



**Cisco IPCC Gateway Deployment Guide
for Unified ICME, Unified CCE, and Unified CCX,**
Enterprise Releases 7.2(1) and Express Release 5.0(1)

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Preface

Purpose

This manual describes how to install, configure, and use the Cisco IPCC Gateway feature, which allows Cisco Unified Contact Center Enterprise (Unified CCE) or Cisco Unified Contact Center Express (Unified CCX) to appear as an ACD to Cisco Unified Intelligent Contact Management Enterprise (Unified ICME).

Audience

This document is intended for contact center system administrators, supervisors, and managers who are responsible for deploying the IPCC Gateway software with Unified CCX, Unified ICME, or Unified CCE software.

Organization

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

Table 1: Organization

Chapter	Description
Chapter 1, About IPCC Gateway (page 11)	Introduces the IPCC Gateway feature.
Chapter 2, Deploying IPCC Gateway with Unified ICME/Unified CCE (page 21)	Provides installation and configuration instructions for deploying IPCC Gateway with Unified ICME/Unified CCE.
Chapter 3, Deploying IPCC Gateway with Unified CCX (page 33)	Provides installation and configuration instructions for deploying IPCC Gateway with Unified CCX.

Chapter 4, Understanding Reporting (page 51)	Describes Enterprise-wide reporting in IPCC Gateway deployments.
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The Index helps you find information in this guide.

Related Documentation

You need the following documentation when deploying IPCC Gateway with Unified CCX:

- *Getting Started with Cisco Unified Contact Center 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 Unified ICME/Unified CCE:

- *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*

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

- *Reporting Guide for Cisco IPCC Enterprise & Hosted Editions*
- *Template Design Guide Using InfoMaker for Cisco ICM/IPCC Enterprise & Hosted Editions*
- *Reporting Guide for Cisco Unified Intelligent Contact Management Enterprise and Hosted Editions*
- *Database Schema Handbook, Cisco ICM/IPCC Enterprise & Hosted Editions*
- *WebView Installation and Administration Guide for Cisco Unified Contact Center 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*

Conventions

This manual uses the following conventions:

Convention	Description
boldface font	Boldface font is used to indicate commands, such as user entries, keys, buttons, and folder and submenu names. For example: <ul style="list-style-type: none"> • Choose Edit > Find. • Click Finish.

Convention	Description
<i>italic font</i>	Italic font is used to indicate the following: <ul style="list-style-type: none"> • To introduce a new term. Example: A <i>skill group</i> is a collection of agents who share similar skills. • For emphasis. Example: <i>Do not</i> use the numerical naming convention. • A syntax value that the user must replace. Example: IF (<i>condition, true-value, false-value</i>) • A book title. Example: See the <i>Cisco CRS Installation Guide</i>.
window font	Window font, such as Courier, is used for the following: <ul style="list-style-type: none"> • Text as it appears in code or that the window displays. Example: <code><html><title>Cisco Systems, Inc. </title></html></code>
< >	Angle brackets are used to indicate the following: <ul style="list-style-type: none"> • For arguments where the context does not allow italic, such as ASCII output. • A character string that the user enters but that does not appear on the window such as a password.

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

The Product Documentation DVD is a comprehensive library of technical product documentation on a portable medium. The DVD enables you to access multiple versions of installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the same HTML 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 (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at this URL:

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We appreciate your comments.

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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 will find information about how to:

- 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>

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at 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:

- For Emergencies only: 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.

- For 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 (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.x through 9.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

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

If you do not have or use PGP, contact PSIRT at the aforementioned e-mail addresses or phone numbers before sending any sensitive material to find other means of encrypting the data.

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 & Documentation 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 pastingshow

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:

<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 Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco offerings. To order and find out more about the Cisco Product Quick Reference Guide, go to this URL:

<http://www.cisco.com/go/guide>

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

<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:

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- *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>

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

<http://www.cisco.com/en/US/products/index.html>

- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

<http://www.cisco.com/discuss/networking>

- 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>



Chapter 1

About IPCC Gateway

This section introduces the IPCC Gateway feature, which allows Unified CCE or Unified CCX to appear as an ACD to Unified ICME.

This section contains the following topics:

- [What is the IPCC Gateway Feature?, page 11](#)
- [What is the Parent and Child Relationship?, page 12](#)
- [About Peripheral Gateways, page 13](#)
- [High Availability and Fault Tolerance in IPCC Gateway Deployments, page 14](#)
- [About IPCC Gateway Deployments, page 14](#)
- [Routing in IPCC Gateway Deployments, page 18](#)
- [The Call Data Transferred Between Parent and Child, page 18](#)
- [Reporting in IPCC Gateway Deployments, page 19](#)
- [Upgrading to Use an IPCC Gateway Solution, page 19](#)

What is the IPCC Gateway Feature?

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

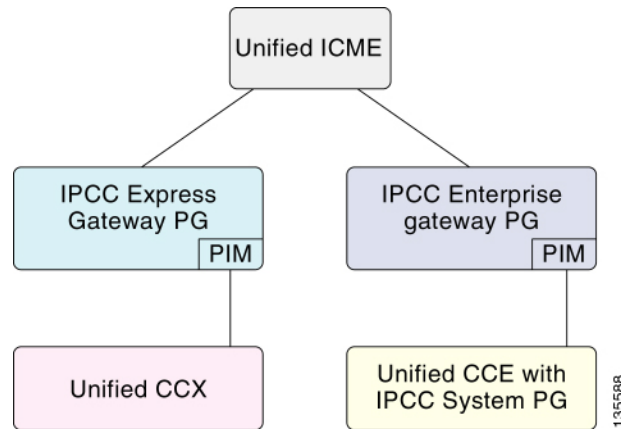
The IPCC Gateway feature uses two distinct PG types:

- IPCC Express Gateway PG, which connects the Unified ICME system to Unified CCX
- IPCC Enterprise Gateway PG, which connects the Unified ICME system to Unified CCE (with an IPCC System PG)

Figure 1 shows the relationship of the PGs to the Unified ICME system.

What is the Parent and Child Relationship?

Figure 1: Unified ICME 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 Unified CCX or Unified CCE and the Unified ICME 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.

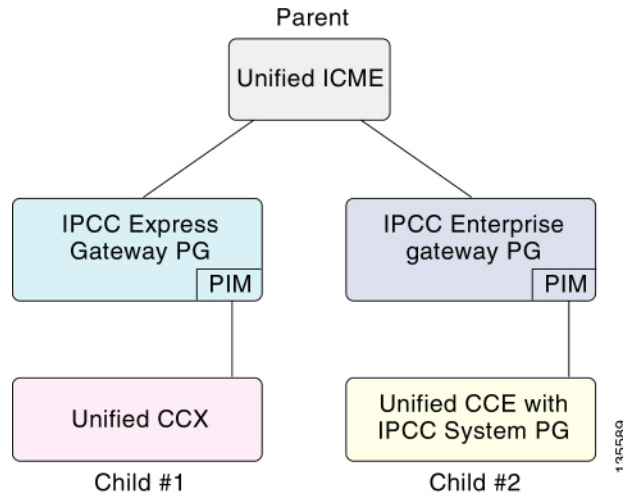
We use the terms parent and child to describe the relationship between these roles:

- **Parent.** The Unified ICME system that serves as the network or enterprise routing point. The parent uses the appropriate IPCC Gateway PGs to communicate to the CTI server on the child Unified CCX or the child Unified CCE. The parent can route between children.
- **Child.** The Unified CCE or Unified CCX system that is set up to function as an ACD. For a child Unified CCE, the IPCC Enterprise Gateway PG is used to communicate with the parent Unified ICME system; for a child Unified CCX, the IPCC Express Gateway PG 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 a Unified CCE or Unified CCX child, it is best to get the child system working first before integrating it with the parent Unified ICME system.

About Peripheral Gateways

Each contact center device (ACD or IVR) communicates with Unified ICME software through a PG. The PG reads status information from the device and passes it back to Unified ICME. 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—including Simple Network Management Protocol (SNMP)—must be installed on the computer.
- You must have set up the Windows Active Directory services for Unified ICME.
- You must have set up at least one Unified ICME 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: Each Unified CCX Gateway deployment can connect to only one Unified ICME instance. However, one Unified ICME instance can support multiple installations of Unified CCX.

High Availability and Fault Tolerance in IPCC Gateway Deployments

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

See Also

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

For release specifics about the Windows operating system, refer to the *Cisco Intelligent Contact Management Software Release 7.0(0) Bill of Materials*

High Availability and Fault Tolerance in IPCC Gateway Deployments

This section describes how IPCC Gateway deployments accommodate failover.

About Unified CCE Solutions and Fault Tolerance

For an Unified CCE solution in an IPCC Gateway deployment, fault tolerance is achieved as it is with other Unified ICME 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 Unified CCX Solutions and High Availability

A Unified CCX 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 Unified CCX cluster looks like one ACD to the Unified ICME parent, and a Side A PG is installed on both nodes of Unified CCX.

See Also

For more information, see [High Availability with IPCC Express Gateway \(page 48\)](#).

About IPCC Gateway Deployments

This section discusses the supported IPCC Gateway deployment models.

IPCC Gateway using IPCC Enterprise Gateway PG

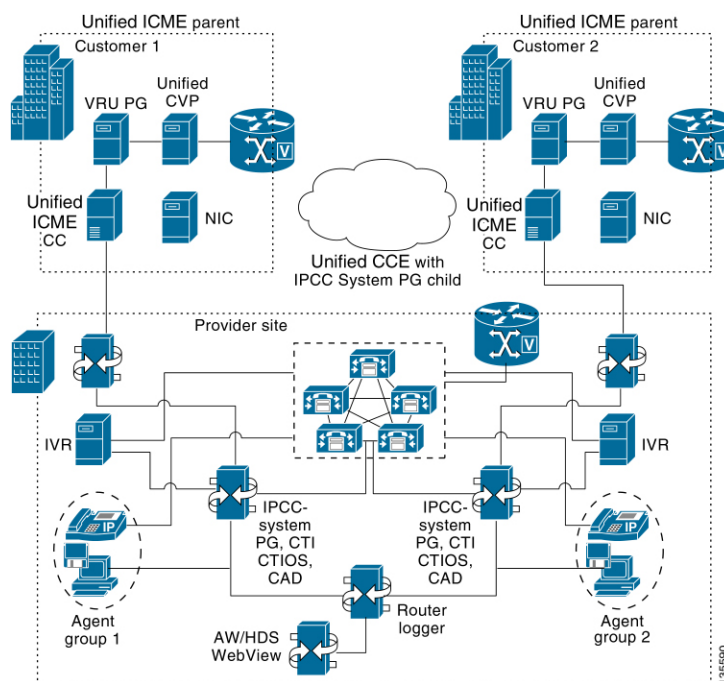
The following topics explain two ways that you can deploy the IPCC Enterprise Gateway PG.

Multiple Unified ICME (parents) with Single Unified CCE (child)

The following figure shows a deployment where two customers (Customer 1 and Customer 2) each running their own Unified ICME parent, outsource calls to a provider site running Unified CCE with System PGs. The provider site has a Unified CCE installation with two IPCC System PGs that connect to their respective IPCC Enterprise Gateway PG for each ICM 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 Cisco Unified Customer Voice Portal (Unified CVP), shown for each customer, before routing calls to the Provider site. The provider site also has the ability to queue calls using Unified IP IVR that is shown connected to the IPCC System PG.

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

Figure 3: Multiple ICM Parents with Single IPCC Enterprise child



Note: Call types on the Unified CCE 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 Unified ICME parent (Services) seeing only a subset of the calls corresponding to the Call Type on the child. See [Chapter 4: Understanding Reporting in an IPCC Gateway Deployment \(page 51\)](#) for more details.

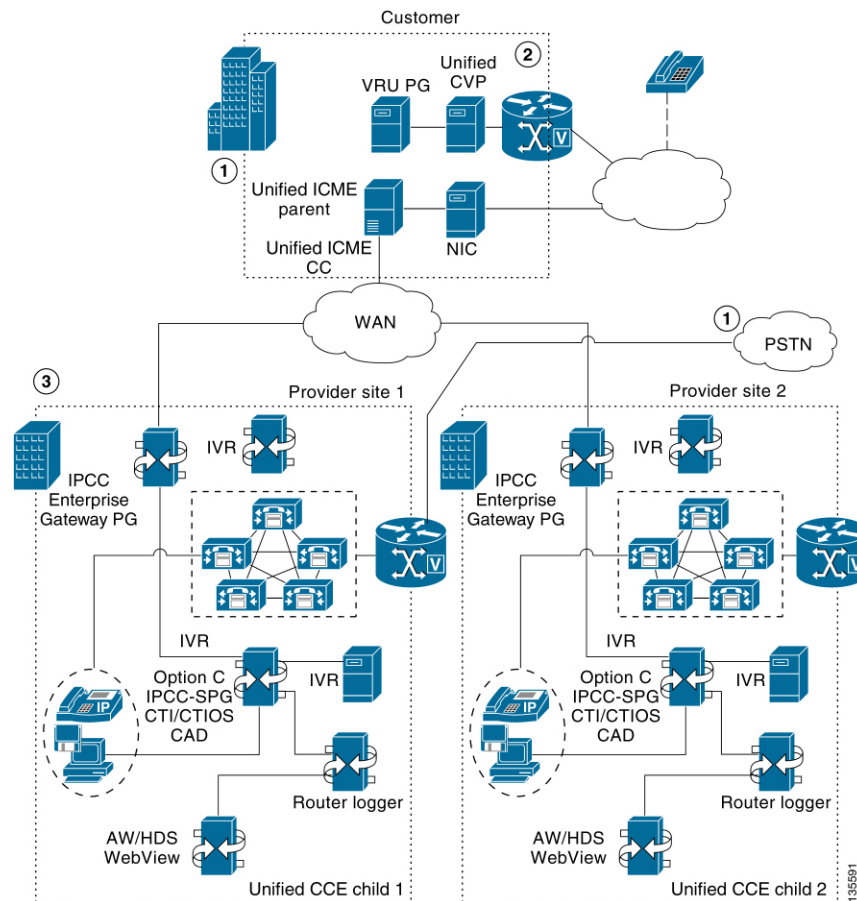
Single Unified ICME Parent with Multiple Unified CCE Children

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

Note: The Unified CCE child systems could be branch offices or service bureaus.

This deployment allows calls to be translation-routed from the Unified ICME parent (Customer shown in figure) to either of the two Unified CCE with IPCC System PG systems (Provider Site 1 and Provider Site 2 in the figure), each of which is treated as a separate ACD by the parent Unified ICME. In the figure, Unified CVP—at the Customer—is shown here doing network queuing from the Unified CCE parent. This deployment also provides the ability for each child Unified CCE to route calls incoming to those sites through Voice Gateways (not shown in the figure) that are not related to the parent Unified ICME, thus ensuring that call center operations continue if the WAN connection is not reliable. It also accommodates the phasing-in of Unified CCE deployments alongside TDM ACDs. This deployment also allows, as does a 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 Unified ICME (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.

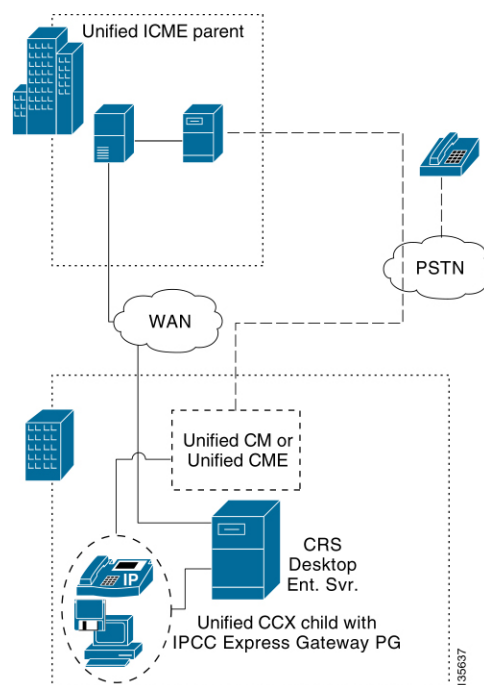
Here are other options:

- The deployment 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 Unified CCE and Unified CCX sites could be connected to the parent Unified ICME through IPCC Gateway PGs.
- You could increase Unified CCE 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 Unified CCX to participate in an enterprise routing environment with Unified ICME.

Figure 5: IPCC Gateway with IPCC Express Gateway PG with ICM Parent



The Unified CCX appears as an ACD to the Unified ICME 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 Unified CCX and automatically configured in Unified ICME.

Unlike Unified CCE deployments, there is no Side B IPCC Gateway in this system – if the Unified CCX system is deployed in a high availability (fault tolerant) model, only the active Unified CCX 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 Unified CCX 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.

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.

The Call Data Transferred Between Parent and Child

Call data is passed from the child and to the child system only during the following 3 steps during a call flow:

- From the child to the parent when the child sends a `ROUTE_SELECT_EVENT` to the parent. This can happen during a Translation routing dialog or a Post-Route dialog initiated from the child.
- From the parent to the child when the parent responds to a `ROUTE_REQUEST_EVENT` with a `ROUTE_SELECT_EVENT`.
- From the child to the parent when data is updated on the child and a `CALL_DATA_UPDATE_EVENT` and other call events are sent.

In the parent-to-child or child-to-parent call flow only a subset of call variables and ECC variables are passed to the call flow. The call data in the following table is what is transferred between parent and child.

Note:

- All ECC and or call variable transfers are subject to the `MAPVAR` and `MAPECC` variables (if present) for filtering.
- Any variables not specifically mentioned here are not transferred. Additionally only ECC variables configured with the same name on both systems can be transferred between parent and child systems.

Item	To Parent in Route Request	To Child in Route Select	To Parent from Call Data update and other events.
Call Variables 1-10	Yes	Yes	Yes
ECC Variables	Yes	Yes	Yes
ANI	Yes	No	No
ANI_II	No	No	No
User To User Info	Yes	No	No
Dialed Number (DNIS)	Yes	No	No
Caller Entered Digits (CED)	Yes	No	No
Call Wrapup Data	No	No	Yes

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; Unified CCE and Unified CCX 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 [Chapter 4, Understanding Reporting in an IPCC Gateway Deployment. \(page 51\)](#)

Upgrading to Use an IPCC Gateway Solution

If you have previous versions of Unified ICME/Unified CCE software or Unified CCX 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 Unified CCE 7.0 and would like to upgrade to Unified CCE 7.2, you must upgrade all of the software products in that solution; that is, you need Cisco Unified

Upgrading to Use an IPCC Gateway Solution

Communications Manager 6.0(1), Cisco Customer Response Solutions (for Unified IP IVR) 5.0(1), Cisco Unified ICME 7.2(0), and one of the 7.2 desktops (CAD or CTI OS).

To upgrade these products, see the following documents:

- *Upgrading Cisco Unified Communications Manager*
- *Cisco CRS Installation Guide*
- *Upgrade Guide for Cisco ICM/IPCC Enterprise and Hosted Editions*

After upgrading to the latest releases for the child Unified CCE, install the parent Unified ICME software, including the IPCC Enterprise Gateway PG. (See [Chapter 2, Deploying IPCC Gateway with IPCC Enterprise \(page 21\)](#) for more information.)

Similarly, if you want to upgrade to use IPCC Gateway with Unified CCX, you would need the same applications, but when installing Cisco CRS, you would choose Unified CCX as the product instead of Unified IP IVR, and you need Cisco Agent Desktop 6.4. Also during the installation of Unified CCX, you can choose to use Cisco Unified Communications Manager (Unified CM) or Cisco Unified Communications Manager Express (Unified CME). (See [Chapter 3, Deploying IPCC Gateway with Unified CCX \(page 33\)](#) for more information.)



Chapter 2

Deploying IPCC Gateway with Unified CCE

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

This section contains the following topics:

- [Deployment Overview, page 21](#)
- [What You Need Before You Install, page 24](#)
- [Installation and Configuration Checklist, page 24](#)
- [How to Configure the IPCC Enterprise Gateway PG, page 26](#)
- [How to Configure the IPCC Enterprise Gateway PIM, page 27](#)
- [Autoconfiguration with IPCC Enterprise Gateway, page 28](#)
- [Routing for the IPCC Enterprise Gateway, page 29](#)
- [Troubleshooting in an IPCC Enterprise Gateway Deployment, page 30](#)

Deployment Overview

To Post-route a call from the child in a Unified CCE system to the parent ICM, you must:

- Create a "transfer number" on the child IPCC's CallManager cluster as a CTI Route Point.

When the agent has a call at the child and wants to post-route it back via ICM, the call is transferred to that dialed number -- either from the desktop or using the Cisco IP Phone.

- Configure the transfer number in both the Child and the Parent -- but in the child, you must tag the number to allow "Application Routing," which means the route request is passed up to the parent for a response. If the parent doesn't respond, the child must also have backup scripting to handle the call locally as well.

In the Parent, you must:

- Create the dialed number for the transfer CTI Route Point.
- Put that dialed number into the Peripheral Monitor Table on the parent ICM. You must also build a call type and associated script to perform the post-route in the parent ICM.

The parent script can instruct the child system:

- To transfer the call to another child (via translation route to the other child's skill group)
- To transfer the call to an agent in the same child
- (or with CVP it can instruct CVP) To connect the call back to the network queue (provided it came from there in the first place).

The Parent/Child design assumes CVP at the Parent gets all the calls first and is used as a network queue point -- that does simplify the call delivery, RONA and subsequent transfers quite a bit.

If you use Unified IP-IVR to do the enterprise queuing at the ICM Parent, you must also be aware of the following:

- There is no built-in RONA timeout for that model like Cisco has with CVP. So, in this case, you must script for RONA at the Child locally and decide in that process if you want to re-route the call all the way back to the Parent ICM or just hold it in queue locally for the next local agent.
- Also, for subsequent transfers between child systems, there is extra work to translation route the calls to the IP-IVR at the Parent in the Parent ICM's post-routing script.
- In addition, there is an impact on call signaling which is hair pinned in that model several times between the layers -- especially if the IP-IVRs are on different CallManager clusters, which can also lead to misleading results from Call Admission Control, as the CAC mechanism may think there is a physical call hair pinned and using up twice the bandwidth when in reality there is only signaling going over the WAN twice and not the actual RTP stream.

In the child, you must:

- Create the dialed number for the transfer CTI Route Point
- Check the box for "enable application routing" and build backup treatment in case the ICM parent does not respond -- the call will be sitting in a CTI Route Point that can timeout, so it is important for there to be a way to deal with that call in the event that the ICM does not return a route.

Figure 6: Example Parent ICM Call Flow Configuration

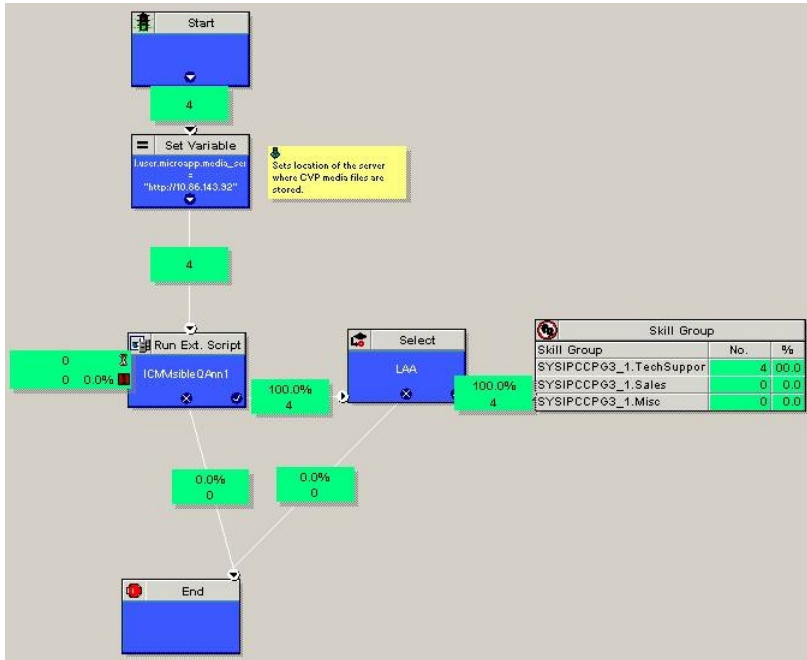
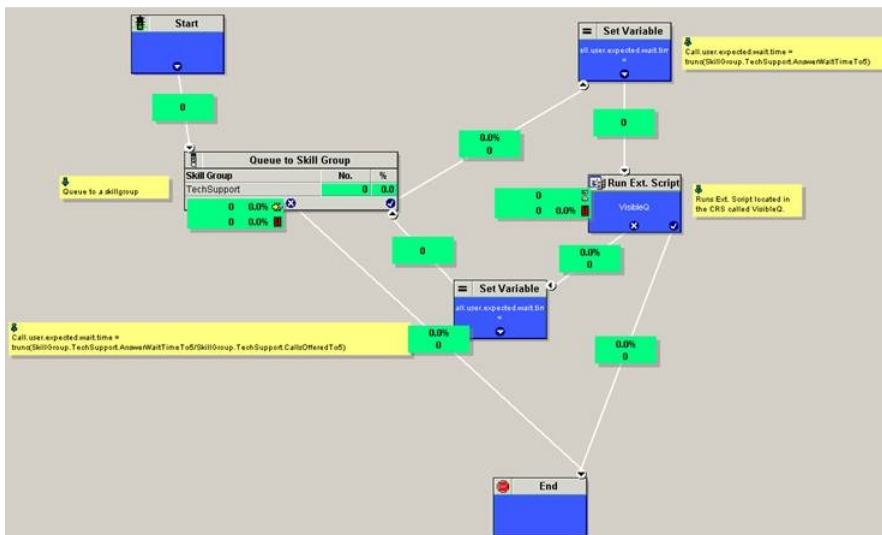


Figure 7: Example Child ICM Call Flow Configuration



What You Need Before You Install

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

- Cisco Unified Communications Manager (Unified CM)
- Cisco Customer Response Solutions (for Unified IP IVR)
- Cisco Unified Intelligent Contact Management Enterprise (Unified ICME)
- 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 Unified ICME; do not use the release that is compatible with Unified CCX.

You will need to install the Unified ICME twice, once as part of the Unified CCE child system, and once as the Unified ICME parent.

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

Table 2: Required Configuration Information

Unified CCE 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 Unified CCE system first and be sure you can route calls. Then install the parent Unified ICME 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 Unified CCE with an IPCC System PG for use with the IPCC Enterprise Gateway PG.

Table 3: Installation and Configuration Checklist

Task	Description/Notes	Reference
<p>1. Install and configure the Unified CCE or System Unified CCE software. This includes the System PG.</p>	<p>The process of doing this task involves installing Unified CM, Unified IP IVR, Unified ICME, and one of the desktops, either CAD or CTI OS. After doing this task, you can test your child Unified CCE system to be sure everything is working correctly.</p> <p>Note:</p> <ul style="list-style-type: none"> To enable call transfers from a parent Unified ICME cluster to a child Unified CCE cluster, you must first satisfy Unified CM IP Telephony requirements -- for example, deploying a Device Trunk such as H.225 Trunk (Gatekeeper Controlled) or Intercluster Trunk (Non-Gatekeeper Controlled) . For more information, see the <i>Cisco Unified Communications Manager System Guide</i>.) 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. 	<p><i>System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition</i> or the <i>IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition</i>.</p> <p>Note: If you are deploying a System Unified CCE child, see the information in Important Notes About System IPCC Deployment as a Unified CCE child. (page 26).</p>
<p>2. Install and configure the Unified ICME parent system, including the IPCC Enterprise Gateway PG.</p>	<p>Use the Unified ICME installation CD. You must install Side A and Side B IPCC Enterprise Gateway PGs.</p>	<p><i>ICM Installation Guide for Cisco ICM Enterprise Edition</i></p>
<p>3. Configure the IPCC Enterprise Gateway PG using the Unified ICME PG Explorer.</p>	<p>Use the instructions in How to Configure the IPCC Enterprise Gateway PG (page 26) and How to Configure the IPCC Enterprise Gateway PIM (page 27).</p> <p>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.</p>	<p><i>ICM Configuration Guide for Cisco ICM Enterprise Edition</i>.</p>
<p>4. Create a script on the parent Unified ICME system.</p>	<p>This script will interact with the IPCC Enterprise Gateway.</p>	<p>For general information about scripting, see “Scripting in an IPCC Environment” in <i>ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise and Hosted Editions</i>.</p>
<p>5. Start the Unified ICME Service for the IPCC Gateway PG.</p>	<p>In the Unified ICME Service Control dialog box, select the Services name for the IPCC Enterprise Gateway PG and click Start.</p>	<p>For general information about Unified ICME Service Control, see the <i>ICM Configuration Guide for Cisco ICM Enterprise Edition</i>.</p>

Important Notes About System IPCC Deployment as a Unified CCE Child

- You must enable the Unified CCE child System's **Permit Application Routing** check box for any route points that will post-route to the parent.
- In the System IPCC deployment model, the parent IPCC Enterprise Gateway PG connects to the Agent/IVR Controller. The Agent/IVR Controller is another name for System PG and does not require an additional server.
- The child System Unified CCE and the parent Unified ICME need to be reachable to/from each other. This is done through the Machine Hostname or IP Address setting.
- During installation of the IPCC Enterprise Gateway PG, the Peripheral ID for the Unified CCE child IPCC System PG is auto-generated from the parent Unified ICME's PG_ICID registry variable.
- After a connection is established between the child System Unified CCE and the parent Unified ICME, configuration in the child System Unified CCE propagates to the parent Unified ICME Configuration Manager.
- Agent configuration information on the child System Unified CCE propagates to the parent Unified ICME, where it is grayed out, indicating that it cannot be modified or deleted at the parent level.

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 Unified ICME 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.

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, in a System IPCC system (where there is web-based configuration), only one peripheral is supported on a System IPCC child system; its Peripheral ID value is **1000**. However, this is only the case where "System IPCC" (web based configuration) is used. In other cases, the true PeripheralID of the Child System IPCC should be used to propagate the skill groups.

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.

Figure 8: Example IPCC Gateway Configuration

The screenshot shows a dialog box titled "IPCC Enterprise Gateway Configuration (PIM 1)". It contains the following fields and values:

- Enabled
- Peripheral name: CCMPPG1
- Peripheral ID: 5000
- System PG A name: 10.16.19.5
- System PG A port: 42027
- System PG B name: 10.16.19.7
- System PG B port: 43027
- System PG Peripheral ID: 5003

Buttons: OK, Cancel, Help

Note: The Peripheral ID is for IPCC Enterprise. It is set based on your system configuration.

Autoconfiguration with IPCC Enterprise Gateway

For IPCC Gateway deployments with a Unified CCE 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 Unified ICME and the child Unified CCE, the following Unified ICME tables are populated:

1. Agent/Person
2. Skill Group
3. Service
4. Peripheral Monitor

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 Unified CCE parent, make these skill groups service members of that Service.

Note: Autoconfiguration does not provide complete configuration for Unified ICME 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 Unified CCE 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 Unified ICME 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.)
- You must ensure that Agent autoconfiguration is disabled so that the the IPCC Enterprise Gateway PG can function properly.

See Also

See the section ["What is the Relationship between Unified ICME Parent Services and Unified CCE Child Call Types?"](#) (page 60)

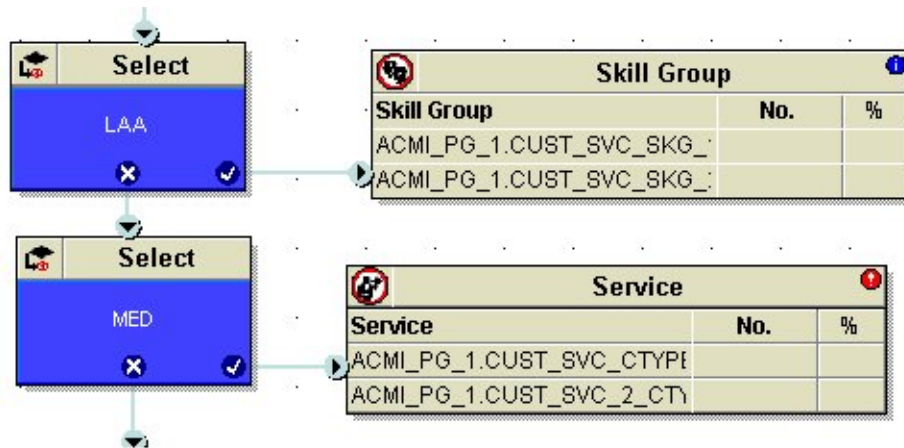
Routing for the IPCC Enterprise Gateway

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

Be sure all route points that are handled remotely (with Application routing enabled) have default "local" scripts to run in case no host (parent) is available. Include Post Route points in the scripts 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 9: Unified CCE Routing Script



Note: Scripting in an IPCC Gateway deployment is no different than scripting between Unified ICME 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.

A conferenced in agent loses the connection when the agent who first received the call hangs up

Symptom:

A conferenced in agent loses the connection when the agent who first received the call hangs up.

The call flow: (1) X initiates a call and the call goes through Unified CVP and then Unified ICME. (2) Unified ICME routes the call to Agent A on Unified CM cluster 1. (3) Agent A conferences the call with Unified IP IVR on Unified CM cluster 2. (4) Agent B on Unified CM cluster 2 becomes available and his phone rings. (5) Agent A releases the call. (6) Agent B answers the call and loses the connection.

Message:

None

Cause:

In the Unified CM configuration for an inter-cluster (non-gatekeeper controlled) trunk, the "Media Termination Point Required" check box had not been checked.

The "Media Termination Point Required" check box is used to indicate whether a media termination point (MTP) is to implement features that H.323 does not support (such as hold and transfer).

Action:

In the Unified CM configuration for an inter-cluster (non-gatekeeper controlled) trunk, you must check (turn on) the "Media Termination Point Required check box for the Non-Gatekeeper Controlled ICT trunk on cluster 1 which communicates with Cluster 2 so that the voice path will maintain between Agent B and X (the customer).

For further information on this topic, see the "Configuring Trunks" section in the *Cisco Unified Communications Manager Administration Guide*.

Post-routing from child system does not work

Symptom:

Post-routing from the Unified CCE child system is not working.

Message:

None.

Cause:

The problem might be one of the following:

- Route point is not configured in the Unified ICME 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 Unified ICME parent.
- Route points for translation route targets are not defined on the Unified CCE 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 Unified ICME parent, that Route points for translation route targets have been defined on the child, and that Route Points are 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 Unified ICME parent system matches the peripheral ID of the Unified CCE child system.



Chapter 3

Deploying IPCC Gateway with Unified CCX

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

This section contains the following topics:

- [What You Need Before You Install, page 33](#)
- [Installation and Configuration Checklist, page 34](#)
- [Routing in IPCC Express Gateway Deployments, page 42](#)
- [High Availability with IPCC Express Gateway, page 48](#)
- [Troubleshooting in an IPCC Express Gateway Deployment, page 49](#)

What You Need Before You Install

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

- Cisco Unified Communications Manager (Unified CM) or Cisco Unified Communications Manager Express (Unified CME)
- Cisco Customer Response Solutions (for Unified CCX)
- Cisco Intelligent Contact Management Enterprise (Unified ICME)
- Cisco Agent and Supervisor Desktops (bundled with Unified CCX)

Note: For Cisco Agent and Supervisor Desktops you must use the release that is bundled with and is compatible with Unified CCX; do not use the release that is compatible with Unified ICME.

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

Installation and Configuration Checklist

Note: The IPCC Express Gateway PG software is located on the Unified ICME installation CD, but you must install that part of the Unified ICME 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 34).

Installation and Configuration Checklist

This section lists the installation and configuration tasks for deploying IPCC Gateway with Unified CCX. With Release 5.0(1) of Cisco CRS, you can install and configure either Unified CM or Unified CME; both work with Unified CCX in the Gateway environment.

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

Table 4: Installation and Configuration Checklist

Task	Description/Notes	Reference
<p>1a. Install Unified CM.</p> <p>See Task 1b if using Unified CME.</p>	<p>After installing Unified CM, configure a Unified CM administrator. Make note of the username and password as well as the IP address of the machine on which Unified CM is running.</p> <p>Note: You must install Unified CM on a different machine than Unified CCX.</p>	<p><i>Cisco Unified Communications Manager Installation Guide</i></p>
<p>1b. Verify that the appropriate version of Unified CME is installed on the router. The corresponding IOS image contains the Unified CME software.</p>	<p>Configure the Unified CME router.</p> <p>Make note of the AXL userID, password, and the router's IP address.</p> <p>Configure Unified CME to enable operability with Unified CCX.</p>	<p><i>Cisco Unified Communications Manager Express 4.2 New Features</i></p>
<p>2. Install the Unified CCX software.</p>	<p>Unified CCX is a product on the Cisco CRS platform. During the CRS installation process, you choose whether you plan to use Unified CM or Unified CME with Unified CCX.</p> <p>Note: All licensed Unified CCX packages (Standard, Enhanced, and Premium) work with the IPCC Gateway. The license is applied later on CRS Administration.</p>	<p><i>Cisco CRS Installation Guide</i></p> <p><i>Getting Started with Cisco Unified Contact Center Express</i> and</p>
<p>3a. Configure the Unified CM software in CRS.</p> <p>See Task 3b if you are using Unified CME.</p>	<p>You will notice that when you configure route points on CRS, they are automatically configured in Unified CM.</p> <p>Agents are configured on Unified CM.</p>	<p><i>Cisco Unified Communications Manager Administration Guide</i></p> <p><i>Cisco CRS Administration Guide</i></p>

Task	Description/Notes	Reference
3b. For Cisco Unified CME, launch the setup wizard on CRS and go through the setup for Unified CME.	<p>When setup launches, you are asked for the AXL userID and password (that you created on Unified CME). You also need to enter the router IP address.</p> <p>Configure CME Telephony Subsystem to enable interoperability with Unified CCX.</p> <p>Create users and assign the agent capability in Cisco CRS.</p> <p>Note: On Unified CME, route points are configured automatically when you configure them on CRS. In addition, a Call Control Channel is created automatically.</p>	<i>Cisco CRS Administration Guide</i>
4. Install and configure the Cisco Agent and Supervisor Desktops.	<p>You will need the IP addresses for Unified CM and CRS during the installation process.</p> <p>If you are using Unified CME, the Cisco Desktop Administrator needs the IP address of the router.</p> <p>After installing and configuring CAD, you can test the child system to be sure all is working as expected.</p>	<i>Cisco CAD Installation Guide</i> and <i>Cisco Desktop Administrator's User Guide</i> .
5. Install the Unified ICME parent system, if the Unified ICME software is not already installed.	<p>Note that you can only connect one Unified ICME instance for IPCC Express Gateway.</p> <p>Note: Some autoconfiguration happens between Unified CCX and Unified ICME. See the section "Autoconfiguration Between Unified CCX and Unified ICME" for details.</p>	<i>ICM Installation Guide for Cisco ICM Enterprise Edition</i>
6. Configure the IPCC Express Gateway PG in Unified ICME.	Use the Unified ICME 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 Unified ICME" and the <i>ICM Configuration Guide for Cisco ICM Enterprise Edition</i> for instructions.
7. Install the Gateway PG software on the same machine where you installed Unified CCX.	<p>The PG software is on the Unified ICME installation CD.</p> <p>Warning! In the MDS and DMP Properties dialog box, make sure that the Disable ICM time synchronization checkbox is <i>checked</i> (the default). For more information, see "IPCC Express Gateway PG Setup and Time Synchronization" (page 40).</p>	See the section "Installing the IPCC Express Gateway PG" and the <i>ICM Installation Guide for Cisco ICM Enterprise Edition</i> .
8. Configure the Unified ICME parent software.	Use the Unified ICME 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.	<i>ICM Configuration Guide for Cisco ICM Enterprise Edition</i>

Installation and Configuration Checklist

Task	Description/Notes	Reference
	<p>Note:</p> <ul style="list-style-type: none"> In an IPCC Express Gateway system the enterprise Expanded Call Context (ECC) variable must be defined in Unified CCX, Cisco Desktop Administrator (CDA), and Unified ICME. 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 45). 	
<p>9. Create a script on Unified CCX.</p>	<p>Create a script that interacts with the IPCC Express Gateway PG, taking special care when specifying call variables/ECC variable settings.</p>	<p>For general information about using the CRS Editor to create scripts, see <i>Cisco CRS Scripting and Development Series: Volume 1, Getting Started with Scripts</i>, Chapter 18 "Designing IPCC Gateway Scripts" and <i>Volume 2, Editor Step Reference</i>.</p>
<p>10. Create a script using Unified ICME.</p>	<p>Create a script that interacts with the IPCC Express Gateway PG, taking special care when specifying call variable/ECC variable settings.</p>	<p>For general information about Unified ICME Scripting, see <i>ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise and Hosted Editions</i>.</p>

How to Configure the IPCC Express Gateway PG in Unified ICME

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

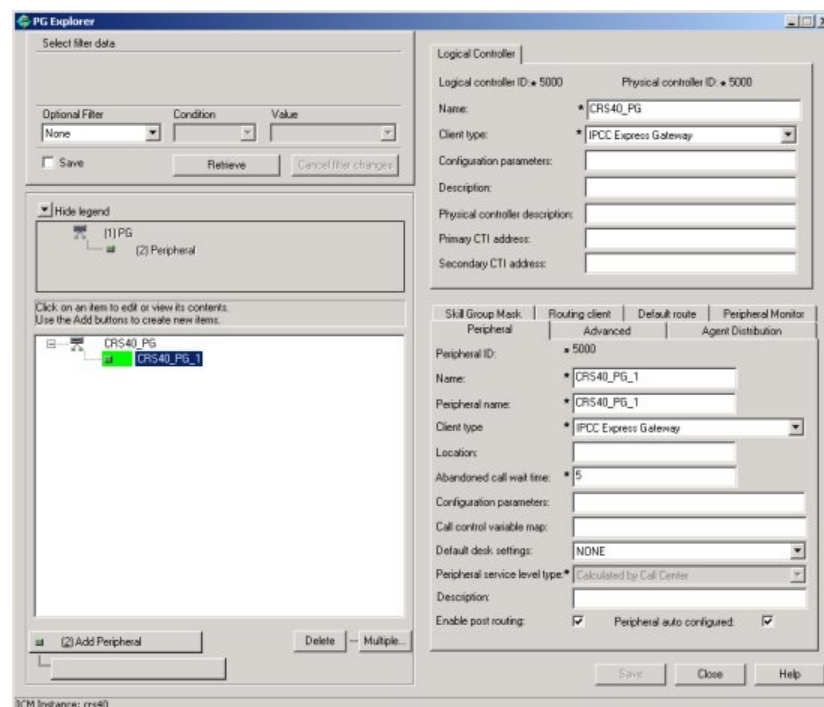
Complete the following steps to configure the PG:

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 Unified ICME 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 10: Unified ICME PG Explorer



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

Figure 11: Routing Client Tab

Peripheral	Advanced	Agent Distribution
Skill Group Mask	Routing client	Default route
		Peripheral Monitor
Name:	* CRS40_PG_RC	ID: * 5000
Timeout threshold:	* 5000	
Late threshold:	* 2500	
Timeout limit:	* 20	
Default media routing domain:	Cisco_Voice	
Default call type:	NONE	
Configuration parameters:		
Use DN/Label map:	<input type="checkbox"/>	
Client type:	* IPCC Express Gateway	
Description:		
Network routing client:		
Network transfer preferred:	<input type="checkbox"/>	

Note: In the Advanced tab of the PG Explorer, be sure that Agent autoconfiguration is disabled so that the IPCC Express Gateway PG can 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 Unified CCX. Do not install the PG on the machine where you install the other Unified ICME software.

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

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 Unified ICME 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 Unified CCX child server.
 - PCC ExpressIn the **IPCC Express Host Port** field, enter the port number of the Unified CCX 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 40).)

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.

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 Unified ICME to perform a *separate* time synchronization--the box is checked by default. The Unified ICME 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 Unified CCX, this box should *always* be checked, even in cases where the Unified CCX machine is in a workgroup. The reason for this is because Unified CCX uses the Network Time Protocol (NTP) service to synchronize the Unified CCX system time with the NTP server that runs on the Cisco Unified Communications Manager. 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 Unified CCX 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 Unified CCX machine will be able to keep the time synchronized with the Unified CM.

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

- The IPCC Express Gateway PG-specific historical data records the Unified CCX system time.
- The ICM central controller delivers a warning message that the IPCC Express Gateway PG is out-of-sync with the Unified ICME 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 Unified ICME. For more information, see ["Understanding Reporting in an IPCC Gateway Deployment"](#) (page 51).

Autoconfiguration between Unified CCX and Unified ICME

Autoconfiguration is a feature of the IPCC Gateway that minimizes the need to perform redundant configuration tasks on the Unified CCX child and the Unified ICME parent.

The following table shows the elements of Unified CCX that automatically get configured in Unified ICME. You make the configuration changes on the CRS Administration user interface.

Table 5: Autoconfiguration

Unified CCX	Unified ICME
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 Unified CM Administration. In Unified CCX agents are called resources. This agent information is automatically sent to Unified ICME 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 "[Understanding Reporting in the ICM Enterprise Parent and IPCC Express Child Deployment](#)" (page 67).

Autoconfiguration Example of CSQ/Skill Group

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

To enter a Unified CCX CSQ, complete the following steps:

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

The Unified CCX Configuration web page opens, displaying the RM JTAPI Provider area.

2. On the Unified CCX 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*.

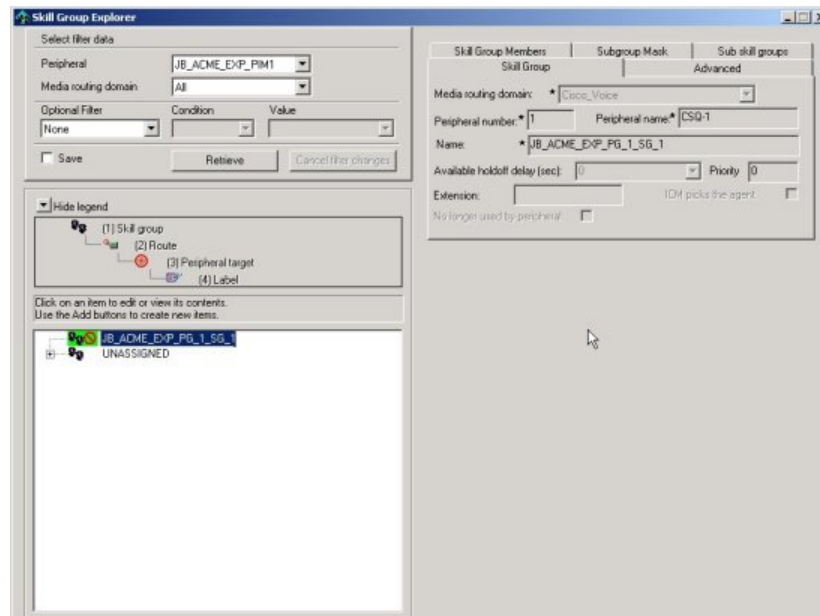
3. When all steps in the procedure are complete, click **Add**. The new CSQ displays and all agents belonging to the resource group or skill group selected are now a part of this CSQ.

You can confirm that the skill group has been added to Unified ICME by checking the Unified ICME Skill Group Explorer. As shown in the following Skill Group Explorer window, autoconfigured items display on the Unified ICME 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 Unified CCX only. In addition, some entry fields, such as the No longer used by peripheral check box, are grayed out.

Routing in IPCC Express Gateway Deployments

For information about autoconfiguration maintenance, see the section "[Autoconfiguration with IPCC Enterprise Gateway](#)" (page 28).

Figure 12: Skill Group Explorer with Red Circle Icon



Autoconfiguration settings cannot be changed on Unified ICME. If you want to make a change to an agent, skill group, or service, you must do so on the child Unified CCX 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. Be sure that Agent autoconfiguration is disabled so that the IPCC Express Gateway PG can function properly.

See Also

For detailed information about configuring Unified CCX, see the *Cisco CRS Administration Guide*.

Routing in IPCC Express Gateway Deployments

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

Pre-Routing

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

As Unified CCX integrates with the Unified ICME parent as an ACD, Unified ICME receives a continuous feed of calls and agent state information from Unified CCX via the IPCC Express Gateway PG, and thus Unified ICME knows about the number of agents available in different CSQs on all connected Unified CCX 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 Unified ICME via NIC. Unified ICME returns a route response to the network carrier with a label, which is a route-point (trigger) on a Unified CCX site connected to the Unified ICME parent. The network uses the label to send the call to the specified destination (Unified CCX child). When the call arrives at the Unified CCX, 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

Post-routing is another Unified ICME routing concept which enables Unified ICME to make secondary routing decisions after a call has been initially processed at a connected ACD (child Unified CCX site).

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

When Unified ICME gets the route request by way of the IPCC Express Gateway PG, a Unified ICME script is executed and returns a label to Unified CCX. The Unified CCX 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 Unified ICME are:

- **Route point (local or remote):** Design the Unified CCX 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 Unified CCX script 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 Unified CCX script to send the call to an agent.

Note:

- Request Route Step will not allow modification of call data. A Unified CCX 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 Unified CCX child to another Unified CCX child, based upon a label returned by Unified ICME, the call variables will not be transferred from one Unified CCX site to the other and the call will appear as a new call to the second Unified CCX site.

Translation Routing

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

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

Translation routes must be configured on Unified ICME with a pool of dialed numbers that have been defined on Unified CCX as route points. A Unified ICME 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 a Unified CCX site gets a new call and sends a route request to Unified ICME, and Unified ICME decides to redirect the call to another Unified CCX site. Unified ICME returns a label, which points to a route point (trigger) on another Unified CCX site. In addition to returning the route response (label) to the requesting Unified CCX Site, Unified ICME also sends a separate message (known as the pre-call) with the call variables to the IPCC Express Gateway PG on the Unified CCX site where the call will be redirected.

Upon receiving the label, the first Unified CCX site redirects the call to the second Unified CCX. When the call arrives at the second Unified CCX, it makes another route request to Unified ICME 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 Unified ICME and returns a label and call variables to Unified CCX. Unified CCX 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 is similar to pre-routing. In addition to directing the network carrier to send the call to a given Unified CCX site, the Unified ICME also sends a pre-call to the IPCC Express Gateway PG on that site containing the call variables. When the call arrives at the Unified CCX, it follows the same flow described above.

Scripting on the Unified CCX Child

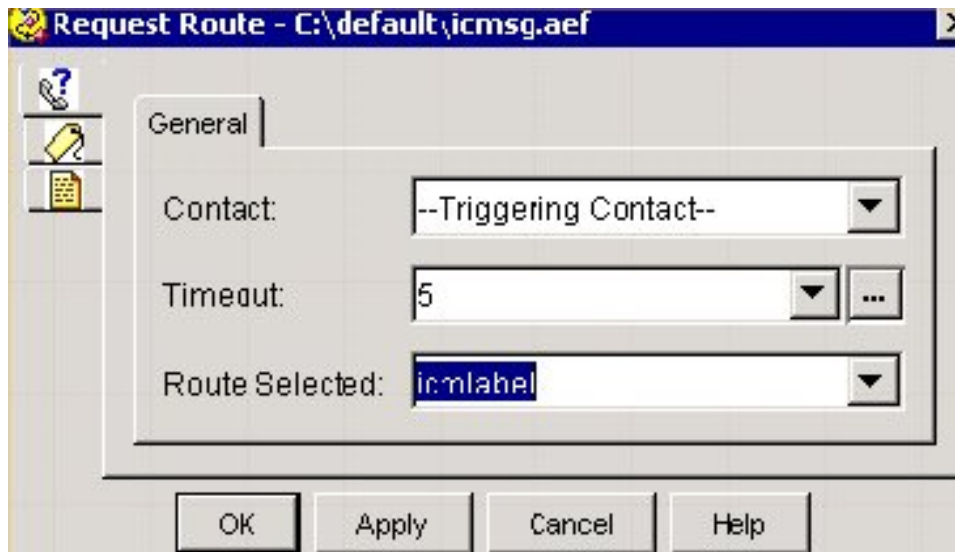
The CRS Editor contains three steps that specifically interface with IPCC Gateway:

- **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 Unified CCX to the Unified ICME parent and Cisco Agent Desktop. As this step must appear in a CRS script before the call is connected to an agent, place this step in the script before the Request Route or Select Resource Step.
- **Request Route** (ACD palette). Use the Request Route step to request a call routing label from Unified ICME. A Unified CCX script can then use that label to process the call further. The route point must be registered in the Peripheral Monitor table of Unified ICME, 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 Unified ICME.
- **Failed.** The Request Route step failed to return a routing destination from Unified ICME.

Figure 13: Request Route Step



Call Variables in IPCC Express Gateway

Unified CCX 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.

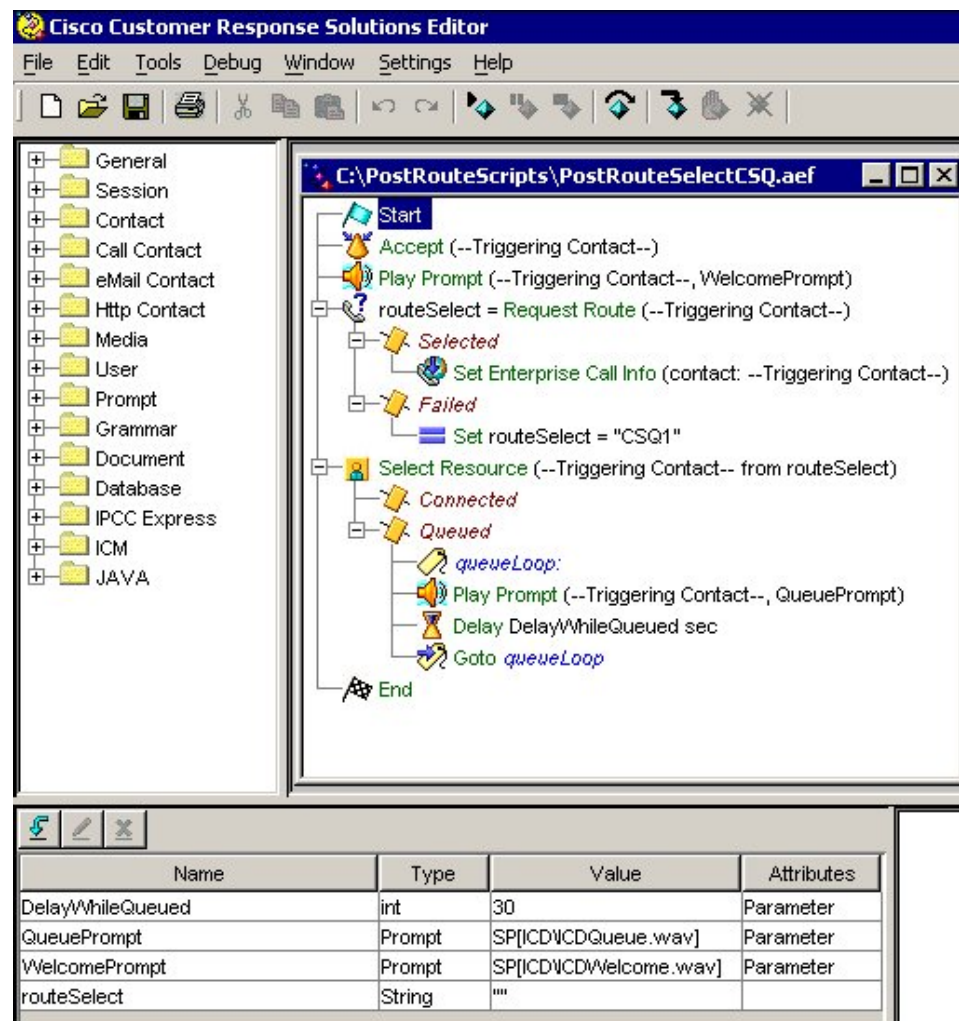
Every enterprise ECC variable must be defined on both sides of the system that sends and receives the variable data. In a Unified CCX system integrated with Unified ICME through the IPCC Gateway, the enterprise ECC variable must be defined both in Unified CCX, in Cisco Desktop Administrator (CDA), and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

Note:

- All ECC variable names must begin with the characters: **user.** (includes period).
- For more information about defining Call Variables/Expanded Call Variables in Unified CCX, 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 Unified CCX Script that Selects a CSQ:

Figure 14: Unified CCX Script



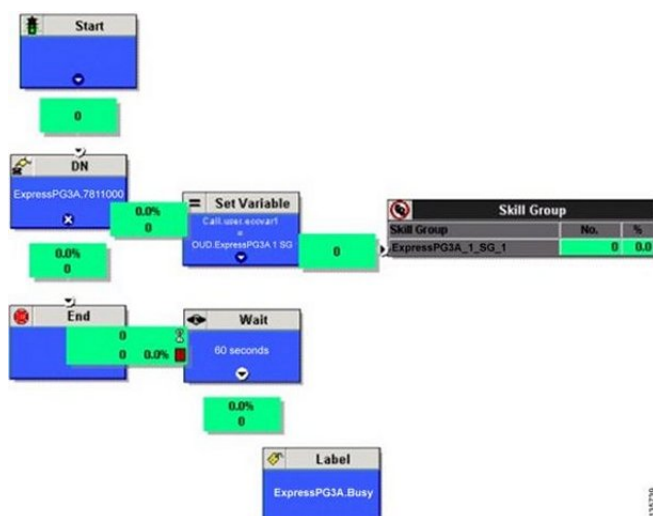
The variables used in the script are shown at the bottom of the figure. The variables, this script, and other scripts are described in detail in the "Designing IPCC Gateway Scripts" chapter in

Cisco CRS Scripting and Development Series: Volume 1, Getting Started with Scripts. The Unified CCX 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.*

Scripting on the Unified ICME Parent

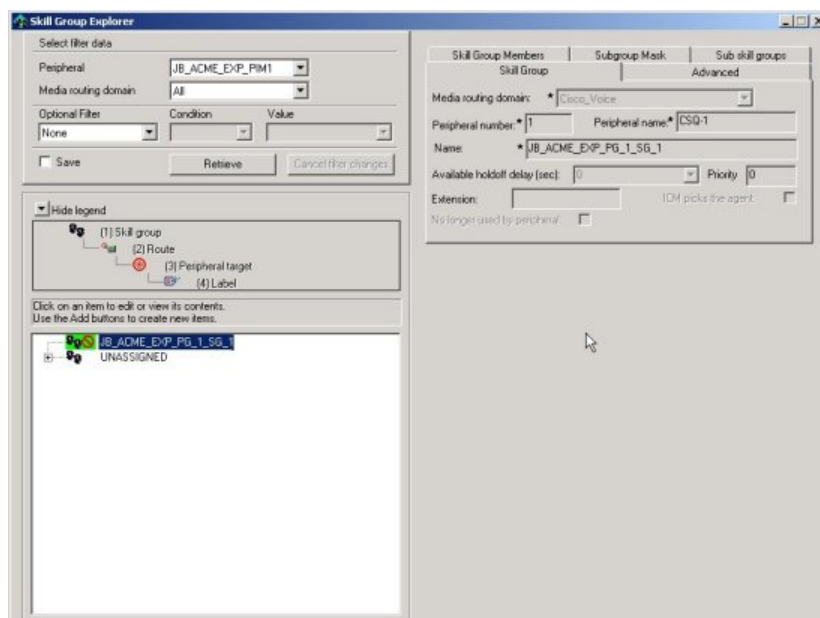
The script on the Unified ICME parent interacts with the IPCC Gateway PG. The following figure shows a Unified ICME parent script that selects Ready resource from skill group and returns a CSQ label.

Figure 15: Unified ICME Routing Script



The following figure shows a Skill Group Explorer configuration that returns a CSQ label.

Figure 16: CSQ Label on Skill Group Explorer

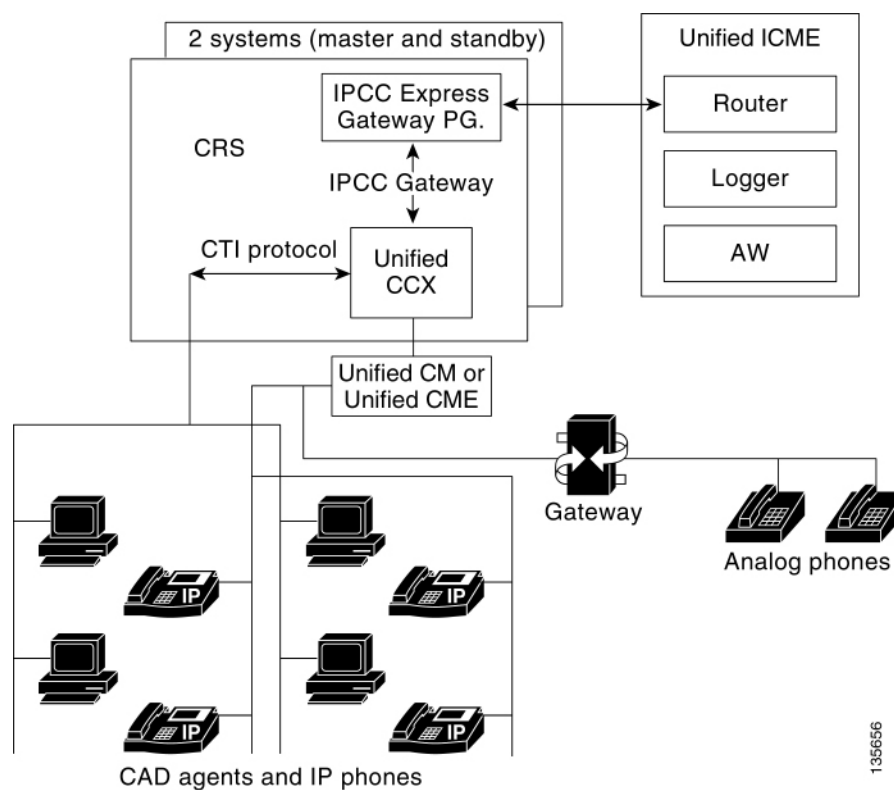


High Availability with IPCC Express Gateway

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 17: High Availability with IPCC Express Gateway PG



Only the IPCC Express Gateway PG on the Master CRS node is activated and connects to the Unified ICME CallRouter; the IPCC Gateway Manager controls activation and deactivation of the IPCC Express Gateway PG.

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

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

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, Unified ICME Node Manager restarts the IPCC Gateway PG. There is no fault tolerance at the Unified ICME level; all call and agent state changes that occur while the PG is inactive will be lost to Unified ICME. When Unified ICME reconnects, it receives call and agent information for the *current* time period.
- **IPCC Gateway PG-to-Unified ICME Connectivity Fails.** If a network problem disrupts the connection between IPCC Gateway PG and Unified ICME, the Unified ICME keeps trying to reconnect until it is successful. When Unified ICME reconnects, it receives call and agent information for both the current *and* disconnected time periods.
- **Unified ICME Side A Fails/IPCC Gateway PG Active.** If a problem occurs on the Unified ICME side, Unified ICME 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 Unified CCX 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 Unified CCX, when a previously deleted application or agent is added back to Unified CCX, the application or agent does not appear on Unified ICME.

Message:

None.

Cause:

You must physically delete all records marked for deletion on Unified ICME before recreating the records on Unified CCX.

Action:

Complete the following steps before recreating the application or agent on Unified CCX:

1. On the Cisco ICM AW Configuration Manager, select **ICM > Administration > Deleted objects**.
2. Delete the records marked for deletion.

VoIP Monitor Subsystem on Unified CCX 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 Unified ICME'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**.



Chapter 4

Understanding Reporting in an IPCC Gateway Deployment

This section describes reporting in an IPCC Gateway deployment—a deployment in which a Unified CCX or a Unified CCE functions as an ACD child with respect to a Unified ICME parent. For complete details on ACD-level reporting on Unified CCE, refer to the *IPCC Enterprise Reporting Guide*. Similarly, for complete details on ACD-level reporting on Unified CCX, 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 Unified ICME Reporting, page 51](#)
- [Understanding Reporting in the Unified ICME Parent and Unified CCE Child Deployment Model, page 57](#)
- [Understanding Reporting in the Unified ICME Parent and Unified CCX Child Deployment Model, page 67](#)
- [Troubleshooting Reports in IPCC Gateway Deployments, page 83](#)

Understanding Unified ICME Reporting

Unified ICME uses real-time data on agent and call center activity to make call routing decisions. To make the best decision possible, the Unified ICME constantly collects information about agent activity at each call center. Unified ICME 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.

Unified ICME also collects data about the calls coming into the call centers, such as the number of calls in progress, handled, and ended; 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.

The *Reporting Guide for Cisco Unified ICM Enterprise & Hosted* explains the components that make up the Unified ICME architecture and how those components affect reporting. The *Reporting Guide for Cisco Unified ICM Enterprise & Hosted* also explains reporting concepts and the real-time and historical data that populate reports.

Using WebView to Generate Reports

WebView provides Unified ICME 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 Unified ICME 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 Unified ICME parent display in the application. If you are not sure whether a particular report is applicable for enterprise-level reporting at the Unified ICME parent, refer the WebView On-line Help for that particular report.

The following figure shows the WebView ICM Templates check box.

Figure 18: WebView Check Box



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

Reporting Templates

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 Unified ICME 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.

Call Type Reports

Reports generated from most categories operate as describe in the *Reporting Guide for Cisco Unified ICME* and the *WebView On-line Help*. One exception is Call Type Reports, which have a different behavior as described in this section.

A call type is a category of incoming routable tasks. When Unified ICME 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). Unified ICME 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 Unified ICME 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 Unified ICME parent help to determine the following:

- Number of calls received by the call type to be routed to different peripherals (example: Multiple Unified CCE children, or different ACDs)
- Number of calls routed to different peripherals (example: Multiple Unified CCE 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 Unified ICME parent:

- If you are using translation routing at the Unified ICME 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 Unified ICME 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 Unified ICME parent to report on the queuing statistics. The number of calls queued and the network queue time will not be available at the Unified CCE child. For more details, refer to the section "[Network Queuing and Reporting](#)" (page 51).

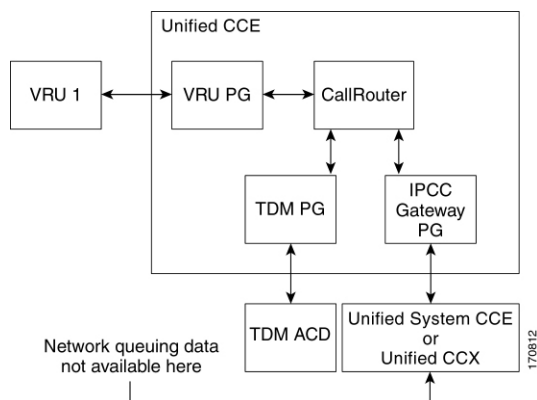
Note: To determine which specific Call Type reports are applicable at the Unified ICME parent, refer to the *WebView On-line Help* associated with each individual ICM Template available in *WebView* under the Call Type Report category.

Network Queuing and Reporting

The existence of a network VRU in a Unified ICME or a Unified CCE deployment affects Unified ICME/Unified CCE 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 19: Network VRU in a Gateway Deployment



Using the terms *ICM-TR* to denote a Unified ICME system in which all calls are translation routed when sent to an ACD and *ICM-Not-TR* to denote a Unified ICME 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 54) and "[Network VRU and Skill Group Metrics](#)" (page 54).

Network VRU and Call Type Metrics

All of the Call Type metrics apply to both Unified CCE and Unified ICME. In Unified ICME 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 Unified CCE and Unified ICME, 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.

With regard to ICM-Not-TR systems, the Call Type queuing and at-VRU metrics are the same as for Unified CCE 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:

Table 6: 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	DelayAgentAbandTimeTo5
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
			TotalCallsAbandTo5
			TotalCallsAbandToday

Understanding Unified ICME Reporting

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

Table 7: 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	CallDelayAbandTimeHalf
RouterQueueCallsToHalf	VRUTimeToHalf	ServieLevelCallsOfferedHalf	CTDelayAbandTimeHalf
RouterQueueCallType LimitToHalf	Answered:	ServiceLevelHalf	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 Unified CCE 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 queuing and at-VRU metrics are the same as for Unified CCE 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.

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

Table 8: 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:

Table 9: Skill_Group_Half_Hour Table and Reporting Metrics

Queued Metrics	At VRU Metrics/ Answered Metrics	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 Unified ICME Parent and Unified CCE 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 (Unified ICME parent)
- Reporting on the ACD (Unified CCE child)

Note: In the Unified ICME parent with Unified CCE child deployment model, it is important to pay close attention to comments in the *IPCC Enterprise Reporting Guide* regarding Unified CCE with System PG. These comments highlight the differences in reporting data collection

Understanding Reporting in the Unified ICME Parent and Unified CCE Child Deployment Model

under different deployment models used for Unified CCE. A Unified CCE 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 Unified CCE reports on the child to monitor the state of the ACD (child) system.

However, to get enterprise-level reporting across Unified CCE children (ACDs) you need to run Unified ICME reports at the Unified ICME 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.

Table 10: Reporting Options, IPCC Enterprise Gateway Deployment Model

Deployment Model	Parent Reporting	Child Reporting	Caveats
Unified ICME parent/ Unified CCE with an IPCC System PG Note: <ul style="list-style-type: none"> • Can have more than one child; Unified ICME treats each child as a separate ACD. • For details on this model, see Chapter 1. 	The Unified ICME 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 Unified ICME parent for enterprise-wide reporting across multiple Unified CCE with IPCC System PG children.	Each Unified CCE 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 Unified CCE with an IPCC System PG child for local agent performance and customer experience measurement.	The Agent and Skill Group reports on the Unified ICME 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 Unified CCE child. Outbound Option reports at the Unified ICME parent; WebView will not reflect Outbound Dialer Campaign or Dialer statistics that are reported on the child.
Multiple Unified ICME (parents) connected to Single Unified CCE system through individual IPCC System PGs; for example, multiple Outsourcers sending calls from their Unified ICME parent to a single Unified CCE child (Provider). Note: For details see Chapter 1.	Each Unified ICME parent has its own reporting components. For example, each Outsourcer has its own individual Unified ICME 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 Unified CCE child (Provider). Each Unified ICME parent can only see reporting information that is associated with its own IPCC Enterprise Gateway PG.	The receiving Unified CCE system has its own component (HDS/AW/WebView) and provides reporting on agent performance and customer experience on calls routed to the Unified CCE child from multiple Unified ICME parents.	In this deployment the child Unified CCE System has two peripherals (IPCC System PGs) each talking to different Unified ICME parents. Note: The child Unified CCE should not set up call types that span the two peripherals.

Deployment Model	Parent Reporting	Child Reporting	Caveats
A Unified ICME parent deployed with a Unified CCE child with System PG, TDM ACD through respective ACD PG, and a Unified CCX 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 Unified ICME parent for consolidated enterprise-wide reporting across Unified CCE child, various TDM ACD peripherals, and Unified CCX child.	<p>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.</p> <p>Unified CCE child site-level supervisors can use "IPCC Templates" WebView Reports on each Unified CCE with an IPCC System PG child.</p> <p>Unified CCX child site-level supervisors can use Historical Reporting Client on the Unified CCX child.</p> <p>TDM ACD site-level supervisors can use the reporting capabilities available on their TDM ACD.</p>	The statistics reported on the Unified ICME parent might differ for the different ACDs (Unified CCE, Unified CCX, 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. Unified ICME uses naming conventions to assist in tracking data mapping between parent and child systems.

If you are deploying an IPCC Gateway system, in which Unified CCE appears as an ACD to a parent Unified ICME system, limit the number of characters in the names of agents, skill groups and call types on the child Unified CCE System. When these names are passed to the parent ICM Enterprise during autoconfiguration, Unified ICME/Unified CCE 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 Unified ICME system. This means that you will not be able to find the name in reports run on the Unified ICME 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

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 Unified ICME Parent Services and Unified CCE Child Call Types?

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

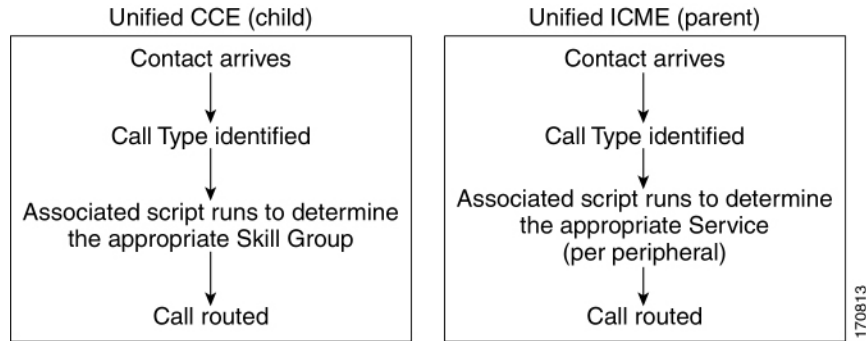
Note: However, the Unified ICME parent will continue to process the Call Type data it owns using the "traditional" method, that is, using it to populate Call Type tables for Call Types configured on the Unified ICME parent.

About Call Types and Services

On both the Unified ICME parent and the Unified CCE 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 Unified CCE 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 Unified ICME 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.

Figure 20: Child Skill Group/Parent Service



On the Unified ICME 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 **Unified ICME parent**, use “ICM Templates” in WebView in the Services category. To measure customer experience at the **Unified CCE child**, use the “IPCC Templates” under Call Type category in the WebView reporting system.

Mapping Data between the Unified CCE Child and Unified ICME Parent

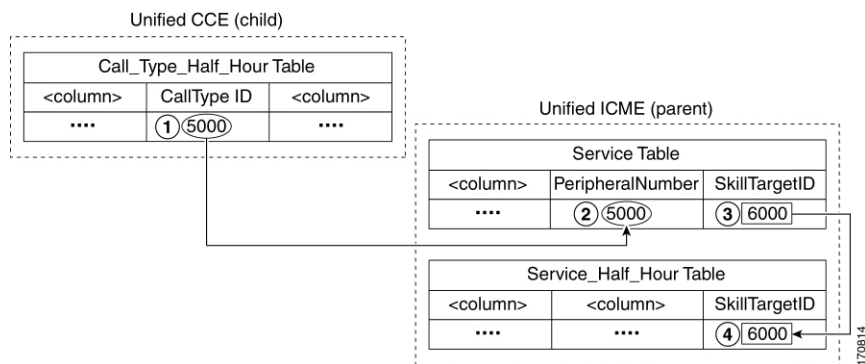
When the Unified CCE child maps a Call Type to a Unified ICME Service, the following attributes are passed from the Call_Type table to the Service table:

- The CallTypeID in the Call_Type table on the Unified CCE child system maps to the PeripheralNumber in the Service table on the Unified ICME parent.
- The EnterpriseName in the Call_Type table on the Unified CCE child maps to the PeripheralName in the Service table on the Unified ICME parent.

You can use this mapping process to locate the corresponding Service records on the Unified ICME parent for a call type record on the Unified CCE child.

The figure that follows shows an example of data mapping.

Figure 21: Data Mapping Between Unified CCE child and Unified ICME parent



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 Unified CCE Child Call Type and Unified ICME Parent Service Database Tables

This section describes the relationship between customer experience data available at the Unified ICME parent and at the Unified CCE child. It discusses Services data concepts at the Unified ICME parent and corresponding similar concepts at the Unified CCE 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 Unified ICME Parent and Unified CCE Child Reporting](#)" (page 57), the data collected and presented in Service database tables and Services WebView reports at the Unified ICME parent is expected to vary from data collected and presented on Call Type database tables and Call Type reports on the Unified CCE 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 Unified ICME parent and see a corresponding data field in Call Type table in the Unified CCE 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.

Table 11: 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.
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.)

Table 12: 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.

Parent: Service_Real_Time	Child: Call_Type_Real_Time	Comments
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.
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 Unified CCE Child and Unified ICME Parent

The service level data collected and presented in reports on the Unified CCE child system will differ from service level data in reports on the Unified ICME parent. This happens because:

- At the Unified CCE 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 a Unified ICME parent, service level data is only collected and reported in Service database tables and reports.

Note: For information about the available Unified ICME Service reports, see the WebView online help.

In addition to these differences, in a Unified CCEchild, 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 Unified ICME 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 Unified CCE child with the ServiceLevel field values in Service_Half_Hour/Real_Time tables at the Unified ICME parent.

Differences between Unified ICME Parent and Unified CCE 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 Unified ICME parent is expected to be different from data collected and presented at the Unified CCE 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 Unified ICME parent and the Unified CCE child.
- **Differences in supported concepts at the Unified ICME parent and Unified CCE 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 Unified ICME parent or the Unified CCE child, certain agent performance and customer experience statistics might only be available at the Unified ICME parent or at the Unified CCE child. For example, Skill Group Service Levels are supported in the Unified CCE child but not the Unified ICME parent. Similarly Abandon Answer Distribution Call Type reports are available at the Unified CCE child and not at the Unified ICME 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 Unified ICME parent would use Service Level statistics on Service Reports while WebView users at the Unified CCE child would use Service Level statistics on Call Type Reports.

Note: For more information, see "About Service Levels on the Unified CCE Child and Unified ICME Parent".

- **Differences in configuration of parent and child systems.** Although IPCC Gateway minimizes this issue due to auto configuration, discrepancies between Unified CCE child and Unified ICME 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 Unified ICME 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 threshold" in the global settings for Call Types on the Unified CCE child system, differences could arise between abandon counts on the two systems. A call might be considered as abandoned on the Unified ICME parent and as a Short Call on the Unified CCE 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 Unified ICME parent matches the "Answered Short Call threshold" configured on the IPCC System peripheral configured on the Unified CCE child.

- **Agent Reporting:** If you are using the Unified ICME 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 Unified ICME 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 Unified ICME parent system will not show any agent data.

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

If you plan to report on "Not Ready reason Codes" on the Unified ICME parent system then it is important to configure the following on Unified ICME 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 Unified CCE 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 Unified CCE child.
- **Mapping of Call Types and Services:** The Call Types on the IPCC Enterprise child are auto configured as Services on the Unified ICME parent. However Call Types are not specific to peripherals, whereas, Services are. If you have an Unified CCE 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 Unified CCE child, these are configured as two services on the Unified ICME parent system, one for each peripheral. Hence, a single call type on the Unified CCE child will map to two different Services on the Unified ICME parent resulting in reporting differences.

Understanding Reporting in the Unified ICME Parent and Unified CCX 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 (Unified ICME parent).
- Reporting on the ACD level (Unified CCX child).

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

However, to get enterprise-level reporting across Unified CCX children (ACDs) you need to run Unified ICME reports at the Unified ICME 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.

Table 13: Reporting Options, IPCC Express Gateway Deployment Model

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

Deployment Model	Parent Reporting	Child Reporting
each Unified CCX child can have only one Unified ICME instance.	ICME parent WebView for enterprise-wide reporting.	

Using Unified CCX and Unified ICME Reports

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

Table 14: Deciding Which Reports to Use

Activity	ICM Enterprise Parent	IPCC Express Child
Managing agent performance	"ICM Templates" in Agent WebView Report Category at the Unified ICME parent.	Use Agent Reports (such as Agent Call Summary, Agent Summary Report, Agent 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 Unified ICME 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 Unified ICME 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 Unified CCX reports for local ACD reporting and use Unified ICME reports for enterprise-wide reporting. For additional discussion on reporting at the Unified ICME parent, see "Using Unified ICME Reporting to Manage Agents and Measure Customer Experience". For details about all of the Unified CCX reports, see the *Cisco CRS Historical Reports User Guide*.

Understanding Similar Data Concepts in Unified CCX Child and Unified ICME Parent Database Tables

This section describes the relationship between customer experience data available at the Unified ICME parent and the Unified CCX child. It discusses data concepts at the Unified ICME parent and corresponding similar concepts at the Unified CCX child.

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

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

Table 15: Methods IPCC Express and ICM Use to Store and Calculate Data

Unified CCX	Unified ICME
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 Unified CCX reports is aggregated and calculated from detailed records when the report is generated.	Data presented in Unified ICME 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 "[Differences between Unified ICME Parent and Unified CCX Child Reporting](#)" (page 78).

The tables in this section provide a discussion on key data fields in a Unified CCX child's Historical reports and similar concepts in a Unified ICME 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* Unified CCX and Unified ICME increment values. Unified CCX increments counts for the interval in which the call started, not when an event occurred; Unified ICME 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 Unified CCX includes CSQ, Application, and Agent reports.

Note: This timing issue is applicable to **all** data passed from Unified CCX to Unified ICME.

2. **Additional Calculations Needed.** Many Unified CCX report data will need some sort of derivation to match corresponding Unified ICME report data (due to differences in definitions and values included on reports). For example, Average Hold Time for Unified CCX is calculated for incoming calls, only, while Average Hold Time on Unified ICME is calculated on incoming *and* outgoing calls. As the Unified ICME 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 Unified ICME database.

3. **Difference in Service Level Concept Implementation.** Service Level for Unified ICME is calculated for Services, not Skill Groups. Service Level in Unified CCX is calculated for CSQs (which correspond to Unified ICME Skill Groups), not Applications (which correspond to Unified ICME Services). Since values are not being calculated on equivalent

objects, a Unified CCX Service Level report is not comparable to a Unified ICME Service Level report .

4. **Time in Reason Code.** One Unified CCX agent report shows time in reason code 0-9 on separate lines. Unified CCX 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). Unified ICME has reason code on its summary report but only last reason code received not time in separate reason code buckets.
5. **Unified ICME 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.** Unified CCX does not have a concept equivalent to Unified ICME'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.

Measuring Customer Experience

Application reports provide key statistics that help call center managers measure customer experience at the Unified CCX child. At the Unified ICME 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 Unified CCX child and similar concepts in Service Half Hour tables at the Unified ICME parent.

Table 16: Measuring Customer Experience: Unified CCX Application Call Counts and Durations

Unified CCX Application Report Concept	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
Calls Presented <i>(Found on Application Summary Report.)</i>	Reports display the total number of calls that each application received. This number is equal to the number of calls handled by the application <i>plus</i> the number of calls abandoned while in the application.	The closest concept on Unified ICME 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 Unified CCX does.
Calls Handled <i>(Found on Application Summary Report.)</i>	Reports display the total number of calls that are handled by each application. A call is considered handled when it	The closest concept on Unified ICME is Service_Half_Hour.CallsHandledToHalf, which is the number of tasks handled by service. A task is counted as handled when it is finished.	Timing differences will exist.

Unified CCX Application Report Concept	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
<i>Summary Report.)</i>	reaches the workflow step that defines the call as handled, or when it is handled by an agent. Note: The Unified CCX script writer needs to include a step that explicitly sets the Handled flag.	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.)	
<i>Call Abandoned (Found on Application Performance Analysis and Application Summary Reports.)</i>	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. Note: The Unified CCX script writer needs to include a step that explicitly sets the Handled flag.	There is no one specific closest concept on Unified ICME. However, at the Unified ICME 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 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 Unified ICME parent, calls that are abandoned in short call time period will not be counted in Service_Half_Hour.CallsAbandQToHalf. Since Unified CCX does not support short calls, Calls Abandoned on Unified CCX reports represent all calls abandoned. Service_Half_Hour.Forced ClosedCallsToHalf – Since the definition of Application Calls Abandoned in the Unified CCX 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	Timing differences will exist.

Understanding Reporting in the Unified ICME Parent and Unified CCX Child Deployment Model

Unified CCX Application Report Concept	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
		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 Unified ICME 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 (Found on Application Summary Report.)	Number of calls entering the application; specifically, calls redirected to this application from another through a workflow script, not from an agent or external system.	The closest concept on the ICM is Service_Half_Hour.OverflowInToHalf, which 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).	Timing differences will exist.
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 Unified ICME 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.	Timing differences will exist.

Unified CCX Application Report Concept	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
		AnswerWaitTimeToHalf /Service_Half_Hour. CallsAnsweredToHalf.	
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 Unified ICME 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 Unified CCX child. At the Unified ICME parent, customer experience data is stored in a variety of Agent tables (such as Agent_Half_Hour and Agent_Skill_Group_Half_Hour tables.)

Note: The "Enable Agent Reporting" checkbox on the Unified ICME 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 Unified ICME parent.

Note: Calls not associated with a CSQ on the Unified CCX child will not pass on to the Unified ICME 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.

Table 17: Measuring Agent Performance: Unified CCX Agent Call Counts and Durations

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
Calls Handled (Found on Agent Summary Report.)	Number of calls that answered by agent.	The closest concept on Unified ICME 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	Number of calls sent to an agent, regardless of whether the agent answered or not.	While there is no specific closest concept on Unified ICME, you can look collectively at the following:	Timing differences will exist.

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
<i>(Found on Agent Summary Report.)</i>		<p>Agent_Skill_Group_Half_Hour.CallsHandledToHalf -</p> <p>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.</p> <p>Agent_Skill_Group_Half_Hour.RedirectNoAnsCallToHalf-</p> <p>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.</p> <p>Agent_Skill_Group_Half_Hour.AbandonRingCallsToHalf-</p> <p>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.</p>	
Talk Time <i>(Found on Agent Detail Report.)</i>	Total talk time for agent on all calls during the report period.	<p>While there is no specific closest concept on Unified ICME, you can look collectively at the following concepts:</p> <p>Agent_Skill_Group_Half_Hour.TalkInTimeToHalf-</p> <p>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.</p> <p>Agent_Skill_Group_Half_Hour.TalkOutTimeToHalf -</p>	Timing differences will exist.

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
		<p>The number of seconds an agent associated with this skill group spent talking on external outbound or consultive transfer calls during the half-hour interval. TalkOutTime is included in the calculation of TalkTime and LoggedOnTime.</p> <p>Agent_Skill_Group_Half_Hour.TalkOtherTimeToHalf-</p> <p>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.</p>	
<p>Hold Time <i>(Found on Agent Detail Report.)</i></p>	<p>Total hold time for agent on all calls during the report period.</p>	<p>The closest concept on Unified ICME is</p> <p>Agent_Skill_Group_Half_Hour.HoldTimeToHalf,</p> <p>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.</p>	<p>Timing differences will exist.</p>
<p>Work Time <i>(Found on Agent Detail Report.)</i></p>	<p>Total work time for agent on all calls during the report period.</p>	<p>The closest concept on Unified ICME is a combination of the following:</p> <p>Agent_Skill_Group_Half_Hour.WorkReadyTimeToHalf -</p> <p>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.</p> <p>Agent_Skill_Group_Half_Hour.WorkNotReadyTimeToHalf-</p>	<p>Timing differences will exist.</p>

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
		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.	

Table 18: Measuring Agent Logging Activity and State Information

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Services Similar Concept(s)	Comment(s)
Logout Date Time <i>(Found on Agent Login/Logout Detail Report.)</i>	Date and time that the agent logged out of the Unified CCX 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 Unified ICME 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 <i>(Found on Agent Login/Logout Detail Report.)</i>	Elapsed time between the Login Time and the Logout Time.	The closest concept on Unified ICME is Agent_Half_Hour. Agent_Logout.LoginDuration, which is the number of seconds the agent was logged in.	Timing differences will exist.
Logout Reason Code <i>(Found on Agent Login/Logout Detail Report.)</i>	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 Unified ICME 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 Unified CCX child. At the Unified ICME 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 Unified CCX child and similar concepts in Skill_Group_Half Hour tables at the Unified ICME parent.

Table 19: Measuring Skill Group Performance: IPCC Express CSQ Call Counts and Durations

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
<p>Calls Presented</p> <p><i>(Found on Common Skill CSQ Activity, CSQ Activity by CSQ, CSQ Activity by Interval, CSQ Activity, CSQ Priority Summary, CSQ Service Level Priority Reports.)</i></p>	<p>Number of calls routed to CSQ, whether or not the agent picks up the call.</p>	<p>The closest term is CallsOfferedToHalf, which is the number of calls received by this skill group for the current half-hour interval.</p> <p>Note: For consistent values, in Unified CCE regardless of whether or not there is an IPCC System PG, use RouterCallsOfferedToHalf.</p>	<p>Timing differences will exist.</p>
<p>Calls Handled</p> <p><i>(Found on Common Skill CSQ Activity, CSQ Activity by CSQ, CSQ Activity by Interval, CSQ Activity, CSQ Call Distribution, CSQ-Agent Summary Reports.)</i></p>	<p>Number of calls handled by CSQ. Call handled if caller connected to an agent while queued for CSQ.</p>	<p>The closest concept on Unified ICME 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.</p>	<p>Timing differences will exist.</p>
<p>Calls Abandoned</p> <p><i>(Found on Common Skill CSQ Activity, CSQ Activity by CSQ, CSQ Activity by Interval, CSQ Activity, and CSQ Call Distribution Reports.)</i></p>	<p>Number of calls routed to CSQ but not answered by an agent because caller hangs up or is disconnected.</p> <p>Note: This value is counted for each of the CSQs the call was queued for.</p>	<p>While there is no specific closest concept on Unified ICME, you can look collectively at the following concepts: Skill_Group_Half_Hour.RouterCallsAbandQToHalf & Skill_Group_Half_Hour.AbandonRingCallsToHalf.</p> <p>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.</p>	<p>Timing differences will exist.</p>
<p>Average Handle Time</p> <p><i>(Found on Common Skill CSQ Activity and CSQ Activity Reports.)</i></p>	<p>Average handle time for all calls that the contact service queue processed. Handle time is talk time + hold time + work time.</p>	<p>The closest concept on Unified ICME 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.</p> <p>This value is calculated as follows: HandledCallsTimeToHalf / CallsHandledToHalf.</p> <p>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.</p>	<p>Timing differences will exist.</p>

Understanding Reporting in the Unified ICME Parent and Unified CCX Child Deployment Model

Unified CCX Application Report	Unified CCX Report Definition	Unified ICME Database Similar Concept(s)	Comment(s)
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 Unified ICME 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 Unified ICME Parent and Unified CCX 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 Unified ICME parent is expected to be different from data collected and presented at the Unified CCE child WebView reports.

Here are some reasons that cause these variations:

- **Different methodologies for sampling data.** The Unified ICME parent system and the Unified CCX 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 Unified ICME parent and the Unified CCX child:

- In Unified CCX, all call events are associated with the interval in which the call started regardless of when they occurred.
- In Unified ICME, 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 a Unified CCX 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: Unified CCX 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 Unified CCX reports will not match equivalent matrixes on Unified ICME reports.

- **Differences in configuration of parent and child systems.** Although IPCC Gateway minimizes this issue, discrepancies between Unified CCX child and Unified ICME parent configuration settings can lead to reporting discrepancies.
- **Differences in supported concepts.** Differences in supported concepts can result in differences between Unified ICME parent and Unified CCX child reporting data as well as the amount of data available at the Unified ICME parent and the Unified CCX 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.)
 - Unified CCX uses CSQ Call Priority and Abandon/Answer Distribution Reports to measure CSQ performance and customer experience. However, Unified ICME does not support these concepts; therefore this Unified CCX child data will not be available at the Unified ICME parent for enterprise-wide reporting.
 - While Unified CCX does support the concept of agent states, Unified CCX does not contain as many state options as Unified ICME. 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 Unified CCX Child and Unified ICME 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 Unified CCX child system OfferedCalls data element might not be the same as the Unified CCE parent Offered Calls data element.
 - **Differences in implementation of similar concepts in parent and child systems.** For example, in a Unified CCX 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 a Unified ICME 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 Unified CCX and Unified ICME is stored and processed differently to populate reports. Unified CCX database stores detail records, and calculated matrixes on Unified CCX reports are computed at run time based on requested time intervals input by the user. The Unified ICME 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 Unified ICME parent and Unified CCX child can also result in differences in data at the parent and child reports. For example, Unified CCX 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 Unified CCX short-interval (half-hour) reports. In addition, Unified CCX implements a five-second delay for call handled so the script can finish; data is written to the Unified CCX database, but the event is not sent for another five seconds. There is also the potential for timing synchronization problems between Unified CCX writing to its database and the IPCC Express Gateway PIM sending event data to the Unified ICME system.

For example, if a half-hour report were run on the Unified CCX 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 Unified CCX database updating only after the call completes; therefore, no call events are written to the Unified CCX 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, Unified CCX stores conference calls data as one call segment, although individual agents' time is stored in a separate table (ACDR), and Unified ICME stores as separate call segments so work time for each agent can be stored.
- **Different Reason Code processing.** One Unified CCX 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. Unified ICME 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 Unified CCX 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 Unified CCX Child and the Unified ICME Parent

The Unified CCX child passes agent state information to the Unified ICME parent for use in the Agent_State_Trace table, only. (This is in contrast the Unified ICME 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.

Unified CCX does not have as many agent state options available as Unified ICME. 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 Unified ICME and Unified CCX.

Table 20: Agent States

Unified ICME Agent State	Unified CCX Agent State	AgentState Value stored in Agent_State_Trace Table on Unified ICME Parent
Logged Off	Logout (Not displayed anywhere.)	Unified ICME and Unified CCX: 0
Logged On	Login (Not displayed anywhere.)	Unified ICME and Unified CCX: 1
Not Ready	Not Ready (Not available to receive routed calls.)	Unified ICME and Unified CCX: 2
Ready	Ready	Unified ICME and Unified CCX: 3
Talking	Talk (Agent speaking with customer or other agent. State set automatically; does not have corresponding button.)	Unified ICME and Unified CCXs: 4
Work Not Ready	Work Completing work for a previous call and unavailable to receive routed calls.)	Unified ICME and Unified CCX: 5
Work Ready	No mapping available	Unified ICME: 6 Unified CCX: Nothing passed
Busy Other	No mapping available	Unified ICME: 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, Unified CCX places agent in the Not Ready state.	Unified ICME: 8 Unified CCX: Nothing passed
Call Initiated	No mapping available	Unified ICME: 9 Unified CCX: Nothing passed

Unified ICME Agent State	Unified CCX Agent State	AgentState Value stored in Agent_State_Trace Table on Unified ICME Parent
Call Held	No mapping available	Unified ICME: 10 Unified CCX: Nothing passed
Active	No mapping available	Unified ICME: 11 Unified ICME and Unified CCX: Nothing passed
Paused	Hold	Unified ICME and Unified CCX: 12
Interrupted	No mapping available	Unified ICME: 13 Unified CCX: Nothing passed
Not Active	No mapping available	Unified ICME: 14 Unified CCX: Nothing passed

What is the Relationship Between Unified CCX and Unified ICME Reporting Entities?

The following table shows the elements that are mapped between Unified CCX and Unified ICME in an IPCC Gateway deployment:

Table 21: Relationship Between Reporting Entities

Unified CCX entity	Unified ICME entity
Application	Service
Route Point (Trigger)	Routing Device, Peripheral Monitor table
Contact Service Queue (CSQ)	Skill Group
Resource	Agent

Mapping Details

When a Unified CCX Application maps to a Unified ICME Service, the following attributes are passed:

- Unified CCX Application ID maps to Unified ICME Peripheral Number.
- Unified CCX Application Name maps to Unified ICME Peripheral Name.
- Unified CCX Description maps to Unified ICME 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 a Unified CCX Route Point maps to a Unified ICME Routing Device, there are no additional attributes mapped.

When a Unified CCX Contact Service Queue (CSQ) maps to a Unified ICME Skill Group, the following attributes are passed:

- Unified CCX CSQ ID maps to Unified ICME Peripheral Number. (This field is not exposed to the customer in CRS Administration but is autogenerated and stored in the Unified CCX database.)
- Unified CCX CSQ Name maps to Unified ICME Peripheral Name.
- The value in the Unified ICME 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.

When a Unified CCX Resource maps to a Unified ICME Agent, the following attributes are passed:

- The first part of a Unified CCX Resource Name maps to Unified ICME First Name.
- The second part of a Unified CCX Resource Name maps to Unified ICME Last Name.
- Unified CCX Resource ID maps to Unified ICME Login name.
- The Unified ICME Password field will be blank.
- Unified ICME 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 Unified CCX, then the CSQ names corresponding to the skills will be listed under Skill Group Members tab in the Unified ICME 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 Unified CCE child, see the *IPCC Enterprise Reporting Guide*.
- For deployments with a Unified CCX child, see the *Cisco CRS Servicing and Troubleshooting Guide*.

Double counting in a Unified CCX 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:

A Unified CCX script using the Call Redirect step to send the call to the second route point. Using the Call Redirect step in a Unified CCX script causes calls to be double-counted in 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 Unified CCX deployments, whether standalone or with IPCC Gateway.

Data elements do not match

Symptom:

ACD database item yyy does not match the Unified ICME Schema element yyy.

Message:

None.

Cause:

You are probably trying to match unlike data elements when comparing Unified ICME and ACD data. If you attempt to match unlike elements from the Unified ICME 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 Unified ICME 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.

Abandoned counts do not match between Unified CCE Child and Unified ICME Parent

Symptom:

In Service reports on the Unified ICME parent, the abandoned counts are not the same as the abandoned counts in Call Type reports on the Unified CCE child.

Message:

None.

Cause:

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

Action:

Ensure that the configurations are the same on both systems.

Service level metrics do not match between Unified ICME parent and Unified CCE child

Symptom:

Information in Service Reports on the Unified ICME parent for service levels does not match the information in Call Type Reports for service levels in Unified CCE child.

Message:

None.

Cause:

Troubleshooting Reports in IPCC Gateway Deployments

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

Action:

None.

Default Skill Group on Unified ICME 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.

Message:

None.

Cause:

A default skill group is created for the Unified ICME 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 Unified CCE child system; they are not the same. Default skill groups on the Unified CCE child get created as real skill groups on the ICM Enterprise parent. The reporting statistics gathered for the default skill group for the Unified CCE child will show up in these real skill groups on the Unified ICME parent.

Action:

Select the skill group in the Item Selection list in WebView in the Unified ICME parent that corresponds to the default skill group on the Unified CCE child.

No agent data available in reports on the Unified ICME parent

Symptom:

In either the IPCC Enterprise or the IPCC Express Gateway deployments, the WebView reports on the Unified ICME 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.

Unexpected Call Disposition data in Termination Call Detail Records

Symptom:

A Termination Call Detail (TCD) record contains data that does not accurately reflect a call disposition, for instance, showing a call as abandoned when it was, in fact, answered.

Message:

None.

Cause:

During call processing, TCD records are created for each leg of the call flow. In an IPCC Gateway deployment, a call flow spans parent and child systems and -- sometimes -- Unified CM clusters. Since multiple call legs occur, the system generates multiple TCD records. Depending on where in the call flow a specific TCD record is generated, the CallDisposition field might contain an unexpected result.

Examples:

- A parent/child intercluster third-party conference call executes successfully. However, the TCD record for the child in the external Unified CM cluster shows a CallDisposition value of 14 (disconnect/drop handled other).

This scenario might occur because, when an agent consults and conferences an agent on a separate (child) PG, the called party is not observed by the PG on the parent. Therefore, the TCD for the conference call shows a CallDisposition value of 14. (In addition, if the consult call was routed, the destination peripheral would show an *incoming* call with CallDisposition 13.)

- In an IPCC Gateway deployment using CVP, a parent/child call flows executes successfully. Two of the TCD records generated have the following CallDisposition values: 6 (abandoned agent terminal) and 13 (disconnect/drop handled primary route), which is the expected value.

This scenario might occur when a call is translation routed from CVP to a Unified CCE Child system because of the way the call legs are processed. Depending on the trunk configuration:

- One leg could send an alerting message which the system later perceives as dropped.
- The other leg could send a Request Instruction, a script is run, and then it is cleared.

Action:

None.

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