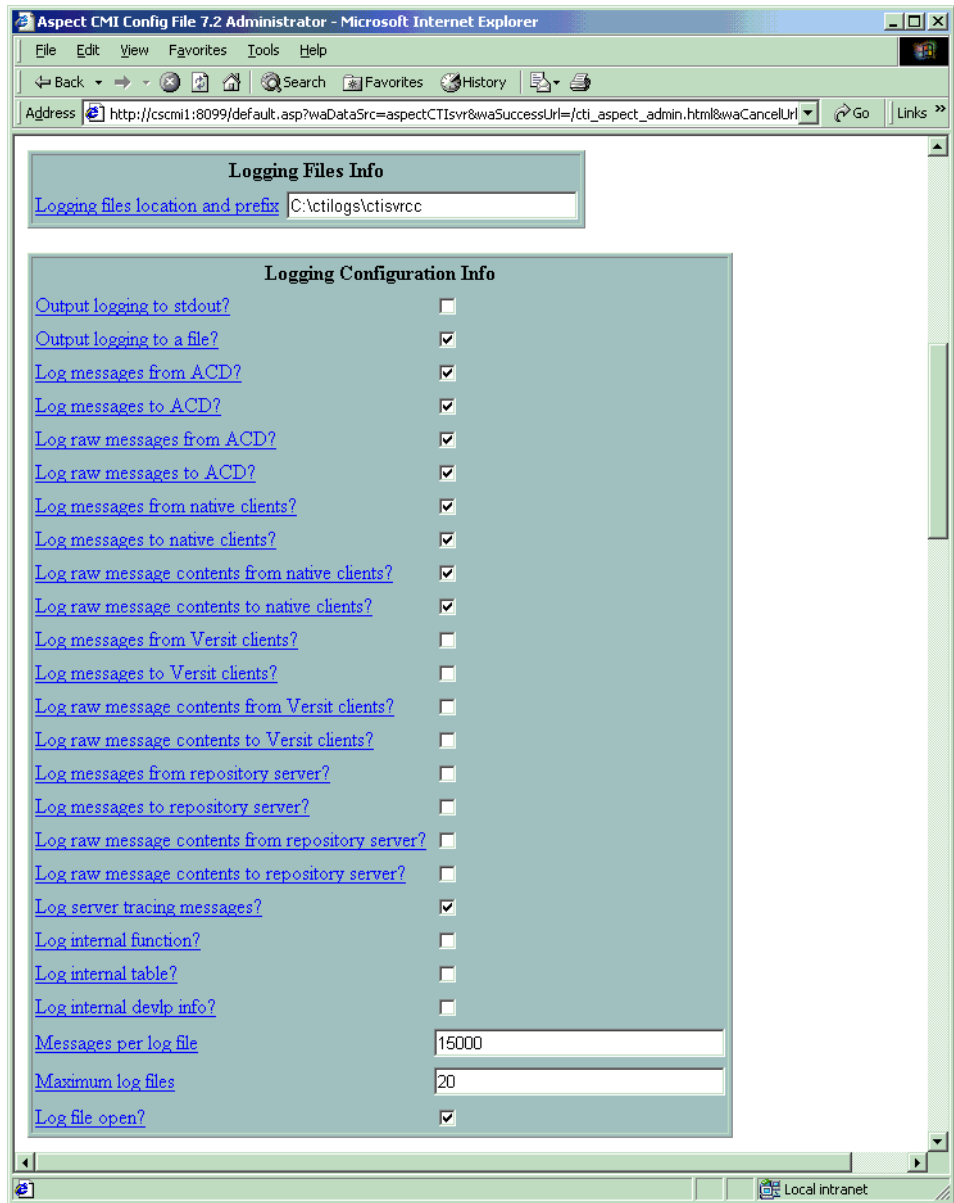


Figure 27: Aspect CMI Server Logging Configuration Form

Logging Files Info

Logging Files Location and Prefix: This field includes both the CMI Server log files directory (in this example, “C:\ctilog”) and the prefix for the log file name (in this example, “ctisvrcc”). The CMI Server names each log file with this text string and a numeric value as a file extension. The numeric value increments with each new log file. For example, the first log file is **ctisvrcc.1**, the second is **ctisvrcc.2**, and so on. The log files are ASCII text files.

Logging Configuration Info

The ‘Logging Configuration Info’ frame, as shown in Figure 27, controls the information and amount of detail that the CMI Server writes to the log files.

Consult the online help for a detailed description of each item.

Once the CMI Server is in a production environment, UNCHECK most of these items to reduce the load that logging places on the system.

The items checked in the screen shot examples are desirable for a lab environment or for a problem-debugging situation.

Aspect recommends checking the *Log file open* option to ensure that buffers are flushed quickly. Thus, the contents of the log more accurately reflect the current state. Messages are not waiting to be flushed from output buffers.

To ensure appropriate PIM operation, configure no other parameters on this form.

Call Data Configuration Info

Number of entries of call data

Aspect Event Bridge Configuration Info

[Aspect event bridge monitor table](#)

	Monitor whom	Monitor number	Agent state map	Call state map
0	<input type="radio"/> Monitor all agent group	<input type="text"/>	YYYYYYNNNN	YYYYYYYYYYYYNNNN
1	<input type="radio"/> Monitor all trunks	<input type="text"/>	YYYYYYNNNN	YYYYYYYYYYYYNNNN

Telephony Configuration Info

[Heart beat](#) (Required)

[Maximum calls](#) (Required)

[Maximum agents](#) (Required)

[Maximum devices](#) (Required)

[Maximum monitors](#) (Required)

[Maximum routing entries](#) (Required)

[Max no-confirmation servers tolerated](#) (Required)

[Device ID monitored](#) (Required)

[Time CMI wait for route](#) (Required)

Figure 28: Aspect CMI Server Configuration Info

The Aspect Event Bridge Configuration Info specifies the messages which the Event Bridge sends to the CMI Server from the ACD. Configure this section as shown, or the PIM does not receive the necessary call and the agent state events from the ACD through the CMI Server.

The "Agent state map" is "YYYYYYNNNN" – six Ys followed by four Ns for a total of ten characters. The Call state map is "YYYYYYYYYYYYNNNNNNNNNN" – eleven Ys followed by nine Ns for a total of 20 characters. Click the "Aspect event bridge monitor table" link within this section for help.

Note: When you edit this form, click **OK** to make the changes persistent. Also, refresh the page occasionally to maintain the connection. If you take longer than 5 minutes between loading the page and clicking **OK**, the connection times out, and you lose the changes. Click **OK** shortly after you edit the form to avoid losing the settings. However, once you save your settings, you return to the high-level page.

When all your changes are made, restart the CMI Server (NT) service to use the new settings. Choose Start > Control Panel > Administrative Tools > Services to restart the service. The changes take effect once you restart the service.

2.7.5. Testing Connectivity with the CMI Server

Aspect provides a sample client application that you can also use to test connectivity with the CMI Server and to test the link to the ACD. This application is on the installation media for the Aspect Contact Server. See Section 2.7.2 for installation guidance.

The sample application is a single-dialog Windows application that mimics an Aspect TeleSet, essentially, a *Soft Phone*.

In the following steps, use the sample application to connect to the CMI Server and sign on an agent. If a step fails, the cause is likely a configuration problem with either the CMI Server or its Data Link.

Note: Ensure that the CMI Server service is running and that you can ping the CMI Server node from the node on which you run the sample application.

Locate an Aspect TeleSet to monitor the success of the agent sign-on attempt. Use the instrument number of this TeleSet and a valid agent ID. After attempting to sign on the agent with the sample Soft Phone, observe the agent state on this device to confirm a successful sign-on.

Launch the Aspect Sample Application. If the CMI API Software Development Tools were installed in the default location, look for **SAMPLE.EXE** in the folder:

C:\Aspect\aspect\ctiapi\win32\Sample\Release

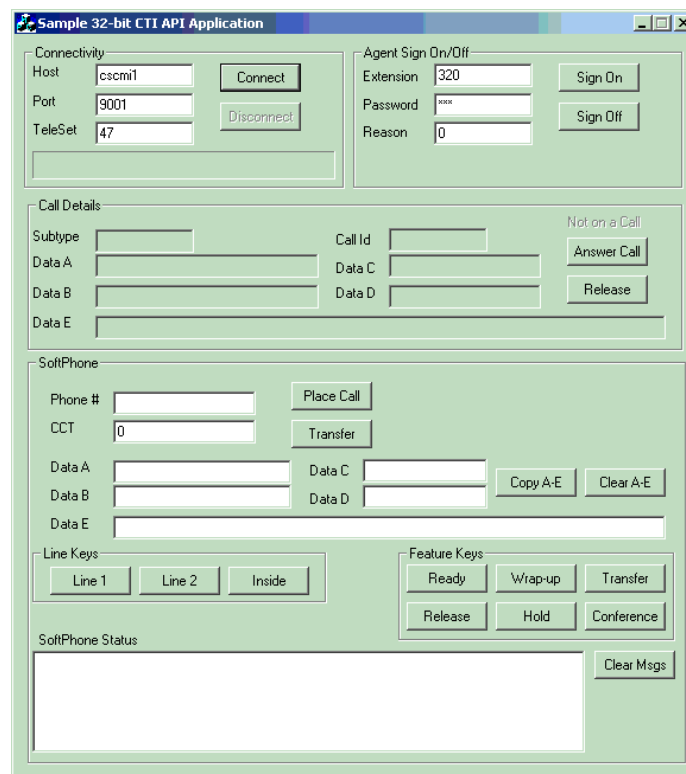


Figure 29: Aspect CMI API Sample Application

In the “*Connectivity*” frame, enter the host name of the CMI Server in the “*Host*” field. Also enter the port on which the CMI Server is listening for client connections and enter a valid TeleSet number, agent ID, and password.

Once entered, click “*Connect*” in the “*Connectivity*” frame. If successful, “*ACD Connection is UP*” appears in the box just below the TeleSet field.

Next, click “*Sign On*” in the “*Agent Sign On/Off*” frame. Event and status messages appear in the “*SoftPhone Status*” box at the bottom of the dialog.

If both steps are successful, the CMI Server is properly configured. The CMI Server can communicate with the ACD, relaying messages and events between the ACD and the client application.

The Aspect Contact Server PIM is a client to the CMI Server just as this sample application is a client. Once the PIM is properly configured (with the valid CMI Server host name and port), the PIM connects to the CMI Server.

3. Unified ICM Configuration

To properly configure and maintain Unified ICM database, you need to understand the relationships between the Aspect Call Center database objects and Unified ICM database objects. For example, a Unified ICM Service corresponds directly to an Application on the Aspect Call Center ACD. A Unified ICM Skill Group is equivalent to an Aspect Agent Group.

When you understand the relationships between the database objects in both applications, you can keep the Aspect and Unified ICM databases synchronized easily.

This chapter describes how objects map between the Aspect ACD and Unified ICM. The chapter also provides information specific to configuring an Aspect PG with the Unified ICM configuration tool.

See also: For detailed information on the Unified ICM configuration tools, see the online help and *Configuration Guide for Cisco Unified ICM/Contact Center Enterprise and Hosted*.

3.1. Peripheral Configuration

In Unified ICM terms, the Aspect Call Center corresponds to a peripheral. Unified ICM treats all contact center devices (for example, ACDs, PBXs, VRU systems) as peripherals.

No special Unified ICM peripheral configuration parameters are required. However, there are certain items within Unified ICM configuration to check.

3.1.1. Peripheral Configuration Parameters

Typically, you leave blank the Configuration Parameters fields within the Peripheral Configuration window for peripherals that are configured with the Aspect Event Link. The required peripheral configuration parameters are set automatically in the Windows registry during PG setup.

However, the Configuration Parameters field does support the configuration of Idle Reason Code and Resource Bridge Available, as shown in Table 2. The format for these parameters is as follows:

<i>/parameter value</i>

In this example, *parameter* is the parameter to configure, and *value* is the value for this parameter. You can enter multiple configuration parameters in the Configuration Parameters field. All parameters and values are space-separated. The order in which the parameters are entered is not significant.

Table 2: Supported Peripheral Configuration Parameters

Configuration Parameter	Definition	Example
irc	Command defining the default Idle Reason Code. Use any valid idle reason code for a value.	<code>/irc 5</code> This value sets the default Idle Reason Code to 5.
rba	Command defining whether the resource bridge is available. A value of 0 indicates that it is not available; a value of 1 indicates that it is available.	<code>/rba 1</code> Sets the default to use the Resource Bridge. <code>/rba 0</code> Sets the default to not use the Resource Bridge.

3.1.2. Peripheral Call Control Variable Map

The Call Control Variable Map field controls the mapping of route request elements to peripheral variables. The following example defines the format of the Call Control Variable Map field:

```
/command switch-var= cmd-var switch-var= cmd-var /command switch-var= cmd-var
```

Figure 30 shows some examples of entries in the Call Control Variable Map field. Examples 1 and 2 define the same Call Control Variable Map settings. However, Example 2 uses the abbreviated commands and variable references that are available in ICM. Example 3 shows a different example of Call Control Variable Map settings.

Example 1:

```
/route %d= callednum /transfer %subtype= callednum /calloffered %d= dnis /new %d= dnis
```

Example 2:

```
/rte %d= dn /xfr %st= dn /cop %d= dnis /new %d= dnis
```

Example 3:

```
/rte %d= dn /cop %d= dnis /resp %a= ld
```

Figure 30: Call Control Variable Map Examples

Table 3 defines the commands to use in the Call Control Variable Map field. All fields are space-separated. The order in which the commands are entered is not significant. For some commands, the abbreviation (for example, rte) can be used instead of typing the whole command.

Table 3: Call Control Variable Map Commands

Commands	Definition
route (rte)	Command defining the variable map for the post-route request.
transfer (xfr)	Command defining the variable map for a post-route request that deal with transfers.
queue (que)	Obsolete.
calloffered (cop)	Command defining the variable map for the CALL OFFERED indication message from the ACD. (Call diversion sequences can require the usage of COP.)
response (resp)	Command defining the variable map for the post-route response data.
new	Command defining the variable map for the NEW TRANSACTION indication message.
arr	Command defining the variable map for the Adjunct Route Request (post-routing request).
are	Command defining the variable map for the Adjunct Route End Request (post-routing request).

Table 4 defines the variables for the route, rte, transfer, xfr, and arr commands that are associated with post-routing applications on the Aspect ACD. For some commands, you can use an abbreviated version of the command (for example, dn).

Table 4: Route Command Variables

Variable	Definition
dnis	Defines the DNIS digits associated with the call.
callednum (dn)	Defines the Called Number associated with the call.
callingnum (ani)	Defines the Calling Number associated with the call.
ced	Defines the Caller Enter Digits associated with the call.

Table 5 defines the variables for the calloffered command from the Aspect ACD.

Table 5: Call Offered Public Variables

Variable	Definition
dnis	Defines the DNIS digits associated with the call.

Table 6 defines the variables used by the PG when sending a response to a Call Center post-route request using the `rte` or the `xfr Send Data` commands.

Table 6: Route Response Variables

Variable	Definition
labeldata (ld)	Defines the GLOBAL mapping for extra label data returned during Post-Route Request. (Refer to “Label Syntax,” later in this section, for additional information.)

Table 7 defines the variables used by the new command from the Aspect ACD.

Table 7: New Transaction Variables

Variable	Definition
dnis	Defines the DNIS digits associated with the call.

Table 8 defines the switch variables that you can map to the previously defined command variables.

Table 8: Aspect Variables Definition

Switch Variable	Definition
%a	Used to denote the A variable for Aspect ACD.
%b	Used to denote the B variable for Aspect ACD.
%c	Used to denote the C variable for Aspect ACD.
%d	Used to denote the D variable for Aspect ACD.
%e	Used to denote the E variable for Aspect ACD.
%subtype (%st)	Used to denote values as specified in the Sub-Type field of a SEND DATA CCT step.

3.2. Peripheral Target Configuration

A Unified ICM Peripheral Target is a network target identified by a Trunk Group and DNIS that terminates on the Aspect ACD. A Peripheral Target is required for all DNIS and Trunk Groups through which an incoming call arrives.

Important: Configure all TrunkGroup/DNIS combinations that handle any incoming ACD call in Unified ICM as Peripheral Targets to ensure complete call monitoring.

Those calls that do not map to a valid Peripheral Target are associated with the Service defined in the sub-type of the SEND DATA CCT step. If neither mapping fits, the call is associated with the Peripheral’s default route as defined in Unified ICM Peripheral Configuration table. If a Default Route is not defined, the PG will log an event.

3.3. Trunk Group Configuration

Trunk Groups for the Aspect ACD require no special configuration information. The Unified ICM and Aspect Trunk Group mapping is as follows:

Unified ICM	Aspect
Trunk Group	Trunk Group
Trunk Group Peripheral Number	Trunk Group number (for example, Trunk Group 5)
Trunk Group Extension	(Not used by Aspect PG)

3.4. Trunk Configuration

The Aspect ACD trunk instrument number monitors Call Event notification, for both inbound and outbound ACD calls. For Unified ICM to properly monitor ACD calls, configure **all** individual trunks and their corresponding Trunk Group assignments in the Unified ICM database. If the PG is informed of a call with an unknown Trunk Instrument number, a Unified ICM Event is logged.

The Trunk Instrument Number as defined on the ACD (for example, Instrument 5) is the Unified ICM Trunk Peripheral Number.

3.5. Service Configuration

Unified ICM and Aspect Service mapping is as follows:

Unified ICM	Aspect
Service	Application
Service Peripheral Number	Application Number

The Service Peripheral Number is the Application Number as defined by the Aspect ACD. You can set the Peripheral Service Level to one of the four Aspect Peripheral Service Levels. The Peripheral Service Level corresponds to the Applications Service Level.

3.6. Skill Group Configuration

Unified ICM and Aspect Skill Group mapping is as follows:

Unified ICM	Aspect
Skill Group	Agent Group
Skill Group Peripheral Number	Agent Group Number
Skill Group Extension	(Not used by Aspect PG)

The Unified ICM Skill Group Peripheral Number is the Aspect ACD Agent Group Number. The Skill Group for the Aspect ACD requires no special configuration information.

3.7. Skill Group-to-Service Mapping

Unified ICM Skill Group-to-Service mapping corresponds to the list of Aspect ACD Agent Groups that are selected throughout a Call Center's CCTs. The Application assigned to the CCT maps to the specified Unified ICM Service Peripheral Number that you used to map the Skill Groups.

There are no special Unified ICM configuration considerations.

3.8. Agent Configuration

The PG dynamically configures agents. **Do not** add the agents individually through the Unified ICM configuration tools.

Unified ICM and Aspect agent mapping is as follows:

Unified ICM	Aspect
Agent	Agent
Agent Peripheral Number	ACD extension number assigned to the agent

Note: While using CTI clients (such as CTIOS, CTI Desktop, or Custom Clients), the agent must select the **placement of the call** as **Outbound** before making an Outbound call.

3.9. Agent States

Table 9 lists the Aspect agent states and their definitions.

Table 9: Aspect Agent State Definitions

Aspect Agent State	Definition
ACD1	Agent is handling and incoming call on line 1.
ACD2	Agent is handling and incoming call on line 2.
ACT1	Agent is handling an ACT call on line 1.
ACT2	Agent is handling an ACT call on line 2.
AVAIL	Agent is available to handle calls.
CONF	Agent is in a conference with two lines.
EMER	The Emergency KEY is pressed on the TeleSet.
HELP	Agent is listening to a help announcement.
HOLD	One or more calls are on HOLD.

Aspect Agent State	Definition
IDLE	Agent is in the IDLE state.
INS	Agent is talking on the inside line.
MSG	Agent is listening to void mail or callback messages.
OFF	Agent is not signed on to a TeleSet.
OUT1	Agent is making an outgoing call on line1.
OUT2	Agent is making an outgoing call on line2.
RSVD	Agent is reserved for an incoming InterQueue call.
SUPR	Agent is talking on the supervisor line.
WRAP	Agent is in wrap-up State.

Table 10 shows how Unified ICM agent states are derived from the Aspect states.

Table 10: Unified ICM-Aspect Agent State Derivation

Unified ICM Agent State	Derivation from Aspect Agent States
Not Ready	IDLE
Ready	Any state other than those states identified by the NotReady state.
Available	AVAIL
WorkReady	WRAP
TalkingIn	ACD1, ACD2, ACT1, ACT2, (HOLD, CONF)
TalkingOut	OUT1, OUT2, (HOLD, CONF)
TalkingOther	INS, SUPR, (HOLD, CONF)
BusyOther	Not mapped to an Aspect agent state.
Reserved	RSVD
Hold	When all call appearances are on HOLD by an agent.
Logged Out	OFF

3.10. Route Configuration

Routes require no special Unified ICM configuration.

A CallRouter is one or more Unified ICM Peripheral Targets. A Unified ICM Peripheral Target is a Network Target that is identified by a trunk group and DNIS that terminate on the Aspect ACD. A Peripheral Target is

equivalent to the combination of DNIS and the trunk groups through which the incoming calls arrive.

3.11. Translation Route Configuration

Translation routes require no special Unified ICM configuration. Translation routes are supported on the Aspect PG. You can use translation routes to pass caller information to Aspect (for example, ANI or Network CED).

3.12. Routing Client Configuration

Leave the Configuration Parameters field in the Routing Client Configuration window blank. No information is required in this field.

See also: For more information on Routing Client configuration and Post-Routing, see Chapter 4, “Post-Routing.”

3.13. Application Bridge Server

The Aspect Application Bridge provides the Call Disconnect Message (CDM) or Call Transfer Message (CTM) *only* to the last data link that handled the call. The lack of these messages can cause Unified ICM to leave call states hanging until certain recovery checks are enabled. This situation can cause other applications that monitor a call to miss a CDM or CTM.

To work around the loss of CDM and CTM messages, Cisco provides a server process for the Application Bridge. The Application Bridge Server (ABS) ensures that all applications that track a call receive a CDM or CTM for the disconnected or transferred call.

Note: The PG does not rely on the CDM or CTM messages. So, you require the ABS if the Call Center invokes SEND DATA steps to the PG to work around missing Event Link Notifications of calls. You also use the ABS if the Call Center performs a post-route request to the PG after another application was informed of the call over another data link.

3.13.1. ABS Client

The Application Bridge Server uses the Windows registry to configure the list of clients to monitor. You add clients through the ABS setup procedure.

When using ABS with redundant Aspect Event PIMs, also change the OPC-configured timeout (PIMConfiguredTimeout) on the PG systems to at least 90 seconds. When ABS toggles between the sides on connection failures, this setting gives the PIMs enough time to connect to the ABS and fully establish their links to the Call Center. You can change the OPC-configured timeout in the following registry location:

`\Cisco\ICM\CustomerName\PG1A\PG\CurrentVersion\OPC\PIMConfiguredTimeout`

Once the client name is entered, update the registry information for your client. Update the information in the following registry key:

```
\Cisco\ICM\CustomerName\ABS\CurrentVersion\Clients\ClientName
```

The following list defines the registry data elements required to support the Application Bridge Server process. Each application that the ABS manages requires the following entries:

- **ApplicationActive.** A non-zero value enables this client for the Application Bridge Server. The Application Bridge Server allows activation/deactivation of clients while the system is running.
- **AppProgramHostNameSideA.** TCP/IP Host Name for the Data System Application Bridge Program running on Side A.
- **AppProgramHostNameSideB.** TCP/IP Host Name for the Data System Application Bridge Program running on Side B. Configure the Side B Application Bridge Program Host Names for applications that support redundancy.
- **AppProgramPortNumberSideA.** TCP/IP Port Number for Data System Application Bridge Program running on AppProgramHostNameSideA. If CallCenterHostName equals the AppProgramHostNameSideA, then the value here must be different from the CallCenterPortNumber.
- **AppProgramPortNumberSideB.** TCP/IP Port Number for Data System Application Bridge Program running on AppProgramHostNameSideB. If CallCenterHostName equals the AppProgramHostNameSideB, then the value here must be different from the CallCenterPortNumber.
- **CallCenterConnectsFirst.** Used to determine which side of the connection activates the Data Link connection. A non-zero value disables the connection to the Application (AppProgramHostNameSideA and AppProgramPortNumberSideB) until a connection is received from the Call Center (CallCenterHostName and CallCenterPortNumber).
- **CallCenterHostName.** TCP/IP Host Name for the Call Center.
- **CallCenterPortNumber.** TCP/IP Port Number used accepts the connection from the Call Center. This value reflects the value from the Aspect Call Center Data Link Configuration Table.
- **DataLinkNumber.** Application Bridge Data Link Number as configured on the Call Center. This value reflects the value from the Aspect Call Center Data Link Configuration Table.
- **FieldSeparator.** As defined in the Data Link Configuration Table. This value reflects the value from the Aspect Call Center Data Link Configuration Table.
- **MessageFormatFixed.** Specifies either Fixed-Length or Variable-Length message formats over the data link. A value of zero specifies a variable length message format (default). This value reflects the value from the Aspect Call Center Data Link Configuration Table.

Note: When configuring a client for the PG application, set the CallCenterConnectsFirst field to zero.

Optionally, you can update the PIM configuration refresh rate registry information (for real-time messages) for your client. The registry key is as follows:

```
Cisco\ICM\CustomerName\NodeName\PG\CurrentVersion\PIMS\ProcessName\
AspPIMData\Config
```

The following defines the Windows registry Data Elements to support the adjustment of the refresh rates for the trunk group, RT3 service, real-time peripheral, and RT4 agent group.

- **AgentGroupRT4QueryListEvent.** Real-Time Bridge default configuration information for reporting of agent group RT4 queries. This value specifies the frequency with which these events are reported, with a default value of 300 seconds.
- **PeripheralRealtimeQueryListEvent.** Real-Time Bridge default configuration information for reporting of peripheral real-time queries. This value specifies the frequency with which these events are reported, with a default value of 60 seconds.
- **ServiceRT3QueryListEvent.** Real-Time Bridge default configuration information for reporting of service RT3 queries. This value specifies the frequency with which these events are reported, with a default value of 3 seconds.
- **TrunkGroupQueryListEvent.** Real-Time Bridge default configuration information for reporting of trunk group queries. This value specifies the frequency with which these events are reported, with a default value of 3 seconds.

For third-party support, the client includes Idle with Reason Code. This registry key supports (through CTI) an agent going idle with a valid reason code:

```
Cisco\ICM\CustomerName\NodeName\PG\CurrentVersion\PIMS\ProcessName\
AspPIMData\Dynamic
```

The following entries support the Idle Reason Code implementation:

- **TPRetryIRROnFailure.** This entry tells the PIM whether to send the default value (set in the Unified ICM configuration tools) if the PIM receives an invalid reason code when an agent goes idle. If set to one (1), the PIM sends the default idle reason code. If set to zero (0), the PIM does not send the default idle reason code.
- **TPUpdateOPConRetry.** This entry tells the PIM whether to update OPC when a retry on sending the default idle reason code is issued. If set to one (1), the PIM sends the default idle reason code. If set to zero (0), the PIM does not send the default idle reason code.

3.14. Maintaining Your Configuration

Change your configuration first on the Aspect ACD, then in Unified ICM configuration. This order ensures that the PG sees the configuration updates on the Aspect ACD systems.

4. Post-Routing

The Aspect PG supports *Post-Routing* and can 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 Aspect PG. The chapter also discusses considerations for use of *Post-Routing* or Translation Routing on the PG.

See also: For information on *Post-Routing* configuration on the Aspect ACD, see Chapter 2, “ACD Configuration.”

4.1. Routing Client Dialogs

There are two types of Routing Client dialogs that are supported between the Aspect ACD and the PG: a two-step RC dialog and a three-step RC dialog. The three-step Routing Client dialog provides more control when you post-route calls using translation routing.

To start a post-route, call processing on the Aspect ACD executes a SEND DATA step followed by a RECEIVE DATA step. The responding Unified ICM label is an Aspect CCT number where call processing resumes.

See also: See “Peripheral Call Control Variable Map” in Chapter 3, “Unified ICM Configuration,” for more information on the Aspect A-E variable definitions.

Note: A responding CCT value of “000” causes the ACD to resume call processing at the step following the RECEIVE DATA step. This response occurs when the Route Request resulted in an error or the Routing Client Timer expired for the pending request.

4.1.1. Route Request (Two-Step RC)

The Aspect ACD sends a route request to the PG through the SEND DATA CCT step with one of these SUBTYPEs:

- RTE<xxxxxxxx >
- XFR<xxxxxxxx >

Where <xxxxxxxx > can specify extra routing information for the dialed number or the Aspect Application ID.

The following information is extracted from the Application Bridge message that is generated from the SEND DATA step:

- Called number (typically the DNIS) from A-E variables or Sub-type string.
- Last set of collected digits (CED) (if any) from A-E variables.
- DNIS chars (optional) from A-E variables.
- Call ID.
- Trunk Instrument or Agent Instrument number.

See also: See “Peripheral Call Control Variable Map” in Chapter 3, “Unified ICM Configuration,” for more information on the Aspect A-E variable definitions.

4.1.2. Adjunct Route Request (Three-Step RC)

The Call Center-to-Unified ICM Routing dialog includes a 3-step Adjunct Route Request mechanism to provide Unified ICM with more control for calls routed by Translation Routes. The Aspect ACD begins an Adjunct Route Request by performing a SEND DATA CCT step with the SUBTYPE set to ARR<xxxxxxxx >, where <xxxxxxxx > can specify extra routing information for the dialed number or the Aspect Application ID.

The following information is extracted from the Application Bridge Message that is generated from the SEND DATA step.

- Called number (typically the DNIS) from A-E variables or Sub-type string. The DN (called number) is taken from variable C if a value is present in this variable. Otherwise, the step gets the DN from the subtype field.
- Last set of collected digits (CED) (if any) from A-E variables.
- DNIS chars (optional) from A-E variables.
- Call ID.
- Trunk Instrument or Agent Instrument number.

See also: See “Peripheral Call Control Variable Map” in Chapter 3, “Unified ICM Configuration,” for more information on the Aspect A-E variable definitions.

4.1.3. Adjunct Route End/Timeout

In the second step of an Adjunct Route Request, the PG responds to the Aspect Call Center with a CCT. The CCT specifies where call processing resumes for the call that is associated with the ARR request. The steps for the response to the ARR request are similar to the steps in the “Route Select,” section with the following requirements:

- To terminate the Adjunct Route Request routing dialog, the Call Center issues an Adjunct Route End or Adjunct Route Timeout to the PG.
- For the Call Center to indicate the Route Select that Unified ICM chose, the CCT for the response performs a SEND DATA CCT step with the SUBTYPE set to ARE<xxxxxxxx >, where <xxxxxxxx > specifies the Aspect Application ID for the CCT. The ARE step informs the PG that the Routing Client Dialog for the previously routed call has terminated.
- For the Call Center to indicate to the PG that the Routing Dialog has timed out, the CCT Step after the RECEIVE DATA contains a SEND DATA with the SUBTYPE set to ART<xxxxxxxx >, where <xxxxxxxx > specifies the Aspect ApplicationID for the CCT.
- The Call Center uses both the ARE and ART to inform the PG that the routing dialog has terminated. These messages are the third and final step involved with Adjunct Route Request.

4.1.4. Route Select

The PG receives the selected route information from the CallRouter. The PG then converts the route into a Call Information Response message for the Aspect ACD. The PG directs the Call Information Response message to a call blocked on a RECEIVE DATA CCT step. The resulting Label corresponds to a CCT number as defined by the Aspect Call Center. When the Aspect ACD receives the Call Information Response message, call processing resumes at the CCT specified in the message.

Call Information Response results that contain a value of “000” cause the call processing on the Aspect ACD to resume on the CCT step after the original RECEIVE DATA step. Unified ICM scripts that control the dialed number can pass extra information to the Aspect ACD by setting the A-E variables.

See also: See “Peripheral Call Control Variable Map” in Chapter 3, “Unified ICM Configuration,” for more information on the Aspect A-E variable definitions.

4.2. Label Syntax

The primary makeup of the Unified ICM Label for post-routing on the Aspect ACD is a valid CCT number as defined on the Aspect Call Center. On the Call Center, a valid CCT number is from “000” to “999”. Invalid CCT numbers (that is, CCTs that do not exist or are out of the valid range), result in an error in the Aspect Call Center Activity logs.

See also: Refer to the *Aspect Call Center Workstation User’s Guide* for additional information on access to the Activity Logs.

Labels containing the value “000” or invalid CCT numbers cause call treatment on the Aspect ACD to resume at the step after the original SEND DATA step. Labels containing valid CCT numbers cause call treatment to resume at the beginning of the specified CCT number.

In addition to the CCT number, the label can contain extra data to pass down to the Call Center. The extra data comes after the first three digits in the label. Valid data is alphanumeric and is stored in one of the defined Call Center A-E variables.

The formats used for Labels are as follows:

XXX

XXX is the CCT number returned to the Call Center.

XXXyyyyyyyyyy

XXX is the CCT Number returned to the Call Center and yyyyyyyyyy is the additional label data that is stored in the variable configured by the /response %<var >= labeldata in the Call Control Variable Map field. The variable limits the amount of information passed down.

XXX%2yyyyyyyyyy

XXX is the CCT Number returned to the Call Center. In this example, %2 specifies to use the Call Center “B” variable when storing the additional information and yyyyyyyyyy is the additional label data in the variable that is specified after the % escape field in the label. The variable limits the amount of information passed down.

4.2.1. Label Examples

```
02412345678 -
```

The digits 12345678 are stored in the variable that is defined by the Call Control Variable Map field /response %a= labeldata. In this example, Call Center variable A stores the data. Control of the call resumes in CCT 24 of the Call Center.

Use the following formats to override the variable selection from the Call Control Variable Map field:

```
033%112345678
```

The digits 12345678 are stored in variable A (defined by %1). Control of the call resumes in CCT 033 of the Call Center.

```
33%21234567890
```

The digits 1234567890 are stored in variable B (defined by %2). Control of the call resumes in CCT 033 of the Call Center.

```
33%31234567890
```

The digits 1234567 are stored in variable C (defined by %3). Control of the call resumes in CCT 033 of the Call Center. The length of the variable supported on the Call Center limits the extra label data in the Call Center variable C to the first seven digits.

```
198%41234567890
```

The digits 1234567 are stored in variable D (defined by %4). Control of the call resumes in CCT 198 of the Call Center. The length of the variable supported on the Call Center limits the extra label data in the Call Center variable C to the first seven digits.

```
198%51234567890ABCDEFG
```

The digits 1234567890ABCDEFG are stored in variable E (defined by %5). Control of the call resumes in CCT 198 of the Call Center. Variable E is the **only** Call Center Variable that supports alphanumeric strings. Passing an alphanumeric string in the other variables results in a null string presented to the Call Center CCT.

4.2.2. Network Take-Back and Transfer Support

From Release 6.2.1, the Application Bridge Interface provides messages to enable an application (for example, the PG) to take advantage of the AT&T Call Transfer feature. The new message set enables a host to generate a transfer call request to the carrier (AT&T *8xxxxxxxxxx).

Unified ICM customers currently perform the following actions when transferring calls inter-switch using Unified ICM Enterprise Routing:

1. An agent receives an inbound call.

2. The agent begins a consultative call (#8XXX or speed dial #), which results in a new call in an Aspect CCT that performs a Post-Route Request.
3. The Unified ICM response to the Post-Route request is either of the following:
 - A CCT that targets another Switch using tie lines between ACDs
 - A CCT that targets agent groups locally on the requesting ACD.
4. The agent then consults with the target agent and either conferences or transfers the call. When inter-switch transfers are performed, the ACD requires trunk lines between all targeted ACDs.

With the use of the new interfaces, the following steps are performed when transferring calls inter-switch:

1. An agent receives an inbound call.
2. The agent then begins a consultative call (#8XXX or speed dial #). A new call executes in an Aspect CCT that performs a Post-Route Request.
3. Unified ICM response to the Post-Route request is a label of the form DTMF*8xxxxxxx or DTMFD*8xxxxxxx. The DTMF and DTMFD (TBD) prefix in the label informs the PIM that it must perform a Carrier Call Transfer.

To perform the Carrier Call Transfer, the Aspect PIM must perform the following steps:

1. Terminate the consultative call that performed the post-route request. The PIM issues a Release Call Request (505) to the Aspect ACD over the Application Bridge.
2. When the PIM receives the Release Call Request Response (105) message (confirmation of call disconnecting), the PIM connects the initial call that was placed on HOLD by the customer. The new interface requires that the call be in the connected state for the Carrier Call Transfer. The PIM issues a Retrieve Call Request (514) to the Aspect ACD over the Application Bridge.
3. When the PIM receives the Retrieve Call Request Response (114) message (confirmation the call was retrieved and is in the connected state), the PIM then issues the new Dial DTMF Digits Request with the digits in the label from Unified ICM.

The DTMFD is similar to the DTMF prefix, except that DTMFD instructs the PIM to disconnect the original call when the SendDTMF request completes. Use this option when Carrier Call Transfers are implemented on an MCI network that requires a customer to use either all Blind Transfers or all Consultative Transfers. If the customer wishes to mix the transfer types, enable the Consultative Transfer method. Then, the PIM can terminate the agents association with the call if the DTMFD prefix is used (similar to a blind transfer configuration where the network terminates the associated agent).

The PIM currently uses the Release Call Request and Retrieve Call Request for CTI Third-Party Call Control Interfaces. These steps enable hands-free transfer steps after initiating the consultative call.

5. Redundant CMI Support

This chapter describes how the Aspect Contact Server PG provides dual CMI support. The chapter describes how the Aspect Contact Server PG provides connection with a backup CMI server when the Primary CMI server fails.

Note: Dual CMI Support to the Aspect Contact Server PG is also available in Unified ICM. However, the existing CMI configuration continues to be valid.

5.1. Overview of Dual CMI Configuration

Aspect Contact Server PG connects to an Aspect Contact (CMI) Server to obtain call and agent state information. You can configure CMI servers in a dual mode. When one CMI server fails, the Aspect Contact Server PG can use the other Aspect Contact (CMI) Server to obtain call and agent state events.

You can configure the Aspect Contact Server PG in simplex or redundant configuration. With two Aspect CMI Servers in a dual¹ configuration, when one of the CMI servers fails, the PIM connects to the other CMI server.

The following sections describe both single and dual configurations.

5.1.1. Interface Specifications

Figure 31 shows one of the common interface connections to the Aspect Contact (CMI) Server for the Aspect Contact Server PG implementation. For a simplex PG configuration that uses a single Aspect Contact (CMI) Server, refer to Figure 24.

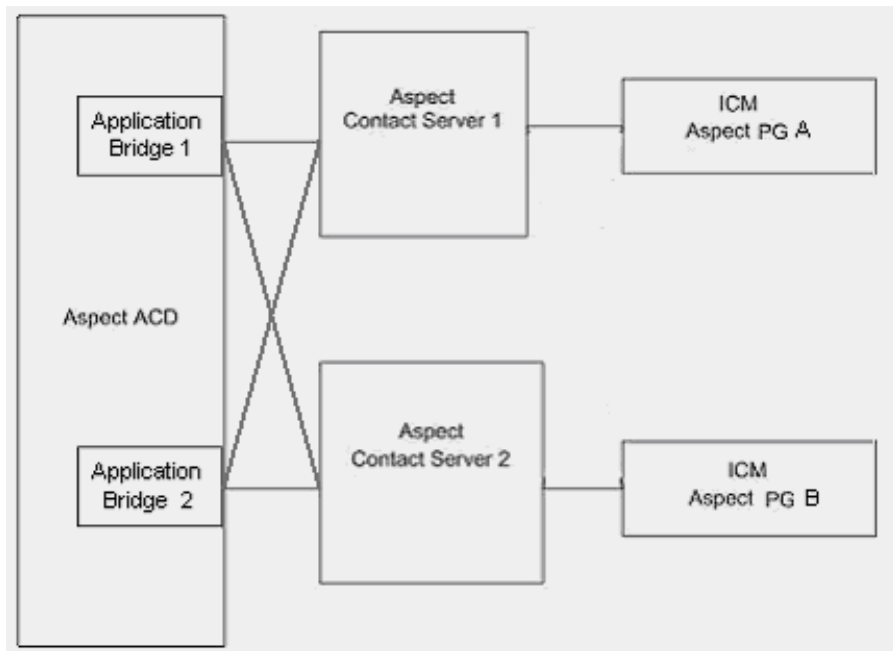


Figure 31: Aspect Contact (CMI) Server – Before ICM 7.0(0) SR1

¹ From the PG perspective one CMI server is treated as Primary and the other is treated as a Backup CMI Server.

In Figure 31, there is no connection from PG A to Aspect Contact Server 2 and from PG B to Aspect Contact Server 1. For this reason, if PG A fails, PG B cannot connect to Contact Server 1 or the reverse.

Configuration Using a Simplex PG with Dual CMI Servers

In a simplex PG configuration, Aspect Contact Server PG connects with the backup CMI server if the primary CMI server fails. This configuration is shown in Figure 32.

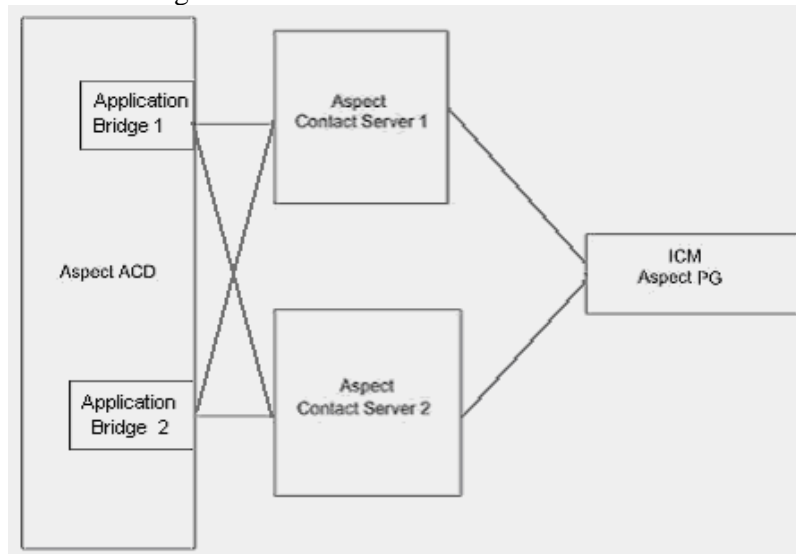


Figure 32: Aspect Contact Server Simplex PG Configuration

Configuration Using a Redundant PG with Dual CMI Servers

In a redundant configuration of the Aspect Contact Server PG, there is a connection from PG A to Contact Server2. This configuration, as shown in Figure 33, enables PG A to connect to the Aspect Contact Server2 if Aspect Contact Server1 fails.

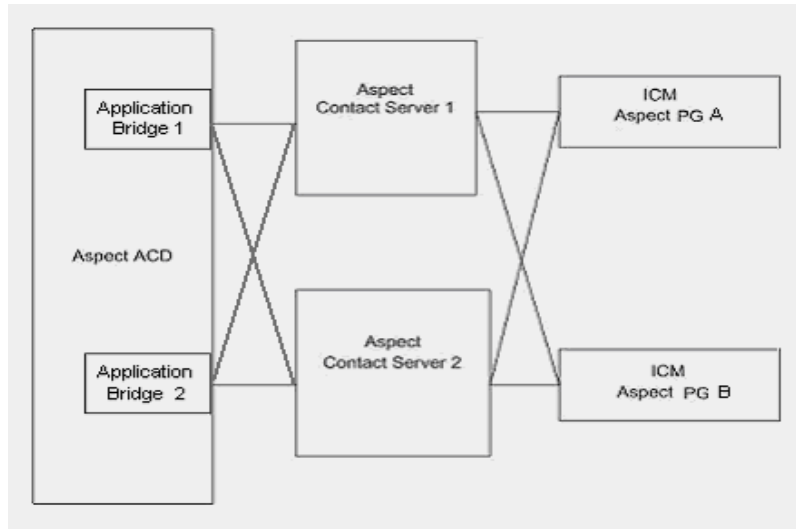


Figure 33: Aspect Contact Server Redundant PG Configuration

In a redundant configuration of the Aspect Contact Server PG, when PG A fails, the configuration enables PG B to connect to the Aspect Contact Server1. When PG A fails, the link is still active between the Aspect ACD Application Bridge and the Aspect Contact Server1. PG B attempts to establish a connection with Aspect Contact Server1. This configuration is shown in Figure 33.

Appendix A: Outstanding Event Link Issues

The following list highlights several outstanding issues with the new version of the Aspect Event Link provided in Call Center Release 6.0. Issues about the Event Link resolved with Unified ICM workarounds are not provided.

- **Running Multiple Data Link Applications.**

The Aspect Call Center only provides the CDM/CTM to the last Data Link for which the Call Center invoked a SEND DATA or RECEIVE DATA step. Unified ICM PG uses the Event Link Interfaces and does not require the CDM/CTM to properly terminate calls. But, because there are occasions when the Call Center must provide a SEND DATA or RECEIVE DATA step (Post-Routing or CCT JUMPING), multiple applications running for a Call Center require the Unified ICM Application Bridge Server.

- **Data Links that are configured NOT to receive the CDMs or CTMs still have precedence for those messages if they are the last Data Link to apply Call Treatment.**

To address this problem, the Call Center should not consider Data Links that are NOT configured to receive the CDM/CTM when a call terminates. You then configure the Unified ICM Data Link to NOT receive the CDM/CTM.

- **Calls that are Interflow rejected cause the Aspect Event Link to issue a Call Disconnect Event even though the call persists on the original Call Center.**

There is currently no workaround for this problem.

(FIXED in Release 6.1.)

- **The Event Link does not send over a Call Disconnect Event for HELP calls noticed.**

Unified ICM does not track help calls invoked by agents, because the Event Link does not provide a Call Disconnect Event.

(FIXED in Release 6.1.)

- **Delivery of Transfer and Disconnect Event Messages are inconsistent.**

The Aspect Event Link does not provide a Call Disconnect Event Message for the resulting call in a consultative transfer (#8xxx). This behavior can be an issue for calls transferred off switch, where they might not be properly terminated when the call drops.

The Aspect Event Link does not provide a Call Disconnect Event Message for the resulting call in an Agent-to-Agent consultative transfer. Unified ICM has provided a workaround for this case.

- **The Transfer and Disconnect Event Message do not consistently set the Reason CODE of the transferred call to 'E' the Transfer Termination Indication FLAG.**

Research for a workaround is in progress.

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