CISCO SYSTEMS

Cisco IPCC Gateway Deployment Guide
ICM/IPCC Enterprise Edition Release 7.0(0), IPCC Express Release 4.0(0)

Releases 7.0(0) and 4.0(0)

March 2006

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Preface

Purpose

This manual describes how to install, configure, and use the Cisco IPCC Gateway feature, which allows Cisco IPCC Enterprise or Cisco IPCC Express to appear as an ACD to Cisco ICM software.

Audience

This document is intended for contact center system administrators, supervisors, and managers who are responsible for deploying the IPCC Gateway software with IPCC Express or ICM/IPCC Enterprise software.

Organization

The following table describes the information contained in each chapter of this guide.

Organization

Chapter	Description
Chapter 1, About IPCC Gateway (page 9)	Introduces the IPCC Gateway feature.
Chapter 2, Deploying IPCC Gateway with ICM/IPCC Enterprise (page 19)	Provides installation and configuration instructions for deploying IPCC Gateway with ICM/IPCC Enterprise.
Chapter 3 Deploying IPCC Gateway with IPCC Express (page 27)	Provides installation and configuration instructions for deploying IPCC Gateway with IPCC Express.
Chapter 4, Understanding Reporting (page 45)	Describes Enterprise-wide reporting in IPCC Gateway deployments.

The Index helps you find information in this guide.

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Related Documentation

You need the following documentation when deploying IPCC Gateway with IPCC Express:

- *Getting Started with Cisco IPCC Express*

- *Cisco CRS Installation Guide*

- *Cisco CRS Administration Guide*

- *Cisco CRS Scripting and Development Series: Volume 1, Getting Started with Scripts, and Volume 2, Editor Step Reference*

- *Cisco CAD Installation Guide*

- *Cisco Desktop Administrator User's Guide*

You need the following documentation when deploying IPCC Gateway with ICM/IPCC Enterprise:

- *ICM Installation Guide for Cisco ICM Enterprise Edition*

- *ICM Configuration Guide for Cisco ICM Enterprise Edition*

- *System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition*

- *IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition*

- *IPCC Administration Guide for Cisco IPCC Enterprise Edition*

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You need the following documentation to help you understand enterprise-wide Reporting:

- *IPCC Enterprise Reporting Guide*

- *Template Design Guide Using InfoMaker for Cisco ICM/IPCC Enterprise & Hosted Editions*

- *Database Schema for Cisco ICM/IPCC Enterprise & Hosted Editions*

- *WebView Installation and Administration Guide for Cisco ICM/IPCC Enterprise & Hosted Editions*

- WebView On-line Help and *WebView Template Reference Guide for Cisco IPCC Enterprise & Hosted Editions*

- *Cisco CRS Database Schema*

- *Cisco CRS Historical Reports User Guide*

- *Cisco CRS Historical Reporting Administrator and Developer Guide*

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

Cisco documentation and additional literature are available in the Product Documentation DVD package, which may have shipped with your product. The Product Documentation DVD is updated regularly and may be more current than printed documentation.

The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software

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installation, configuration, and command guides for Cisco products and to view technical documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD from the Ordering tool or Cisco Marketplace.

Cisco Ordering Tool:

http://www.cisco.com/en/US/partner/ordering/

Cisco Marketplace:

http://www.cisco.com/go/marketplace/

Ordering Documentation

Beginning June 30, 2005, registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL::

http://www.cisco.com/go/marketplace/

Cisco will continue to support documentation orders using the Ordering tool:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/

- Instructions for ordering documentation using the Ordering tool are at this URL:

  http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

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Cisco Systems Attn: Customer Document Ordering 170 West Tasman Drive San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL: **http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html**

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.

- Obtain assistance with security incidents that involve Cisco products.

- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL: **http://www.cisco.com/go/psirt**

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL: **http://www.cisco.com/en/US/products/products_psirt_rss_feed.html**

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies - security-alert@cisco.com

    An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- Nonemergencies - psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302

- 1 408 525-6532

Note: We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information

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that is compatible with PGP versions 2.x through 8.x. Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one that has the most recent creation date in this public key server list: **http://pgp.mit.edu:11371/ pks/lookup?search=psirt%40cisco.com&op=index&exact=on**

The link on this page has the current PGP key ID in use.

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note: Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

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http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly

To open a service request by telephone, use one of the following numbers:

- Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

- EMEA: +32 2 704 55 55

- USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1) -- Your network is down, or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2) -- Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3) -- Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4) -- You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

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http://www.cisco.com/go/marketplace/

- Cisco Press publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

http://www.ciscopress.com

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

http://www.cisco.com/packet

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

http://www.cisco.com/go/iqmagazine

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

http://www.cisco.com/ipj

- World-class networking training is available from Cisco. You can view current offerings at this URL:

http://www.cisco.com/en/US/learning/index.html

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Chapter 1

About IPCC Gateway

This section introduces the IPCC Gateway feature, which allows Cisco IPCC Enterprise or Cisco IPCC Express to appear as an ACD to Cisco ICM software.

This section contains the following topics:

What is the IPCC Gateway Feature?

The IPCC Gateway feature allows IPCC Enterprise or IPCC Express to appear as a traditional ACD connected to the ICM system. IPCC Gateway does this by using the ICM Peripheral Gateway (PG) component to communicate through the CTI layer interface in IPCC Enterprise or IPCC Express.

The IPCC Gateway feature uses two distinct PG types:

- IPCC Express Gateway PG, which connects the ICM system to IPCC Express

- IPCC Enterprise Gateway PG, which connects the ICM system to IPCC Enterprise (with an IPCC System PG)

Figure 1 shows the relationship of the PGs to the ICM system.

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Figure 1: ICM and PG Relationship
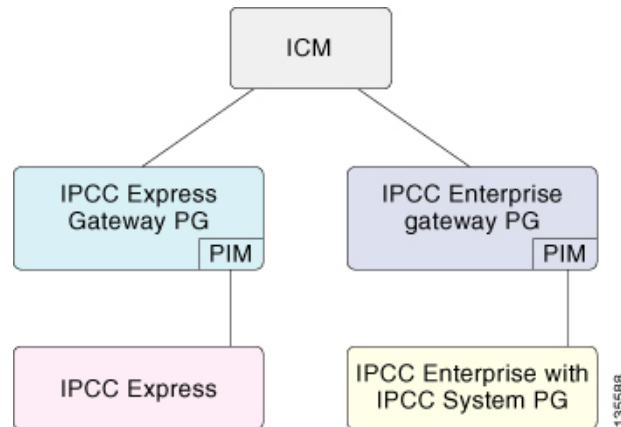
IPCC Gateway PG provides all standard Peripheral Interface Manager (PIM) data and functionality including:

- Call event notification

- Agent State notification

- Translation Routing

- Pre- and Post-Routing

Additionally, IPCC Gateway provides an autoconfiguration feature, which reduces the need for repeating configuration tasks between IPCC Express or IPCC Enterprise and the ICM systems. Autoconfiguration is described in more detail in the deployment chapters (Chapters 2 and 3).

Note: There are differences between the way the IPCC Express Gateway and the IPCC Enterprise Gateway are configured and used. See Chapter 2 for information about deploying the IPCC Enterprise Gateway and Chapter 3 for information about deploying the IPCC Express Gateway.

What is the Parent and Child Relationship?

The systems in an IPCC Gateway deployment play different roles.

We use the terms parent and child to describe the relationship between these roles:

- **Parent**. The ICM Enterprise system that serves as the network or enterprise routing point. The child looks like an ACD to the parent, which uses the appropriate IPCC Gateway PGs to communicate to the CTI server on the child IPCC Express or IPCC Enterprise. In addition, the parent can route between children.

- **Child**. The IPCC Enterprise or IPCC Express system that is set up to function as an ACD. For IPCC Enterprise, this means that the IPCC Enterprise Gateway PG is used to communicate with the parent ICM system; for IPCC Express, it means that the IPCC Express Gateway PG

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is used. The child can receive calls routed from the parent, but is not aware of any other peripherals attached to the parent.

Figure 2 illustrates this relationship.

Figure 2: Parent and Child Relationship
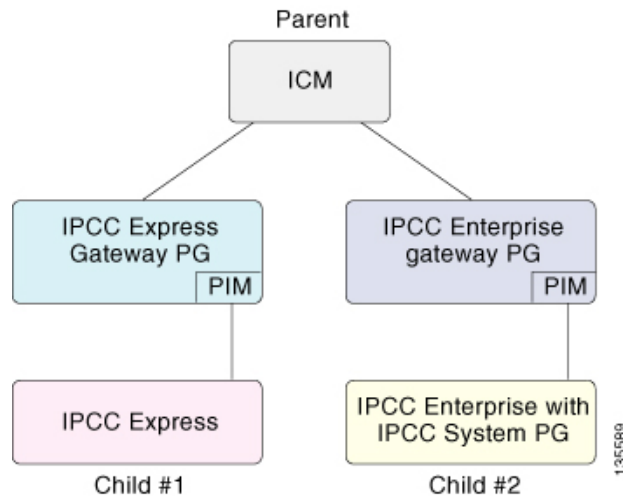
Note: When deploying the IPCC Gateway with either an IPCC Enterprise or IPCC Express child, it is best to get the child system working first before integrating it with the parent ICM system.

About Peripheral Gateways

Each contact center device (ACD or IVR) communicates with ICM software through a PG. The PG reads status information from the device and passes it back to ICM software. The PG runs one or more PIM processes, which are the software components that communicate with proprietary ACD and IVR systems. A single PIM is required for each peripheral to which the PG will interface.

Before you install a Peripheral Gateway (PG), the Windows operating system (for release specifics refer to the *Cisco Intelligent Contact Management Software Release 7.0(0) Bill of Materials*—including Simple Network Management Protocol (SNMP)—must be installed on the computer, you must have set up the Windows Active Directory services for ICM software and you must have set up at least one ICM instance. In the IPCC Express Gateway deployment model, where the IPCC Express Gateway PG is co-resident on the CRS server, the PG's SNMP data is not available

Note: For IPCC Express Gateway deployments, you can connect to only one ICM instance, but one ICM instance can support multiple installations of IPCC Express.

Further, before you can complete the installation of a Peripheral Gateway, you must create configuration records in the ICM database. To create these configuration records you must have installed a CallRouter, a Logger, and an Admin Workstation on the ICM Enterprise parent system.

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See Also

See Chapters 2 and 3 for additional information about deploying IPCC Gateway.

High Availability and Fault Tolerance in IPCC Gateway Deployments

This section describes how IPCC Gateway deployments accommodate failover.

About IPCC Enterprise Solutions and Fault Tolerance

For an IPCC Enterprise solution in an IPCC Gateway deployment, fault tolerance is achieved as it is with other ICM PGs; there is a Side A and Side B PG which can connect to either side (A or B) of a System PG on a child system.

See Also

For more information about fault tolerance, see the *IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition.*

About IPCC Express Solutions and High Availability

An IPCC Express solution in an IPCC Gateway deployment does not support the Side A/Side B model of fault tolerance. Instead, it supports a high availability model.

In the high availability model, the IPCC Express cluster looks like one ACD to the ICM Enterprise parent, and a Side A PG is installed on both nodes of IPCC Express.

See Also

For more information, see High Availability with IPCC Express Gateway (page 41).

About IPCC Gateway Deployments

This section discusses the supported IPCC Gateway deployment models.

IPCC Gateway using IPCC Enterprise Gateway PG

The following topics explain two ways that you can deploy the IPCC Enterprise Gateway PG:

Multiple ICM (parents) with Single IPCC Enterprise (child)

The following figure shows a deployment where two customers (Customer 1 and Customer 2) each running their own ICM Enterprise parent, outsourcing calls to provider site running IPCC Enterprise with System PGs. The provider site has an IPCC Enterprise installation with two IPCC System PGs that connect to their respective IPCC Enterprise Gateway PG for each ICM

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Enterprise parent. The two IPCC Gateway PGs enforce a security in that the information of one customer is not seen by the other and vice versa. The deployment also shows that each customer provides call treatment (prompting) and queuing using Customer Voice Portal (CVP), shown for each customer, before routing calls to the Provider site. The provider site also has the ability to queue calls using IP IVR that is shown connected to the IPCC System PG.

The agents must be broken up into two peripherals (and a separate IP IVR is required if there is local queuing). The provider does realize some economies over having two separate IPCC Enterprise setups for each ICM Enterprise parent, in that the IPCC Router and Logger and Admin Workstation (AW)/WebView/HDS can be shared between them.

Figure 3: Multiple ICM Parent with Single IPCC Enterprise child
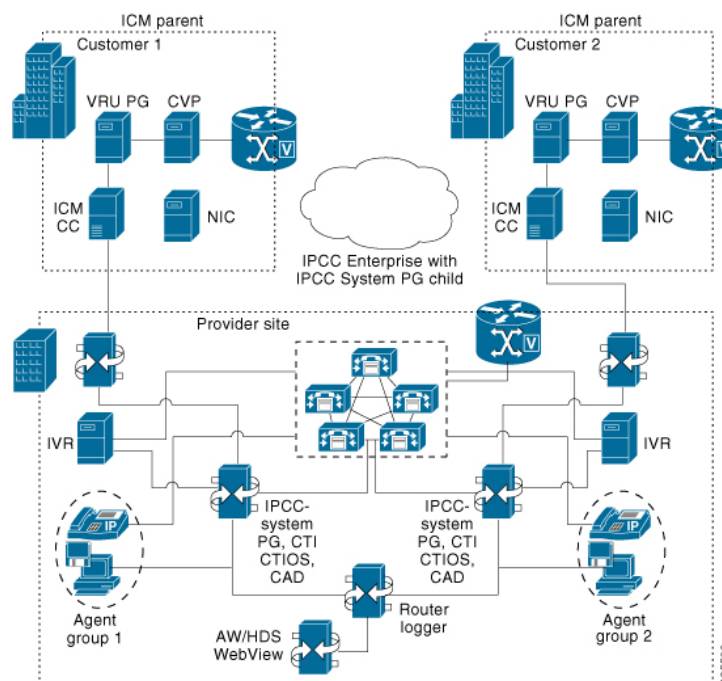
Note: Call types on the IPCC Enterprise child must not span peripherals. That is, a separate set of Call Types is required for each peripheral on the child. This is to keep the correlation between the Call Type on the child to a single peripheral on the parent. Failure to do this will result in the ICM Enterprise parent (Services) seeing only a subset of the calls corresponding to the Call Type on the child. See for more details.

Single ICM Enterprise Parent with Multiple IPCC Enterprise Children

This deployment shows a ICM Enterprise parent with two IPCC Enterprise Gateway PGs connected to two IPCC Enterprise children with IPCC System PG systems.

Note: The IPCC Enterprise child systems could be branch offices or service bureaus.

This deployment allows calls to be translation-routed from the ICM Enterprise parent (Customer shown in figure) to either of the two IPCC Enterprise with IPCC System PG systems (Provider Site 1 and Provider Site 2 shown in figure), each of which will be treated as a separate ACD by the parent ICM. In the figure Customer Voice Portal (CVP)--at the Customer--is shown here

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doing network queuing from the ICM Enterprise parent. This deployment also provides the ability for each child IPCC Enterprise to route calls incoming to those sites through Voice Gateways (not shown in the figure) that are not related to the parent ICM, thus ensuring that call center operations continue if the WAN connection is not reliable. It also accommodates the phasing-in of IPCC Enterprise deployments alongside TDM ACDs. This deployment also allows (identical to TDM) post and translation routing from one child to another through the parent. This includes transfers, consults, and so forth.

Figure 4: Single ICM Parent with Multiple IPCC Enterprise children
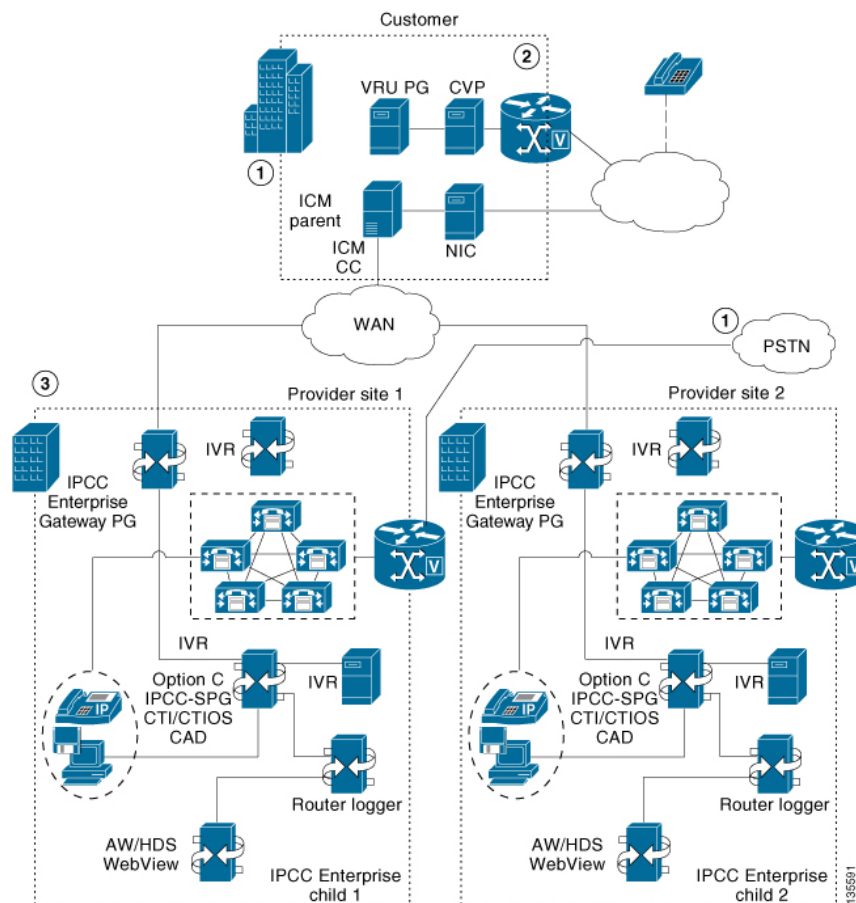
Note:

- This deployment also allows an existing ICM (parent) to coordinate the outsourcing of calls to a Service bureau (Provider sites shown in the figure)

- Although not shown in the figure, this deployment could be expanded.

    Here are other options:

    - It could also route unrelated calls between the two provider sites from the PSTN network through its own Network Interface Controller (NIC). Note that this NIC is not illustrated in the diagram.

    - Separate IPCC Enterprise and IPCC Express sites could be connected to the parent ICM through IPCC Gateway PGs.

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–   You could increase IPCC Enterprise capacity by adding more children to the parent system.

IPCC Gateway using IPCC Express Gateway PG

The following figure shows a deployment model that allows IPCC Express to participate in an enterprise routing environment with ICM software.

Figure 5: IPCC Gateway with IPCC Express Gateway PG with ICM Parent
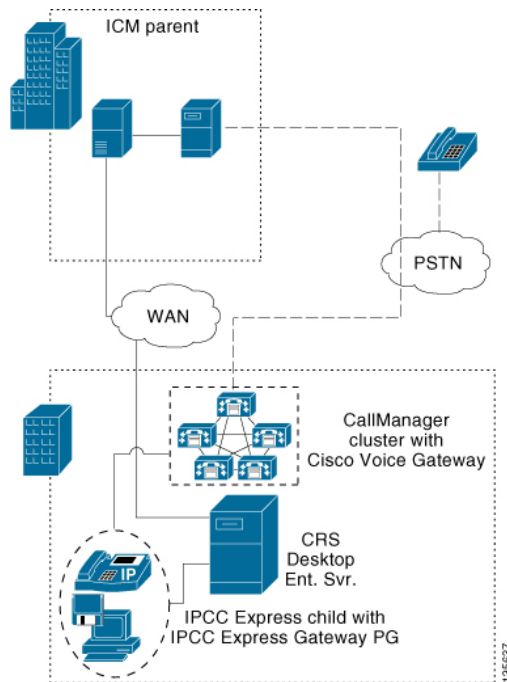
The IPCC Express appears as an ACD to the ICM Enterprise parent (Router and Logger).

Note: The IPCC Express Gateway PG is installed on the same server as the CRS Engine, where it connects with the internal CTI Server of CRS.

Some configuration settings are pulled from the IPCC Express and automatically configured in ICM software.

Unlike IPCC Enterprise deployments, there is no Side B IPCC Gateway in this system – if the IPCC Express system is deployed in a high availability (fault tolerant) model, only the active IPCC Express node is an active IPCC Gateway; all other PGs are also Side A PGs, but inactive. In the case of a failover to the second IPCC Express node, the PG on that node activates.

Routing in IPCC Gateway Deployments

In its purest form, routing is simply a routing client (a PG or NIC) querying the Router for a destination for which to send the call. Different names are given to this function, depending upon the information used and passed, and the destination for the call.

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Before you can route calls, you must create scripts on the child and the parent. For information about routing and scripting see the deployment chapter (Chapter 2 or 3) for your specific solution.

Reporting in IPCC Gateway Deployments

There are two levels of reporting in IPCC Gateway deployments:

- ACD (child)

- Enterprise (parent)

The addition of the IPCC Gateway PGs does not affect the reports on the ACD level; IPCC Enterprise and IPCC Express reports can be run and accurately reflect the state of their respective systems.

However, the data that the child system feeds to the parent through IPCC Gateway will not always correlate on both systems, and this affects the reports on the enterprise level. In some instances, discrepancies are due to timing period issues; in others, they occur because the IPCC Gateway does not populate certain database fields.

See Also

For complete details about the differences between report data in child and parent systems, see

Upgrading to Use an IPCC Gateway Solution

If you have previous versions of ICM/IPCC Enterprise software or IPCC Express software and would like to upgrade so you can use an IPCC Gateway solution, upgrade each product in the IPCC Gateway solution before integrating the parent and child software and installing the PG.

For example, if you have IPCC Enterprise 6.0 and would like to upgrade to IPCC Enterprise 7.0, you must upgrade all of the software products in that solution; that is, you need Cisco CallManager 4.1(3), Cisco Customer Response Solutions (for IP IVR) 4.0(1), Cisco ICM software 7.0(0), and one of the 7.0 desktops (CAD or CTI OS).

To upgrade these products, see the following documents:

- *Upgrading Cisco CallManager*

- *Cisco CRS Installation Guide*

- *Upgrade Guide for Cisco ICM/IPCC Enterprise and Hosted Editions*

After upgrading to the latest releases for the child IPCC Enterprise, install the parent ICM software, including the IPCC Enterprise Gateway PG. (See for more information.)

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Similarly, if you want to upgrade to use IPCC Gateway with IPCC Express, you would need the same applications, but when installing Cisco CRS, you would choose IPCC Express as the product instead of IP IVR, and you need Cisco Agent Desktop 6.1. (See Chapter 3, Deploying IPCC Gateway with IPCC Express (page 27) for more information.)

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Upgrading to Use an IPCC Gateway Solution

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Chapter 2

Deploying IPCC Gateway with IPCC Enterprise

This section provides instructions for deploying the IPCC Gateway feature with IPCC Enterprise.

This section contains the following topics:

What You Need Before You Install

You need the following software so that the IPCC Enterprise Gateway feature can function:

- Cisco CallManager

- Cisco Customer Response Solutions (for IP IVR)

- Cisco Intelligent Contact Management Software

- Cisco Agent and Supervisor Desktops or Cisco CTI OS Desktop

Note: For the Cisco Agent and Supervisor Desktops, be sure to use the release that is compatible with ICM software; do not use the release that is compatible with IPCC Express.

You will need to install the ICM software twice, once as part of the IPCC Enterprise child system, and once as the ICM Enterprise parent.

The following table provides a list of configuration information to collect before you begin:

Required Configuration Information

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IPCC Enterprise Child	Information
Agent	None needed. If configuration is desired it is entered in Agent configuration and agent peripheral number is needed.
Call Type	Call Type ID, Service Level Type, Service Level Threshold
Connection Information	Side A CTI-Server Host IP Address/Connection Port Side B CTI-Server Host IP Address/Connection Port
Instrument	ACD Extension (if device targets are used); agent IDs if they are not.
Peripheral (Simplified)	Peripheral ID
Route Point	Dialed Number
Service	None
Skill Group	Skill Group Peripheral Number

Installation and Configuration Checklist

Install the child IPCC Enterprise system first and be sure you can route calls. Then install the parent ICM Enterprise software. The following table provides the list of tasks involved in setting up the child and parent.

Note: The IPCC Gateway feature supports only the child IPCC Enterprise with an IPCC System PG for use with the IPCC Enterprise Gateway PG.

Installation and Configuration Checklist

Task	Description/Notes	Reference
1. Install and configure the IPCC Enterprise or System IPCC Enterprise software. This includes the System PG.	The process of doing this task involves installing CallManager, IP IVR, ICM, and one of the desktops, either CAD or CTI OS. After doing this task, you can test your child IPCC Enterprise system to be sure everything is working correctly. **Note:** Remember to check the Application Routing Enabled box on the child system for those route points on which you will post-route to the parent.	*System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition* or the *IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition*.
2. Install and configure the Cisco ICM Enterprise parent system, including the IPCC Enterprise Gateway PG.	Use the ICM installation CD. You must install Side A and Side B IPCC Enterprise Gateway PGs.	*ICM Installation Guide for Cisco ICM Enterprise Edition*
3. Configure the IPCC Enterprise Gateway PG using the ICM PG Explorer.	Use the instructions in How to Configure the IPCC Enterprise Gateway PG (page 21) and How to Configure the IPCC Enterprise Gateway PIM (page 22).	*ICM Configuration Guide for Cisco ICM Enterprise Edition*.

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Task	Description/Notes	Reference
	Note: In the Advanced tab of the PG Explorer, ensure that Agent autoconfiguration is disabled in order for the IPCC Enterprise Gateway PG to function properly.	
4. Create a script on the parent ICM Enterprise system.	This script will interact with the IPCC Enterprise Gateway.	For general information about scripting, see "Scripting in an IPCC Environment" in *ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise and Hosted Editions*.
5. Start the ICM Service for the IPCC Gateway PG.	In the ICM Service Control dialog box, select the Services name for the IPCC Enterprise Gateway PG and click **Start**.	For general information about ICM Service Control, see the *ICM Configuration Guide for Cisco ICM Enterprise Edition*.

How to Configure the IPCC Enterprise Gateway PG

Complete the following steps:

1. Start the Configuration Manager on the Admin Workstation. To start the Configuration Manager, double-click on its icon within the ICM Admin Workstation program group.

   For information about the Configuration Manager, see the *ICM Configuration Guide for Cisco ICM Enterprise Edition.*

2. Follow the instructions in the Peripheral Gateway chapter of the *ICM Installation Guide for Cisco ICM Enterprise Edition* using the following IPCC Enterprise Gateway-specific settings:

   In the Peripheral Gateway Properties dialog box: **Client Type Selection**. Select IPCC Enterprise Gateway as your "switch" PG type.

   You cannot also select VRU. If you attempt to add a VRU in this case, an error message is displayed.

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How to Configure the IPCC Enterprise Gateway PIM

To configure the PIM, complete the following steps:

1. In the IPCC Enterprise Gateway Configuration dialog box, to put the PIM into service, check the **Enabled** option. This allows the PIM to communicate with the peripheral when the Peripheral Gateway is running.

2. In the **Peripheral name** field, enter the Peripheral name of the *parent* server from the Configuration Manager (use the PG Explorer tool to view the Peripheral name).

3. In the **Peripheral ID** field, from the Peripheral record, enter the Peripheral ID value of the *parent* server from the Configuration Manager (use the PG Explorer tool to view the Peripheral ID).

4. In **System A name**, enter the hostname or IP address of the Side A *child* server.

5. In **System A port**, enter the port on the Side A *child* server (the server port of the CG).

6. In **System A Peripheral ID**, enter the peripheral ID of the Side A *child* peripheral.

   Note: Currently, only one peripheral is supported on an IPCC Enterprise child system; its Peripheral ID value is **1000**.

7. If the child system is duplexed, in **System B name**, **System B port**, and **System B Peripheral ID**, enter the corresponding information for Side B. If the child system is simplexed, leave these fields blank.

Autoconfiguration with IPCC Enterprise Gateway

For IPCC Gateway deployments with an IPCC Enterprise child *Call Types* are configured as *Services*. Autoconfiguration is enabled by default in the Peripheral tab of the PG Explorer. Autoconfiguration takes effect when the PG is started.

When autoconfiguration occurs between the parent ICM and the child IPCC Enterprise, the following ICM software tables are populated:

1. Agent/Person

2. Skill Group

3. Service

4. Peripheral Monitor

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Note: Autoconfiguration-like entities are configured on the parent for Agent, Skill Group, but not for Call Type (child) and Service (parent).

Default skill groups on the child, which are non-viewable, get created as real skill groups on the parent. Note that activity done in the default skill group on the child will show up in these real skill groups on the parent.

Configure Service members on the parent. To configure service members for any given service, examine the script for a call type on the child and note to what skill groups the script offers the call. On the ICM Enterprise parent, make these skill groups service members of that Service.

Note: Autoconfiguration does not provide complete configuration for ICM software. You must configure many other elements, such as Dialed Numbers, scripts, peripheral targets, routes, and so forth.

If *any* error occurs during autoconfiguration, the keys on the parent are not updated. The IPCC Enterprise PIM continues to upload the entire child configuration to compare it every time it is started until no configuration errors are encountered.

Autoconfiguration Maintenance

The following information provides help with maintenance:

- Errors from the last run of the autoconfiguration dialog box can be found in the main PG directory for the PG in question. The file is named **AutoConfigError.txt**. It can be viewed with any text editor. For example, **C:\icm\cust1\PG1A\AutoConfigError.txt** could be an example file name. The file contains the time and date and a brief error message as to why an element could not be configured. The same is true for autoconfiguration with the IPCC Express Gateway.

- Periodically, manually delete entries in the Service, Agent, and Skill Group tables that allow deletion. Items that do not allow deletion show a circle with a line through it next to them. Items can be deleted on the parent when they are deleted on the child.

- Frequently use the Administer Deleted ICM tool to **permanently delete** any deleted records. This will help to reduce the number of autoconfiguration errors. The fewer records that are marked for deletion that still exist, the smaller the chance that autoconfiguration will get duplicate errors when creating objects.

Note: Do not confuse IPCC Gateway autoconfiguration with Agent autoconfiguration, which activates the AgentCfg utility to maintain agent configuration data for the peripheral. (Agent autoconfiguration is a check box option available on the Advanced tab in the PG Explorer.) In fact, you must ensure that Agent autoconfiguration is disabled in order for the IPCC Enterprise Gateway PG to function properly.

See Also

See the section

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Routing for the IPCC Enterprise Gateway

The script on the ICM Enterprise parent interacts with the IPCC Gateway. For information about scripting for IPCC Enterprise, see the *ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise and Hosted Editions.*

All route points that are handled remotely (with Application routing enabled) should have default "local" scripts to run in case there is no host (parent) available. These scripts should include Post Route points as well as translation route destinations.

The following simple routing script has an LAA node that selects the skill group with the longest available agent (if an agent is available) among skill groups on the same ACD or a different ACD. If no agents are available, then the script selects the Service with the Minimum Expected Delay (MED) among services on the same or different ACD.

Figure 6: IPCC Enterprise Routing Script
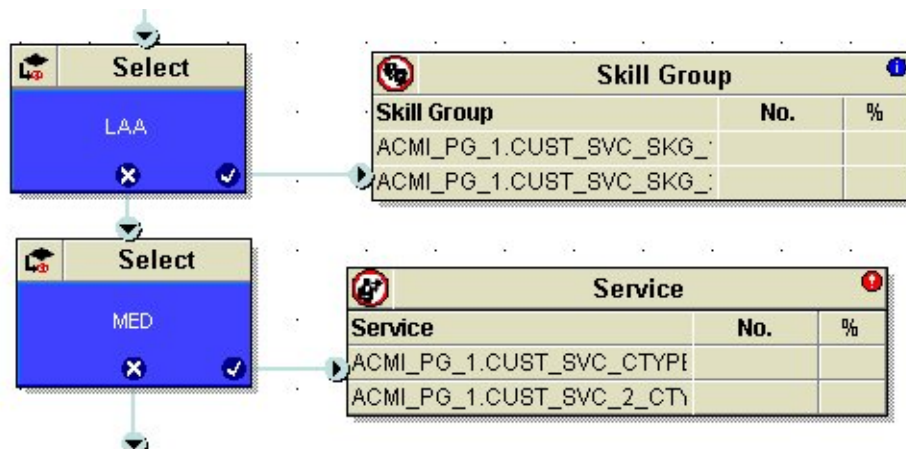
Note: Scripting in an IPCC Gateway deployment is no different than scripting between ICM and all other TDMs.

Troubleshooting in an IPCC Enterprise Gateway Deployment

This section provides help in diagnosing and correcting problems that occur in an IPCC Gateway deployment.

Post-routing from child system does not work

Symptom:

Post-routing from the IPCC Enterprise child system is not working.

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Message:

None.

Cause:

The problem might be one of the following:

- Route point is not configured in the ICM Enterprise parent Peripheral Monitor table.

- The child system does not have a dialed number configured.

- The Application Routing Permitted check box is not checked in the child system dialed number configuration.

Action:

Check the Peripheral Monitor table to be sure a Route Point has been configured. Also check to be sure a dialed number has been configured and that the Application Routing Permitted check box is checked.

Translation Routing does not work

Symptom:

Translation Routing is not working.

Message:

None.

Cause:

The problem might be one of the following:

- The Translation Route is not defined on the ICM Enterprise parent.

- Route points for translation route targets are not defined on the IPCC Enterprise child.

- Route points are not defined in the Dialed Number Table of the child system.

- Route points defined in the child system Dialed Number Table do not have the Application Routing Permitted check box checked.

Action:

Check to be sure that Translation Routes are defined on the ICM Enterprise parent, that Route points for translation route targets have been defined on the child, and that Route Points are

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defined in the child system's Dialed Number Table and that the Application Routing Permitted check box is checked.

Events are coming across but no statistics are showing up

Symptom:

Although events are happening, no statistics are available.

Message:

None.

Cause:

A possible cause for this problem is that the peripheral ID of the parent system does not match the peripheral ID of the child system.

Action:

Ensure that the host peripheral ID of the ICM Enterprise parent system matches the peripheral ID of the IPCC Enterprise child system.

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Chapter 3

Deploying IPCC Gateway with IPCC Express

This section provides instructions for deploying the IPCC Gateway feature with IPCC Express.

This section contains the following topics:

What You Need Before You Install

You need the following software so that the IPCC Express Gateway feature can function:

- Cisco CallManager

- Cisco Customer Response Solutions (for IPCC Express)

- Cisco Intelligent Contact Management Software

- Cisco Agent and Supervisor Desktops

Note: For Cisco Agent and Supervisor Desktops you must use the release that is compatible with IPCC Express; do not use the release that is compatible with ICM software.

Although Cisco CallManager and Cisco CRS can usually be installed on the same machine, when using the IPCC Express Gateway feature, you must install Cisco CallManager and Cisco CRS on separate machines.

Note: The IPCC Express Gateway PG software is located on the ICM installation CD, but you must install that part of the ICM software on the same machine as the CRS software. You will find installation instructions for the PG software in "How to Install the IPCC Express PG" (page 28).

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Installation and Configuration Checklist

This section lists the installation and configuration tasks for deploying IPCC Gateway with IPCC Express.

Note: For high availability in an IPCC Express Gateway deployment, you must install IPCC Express and the IPCC Express Gateway PG on two nodes of CRS (master and standby).

Installation and Configuration Checklist

Task	Description/Notes	Reference
1. Install the CallManager software.	You must install CallManager on a different machine than IPCC Express. After installing CallManager, configure a CRS administrator. Make note of the username and password as well as the IP address of the machine on which CallManager is running.	*Cisco CallManager Installation Guide*
2. Install the IPCC Express software.	Cisco IPCC Express is a product on the Cisco CRS platform. During the CRS installation process, you choose the IPCC Express product. All licensed IPCC Express packages (Standard, Enhanced, and Premium) work with the IPCC Gateway.	*Cisco Customer Response Solutions Installation Guide*
3. Configure the CallManager and IPCC Express software.	You will notice that when you configure route points and ports on CRS, they are also configured in CallManager. Some autoconfiguration happens between IPCC Express and ICM software. See the section "Autoconfiguration Between IPCC Express and ICM" for details.	*Cisco CallManager Administration Guide, Getting Started with Cisco IPCC Express* and *Cisco CRS Administration Guide*
4. Install and configure the Cisco Agent and Supervisor Desktops.	You will need the IP addresses for CallManager and CRS during the installation process. After installing and configuring CAD, you can test the child system to be sure all is working as expected.	*Cisco CAD Installation Guide* and *Cisco Desktop Administrator's User Guide*.
5. Install the Cisco ICM Enterprise parent system, if the ICM software is not already installed.	Note that you can only connect one ICM instance for IPCC Express Gateway.	*ICM Installation Guide for Cisco ICM Enterprise Edition*
6. Configure the IPCC Express Gateway PG in the ICM software.	Use the ICM Configuration Manager on the Admin Workstation to access the PG Explorer to complete this task.	See the section "Configuring the IPCC Express Gateway PG in ICM" and the *ICM Configuration Guide for Cisco ICM Enterprise Edition* for instructions.

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Task	Description/Notes	Reference
7. Install the Gateway PG software on the same machine where you installed IPCC Express.	The PG software is on the ICM installation CD. **Warning!** In the MDS and DMP Properties dialog box, make sure that the **Disable ICM time synchronization checkbox** is *checked* (the default). For more information, see "IPCC Express Gateway PG Setup and Time Synchronization" (page 33).	See the section "Installing the IPCC Express Gateway PG" and the *ICM Installation Guide for Cisco ICM Enterprise Edition*.
8. Configure the ICM Enterprise parent software.	Use the ICM Configuration Manager on the Admin Workstation to complete this task. Some autoconfiguration has taken place; configure other elements such as call types, labels, and so forth. **Note:** • In an IPCC Express Gateway system the enterprise Expanded Call Context (ECC) variable must be defined in IPCC Express, Cisco Desktop Administrator (CDA), and ICM software. In addition, all ECC variable names should begin with the characters: `user.`(includes period). • For more information on ECC variables, see "Call Variables in IPCC Express Gateway" (page ?).	*ICM Configuration Guide for Cisco ICM Enterprise Edition*
9. Create a script on IPCC Express	Create a script that interacts with the IPCC Express Gateway PG, taking special care when specifying call variables/ECC variable settings.	For general information about using the CRS Editor to create scripts, see *Cisco CRS Scripting and Development Series: Volume 1, Getting Started with Scripts*, Chapter 18 "Designing IPCC Gateway Scripts" and *Volume 2, Editor Step Reference*.
10. Create a script using ICM software.	Create a script that interacts with the IPCC Express Gateway PG, taking special care when specifying call variable/ECC variable settings.	For general information about ICM Scripting, see *ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise and Hosted Editions*.

How to Configure the IPCC Express Gateway PG in ICM

On the machine where you have installed the ICM software, open the Admin Workstation.

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Complete the following steps to configure the PG:

1. From the Configuration Manager, select **Tools > Explorer Tools > PG Explorer**.

2. In the Logical Controller tab in the **Name** field enter the name of the PG.

3. In the Client Type field select **IPCC Express Gateway**.

4. Click **Save**. In the bottom left pane of the PG Explorer the PG name appears. Also, additional tabs appear under the Logical Controller tab. On the Logical Controller tab you see the Logical Controller ID and the Peripheral ID.

5. On the Peripheral tab, be sure to check the **Enable Post-Routing** check box and the **Peripheral Auto Configured** check box.

6. On the Routing Client tab, add the name of the PG in the Name field and complete the other fields.

7. Click **Save.**

The following figure shows the ICM PG Explorer with the configured PG and Peripheral Tab fields.

Note: The Logical Controller ID on the Logical Controller tab is a unique identifier used to reference the PG's Logical Interface Controller table. This is a read-only field. When you create a new PG, the system places UNASSIGNED in this field and automatically creates an ID when you save your edits. See the *ICM configuration Guide for cisco ICM Enterprise Edition* and the *ICM Installation Guide for Cisco ICM Enterprise Edition* for more details.

Figure 7: ICM PG Explorer

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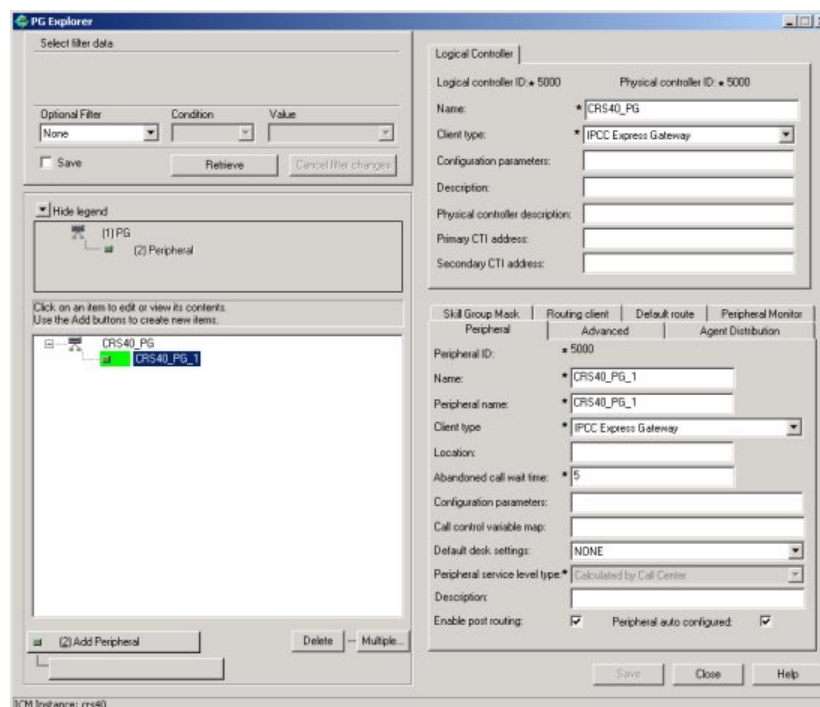
The following figure shows the configured Routing client tab of the PG Explorer:

Figure 8: Routing Client Tab

Note: In the Advanced tab of the PG Explorer be sure that Agent autoconfiguration is disabled in order for the IPCC Express Gateway PG to function properly.

How to Install the IPCC Express Gateway PG

The IPCC Express Gateway PG must be installed on the same machine where you install IPCC Express. Do not install the PG on the machine where you install the other ICM software.

Note: If you want to use high availability, you must repeat the following procedure on a second machine on which IPCC Express is installed.

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To install the IPCC Express Gateway PG, complete the following steps:

1. Run **setup.exe** from the ICM installation CD. The Cisco ICM Setup dialog box appears.

2. Click **Add** under ICM Instances, and add an instance if one does not already exist.

3. Click **Add** under ICM components. The ICM Component Selection dialog box appears.

4. Select **Peripheral Gateway**. The Peripheral Gateway Properties dialog box appears.

5. Make sure that the following boxes are *not checked*: **Auto start at system startup** and **Duplexed Peripheral Gateway**.

6. Select **IPCC Express Gateway** from the Client Type Selection section of the window.

7. Accept the default drive location for the installation of the PG software, choose a language, and then click **Next**. The Peripheral Gateway Component Properties dialog box appears.

8. In the Peripheral Interface Managers section, click **Add**. The Add PIM dialog box appears.

9. Add a PIM; for example, PIM1. Click **OK**. A configuration dialog box appears.

   Do the following:

   – Check the **Enabled** option.

   – In the **Peripheral Name** field enter the name of your PG.

   – In the **Peripheral ID** field, enter the ID of the ICM Enterprise parent server. You can use the ICM PG Explorer tool to access the ID.

   – In the **IPCC Express Host Name** field, enter the IP address or the host name of the IPCC Express child server.

   – In the **IPCC Express Host Port** field, enter the port number of the IPCC Express child server. The default port number is 42027.

10. Click **OK**. The Peripheral Gateway Component Properties dialog box reappears.

11. Click **Advanced**. The MDS and DMP Properties dialog box opens.

12. In the MDS and DMP Properties dialog box, make sure that the **Disable ICM time synchronization checkbox** is *checked* (the default).

Warning: Leaving this box *unchecked* can lead to catastrophic results, in some cases even bringing down the call center. (For more information, see "IPCC Express Gateway PG Setup and Time Synchronization" (page 33).)

13. Click **OK**. The Peripheral Gateway Component Properties dialog box reappears.

14. Click **Finish** to exit Setup. After the PG is installed, you will see the ICM Service Control icon on your desktop.

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Note: More detailed information is provided about installing and configuring PGs in the *ICM Installation Guide for Cisco ICM Enterprise Edition*. What is provided here is information particular to the IPCC Express Gateway PG.

IPCC Express Gateway PG Setup and Time Synchronization

The **Disable ICM time synchronization** checkbox in the MDS and DMP Properties dialog affects time synchronization between systems. Since the Windows operating system uses its own integrated time service--making it unnecessary for the ICM to perform a *separate* time synchronization--the box is checked by default. The ICM software documentation states that you should accept this default, except in cases where the PG is configured as a workgroup machine (that is, not a domain).

However, when an IPCC Express Gateway PG is co-located with IPCC Express, this box should *always* be checked, even in cases where the IPCC Express machine is in a workgroup. The reason for this is because IPCC Express uses the Network Time Protocol (NTP) service to synchronize the IPCC Express system time with the NTP server that runs on the Cisco CallManager. If the **Disable ICM time synchronization** box is "unchecked", the IPCC Express Gateway PG will attempt time synchronization with the ICM Central Controller; this will conflict with the NTP service.

Warning: This dual-time synchronization can have a detrimental impact on IPCC Express functionality!

Accepting the default for the **Disable ICM time synchronization** checkbox during the IPCC Express Gateway PG setup will prevent a conflict and the NTP client service running on IPCC Express machine will be able to keep the time synchronized with the Cisco CallManager.

This means that the time on the IPCC Express server and the ICM Central Controller might not be in sync. When this happens:

- The IPCC Express Gateway PG-specific historical data records the IPCC Express system time.

- The ICM central controller delivers a warning message that the IPCC Express Gateway PG is out-of-sync with the ICM system.

- Peripheral reports might not cover equivalent time periods relative to system reports (for example, Call Type reports).

This behavior is similar to what is seen when other ACDs are integrated with ICM software. For more information, see "Understanding Reporting in an IPCC Gateway Deployment" (page 45).

Autoconfiguration between IPCC Express and ICM Software

Autoconfiguration is a feature of the IPCC Gateway that minimizes the need to perform redundant configuration tasks on the IPCC Express child and the ICM Enterprise parent.

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The following table shows the elements of IPCC Express that automatically get configured in the ICM software. You make the configuration changes on the CRS Administration user interface.

Autoconfiguration

IPCC Express	ICM Software
Resource	Agent. Note that the agent extension goes to the Station field of the Peripheral Monitor Table.
CSQ	Skill Group
Application	Service
Route Point (Trigger)	Routing Device, Peripheral Monitor Table

Agents are added and extensions are assigned to them in CallManager Administration. In IPCC Express, agents are called resources. This agent information is automatically sent to ICM software by the IPCC Express Gateway. You assign resource groups and skills to agents using the CRS Administration web interface. See the *Cisco CRS Administration Guide*.

Note: For additional information, see .

Autoconfiguration Example of CSQ/Skill Group

For example, when you configure a Contact Service Queue (CSQ) on IPCC Express, the data is sent by the IPCC Express Gateway to the ICM software, where it is automatically configured as a Skill Group.

To enter an IPCC Express CSQ, complete the following steps:

1. From the CRS Administration menu bar, choose **Subsystems > RmCm**.

   The IPCC Express Configuration web page opens, displaying the RM JTAPI Provider area.

2. On the IPCC Express Configuration navigation bar, click the **Contact Service Queues** hyperlink.

   The Contact Service Queues summary web page opens. Enter information in the fields and additional windows as described in the *Cisco CRS Administration Guide*.

3. When all steps in the procedure are complete, click **Add**. The new CSQ displays and all agents belonging to the resource group or skill group selected are now a part of this CSQ.

You can confirm that the skill group has been added to the ICM software by checking the ICM Skill Group Explorer. As shown in the following Skill Group Explorer window, autoconfigured items display on the ICM AW with a special icon next to them (a red circle with a line through the center). This icon means that changes are to be done from IPCC Express only. In addition, some entry fields, such as the No longer used by peripheral check box, are grayed out.

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For information about autoconfiguration maintenance, see the section "Autoconfiguration with IPCC Enterprise Gateway" (page 22).

Figure 9: Skill Group Explorer wtih Red Circle Icon
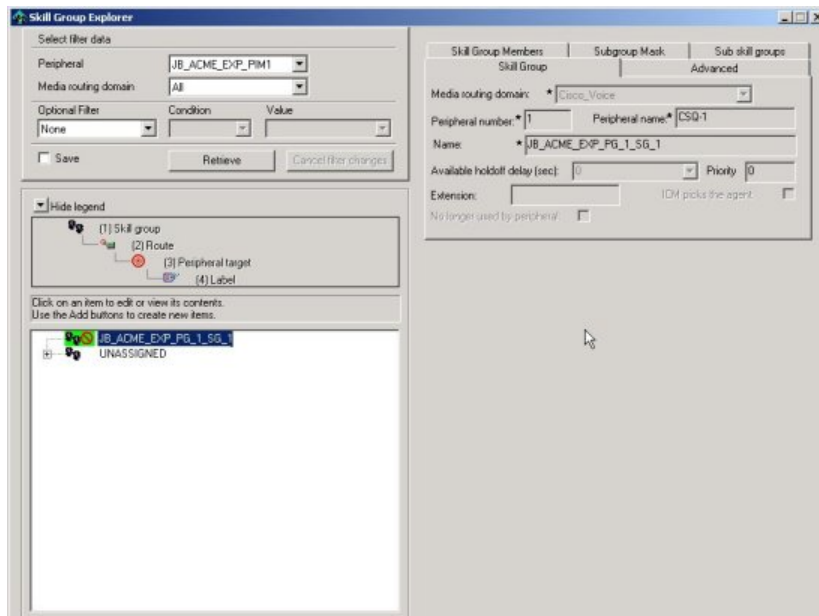
Autoconfiguration settings cannot be changed on ICM software. If you want to make a change to an agent, skill group, or service, you must do so on the child IPCC Express system using the CRS Administration web interface.

Note: Do not confuse IPCC Gateway autoconfiguration with Agent autoconfiguration, which activates the AgentCfg utility to maintain agent configuration data for the peripheral. (Agent autoconfiguration is a check box option available on the Advanced tab in the PG Explorer.) In fact, you must ensure that Agent autoconfiguration is disabled in order for the IPCC Express Gateway PG to function properly.

See Also

For detailed information about configuring IPCC Express, see the *Cisco CRS Administration Guide*.

Routing in IPCC Express Gateway Deployments

In the IPCC Express Gateway deployment model, the IPCC Express child is integrated with the ICM Enterprise parent as an ACD, and all the ICM routing concepts, namely, pre-routing, translation-routing, and post-routing are supported in this deployment model.

Pre-Routing

Pre-routing is an ICM routing concept that enables ICM to execute routing business logic to select the site that the call should be sent to while the call is still in the network.

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As IPCC Express integrates with the ICM Enterprise parent as an ACD, ICM receives a continuous feed of calls and agent state information from IPCC Express via the IPCC Express Gateway PG, and thus ICM knows about the number of agents available in different CSQs on all connected IPCC Express child systems.

In the pre-routing call flow, when a customer makes a call, the network holds the call and sends a route request to ICM via NIC. ICM returns a route response to the network carrier with a label, which is a route-point (trigger) on an IPCC Express site connected to the ICM Enterprise parent. The network uses the label to send the call to the specified destination (IPCC Express child). When the call arrives at the IPCC Express, the call triggers a script that queues the call and routes to an agent.

Note: No call variables are passed during pre-routing.

Post-Routing

Another ICM routing concept which enables the ICM to make secondary routing decisions after a call has been initially processed at a connected ACD (child IPCC Express site).

When a call arrives at an IPCC Express trigger, a workflow (script) is executed. IPCC Express can make a post-route request to ICM software to query final destination of the call (by placing the Request Route step in the workflow).

When ICM software gets the route request by way of the IPCC Express Gateway PG, an ICM script is executed and returns a label to IPCC Express. The IPCC Express script, which sent the post-route request using the Route Request Step, then handles the call according to the label received.

In the case of the IPCC Express Gateway, some examples of the labels returned by ICM are:

- Route point (local or remote): Design the IPCC Express script to redirect the call to the specified route point by using the redirect step and passing the route point in the label.

- CSQ ID (for skill-based routing): Design the IPCC Express to queue the call to a Contact Service Queue (CSQ) by using the Select Resource step and passing the CSQ-Id received in the label.

- Agent ID (for agent-based routing): Design the IPCC Express script to send the call to an agent.

Note:

- Request Route Step will not allow modification of call data. An IPCC Express workflow needs to use the new steps--Get Enterprise Call Info and Set Enterprise Call Info--to access call data

- If the call is redirected from one IPCC Express child to another IPCC Express child, based upon a label returned by ICM, the call variables will not be transferred from one IPCC Express site to the other and the call will appear as a new call to the second IPCC Express site.

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Translation Routing

Translation routing is another ICM routing concept which enables passing the call variables along with a call in case the call is routed from one peripheral to another (one IPCC Express child to another in this deployment model). For sending call from one IPCC Express to another IPCC Express (or IPCC Enterprise), an inter-cluster trunk must be set up between the two CallManagers on each site.

Note: This implies that translation routing should only be used when there are multiple IPCC Express child systems connected to the same ICM Enterprise parent and it is required to pass call variables when calls are redirected from one IPCC Express child to another.

Translation routes must be configured on ICM with a pool of dialed numbers that have been defined on IPCC Express as route points. An ICM script must be set up to set call data and route the call to a service that has been defined as an application on IPCC Express.

Translation routing can be used with both pre- and post-routing.

The translation routing with post-routing call flow is similar to the post-route call flow, until the point where an IPCC Express site gets a new call and sends a route request to the ICM, and the ICM software decides to redirect the call to another IPCC Express site. So the ICM returns a label, which points to a route point (trigger) on another IPCC Express site. In addition to returning the route response (label) to the requesting IPCC Express Site, ICM also sends a separate message (known as the pre-call) with the call variables to the IPCC Express Gateway PG on the IPCC Express site where the call will be redirected.

Upon receiving the label, the first IPCC Express site redirects the call to second IPCC Express. When the call arrives at the second IPCC Express, it makes another route request to ICM using the Request Route step. When the IPCC Express Gateway PG on this second site gets this route request, it matches the route request with the pre-call message from ICM and returns a label and call variables to IPCC Express. IPCC Express handles the call in accordance with the label received and adds the call variables, if present.

In case of translation routing with pre-routing, the call flow in similar to pre-routing. In addition to directing the network carrier to send the call to a given IPCC Express site, the ICM also sends a pre-call to the IPCC Express Gateway PG on that site containing the call variables. When the call arrives at the IPCC Express, it follow the same flow described above.

Scripting on the IPCC Express Child

The CRS Editor contains three steps that specifically interface with IPCC Gateway:

- **Get Enterprise Call Info** / **Set Enterprise Call Info** (Call Contact palette of CRS Editor). Use these steps to retrieve or send data from one part of your system to another. In an IPCC Gateway deployment this enables getting and setting data from IPCC Express to the ICM Enterprise parent and Cisco Agent Desktop. This step must appear in a CRS script before

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the call gets connected to an agent, so place this step in the script before the Request Route or Select Resource Step.

- **Request Route** (IPCC Express palette). Use the Request Route step to request a call routing label from Cisco ICM software. An IPCC Express script can then use that label to process the call further. The route point must be registered in the Peripheral Monitor table of the ICM software, and the route request is uniquely identified by the route point.

  The Request Route step has two output branches:

  – **Selected**. The Request Route step successfully returned a routing destination from ICM software.

  – **Failed**. The Request Route step failed to return a routing destination from ICM software.

Figure 10: Request Route Step
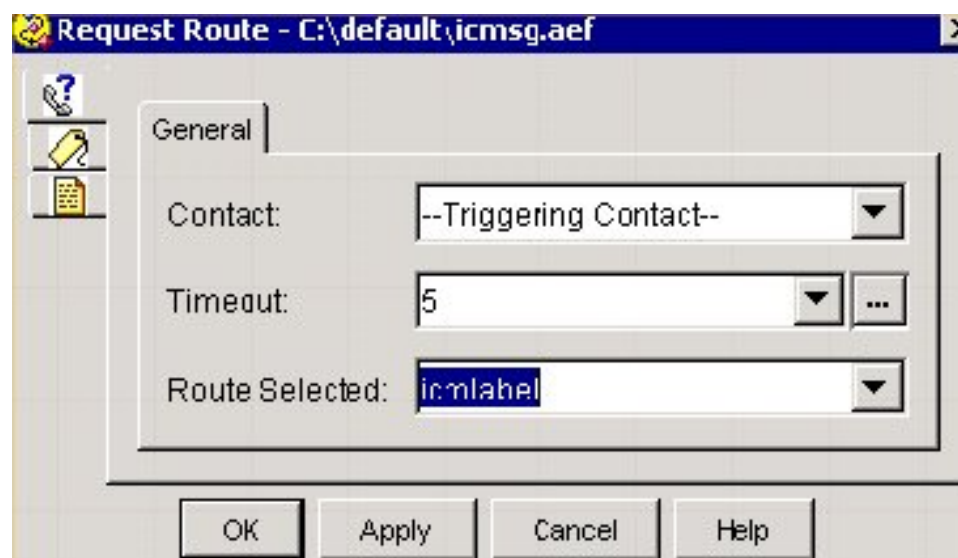
Call Variables in IPCC Express Gateway

IPCC Express uses Call Variables and Expanded Call variables when passing data between the systems. For example, the Set Enterprise Call Info step in the CRS Editor has two tabs. Use the General tab to set call data in predefined call variables; use the Expanded Call Variables tab to set data in enterprise ECC variables.

Every enterprise ECC variable must be defined on both sides of the system that sends and receives the variable data. In an IPCC Express system integrated with ICM software through the IPCC Gateway, the enterprise ECC variable must be defined both in IPCC Express, in Cisco Desktop Administrator (CDA), and also in ICM software (in the Expanded Call Variable List Tool in ICM Configuration Manager).

Note:

- All ECC variable names should begin with the characters: `user.` (includes period).

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- For more information about defining Call Variables/Expanded Call Variables in IPCC Express, see *Cisco CRS Scripting and Development Series: Volume 1, Getting Started with Scripts*, and *Volume 2, Editor Step Reference*. For more information about defining Call Variables/Expanded Call Variables in ICM, see *Scripting and Media Routing Guide for ICM/IPCC Enterprise and Hosted Editions*.

The following figure shows a sample IPCC Express Script that Selects a CSQ:

Figure 11: IPCC Express Script
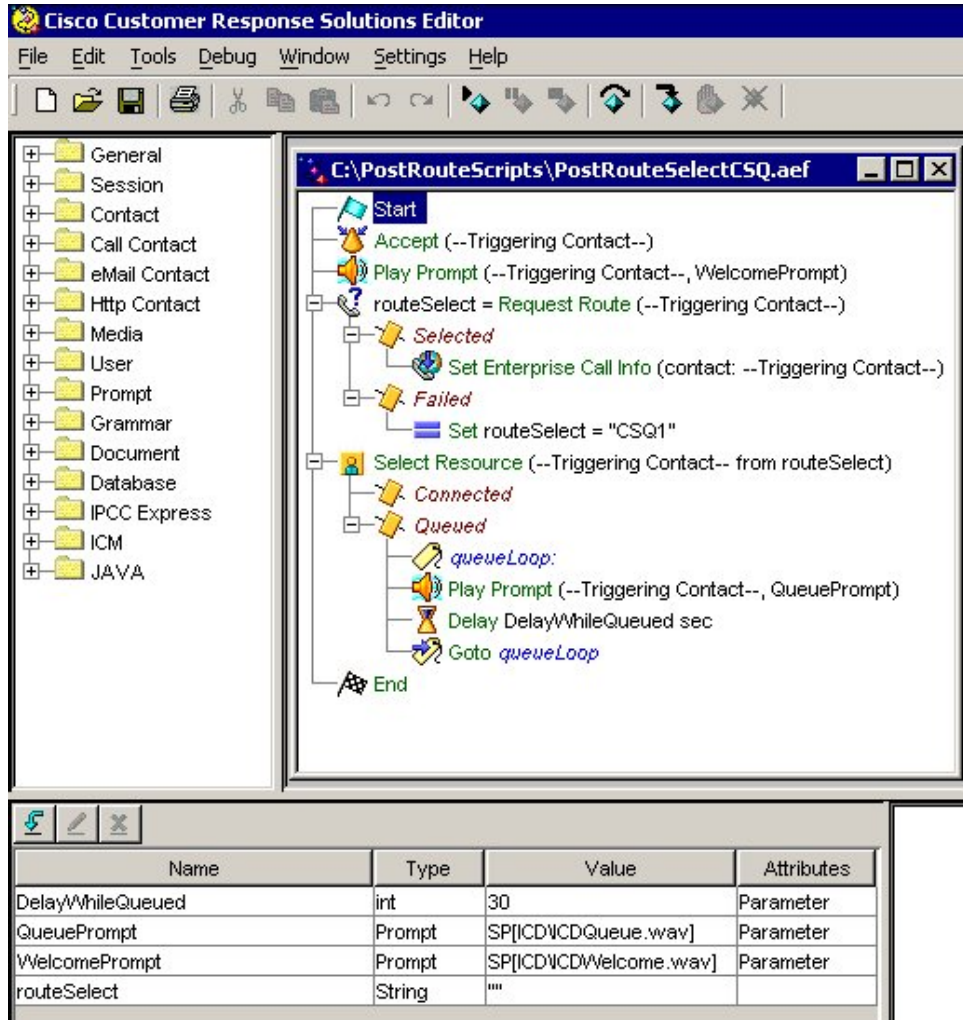
The variables used in the script are shown at the bottom of the figure. The variables, this script, and other scripts are described in detail in the "Designing IPCC Gateway Scripts" chapter in *Cisco CRS Scripting and Development Series: Volume 1, Getting Started with Scripts.* The IPCC Express steps, agent-based routing, and skill-based routing are also explained in that book as well as in *Cisco CRS Scripting and Development Series: Volume 2, Editor Step Reference.*

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Scripting on the ICM Enterprise Parent

The script on the ICM Enterprise parent interacts with the IPCC Gateway PG. The following figure shows an ICM Enterprise parent script that selects Ready resource from skill group and returns a CSQ label.

Figure 12: ICM Routing Script
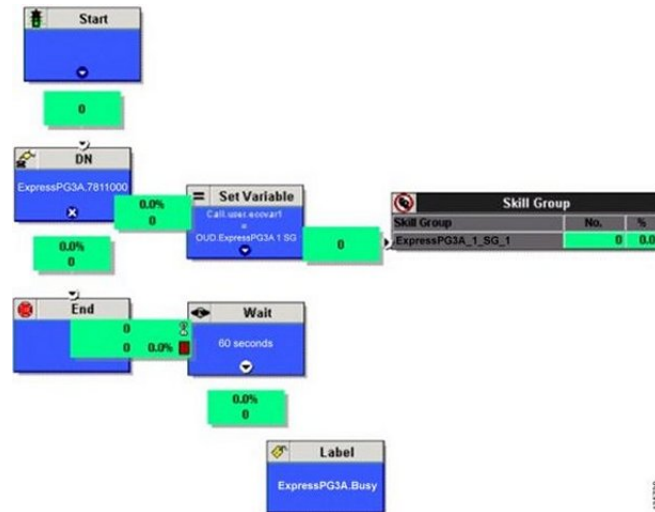
The following figure shows a Skill Group Explorer configuration that returns a CSQ label.

Figure 13: CSQ Label on Skill Group Explorer

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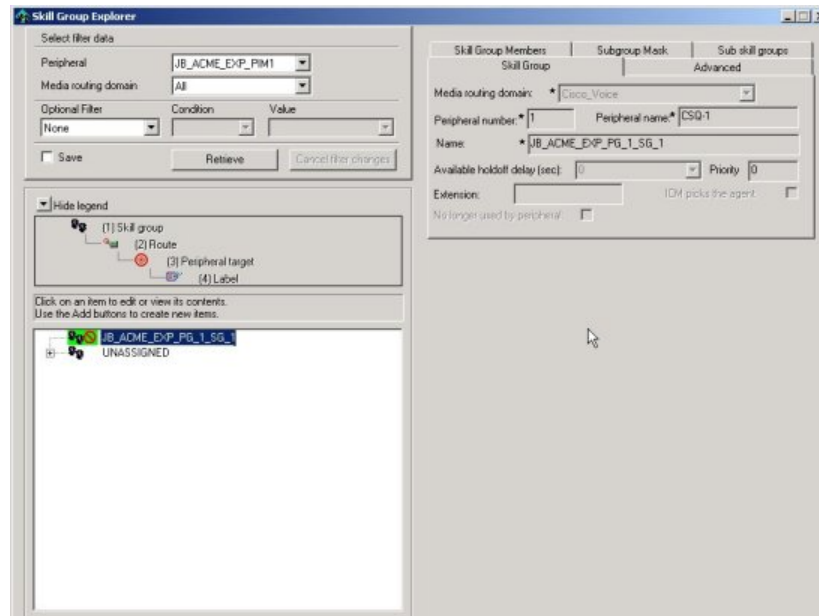
High Availability with IPCC Express Gateway

In high availability, there is a Side A PG installed on each of the two nodes of CRS. Only one of the servers, the Master, is active at a time. When the active side fails, the standby side starts up, but all the calls in queue are dropped and the now-active server and PGs go through a full re-initialization. (For more information on the CRS Master Server, see the *Cisco CRS Administration Guide*.)

The following figure shows an IPCC Gateway Express PG on two CRS Servers, the master and the standby servers.

Figure 14: High Availability with IPCC Express Gateway
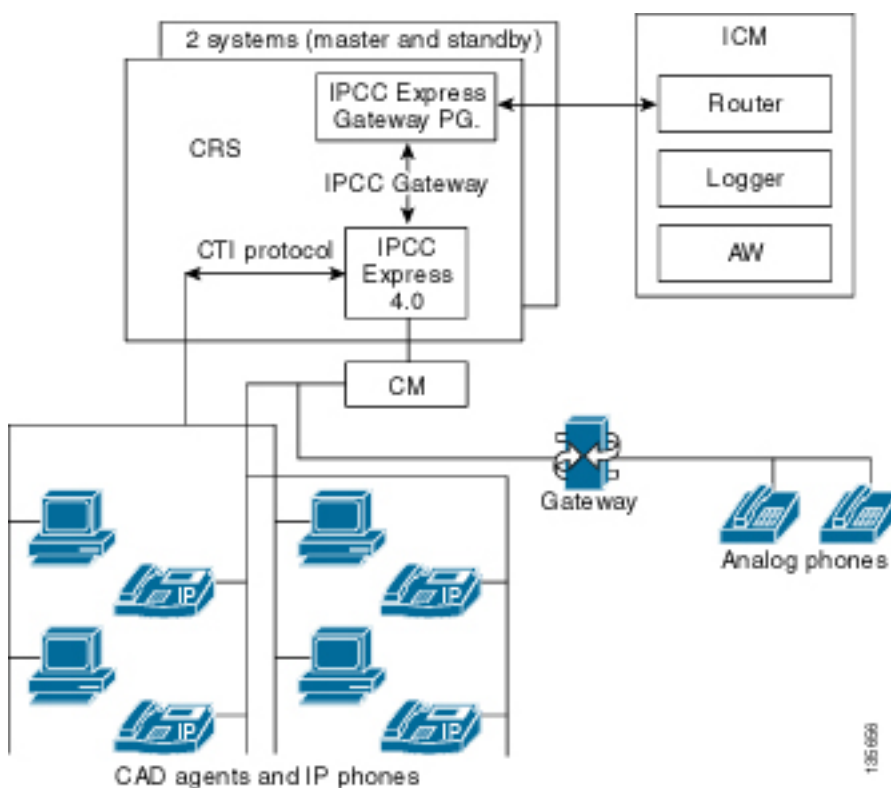
Only the IPCC Express Gateway PG on the Master CRS node is activated and connects to the ICM software CallRouter; the IPCC Gateway Manager controls activation and deactivation of the IPCC Express Gateway PG.

When there is a Mastership change (failover) on the IPCC Express servers, the PGs on both nodes are notified of the change; and activate or deactivate according to their Mastership status.

The IPCC Express child still maintains its *site* or local routing capability. In contrast to IPCC Enterprise deployments where CallManager PG loses contact with the CallRouter, IPCC Express is self-sustaining and does not need ICM to function.

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The following describes IPCC Gateway PG recovery in three different failure scenarios:

- **IPCC Gateway PG Fails/CRS Server Active**. If a software problem causes IPCC Gateway PG failure, ICM Node Manager restarts the IPCC Gateway PG. There is no fault tolerance at the ICM level; all call and agent state changes that occur while the PG is inactive will be lost to the ICM. When ICM reconnects, it receives call and agent information for the *current* time period.

- **IPCC Gateway PG-to-ICM Connectivity Fails**. If a network problem disrupts the connection between IPCC Gateway PG and ICM, the ICM keeps trying to reconnect until it is successful. When ICM reconnects, it receives call and agent information for both the current *and* disconnected time periods.

- **ICM Side A Fails/IPCC Gateway PG Active**. If a problem occurs on the ICM side, ICM will automatically fail over to its Side B; there is no disruption in the flow of information from IPCC Gateway PG.

Troubleshooting in an IPCC Express Gateway Deployment

This section provides help in correcting problems specific to IPCC Gateway deployments. For more information about IPCC Express problems, see the *Cisco CRS Servicing and Troubleshooting Guide*.

An application or agent does not appear on ICM after being recreated on IPCC Express

Symptom:

In an IPCC Gateway deployment using IPCC Express, when a previously deleted application or agent is added back to IPCC Express, the application or agent does not appear on ICM.

Message:

None.

Cause:

You must physically delete all records marked for deletion on Cisco ICM before recreating the records on IPCC Express.

Action:

Complete the following steps before recreating the application or agent on IPCC Express:

1. On the Cisco ICM AW Configuration Manager, select **ICM > Administration > Deleted objects**.

2. Delete the records marked for deletion.

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VoIP Monitor Subsystem on IPCC Express in partial service

Symptom:

The VoIP Monitor Subsystem remains in partial service, even after restarting the CRS Engine and rebooting the machine.

Message:

None.

Cause:

The IPCC Express Gateway PG is installed on the CRS Server. As part of the installation process, the CRS Server is added to the ICM's Active Directory Domain. This means that the host name changes—as the domain name becomes part of the host name—and VoIP becomes partial service. For more information, see the *Cisco Desktop Administrator User's Guide*, Release 6.1(1).

Action:

Complete the following steps:

1. In Cisco Desktop Administrator's VoIP Monitor window, click **Remove VoIP, Recording/Playback Server** on the toolbar.

   The Remove VoIP/Recording & Playback Server dialog box appears.

2. In the VoIP Monitor Servers drop-down list, select the service you want to remove from Directory Services.

3. Click **Remove**. The selected service is removed from Directory Services and unregistered from the LRM service.

4. Click **Close**.

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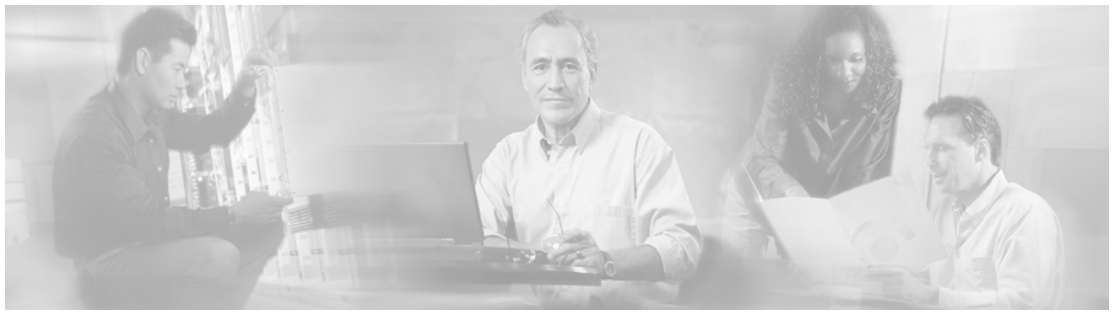
Chapter 4

Understanding Reporting in an IPCC Gateway Deployment

This section describes reporting in an IPCC Gateway deployment—a deployment in which an IPCC Express or an IPCC Enterprise functions as an ACD child with respect to an ICM Enterprise parent. For complete details on ACD-level reporting on IPCC Enterprise, refer to the *IPCC Enterprise Reporting Guide*. Similarly, for complete details on ACD-level reporting on IPCC Express, refer to the *Cisco CRS Historical Reporting Administrator and Developer Guide*. Additional reporting documentation is listed in the Related Documentation section of the Preface of this book.

This section contains the following topics:

Understanding ICM Reporting

Cisco ICM software uses real-time data on agent and call center activity to make call routing decisions. To make the best decision possible, the ICM constantly collects information about agent activity at each call center. The ICM tracks the current call handling state of each agent, the number of agents in a particular state, and the time that agents spend in these states.

ICM software also collects data about the calls coming into the call centers, such as the number of calls in progress, handled, and finished; how calls were routed; and how long callers were on hold. These management data are essential to intelligent call routing. They are also important for enterprise-wide real-time monitoring and historical reporting of agent performance and customer experience.

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This section provides an overview of ICM Reporting Architecture at the ICM Enterprise parent and how regional and call center managers can use reporting capabilities in the ICM Enterprise parent for enterprise wide reporting.

Overview of ICM Reporting Architecture in the ICM Enterprise Parent

To obtain routing and reporting data, the Cisco ICM software communicates with the network peripherals (such as IPCC Enterprise, IPCC Express, TDM ACD, and IVR). This communication occurs through a node called the Peripheral Gateway (PG).

The PG reads status information from the peripheral and passes it to the CallRouter. The CallRouter uses this status information to make timely and informed call routing decisions.

The CallRouter also forwards the information to the Logger, which saves it in the Historical Database Server (HDS). The historical data is stored in the Historical Database Server (HDS) in summary half-hour intervals. These summary records are then used to populate historical half-hour and daily WebView reports.

Note: WebView is a web-based application that allows supervisors and contact center managers to run and view a multitude of contact center reports in both ICM and IPCC Enterprise deployment models.

The Historical Database Server also stores call detail records. A detailed record is written for each call routed to a peripheral by the ICM and a termination call detail is written for each call that is connected and then terminated. These details are stored in the Historical Database Server Route_Call_Detail and Termination_Call_Detail records.

The CallRouter uses a real-time feed mechanism to forward real-time monitoring data to the Distributor Admin Workstation (AW). The Distributor AW receives the real-time feed from the CallRouter and acts as a data distributor to all other AWs at the site. Each Distributor AW has its own local database, which stores the real-time monitoring data that is used to populate WebView real-time reports.

The relationship of the call center peripheral to the PG, and the ICM Router, and Logger is shown in the following figure.

Figure 15: ICM Reporting Architecture

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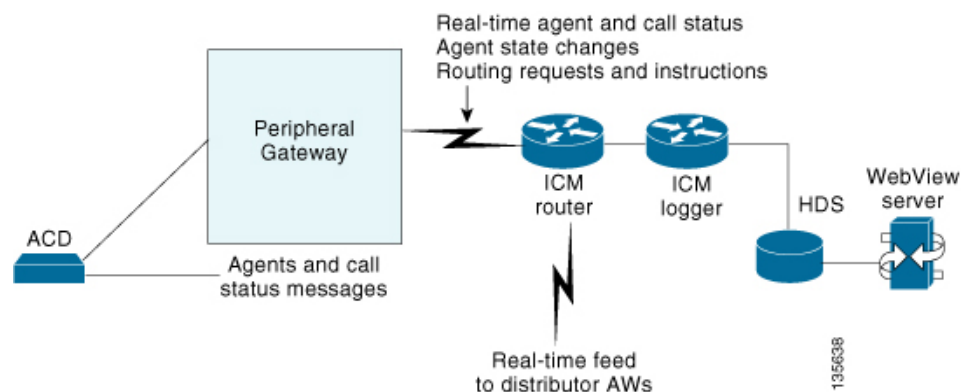
Each call center peripheral requires a connection to a Peripheral Gateway, and ICM software has unique Peripheral Gateways for each device it supports. For example, each of the supported TDM ACDs has its own PG. IPCC Gateway is the PG ICM software uses to connect to IPCC Enterprise (with IPCC System PG) and IPCC Express.

Each PG has its own method of communicating with the peripheral about agent and call status, third party control, and so forth. The type of connection used depends on the type of peripheral. For example, some ACDs use a TCP/IP Ethernet connection, while others require X.25 links.

About Real-Time and Historical Report Data

The ICM Central Controller collects real-time and historical data.

Real-Time Data

In real-time, each PG passes current status information to the ICM CallRouter. Periodically, the CallRouter forwards the latest data to the Distributor AW local database. The current, or real-time data, which is kept in the CallRouter's memory, includes data about agents, skill groups, services, trunk groups, routes, scripts, and other ICM entities. On the CallRouter, this data is called in-memory data. In the ICM local database on the Distributor AW, and for purposes of reporting, this data is called real-time data.

The ICM system tracks real-time data in a number of real-time tables that have data fields that reflect the following time intervals:

- **Half values**. "Half" values contain data for the current half-hour. The current half-hour is defined as the time period falling between (xx:00:00 and xx:29:59, or xx:30:00 and xx:59:59). For example, if it is currently xx:18:33, the CallsOfferedHalf (in the Call_Type_Real_Time table) real-time element contains a value that reflects calls offered to this call type in the first 18 minutes and 33 seconds of the specific half-hour. When a new half-hour begins, at time (xx:00:00 or xx:30:00), the database element is reset to zero. Note that the half values here are different from the ToHalf values in the Historical Half-Hour data section.

- **Now values**. "Now" values contain a snapshot of activity at a particular instant. For example, the ICM tracks CallsQueuedNow (in the Skill_Group_Real_Time table), which is the number of calls currently in queue. When a call is answered, the CallsQueuedNow count is immediately reduced by one because the call has left the queue. This change is seen at the next real-time data update.

- **To5 values**. The "To5" values track data on a rolling five-minute basis. The rolling five-minute data employs a "sliding" five-minute window. The To5 data is updated every three seconds. When the oldest three-second interval expires, a new three-second interval is added. In this manner, the window is always placed on the current five-minute interval. An example of the To5 data element is the CallsHandledTo5 value in the Service_Real_Time table, which is the number of calls handled by the service during the rolling five minute interval.

- **Today values**. To arrive at "Today" values, the ICM totals the value for each half-hour interval since midnight plus any data for the current half-hour. For example, the CallsOfferedToday data value in the Service_Real_Time table provides a running total of calls routed to the service by the ICM since midnight. At the end of each half-hour, the data

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> from the half-hour table (for example, CallsOfferedHalf) is summed into the Today table. At midnight, the real-time Today count is cleared in the database.

Historical Half-Hour Data (ToHalf)

> Every 30 minutes, the ICM sends a summary of performance data to the central database. This data is stored in tables with the extension "ToHalf" (for example, Skill_Group_Half_Hour.CallsHandledToHalf). These elements contain a value for a completed half-hour interval. The completed half-hour interval is defined as the time period falling between (xx:00:00 to xx:29:59 and xx:30:00 to xx:59:59).

Data Comparisons

> When running reports, you might compare data within a report and across reports. This section explains issues that you might encounter when comparing data that should not be compared.

Real-Time and Historical Record Comparison

> Data in real-time and historical records are not comparable. Counts in the real-time data (for example, CallsHandledTo5) do not match up with counts in the historical half-hour data (for example, CallsHandledToHalf) because the real-time data is moved to the historical database at the end of each half-hour interval.

> Consider this example, at 8:55 a call comes into the contact center and is answered by an agent. The real-time count for CallsAnswered would be increased by one (+1). However, the answered call would not be populated in the half-hour data until 9:00, when the half-hour interval ends. Therefore, between 8:55 and 9:00 the real-time data would show the answered call, but the half-hour data would not because the latest data in the historical database is for the 8:00 to 8:29:59 interval.

Half-Hour Boundary Issues for Reporting Data

> Counts that would typically match up for a day, such as CallsOffered and CallsHandled, might not always match up over specific half-hour intervals. This is because the counts for some data elements might be increased across half-hour boundaries. Consider this example: at 8:55 a call comes into the contact center and is answered by an agent. The agent completes the call at 9:05. In the historical database, the call is counted as offered in the 8:30:00 to 8:59:59 interval. The call is also counted as handled in the 9:00:00 to 9:29:59 interval. Therefore, if you run a report for the 9:00:00 to 9:29:59 interval, you will see in reports that tasks handled does not equal tasks offered for the interval.

> You also might notice, for example, that tasks offered does not equal tasks abandoned + tasks handled for a half-hour interval. Tasks offered reflects the number of calls and tasks that were offered to agents in this interval, while tasks handled and tasks abandoned might include calls that were offered in the last interval and completed in this interval. Some historical report templates group statistics into "Completed Tasks," to indicate that the statistics represent all calls and tasks that completed in this half-hour interval.

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In general, half-hour boundary issues are reduced if you run daily reports. However, if your contact center runs 24 hours a day, you might still notice half-hour discrepancies for the 23:30:00 to 23:59:59 and 00:00:00 to 00:29:59 intervals.

Using ICM Enterprise Reporting to Manage Agents and Measure Customer Experience

WebView provides ICM real-time and historical reports for agents, skill groups, services, call types, trunk groups, routes, and scripts. These reports can be used to manage agents, measure customer experience, and monitor call center operations.

Note: When using WebView at the ICM Enterprise parent to run enterprise-wide reports, always select the ICM Templates check box in each report category, as shown in the following figure. Leave the IPCC Templates check box unchecked. When the ICM Templates check box is checked, only reports that are applicable for enterprise-level reporting at the ICM Enterprise parent display in the application. If you are not sure whether a particular report is applicable for enterprise-level reporting at the ICM Enterprise parent, refer the WebView On-line Help for that particular report.

The following figure shows the WebView ICM Templates check box.

Figure 16: WebView Check Box

The topics that follow describe the main WebView Report categories and provide suggestions on how to use them.

Agent Reports

Agent reports provide metrics that enable supervisors and call center managers to monitor real-time agent activity and review historical agent performance.

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To measure performance of:

- Individual agents, use Agent > By Agent report categories.

- Agents who reside on a particular peripheral, use Agent > By Peripheral report category.

- Agents who work within a particular Skill Group, use Agent > By Skill Group Category.

- Agents assigned to a particular team, use Agent > By Team category.

Skill Group Reports

Skill group reports provide performance metrics on a collection of agents who share a common set of skills, such as all agents who are skilled to handle English speaking callers.

The skill group reports help to monitor the operational performance such as:

- Number of agents in different states such as Active (talking), Not Ready, Not Active, and so forth, in a skill group.

- Queuing statistics associated with a skill group.

- Staffing requirements.

To measure performance of:

- Individual Skill Groups that are associated with a peripheral, use Skill Group > By Peripheral report category.

- In ICM software, you can define and report on Enterprise Skill Groups. An Enterprise Skill Group is a collection of skill groups from several ICM peripherals. While each individual skill group is associated with a specific peripheral, an enterprise skill group can span several skill groups from different peripherals in the contact center. This allows contact center managers to get a consolidated performance measure of similar skill groups configured on different ACD peripherals distributed throughout the contact center. To run Enterprise Skill Group reports, use Skill Group > By Enterprise report category.

Services Reports

Services reports are used to measure the customer experience across peripheral services. A peripheral service is a service that is tied to a specific peripheral (IPCC Enterprise, IPCC Express, TDM ACD, and IVR) in the contact center enterprise. A single peripheral might have several services defined such as Sales, Technical Support, and Customer Accounts.

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To measure performance of:

- Individual Peripheral Services, such as Sales or Technical Support Services, at a local peripheral, use Services > By Peripheral report categories.

- Similar to Enterprise Skill Groups discussed earlier, in ICM software, you can define and report on Enterprise Services. An Enterprise Service is a collection of services from several ICM peripherals. While each individual service is associated with a specific peripheral, an Enterprise Service can span several services from different peripherals in the contact center. This allows contact center managers to get a consolidated measure of customer experience across similar services configured on different ACD peripherals distributed throughout the contact center. To run Enterprise Service reports, use Services > By Enterprise report category.

Call Type Reports

A call type is a category of incoming routable tasks. When ICM software receives a route request for a call, it first determines the Call Type of the call based on dialed number (DN), caller entered digits (CED), or the calling line ID (CLID). ICM software finds the script currently scheduled for that call type and routes it to the desired destination. A route represents the destination for a call and the type of service to be provided to the caller. Every call routed to a peripheral must have an associated peripheral service. As indicated in the "Services Reports" section above, at the ICM Enterprise parent, regional and contact center managers use Service reports to measure customer experience for individual Peripheral Services and Enterprise Services.

Call Type reports on the ICM Enterprise parent help to determine the following:

- Number of calls received by the call type to be routed to different peripherals (example: Multiple IPCC Enterprise children, or different ACDs)

- Number of calls routed to different peripherals (example: Multiple IPCC Enterprise children, or different ACDs)

- Number of calls that encountered routing errors.

However, there are a limited number of scenarios where Call Type reports might be used to measure customer experience at the ICM Enterprise parent:

- If you are using translation routing at the ICM Enterprise parent, then certain Call Type reports might be useful in measuring customer experience associated with those translation routed calls.

- If you are using a network VRU at the ICM Enterprise parent for network queuing or network prompting, then the Call Type reports are useful to provide information on the calls handled by the VRU applications and also provide the queuing statistics. In an IPCC Gateway deployment if you are queuing the calls at the network, then use Call Type reports on the ICM Enterprise parent to report on the queuing statistics. The number of calls queued and the network queue time will not be available at the IPCC Enterprise child. For more details, refer to the section "Network Queuing and Reporting" (page 45).

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Note: To determine which specific Call Type reports are applicable at the ICM Enterprise parent, refer to the WebView On-line Help associated with each individual ICM Template available in WebView under the Call Type Report category.

The specific WebView ICM reporting templates that you choose to use in each of the report categories depends on several factors, including your role in the contact center and the type of data that you want to see. Please refer to the following documentation to get detailed information about WebView report categories available to you at the ICM Enterprise parent, report templates available to you in each report category, and a detailed discussion of individual performance matrices displayed on the reports: *WebView Template Reference Guide* or the WebView On-line Help.

Recommendations for Configuring the Enterprise Skill Group and Enterprise Service

As discussed in the previous section, in addition to peripheral-specific Skill Groups and Services, ICM software also allows you to configure and report on a group of Skill Groups or Services from multiple peripherals distributed throughout the contact center.

ICM software aggregates data associated with each peripheral Skill Group or Service that is mapped to an Enterprise Skill Group or Service and provides a consolidated enterprise-wide view of performance data across the Enterprise Skill Group or Service. For example, to obtain the number of agents available in an Enterprise Skill Group, ICM software adds the number of agents available in each member peripheral skill group. ICM software also conducts advanced calculations for average values or calculated values to appropriately aggregate data from individual Peripheral Skill Groups or Services. For example, to calculate Average Handle Time for a particular Enterprise Skill Group, ICM software totals the handle time for each of the Peripheral Skill Groups mapped to the Enterprise Skill Group and then divides this number by the total tasks handled by each member Peripheral Skill Group.

Enterprise Skill Group reports can be used to measure the consolidated performance of similar skill groups across multiple ACDs to which ICM software is routing calls. For example, if a regional manger wants to determine how long agents across multiple contact centers who have Spanish Customer Support skills are taking to handle incoming calls (if the relevant Spanish Customer Support skill groups are mapped to a Spanish Customer Support Enterprise Skill Group), then they can run an Enterprise Skill Group WebView report to see the Average Handle Time associated with the Spanish Customer Support Enterprise Skill Group.

Similarly, Enterprise Service reports can be used to measure the customer experience across multiple ACDs to which ICM software is routing calls. For example, if a regional sales manager wants to get an understanding of queuing experiences of customers when they call for sales-related activities during a promotion (if the relevant Sales services at each peripheral are mapped to a Sales Enterprise Service), then they can run real-time Enterprise Service WebView reports that show consolidated queuing statistics (such as Average Speed to Answer, Longest Task in Queue, or Average Delay in Queue).

An enterprise service is a collection of peripheral services, typically from several contact centers. While each individual service is tied to a specific peripheral, an enterprise service can span several peripherals.

Note: If you group skill groups from the same peripheral into an enterprise skill group, you will see double-counting of some metrics in your reports. This is also true for Enterprise Services.

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Network Queuing and Reporting

The existence of a network VRU in an ICM or an IPCC Enterprise deployment affects ICM/IPCC Enterprise Call Type and Skill Group reporting.

How a call is sent to the VRU does not affect reporting; that is, it does not matter if the ICM script used a Send To VRU node or a Translation Route To VRU node.

Figure 17: Network VRU in a Gateway Deployment
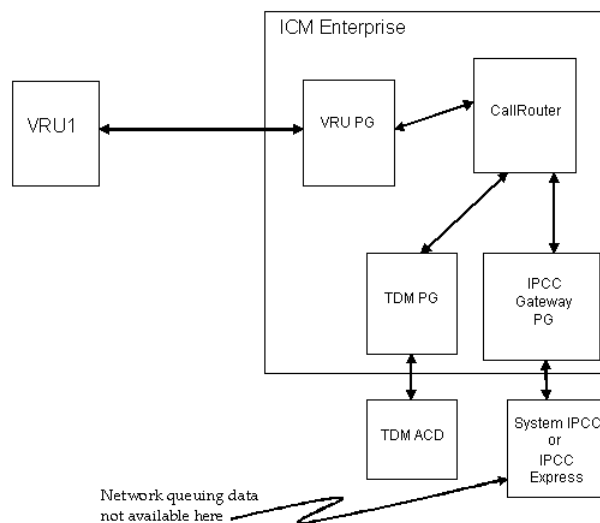
Using the terms *ICM-TR* to denote an ICM system in which all calls are translation routed when sent to an ACD and *ICM-Not-TR* to denote an ICM system in which some or all calls are not translation routed when sent to an ACD, we explain here the Call Type metrics and Skill Group metrics.

The Call Type and Skill Group reporting metrics that are affected by the existence of a network VRU, include *queued* metrics, *at VRU* metrics, *answered* metrics, *service level* metrics, and *abandoned* metrics. Tables that provide more information about these metrics see "Network VRU and Call Type Metrics" (page ?) and "Network VRU and Skill Group Metrics" (page ?).

Network VRU and Call Type Metrics

All of the Call Type metrics apply to both IPCC and ICM. In ICM systems, Answer Wait Time, ASA, and Service Level include both the time spent in the network queue and the time spent in the ACD queue.

For both IPCC Enterprise and ICM, the measurement of Answer Wait Time for a call begins when the call is *queued*, whereas the measurement of Service Level begins when the call *arrives* at the routing script, or when its call type is *changed*. This means that if self-service is performed on a call before the call is queued to an agent, the routing script must be set up to change the call type of the call when self-service is completed. Otherwise, the time spent in self-service will negatively impact the Service Level.

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With regard to ICM-Not-TR systems, the Call Type queueing and at-VRU metrics are the same as for IPCC Enterprise and ICM-TR. The Call Type abandoned metrics allow you to determine the number of calls that were abandoned while queued in the Router, but they do not allow you to determine the number of calls that were abandoned while in self service, nor the number of calls that were abandoned after they leave the VRU and before an agent answers them. The Call Type answered metrics are always zero. The Call Type Service Level metrics are meaningless and can be ignored.

The following table shows the fields in the Call_Type_Real_Time table that affect reporting metrics by metric category:

Call_Type_Real_Time Table and Reporting Metrics

Queued Metrics	At VRU Metrics/ Answered Metrics	Service Level Metrics	Abandoned Metrics
AvgRouterDelayQHalf	**At VRU:**	ServiceLevelAbandHalf	CallDelayAbandTimeHalf
AvgRouterDelayQNow	CallsAtVRUNow	ServiceLevelAbandTo5	CallDelayAbandTimeTo5
AvgRouterDelayQTo5	**Answered:**	ServiceLevelAbandToday	CallDelayAbandTimeToday
AvgRouterDelayQToday	AnsweredWaitTimeHalf	ServiceLevelCallsHalf	CTDelayAbandTimeHalf
CallsLeftQTo5	AnswerWaitTimeTo5	ServiceLevelCallsTo5	CTDelayAbandTimeTo5
CallsAtVRUNow	AnswerWaitTimeToday	ServiceLevelCallsToday	CTDelayAbandTimeToday
RouterCallsQNow	CallsAnsweredHalf	ServiceLevelCallsOfferedHalf	DelayAgentAbandTimeHalf
RouterCallsQNowTime	CallsAnsweredTo5	ServiceLevelCallsOfferedTo5	DelayAgentAbandTimeTo55
RouterLongestCallQ	CallsAnsweredToday	ServiceLevelCallsOfferedToday	DelayAgentAbandTimeToday
RouterQueueCallsHalf	CallsAtAgentNow	ServiceLevelHalf	DelayQAbandTimeHalf
RouterQueueCallsTo5		ServiceLevelTo5	DelayQAbandTimeTo5
RouterQueueCallsToday		ServiceLevelToday	DelayQAbandTimeToday
RouterQueueWaitTimeHalf			RouterCallsAbandQHalf
RouterQueueWaitTimeTo5			RouterCallsAbandQTo5
RouterQueueWaitTimeToday			RouterCallsAbandQToday
ServiceLevelCallsQHeld			RouterCallsAbandToAgentHalf
			RouterCallsAbandToAgentTo5
			RouterCallsAbandToAgentToday
			TotalCallsAbandHalf

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Queued Metrics	At VRU Metrics/ Answered Metrics	Service Level Metrics	Abandoned Metrics
			TotalCallsAbandTo5
			TotalCallsAbandToday

The following table shows the fields (by metric category) in the Call_Type_Half_Hour table that affect reporting metrics:

Call_Type_Half_Hour Table and Reporting Metrics

Queued Metrics	At VRU Metrics/ Answered Metrics	Service Level Metrics	Abandoned Metrics
AvgRouterDelayQToHalf	**At VRU:**	ServiceLevelAbandHalf	AbandInterval1 - AbandInterval10
CallsQHandledToHalf	CTVRUTimeToHalf	ServiceLevelCallsHalf	
RouterQueueCallsToHalf	VRUTimeToHalf	ServieLevelCallsOfferedHalf	CallDelayAbandTimeHalf
RouterQueueCallType LimitToHalf	**Answered:**	ServiceLevelHalf	CTDelayAbandTimeHalf
			DelayAgentAbandTimeHalf
RouterQueueGlobalLimitToHalf	AnsInterval1 - AnsInterval10		DelayQAbandTimeHalf
RouterQueueWaitTimeToHalf	AnswerWaitTimeHalf		RouterCallsAbandQHalf
	CallsAnsweredToHalf		RouterCallsAbandToAgentHalf
			TotalCallsAbandHalf

For additional information on the Call_Type_Real_Time and Call_Type_Half_Hour table fields, see the *Database Schema for Cisco ICM/IPCC Enterprise and Hosted Editions.*

Network VRU and Skill Group Metrics

All of the skill group metrics apply to both IPCC Enterprise and ICM-TR. However, the Answer Wait Time and ASA metrics do not include the time spent in the network queue, while the Service Level metrics do.

For ICM-Not-TR systems, the Skill Group queueing and at-VRU metrics are the same as for IPCC Enterprise and ICM-TR. The Skill Group abandoned metrics allow you to determine the number of calls that abandoned while queued to the Router, but they do not allow you to determine the number of calls that abandoned after they left the VRU and before an agent answered them. The Skill Group answered metrics are always zero. The Skill Group Service Level metrics are meaningless and can be ignored.

Note: None of the Skill Group metrics include time spent in self-service or calls that ended during self-service because a call is not associated with a skill group until it is queued, and a call is queued after self-service is complete.

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The following table shows the fields (by metric category) in the Skill_Group_Real_Time table that affect reporting metrics:

Skill_Group_Real_Time Table and Reporting Metrics

Queued Metrics	At VRU Metrics/ Answered Metrics	Service Level Metrics	Abandoned Metrics
CallsQueuedNow	**At VRU:**	ServiceLevelTo5	RouterCallsAbandQTo5
LongestCallQ	None.	ServiceLevelCallsTo5	RouterCallsAbandToAgentTo5
RouterCallsQNow	**Answered:**	ServiceLevelCallsAbandTo5	
RouterLongestCallInQ	AnswerWaitTimeTo5	ServiceLevelCallsDequeuedTo5	
	CallsAnsweredTo5	ServiceLevelRonaTo5	
		ServiceLevelCallsOfferedTo5	

The following table shows the fields (by metric category) in the Skill_Group_Half_Hour table that affect reporting metrics:

Skill_Group_Half_Hour Table and Reporting Metrics

Queued Metrics	At VRU Metrics/ Answered M etrics	Service Level Metrics	Abandoned Metrics
CallsQueuedToHalf	**At VRU:**	ServiceLevelHalf	AbandonRingCallsToHalf
RouterQueueCallsToHalf	None.	ServiceLevelCallsHalf	AbandonRingTimeToHalf
	Answered:	ServiceLevelCallsAbandHalf	RouterCallsAbandQToHalf
	AnswerWaitTimeToHalf	ServiceLevelCallsDequeuedHalf	RouterCallsAbandToAgentHalf
	CallsAnsweredToHalf	ServiceLevelErrorHalf	

For additional information on the Skill_Group_Real_Time and Call_Type_Half_Hour table fields, see the *Database Schema for Cisco ICM/IPCC Enterprise and Hosted Editions.*

Understanding Reporting in the ICM Enterprise Parent and IPCC Enterprise Child Deployment Model

This section provides information to help you understand the differences between the two levels of reporting in IPCC Gateway deployments:

- Reporting on the Enterprise (ICM Enterprise parent)

- Reporting on the ACD (IPCC Enterprise child)

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Note: In the ICM Enterprise parent with IPCC Enterprise child deployment model, it is important to pay close attention to comments in the *IPCC Enterprise Reporting Guide* regarding IPCC Enterprise with System PG. These comments highlight the differences in reporting data collection under different deployment models used for IPCC Enterprise. An IPCC Enterprise with IPCC System PG is the only supported deployment model for the IPCC Gateway feature.

The presence of an IPCC Enterprise Gateway PG does not affect the reports on the ACD level; you would run IPCC Enterprise reports on the child to monitor the state of the ACD (child) system.

However, to get enterprise-level reporting across IPCC Enterprise children (ACDs) you need to run ICM reports at the ICM Enterprise parent.

The following table provides a brief outline of the reporting options on the parent and child systems for each IPCC Enterprise Gateway deployment model.

Reporting Options, IPCC Enterprise Gateway Deployment Model

Deployment Model	Parent Reporting	Child Reporting	Caveats
Cisco ICM Enterprise parent/ IPCC Enterprise with an IPCC System PG **Note:** • Can have more than one child; ICM treats each child as a separate ACD. • For details on this model, see Chapter 1.	The ICM Enterprise parent has its own reporting components, such as Historical Data Server (HDS), Admin Workstation (AW) and WebView. Regional or call center managers can use "ICM Templates" WebView Reports on the ICM Enterprise parent for enterprise-wide reporting across multiple IPCC Enterprise with IPCC System PG children.	Each IPCC Enterprise with an IPCC System PG child system has its own individual reporting components (HDS/AW/ WebView). Local site-level supervisors and call center managers can use "IPCC Templates" WebView Reports on each IPCC Enterprise with an IPCC System PG child for local agent performance and customer experience measurement.	The Agent and Skill Group reports on the ICM Enterprise parent do not reflect reporting statistics for the Outbound Option dialer, and Multimedia (Email, Single Session Chat, Multi-Session Chat and Blended Collaboration) tasks that are handled by agents in the IPCC Enterprise child. Outbound Option reports at the ICM Enterprise parent WebView will not reflect Outbound Dialer Campaign or Dialer statistics that are reported on the child.
Multiple ICM (parents) connected to Single IPCC Enterprise system through individual IPCC System PGs; for example, multiple Outsourcers sending calls from their ICM Enterprise parent to a single IPCC Enterprise child (Provider).	Each ICM Enterprise parent has its own reporting components. For example, each Outsourcer has its own individual ICM Enterprise parent with its own reporting components (WebView). The outsourcer can use "ICM Templates" in WebView to see information on the call it sends to the IPCC Enterprise child (Provider). Each ICM Enterprise parent can only	The receiving IPCC Enterprise system has its own component (HDS/AW/WebView) and provides reporting on agent performance and customer experience on calls routed to the IPCC Enterprise child from multiple ICM Enterprise parents.	In this deployment the child IPCC Enterprise System has two peripherals (IPCC System PGs) each talking to different ICM Enterprise parents. **Note:** The child IPCC Enterprise should not set up call types that span the two peripherals.

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Deployment Model	Parent Reporting	Child Reporting	Caveats
Note: For details see Chapter 1.	see reporting information that is associated with its own IPCC Enterprise Gateway PG.		
Cisco ICM Enterprise parent deployed with IPCC Enterprise child with System PG, TDM ACD through respective ACD PG, and an IPCC Express at the same time.	ICM Enterprise parent has its own reporting components (WebView). Regional or central call center managers can use "ICM Templates" WebView Reports on the ICM Enterprise parent for consolidated enterprise-wide reporting across IPCC Enterprise child, various TDM ACD peripherals, and IPCC Express child.	To measure agent performance and customer experience at the local site, local site-level supervisors and call center managers can use reporting capabilities on local ACD or contact center site. IPCC Enterprise child site-level supervisors can use "IPCC Templates" WebView Reports on each IPCC Enterprise with an IPCC System PG child. IPCC Express child site-level supervisors can use Historical Reporting Client on the IPCC Express child. TDM ACD site-level supervisors can use the reporting capabilities available on their TDM ACD.	The statistics reported on the ICM Enterprise parent might differ for the different ACDs (IPCC Enterprise, IPCC Express, or TDM ACD).

Naming Conventions for Mapping on the Parent

Mapping is the method that IPCC Gateway uses to manage data that the child system delivers to a parent system. Mapping occurs during the autoconfiguration process. The ICM software uses naming conventions to assist in tracking data mapping between parent and child systems.

If you are deploying an IPCC Gateway system, in which IPCC Enterprise appears as an ACD to a parent ICM Enterprise system, limit the number of characters in the names of agents, skill groups and call types on the child IPCC Enterprise System. When these names are passed to the parent ICM Enterprise during autoconfiguration, ICM/IPCC software configures the name such as **(Parent)Peripheral.EnterpriseName +"."+ (Child)Skill_Group.PeripheralName**. If the configured name exceeds 32 characters, it is automatically truncated and the name of the skill group, agent, or call type is replaced with a number on the ICM Enterprise system. This means that you will not be able to find the name in reports run on the ICM Enterprise system.

The following list provides the mapping naming convention syntax descriptions for each data entity using the example of a Peripheral.EnterpriseName value of IPCC1:

- **Skill Group**

   Default syntax (under 32 characters): (Parent)Peripheral.EnterpriseName+"." +(Child)Skill_Group.PeripheralName

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Example: IPCC1.Sales

Fallback syntax (over 32 characters): (Parent)Peripheral.EnterpriseName+"."
+(Child)Skill_Group.PeripheralNumber

Example: IPCC1.5001

- **Service**

    Default syntax: (Parent)Peripheral.EnterpriseName+"."+ (Child)Call_Type.Name

    Example: IPCC1.TECH_SUPPORT_CT

    Fallback syntax: (Parent)Peripheral.EnterpriseName+"."+ (Child)Call_Type.CallTypeID

    Example: IPCC1.5009

- **Agent**

    Default syntax: (Parent)Peripheral.EnterpriseName+"."+ (Child)Agent.LastName + "."+
    (Child)Agent.FirstName

    Example: IPCC1.Smith.Jane

    Fallback syntax: (Parent)Peripheral.EnterpriseName+"."+ (Child)Agent.PeripheralNumber

    Example: IPCC1.5011

What Is the Relationship between ICM Enterprise Parent Services and IPCC Enterprise Child Call Types?

Most data entities on an IPCC Enterprise child map to corresponding entities on the ICM Enterprise parent, with one important exception: for reporting purposes, *Call Types* on the IPCC Enterprise child map to *Services* on the ICM Enterprise parent. That is, when autoconfiguration occurs, data from the Call Type tables on the IPCC Enterprise child populate the Service tables on the ICM Enterprise parent.

Note: However, the ICM Enterprise parent will continue to process the Call Type data **it** owns using the "traditional" method, that is, using it to populate Call Type tables for Call Types configured on the ICM Enterprise parent.
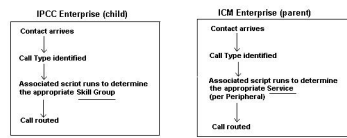
About Call Types and Services

On both the ICM Enterprise parent and the IPCC Enterprise child, Call Type is the first-level category by which data is determined about the contact and a script is associated with the Call Type. On the IPCC Enterprise child, when a contact of a certain Call Type is received, the associated script runs to determine the appropriate Skill Group to route the call to. However, on the ICM Enterprise parent, when a contact of a certain Call Type is received, the associated script runs to determine the appropriate Service to which to route the call.

The following figure illustrates this difference.

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Figure 18: Child Skill Group/Parent Service

On the ICM Enterprise parent, a Service is a particular type of processing that a customer requires. For example, a peripheral might have services defined for Sales, Technical Support, or New Accounts. Each service has one or more Skill Groups whose members provide the service. A service is associated with a peripheral and Skill Groups that provide the service are specific to that peripheral.

Note: In order to measure customer experience at the **ICM Enterprise parent**, use "ICM Templates" in WebView in the Services category. To measure customer experience at the **IPCC Enterprise child**, use the "IPCC Templates" under Call Type category in the WebView reporting system.

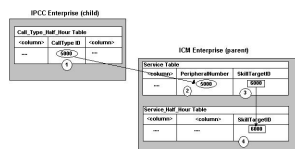## Mapping Data between the IPCC Enterprise Child and ICM Enterprise Parent

When the IPCC Enterprise child maps a Call Type to an ICM Enterprise Service, the following attributes are passed from the Call_Type table to the Service table:

- The CallTypeID in the Call_Type table on the IPCC Enterprise child system maps to the PeripheralNumber in the Service table on the ICM Enterprise parent.

- The EnterpriseName in the Call_Type table on the IPCC Enterprise child maps to the PeripheralName in the Service table on the ICM Enterprise parent.

You can use this mapping process to locate the corresponding Service records on the ICM Enterprise parent for a call type record on the IPCC Enterprise child.

The figure that follows shows an example of data mapping.

Figure 19: Data Mapping between IPCC Enterprise Child and ICM Parent

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In the figure:

1. On the child, the record in the Call_Type_Half_Hour table you are interested in has a CallTypeID value of 5000.

2. On the parent, you would search the Service table for a Service with a PeripheralNumber field that matches the CallTypeID on the child (5000).

3. The SkillTargetID for that Service is 6000.

4. Using the SkillTargetID value (6000), look up the corresponding record in any of the Service Tables (for example, Service_Half_Hour, Service_Real_Time).

Understanding Similar Data Concepts in IPCC Enterprise Child Call Type and ICM Enterprise Parent Service Database Tables

This section describes the relationship between customer experience data available at the ICM Enterprise parent and at the IPCC Enterprise child. It discusses Services data concepts at the ICM Enterprise parent and corresponding similar concepts at the IPCC Enterprise child.

Note: "Similar concept" in this discussion means "closest in meaning"; it does **not** imply an absolute match.

Due to the variety of reasons discussed in "Differences between ICM Enterprise Parent and IPCC Enterprise Child Reporting" (page 56), the data collected and presented in Service database tables and Services WebView reports at the ICM Enterprise parent is expected to vary from data collected and presented on Call Type database tables and Call Type reports on the IPCC Enterprise child. Although the two data sets are not expected to be an exact match, in some cases, the customer can look at a specific data field in the Services table at the ICM Enterprise parent and see a corresponding data field in Call Type table in the IPCC Enterprise child that is similar in meaning.

Note:

- Data fields that are not listed in these tables are either not mappable (that is, although they might be populated on a parent system, they have no corresponding value on the child system) or not available (that is, they are null or zero on the parent.)

- There are no corresponding fields or tables in the child for the parent Service_File_Minute table.

Service_Half_Hour Data Mapping

Parent: Service_Half_Hour	Child: Call_Type_Half_Hour	Comments
AnswerWaitTimeToHalf	AnswerWaitTimeHalf	
AvgDelayQToHalf	AvgRouterDelayQToHalf	Network queuing data is not available at the child level.
CallsAbandQToHalf	RouterCallsAbandQToHalf	See Note 1.

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Parent: Service_Half_Hour	Child: Call_Type_Half_Hour	Comments
CallsAnsweredToHalf	CallsAnsweredToHalf	
CallsHandledToHalf	CallsHandledHalf	
CallsOfferedToHalf	CallsOfferedHalf	
DelayQAbandTimeToHalf	DelayQAbandTimeHalf	See Note 1.
HandleTimeToHalf	HandleTimeHalf	
HoldTimeToHalf	HoldTimeToHalf	
OverflowOutToHalf	OverflowOutHalf	
SkillTargetID	No direct map	The PeripheralNumber of this service in the Service table maps to the CallTypeID in the child table.
TalkTimeToHalf	TalkTimeHalf	
TimeZone	TimeZone	

Note 1: Any condition on the child causing the call to terminate while in queue is documented in this field in the database schema. (The child Call Type reports have more granularity with regard to "error" calls, etc.)

Service_Real_Time Data Mapping

Parent: Service_Real_Time	Child: Call_Type_Real_Time	Comments
AnswerWaitTimeHalf	AnswerWaitTimeHalf	
AnswerWaitTimeTo5	AnswerWaitTimeTo5	
AnswerWaitTimeToday	AnswerWaitTimeToday	
AvgDelayQATo5	AvgRouterDelayQTo5	See Note 1.
AvgDelayQNow	AvgRouterDelayQNow	
CallsAbandQHalf	RouterCallsAbandQToHalf	See Note 1.
CallsAbandQTo5	RouterCallsAbandQTo5	See Note 1.
CallsAbandQToday	RouterCallsAbandQToday	See Note 1.
CallsAnsweredHalf	CallsAnsweredHalf	
CallsAnsweredTo5	CallsAnsweredTo5	
CallsAnsweredToday	CallsAnsweredToday	
CallsHandledHalf	CallsHandledHalf	
CallsHandledTo5	CallshandledTo5	
CallsHandledToday	CallsHandledToday	
CallsOfferedHalf	CallsOfferedHalf	
CallsOfferedTo5	CallsOfferedTo5	
CallsOfferedToday	CallsOfferedToday	
DelayQAbandTimeTo5	DelayQAbandTimeTo5	See Note 1.

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Parent: Service_Real_Time	Child: Call_Type_Real_Time	Comments
HandleTimeHalf	HandleTimeHalf	
HandleTimeTo5	HandleTimeTo5	
HandleTimeToday	HandleTimeToday	
HoldTimeHalf	HoldTimeHalf	
HoldTimeTo5	HoldTimeTo5	
HoldTimeToday	HoldTimeToday	
RedirectNoAnsCallsHalf	CallsRONAHalf	
RedirectNoAnsCallsTo5	CallsRONATo5	
RedirectNoAnsCallsToday	CallsRONAToday	
TalkTimeHalf	TalkTimeHalf	
TalkTimeTo5	TalkTimeTo5	
TalkTimeToday	TalkTimeToday	

Note 1: Any condition on the child causing the call to terminate while in queue is documented in this field in the database schema. (The child Call Type reports have more granularity with regard to "error" calls, etc.)

About Service Levels on the IPCC Enterprise Child and ICM Enterprise Parent

The service level data collected and presented in reports on the IPCC Enterprise child system will differ from service level data in reports on the ICM Enterprise parent. This happens because:

- At the IPCC Enterprise child, service level data is collected and presented in Call Type and Skill Group database tables and reports.

  Note: For a detailed discussion about service level data, see the *IPCC Enterprise Reporting Guide*.

- In an ICM Enterprise parent, service level data is only collected and reported in Service database tables and reports.

  Note: For information about the available ICM Enterprise Service reports, see the WebView online help.

In addition to these differences, in an IPCC Enterprise *child*, you can also use scripting to change call types in order to capture certain statistics. In such scripts, when a call changes call types, the old call type Service Level timer stops and the Service Level timer associated with the new call type starts. However, the Service Level timer for Services on the ICM *parent* is not stopped and reset.

Note: Due to this timing issue, you **should not** compare ServiceLevel field values in Call_Type_Half_Hour/Real_Type tables on the IPCC Enterprise childe with the ServiceLevel field values in Service_Half_Hour/Real_Time tables at the ICM Enterprise parent.

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Differences between ICM Enterprise Parent and IPCC Enterprise Child Reporting

Due to a variety of reasons, data collected and presented on WebView Reports to measure customer experience and manage agent performance at the ICM Enterprise parent is expected to be different from data collected and presented at the IPCC Enterprise child WebView reports.

Here are some of the reasons that could cause these variations:

- **Differences due to transmission delays**. All times computed on the parent, such as various state transitions, are based upon event arrival time in the parent, not their actual event occurrence on the child. Due to such network transmission delays, variations are expected between reporting data seen on WebView Reports at the ICM Enterprise parent and the IPCC Enterprise child.

- **Differences in supported concepts at the ICM Enterprise parent and IPCC Enterprise child**. Differences in supported concepts can cause variations in the data available to measure agent performance and customer experience between the parent and the child systems.

  Since certain concepts are only supported at the ICM Enterprise parent or the IPCC Enterprise child, certain agent performance and customer experience statistics might only be available at the ICM Enterprise parent or at the IPCC Enterprise child. For example, Skill Group Service Levels are supported in the IPCC Enterprise child but not the ICM Enterprise parent. Similarly Abandon Answer Distribution Call Type reports are available at the IPCC Enterprise child and not at the ICM Enterprise parent.

- **Differences in implementation of similar concepts in the parent and child**. For example, in order to measure the Service Level experienced by incoming callers, WebView users at the ICM Enterprise parent would use Service Level statistics on Service Reports while WebView users at the IPCC Enterprise child would use Service Level statistics on Call Type Reports.

  Note: For more information, see "About Service Levels on the IPCC Enterprise Child and ICM Enterprise Parent".

- **Differences in configuration of parent and child systems**. Although IPCC Gateway minimizes this issue due to auto configuration, discrepancies between IPCC Enterprise child and ICM Enterprise parent configurations can lead to reporting discrepancies. There are certain configurations that are required which needs to be considered for reporting.

  The following are some examples:

  - **Short Calls**: A short call is a call that is either abandoned or answered and terminated very quickly. By defining what you believe to be a short call, then you can filter out those calls that you believe did not stay in the system long enough to be counted as a real call. Short calls can be configured for call types, peripherals, and services.

    Abandoned Short Calls: For call types and services you configure only abandoned short calls, answered short calls are not reported for call types and services. On the ICM Enterprise parent if the "Abandon Wait Time threshold" for services which is configured in the IPCC Gateway peripheral is not configured to be the same as the "Aban Wait Time

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threshold" in the global settings for Call Types on the IPCC Enterprise child system, differences could arise between abandon counts on the two systems. A call might be considered as abandoned on the ICM Enterprise parent and as a Short Call on the IPCC Enterprise child and vice versa.

Answered Short Calls: Similar to abandoned short calls, answered short calls can also cause a difference in reporting. Answered short calls apply to the skill group and the agent skill group database tables. This is the minimum amount of time that the call is connected to the agent. The short call timer starts when the agent answers the call. CallsAnswered is updated for these calls. However, the ShortCalls fields within the skill group and agent skill group tables are also incremented. The call is reported both as handled as a short call. It is important to ensure that the "Answered Short Call threshold" configured on the IPCC Gateway Peripheral on the ICM Enterprise parent matches the "Answered Short Call threshold" configured on the IPCC System peripheral configured on the IPCC Enterprise child.

– **Agent Reporting**: If you are using the ICM Enterprise parent system to report on agents it is important to consider the following configurations.

Ensure that the Agent reporting is enabled on the IPCC Gateway peripheral on the ICM Enterprise parent system and identify the Admin Workstation distributor in the Agent Distribution list when configuring the IPCC Enterprise Gateway peripheral. If these configurations are not done then the WebView that is used for reporting on the ICM Enterprise parent system will not show any agent data.

If you plan to use Agent Team reports on the ICM Enterprise parent system and expect them to report similar to the IPCC Enterprise child system then it is important to configure Agent Teams and the Agent Team Members on the ICM Enterprise parent to match the Agent IPCC Enterprise child systems.

If you plan to report on "Not Ready reason Codes" on the ICM Enterprise parent system then it is important to configure the following on ICM Enterprise parent:

a. Configure the Not Ready reason codes in the ICM Configuration tool. Enter the numeric and text value for each reason code. For example, if you want Not Ready reason code 1 to equal Break, enter 1 for the Reason Code and Break for Reason Code Text. These codes need to match and must be identical as configured on the IPCC Enterprise child system.

b. Ensure that agent event detail is enabled on the IPCC Enterprise Gateway PG that is configured to talk to the IPCC System PG on the IPCC Enterprise child.

– **Mapping of Call Types and Services**: The Call Types on the IPCC Enterprise child are auto configured as Services on the ICM Enterprise parent. However Call Types are not specific to peripherals, whereas, Services are. If you have an IPCC Enterprise child that has two IPCC System PGs (peripherals), ensure that you have not configured call types that span these two peripherals. If you configure a Call Type that spans peripherals on the IPCC Enterprise child, these are configured as two services on the ICM Enterprise parent system, one for each peripheral. Hence, a single call type on the IPCC Enterprise child will map to two different Services on the ICM Enterprise parent resulting in reporting differences.

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Understanding Reporting in the ICM Enterprise Parent and IPCC Express Child Deployment Model

This section provides information to help you understand the differences between the two levels of reporting in IPCC Gateway deployments:

- Reporting on the Enterprise level (ICM Enterprise parent).

- Reporting on the ACD level (IPCC Express child).

The presence of an IPCC Express Gateway PG does not affect the reports on the ACD level; you would run IPCC Express reports to monitor the state of the ACD (child) system.

However, to get enterprise-level reporting across IPCC Express children (ACDs) you need to run ICM reports at the ICM Enterprise parent.

Note: The data that the child system feeds to the parent through an IPCC Express Gateway PG will not always correlate on both systems; this affects the reports on the Enterprise level.

The following table provides a brief outline of the reporting options on the parent and child system for the IPCC Express Gateway deployment model.

Reporting Options, IPCC Express Gateway Deployment Model

Deployment Model	Parent Reporting	Child Reporting
Cisco ICM Enterprise parent / IPCC Express child. It is possible to have more than one child; ICM treats each child as a separate ACD. However, each IPCC Express child can have only one ICM instance.	The ICM Enterprise parent has its own reporting components (HDS/AW/WebView). As with ICM Enterprise with TDM ACDs, use "ICM Template" WebView reports on the ICM Enterprise parent WebView for enterprise-wide reporting.	Each IPCC Express child has its own reporting components (Historical Reports database, Historical Reporting Client). Use Historical Reports in the Historical Reporting Client for local ACD reporting.

Using IPCC Express and ICM Reports

The following table provides some examples of when to use IPCC Express Reports and when to use ICM Reports to manage call center operations when using the IPCC Express Gateway deployment model.

Deciding Which Reports to Use

Activity	ICM Enterprise Parent	IPCC Express Child
Managing agent performance	"ICM Templates" in Agent WebView Report Category	Use Agent Reports (such as Agent Call Summary, Agent Summary Report, Agent

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Activity	ICM Enterprise Parent	IPCC Express Child
	at the ICM Enterprise parent.	Detail, Agent Login Logout Detail, Agent Not Ready Reason Code, Agent State Detail Report, and Agent State Summary Reports) provided in the CRS Historical Reporting Client.
Measuring performance of agents with similar skills	"ICM Templates" in Skill Group WebView Report category at ICM Enterprise parent.	Use CSQ Reports (such as Common CSQ Activity Report, Contact Service Queue Activity Report, CSQ Call Distribution Summary Report, Contact Service Queue Activity Report, and CSQ Agent Summary Report) to measure queue statistics, call counts, and durations associated with each CSQ.
Measuring customer experience	Primarily use "ICM Templates" in Services WebView Report category at ICM Enterprise parent.	Use Application Reports (such as Application Performance Analysis, Application Summary Analysis, and Called Number Summary Analysis) to measure Application performance through call counts and durations.

Note: Use IPCC Express reports for local ACD reporting and use ICM reports for enterprise-wide reporting. For additional discussion on reporting at the ICM Enterprise parent, see "Using ICM Enterprise Reporting to Manage Agents and Measure Customer Experience". For details about all of the IPCC Express reports, see the *Cisco CRS Historical Reports User Guide*.

Understanding Similar Data Concepts in IPCC Express Child and ICM Enterprise Parent Database Tables

This section describes the relationship between customer experience data available at the ICM Enterprise parent and the IPCC Express child. It discusses data concepts at the ICM Enterprise parent and corresponding similar concepts at the IPCC Express child.

Note: "Similar concept" in this discussion means "closest in meaning"; it does **not** imply an absolute match.

IPCC Express-related data appearing in ICM Enterprise parent database tables and WebView reports **will not be identical** to the data appearing in the IPCC Express child database and Historical Client Reports. This occurs for a variety of reasons, the most significant of which is the different methods IPCC Express and ICM use to store and calculate data:

Methods IPCC Express and ICM Use to Store and Calculate Data

IPCC Express	ICM
Data presented in Historical Reports is stored in a detailed record database.	Data presented in WebView Reports is stored in half hour summary database tables.
Data presented in IPCC Express reports is aggregated and calculated from detailed records when the report is generated.	Data presented in ICM Enterprise parent reports is already aggregated in half hour tables in the database.

Note: For a complete discussion of the key reasons behind the different reporting data, see

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The tables in this section provide a discussion on key data fields in an IPCC Express child's Historical reports and similar concepts in an ICM Enterprise parent's database Half Hour tables. For each of the data fields discussed, a brief explanation is also provided as to the reasons that contribute to the differences between the two concepts. However, the following reasons apply to many or all of the data fields discussed in the table:

1. **Timing Differences**. There's a fundamental difference in *when* IPCC Express and ICM software increment values. IPCC Express increments counts for the interval in which the call started, not when an event occurred; the ICM software increments counts for the interval in which the event occurred.

   This difference affects all reports with call event data (including completed call statistics) which on IPCC Express includes CSQ, Application, and Agent reports.

   Note: This timing issue is applicable to **all** data passed from IPCC Express to ICM.

2. **Additional Calculations Needed**. Many IPCC Express report data will need some sort of derivation to match corresponding ICM software report data (due to differences in definitions and values included on reports). For example, Average Hold Time for IPCC Express is calculated for incoming calls, only, while Average Hold Time on ICM is calculated on incoming *and* outgoing calls. As the ICM software does not display inbound and outbound hold time separately on a report, you cannot simply visually compare the reports from the two systems.

   Note: Additional Calculations Needed is applicable to values where information is only available by calculating data from different fields and/or tables in the ICM database.

3. **Difference in Service Level Concept Implementation**. Service Level for ICM software is calculated for Services, not Skill Groups. Service Level in IPCC Express is calculated for CSQs (which correspond to ICM Skill Groups), not Applications (which correspond to ICM Services). Since values are not being calculated on equivalent objects, an IPCC Express Service Level report is not comparable to an ICM Service Level report .

4. **Time in Reason Code**. One IPCC Express agent report shows time in reason code 0-9 on separate lines. IPCC Express reports display up to eight Not Ready reason codes in separate columns. The other reason codes are displayed as a lump sum. (By default, these eight reason codes will be the first eight in numeric order. You can also pick and choose what are the eight reason codes that they want to see in detail, by going to the Detail tab of the historical reporting client viewer). The ICM software has reason code on its summary report but only last reason code received not time in separate reason code buckets.

5. **ICM Agent_SkillGroup table**. Each row of Agent_Skill_Group_Half_Hour table provides half-hour statistics for a member of a skill group. If an agent is a member of multiple skill groups, multiple Agent Skill Group Half Hour rows are created for that agent each half-hour.

6. **Short Abandoned Call**. IPCC Express does not have a concept equivalent to the ICM software's short abandoned call concept.

Note: In the tables that follow, any discrepancies that apply to a particular concept will be noted in the Comments column of that row.

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Measuring Customer Experience

> Application reports provide key statistics that help call center managers measure customer experience at the IPCC Express child. At the ICM Enterprise parent, customer experience data is stored in Service Half Hour tables. The following table provides a sample of key customer experience data presented in Application Reports at the IPCC Express child and similar concepts in Service Half Hour tables at the ICM Enterprise parent.

Measuring Customer Experience: IPCC Express Application Call Counts and Durations

IPCC Express Application Report Concept	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
Calls Presented *(Found on Application Summary Report.)*	Reports display the total number of calls that each application received. This number is equal to the number of calls handled by the application *plus* the number of calls abandoned while in the application.	The closest concept on the ICM is Service_Half_Hour. CallsOfferedToHalf, which is the number of incoming calls plus internal calls offered to the service during the half-hour interval.	Timing differences will exist. Service_Half_Hour. CallsOfferedToHalf would not count calls transferred internally from service to service, while IPCC Express does.
Calls Handled *(Found on Application Summary Report.)*	Reports display the total number of calls that are handled by each application. A call is considered handled when it reaches the workflow step that defines the call as handled, or when it is handled by an agent. **Note:** The IPCC Express script writer needs to include a step that explicitly sets the Handled flag.	The closest concept on the ICM is Service_Half_Hour.CallsHandledToHalf, which is the number of tasks handled by service. A task is counted as handled when it is finished. For example, CallsHandledToHalf field counts the number of tasks that finished during the half-hour interval. (These might have been answered before the interval began.)	Timing differences will exist.
Call Abandoned *(Found on Application Performance Analysis and Application Summary Reports.)*	Reports display total number of calls abandoned for this application. A call is abandoned if it does not reach the workflow step that defines the call as handled or if the caller terminates the call before an agent answers it. This value includes calls aborted or rejected by the system.	There is no one specific closest concept on the ICM. However, at the ICM Enterprise parent, the following statistics collectively provide customer service experience on Abandon Calls: **Service_Half_Hour.Calls AbandQToHalf**, which is the number of calls abandoned in queue for service during the half-hour interval. This also includes the number of calls associated with this service that completed in the half hour interval that were either fully	Timing differences will exist.

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IPCC Express Application Report Concept	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
	Note: The IPCC Express script writer needs to include a step that explicitly sets the Handled flag.	self-service, or were abandoned before self-service completed, or were sent to an agent (regardless of whether self-service was performed first) and abandoned before the agent answered. **Service_Half_Hour.ShortCallsToHalf**, which is the number of calls to the service during the half-hour interval that were too short to be considered abandoned. If short call time is configured in the ICM Enterprise parent, calls that are abandoned in short call time period will not be counted in Service_Half_Hour.CallsAbandQToHalf. Since IPCC Express does not support short calls, Calls Abandoned on IPCC Express reports represent all calls abandoned. **Service_Half_Hour.Forced ClosedCallsToHalf** – Since the definition of Application Calls Abandoned in the IPCC Express child also includes aborted and rejected calls, you also need to consider Service_Half_Hour.ForcedClosedCallsToHalf. This field captures the number of calls to the service that were determined to be closed following an interruption in data during the half hour interval.	
Average Call Duration *(Found on Application Performance Analysis Report.)*	Average time elapsed from the time the call entered the workflow until the call exited the workflow by hanging up or entering another workflow. **Note:** This value does not include any time spent in the Work agent state.	The closest concept on the ICM is Service_Half_Hour.AvgHandleTimeToHalf, which is the average handled calls time in seconds for calls counted as handled by the service during the half hour interval. Handle Time is tracked only for Inbound ACD calls that are counted as handled for the service. HandleTime is the time spent from the call being answered by the agent to the time the agent completed after-call work time for the call. This includes any TalkTime, HoldTime, and WorkTime associated with the call. The AvgHandleTime value is counted when the after-call work time associated with the call is completed.	Timing differences will exist.
Flow In	Number of calls entering the application; specifically, calls	The closest concept on the ICM is Service_Half_Hour.OverFlowInToHalf, which	Timing differences will exist.

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IPCC Express Application Report Concept	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
(Found on Application Summary Report.)	redirected to this application from another through a workflow script, not from an agent or external system.	is the number of calls that the peripheral re-targeted, or overflowed, into this service during the half-hour interval. ICM software keeps count of the number of calls moved out of each service or route (overflowed out) and moved into each service or route (overflowed in).	
Flow Out *(Found on Application Summary Report.)*	Number of calls exiting the application; specifically, calls redirected to another application or destination outside the system without talking to an agent.	The closest concept on the ICM is Service_Half_Hour.OverFlowOutToHalf, which is the number of calls that the peripheral re-targeted, or overflowed, out of this service during the half-hour interval. ICM software keeps count of the number of calls moved out of each service or route (overflowed out) and moved into each service or route (overflowed in).	Timing differences will exist.
Average Speed of Answer *(Found on Application Summary Report.)*	Average time caller spent in call before call was answered. Calculated as queue time plus ring time divided by number of calls. Only counted for calls that connected to agents.	The closest concept on the ICM is Service_Half_Hour.AvgSpeedAnswerToHalf. AnswerWaitTimeToHalf /CallsAnsweredToHalf, which is the average answer wait time that all calls offered to the service waited before being answered. This value is calculated using the following formula: Service_Half_Hour. AnswerWaitTimeToHalf /Service_Half_Hour. CallsAnsweredToHalf.	Timing differences will exist.
Average Talk Time *(Found on Application Summary Report.)*	Average talk time for calls connected to agents. This value is calculated as total talk time divided by number of calls handled. **Note:** This value does not include any time spent in the Work agent state.	The closest concept on the ICM is Service_Half_Hour.AvgTalkTimeToHalf, which is the average task time in HH:MM:SS (hours, minutes, seconds) for tasks associated with the service ending in the half-hour interval.	Timing differences will exist.

Measuring Agent Performance

Agent reports provide key statistics that help call center managers measure performance of individual agents at the IPCC Express child. At the ICM Enterprise parent, customer experience data is stored in a variety of Agent tables (such as Agent_Half_Hour and Agent_Skill_Group_Half_Hour tables.)

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Note: The "Enable Agent Reporting" checkbox on the ICM Enterprise parent PG Explorer's Agent Distribution tab must be set, otherwise, the Agent_Skill_Group_Half_Hour and Agent_Half_Hour tables will not get populated.

The following table provides a sample of key agent performance data presented in Agent Reports at the IPCC Express child and similar concepts in Agent tables at the ICM Enterprise parent.

Note: Calls not associated with a CSQ on the IPCC Express child will not pass on to the ICM Enterprise parent Agent reports. If a CSQ is not involved in the call--for example, in the case of direct-dialed, agent-to-agent, outbound, ABR (agent-based routing), or AA (autoattendant) calls--then no data will be added to the Agent_Skillgroup_Half_Hour table.

Measuring Agent Performance: IPCC Express Agent Call Counts and Durations

IPCC Express Application Report	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
Calls Handled *(Found on Agent Summary Report.)*	Number of calls that answered by agent.	The closest concept on the ICM is Agent_Skill_Group_Half_Hour.CallsHandledToHalf. The total number of tasks handled by the agent in the half hour interval.	Timing differences will exist.
Calls Presented *(Found on Agent Summary Report.)*	Number of calls sent to an agent, regardless of whether the agent answered or not.	While there is no specific closest concept on the ICM, you can look collectively at the following: **Agent_Skill_Group_Half_Hour.CallsHandledToHalf** - The number of inbound ACD calls that have been answered and have completed wrap-up by agents in the skill group during the half-hour interval. **Agent_Skill_Group_Half_Hour.RedirectNoAnsCallToHalf**- During the half-hour interval, the number of ACD calls to the skill group that rang at an agent's terminal and redirected on failure to answer. The value is counted at the time the call is diverted to another device, and the database is updated every half hour. **Agent_Skill_Group_Half_Hour.AbandonRingCallsToHalf**- During the half-hour interval, the total number of ACD calls that abandoned while ringing at an agent's position. The value is incremented at the time the call disconnects.	Timing differences will exist.
Talk Time *(Found on Agent Detail Report.)*	Total talk time for agent on all calls during the report period.	While there is no specific closest concept on the ICM, you can look collectively at the following concepts: **Agent_Skill_Group_Half_Hour.TalkInTimeToHalf**- The number of seconds an agent associated with this skill group spent talking on inbound ACD calls (neither internal nor outbound) during the half-hour interval. TalkInTime is included in the calculation of TalkTime and LoggedOnTime. **Agent_Skill_Group_Half_Hour.TalkOutTimeToHalf** - The number of seconds an agent associated with this skill group spent	Timing differences will exist.

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IPCC Express Application Report	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
		talking on external outbound or consultive transfer calls during the half-hour interval. TalkOutTime is included in the calculation of TalkTime and LoggedOnTime. **Agent_Skill_Group_Half_Hour.TalkOtherTimeToHalf**- The number of seconds that an agent in the skill group spent talking on other calls (neither inbound or outbound) during the half-hour interval. Examples: Agent-to-agent transfers and supervisor calls. TalkOtherTime is included in the calculation of TalkTime and LoggedOnTime.	
Hold Time *(Found on Agent Detail Report.)*	Total hold time for agent on all calls during the report period.	The closest concept on the ICM is Agent_Skill_Group_Half_Hour.HoldTimeToHalf, which is the number of seconds where all calls to the agent are on hold during the half-hour interval. HoldTime is counted only while the agent is doing no other call-related activity. HoldTime is included in the calculation of LoggedOnTime.	Timing differences will exist.
Work Time *(Found on Agent Detail Report.)*	Total work time for agent on all calls during the report period.	The closest concept on the ICM is a combination of the following: **Agent_Skill_Group_Half_Hour.WorkReadyTimeToHalf** - Total seconds an agent in the skill group was in the Work Ready state for tasks associated with this skill group that ended during the half-hour interval. WorkReadyTime is included in the calculation of LoggedOnTime. **Agent_Skill_Group_Half_Hour.WorkNotReadyTimeToHalf**- Total time in seconds an agent associated with this skill group was in the Work Not Ready state during the half-hour interval. WorkNotReadyTime is included as in the calculation of LoggedOnTime.	Timing differences will exist.

Measuring Agent Logging Activity and State Information

IPCC Express Application Report	IPCC Express Report Definition	ICM Services Similar Concept(s)	Comment(s)
Logout Date Time *(Found on Agent Login/Logout Detail Report.)*	Date and time that the agent logged out of the IPCC Express system. If this information is preceded by a greater-than sign (>), the agent was still logged in at the end time of the data in the report.	The closest concept on the ICM is Agent_Half_Hour. Agent_Logout.LogoutDateTime, which is the Central Controller date and time when the agent logged out.	Timing differences will exist.
Login Duration *(Found on Agent Login/Logout Detail Report.)*	Elapsed time between the Login Time and the Logout Time.	The closest concept on the ICM is Agent_Half_Hour. Agent_Logout.LoginDuration, which is the number of seconds the agent was logged in.	Timing differences will exist.

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IPCC Express Application Report	IPCC Express Report Definition	ICM Services Similar Concept(s)	Comment(s)
Logout Reason Code *(Found on Agent Login/Logout Detail Report.)*	Numeric reason code that the agent enters when the agent logs out from the Cisco Agent Desktop. **Note:** A value of 0 indicates that no logout reason code is configured or that the agent was unable to enter a reason code.	The closest concept on the ICM is Agent_Half_Hour.Agent_Logout.ReasonCode, which is the Reason code returned by the peripheral for the agent logout.	Timing differences will exist.

Measuring Skill Group Performance

> CSQ reports provide key statistics that help call center managers measure performance of individual contact service queues at the IPCC Express child. At the ICM Enterprise parent, skill group performance data is stored in Skill_Group_ Half Hour tables.

> The following table provides a sample of key CSQ performance data presented in CSQ Reports at the IPCC Express child and similar concepts int Skill_Group_Half Hour tables at the ICM Enterprise parent.

Measuring Skill Group Performance: IPCC Express CSQ Call Counts and Durations

IPCC Express Application Report	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
Calls Presented *(Found on Common Skill CSQ Activity, CSQ Activity by CSQ, CSQ Activity by Interval, CSQ Activity, CSQ Priority Summary, CSQ Service Level Priority Reports.)*	Number of calls routed to CSQ, whether or not the agent picks up the call.	The closest term is CallsOfferedToHalf, which is the number of calls received by this skill group for the current half-hour interval. **Note:** For consistent values, in IPCC Enterprise regardless of whether or not there is an IPCC System PG, use RouterCallsOfferedToHalf.	Timing differences will exist.
Calls Handled *(Found on Common Skill CSQ Activity, CSQ Activity by CSQ, CSQ Activity by Interval, CSQ Activity, CSQ Call Distribution, CSQ-Agent Summary Reports.)*	Number of calls handled by CSQ. Call handled if caller connected to an agent while queued for CSQ.	The closest concept on the ICM is Skill_Group_Half_Hour.CallsHandledToHalf. CallsHandledToHalf is the number of inbound ACD calls answered and wrap-up completed by agents associated with this skill group during the half-hour interval.	Timing differences will exist.

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IPCC Express Application Report	IPCC Express Report Definition	ICM Database Similar Concept(s)	Comment(s)
Calls Abandoned *(Found on Common Skill CSQ Activity, CSQ Activity by CSQ, CSQ Activity by Interval, CSQ Activity, and CSQ Call Distribution Reports.)*	Number of calls routed to CSQ but not answered by an agent because caller hangs up or is disconnected. **Note:** This value is counted for each of the CSQs the call was queued for.	While there is no specific closest concept on the ICM, you can look collectively at the following concepts: Skill_Group_Half_Hour.RouterCallsAbandQToHalf & Skill_Group_Half_Hour.AbandonRingCallsToHalf. **Note:** Calls are counted as Abandon Calls for each Skill Group that the call was offered to since each Skill Group had the opportunity to answer the call.	Timing differences will exist.
Average Handle Time *(Found on Common Skill CSQ Activity and CSQ Activity Reports.)*	Average handle time for all calls that the contact service queue processed. Handle time is talk time + hold time + work time.	The closest concept on the ICM is Skill_Group_Half_Hour.HandleCallsTimeToHalf divided by Skill_Group_Half_Hour.CallsHandledToHalf, which is the average handle time in seconds for inbound calls associated with the skill group that were handled during the half-hour interval. This value is calculated as follows: HandledCallsTimeToHalf / CallsHandledToHalf. The AvgHandledCallsTime value is counted when any after-call work time associated with the call is completed, and the database is updated every half hour.	Timing differences will exist.
Average Speed to Answer *(Found on CSQ Activity Report.)*	For each contact service queue, the average speed of answer for calls handled. Calculated as follows: (total queue time + total ring time) / calls handled.	The closest concept on the ICM is Skill_Group_Half_Hour.AnswerWaitTimetoHalf divided by Skill_Group_Half_Hour.CallsAnsweredToHalf. There is not a database field, it is derived: The average speed of answer measured in HH:MM:SS (hours, minutes, seconds) for the skill group as the total time callers spent ringing at the agent's voice device (handled or internal calls) in relation to the number of tasks begun. Derived from: Skill_Group_Half_Hour.AnswerWaitTimetoHalf / Skill_Group_Half_Hour.CallsAnsweredToHalf	Timing differences will exist.

Differences between ICM Enterprise Parent and IPCC Express Child Reporting

Due to a variety of reasons, data collected and presented on WebView Reports to measure customer experience and manage agent performance at the ICM Enterprise parent is expected to be different from data collected and presented at the IPCC Enterprise child WebView reports.

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Here are some reasons that cause these variations:

- **Different methodologies for sampling data**. The ICM Enterprise parent system and the IPCC Express child system in many instances differ in how, when, and where in a call scenario an event is counted.

  For example, call event data collection is performed at different times in the ICM Enterprise parent and the IPCC Express child:

  - In IPCC Express, all call events are associated with the interval in which the call started regardless of when they occurred.

  - In ICM software, completed call metrics are associated with the interval in which the call ended, and other call events (Offered, Answered, RONA, and so forth) are associated with the interval in which they occurred.

  Assume the following events occur on an IPCC Express system (half-hour intervals are used for ease of discussion):

  - A call is sent to an agent at 7:59:40.

  - The call RONAs at 8:00:02.

  - The call is answered in the 8:00-8:30 interval.

  - The call is completed in the 8:30-9:00 interval.

  The two systems count the events in different ways: IPCC Express counts Offered, RONA, Answered, and Handled in the 7:30:00-8:00 interval. ICM counts Offered in the 7:30-8:00 interval, RONA and Answered in the 8:00-8:30 interval, and Handled in the 8:30-9:00 interval. This means that all completed call and event information currently calculated on IPCC Express reports will not match equivalent matrixes on ICM reports.

- **Differences in configuration of parent and child systems**. Although IPCC Gateway minimizes this issue, discrepancies between IPCC Express child and ICM Enterprise parent configuration settings can lead to reporting discrepancies.

- **Differences in supported concepts**. Differences in supported concepts can result in differences between ICM Enterprise parent and IPCC Express child reporting data as well as the amount of data available at the ICM Enterprise parent and the IPCC express child to measure agent performance and measure customer experience.

  For example:

  - IPCC Express does not support the concept of short calls; ICM software *does* support it. Therefore, if a Short Call interval is configured at the ICM Enterprise parent, abandon call counts at the ICM Enterprise parent will not reflect calls abandoned in the Short Call time interval. (The IPCC Express child system will reflect all abandon call counts.)

  - IPCC Express uses CSQ Call Priority and Abandon/Answer Distribution Reports to measure CSQ performance and customer experience. However, ICM does not support these concepts;

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therefore this IPCC Express child data will not be available at the ICM Enterprise parent for enterprise-wide reporting.

– While IPCC Express does support the concept of agent states, IPCC Express does not contain as many state options as the ICM software. In addition, some similarly named agent states might not have the same definition on both the child and parent systems. (For more information, see "Agent States on the IPCC Express Child and ICM Enterprise Parent".

- **Differences in terminology and definitions of data schema fields**. On the surface, database naming conventions might appear to be the same but, in fact, are not. Each system might use different criteria to evaluate what constitutes an offered call. This means that the IPCC Express child system OfferedCalls data element might not be the same as the ICM Enterprise parent Offered Calls data element.

- **Differences in implementation of similar concepts in parent and child systems**. For example, in an IPCC Express child system, Service Levels are implemented as CSQ ("Skill Group") and are used to measure the ability of agents in various CSQ to meet service level targets. In an ICM Enterprise parent system, Service Levels are implemented at Services and are used to measure the customer experience relative to Service Level thresholds independent of which CSQ responded to those calls.

  Note: It is important to understand that data in IPCC Express and ICM software is stored and processed differently to populate reports. IPCC Express database stores detail records, and calculated matrices on IPCC Express reports are computed at run time based on requested time intervals input by the user. The ICM Enterprise parent system on the other hand increments counts in summary tables for different time intervals and accesses these up to date values when compiling data for WebView reports.

- **Timing differences**. Time differences between ICM Enterprise parent and IPCC Express child can also result in differences in data at the parent and child reports. For example, IPCC Express half-hour reports can differ depending on when a report is run. This is due to values being updated in a start-time bucket after a call finishes. Such timing issues are more pronounced for IPCC Express short-interval (half-hour) reports. In addition, IPCC Express implements a five-second delay for call handled so the script can finish; data is written to the IPCC Express database, but the event is not sent for another five seconds. There is also the potential for timing synchronization problems between IPCC Express writing to its database and the IPCC Express Gateway PIM sending event data to the ICM system.

  For example, if a half-hour report were run on the IPCC Express child system for time period 8:00 to 8:30, then no counts for the example call would be included in that report. This is caused by the IPCC Express database updating only after the call completes; therefore, no call events are written to the IPCC Express database yet. Also note that when the call completes, all counts are updated for the time period in which the call starts, regardless of when the call completes. This results in report values that differ from the previously run report even though the report was generated for the same time period.

- **Different methods of measuring and storing data**. For example, IPCC Express stores conference calls data as one call segment, although individual agents' time is stored in a

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separate table (ACDR), and ICM stores as separate call segments so work time for each agent can be stored.

- **Different Reason Code processing**. One IPCC Express agent report shows eight separate reason code slots on separate lines, The numbers on the reports are place holders and the actual reason codes being used are dynamically extracted from the database. ICM software includes a reason code on its summary report. However, this is only the last reason code received, not the time in separate reason code buckets.

Note: For information on interpreting the data on the Enterprise (parent) level, see *IPCC Enterprise Reporting Guide*. For information about reporting on the IPCC Express child, see *Cisco CRS Historical Reports User Guide*, *Cisco CRS Historical Reporting Administrator and Developer Guide*, and *Cisco CRS Database Schema*.

Agent States on the IPCC Express Child and the ICM Enterprise Parent

The IPCC Express child passes agent state information to the ICM Enterprise parent for use in the Agent_State_Trace table, only. (This is in contrast the ICM Enterprise parent, which uses agent state information in several tables.) This table tracks detail on historical agent-state changes.

Note: The Agent State Trace data is not turned on by default; use the ICM Configuration Manager to turn on this option. Enable the Agent State Trace option can have a negative effect on your system, as it causes the generation of a large amount of historical data. It is recommended that you only enable this option for a small subset of your agents and only for a limited amount of time.

IPCC Express does not have as many agent state options available as the ICM software. In addition, some similarly named agent states do not have the same definition on both the child and parent systems.

The following table describes agent states available in the ICM and IPCC Express.

Agent States

ICM Enterprise Agent State	IPCC Express Agent State	AgentState Value stored in Agent_State_Trace Table on ICM Enterprise Parent
Logged Off	Logout (Not displayed anywhere.)	ICM and IPCC Express: 0
Logged On	Login (Not displayed anywhere.)	ICM and IPCC Express: 1
Not Ready	Not Ready (Not available to receive routed calls.)	ICM and IPCC Express: 2
Ready	Ready	ICM and IPCC Express: 3
Talking	Talk	ICM and IPCC Express: 4

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ICM Enterprise Agent State	IPCC Express Agent State	AgentState Value stored in Agent_State_Trace Table on ICM Enterprise Parent
	(Agent speaking with customer or other agent. State set automatically; does not have corresponding button.)	
Work Not Ready	Work Completing work for a previous call and unavailable to receive routed calls.)	ICM and IPCC Express: 5
Work Ready	No mapping available	ICM: 6 IPCC Express: Nothing passed
Busy Other	No mapping available	ICM: 7
Reserved	Reserved Agent assigned to receive a specific call. (State set automatically; does not have corresponding button.) State changes to the Talking when agent answers the call. If agent fails to answer the call within a time limit specified by the system administrator, IPCC Express places agent in the Not Ready state.	ICM: 8 IPCC Express: Nothing passed
Call Initiated	No mapping available	ICM: 9 IPCC Express: Nothing passed
Call Held	No mapping available	ICM: 10 IPCC Express: Nothing passed
Active	No mapping available	ICM: 11 IPCC Express: Nothing passed
Paused	Hold	ICM and IPCC Express: 12
Interrupted	No mapping available	ICM: 13 IPCC Express: Nothing passed
Not Active	No mapping available	ICM: 14 IPCC Express: Nothing passed

What is the Relationship Between IPCC Express and ICM Software Reporting Entities?

The following table shows the elements that are mapped between IPCC Express and ICM software in an IPCC Gateway deployment:

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Relationship Between Reporting Entities

IPCC Express entity	ICM Software entity
Application	Service
Route Point (Trigger)	Routing Device, Peripheral Monitor table
Contact Service Queue (CSQ)	Skill Group
Resource	Agent

Mapping Details

When an IPCC Express Application maps to an ICM Service, the following attributes are passed:

- IPCC Express Application ID maps to ICM Peripheral Number.

- IPCC Express Application Name maps to ICM Peripheral Name.

- IPCC Express Description maps to ICM Description.

- The value in the ICM Name field is a combination of the name of the peripheral as it appears on the left pane of the Service Explorer (_SVC) and the Peripheral Number. For example, if the name of the peripheral is ExpressPG and the Peripheral Number is 3, then the Name is ExpressPG_SVC_3.

When an IPCC Express Route Point maps to an ICM Routing Device, there are no additional attributes mapped.

When an IPCC Express Contact Service Queue (CSQ) maps to an ICM Skill Group, the following attributes are passed:

- IPCC Express CSQ ID maps to ICM Peripheral Number. (This field is not exposed to the customer in CRS Administration but is autogenerated and stored in the IPCC Express database.)

- IPCC Express CSQ Name maps to ICM Peripheral Name.

- The value in the ICM Name field is a combination of the name of the peripheral as it appears on the left pane of the Skill Group Explorer (_SG) and the Peripheral Number. For example, if the name of the peripheral is ExpressPG and the Peripheral Number is 1, then the Name is ExpressPG_SG_1.

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When an IPCC Express Resource maps to an ICM Agent, the following attributes are passed:

- The first part of an IPCC Express Resource Name maps to ICM First Name.

- The second part of an IPCC Express Resource Name maps to ICM Last Name.

- IPCC Express Resource ID maps to ICM Login name.

- The ICM Password field will be blank.

- ICM Enterprise Name field is a combination of the name of the peripheral as it appears on the left pane of the Agent Explorer (_AG) and the Login name. For example, if the name of the peripheral is ExpressPG and the Login name is agt99, then the Enterprise Name is ExpressPG_AG_agt99.

Note: If the agent is assigned skills on IPCC Express, then the CSQ names corresponding to the skills will be listed under Skill Group Members tab in the ICM Agent Explorer.

Troubleshooting Reports in IPCC Gateway Deployments

This section provides help in correcting reporting problems specific to IPCC Gateway deployments, only. It addresses issues with reports on the enterprise (parent) level.

For troubleshooting information specific to the ACD (child) level, see the following documentation:

- For deployments with an IPCC Enterprise child, see the *IPCC Enterprise Reporting Guide*.

- For deployments with an IPCC Express child, see the *Cisco CRS Servicing and Troubleshooting Guide*.

Double counting in an IPCC Express Deployment

Symptom:

A call is placed to a route point, a script executes the Call Redirect step, and sends the call to another route point. The report, instead of showing one inbound call, displays two separate inbound calls.

Message:

None. However, the report will show two calls with the same sessionID but two sessionSeqNums.

Cause:

An IPCC Express script using the Call Redirect step to send the call to the second route point. Using the Call Redirect step in an IPCC Express script causes calls to be double-counted in

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reports. This happens because the Redirect step internally creates two contacts (one for the initial inbound call and the second for the Redirect step, which are counted as two separate inbound calls).

Action:

None. This issue occurs in all IPCC Express deployments, whether standalone or with IPCC Gateway.

Data elements do not match

Symptom:

ACD database item *yyy* does not match the ICM Schema element *yyy*.

Message:

None.

Cause:

You are probably trying to match unlike data elements when comparing ICM and ACD data. If you attempt to match unlike elements from the ICM software and ACD, you will see discrepancies in the reporting data.

Action:

Determine exactly which database table you are attempting to compare. This will help to ensure that the comparison is matching like elements.

Some report columns are blank

Symptom:

Some columns in a report display no data.

Message:

None.

Cause:

IPCC Gateway does not populate all PG-related fields in the ICM database schema. Since data is not recorded in these database fields, some columns in reports will be empty.

Action:

Because the report concerns an IPCC Gateway deployment, verify that a report column is empty by consulting the WebView On-line Help for the report.

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Abandoned counts do not match between IPCC Enterprise Child and ICM Enterprise Parent

Symptom:

In Service reports on the ICM Enterprise parent, the abandoned counts are not the same as the abandoned counts in Call Type reports on the IPCC Enterprise child.

Message:

None.

Cause:

The configuration for Abandon Wait Time threshold (short calls) does not match between the ICM Enterprise parent and the IPCC Enterprise child. See "Differences Between ICM Enterprise Parent and IPCC Enterprise Child Reporting".

Action:

Ensure that the configurations are the same on both systems.

Service level metrics do not match between ICM Enterprise parent and IPCC Enterprise child

Symptom:

Information in Service Reports on the ICM Enterprise parent for service levels does not match the information in Call Type Reports for service levels in IPCC Enterprise child.

Message:

None.

Cause:

The call types in the IPCC Enterprise child get autoconfigured as services on the ICM Enterprise parent. The IPCC Enterprise child resets the service level timer every time call type changes. This behavior is not the same for services in the ICM Enterprise parent.

Action:

None.

Default Skill Group on ICM Enterprise parent shows no data

Symptom:

The default skill group that appears in the Item Selection list for WebView does not show any data when selected for reporting.

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Message:

None.

Cause:

A default skill group is created for the ICM Enterprise parent system. This default skill group does not collect any reporting statistics. Also, do not confuse this default skill group with the default skill group that is created for the IPCC Enterprise child system; they are not the same. Default skill groups on the IPCC Enterprise child get created as real skill groups on the ICM Enterprise parent. The reporting statistics gathered for the default skill group for the IPCC Enterprise child will show up in these real skill groups on the ICM Enterprise parent.

Action:

Select the skill group in the Item Selection list in WebView in the ICM Enterprise parent that corresponds to the default skill group on the IPCC Enterprise child.

No agent data available in reports on the ICM Enterprise parent

Symptom:

In either the IPCC Enterprise or the IPCC Express Gateway deployments, the WebView reports on the ICM Enterprise parent show no agent data.

Message:

None.

Cause:

Agent Reporting is not enabled on the respective IPCC Gateway PG.

Action:

In the ICM PG Explorer Agent Distribution tab, enable agent reporting.

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