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Preface

Purpose

Welcome to the Reporting Guide for Cisco IPCC Enterprise & Hosted. This guide provides information to help you understand how reporting data is generated and how to interpret reporting data in a Cisco IPCC Enterprise environment. This guide also helps you understand the implications of configuration and scripting on reporting data.

Audience

This guide is written for anyone who uses WebView or Cisco Unified Intelligence Suite (Unified IS) to generate reports in an IPCC environment to monitor contact center agent performance, operational effectiveness, and customer experience. Contact center supervisors and managers and individuals responsible for configuring and scripting will find this guide useful.

This guide also applies to reporting in an Unified ICM Enterprise environment with an Agent Routing Interface (ARI) deployment. In an ARI deployment, an ARS PG interfaces with an ACD/PBX.

To generate reports for the ARS PG and for the agents, skill groups, and other entities associated with it, select the IPCC report templates in WebView.

This guide does not include reporting in an IPCC Gateway environment, in which an IPCC Enterprise system is connected as a child IP ACD to a parent ICM Enterprise. To understand reporting implications for this type of deployment, refer to the Cisco IPCC Gateway Deployment Guide.
This document contains the following sections:

- **Planning the IPCC Enterprise System to Meet Reporting Needs (page 5)**
  
  This section provides a high-level overview of the configuration and scripting necessary for producing reporting data that you require from your deployment.

- **Understanding IPCC Enterprise Reporting Architecture (page 25)**
  
  This section explains how the architecture and components of the system generate and affect reporting data.

- **Managing Agents (page 45)**
  
  This section provides statistics for measuring agent performance and identifying training needs and explains how data for the agent is generated.

- **Measuring Customer Experience (page 77)**
  
  This section provides statistics for measuring customer experience and explains how data for customer experience is generated.

- **Monitoring Operations, Configuration, and Scripting (page 97)**
  
  This section provides statistics for monitoring operational, configuration, and scripting accuracy and efficiency and explains how operational data is generated.

- **Implications of fail-over for Reporting (page 121)**
  
  This section explains what happens to reporting data when components in the IPCC Enterprise system Fail-over.

- **Sample Calls and Report Data (page 125)**
  
  This section describes sample calls in the system and the report data generated for agent, skill group, and call type reports.

- **Troubleshooting Reporting Data (page 147)**
  
  This section describes how to correct common reporting data issues.

**Related Documentation**

Refer to the following documentation for additional information:
This manual uses the following conventions:

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<tr>
<td><strong>boldface</strong> font</td>
<td>Boldface font is used to indicate commands, such as user entries, keys, buttons, and folder and submenu names. For example:</td>
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<td></td>
<td>- Choose <strong>Edit &gt; Find</strong>.</td>
</tr>
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<td></td>
<td>- Click <strong>Finish</strong>.</td>
</tr>
<tr>
<td><em>italic</em> font</td>
<td>Italic font is used to indicate the following:</td>
</tr>
<tr>
<td></td>
<td>- To introduce a new term. Example: A <em>skill group</em> is a collection of agents who share similar skills.</td>
</tr>
<tr>
<td></td>
<td>- For emphasis. Example: <em>Do not</em> use the numerical naming convention.</td>
</tr>
<tr>
<td></td>
<td>- A syntax value that the user must replace. Example: IF (condition, true-value, false-value)</td>
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Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:


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We appreciate your comments.
Planning the IPCC Enterprise System to Meet Reporting Needs

The manner in which you configure and script the Cisco IPCC Enterprise system greatly affects the accuracy and usefulness of the reporting metrics. This section discusses guidelines for configuring and scripting features and components to ensure that the reports display correct and relevant metrics for the contact center implementation.

Consider the guidelines in this section while planning the configuration and scripts for your system. If your system is already installed, review the guidelines to correct any configuration and scripting problems that might affect the reporting data.

If you are using a Cisco IPCC Enterprise deployment other than System IPCC Enterprise, refer to the IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition for instructions on configuring the system to meet these guidelines. If you are using a System IPCC Enterprise deployment, refer to Cisco IPCC Enterprise Edition System IPCC Installation and Configuration Guide.

For instructions on creating scripts to meet these guidelines, refer to the ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise & Hosted Editions.

This chapter contains the following topics:

- Reporting Concepts, page 6
- Planning for Naming Conventions, page 10
- Planning for Reporting on Call Types, page 11
- Planning for Agent Reporting, page 12
- Planning for Skill Group Reporting, page 14
- Planning for Enterprise Skill Group Reporting, page 16
- Planning for Agent Teams and Supervisors, page 16
- Planning for Transfer and Conference Reporting, page 16
- Planning for Supervisor Assist and Emergency Assist Reporting, page 17
- Planning for Redirection on No Answer Reporting with IP-IVR, page 17
- Planning for Redirection on No Answer Reporting with Customer Voice Portal, page 18
Reporting Concepts

As you plan your deployment, it is necessary to understand several important concepts for Cisco IPCC Enterprise reporting, including the role of call types, peripherals, skill groups, agent teams, media routing domains and media classes, and the different purposes that VRUs can serve.

Reporting Applications

This guide uses many references to WebView, Cisco System's legacy reporting application.

The Unified Intelligence Center, introduced in Release 7.5(1), is Cisco's new reporting engine.

Unified IC is one of two components of the Cisco Unified Intelligence Suite.

Like WebView, it is a browser-based application and pulls reporting data from the AW and HDS databases on the Unified ICM Admin Workstation.

Unlike WebView, it is installed with fewer than two dozen stock templates. These templates are based on the WebView All Fields templates. Unified IC offers extensive flexibility in that it allows you clone these templates and, in your cloned versions, to hide or show fields, rename fields, move fields, and change grouping and sorting.

This guide contains reporting concepts and guidance for configuring Unified ICM for reporting that are applicable to both WebView and Unified IC.

About Call Types

Call types are the highest level reporting entity in the Cisco IPCC Enterprise system. Call types are used to group calls for the purpose of call treatment and reporting. Call types determine the manner in which a call is treated when it enters the system by selecting the routing script to run for a call.

The call type can be changed throughout the life of a call to direct the call to a new routing script and to gather report metrics for different legs or transactions. Reporting on call type activity provides insight into end-to-end customer interactions with the system and with agents by providing data such as Service Level adherence, transfers, average speed of answer, calls handled, and calls abandoned.

A call type is defined as a category of incoming call or non-voice task that can be routed to an agent by the Central Controller. Each call type has a schedule that determines which routing script or scripts are active for that call type at any time.
There are two classes of call types:

- **Voice (phone calls):** Voice call types are categorized initially by the dialed number (DN) and, optionally, by the caller-entered digits (CED) and the calling line ID (CLID).

- **Non-voice (e-mail and text chat):** Non-voice call types are categorized initially by the Script Type Selector and, optionally, Application String 1 and Application String 2.

You might change the call type within a routing script for several reasons. Consider these examples:

- In a Self-Service **VRU (page 9)** application script, you might change the call type at specific points in the script to indicate that a transaction has been completed. For example, if the customer is calling a bank and successfully checks his or her account balance using a Self-Service script, you might want to change the call type to indicate that the account balance transaction has completed and a new transaction has begun. In this case, you would create a call type for each transaction on which you want to report.

- You might change the call type when a call enters a queue at the end of an **Information Gathering VRU** application in order to separate Information Gathering and queuing metrics. In this case, you would create call types associated with the Information Gathering applications and call types associated with queuing.

- You might change the call type in a script to direct the call to a new routing script associated with that call type.

You can also use call types to report on certain activities that occur within the contact center. For example, you might create separate call types for these situations:

- Calls that redirect on no answer (**RONA (page 9)**).

- Calls that are transferred to other agents.

- Requests for supervisor assistance.

**About Peripherals**

A peripheral is a device, such as the Cisco CallManager, IP IVR, Cisco Customer Voice Portal (CVP), and multi-channel options, that receives tasks that have been routed by the Cisco software. The **Peripheral Gateway (PG)** is the component that talks to the telephony devices (peripherals) through their own proprietary CTI interface and keeps track of the agent states and calls that are on the telephony devices.

In Cisco IPCC systems, reporting data is gathered for each peripheral. In order to understand how reporting data is gathered in your environment, it is important to understand the deployment used to meet the contact center’s needs.

In Cisco IPCC Enterprise deployments that use the **Generic PG** (that allows multiple peripherals of different types to reside inside of the same PG), or separate PGs for Cisco CallManager and...
the VRU, the Cisco CallManager and VRU appear as separate peripherals to the software. In this case, each time a task switches between the Cisco CallManager and the VRU peripherals, the task appears as a new task to the system. From a reporting perspective, this has an impact on how and when data is collected.

In this deployment, for example:

- A task (call) that comes into the Cisco CallManager then gets transferred to the VRU and then back to an agent looks like three separate tasks (calls). A Termination_Call_Detail is written for each task (call).

- A task (call) that is queued to a skill group and later answered by an agent is not considered as offered to a skill group until the task (call) is answered.

In an Cisco IPCC Enterprise deployment with IPCC System PG (including the System IPCC Enterprise deployment), the IPCC System PG consolidates the Call Manager and VRU peripherals into a single peripheral. In this case, each time a task switches between the Cisco CallManager and the VRU peripheral, the task appears as a single task to the IPCC Enterprise system.

Hence in this deployment data is collected differently; for example:

- A task (call) that comes into the Call Manager then gets transferred to the VRU and then back to an agent looks like a single task (call) to the ICM/IPCC software and a single Termination_Call_Detail is written.

- A task (call) is considered as offered to a skill group when the task (call) is queued to a skill group.

About Skill Groups

A skill group is a collection of agents at a single contact center who share a common set of competencies and can handle the same types of requests. Each skill group belongs to a Media Routing Domain (page 9). You can report on agents individually or report on all of the agents in one or more skill groups to monitor agent performance. You can also report on skill groups as a whole to see how the skill group is performing compared to other skill groups. You might use this level of reporting, for example, to see if calls are being distributed evenly by your routing scripts and configuration.

About Enterprise Skill Groups

An enterprise skill group is a collection of skill groups. While each individual skill group is tied to a specific peripheral, an enterprise skill group can span peripherals. For example, you may have a skill group called Boston_Sales on one peripheral and a skill group called NewYork_Sales on another peripheral. You could create a Sales enterprise skill group to organize these two skill groups for reporting purposes. The software can simply total some statistics to obtain enterprise-wide values. For example, to obtain the number of agents available in an enterprise skill group, the software adds the number of agents available in each member peripheral skill group.
If you consolidate skill groups from the same peripheral into an enterprise skill group, you will see double-counting of some metrics in your reports.

### About Agent Teams

An agent team is a group of related agents associated with a single peripheral. Agent teams are associated with a primary supervisor and can be associated with one or more secondary supervisors. You can report on agent teams to monitor the performance of a particular team. Supervisors might find these reports useful to monitor the agents that they supervise.

### About Media Classes and Media Routing Domains

If you have deployed Cisco Collaboration Server or Cisco E-Mail Manager in your Cisco IPCC system, agents can be configured to receive requests from multiple media channels, including voice, Web, and e-mail. A Media Class represents a combination, or a single instance, of media that are to be treated as a single concept. In Cisco IPCC Enterprise systems, Media Classes include voice, multi-session chat, single-session chat, blended collaboration, and e-mail.

A Media Routing Domain (MRD) is a collection of skill groups and services that are associated with a common media class. Each skill group is assigned to a Media Routing Domain. The software uses MRDs to route a task to an agent who is associated with a skill group and a particular medium.

You can report on activity for all of the MRDs that you have configured in your system.

### About Redirection on No Answer

The Redirection on No Answer (RONA) feature ensures that if an agent does not answer a call within a specified amount of time, the call is assigned to a different skill group or agent and the original agent is made Not Ready so that he or she is not routed additional calls. This feature is implemented differently depending on whether you are installing IP-IVR or CVP as the VRU for your system.

Redirection on No Answer is not supported for the AGS PG.

### About VRU Applications

Your enterprise might implement one or more types of VRU applications. VRU applications include Self-Service and Information Gathering. In Self-Service applications, the customer can obtain information through a series of VRU prompts and the entire transaction occurs within the VRU. For example, if the customer calls a bank, the Self-Service application might prompt the user for his or her account number and password and then provide abilities to check account balance, review recent payments, modify PIN numbers, and so forth. In Information Gathering applications, the VRU prompts the caller for certain information, such as which department he or she wants to reach, and then uses the information in the routing decision and passes the information to the agent desktop.
The VRU is also used to queue calls while a customer waits for an available agent. During queuing, the VRU might be configured to play music on hold or perform a VRU application.

The types of VRU applications that you use determine what report data to monitor.

For example:

- If your VRU only performs queuing, you might want to see how long callers waited in queue and number of callers who abandoned while queued.

- If your VRU is used for Self-Service, you might want to see how many successful transactions occurred in the Self-Service application and whether the caller was transferred to an agent from the application.

- If you are using an Information Gathering application, you might want to see how many callers opted out of the digit collection to be transferred directly to an agent.

Planning for Naming Conventions

Before configuring the system, decide on the naming conventions to be used throughout the contact center enterprise.

When planning your installation, consider how you want to name the components and entities that you will be configuring. For example, what kind of names do you want to use for call types and skill groups? The names for agents, skill groups, agent teams, peripherals (such as VRU peripherals and CallManager peripherals), call types, VRU services, trunk groups, and application gateways appear in WebView as selection criteria for reports.

Depending on your contact center, a wide range of individuals might be running reports and using the selection criteria. Using intuitive names for components and entities will help these users interpret the report selection criteria correctly. For example, instead of using numbers for call type names, use descriptive text such as "RedirectOnNoAnswer" or "SupervisorAssist".

When you generate a WebView report, you can select up to 1000 items from the list. If you are running an agent report, you can select from a list of agents; if you are running a skill group report, you select from a list of skill groups, and so forth.

Also the selections and reports are sorted by names. Using meaningful naming conventions (for example, prefixing the name of items associated with a particular workgroup with the same prefix) helps contact center personnel find a particular report more easily.

If you are deploying an IPCC Gateway system, in which Cisco IPCC Enterprise appears as an IP ACD to a parent ICM Enterprise system, limit the number of characters in the names of agents, skill groups and call types on the child IPCC Enterprise system. When these names are passed to the parent ICM during auto-configuration, the software configures the name such as (Parent)Peripheral.EnterpriseName +"."+(Child)Skill_Group.PeripheralName. configured name exceeding 32 characters are automatically truncated and replaced with a number. This means you will not be able to find the name in reports run on the ICM Enterprise system. Refer...
to the Cisco IPCC Gateway Deployment Guide for more information about IPCC Gateway deployment and considerations.

Planning for Reporting on Call Types

Follow these guidelines to obtain accurate and useful reporting data:

• Determine how many call types you need to configure to meet your reporting needs.

  Consider the following when determining the number of call types required:

  – Configure a separate call type for each type of call treatment that you want to offer.

  – Configure a separate call type associated with Redirection on No Answer (RONA) situations. This enables you to direct calls that Ring No Answer to a routing script designed for this situation and to report on this Redirection on No Answer call type to see how calls that redirect on no answer are eventually handled.

  – Configure a separate call type associated with the Supervisor and Emergency assist script for each agent team. This enables you to direct the assistance request to the Supervisor and Emergency Assist routing script which can assign the request to the primary or secondary supervisor for that agent's team. You can use call type reports to view data for supervisor assistance calls.

  – Configure a separate call type associated with call transfers and conferences. This enables you to direct the transfer to a different routing script.

  – If you are planning to report on individual transactions within VRU Self-Service or Information Gathering applications, configure a separate call type for each transaction.

  – If you want to separate Information Gathering VRU metrics from queue metrics, configure a separate call type for queuing.

• Determine the Service Level for call types.

  Service Level indicates how well you are meeting your goal for answering calls. For example, your goal might be to answer 80% of calls within two minutes. In this case, you would set the Service Level Threshold to 120 seconds. Reports show you the percentage of calls that are answered within that time threshold, enabling you to see whether you are meeting your goal.

  Also, determine how the abandoned calls will impact the Service Level. Decide whether the abandoned calls are ignored in the Service Level calculation, negatively affect Service Level, or positively affect Service Level. For example, for VRU Self-Service applications all calls that terminate are considered abandoned, even if the caller received the information he or she required. You might want to ignore these calls or have them affect Service Level positively. You might want calls that abandon while queuing or while ringing to impact Service Level negatively.
You can configure the Service Level setting individually for each call type, or set a global Service Level for all call types.

- Decide whether you want to configure abandoned short calls to filter out calls that abandon very quickly.

If you want to use abandoned short calls, you configure the call type Abandon Wait Time in the configuration tool. Calls that abandon within the Abandon Wait Time are reported as short calls.

If you do not want to use abandoned short calls, leave the Abandon Wait Time field blank.

- Decide whether you want to define time intervals for reporting on answered and abandoned calls for the call type.

These intervals appear in call type reports which display the number of calls answered and abandoned for each interval. These reports are useful for monitoring when calls are abandoning or being answered. You might want to configure the intervals in relation to the Service Level for the call type to see how close to the Service Level calls are being answered and abandoned. Service Level tells you what percentage of calls are being answered within a certain time, but does not tell you how closely to the Service Level calls are being answered or abandoned. Call type intervals provide additional insight into how long callers are waiting before their calls are answered or before they abandon.

For example, if your Service Level is two minutes, you might want to set up intervals for 30 seconds, one minute, 80 seconds, 120 seconds, 180 seconds, 210 seconds, and 240 seconds. Using these intervals, you can see whether calls are being answered in the thirty seconds after the Service Level Threshold of 180 seconds or if most are waiting a full minute longer to be answered.

The intervals also give you insight into how long callers are willing to wait before abandoning. Perhaps many callers do not abandon until two minutes past the Service Level. This might indicate that your Service Level goal can be modified.

You can configure the intervals individually for each call types, or set a global interval for all call types.

- Call Types cannot span ACDs and Cisco Unified Contact Center Enterprise PGs. This means that if your system uses both Cisco Unified Contact Center Enterprise components and legacy ACDs, you must create separate call types for the ACDs and the Cisco Unified Contact Center Enterprise components.

Planning for Agent Reporting

Follow these guidelines to ensure that you are able to obtain accurate and useful data for agents:

- Decide whether you want to view agent data in reports.
If you do want to view agent data, you must ensure that the agent reporting option is enabled for the Cisco CallManager peripheral.

**Note:** The agent reporting option can be enabled in Configuration Manager -> Peripheral -> PG Explorer in ICM AW. This option is enabled by default and for System IPCC deployments, this option cannot be disabled.

If you are using any deployment other than System IPCC, you also must identify the Admin Workstation distributor in the Agent Distribution list for the CallManager peripheral so that agent data is sent to the correct Admin Workstation.

- Decide whether you want to report on agent state in the agent state trace report. If you do want to see this information, enable the agent state trace option in the configuration tool for each agent whose state information you want to view.

Enabling agent state trace for many agents might impact system performance as the option causes more records to be written to the database. If you notice a performance problem, you might want to disable agent state trace, or only enable agent state trace for those agents on whom you are reporting. Also consider this when sizing the databases.

- If you want to report on agent Not Ready reason codes, determine what reason codes you want to use.

You configure the Not Ready Reason codes both in the ICM/IPCC configuration tool and on the agent desktop software (CTI OS or Cisco Agent Desktop). The codes configured on the configuration tool are the enterprise-level codes that appear in WebView reports while the codes configured on the desktop software are the codes that the agent selects when entering Not Ready state. Ensure that the codes that display in WebView match the desktop codes to avoid confusion.

Also, ensure that the agent event detail option is enabled on the CallManager peripheral. (It is enabled by default for the CallManager peripheral.) In System IPCC Enterprise deployments, this is enabled by default and cannot be disabled.

- If you want to report on agent Logout reason codes, determine what reason codes you want to use.

Also, configure the Logout reason codes in the agent desktop software (CTI OS or Cisco Agent Desktop). Some codes are generated automatically by the system. In reports, you will see the numeric equivalent of each reason code, not the textual code. For example, if Logout reason code 1 is "End of Shift", you will see "1" in the report.

Planning for agent reporting also involves planning how you want to group agents into teams and skill groups.

**See Also**

Planning for Skill Group Reporting on page 14
Planning for Agent Teams and Supervisors on page 16
Planning for Skill Group Reporting

Follow these guidelines to obtain accurate and useful reporting data:

- Decide whether to implement base skill groups or sub-skill groups. For Cisco IPCC Enterprise systems, we generally recommend that you configure base skill groups only and not configure sub-skill groups, to avoid confusion in reporting and scripting.

For System IPCC and ARI deployments, sub-skill groups are not supported. If you have deployed System IPCC or ARI, you can configure only base skill groups.

There may be limited instances where configuring sub-skill groups may be useful, such as using sub-skill groups as overflow groups in scripts. For example, the script might first attempt to select an agent in the primary sub-skill group and then, if no agents are available, attempt to select an agent in the secondary skill group. In this way, you see how many calls are overflowing out of the primary skill group. However, while there are benefits to using sub-skill groups, there are also many issues that you might experience if you configure sub-skill groups.

If you do configure sub-skill groups, understand the following issues that occur when using sub-skill groups:

- Sub-skill groups represent primary, secondary, etc., levels of a base skill group. Agents that are most competent in a skill group would be grouped into the primary sub-skill group. The name of a sub-skill group is the name of its base skill group with .pri, .sec., etc. appended to the end of the name.

- WebView reports are designed for base skill groups.

  However, when you run skill group reports in WebView and have configured sub-skill groups, do not select the base skill group for the report. Agents are not assigned to the base skill group; they are assigned to the sub-skill group. Because the reports are designed to gather data from base skill group metrics only, they might not be appropriate for reporting on sub-skill groups.

- Sub-skill groups do not imply priority in scripting. You must indicate the priority of each sub-skill group in the script.

- If you have configured sub-skill groups, queue calls only to those sub-skill groups, not to base skill groups. If you queue to the base skill-group when sub-skill groups are configured, queue statistics are not counted against the sub-skill groups. You must queue to the sub-skill groups to see correct queue reporting data on the agent desktop reporting applications and WebView.

- If you queue to multiple sub-skill groups created for the same base skill group, the number of calls queued roll up into the base skill group data. For example, if you queue one call to two sub-skill groups, two calls are reported as queuing to the base skill group.
Each sub-skill group is treated as a separate skill group by the ICM/IPCC Central Controller, however the data from sub-skill groups automatically rolls up into base skill groups.

By design, all Outbound Option calls are attributed to the base skill group since that is what is provided in the Set Device Attribute message from the Dialer. This is appropriate when the agent is logged into the base skill group. However, if sub-skill groups are configured under IPCC, the default behavior is to not report on the base skill group for Agent Skill Group reports, meaning that no Outbound Option calls are reported on in this configuration.

ICM/IPCC needs to check if the agent belongs to the base skill group for Outbound Option calls and, if not, examine whether they belong to a sub-skill group. Reporting can then be moved to the sub-skill group.

- Determine the Service Level (SL) for skill groups.

As pointed out earlier, call type Service Levels are used to measure customer experience relative to configured Service Levels for call types (i.e. Service Level by Sales, or Customer Support) independent of which skill groups answered the call. In Cisco IPCC Enterprise, you also have the ability to configure service levels for skill groups, enabling you to measure relative performance of skill groups for a particular call type. For example, if you have a Service Level threshold of 120 seconds for a particular call type with abandoned calls having negative impact on Service Level and followed the guideline pointed out earlier of configuring a separate call type for queuing, then you can configure skill group Service Level threshold of 120 seconds with abandoned calls having negative impact on Service Level for each of the skill groups associated with that call type in order to get additional visibility into which skill groups on average are positively or negatively contributing to the overall call type Service Level.

If you are planning to use Skill Group Service Levels, it is important to understand the benefits and limitations of skill group SLs in Cisco IPCC Enterprise deployment model.

- First, it is important to understand the relationship between call types and skill groups that are defined through your scripts. In Cisco IPCC Enterprise, you have the flexibility to define many to many relationships between call types and skill groups. If this is the case, the skill group Service Level statistics will reflect call counts from all the call types.

- Second, call type Service Level and associated skill group Service Level statistics are not expected to balance. As described earlier, a skill group can receive calls from different call types, hence the skill group Service Level statistics reflect call counts from different call types. Call type metrics are incremented differently depending on your scripting. For example, if a call disconnects for any reason before it reaches the Queue to Skill Group node, the call is included in the calculation of Service Level for the call type but not the skill group.

- Third, determine how abandoned calls are to impact the Service Level. You decide whether abandoned calls are ignored in the Service Level calculation, negatively affect Service Level, or positively affect Service Level.

- Fourth, in Cisco IPCC Enterprise calls can queue to more than one skill group, and therefore Service Level metrics are updated for each skill group to which a single call queues. Abandon calls in this scenario could have a negative impact on the skill group service
levels. For example, if a single call is queued to multiple skill groups and the call abandons, this impacts Service Level metrics for Offered and abandon for all those skill groups.

You can configure the Service Level setting individually for each skill group, or globally for skill groups grouped by MRD or peripheral. For System IPCC deployments, you set the global Service Level grouped by MRD only.

Planning for Enterprise Skill Group Reporting

Determine which skill groups you want to group into an enterprise skill group. These skill groups might be from several peripherals and/or from different media. For example, you may have a skill group called Boston_Sales on one peripheral and a skill group called NewYork_Sales on another peripheral. You could create an Enterprise skill group called Enterprise_Sales.

If you group skill groups from the same peripheral into an Enterprise skill group, you will see double-counting of some metrics in your reports.

If you are using an IPCC Gateway deployment, in which Cisco IPCC Enterprise acts as an IP ACD to a parent ICM Enterprise system, decide which skill groups on the Cisco IPCC Enterprise system are to be grouped into enterprise skill groups as the parent level. Refer to the Cisco IPCC Gateway Deployment Guide for more information about IPCC Gateway deployment and considerations.

Planning for Agent Teams and Supervisors

Follow these guidelines if you want to report on agents grouped into teams:

• Organize your agents into teams. An individual agent can be assigned to one team only. You create agent teams and assign agents to the teams using the configuration tool. Teams are peripheral-specific.

• Optionally, select one primary supervisor for each team. You can select multiple secondary supervisors for each team. Each supervisor can be a supervisor for multiple teams.

  **Note:** All agents on a team and the supervisor(s) for the team must reside on the same peripheral.

Supervisors can only view data for their own team(s) in agent reports.

Planning for Transfer and Conference Reporting

If you are planning to allow agents to transfer and conference calls, follow these guidelines to obtain accurate and useful data from transfers and conferences:
• Configure the dialed numbers with associated route points for transfer and conference to agents and skill groups.

• Plan to create a separate script for transfers that use the dialed numbers you configured. In the initial script, change the call type when the call is transferred to direct the call to the transfer script. Having a separate script allows you to track data across call types and skill groups, instead of the agent's default skill group.

Planning for Supervisor Assist and Emergency Assist Reporting

If you are planning to allow Supervisor Assist and Emergency Assist, follow these guidelines to ensure that you are able to obtain accurate and useful data from these features:

• Plan to configure skill groups for supervisors handling Supervisor Assist and Emergency Assist requests. For example, you might configure one skill group for the primary and secondary supervisors of each agent team. This way, you can direct requests to these skill groups and report on Supervisor and Emergency Assist call activity for these skill groups.

• Plan to create call types, and configure dialed numbers that map to the created call type, to run scripts that direct the requests to the appropriate supervisor skill group. In the script, first target the primary supervisor and then, if you have configured secondary supervisors, queue to secondary supervisors.

Planning for Redirection on No Answer Reporting with IP-IVR

If you are implementing Redirection on No Answer and have deployed IP-IVR as the VRU, follow these guidelines to obtain accurate and useful data from Redirection on No Answer situations:

• Decide how long a call is to ring before being redirected to a new agent or skill group. When deciding this, consider how Redirection on No Answer calls are to affect the Service Level. If you want Redirection on No Answer calls to adversely affect the Service Level, the amount of time the call is allowed to ring before being redirected must be above the Service Level threshold time. You configure the ring no answer time in the configuration tool.

• Decide what number be dialed in order to redirect calls that are not answered by agents within the ring no answer time. You configure the ring no answer dialed number in the Agent Desk Settings tool in the configuration tool.

• Plan to create a separate call type for Redirection on No Answer situations and to associate this call type with the ring no answer dialed number.

You create a separate script for Redirection on No Answer that is associated with the Redirection on No Answer call type. In the Redirection on No Answer Script, queue the calls at a higher priority. The call variables set in the first script are carried over into the second script and you can use these variables if you choose.
Using a separate call type not only enables you to redirect calls that are not answered to a script that queues the calls at a higher priority, but also enables you to report on activity for the Redirection on No Answer call type. Viewing data for this call type helps you gain insight into the number of calls that redirect on no answer and to see how the calls are finally handled.

Planning for Redirection on No Answer Reporting with Customer Voice Portal

**Note:** In Releases prior to Release 3.0, the Customer Voice Portal (CVP) product was named Internet Service Node (ISN)

If you are implementing Redirection on No Answer and have deployed CVP as the VRU, follow these guidelines to obtain accurate and useful data from Redirection on No Answer situations.

- Decide how long a call rings before being redirected to a new agent or skill group.

  You configure the ring no answer time in two places: CVP software and ICM/IPCC software. Configure the CVP Ring No Answer timeout in the CVP Voice Browser Administration application. This timer will be used to requery the call if the call is not answered. Configure the ICM/IPCC Agent Desk Settings Ring no answer time. This time determines when the agent is made Not Ready so that additional calls are not assigned to the agent. CVP Ring No Answer timeout be approximately 2 seconds higher than the Ring no answer time configured in Agent Desk Settings. The CVP Ring No Answer timeout also be less than 30 seconds because the ICM/IPCC Central Controller waits up to 30 seconds for a response to arrive from the CVP. If the response is not received within 30 seconds, the call fails.

- Within the routing script, plan to enable the Target Requery option in the routing script. Target Requery is available from the Queue, Queue to Agent, Label, Select, and RouteSelect nodes. Change the call type in the script after the requery and create a path for calls that are requeried within the script. Queue calls that are requeried at a higher priority.

  Using a separate call type enables you to report on activity for that call type. Viewing data for this call types helps you gain insight into the number of calls that are requeried and to see how the calls are finally handled.

Planning for VRU Application Reporting

For all deployments, follow these guidelines to obtain accurate and useful data for VRU applications:

- If you have Self-Service or Information Gathering IVR applications and want to separate self-service/digit collection metrics from queuing metrics, plan to change the call type in the routing script before the call is queued. This ensures that you can report on both the self-service/digit collection section of the call and the queuing section of the call using Call Type reports.
If you want to track how callers have progressed through a Self-Service or Information Gathering IVR application, plan to use the VRUProgress variable in the Set node of the routing script to indicate the status of the call at different points in the routing script. Use the VRU Activity reports to view how callers have progressed through the VRU script. You can use this variable to determine how many calls the application did not handle, how many were handled, how many were transferred to an agent at the caller's request, how many calls were not able to navigate and were redirected to an agent, and how many encountered error conditions and were redirected to an agent.

For each transaction in the VRU Self-Service or Information Gathering application for which you plan to change the VRUProgress variable, create a separate call type. In the script, change the VRUProgress variable when the call reaches the end of a transaction and then change the call type. This enables you to report on each transaction separately using the call type VRU Activity reports.

For all deployments other than System IPCC and ARI deployments, follow these additional guidelines to obtain accurate and useful data for VRU applications:

- Plan to enable Service Control and Queue Reporting at the VRU peripheral if you want to report on VRU applications, services, queuing, and trunk groups. This is applicable if you are using the IPCC System PG with CVP in your deployment and not applicable if you are using only the IPCC System PG in your deployment.

- Determine the Service Level for VRU services. This is not available in System IPCC or ARI deployments.

Service Level indicates how well you are meeting your goal for answering calls. For example, your goal might be to answer 80% calls within two minutes. In this case, you would set the Service Level Threshold to 120 seconds. Reports show you the percentage of calls that are answered within that time threshold, enabling you to see whether you are meeting your goal.

Also, determine how abandoned calls impact the Service Level. You decide whether abandoned calls be ignored in the Service Level calculation, negatively affect Service Level, or positively affect Service Level. For example, for VRU Self-Service applications, all calls that terminate are considered abandoned, even if the caller received the information he or she required. You might want to ignore these calls or have them positively affect Service Level. You might want calls that abandon while queuing or while ringing to negatively impact Service Level.

You can configure global Service Level for all VRU services or configure Service Level for individual services.

- You will need to configure services on ICM/IPCC software with peripheral IDs that match the information sent from the VRU.

The peripheral ID that you enter depends on whether you are using IP-IVR or CVP as the VRU.

- If you are using IP-IVR, you configure a service with a peripheral ID that matches the ID you entered in CRS Application Administration as the ICM/IPCC post routing ID.
Planning for Reporting on Unexpected Scripting Conditions

Remember the ICM/IPCC post routing ID that you configure for use when creating services on ICM/IPCC software.

- If you are using CVP, the peripheral ID that you enter depends on the VRU type.
  
  If the CVP is a routing client that handles new calls (VRU type 5), the peripheral service ID be 1.
  
  If the CVP receives pre-routed calls (VRU types 2, 3, 7, or 8), the peripheral service ID be 2.

- Optionally, if you are using CVP as your VRU and want to perform advanced custom reporting on VRU application details, configure the Capture microapplication, which you can include in a script to trigger the creation of a TCD record at any point in a routing script. Configure the Capture microapplication as a VRU script; execute the application using the RunExternalScript node. You must name the script "CAP" or "CAP, xxx", where xxx is any string that makes the script name unique. (For example CAP, bankingApplication). You might want to trigger TCD creation at important points in a script, such as when a caller completes a transaction.

- There might be cases when a call is not queued, but instead sent to the agent directly (using the LAA Select node) from the VRU. You must ensure the VRU PG is configured correctly to ensure that such a call is considered answered at the VRU service rather than abandoned.

  If you are using IP-IVR as the VRU, set the Configuration parameter in the VRU PG record to /ASSUME_ANSWERED to ensure that calls sent from the VRU to an agent without being queued are reported as Answered. Do not set this parameter if you are using CVP as the VRU.

Planning for Reporting on Unexpected Scripting Conditions

Follow these guidelines to ensure that you are able to identify when a routing script encounters unexpected conditions:

- Decide whether you want calls that encounter unexpected scripting conditions to be counted as default routed or as errors.

  In deployments other than System IPCC, if you want the calls to count as default routed, plan to configure default labels for each dialed number if you do not want calls that cannot be routed to be reported as errors. When a call is routed to a default label, the call is added to the count of default routed calls to the call type. If the call cannot be routed and a default label is not assigned, the call is counted as an error. In System IPCC you do not configure default labels.

  Also, plan to include a Termination Node with Termination type of default label for all scripts in which there is some unexpected input (else condition). This ensures that the call is added to the count of default routed calls to the call type. If the call cannot be routed and a default label is not assigned, the call is counted as an error.
In all scripts, account for failure by creating a path for calls that encounter unexpected conditions. You might want to route these calls to voice mail, an announcement, or a busy signal.

Planning for Reporting on Short Calls

If you are planning to use Short Calls in your system to filter out false abandons or to detect when calls are answered and terminated too quickly to be considered handled, follow these guidelines to obtain reporting data for short calls:

- You can configure abandoned short calls globally for all call types. Set the Abandon Call Wait Time to the number of seconds that you want. If you want abandoned calls to adversely affect the Service Level, define the Service Level threshold at the call type to be less than the Abandon Call Wait time.

  **Note:** If you do not want to count any abandoned calls as short calls regardless of how quickly they abandon, you can disable abandoned short calls by leaving the Abandon Wait Time field blank for the Call Type.

- You can configure abandoned short calls for the peripheral. These are tracked for the services that are configured for that peripheral. This does not apply to System IPCC or ARI deployments, as those deployments do not use services. Set the Abandon Call Wait Time to the number of seconds that you want. If you want abandoned calls to adversely affect the Service Level, define the Service Level threshold at the service to be less than the Abandon Call Wait time.

  **Note:** If you do not want to count any abandoned calls as short calls regardless of how quickly they abandon, you can disable abandoned short calls by leaving the Abandon Wait Time field blank.

- You can configure answered short calls for agents and skill groups. This is not applicable for System IPCC or ARI deployments. Set the Answered Short Call Threshold to the number of seconds that you want when configuring the peripheral using the configuration tool. All calls that have talk times less than the configured threshold will be considered as short calls. These calls are incremented in the ShortCalls field in the Agent_Skill_Group_Half_Hour and Skill_Group_Half_Hour database tables. If you do not want answered short calls to impact Service Level, set the value to be less than the Service Level threshold.

  Answered short calls are not available for the call type.

  **Note:** If you do not want to count any answered calls as short calls regardless of how quickly they terminate, you can disable answered short calls by leaving the Answered Short Call Threshold field blank.
Planning the Historical Data Server for Reporting

If you plan to use WebView as your reporting tool, you must configure an ICM/IPCC Distributor Admin Workstation as a Historical Data Server (HDS). The HDS stores historical reporting data and WebView connects to the HDS to retrieve report information.

If you are using the System IPCC deployment, the HDS is installed for you in each deployment other than the All-In-One deployment. The All-In-One deployment is for lab use only; in this deployment reporting data is stored on the Central Database and WebView connects to this database to retrieve report information.

Follow these guidelines to ensure that your Historical Data Server is configured to meet your reporting needs:

- Determine the size of the HDS. This section does not apply to System IPCC.

  The size of the database depends on the size of your configuration and the amount of time for which you want to retain data. Configuration that impacts the size of the HDS includes the number of call types, skill groups, agents, skills per agent, routing clients, trunk groups, services, peripherals, scripts, calls routed daily, and calls terminated daily. The larger the configuration, the bigger the HDS must be to store data. For example, the historical Call Type database tables store data for each call type for each five minute and half hour interval.

  The amount of time that you want to retain data on the HDS also affects database size. Decide how long you want to retain reporting data before it is purged automatically from the databases. Data beyond the configured retention time is purged automatically each day at 12:30.

  You can use the ICM/IPCC Database Administration (ICMDBA) tool to estimate the sizes of your databases. The tool prompts you for your configuration information and the amount of time that data is retained in the databases.

- In System IPCC deployments, the HDS size is configured automatically during installation. During configuration, you determine how long you want to retain reporting data before it is purged automatically from the databases. Data beyond the configured retention time is purged automatically each day at 12:30.

- Determine how you want to back up the HDS.

  You can back up the HDS either while the HDS is running or while it is offline (generally when the contact center is closed or during a time with low call volume).

  Generally, performing a backup during peak hours while running is not recommended. Backing up while the HDS is running might impact performance, especially if you are backing up a large amount of data. While the HDS database is being backed up, new data from the Logger is stored in the transaction log. If the transaction log reaches its maximum capacity before the HDS has completed the backup, updates to the database stop until an administrator manually empties the log.
Instead, back up at a regularly scheduled time when the contact center is not busy. You can also take the HDS offline and perform a backup. However, the HDS is not available for reporting when offline. If you plan to back up the HDS database while offline, you might want to configure a secondary HDS to use for reporting during the backup interval.

- Determine the HDS backup schedule and the number of days for which data is retained on the Logger.

Configure the number of days for which data is stored in the Logger central database and the HDS. The Logger stores data for less time than the HDS. For example, you might store two weeks of data on the Logger and a year of data on the HDS. You configure the amount of time that data is stored on the Logger in relation to the schedule for HDS backups to ensure that you do not lose data in the event that the HDS goes offline. When the HDS recovers after going offline, it retrieves all data from the Logger for the interval for which data is missing from the backup.

For example, if the HDS backup has data up to the last two weeks, the HDS would replicate the last two weeks of data from the Logger when recovering from a failure. The amount of data retained on the Logger cover, at a minimum, the time period between HDS backups. For example, if the Logger stores data for two weeks, then you need to back up at least every other week to ensure that you can recover all historical data after a HDS failure.

- Decide how many Historical Data Servers you require. For System IPCC deployments, the required number of HDSs are installed automatically for your selected deployment.

The number of Historical Data Servers that you configure depends on how long the HDS will take to backup and your reporting needs. If you are storing large amounts of data, backup might take several hours. The HDS not be used to run historical reports while it is backing up as this might decrease performance. If you want to run reports while the HDS is backing up, you configure at least one additional HDS to use to run WebView reports.

See the Cisco ICM/IPCC Enterprise & Hosted Editions Release 7.1(1) Hardware and System Software Specifications (Bill of Materials) for guidelines on Reporting Users per HDS and HDS capacity.

See Also

Pre-Installation Planning Guide for Cisco ICM Enterprise Edition
ICM Installation Guide for Cisco ICM Enterprise Edition
Cisco IPCC Enterprise Edition System IPCC Installation and Configuration Guide

Planning which Report Templates to Use

Refer to the following sections of this guide to determine which report templates meet your reporting needs:

- Useful Agent Statistics and Report Templates (page 45)
- Useful Customer Experience Statistics and Report Templates (page 77)
Planning for Custom Reporting

To determine whether you require custom templates to meet your reporting needs, decide what data you need and review the data available through WebView IPCC reports. If the existing reports do not meet your needs, you can modify existing report templates or create custom report templates. If you want to include the same types of data provided by the WebView reports in new or modified templates, the customization might not impact database or WebView performance.

However, if you require more detailed or application-specific data, the customization might be more resource intensive and decrease the performance of the database or WebView. You understand the performance impact of custom reports before running the reports using WebView.

Refer to the Template Design Guide Using InfoMaker for more information about creating custom reports.
Understanding Cisco IPCC Reporting Architecture

The Cisco IPCC Enterprise system functions as a virtual ACD. Some of the capabilities include intelligent multichannel contact routing, ACD functionality, network-to-desktop computer telephony integration (CTI), voice response unit (VRU) integration, call queuing, and consolidated reporting.

The Cisco IPCC Enterprise architecture affects reporting and differs considerably from the architecture of ICM configurations that use ACDs.

To understand Cisco IPCC Enterprise reporting, you first understand the components, how the Cisco IPCC Enterprise architecture differs from ICM with ACD configurations, and data flow in Cisco IPCC Enterprise systems.

If you are using the System IPCC deployment, note that some of the IPCC Enterprise components have been renamed with different naming conventions, although their functionality remains the same. This guide refers only to the non-rebranded components. If you are using System IPCC deployment, carefully read the section below that maps System IPCC components to non-rebranded IPCC Enterprise components.

This chapter contains the following topics:

- System IPCC to ICM Component Mapping, page 26
- Overview of IPCC Enterprise Components, page 26
- IPCC Enterprise Deployments Presented In This Guide, page 27
- IPCC Enterprise Versus ICM Enterprise with ACD Architecture, page 28
- IPCC Enterprise with Multichannel Applications Architecture, page 30
- Understanding the Historical Data Server, page 32
- Reporting Intervals , page 33
- Data Comparisons, page 35
- Reporting in a Multichannel Environment, page 37
- Entities that Capture Reporting Data, page 42
System IPCC to ICM Component Mapping

The table below maps System IPCC machine types to their equivalent ICM components.

<table>
<thead>
<tr>
<th>System IPCC Machine Type</th>
<th>Corresponding ICM Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Controller</td>
<td>CallRouter, Logger</td>
</tr>
<tr>
<td>Agent/IVR Controller</td>
<td>System PG, CTI Server, CTI OS Server</td>
</tr>
<tr>
<td>Administration &amp; WebView Reporting</td>
<td>Distributor Admin Workstation, Historical Data Server (HDS), WebView</td>
</tr>
<tr>
<td>Multichannel Controller</td>
<td>Media Routing Peripheral Gateway (MR PG)</td>
</tr>
<tr>
<td>Outbound Controller</td>
<td>Outbound Dialer, MR PG</td>
</tr>
</tbody>
</table>

Overview of IPCC Enterprise Components

Basic components in an IPCC Enterprise system include:

- **Cisco Intelligent Contact Management (ICM) software**

  The ICM software on the Central Controller provides ACD functionality, including monitoring and controlling of agent state, routing and queuing of tasks, CTI capabilities, collecting real-time data for agents and supervisors, and historical reporting for management. The ICM/IPCC Central Controller consists of two components: CallRouter and Logger. ICM/IPCC software also provides Outbound Option, which enables agents to make automated outbound calls to customers.

- **Cisco CallManager**

  Cisco CallManager provides features comparable with those of a traditional PBX system to Voice over IP telephony devices such as Cisco IP phones and VoIP gateways. Cisco CallManager handles the switching requirements of the IPCC system and allows deployment of voice applications and the integration of telephony systems with Intranet applications.

- **Voice Response Unit (VRU)**

  The Voice Response Unit serves several purposes. It acts as the routing client, is used for information gathering through DTMF digit or ASR (Automatic Speech Recognition) collection, provides self-service functionality, and serves as the queue point for the IPCC Enterprise solution by playing announcements and/or music to the caller. This guide discusses two VRUs supported by IPCC Enterprise: Cisco Customer Voice Portal (CVP) and Cisco IP-IVR. Because these VRUs support different features and behave differently, IPCC Enterprise reporting data is affected by the type of IVR you have deployed in your system. Note that several other VRUs are also supported for IPCC Enterprise.

  In System IPCC deployments, ARI deployments, and IPCC Enterprise deployments that use the IPCC System PG, both IP-IVR and CVP is supported.
Peripheral Gateways (PGs)

Peripheral Gateways act as proxies for the Cisco CallManager and IVR components to the ICM/IPCC Central Controller. They are also responsible for collecting historical and real-time data on the IVR and agent activities and sending this data to the ICM/IPCC Central Controller. PGs contain Peripheral Interface Managers (PIMs), which provide communication between ICM/IPCC software and peripherals such as Cisco CallManager and IVR. If multichannel options and/or Outbound Option have been integrated into the IPCC Enterprise system, the configuration also includes Media Routing Peripheral Gateways (MR PGs) used to send routing requests from the multichannel applications to ICM/IPCC software. A single Media Routing Peripheral Gateway (MR PG) can support multiple applications; you configure a separate PIM for each application.

Agent/Supervisor Desktops

IPCC Enterprise supports two agent/supervisor desktop solutions: Cisco CTI Object Server (CTI OS) and Cisco Agent/Supervisor Desktop (CAD). CTI OS and CAD are server-based CTI solutions that provide desktops used by contact center agents and supervisors. CTI OS is a toolkit that enables you to create customized agent and supervisor desktops.

Multichannel options

Multichannel options include Cisco Collaboration Server and Cisco E-Mail Manager. Cisco Media Blender and Cisco Dynamic Content Adapter are optional components of Collaboration Server. Collaboration Server provides the ability for agents to share information with customers over the Web, such as Web pages, forms, and applications, while at the same time conducting a voice conversation or a text chat. Cisco E-Mail Manager manages high volume of customer inquiries submitted to company e-mail boxes or a Web site. E-Mail Manager selects agents and teams to receive incoming messages, categorizes and prioritizes messages, suggests response templates, and, if desired, sends automatic responses. If included in the IPCC Enterprise system, multichannel options connect to ICM/IPCC software component in the system. The multichannel options are responsible for sending the incoming task request to ICM/IPCC software for agent/skill group selection through the MR PG and placing the selected agent into session with the task. Agent status and activity for Collaboration Server and E-Mail Manager is sent to ICM/IPCC software through the Agent PG.

IPCC Enterprise Deployments Presented In This Guide

This guide discusses several types of IPCC Enterprise deployments, and there are reporting differences between these configurations. When necessary, this guide calls out the differences between the deployments for reporting. If no differences are noted, the reporting information is the same for all deployments.

The configurations presented are:

- **IPCC Enterprise deployments with an IPCC System PG.** In these deployments, the PG contains a single peripheral for Cisco CallManager and IP-IVR. The metrics gathered for reporting are consolidated from a single peripheral. However, when System PG with CVP is used in these deployments, there are two peripherals present and the metrics for reporting
are gathered from the two peripherals (As the System PG and CVP are on different peripherals).

- **System IPCC deployments.** These deployments use the IPCC System PG. While the manner in which reporting data is gathered for IPCC Enterprise deployments with an IPCC System PG and System IPCC deployments is largely the same, the two deployments are configured differently. System IPCC deployments are configured through IPCC Web Administration, while IPCC Enterprise deployments with an IPCC System PG are configured through ICM Configuration Manager.

- **IPCC Enterprise deployments with PGs other than the IPCC System PG.** In these deployments, the Cisco Callmanager and VRU are connect to the ICM/IPCC using different PIMs in the case of the Generic PG or using different PGs, such as CallManager PG and VRU PG. The metrics gathered for reporting therefore span two different peripherals.

- **ARI deployments.** In these deployments, an ACD/PBX is connected to Unified ICM by an ARS PG. This allows Unified ICM to select an agent and to route calls directly to that agent. IPCC reporting templates are selected to report on the ACD/PBX. Peripheral Service and Truck Group reports are not applicable for an ARI deployment.

### IPCC Enterprise Versus ICM Enterprise with ACD Architecture

This section describes the differences in architecture and reporting between ICM Enterprise with ACD systems and IPCC Enterprise systems.

#### ICM Enterprise with ACD Architecture

In an ICM Enterprise system with an ACD, the configuration includes one PG that connects to the ACD. An IVR could be used for information gathering or self-service, but is not mandatory. The calls are queued within the legacy ACD system.

The following image depicts the topology of a basic legacy ACD site.

*Figure 1: ICM Enterprise with ACD architecture*

Note: Traditional ICM Enterprise with ACD configurations might also include a VRU. However, in an ACD configuration VRUs are optional and serve the purpose of collecting caller
information. A VRU cannot be used for call queuing in traditional ACD configurations; the ACD is used to queue the call.

This deployment could also be an IPCC Gateway deployment, in which a parent ICM Enterprise system connects to a child IP ACD (either IPCC Enterprise with the IPCC System PG or IPCC Express). In this case, the ACD PG would be the IPCC Gateway PG.

IPCC Enterprise Architecture

Unlike the ICM Enterprise with ACD configuration which performs its own queuing, the IPCC Enterprise system requires a VRU in order to queue calls. The VRU can be used for information gathering and self-service in addition to queuing. The IPCC Enterprise system therefore connects to both a VRU and the Cisco CallManager. The Cisco CallManager supports the agent activity and the VRU interacts with ICM/IPCC software for task queuing. Reporting data is gathered both while tasks are at the CallManager and while they are at the VRU.

The following image depicts the topology of an IPCC Enterprise site that uses separate PGs for the Cisco CallManager and IP-IVR, with IP-IVR as the VRU, in which multichannel applications have not been deployed. Note that for System IPCC deployments and IPCC Enterprise with IPCC System PG deployments, the Cisco CallManager and VRU are on the same peripheral. However, when IPCC System PG with CVP is used in the System IPCC and IPCC Enterprise deployments, the Cisco CallManager and VRU are on different peripherals.

Figure 2: IPCC Enterprise Architecture

Refer to either the Cisco IPCC Enterprise Installation and Configuration Guide or the Cisco IPCC Enterprise Edition System IPCC Installation and Configuration Guide for more details about your specific deployment.

IPCC Enterprise call flows differ significantly from ICM/IPCC with traditional ACD call flows. In ICM/IPCC with traditional ACD systems, ICM software identifies the ACD service to which to route the call and notifies the routing client. The call is queued and answered by an agent.
selected by the ACD at the ACD service. The ACD service retains and tracks all the queuing and agent information.

While legacy ACD systems track statistics using the ACD service, IPCC Enterprise systems disperse statistics among several components, including

- Call type. These statistics are gathered by the ICM/IPCC Central Controller. While the service in the ICM/IPCC Enterprise with ACD system determines call treatment, the call type in the IPCC Enterprise system determines call treatment and can be used to report on calls and how they were handled.

- Service associated with the VRU, for deployments other than System IPCC and ARI, which tracks statistics such as wait times and VRU activity. These statistics are gathered by the VRU PG. In System IPCC and ARI deployments, the VRU services are not configured. You monitor these statistics using call type.

- Skill groups associated with the agent, which track statistics such as talk/active time, hold/paused time, and wrap up time.

The IPCC Enterprise system disperses statistics in this manner because the ICM/IPCC software component does not have media termination points; physical voice calls must be sent to the VRU while being queued by the ICM/IPCC Router.

The data is stored in ICM/IPCC software databases for centralized reporting. Real-time data is stored in the ICM/IPCC Central Controller local database and historical data is stored in the ICM/IPCC historical database located on the ICM/IPCC Historical Data Server (HDS).

**IPCC Enterprise with Multichannel Applications Architecture**

The E-Mail Manager and Collaboration Server provide multichannel capabilities to the IPCC Enterprise system. Agents can be configured to handle voice calls, e-mail messages, online chat sessions, and integrated voice/Web content sharing sessions. Both the E-Mail Manager and Collaboration Server connect to the ICM/IPCC Central Controller through an Media Routing MR PG (MR PG), which is used for routing and to the Cisco CallManager PG (or agent PG), which sends agent status to the ICM/IPCC Central Controller. This architecture is illustrated in the following diagram.
When the E-Mail Manager receives an e-mail task request, it sends the task information to the ICM/IPCC Central Controller for routing purposes. The ICM/IPCC Central Controller returns an agent and skill group, and the E-Mail Manager pushes the task to the agent. If an agent is not available, the task queues logically at the E-Mail Manager until the agent becomes available. Because the task does not involve voice, physical queuing is not needed.

When the Collaboration Server receives a single-session or multi-session chat task request, it sends the task information to the ICM/IPCC Central Controller for routing purposes. The ICM/IPCC Central Controller returns an agent and skill group, the Collaboration Server pushes the task to the agent. If an agent is not available, the task queues logically in the ICM/IPCC queue of the Web Collaboration Option until the agent becomes available. Because the task does not involve voice, physical queuing is not needed.

If the Collaboration Server is used for callback, delayed callback, or blended collaboration sessions, it also sends the task information request to the ICM/IPCC Central Controller for routing purposes. However, the Media Blender component is also involved in the task process. When the ICM/IPCC Central Controller returns an agent and skill group, the Media Blender ensures the correct agent and caller engage in an automatic phone call and Web collaboration. If an agent is not available, the task queues logically in the ICM/IPCC queue of the Collaboration Server until the agent becomes available. Because the task does not involve voice until the Media Blender actually places the call, physical queuing is not needed.

The Collaboration Server implementation might also include the Dynamic Content Adapter (DCA) component that enables agents and customers to share Web content that is secure, personalized, live, interactive, or transactional (SPLIT content).
Understanding the Historical Data Server

Historical data is stored in the ICM/IPCC Logger's central database and in the Historical Data Server (HDS) on the Distributor Admin Workstation.

You must use the HDS if you want to use WebView for reporting. Using the Logger's central database for reporting with WebView is not supported. The only exception to this is for the System IPCC All-In-One deployments that are for lab use only.

Typically, you set up two Distributor Admin Workstations as HDS machines. The same fault-tolerant strategy that applies to the real-time Distributor AW also applies to the HDS; that is, when the primary HDS fails, the Client Admin Workstation automatically switch over to use the backup HDS. In System IPCC deployments, the appropriate number of HDSs for your configuration are installed automatically.

Relationship Between the Logger and Historical Data Server

Each Historical Data Server (HDS) is connected to a single Logger. The Logger's central database replicates historical data to the HDS. The replication process may have a latency of about one to five minutes because the Logger replicates data table-by-table on the HDS.

You configure the number of days for which data is stored in the Logger central database and the HDS. The Logger stores data for less time than the HDS. For example, you might store two weeks of data on the Logger and a year of data on the HDS. You configure the amount of time that data is stored on the Logger in relation to the schedule for HDS backups to ensure that you do not lose data in the event that the HDS goes offline. When the HDS recovers after going offline, it retrieves all of the data on the Logger for the interval for which data is missing from the backup, and you manually restore the rest of the data from the last HDS backup. For example, if the HDS backup has data up to the last two weeks, the HDS would replicate the last two weeks of data from the Logger when recovering. The amount of data retained on the Logger cover, at a minimum, the time period between HDS backups. For example, if the Logger stores data for two weeks, then you need to back up at least every other week to ensure that you can recover all historical data.

Logger and Historical Data Server Failure and Recovery

If the Logger connected to the HDS goes offline, the HDS does not connect to a different Logger. For example, if the HDS is connected to Logger B, it does not connect to Logger A if Logger B fails. When Logger B comes back up, it recovers data from Logger A and begins to receive current historical information. Once the Logger has recovered all of the data from Logger A, it begins to replicate this data to the HDS. If reports are run from this HDS for recent intervals while the Logger is offline, or while the Logger is in the process of recovering or replicating data, you might not see data for those intervals in reports. This is temporary and you will see the data once the replication process for the tables utilized by the reports is complete. If you are using a fault-tolerant system with two HDS Distributor Admin Workstations, you can run reports using the backup HDS while the primary HDS is not receiving data.
If the HDS goes offline and you are using a fault-tolerant system with two HDS Distributor Admin Workstations, you can run reports using the backup HDS. When the HDS comes back up, it recovers data from the last HDS data backup. It also replicates data from the Logger for the most recent data not available in the backup. The recovery data replication is faster than regular Logger-HDS data replication. Once the HDS has recovered to its typical Logger-HDS latency of one to 5 minutes, data replication proceeds as usual. If you are not using a fault-tolerant system, you will not see data in historical reports until the HDS is restored. You might also notice missing data as the replication process is in progress. This is temporary and you will see the data once the replication process for the tables utilized by the reports is complete.

See Also

- Pre-Installation Planning Guide for Cisco ICM Enterprise Edition
- ICM Installation Guide for Cisco ICM Enterprise Edition
- Cisco IPCC Enterprise Edition System IPCC Installation and Configuration Guide

### Reporting Intervals

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

The historical data is stored in the ICM/IPCC historical database in summary five-minute and half-hour intervals. The ICM/IPCC Router forwards real-time contact center data to the Distributor AW local database. This real-time and historical data can be accessed by client AWs and the WebView reporting software.

The Central Controller also collects event-driven records, which include Route_Call_Detail (RCD) and Termination_Call_Detail (TCD) records. RCD records contain details for each task routed and TCD records contain details for every task that is connected and the terminated.

In IPCC Enterprise deployments with IPCC System PG with CVP and System IPCC with CVP, the following three TCD Reports are generated and stored in ICM/IPCC historical database:

- One record from the initial CTI route point (Cisco CallManager PG)
- One from the VRU (VRU PG)
- One from the agent (Cisco CallManager PG)

In IPCC Enterprise deployments with the IPCC System PG and System IPCC deployments, one TCD record is generated and in IPCC System PG deployments with CVP, the TCD records are generated as in the IPCC Enterprise.

**Note:** For accurate reporting, the time on the Peripheral Gateways and Central Controller be synchronized.

### Real-time Data

In real-time, each PG passes current status information to ICM/IPCC software. Every 15 seconds (by default), the ICM/IPCC system forwards the latest data to the Distributor AW local database.
The current, or real-time data, which is kept in the Router's memory, includes data about agents, skill groups, services, call types, trunk groups, and other ICM/IPCC entities. The following image illustrates how data is moved to the local database.

Figure 4: Real-time Data Moved to Local Database

Note: This refresh rate applies only to real-time reporting with WebView, which is not the same mechanism used on the CTI agent desktop.

Real-time data is stored in several increments, as described in the following table.

Table 1: Real-time Database Data Increments

<table>
<thead>
<tr>
<th>Real-time Data Increment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half</td>
<td>&quot;Half&quot; values contain a value for the current half-hour. The current half-hour is defined as the time period falling between xx:00:00 and xx:29:59, or xx:30:00 and xx:59:59. For example, if it is currently xx:18:33, the CallsOfferedHalf real-time element contains a value that reflects the first 18 minutes and 33 seconds of the specific half-hour. When a new half-hour begins, at time (xx:00:00 or xx:30:00), the database element is reset to zero.</td>
</tr>
<tr>
<td>Now</td>
<td>In the real-time tables, &quot;Now&quot; values contain a snapshot of activity at a particular instant. For example, ICM/IPCC software tracks CallsQNow, which is the number of calls currently in queue for a service or route. When a call is answered, the CallsQNow count is reduced immediately by one (-1) because the call has left the queue. This change is seen at the next real-time update of the WebView report screen.</td>
</tr>
<tr>
<td>To5</td>
<td>The &quot;To5&quot; values track data on a rolling five-minute basis. The rolling five-minute data employs a &quot;sliding&quot; five-minute window. The To5 data is updated every ten seconds in the database.</td>
</tr>
<tr>
<td>Today</td>
<td>To arrive at values for today, ICM/IPCC software adds the values at the end of each half-hour interval since midnight. It also counts the values for the current half-hour. At the end of each half-hour, half hour data (for example CallsOfferedHalf) is summed into the Today data. At midnight, the real-time Today count is cleared in the database. Midnight is defined using the time of the peripheral.</td>
</tr>
</tbody>
</table>
ICM/IPCC software stores historical information in five-minute and half-hour intervals. The ICM/IPCC Central Controller writes these records to the central database (on the Logger). These records are replicated to the Historical Data Server (HDS) and are used for historical reporting.

The five-minute data includes many of the same data elements as found in the real-time data. Every five-minutes, ICM/IPCC software copies the real-time data to the five-minute tables in the historical database. In this way, a snapshot of the real-time data is kept in the historical database and used as historical data. The real-time data, which is written to the Admin Workstation local database, continues to be overwritten with new values at each real-time update.

The historical data fields are stored in the database with the extension "ToHalf" (for example, Skill_Group_Half_Hour.CallsHandledToHalf). These elements contain a value for a completed half-hour interval. The completed half-hour interval is the time period falling between xx:00:00 and xx:29:59, or xx:30:00 and xx:59:59.

Half-hour data is populated in the database only for completed half-hour intervals. For example, if a call is offered at 15:47:00, it will be counted as an offered call in the 15:30:00 to 15:59:59 half-hour interval. Data for this half-hour interval is not written to the database until the interval is complete (for example 16:00:00). Therefore, the latest calls offered half-hour data is available for the previous completed half-hour interval (that is, the 15:00:00 to 15:29:59).

When running reports, you might compare data within a report and across reports. This section explains how you compare data and describes issues that you might encounter when comparing data that not be compared because of configuration, scripting, or when the records are written.

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

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

In ICM Enterprise with ACD environments, services define call treatment. All skill groups belong to specific services and, therefore, skill group data rolls up to the service. Reports for services provide call treatment information for all of the skill groups assigned to those services.

In IPCC Enterprise systems, call types define call treatment and provide the types of statistics that services provide in ACD environments. However, skill groups are associated with call types only through routing scripts; they are not assigned to call types through static configuration. In routing scripts, you first determine the call type of a call then base routing decisions on which skill groups are capable of handling that type of call. You can assign multiple skill groups to a call type in a routing script and can assign a skill group to multiple routing scripts for different call types. Therefore, there is not necessarily a 1:1 relationship between call types and skill groups.

You might notice that data for a call type and the skill group(s) related to the call type through a routing script do not match. If a skill group is used in multiple scripts, reporting for that skill group includes data for all of the call types to which it is assigned. If a call type routes to multiple skill groups, data for the call type is distributed among those skill groups.

You compare call type and skill group records only if all of the following are true:

- There is a 1:1 correlation between a call type and skill group. Your routing script cannot queue to two skill groups simultaneously if you want a 1:1 correlation. This 1:1 correlation is not a useful configuration; in production environments, the routing scripts might queue to multiple skill groups, and an individual skill group might be used in several scripts that are associated with different call types. For example, if you configure a separate call type for Redirection on No Answer calls, you might want to queue to the same skill groups to which the call was queued initially.

- The call type is qualified again in the routing script before the call is offered to an agent using the LAA and/ or Queue node to avoid extraneous offered and flow out information.

However, even if you configure your scripts using the 1:1 call type to skill group correlation and change the call type when appropriate, you will still notice some reporting discrepancies for the number of tasks offered and the manner in which hold time for consult calls is reported.

The number of tasks offered to the call type and skill group will not match because call type tasks offered is incremented for each task routed using that call type, but skill group tasks offered is only incremented when the task is offered to an agent in that skill group.

The call type and skill group hold time and talk time might not balance for agents who are in hold state in a consult call. This is reported as hold time for the call type and talk time for the skill group because the state of the consult call is hold, but the agent not on hold is in talking state as he or she is talking to the customer on the other line.
Half-hour Boundary Issues for Reporting Data

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

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

In general, half-hour boundary issues are reduced if you run daily reports. However, if your contact center runs 24 hours a day, you might still notice half-hour discrepancies for the 11:30:00 to 11:59:59 and 12:00:00 to 12:29:59 intervals.

Reporting in a Multichannel Environment

WebKit reporting provides data on task and agent activity for multichannel options, including Collaboration Server and E-Mail Manager, if they are deployed in your IPCC Enterprise system. To interpret report data correctly, you have a good understanding of how Media Routing Domains and Media Classes are used, how agent availability and routing ability are determined, and differences in report data between voice tasks and non-voice tasks.

Media Routing Domains

ICM/IPCC software uses Media Routing Domains (MRDs) to organize how requests for different media are routed. A MRD is a collection of skill groups and services that are associated with a common media, such as voice, chat, e-mail, or blended collaboration which blends voice and Web collaboration. ICM/IPCC software uses the MRD to route a task to an agent who is associated with a skill group and a particular medium. When configuring your IPCC Enterprise system, you first configure MRDs on ICM/IPCC software and then enable the appropriate MRDs on the Collaboration Server and E-Mail Manager applications. MRDs have unique IDs across the enterprise. Each skill group is assigned to a Media Routing Domain.

Note: Multimedia integration is not supported for ARI.

The Voice MRD is created by default for all deployments. In System IPCC deployments, MRDs for all media are configured by default.
Media Classes

A Media Class describes the type of requests that you want to set up for routing on ICM/IPCC software.

Each Media Routing Domain belongs to a Media Class.

Media Classes available in IPCC Enterprise systems include:

- Voice, which includes incoming and outgoing phone calls. Voice also includes Web Callback and Delayed Callback through the Web Collaboration Option.
- Single-session chat, through Web Collaboration Option
- Multi-session chat, through Web Collaboration Option
- Blended collaboration, through Web Collaboration Option
- E-mail, through E-Mail Manager Option

If your system is designed to handle voice-calls only, you only have the Voice Media Class.

Agent Availability and Route Ability

The ability for ICM/IPCC software to route a call or multichannel task to an agent depends on the agent's route ability and availability within the MRD of the call or task. WebView reports contain fields indicating agents' availability in the MRD.

An agent might be in Routable or Not Routable mode for each MRD to which he or she belongs. Route ability refers to whether the ICM/IPCC or the Web Collaboration Option or E-Mail Manager Option is configured to assign tasks to the agent. For example, your IPCC Enterprise system might be configured to allow the Web Collaboration Option to select an agent to handle a task. In this case, ICM/IPCC software gathers reporting data for those tasks, but does not perform the routing. If ICM/IPCC software is configured to assign the task, it both routes and reports on the task.

For voice calls, ICM/IPCC software is always configured to route the call. Therefore, the agent is always Routable.

The following table describes what it means when an agent is Routable and Not Routable.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routable</td>
<td>ICM/IPCC software is configured to assign tasks to the agent</td>
</tr>
<tr>
<td>Not Routable</td>
<td>The Web Collaboration Option or E-Mail Manager Option is configured to assign tasks to the agent.</td>
</tr>
</tbody>
</table>
While Route ability determines whether the ICM/IPCC Router is allowed to assign tasks for this MRD, the agent's Availability determines whether the agent is capable of handling new tasks.

An agent is Available, or eligible to be assigned a task in this MRD, if the agent meets all of these conditions:

- The agent is in any state other than Not Ready state for this MRD.
- The agent is not working on a non-interruptible task in another MRD. Only e-mail tasks are interruptible, meaning that ICM/IPCC software can assign the agent another task while he or she is working on an e-mail. Voice calls, single-session chat sessions, multi-session chat sessions, and blended collaboration chat sessions cannot be interrupted.
- The agent has not reached the maximum task limit for this MRD. For Voice, single-session chat, e-mail and blended collaboration MRDs, the task limit is always one task. For the multi-session chat MRD, the task limit is customized through the Web Collaboration Option administration application.

An agent is Not Available in this MRD if the agent is Not Ready, working on a voice, single-session chat, multi-session chat, or e-mail task, or has reached his or her maximum task limit.

Therefore, an agent is:

- ICM available if he or she is Routable and Available for the MRD. This means that the agent can be routed a task by ICM/IPCC software.
- Application available if he or she is Not Routable and Available for the MRD. This means that the agent can be routed a task by the Web Collaboration Option or E-Mail Manager.

Consider the following call/task scenarios and how they affect agent mode and availability.

**Table 3: Scenario 1: Not Routable - Multi-session Chat, then Voice**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is logged into two MRDs, multi-session chat and voice. The agent is <em>not routable</em> in the multi-session chat MRD. The agent is assigned a task in the multi-session chat MRD by the Web Collaboration Option.</td>
<td>ICM/IPCC software does not assign a task to the agent from the Voice MRD, since the agent is working on a non-interruptible task in the Multi-session Chat MRD. The agent is <em>Not Available</em> in Voice.</td>
</tr>
</tbody>
</table>

**Table 4: Scenario 2: Not Routable - Voice then E-Mail**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is logged into two MRDs, multi-session chat and voice.</td>
<td>ICM/IPCC software does not assign e-mail tasks to the agent. The agent is <em>Not Available</em> in the e-mail MRD.</td>
</tr>
</tbody>
</table>
### Table 5: Scenario 3: Not Routable - Voice then Single-session Chat

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is not routable in the e-mail MRD. The agent is assigned a call in the Voice MRD.</td>
<td>- e-mail tasks can still be placed in the agent's personal queue in this scenario by the E-Mail Manager Option. e-mail tasks might also be sent to the agent's queue as a result of a customer responding to an E-Mail from the agent. See ICM software: Cisco E-Mail Manager documentation for complete information on routing E-Mail tasks.</td>
</tr>
</tbody>
</table>

<p>| Table 6: Scenario 4: Routable - Maximum task limit |</p>
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is logged into two MRDs, single-session chat and voice. The agent is not routable in the single-session chat MRD. The agent is assigned a call in the Voice MRD.</td>
<td>- Web Collaboration Option does not assign single-session chat tasks to the agent. The agent is Not Available in single-session chat.</td>
</tr>
</tbody>
</table>

<p>| Table 7: Scenario 5: Routable (busy on non-interruptible task) |</p>
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is logged into two MRDs, multi-session chat and voice. The agent is routable in the multi-session chat MRD. The agent is assigned a task in the multi-session chat MRD.</td>
<td>- ICM/IPCC software continues to assign tasks to the agent until the agent has reached his or her maximum task limit. The agent is ICM Available in the multi-session chat MRD, even though the agent is Active on a task.</td>
</tr>
</tbody>
</table>

<p>| Table 8: Scenario 6: Routable (busy on interruptible task) |</p>
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is logged into two MRDs, e-mail and voice. The agent is routable in the e-mail MRD. The agent is assigned a task in the e-mail MRD.</td>
<td>- ICM/IPCC software does not assign a multi-session chat task to the agent, since the agent is working on a non-interruptible task in the e-mail MRD. The agent is Not Available in the multi-session chat MRD even though the agent is Not Active in multi-session chat skill groups.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>The agent is logged into two MRDs, e-mail and voice. The agent is routable in the e-mail MRD. The agent is assigned a task in the e-mail MRD.</td>
<td>- ICM/IPCC software can assign a voice call to the agent, since the agent is working on an interruptible task in the e-mail MRD. The agent is ICM Available in Voice MRD.</td>
</tr>
</tbody>
</table>
Multichannel Reporting Data

The ICM/IPCC databases store information about agent activity and tasks routed by ICM/IPCC software, including tasks that are submitted to ICM/IPCC software by the Web Collaboration Option or E-Mail Manager Option. Reports contain a Media field, when appropriate, to identify the MRD of each task included in the report.

The following table describes major differences between voice and non-voice tasks in reports. Non-voice tasks include single-session chat, multi-session chat, e-mail, and blended collaboration.

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Data for Voice Tasks</th>
<th>Data for Non-Voice Tasks</th>
</tr>
</thead>
</table>
| Task direction    | Task direction can be both incoming (agent receives call) and outgoing (agent places call).  
Note that calls placed by Cisco Outbound Option appear as incoming calls because of the manner in which the Outbound Option Dialer places calls between agents and customers. | Task direction is always incoming, and values of report fields pertaining to outgoing non-voice tasks are set to null. |
| Session ownership changes | The ownership of a voice task can change through the life of the call. Agents can transfer the call, conference in another agent or supervisor, and request supervisor assistance. Supervisors can barge into a call, meaning that they join the call, or intercept a call to take ownership of the call immediately. | Non-voice tasks do not change session ownership. These tasks cannot be transferred and conferencing is not possible, and supervisors cannot barge into or intercept the task.  
Note that while it is possible for a Web Collaboration agent to allow another agent to join a session and then drop the session, leaving the second agent and the caller in session together, this is not the same as a voice call transfer. ICM/IPCC software interprets this as two different sessions, one for the original agent and one for the second agent.  
Also, while E-Mail Manager agents can forward messages to other agents, this is not the same as a voice call transfer. ICM/IPCC software interprets messaging forwarding as two different sessions, one for the original agent and one or the receiving agent.  
Values of report fields pertaining to transfer, conference, supervisor assist, barge in, and intercept are set to zero. |
| Short calls       | Voice calls are considered to be short calls if they disconnect within the time boundaries defined in the Agent Desk Settings in ICM/IPCC software for short tasks. | The Collaboration Server and E-Mail Manager do not enable administrators to configure a short task time boundary. Therefore, non-voice tasks are not reported as short tasks, even if they disconnect within the short task time defined in |
### Entities that Capture Reporting Data

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Data for Voice Tasks</th>
<th>Data for Non-Voice Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple tasks</td>
<td>Agents can handle one voice task at a time. Agents can handle a voice task and an e-mail task simultaneously. e-mail is an interruptible MRD and agents handling e-mail tasks can be interrupted with a voice call. Reports show the agent as Active for both the e-mail and voice task.</td>
<td>Agents might be configured to handle multiple non-voice tasks, such as multi-session chat, at the same time. If an agent is engaged in several non-voice tasks, the reports contain data for each of the tasks. These tasks might be from multiple skill groups. For instance, because e-mail is an interruptible MRD, an agent can be working on an e-mail tasks while also working on a task or call in any other medium. Also, an agent might be working on three multi-session chat sessions, each from a different skill group. Note that task duration fields are also affected in reporting. For instance, the half-hour duration fields might have a value greater than 30 minutes for non-voice tasks.</td>
</tr>
<tr>
<td>Service Level</td>
<td>You determine which Service Level type you want to use for voice tasks and this setting affects the reporting data.</td>
<td>The Service Level for non-voice tasks is always set to &quot;ignore abandoned calls&quot;. The Service Level setting affects the Service Level data in reports for non-voice tasks.</td>
</tr>
</tbody>
</table>

### Reporting Tools for Multichannel Applications

You can use the WebView report templates provided by ICM/IPCC software to report on multichannel skill groups, agents and tasks. However, the IPCC Enterprise WebView reports do not contain details regarding the Collaboration Server or E-Mail Manager-specific events that transpire during a Collaboration Server or E-Mail Manager task. For example, these WebView reports show that an agent handled a chat task, but do not provide the text of a sent chat message. Also, the reports show than an agent is currently Active on an e-mail task, but do not show the number of e-mails received by an agent. The multichannel applications have separate reporting tools, available through the applications, that provide application-specific details about the sessions.

### Entities that Capture Reporting Data

For each task flow, a single task, such as a voice call or Web collaboration chat session, passes through several reporting entities. Reporting entities are objects configured in ICM/IPCC software, including Call Types, Services, Skill Groups, and Agents. These entities capture particular information about the task. IPCC Enterprise reporting entities are described in the following table.
### Table 10: Reporting Entities

<table>
<thead>
<tr>
<th>Reporting Entity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Type</td>
<td>The Call Type object determines which routing script to run for a particular task, and may represent a service that a contact center provides. The Call Type is matched to a Dialed Number for voice calls, or a Script Selector for non-voice calls. For voice calls, a call type can be comprised of caller entered digits (CED) and calling line ID. For non-voice calls, call types can be comprised of the script selector, AppString1, and AppString2.</td>
</tr>
<tr>
<td>Peripheral VRU Service - Service associated with VRU application(s)</td>
<td>The Service identifies a function that the contact center provides. A Service associated with VRU applications tracks application activity including queuing, self-service and information gathering. Note that if you are using CVP, you only configure one or two services, depending on your configuration.</td>
</tr>
<tr>
<td>Skill Group</td>
<td>A Skill Group represents a group of agents, who might be grouped together because of common expertise, common skill level, or other business reasons.</td>
</tr>
<tr>
<td>Agent</td>
<td>An agent is a person who handles tasks in a contact center.</td>
</tr>
</tbody>
</table>

Note: Outbound Option calls (outbound campaign voice calls) do not pass through the Call Type reporting entity and Call Type data is not gathered for Outbound Option calls.

The following table illustrates the reporting entities that are traversed by different kinds of tasks.

### Table 11: Reporting Entities for Types of Tasks

<table>
<thead>
<tr>
<th>Type of Task</th>
<th>Call Type Affected?</th>
<th>Peripheral VRU Service Affected? Not Applicable for System IPCC or ARI Deployments.</th>
<th>Skill Group Affected?</th>
<th>Agent Affected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICM-routed voice call using Queue to Skill Group script node</td>
<td>yes</td>
<td>yes, if the call goes to the VRU</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Incoming voice call to an agent's direct extension</td>
<td>no</td>
<td>no</td>
<td>yes, default skill group</td>
<td>yes</td>
</tr>
<tr>
<td>ICM-routed call using Agent-to-Agent script node</td>
<td>yes</td>
<td>yes, if the call goes to the VRU</td>
<td>yes, default skill group</td>
<td>yes</td>
</tr>
<tr>
<td>ICM-routed call using Queue to Agent script node</td>
<td>yes</td>
<td>yes, if the call goes to the VRU</td>
<td>yes, if the agent is not logged into the skill group specified</td>
<td>yes</td>
</tr>
<tr>
<td>Type of Task</td>
<td>Call Type Affected?</td>
<td>Peripheral VRU Service Affected?</td>
<td>Skill Group Affected?</td>
<td>Agent Affected?</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------</td>
<td>----------------------------------</td>
<td>-----------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in the Queue to Agent node, the default skill group is used.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To understand how reporting entities are used in reporting, consider an example of a typical voice call. In this example, the routing script uses the Queue to Agent, TranslationRoutetoVRU, Queue to Skill Group and LAA Select nodes.

Note that for IPCC Enterprise with the IPCC System PG and System IPCC deployments, TranslationRoutetoVRU is not necessary. However, TranslationRoutetoVRU is required when System PG with CVP is used for IPCC Enterprise and System IPCC deployments.

In the simplest scenario, a voice call comes into a CTI route point on the Cisco CallManager and then either goes to an initial Call Type or is queued to an agent using the Queue to Agent script node. If no agents are available, the call then goes to the VRU through the TranslationRoutetoVRU script node. After the call is sent to the VRU, the call is queued to a skill group through the Queue to Skill Group node. At this point, the Skill Group is also affected by this call. When an agent becomes available, the Agent is affected by this call. The route associated with the peripheral agent service is also affected.

If agents are available when the call comes in, the call does not have to go the VRU. The call is routed directly to the agent through the LAA Select node within the routing script. For this task, the Agent and the default skill group are affected by this call.
Managing Agents

Managing agents in a contact center might involve measuring performance, determining incentives, and identifying training needs. IPCC Enterprise WebView reports provide metrics that enable you to monitor real-time agent activity and review historical trends for agents.

This section explains which reporting metrics are useful for managing IPCC Enterprise agents and which report templates contain these metrics. This section also describes how the system gathers agent metrics and explains how to configure and script your system so that your reports contain appropriate data.

This chapter contains the following topics:

• Useful Agent Statistics and Report Templates, page 45
• Monitoring Agent States, page 50
• Configuration and Scripting Considerations for Reporting on Agent States, page 57
• Reporting on Agent Task Handling, page 58
• Configuration and Scripting Considerations for Task Reporting, page 64
• Reporting on Agent Call Transfers and Conferences, page 66
• Configuration and Scripting Considerations for Transfer and Conference Reporting, page 71
• Reporting on Supervisor Action, page 72
• Configuration and Scripting Considerations for Reporting on Supervisor Action, page 74

Useful Agent Statistics and Report Templates

WebView reports enable you to monitor real-time agent activity and review historical agent performance trends.

These factors determine the reports that you use to manage agents:

• Whether you need to view current activity or past performance data
• Whether you want to view individual agent records or compare an agent to other members of a skill group, peripheral, or team

• Whether you want to monitor agent state and login status or review how agents are handling the tasks to which they are assigned.

How Do You Want to Report on Agent Performance?

The reporting templates that you use to monitor agent activity and task performance depend on several factors, including your role in the contact center and the type of data that you want to see.

First, determine whether you want to view real-time agent activity or past performance trends. For real-time activity, such as agent state, duration in state, login time and current task information, use the real-time templates. Real-time templates are designated by the words "real-time" in their titles. For past performance trends, such as the number of tasks an agent has handled, how the agent handled the tasks and whether tasks redirected from the agent's phone, use the historical templates. Historical templates are designated by the words "Half Hour", "Summary" or "Daily" in their titles.

Once you have determined whether you want to view real-time or historical templates, you decide how you want to measure the agent's performance: by individual agent, peripheral, team, or skill group. The following table describes the WebView options for measuring agent performance. These options are available from the Agent category in WebView.

Table 12: Report Categories for Managing Agents

<table>
<thead>
<tr>
<th>Reporting Needs</th>
<th>Report Category</th>
<th>Who Use this Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>You want to view current activity for an individual agent or measure an individual agent's performance trends.</td>
<td>Agent &gt; By Agent</td>
<td>This category is useful to Contact Center Administrators with global responsibility for all of the agent in the contact center, regardless of the skill group, peripheral, or team.</td>
</tr>
<tr>
<td>You want to view current activity for agents on a common peripheral or measure/compare agents' performance trends for a common peripheral.</td>
<td>Agent &gt; By Peripheral</td>
<td>This category is useful to Contact Center Administrators who are responsible for a certain site within the enterprise. In an IPCC Enterprise environment, each site is designated by one or more peripherals.</td>
</tr>
<tr>
<td>You want to view current activity for agents in a team or measure/compare agents' performance trends for a team.</td>
<td>Agent &gt; By Team</td>
<td>This category is useful for Contact Center Supervisors who manage teams of agents.</td>
</tr>
<tr>
<td>You want to view current activity for agents in a skill group or measure/compare agents' performance trends for a skill group. You want to view data for queue management.</td>
<td>Agent &gt; By Skill Group</td>
<td>This category is useful for Contact Center Supervisors or team leads who are responsible for certain skill groups.</td>
</tr>
</tbody>
</table>
Note: The Agent > By Skill Group templates report only on skill groups that reside on a single peripheral. If you need to report on Enterprise skill groups (skill groups that span several sites, several peripherals at one site, or several Media Routing Domains (MRDs)) you use the Enterprise Skill Group report templates.

Each Agent report category provides the same types of data, organized according to the manner in which you have chosen to view the data. For example, the Agent > By Agent templates contain generally the same fields as the Agent > By Skill Group, but the Agent > By Agent templates organize the data by individual agents while the Agent > By Skill Group templates organize the data first by skill group and then by agent.

What Data Do You Want to See?

The reports you use depend on whether you are monitoring agent real-time status or historical performance.

Real-time agent data helps you identify immediate issues, such as agents who are talking too long on a call, putting callers on hold for too long, spending too much time in certain states such as Not Ready and logging out when they be handling tasks.

If you are monitoring agents in real-time, you might be interested in these types of statistics:

- Agent's current state and applicable reason codes
- The amount of time the agent has spent in that state
- Agent availability for handling tasks within the Media Routing Domain (MRD)
- The amount of time that the agent has been logged into the system
- Details for the current task on which the agent is working, including whether the agent has requested supervisor assistance for the task
- Number of calls queued to an agent's skill group that can be answered by the agent
- Which agents are currently logged out

The following table describes suggested IPCC Enterprise report templates that provide agent real-time statistics. For details of all IPCC Enterprise report templates, refer to the WebView Template Reference Guide for Cisco IPCC Enterprise & Hosted Editions.

**Table 13: Report Templates for Real-time Monitoring**

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent20: Agent Real Time</td>
<td>Reports on current skill group, agent state, login time, task direction, applicable reason codes, supervisor assistance requests and MRD availability</td>
</tr>
<tr>
<td>agtper20: Agent Peripheral Real Time</td>
<td>Reports on current skill group, agent state, login time, task direction, applicable reason codes, supervisor assistance requests and MRD availability for agents on a specific peripheral.</td>
</tr>
</tbody>
</table>
## Useful Agent Statistics and Report Templates

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>agtskg30: IPCC Agent Skill Group Real Time</td>
<td>Reports on current skill group, agent state, login time, task direction, applicable reason codes, supervisor assistance requests, and MRD availability for agents in specific skill groups. This report also provides the number of calls queued to an agent's skill group that can be answered by the agent.</td>
</tr>
<tr>
<td></td>
<td>If you are reporting on agents who handle multi-session chat tasks, note that these agents can work on more than one task at a time; you gather agent state information from both the Available in MRD and Agent State columns.</td>
</tr>
<tr>
<td>agteam20: Agent Team Real Time</td>
<td>Reports on current skill group, agent state, login time, task direction, applicable reason codes and MRD availability for agents in specific skill groups.</td>
</tr>
<tr>
<td></td>
<td>If you are reporting on agents who handle multi-session chat tasks, note that these agents can work on more than one task at a time; you gather agent state information from both the Available in MRD and Agent State columns.</td>
</tr>
<tr>
<td>agteam32: Agent Team State Counts Real Time</td>
<td>Reports on the number of agents in different agent states, including logged in, active in/out/other, held, not active, wrap up, not ready, reserved, and eligible for task.</td>
</tr>
<tr>
<td>perskg39: Peripheral Skill Group Logout Real Time</td>
<td>Reports on agents who are currently logged out from specific peripheral skill groups.</td>
</tr>
</tbody>
</table>

Historical agent data helps you identify how agents compare to their peers, whether agent performance is improving and whether additional training is required.

If you are measuring agents' past performance or performance trends, you might be interested in these types of statistics:

- How many inbound tasks the agent handled
- How many outgoing calls the agent placed
- Average Handle Time (AHT) for the agent
- Average Hold Time for the agent
- How many transfers and consultations the agent performed
- How many transfers the agent received
- How many tasks abandoned while ringing on the agent's phone
- How many tasks abandoned while on hold
- How many tasks were redirected off the agent's phone
- How much time the agent is spending in Not Ready state
- Whether the agent is logging in and out at the appropriate times
- How many times the agent has requested supervisor assistance
- How many times a supervisor has had to barge in or intercept a call

The following table describes suggested IPCC Enterprise report templates that provide agent historical statistics. For details of all IPCC Enterprise report templates, refer to the *WebView Template Reference Guide for Cisco IPCC Enterprise & Hosted Editions*.

**Table 14: Report Templates for Historical Reporting**

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent21: Peripheral Agent Task Summary Half Hour</td>
<td>Reports on agent task activity for half-hour intervals, including the number of tasks handled, transferred in and out, conference in and out, redirected on no answer, abandoned while ringing and on hold and supervisor assistance and intervention.</td>
</tr>
<tr>
<td>agtper21: Agent Peripheral Task Summary Half Hour</td>
<td>Reports on agent task activity for half-hour intervals, including the number of tasks handled, transferred in and out, conference in and out, redirected on no answer, abandoned while ringing and on hold and supervisor assistance and intervention.</td>
</tr>
<tr>
<td>agtskg21: Agent Skill Group Summary Half Hour</td>
<td>Reports on agent task activity for half-hour intervals, including the number of tasks handled, transferred in and out, conference in and out and on hold.</td>
</tr>
<tr>
<td>agent30: Agent Not Ready Summary</td>
<td>Reports on Not Ready reason codes, duration the agent used that reason code, what percentage of logon time the agent spent in Not Ready and what percentage of Not Ready time the agent used a particular reason code.</td>
</tr>
<tr>
<td>agent03: Agent Media Status Logout</td>
<td>Reports on agent login duration and logout date and time.</td>
</tr>
<tr>
<td>agtper03: Agent Peripheral Media Status Logout</td>
<td>Reports on agent login duration and logout date and time for a specific peripheral.</td>
</tr>
<tr>
<td>agtskg03: Agent Skill Group Media Status Logout</td>
<td>Reports on agent login duration and logout date and time for a specific skill group.</td>
</tr>
<tr>
<td>agteam03: Agent Team Media Status Logout</td>
<td>Reports on agent login duration and logout date and time for a specific team.</td>
</tr>
</tbody>
</table>

**See Also**

*WebView Template Reference Guide for Cisco IPCC Enterprise & Hosted Editions*
Monitoring Agent States

You can monitor agent states in real-time to view current agent activity, or review past performance data to identify trends in agent states. For example, using historical reports you can see how much time an agent spends in Not Ready state, which indicates whether the agent is adhering to the schedule. This section describes the meaning of agent states in an IPCC Enterprise environment.

Agent States

Agent states are determined based on an agent’s activity within a skill group. Agent state is recorded in the Agent_Real_Time and Skill_Group_Real_Time database tables.

Certain reports indicate how many agents are in different states. In these reports, the Hold column is used to report on agents in Hold and Paused states, and the Active column is used to report on agents in the Active and Talking states.

The following table describes agents states that appear in reports. Note that information for some states is different for the Multi-session Chat MRD. This table highlights these differences.

<table>
<thead>
<tr>
<th>State in Skill Group</th>
<th>Description for all Cisco Voice</th>
<th>Description for all MRDs except for Cisco Voice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active/Talking</td>
<td>The agent is working on a task or a call in this skill group. For agents who handle non-voice tasks, this state is reported as Active. For agents who handle voice-tasks, this state is reported as Talking.</td>
<td>The agent is working on one or more chat requests associated with this skill group. For these agents, the state is reported as Active.</td>
</tr>
<tr>
<td>Work Ready</td>
<td>The agent is performing wrap up work for a call or task in this skill group. If the agent is handling a voice call, the agent enters Not Active state when wrap up is complete. If the agent is handling a non-voice task, the agent might enter Not Active or Not Ready state when wrap up is complete.</td>
<td>The agent is performing wrap up work for a task associated with this skill group. The agent is not in the Active state with respect to a task associated with this skill group.</td>
</tr>
<tr>
<td>Paused/Hold</td>
<td>The agent is paused with respect to a call or task associated with this skill group.</td>
<td>The agent is not in Active or Work Ready state with respect to a task associated with this skill group. The agent is Paused with respect to a task associated with this skill group.</td>
</tr>
<tr>
<td>State in Skill Group</td>
<td>Description for all Cisco Voice</td>
<td>Description for all MRDs except for Cisco Voice</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Reserved</td>
<td>The agent has been offered a call or task associated with the skill group. Agents handling Outbound Option calls are never placed in Reserved state; the Outbound Option Dialer puts the agent on hold when reserving him/her for a call.</td>
<td>The agent is not in Active, Work Ready, or Paused state in this skill group. The agent has been offered one or more tasks associated with this skill group.</td>
</tr>
<tr>
<td>Busy Other</td>
<td>The Agent is Active, Work Ready, Reserved, or on Hold/Paused in another skill group in the same MRD.</td>
<td>The agent is not in Active, Work Ready, Reserved, or Paused state with respect to a task associated with this skill group. The agent is in Active, Work Ready, Reserved, or Paused in another skill group in the same MRD.</td>
</tr>
<tr>
<td>Not Active</td>
<td>The agent is not working on any task or call associated with this skill group.</td>
<td>The agent is not working on any task or call associated with this skill group.</td>
</tr>
</tbody>
</table>
| Work Not Ready       | The agent is performing wrap up work for a call in this skill group. The agent enters Not Ready state when wrap up is complete. | A basic non voice MRD agent state, which is used to indicate that IPCC/ICM has lost connection with the application instance that supports MRD. That is, when IPCC/ICM loses connection with the application instance supporting MRD X, agent A’s state is set to WORK_NOT_READY. 

**Note:** The MRD agent state allows IPCC/ICM software to capture the duration of a lost contact. The cause for losing the contact can be:  
- Failure in the network connection between the application instance and IPCC/ICM.  
- Failure of application instances. |
<table>
<thead>
<tr>
<th>State in Skill Group</th>
<th>Description for all Cisco Voice</th>
<th>Description for all MRDs except for Cisco Voice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Ready</td>
<td>The agent is not available to be assigned a task. If an agent is Not Ready in one skill group, the agent is Not Ready in all skill groups within the same Media Routing Domain.</td>
<td>The agent is not available to be assigned a task. If an agent is Not Ready in one skill group, the agent is Not Ready in all skill groups within the same Media Routing Domain.</td>
</tr>
</tbody>
</table>

## Agent States and Skill Groups

Agents can belong to multiple skill groups in a Media Routing Domain. When an agent is handling a task that was routed to a skill group, the agent is Active in that skill group.

For ICM/IPCC routed calls or transferred ICM-routed calls that use the dialed number, the active skill group is the skill group to which the task was queued.

For direct incoming calls or transferred ICM/IPCC routed calls that do not use the dialed number, the active skill group is the default or first skill group defined for the agent.

For new outgoing calls (AgentOutCalls or InternalCalls) or transferred outbound calls, the active skill group is either the default skill group or the first skill group defined for the agent.

The agent's state in the active skill group dictates his or her state in other skill groups in the Media Routing Domain to which the agent belongs, as follows:

- If the agent is Active, Work Ready, Reserved, or Hold/Paused in one skill group in the MRD, the agent state is Busy Other for all other skill groups in the MRD.
- If the agent is Not Ready in one skill group in the MRD, the agent is Not Ready in all skill groups in the MRD.

## Agent State Hierarchy for Multi-session Chat Media Routing Domain

Agent state on a task determines the agent state in a skill group, and agent state in a skill group determines agent state in the MRD. For example, if an agent is Active on a call for SkillGroup A, then the agent state is Active in SkillGroup A and the agent state is Active for the MRD to which SkillGroup A belongs.

However, agents handling multi-session chat tasks can work on more than one task in the same skill group and more than one skill group can belong to a MRD. In this case, a state hierarchy is used to determine how the agent's state in the skill group and in the MRD is reported.
The agent state hierarchy is:

1. Active
2. Work Ready
3. Paused
4. Reserved
5. Busy Other (for different skill groups in the same MRD)
6. Not Active

Consider the following diagram:

*Figure 5: Agent State Hierarchy in Skill Group and MRD*

In the above diagram, an agent belongs to two skill groups in the Multi-session Chat MRD and is configured to work on up to six simultaneous multi-session chat tasks in each MRD. In the first skill group, the agent is working on three tasks, and the agent’s states for those tasks are Work Ready, Reserved, and Paused. Work Ready is the state reported for the agent at the skill group level, because Work Ready is higher than Reserved and Paused in the state hierarchy. In the second skill group, the agent is working on two tasks, and the agent’s states for those tasks are Active and Reserved. Active is the state reported for the agent at the skill group level, because Active is higher than Reserved in the state hierarchy. For the Multi-session Chat MRD, the agent’s state is Active because Active is higher than Work Ready in the hierarchy.

Agent State and Task State Relationship

Agent state times are reported on half hour boundaries regardless of whether the call or task is finished or not. Call and task state times are reported only when the task ends. The call/task ends when wrap up is complete.

The following figure illustrates the correlation between agent state and call state for a Voice call. The agent reserve time includes the time it took the call to arrive at the agent’s phone or
desktop (network time) as well as the amount of time that the call rang on the agent’s phone or waited on the agent’s desktop (offer/ring time).

Figure 6: Agent State and Task State Relationship

If the half hour boundary ends when the call is ringing on the agent’s phone, the reserved time for the agent includes the network time and part of the ring time. At the next half hour interval, the remaining ring time is reported in the reserved time of the agent. However, the call’s time does not appear on a report until wrap up has been completed on the call.

Agent Not Ready Reason Codes

**WebView Agent Not Ready Reason Code** reports enable you to report on the Not Ready reason codes that agents select when entering Not Ready state. These reports help you identify whether agents are taking the appropriate number of breaks and whether their breaks are the appropriate length.

You configure these Not Ready reason codes in the ICM/IPCC configuration tool and in the agent desktop software. The ICM/IPCC configuration tool enables you to specify alphanumeric reason codes and their numeric equivalent. For example, you might configure Break and Lunch reason codes with corresponding numeric values of 1 and 2, respectively. You also configure these reason codes in the agent desktop software so that the agent can select a reason code when entering the Not Ready state. The Not Ready reason codes configured on ICM/IPCC software are system-level codes, while the Not Ready reason codes configured on the agent desktop software are peripheral-specific. You configure reason codes to have the same meaning in both applications.

The **WebView Agent Not Ready Reason Code** reports (agent30 and 31) provide the alphanumeric name of the reason code and the corresponding number in the agent Not Ready detail and Not Ready summary reports. For example, if an agent enters Not Ready state and selects "Break" as the reason code, the report displays "Break [1]". The reason code text that displays is the code configured in ICM/IPCC configuration tool. Not Ready reason codes that do not have an alphanumeric reason code defined in the ICM/IPCC configuration tool appear as numbers in the reports. For example, if you configure reason code "3" and do not specify a text reason code, such as Training, only "3" appears in the reports.

**Note:** In all other reports with the Reason Code field, the report displays the numeric Not Ready reason code.
In addition to Not Ready reason codes that you have defined, the IPCC Enterprise system uses predefined Not Ready reason codes for situations in which the agent is made Not Ready automatically by the software. The following table describes these predefined Not Ready reason codes.

**Table 16: Predefined Not Ready Reason Codes**

<table>
<thead>
<tr>
<th>Predefined Not Ready Reason Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>50002</td>
<td>A CTI OS component failed, causing the agent to be logged out. This could be due to closing the agent desktop application, heartbeat timeout, a CTI OS Server failure, or a CTI OS failure.</td>
</tr>
<tr>
<td>50010</td>
<td>The agent did not receive multiple consecutive calls routed to him/her. The system makes the agent Not Ready automatically so that additional calls are not routed to the agent. By default, the number of consecutive calls missed before the agent is made Not Ready is 2.</td>
</tr>
<tr>
<td>50041</td>
<td>The agent's state was changed to Not Ready because the call fails when the agent's phone line rings busy.</td>
</tr>
<tr>
<td>32767</td>
<td>The agent's state was changed to Not Ready because the agent did not answer a call and the call was redirected to a different agent or skill group.</td>
</tr>
<tr>
<td>20001 - applicable if you are using the Cisco Agent Desktop</td>
<td>The agent's state was changed to Not Ready and the agent was forcibly logged out.</td>
</tr>
<tr>
<td>20002 - applicable if you are using the Cisco Agent Desktop</td>
<td>This is the normal logout reason code condition from Not Ready.</td>
</tr>
<tr>
<td>20003 - applicable if you are using the Cisco Agent Desktop</td>
<td>If the agent is not in Not Ready state, a request is made to place the agent in Not Ready state and then a logout request is made to log the agent out.</td>
</tr>
<tr>
<td>Supervisor Not Ready</td>
<td>This code is reserved.</td>
</tr>
</tbody>
</table>

Predefined Not Ready reason codes do not have associated textual reason codes by default and appear as numbers in reports. If you want to see a textual code for these Not Ready reason codes, enter the predefined Not Ready reason code into the Reason Code List tool with the related text. For example, you might want to label the 32767 Not Ready reason code "Redirection on No Answer".

**Not Ready reason code** reports gather data and calculate percentage of time in Not Ready state and in specific Not Ready reasons based on the time range you specify for the report. If an agent's total login session is not included in the specified time range (for example, the agent was still logged in at the end of the time range), an asterisk (*) appears next to the agent's name in the report to indicate that data for that agent is not complete for the range.

**Note:** If you want to report on Not Ready reason codes, ensure that the reporting of agent event detail data is enabled on the PG with the Cisco CallManager peripheral. This is enabled by default.
Agent Logout Reason Codes

You define agent Logout Reason codes in the agent desktop software. These reason codes appear in historical logout reports. In WebView logout reports, the reason codes are reported as their numeric equivalent. For example, if reason code 1 equals "end of shift" and the agent selects "end of shift" as the reason for logging out, the WebView report displays "1".

The IPCC Enterprise system uses several predefined Logout Reason codes for situations in which the agent is logged out automatically by the software. The following table describes these predefined Logout Reason codes.

Table 17: Predefined Logout Reason Codes

<table>
<thead>
<tr>
<th>Predefined Logout Reason Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>The agent reinitialized due to peripheral restart.</td>
</tr>
<tr>
<td>-2</td>
<td>The PG reset the agent, normally due to a PG failure.</td>
</tr>
<tr>
<td>-3</td>
<td>An administrator modified the agent's extension while the agent was logged in.</td>
</tr>
<tr>
<td>50002</td>
<td>A CTI OS component failed, causing the agent to be logged out. This could be due to closing the agent desktop application, heartbeat time out, a CTI OS Server failure, or a CTI OS failure.</td>
</tr>
<tr>
<td>50003</td>
<td>The agent was logged out because the Cisco CallManager reported the agent's device as out of service.</td>
</tr>
<tr>
<td>50004</td>
<td>The agent was logged out due to agent inactivity as configured in agent desk settings.</td>
</tr>
<tr>
<td>50020</td>
<td>The agent was logged out when his or her skill group assignment dynamically changed on the AW.</td>
</tr>
<tr>
<td>50030</td>
<td>The agent was logged out because the agent was logged into dynamic device target that was using the same dialed number (DN) as the PG static device target.</td>
</tr>
<tr>
<td>50040</td>
<td>The mobile agent was logged out because the call failed.</td>
</tr>
<tr>
<td>50042</td>
<td>The mobile agent was logged out because the phone line disconnected when using nailed connection mode.</td>
</tr>
<tr>
<td>20003- applicable if you are using the Cisco Agent Desktop</td>
<td>Forces the logout request.</td>
</tr>
<tr>
<td>Supervisor Logout- applicable if you are using the Cisco Agent Desktop</td>
<td>This code is reserved.</td>
</tr>
</tbody>
</table>
Configuration and Scripting Considerations for Reporting on Agent States

Follow these guidelines when configuring agent reporting:

- If you want to use the agent state trace report, enable the agent state trace option for each agent whose information you want to view using the ICM/IPCC configuration tool.

  Enabling agent state trace for many agents might impact system performance as the option causes more records to be written to the database. If you notice a performance problem, you might want to disable agent state trace, or only enable agent state trace for those agents on whom you are reporting.

- To obtain agent data in reports:
  - For IPCC Enterprise deployments other than System IPCC, ensure that agent reporting is enabled on the Cisco CallManager peripheral and identify the Admin Workstation distributor in the Agent Distribution list in ICM/IPCC software. It is not enabled by default.
  - For System IPCC deployments, agent reporting is enabled by default, and cannot be disabled.

Reporting when using the Queue to Agent Node in Script Editor.

The Queue to Agent Node in Script Editor allows you to route a call to one or more specified agents; for example, to a primary supervisor. The agents can be specified directly from the list of configured agents or indirectly by providing agent’s SkillTargetID or Enterprise Name.

When you use the Queue to Agent Node, certain reporting statistics are tracked for agents in the Agent_Half_Hour table in the database schema.

Fields are tracked for calls that are offered, abandoned, abandoned in queue, dequeued, redirected, answered, handled, and resulted in an error condition.

See Script Editor online help for more on the Queue to Agent node.

See Schema online help for more on the Agent_Half_Hour table.

See the IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition for instructions on enabling agent reporting.

Configuration and Scripting Considerations for Not Ready Reason Code Reporting

Follow these guidelines when configuring Not Ready reason codes:
• Configure the Not Ready reason codes in the ICM/IPCC 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.

• Configure the codes in the agent desktop software so that the agents can use them.

• Ensure that agent event detail is enabled on the PG with the Cisco CallManager peripheral so that Not Ready reason codes are reported. It is enabled by default, and for System IPCC Enterprise deployments cannot be disabled.

See the IPCC Administration Guide for Cisco IPCC Enterprise Edition for instructions on configuring Not Ready codes.

Configuration and Scripting Considerations for Logout Reason Code Reporting

If you want to report on Logout Reason codes, configure the codes in the agent desktop software. Also, configure the Logout non-activity time in the Agent Desk Settings tool.


See Also

IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
Cisco IPCC Enterprise Edition System IPCC Installation and Configuration Guide
IPCC Administration Guide for Cisco IPCC Enterprise Edition

Reporting on Agent Task Handling

Reports show you what kind of tasks agents are handling and how well they are handling them. For example, reports display statistics for calls placed, received, transferred and conferenced. Reports also indicate how many calls were rerouted from an agent when the agent failed to answer the call.

Types of Tasks

Agents can receive and place many different types of tasks. You can report all of these tasks using WebView.

Tasks can be either internal or external. Internal tasks are calls made to an agent from another person on the same Cisco CallManager cluster. Internal tasks are also calls that encounter busy or an overflow conditions in a script. For example, calls whose Call Type is requalified in a script "overflow" from the first call type into second call type. Overflow might occur in VRU application scripts, where Call Type requalify is used to separate information gathering from queuing, or, if CVP is the VRU, in Redirection on No Answer situations in which the Router requalifies the call type to assign the call to a different agent.
External tasks are tasks that go through a voice gateway or Media Routing PG or tasks that are routed to an agent from a person on a different Cisco CallManager cluster. For example, calls from the call center to customers go through voice gateways and are considered external. Only Voice calls can be external or internal; single-session chat, multi-session chat, e-mail, and blended collaboration task are always external.

In addition to being internal or external, tasks can be incoming or outgoing. An incoming task is a task that an agent receives. An outgoing task is a task that an agent places. For example, if a customer calls an agent, the call is incoming for the agent. If an agent calls a supervisor, the call is outgoing for the agent. Voice calls can be either incoming and outgoing; single-session chat, multi-session chat, e-mail, and blended collaboration task are always incoming.

For Voice calls only, agents can also transfer calls, receive transferred calls, place consultative calls, and engage in conference calls.

The following table describes the tasks that an agent can receive and place and how they are reported.

<table>
<thead>
<tr>
<th>Type of call</th>
<th>Description</th>
<th>Reported As</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming direct/internal calls</td>
<td>Calls that are not routed by an ICM/IPCC routing script. Incoming Direct Tasks are tasks that come directly to the agent’s extension. These calls can be either internal (agent or device on same CallManager cluster or within the VoIP network to another CallManager cluster) or external (through a voice gateway). Examples of this kind of call include: calls that are directly transferred by another agent without going through a script and calls that resulted from agent-to-agent calling. Data for these calls are stored in the InternalCallsRcvd fields of the Agent_Skill_Group_Half_Hour historical database table.</td>
<td>Internal In</td>
</tr>
<tr>
<td>Outgoing external calls</td>
<td>Calls initiated by agents from their extension that pass through a voice gateway. Outgoing External Tasks are always voice tasks. Consult, conference out, and transfer out calls are counted as outgoing external calls if they are outside the voice gateway, which could include a Network IVR or on-premise IVR that is connected using voice gateway or remote agent extensions at another Cisco CallManager site. Agent-to-Agent dialing is outgoing external if the agent initiating the call if the call must traverse a voice gateway to get to the destination agent. Data for these calls are stored in the AgentOutCalls fields of the Agent_Skill_Group_Half_Hour historical database table.</td>
<td>External Out Tasks</td>
</tr>
<tr>
<td>Outgoing internal calls</td>
<td>Calls initiated by agents from their extension to another extension within the Cisco CallManager cluster or to another Cisco CallManager cluster</td>
<td>Internal Out Tasks</td>
</tr>
</tbody>
</table>
within the VoIP network. Outgoing Internal Tasks are always voice tasks.

Consult, conference out and transfer out calls are counted as outgoing internal calls if they are placed to another device that is on the same CallManager cluster. The device could be any of the following: another agent line, any other extensions to the VRU and any IP phone or CTI route point.

Agent-to-Agent calls are outgoing internal for the agent initiating the call if the destination agent is on the same Cisco CallManager cluster as the source agent.

Data for these calls are stored in the InternalCalls fields of the Agent_Skill_Group_Half_Hour historical database table.

ICM-routed/incoming calls

All calls that are routed to the agent by an ICM/IPCC routing script. Outbound Option calls are considered ICM-routed/incoming calls.

Data for these calls are stored in the CallsHandled fields of the Agent_Skill_Group_Half_Hour historical database table.

Transferred in calls

Calls that are transferred to an agent. Both incoming and outgoing calls can be transferred to an agent.

**Note:** For blind transfers in IPCC Enterprise with an IPCC System PG, this field is updated when the call that was blind transferred to an IVR is subsequently transferred to another agent and the agent answers the call. For this call scenario, this field is not updated in IPCC Enterprise without an IPCC System PG which supports only IP-IVR. This field is updated when an IPCC System PG which supports CVP is used in IPCC Enterprise.

Data for these calls are stored in the TransferredIn fields of the Agent_Skill_Group_Half_Hour historical database table.
<table>
<thead>
<tr>
<th>Type of call</th>
<th>Description</th>
<th>Reported As</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferred out calls</td>
<td>Calls that are transferred from an agent. An agent can transfer both incoming and outgoing calls. Data for these calls are stored in the TransferredOut fields of the Agent_Skill_Group_Half_Hour historical database table.</td>
<td>Transfer Out</td>
</tr>
<tr>
<td>Consultative calls</td>
<td>Calls in which an agent consulted with another agent or supervisor while having another call on hold. Data for these calls are stored in the ConsultativeCalls fields of the Agent_Skill_Group_Half_Hour historical database table.</td>
<td>Cons Out</td>
</tr>
<tr>
<td>Conference in calls</td>
<td>Incoming calls that are conferenced. Note: For blind conferences in IPCC Enterprise with an IPCC System PG, this field is updated when the call that was blind conferenced to an IVR is subsequently answered by another agent. For this call scenario, this field is not updated in IPCC Enterprise without an IPCC System PG which supports only IP-IVR. This field is updated when an IPCC System PG which supports CVP is used in IPCC Enterprise. Data for these calls are stored in the ConferencedInCalls fields of the Agent_Skill_Group_Half_Hour historical database table.</td>
<td>Conf In</td>
</tr>
<tr>
<td>Conference out calls</td>
<td>Outgoing calls that are conferenced. Data for these calls are stored in the ConferencedOutCalls fields of the Agent_Skill_Group_Half_Hour historical database table.</td>
<td>Conf Out</td>
</tr>
</tbody>
</table>

**Task Times**

For each type of task that an agent can place, the amount of time that the agent spent working on that task is recorded in the Agent_Skill_Group_Half_Hour database table, as follows:

- ICM routed tasks - The time for these tasks begins when the agent answers the task and ends when the agent completes wrap up. The time is stored in the HandledCallsTimeToHalf field.

- Incoming direct tasks - The time for these tasks begins when the agent answers the task and ends when the task disconnects. The time is stored in the InternalCallsRcvdTimeToHalf field.

- External outgoing tasks - The time for these tasks begins when the agent initiates the task and ends when the task disconnects. The time is stored in the AgentOutCallsTimeToHalf field.

- Outgoing internal tasks - The time for these tasks begins when the agent initiates the task and ends when the task disconnects. The time is stored in the InternalCallsTimeToHalf field.
• Transferred in tasks - The time for these tasks begins when the agent answers the transferred task and ends when the task disconnects. The time is stored in the TransferredInCallsTimeToHalf field.

Note: For blind transfers in IPCC Enterprise with an IPCC System PG, the TransferredInCallsTimeToHalf field is updated when the call that was blind transferred to an IVR is subsequently transferred to another agent and the agent answers the call. For this call scenario, this field is not updated in IPCC Enterprise without an IPCC System PG which supports only IP-IVR. This field is updated when an IPCC System PG which supports CVP is used in IPCC Enterprise.

• Transferred out tasks - The time for these tasks begins when the agent activates the transfer button and ends when the transfer is complete. The time is stored in the InternalCallsTimeToHalf field.

• Consultative tasks - The time for these tasks begins when the agent activates the transfer button and ends when the target agent answers and the held task is restored (drop consultative call) or consult party drops. The time is stored in the ConsultativeCallsTimeToHalf field.

• Conferenced in tasks - The time for these tasks begins when the agent answers the task and ends when the task disconnects. The time is stored in the ConferenceInCallsTimeToHalf field.

Note: For blind conferences in IPCC Enterprise with an IPCC System PG, this field is updated when the call that was blind conferenced to an IVR is subsequently answered by another agent. For this call scenario, this field is not updated in IPCC Enterprise without an IPCC System PG which supports only IP-IVR. This field is updated when an IPCC System PG which supports CVP is used in IPCC Enterprise.

• Conferenced out tasks - The time for these tasks begins when the agent activates the conference button and ends when the agent disconnects from the conference call and the supervisor drops out of the call. The time is stored in the ConferenceOutCallsTimeToHalf field.

You might notice overlapping data in your reports for the amount of time for different types of calls. This happens because incoming tasks, such as ICM/IPCC routed tasks and calls directly to an agent, can be Transferred In and Conferenced In. Both incoming calls and outgoing calls placed by agents can be Transferred Out and Conferenced Out. The total time for the incoming or outgoing call includes transfer and conference time.

Note: Agents can transfer and conference incoming calls both in and out. However, they can transfer and conference outgoing calls out only. This means that if an agent transfers an outgoing task to another agent, it is still considered an outgoing task.

Outbound Option Dialing Campaign Calls

Outbound Option provides automatic outbound dialing capability. The Outbound Option Dialer places outbound calls to customers and connects these calls with agents.

The Dialer assigns and connects calls differently than regular IPCC Enterprise routing. Report data for agents handling Outbound Option calls therefore differs from data for agents handling
typical voice calls and multichannel tasks. In order to interpret agent data for Outbound Option tasks, you understand how Outbound Option reserves agents, reports calls that are connected to agents and handles calls dropped by customers before the calls are connected.

When the Outbound Dialer initiates a call to a customer, it reserves the agent assigned to handle the call by placing a reservation call to the agent and changing the agent's state to Hold. This reservation call is reported as a Direct In call to the agent.

For typical voice calls, the agent is placed into Reserved state when ICM/IPCC software reserves the agent to handle a call; the agent's state is reported as Reserved. For Outbound Option calls, reports show the agent in Hold state when reserved for a call and the time that agent spends reserved is reported as Hold Time. However, for the Outbound Option reports perskg11, perskg12, agtsk06, agtsk10, agtsk11, agtsk12, call reports show the agent in Reserved state when reserved for a call.

When the customer answers the call, the Outbound Option Dialer transfers the call to an agent. The call is now reported as a Transfer In call to the agent. When the customer call is transferred to the agent, the reservation call is dropped by the Dialer and classified as Abandon on Hold. For more information regarding Outbound Option termination call detail records, see the Cisco ICM/IP Contact Center Enterprise Edition Outbound Option User Guide.

The abandoned call wait time, set in the Campaign Configuration screen, determines how calls are reported if the caller hangs up. Calls are counted in the Customer Abandon field in the WebView campaign query templates (camqry01 and camqry02) only if the customer hangs up before the abandoned call wait time is reached.

Redirection on No Answer Calls with IP IVR

The Redirection on No Answer feature, configured in Agent Desk Settings in ICM/IPCC configuration tool, ensures that when an agent does not answer a call, the call is re-assigned to another agent or requeued after a specified number of seconds. Redirection on No Answer is also used to change the agent state to Not Ready when a call is rerouted from the agent's phone. When the Ring No Answer time expires, ICM/IPCC software makes the agent unavailable for routing requests. When the call is actually rerouted, ICM/IPCC software makes the agent Not Ready, with a reason code of 32767.

A count of the calls that experience Redirection on No Answer appears in agent and skill group reports. A high number of redirection on ring no answer calls for an agent might indicate that the agent is not responding quickly enough to incoming calls or, if multiple agents have a high number of reroute on ring no answer calls, might indicate that the Ring No Answer time is too low.

For agent reporting, you can see how many calls experienced Redirection on Ring No Answer through the Redirect No Answer report field in agent and skill group reports.

Redirection on No Answer calls also affect call type reporting. The Calls RONA field is updated for the Call Type when a call redirects on no answer. In call type reports, these calls are grouped into the "Other" category. See Call Type Reporting (page 80) for more information.
Redirection on No Answer calls update Peripheral tables (Peripheral_Real_Time and Peripheral_Half_Hour) differently in IPCC Enterprise with IPCC System PG deployments and System IPCC deployments than in other IPCC Enterprise environments.

Consider this example. An incoming ACD call is sent to an agent, but the agent does not answer it. The call RONAs to an IVR (queued to a skill group), and is answered later by another agent.

In an IPCC Enterprise deployment that does not use the IPCC System PG (with or without CVP support), the CallsOffered fields (CallsOfferedHalf and CallsOfferedToday in Peripheral_Real_Time and CallsOfferedToHalf in Peripheral_Half_Hour) are updated three times in this scenario:

- When the call first arrives, the Peripheral CallsOffered metrics for the CallManager peripheral are incremented.
- When the call is first sent to the IVR, the metrics for the IVR peripheral are incremented.
- When the call is sent to the IVR, the metrics for the IVR peripheral are incremented.

In IPCC Enterprise with the IPCC System PG and System IPCC deployments, this metric is updated only when the call first arrives.

Redirection on No Answer Calls with CVP

The Redirection on No Answer feature, configured in Agent Desk Settings in ICM/IPCC configuration tool and in CVP, ensures that when an agent does not answer a call, the call is taken away from the agent after a specified number of seconds and re-assigned to another agent or requeued. Redirection on No Answer is also used to change the agent state to Not Ready when a call is rerouted from the agent's phone. When the Ring No Answer time in the Agent Desk Settings expires, ICM/IPCC software makes the agent unavailable for routing requests. When the CVP Ring No Answer timeout expires, the call is requeried for routing to a different skill group or agent. ICM/IPCC software makes the agent Not Ready, with a reason code of 32767, when the call is redirected to the new skill group or agent.

Redirection on No Answer calls might also affect call type reporting. See Call Type Reporting (page 80) for more information.

Configuration and Scripting Considerations for Task Reporting

Configuration and Scripting Considerations for Transfers and Conferences

See Configuration and Scripting Considerations for Transfer and Conference Reporting (page 71).
Configuration and Scripting Considerations for Redirection on No Answer with IP-IVR

For calls that redirect on no answer, follow these configuration guidelines to ensure that reporting is accurate:

- Define a Ring No Answer time and Ring No Answer dialed number within the Agent Desktop Settings in the ICM/IPCC configuration tool. Set the Call Forward on No Answer system wide time value in Cisco CallManager greater than the Ring No Answer timer in the Agent Desktop Setting. Remember if you have multiple agent desk setting records, that all must be set to this value that is less than the Cisco CallManager timer.

- If you want to ensure that Redirection on No Answer calls do not adversely affect the Service Level, you define the Service Level threshold to be less than the Ring No Answer timer at the call type and service. Note that you do not create services in System IPCC or ARI deployments.

Redirection on No Answer conditions be handled by two scripts: the initial routing script and a script specifically set up for RONA conditions.

The Redirection on No Answer script include the following:

- The initial routing script might include call variables to collect the skill group to which the call is queued as well as the initial call type. These variables are passed to the RONA script. Optionally, you can configure the script to use these variables.

- In the RONA script, queue the call at the highest priority in the skill group(s) defined.


Configuration and Scripting Considerations for Redirection on No Answer with CVP

For calls that redirect on no answer, follow these configuration guidelines to ensure that reporting is accurate:

- Define a Ring No Answer time within the Agent Desktop Settings in the ICM/IPCC configuration tool. Do not configure the Ring No Answer dialed number. Set the Call Forward on No Answer system wide time value in Cisco CallManager greater than the Ring No Answer timer in the Agent Desktop Setting. Remember that if you have multiple agent desk setting records, they all must be set to this value that is less than the Cisco CallManager timer.

- Configure the CVP Ring No Answer timeout. The Ring No Answer time in Agent Desk Settings is used to make the agent Not Ready, but the actual query of the call occurs when the CVP Ring No Answer timeout occurs.
The Redirection on No Answer script:

- Enable the Target Requery option in the node that is selecting and delivering the call to the agent to instruct the CVP to requery the call to another skill group or agent.
- Queue the call at the highest priority in the skill group(s) defined within the call variables.


See Also

IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise & Hosted Editions

Reporting on Agent Call Transfers and Conferences

Voice calls can be transferred and conferenced. Non-voice tasks, such as e-mail, single-session chat and multi-session chat, and blended collaboration tasks cannot be transferred and conferenced.

Transfer can be either blind or consultative, and is supported only for agents within the same Cisco CallManager cluster. A **blind transfer** is a transfer in which the agent transfers the call to another agent without first ensuring that another agent is available. A **consultative transfer** is a transfer in which an agent places the call on hold, calls the receiving agent to discuss the transfer and then transfers the call to the agent. Consultative transfer is not supported when CVP is used as the VRU.

Transfers and Conferences Using Dialed Numbers

When the agent activates the transfer or conference button and selects a number to which to transfer or conference the call, the dialed number is sent to the ICM/IPCC Central Controller from the agent's PG. This dialed number determines the call type, which in turn selects the transfer routing script. The script include a Queue to Skill Group node that references the appropriate skill group based on the dialed number to which the call be queued.

If an agent is available in the selected skill group, a message is sent from the ICM/IPCC Central controller to the source agent's PG, containing a label or number to be dialed. The PG transfers the call from the source agent’s phone to the target agent using the label returned from the ICM/IPCC Central controller. For these types of transfers and conferences, TransferOut or ConferenceOut is incremented for the source agent and TransferIn or ConferenceIn is incremented for the target agent.

If no agents are available for a transfer in the selected skill group, the Router sends the source agent's PG the label to use to forward the call to the VRU. For these types of transfers and conferences, TransferOut or ConferenceOut is incremented for the source agent. However, TransferIn or ConferenceIn is incremented for the target agent when the VRU eventually routes
the call to the target agent only in IPCC Enterprise with an IPCC System PG and System IPCC deployments. This is also applicable when IPCC System PG with CVP is used in IPCC Enterprise and System IPCC deployments.

How Database Fields Are Affected by Transfers and Conferences

Transfers and conferences affect fields in the Agent_Skill_Group_Half_Hour database table.

The TransferIn field is incremented for the target agent if all of the following conditions are true:

- The call was transferred (blind or consultative) by an agent to a call type or script that checks for agent availability
- For blind transfers only, an agent within the same peripheral was available at the time that the transfer was initiated.

**Note:** For blind transfers in IPCC Enterprise with an IPCC System PG, this field is updated when the call that was blind transferred to an IVR is subsequently transferred to another agent and the agent answers the call. For this call scenario, this field is not updated in IPCC Enterprise without an IPCC System PG which supports only IP-IVR. This field is updated when an IPCC System PG which supports CVP is used in IPCC Enterprise.

The ConferenceIn field is incremented for the target agent receiving the conference call if all of the following conditions are true:

- The call was conferenced by an agent to a calltype or script that checked for agent availability
- An agent within the same peripheral was available at the time that the conference was initiated

**Note:** For blind conferences in IPCC Enterprise with an IPCC System PG, this field is updated when the call that was blind conferenced to an IVR is subsequently answered by another agent. For this call scenario, this field is not updated in IPCC Enterprise without an IPCC System PG which supports only IP-IVR. This field is updated when an IPCC System PG which supports CVP is used in IPCC Enterprise.

The TransferOut field is incremented for the agent initiating either a blind or consultative transfer when the initiating agent disconnects from the transfer.

The Conference Out field is incremented for the agent initiating a conference when the initiating agent disconnects from the conference.

The ConsultativeCalls field is incremented for the initiating agent when the consultative call disconnects and wrap up is complete. Note that consultative transfer is not supported for systems using CVP as the VRU and therefore this field is never incremented if you are using CVP.

**Note:** If you are using CVP as the VRU, the transfer can be performed through a network transfer or through the Cisco CallManager. If the network transfer is used, the TransferIn and TransferOut fields do not display data for these transfers.
How Types of Calls are Affected by Transfer and Conference

The following table describes the fields that are incremented in the Agent_Skill_Group_Half_Hour database table when different types of calls are transferred and conferenced.

**Table 19: How Calls Are Affected by Transfer and Conference**

<table>
<thead>
<tr>
<th>Type of Call</th>
<th>How the call is affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outgoing internal</td>
<td>The InternalCall field is incremented for the source agent that initiates a transfer or conference operation if the target agent is on the same CallManager cluster as the source agent. This field is incremented after the call is disconnected.</td>
</tr>
<tr>
<td>Incoming direct/incoming internal</td>
<td>The InternalCallsRcvd field is incremented for the target agent that completes a transfer or conference if the agent dialed the target agent directly (that is, does not access an ICM/IPCC routing script). This field is incremented after the call is disconnected.</td>
</tr>
<tr>
<td>Outgoing external</td>
<td>The AgentOutCalls field is incremented for the source agent who completes a transfer or conference to an external destination. This field is incremented after the call is disconnected.</td>
</tr>
<tr>
<td>ICM Routed</td>
<td>The CallsHandled field is incremented for the target agent if the call is sent to the agent using an ICM/IPCC routing script. This field is incremented against the skill group to which the routing script queued the call. This field is incremented after the call disconnects and wrap up is completed.</td>
</tr>
</tbody>
</table>

How Skill Groups are Affected by Transfer and Conference

The skill group for which transfer and conference data is reported depends on how the original call was placed. In addition, there are some differences in how this data is reported between IPCC Enterprise deployments that do not use the IPCC System PG (which supports both CVP and IP-IVR) and IPCC Enterprise with the IPCC System PG/System IPCC deployments as described in this section.

The transfer or conference is reported for the default skill group if the original call is a direct call, placed to the agent's extension. For example, if an agent received a call directly to his extension and then transferred the call, the transfer is reported for the default skill group of both the agent who initiated the transfer and agent who received the transfer.

The transfer or conference is reported for the skill group to which the call was routed if the original call was routed using an ICM/IPCC routing script to a specific skill group. For example, if an agent in the Sales skill group received a Sales call and then transferred the call, the transfer out is reported for the Sales skill group. The transfer in is reported for the skill group of the agent who received the transfer.

**Note:** When an agent makes an outbound call as part of a consult call, the call is not attributed to the Default Skill Group. It is attributed to the skill group for the consulting agent on the original call.
The following scenarios further explain how database fields are incremented for different types of transfers and conferences.

**Call Scenario 1: Blind Transfer of ICM-routed call - agent is not available**

In this example, agent A is presented with an ICM-routed call for skill group Y. Agent A selects skill group X using the dialed number (which accesses a script) and initiates and completes a blind transfer. The InternalCalls and TransferOut fields are then incremented for Agent A against skill group Y.

After wrap up is completed, the CallsHandled field is incremented for agent A against skill group Y. Since there are no agents available in skill group X, the call goes to the VRU (VRU stats not shown). When agent B in skill group X becomes available, the VRU routes the call to agent B. Agent B answers the call and the call disconnects and wrap up is complete.

**Table 20: Blind Transfer of ICM-routed Call: Agent A transfer to Agent B**

<table>
<thead>
<tr>
<th>Fields incremented for Agent A against skill group Y</th>
<th>Fields incremented for Agent B against skill group X</th>
</tr>
</thead>
<tbody>
<tr>
<td>CallsHandled, InternalCall, TransferOut</td>
<td>CallsHandled, TransferIn (IPCC with IPCC System PG and System IPCC deployments only)</td>
</tr>
</tbody>
</table>

For agent A, the call is reported in the TasksHandled, Internal Out, and TransferOut report fields. For agent B, the call is reported in the Tasks Handled report fields; in IPCC Enterprise with IPCC System PG (which supports only IP-IVR and not supports CVP) and System IPCC deployments, the call is also reported in the TransferIn field.

**Call Scenario 2: Consultative Transfer of an ICM-routed call-agent available**

In this example, agent A is presented with an ICM-routed call for skill group Y. Agent A selects skill group X using the dialed number and initiates a transfer. The ICM/IPCC script that uses the LAA select node for skill group x realizes that Agent B is available and requests that agent A’s PG initiate a transfer to agent B on behalf of Agent A’s phone. Agent B answers the transferred call. After consulting with Agent B, Agent A completes the transfer. The InternalCall and TransferOut fields are then incremented for Agent A against the skill group Y. After wrap up is completed, the CallsHandled field is incremented for agent A against skill group Y.

Agent B now talks to the caller and when the call disconnects and wrap up is completed, CallsHandled and TransferIn are incremented for Agent B against skill group X.

**Table 21: Consultative Transfer of ICM-routed Call: Agent A transfer to Agent B**

<table>
<thead>
<tr>
<th>Fields incremented for Agent A against skill group Y</th>
<th>Fields incremented for Agent B against skill group X</th>
</tr>
</thead>
<tbody>
<tr>
<td>CallsHandled, InternalCall, TransferOut, Hold</td>
<td>CallsHandled, TransferIn</td>
</tr>
</tbody>
</table>

For agent A, the call is reported in Tasks Handled, Internal Out, Transfer Out, and Incoming Hold and/or All Hold report fields. For agent B, the call is reported in Tasks Handled and Transfer In report fields.
Call Scenario 3: Consultative Conference of a Direct Call

In this example, a direct call comes into agent A’s ACD extension.

Agent A selects skill group X using the dialed number and initiates a conference. The ICM/IPCC script that uses the LAA select node for skill group X realizes that Agent B is available and requests that agent A’s PG initiate a conference to agent B on behalf of Agent A’s phone. Agent B answers the conferenced call. After consulting with Agent B, Agent A completes the conference.

Agent A disconnects from the conference. The InternalCalls and ConferenceOut and InternalCallsRvcd fields are then incremented for Agent A against the default skill group.

Agent B or the caller disconnects. InterCallsRcvd and Conference Out are incremented against the default skill group for agent B.

Table 22: Consultative Conference of a Direct Call: Agent A conferences in Agent B

<table>
<thead>
<tr>
<th>Fields incremented for Agent A against default skill group</th>
<th>Fields incremented for Agent B against skill group X</th>
</tr>
</thead>
<tbody>
<tr>
<td>InternalCallRcvd, InternalCall, ConferenceOut, Hold</td>
<td>CallsHandled, ConferenceIn</td>
</tr>
</tbody>
</table>

For agent A, the call is reported in Tasks Handled, Internal Out, Conf Out, and All Hold (Internal Hold) in report fields. For agent B, the call is reported in Tasks Handled and Conf In report fields.

Call Scenario 4: Consultative Call

In this example, agent A is presented with an ICM-routed call for skill group Y.

Agent A selects skill group X using the dialed number and initiates a consult. The ICM/IPCC script that uses the LAA select node for skill group X realizes that Agent B is available and requests that agent A’s PG initiate a conference to agent B on behalf of Agent A’s phone. Agent B answers the consult call. After consulting with Agent B, Agent A activates the Reconnect button, which disconnects Agent B and Agent A resumes talking to the caller.

Agent A disconnects from the call. After wrap up is completed, CallsHandled and Consultative Calls field are incremented for agent A against skill group Y.

Table 23: Consultative Transfer: Agent A consults with Agent B

<table>
<thead>
<tr>
<th>Fields incremented for Agent A against skill group Y</th>
<th>Fields incremented for Agent B against skill group X</th>
</tr>
</thead>
<tbody>
<tr>
<td>CallsHandled, InternalCall, ConsultativeCall, Hold</td>
<td>CallsHandled</td>
</tr>
</tbody>
</table>

For agent A, the call is reported in Tasks Handled, Internal Out, Cons Out, and Incoming Hold and/or All Hold report fields. For agent B, the call is reported in Tasks Handled report fields.
Configuration and Scripting Considerations for Transfer and Conference Reporting

Configuration and scripting recommendations for transfers and conferences include transfers and conferences to skill groups and transfers and conferences to agents.

Configuration and Scripting Considerations for Transfers and Conferences to Skill Groups

Follow these guidelines when configuring and scripting for transfers and conferences to skill groups:

• Configure the dialed numbers in the ICM/IPCC configuration tool.

• Create a routing script for transferring to skill groups that includes a Queue to Skill Group node. This script ensures that transferred and conferenced calls are queued to the correct skill group.

• Associate the dialed number with the routing script.


Configuration and Scripting Considerations for Transfers and Conferences to Agents

Follow these guidelines when configuring and scripting for transfers and conferences to agents:

• Configure the dialed number in the ICM/IPCC configuration tool.

  The dialed number needs to be associated with an appropriate routing script.

• Create a routing script for transferring to agents that includes a Queue to Agent node.

  This script ensures that transferred and conference calls are routed queued to the correct agents.


See Also

IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise & Hosted Editions
Reporting on Supervisor Action

Agent team supervisors can take advantage of supervisory features available on their desktops. These features include Supervisor Assist, Emergency Assist, Barge-In and Intercept. There are two kinds of Supervisor and Emergency Assist: existing call and no call.

If you are using CVP as the VRU, data is not captured for Barge in or Intercept calls.

Note: These supervisory features are not available to agents using MRDs other than Voice.

WebView reports display data for agent and supervisor use of these features. You might use this data to identify training needs.

Supervisor and Emergency Assist for Existing Call

Agents can activate supervisor assist or emergency assist buttons on their desktop when they need special assistance from the primary or secondary supervisor assigned to their team.

Note: Blind transfer is not supported for Supervisor Assist and Emergency Assist.

If consult is selected as an option on the agent desktop settings for supervisor or emergency assist: if the agent is on a call when he or she activates either the Supervisor or Emergency Assist feature on her/his desktop, the CTI software activates the conference key on behalf of the agent’s phone and call the supervisor using the Supervisor or Emergency Assist script. (This example assumes the emergency or supervisor assist script has an Agent-to-Agent node to find a supervisor. See Configuration and Scripting Considerations for Reporting on Supervisor Action.) The supervisor answers the call and consults privately with the agent. The following fields are incremented within the Agent Skill Group and Skill group tables.

Table 24: Existing Call: Consultative

<table>
<thead>
<tr>
<th>Fields incremented for Agent’s skill group to which the call was routed</th>
<th>Fields incremented for Supervisor's default skill group</th>
</tr>
</thead>
<tbody>
<tr>
<td>CallsHandled, InternalCall, SupervisorAssistCalls/EmergencyAssist</td>
<td>InternalCallsRcvd</td>
</tr>
</tbody>
</table>

For the agent, the call is reported in Tasks Handled and either Sup Assist or Emergency report fields. For the supervisor, the call is reported in Tasks Handled report fields.

Note: During the consultation, the supervisor can decide to barge-in to the call using the supervisor desktop Barge-In feature.

Supervisor and Emergency Assist for No Call

The agent can use the Supervisor Assist and Emergency Assist features at any time, even if not currently on a call. If the agent is not on a call when he or she activates either the Supervisor or Emergency Assist feature on the agent’s desktop, the CTI software activates the make call
functionality on behalf of the agent’s phone and calls the supervisor using the Supervisor or Emergency Assist script. The following fields are incremented within the Agent Skill group and Skill group tables against the default skill group.

**Table 25: No Call**

<table>
<thead>
<tr>
<th>Fields incremented for Agent’s default skill group</th>
<th>Fields incremented for Supervisor’s default skill group</th>
</tr>
</thead>
<tbody>
<tr>
<td>InternalCall, SupervisorAssistCalls/EmergencyAssist</td>
<td>InternalCallsRcvd</td>
</tr>
</tbody>
</table>

For the agent, the call is reported in Tasks Handled and either Sup Assist or Emergency report fields. For the supervisor, the call is reported in Tasks Handled report fields.

**Barge-In**

When the supervisor activates the Barge-in feature from his or her desktop, the agent’s desktop completes a conference to the supervisor so that the supervisor can join into the conversation with the call. The following fields are incremented for both the agent and the supervisor when the barge-in feature is activated in the agent skill group and skill group tables.

**Note:** If you have deployed CVP as the VRU, data is not gathered for Barge-In.

**Table 26: Supervisor Barge-In**

<table>
<thead>
<tr>
<th>Fields incremented for Agent’s skill group to which the call was routed</th>
<th>Fields incremented for Supervisor’s default skill group</th>
</tr>
</thead>
<tbody>
<tr>
<td>CallsHandled, InternalCalls, BargeInCalls</td>
<td>BargeInCalls, InternalCallsRcvd</td>
</tr>
</tbody>
</table>

For the agent, the call is reported in Tasks Handled and Barge In report fields. For the supervisor, the call is reported in Tasks Handled and Barge In report fields.

**Intercept**

If the supervisor decides to intercept (take over) the call, the supervisor activates the Intercept button on his or her desktop. This causes the agent to be dropped out of the conference, thereby allowing the supervisor to take over the call. The following fields are incremented during the intercept operation for both the agent skill group and skill group tables.

**Note:** If you have deployed CVP as the VRU, data is not gathered for Intercept.

**Table 27: Supervisor Intercept**

<table>
<thead>
<tr>
<th>Fields incremented for Agent’s skill group to which the call was routed</th>
<th>Fields incremented for Supervisor’s default skill group</th>
</tr>
</thead>
<tbody>
<tr>
<td>InterceptCalls</td>
<td>InterceptCalls</td>
</tr>
</tbody>
</table>
For the agent, the call is reported in the Intercept report field. For the supervisor, the call is reported in the Intercept report field.

Configuration and Scripting Considerations for Reporting on Supervisor Action

To ensure that your reports contain accurate data for supervisor actions, configure and script for the supervisor features as follows:

• Ensure contact center agents are organized in teams, and that each team has both a primary and secondary supervisor. This provides each agent team with two levels of supervisory support.

• Create skill groups specifically for supervisor and emergency assist situations and assign these to your supervisors to ensure that only supervisor and assist calls will be routed to your supervisors.

• Define a supervisor dialed number for each agent team in the ICM/IPCC configuration tool.

For the agent, the call is reported in the Intercept report field. For the supervisor, the call is reported in the Intercept report field.

Configuration and Scripting Considerations for Reporting on Supervisor Action

To ensure that your reports contain accurate data for supervisor actions, configure and script for the supervisor features as follows:

• Ensure contact center agents are organized in teams, and that each team has both a primary and secondary supervisor. This provides each agent team with two levels of supervisory support.

• Create skill groups specifically for supervisor and emergency assist situations and assign these to your supervisors to ensure that only supervisor and assist calls will be routed to your supervisors.

• Define a supervisor dialed number for each agent team in the ICM/IPCC configuration tool.

On the Attributes Tab of the Agent Team dialog box, specify the dialed number in the Supervisor script dialed number field.

This dialed number identifies a specific routing script when supervisory features are activated. When the agent activates the supervisor or emergency assist button on his or her phone, the Supervisor Dialed Number for the agent’s team is sent to the ICM Central Controller.

• Create a routing script for supervisory features to ensure correct routing of calls being handled using supervisory features. The routing script check the availability of a primary supervisor and use the Agent-to-Agent node to route the call to the primary supervisor, if available.

If the primary supervisor is not available, branch the script to another Agent-to-Agent node, identifying a secondary supervisor.

The script can also use the LAA Select node rather than the Agent-to-Agent node. This allows you to track specifically the times the supervisor is involved with emergency or supervisor assist calls.

Note: Additionally, supervisors who leave their position put themselves into a Not Ready state, to avoid a supervisor or Emergency assist call from being routed to them when they are not at their desk.


See Also

IPCC Installation and Configuration Guide for Cisco IPCC Hosted Edition
System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
Chapter 4

Measuring Customer Experience

Measuring customer experience involves monitoring how calls were treated in the IPCC Enterprise system. This might include the number of calls received, the number of calls handled and abandoned, queue time (answer time), average speed of answer, transfers and whether Service Level objectives are being met. IPCC Enterprise WebView reports provide metrics that enable you to monitor real-time customer experience and review historical trends in customer experience.

This chapter explains which reporting metrics are useful for measuring customer experience in an IPCC Enterprise system and which report templates contain these metrics. This chapter also describes how the system gathers customer experience metrics and explains how to configure and script your system so that your reports contain appropriate and accurate data.

This chapter contains the following topics:

- Useful Customer Experience Statistics and Report Templates, page 77
- Call Type Reporting, page 80
- Configuration and Scripting Considerations for Call Type Reporting, page 85
- Reporting on Average Speed of Answer, page 87
- Service Level Reporting, page 88
- Configuration and Scripting Recommendations for Service Level Reporting, page 95

Useful Customer Experience Statistics and Report Templates

WebView reports enable you to monitor real-time customer experience and review historical customer experience trends.

These factors determine the reports that you use to measure customer experience:

- Whether you need to view current activity or past experience data
- What data you want to see
How Do You Want to Report on Customer Experience?

The reporting templates that you use to monitor customer experience depend on several factors, including your role in the contact center and the type of data that you want to see.

First, determine whether you want to view real-time customer experience or past experience trends. For real-time activity, such as current number of abandoned calls, current Service Levels and current average speed of answer, use the real-time templates. Real-time templates are designated by the words "Real Time" in their titles. For past customer experience trends, such as the average time spent in queue, historical average speed of answer and historical Service Level information, use the historical templates. Historical templates are designated by the words "Half Hour", "Summary" or "Daily" in their titles.

Once you have determined whether you want to view real-time or historical templates, you decide how you want to measure the customers’ experience: from end-to-end, with a particular skill group, or with a particular agent.

While skill group and agent reports provide some of the same metrics as call type reports, including ASA, abandons, redirects, calls handled, and Service Level, the call type reports show a more complete picture of the customer experience and are the best suited for measuring customer experience. Skill group reports provide insight into operational performance and agent reports provide insight into individual agent performance.

The following table describes the WebView options for measuring customer experience.

<table>
<thead>
<tr>
<th>Reporting Needs</th>
<th>Report Category</th>
<th>Who Use this Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>You want to measure a customer’s experience from the initial request to the call completion.</td>
<td>Call Type</td>
<td>This category is useful to Contact Center Administrators with global responsibility for all customer contacts. Reporting on customer experience using this category provides insight in the end-to-end customer experience for different types of call treatment. This category provides the most complete view of customer experience.</td>
</tr>
<tr>
<td>You want to measure a customer’s experience when routed to a particular skill group.</td>
<td>Skill Group</td>
<td>This category is useful to Contact Center Administrators or Supervisors who are responsible for a certain groups of agents or skill groups. Reporting on customer experience using this category provides insight only into the operational performance of selected skill groups.</td>
</tr>
<tr>
<td>You want to measure a customer’s experience with a particular agent.</td>
<td>Agent</td>
<td>This category is useful for Contact Center Supervisors who manage agents. Reporting on customer experience using this category provides insight only into the performance of the selected agents and might identify training needs or agent expertise, but does not provide a global view of how customers are experiencing their interactions with the contact center.</td>
</tr>
</tbody>
</table>
What Data Do You Want to See?

The reports you use depend on whether you are monitoring real-time customer experience or historical experience trends.

For both real-time and historical customer experience, you might be interested in these types of statistics:

- Average Speed of Answer (ASA)
- Number of calls received
- Number of calls handled
- Number of calls abandoned
- How long callers waited in queue
- Number of calls queued for the agent
- Whether Service Level objectives are being met
- Whether the caller had to be transferred
- Number of callers that heard a busy signal
- Where calls are currently located - VRU (prompt or self service), queue, or agent

Real-time customer experience data helps you identify immediate issues, such as Service Levels not being met, calls waiting in queue too long, or calls abandoning before reaching agents.

The following table describes suggested IPCC Enterprise report templates that provide customer experience real-time statistics. For details of all IPCC Enterprise report templates, refer to the WebView Template Reference Guide for Cisco IPCC Enterprise & Hosted Editions.

### Table 29: Report Templates for Real-time Monitoring

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp04: Task Type Service Level Real Time Report</td>
<td>Reports on Service Level status for the day, rolling five minute interval, and current half hour.</td>
</tr>
<tr>
<td>caltyp20: Call Type Real Time Report</td>
<td>Reports on ASA, time spent in queue for the call that has been in longest in queue, number of calls in queue, number of calls offered, handled and abandoned, and the number of calls that have received return ring and return busy treatment. This report also provides the number of calls that are at the VRU (prompt or self service), in queue and with IPCC agents.</td>
</tr>
<tr>
<td>caltyp25: Call Type Queue Status Real Time Report</td>
<td>Reports on the number of calls in queue that are within and outside of the Service Level threshold.</td>
</tr>
</tbody>
</table>
Historical agent data helps you identify whether customer experience is improving or degrading.

The following table describes suggested IPCC Enterprise report templates that provide customer experience historical statistics. For details of all IPCC Enterprise report templates, refer to the WebView Template Reference Guide for Cisco IPCC Enterprise & Hosted Editions.

**Table 30: Report Templates for Historical Reporting**

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp26: Call Type Tasks Offered Over Half Hour Report</td>
<td>Reports on the number of tasks offered during the current half-hour interval.</td>
</tr>
<tr>
<td>caltyp27: Call Type Queue Delay Status Real Time Report</td>
<td>Reports on average time in queue, longest call in queue, and ASA for the rolling five minute interval.</td>
</tr>
<tr>
<td>caltyp28: Call Type Task Status now Real Time Report</td>
<td>Reports on the number of calls that are at the VRU, in queue, and with agents.</td>
</tr>
<tr>
<td>caltyp05: Analysis of Calls Half Hour Report</td>
<td>Reports on wait time in queue, number of tasks queued and number of abandons.</td>
</tr>
<tr>
<td>caltyp21: Call Type Half Hour Report</td>
<td>Reports on ASA, Service Level, tasks offered, handled and abandoned, average abandon delay time, and the number of calls that received return ring and return busy treatment.</td>
</tr>
<tr>
<td>caltyp31: Call Type Abandon/Answer Distribution by Half Hour</td>
<td>Reports on ASA, average abandon delay, and the number of calls that have abandoned and been answered in each call type bucket interval.</td>
</tr>
<tr>
<td>caltyp33: Call Type Abandon/Answer Cumulative Distribution by Half Hour</td>
<td>Reports on percent of calls answered and the cumulative number of calls that have abandoned and been answered in each call type bucket interval.</td>
</tr>
<tr>
<td>caltyp37: Call Type Service Level Abandons Daily Report</td>
<td>Reports on the number of tasks that abandon within service level threshold.</td>
</tr>
</tbody>
</table>

**Call Type Reporting**

Call types define call treatment in an IPCC Enterprise system and group calls for reporting; a call type is associated with a call at the initial route request and can be changed within a script for routing and reporting purposes. Therefore, the call type is the highest level reporting entity. Reporting on call type activity provides insight into end-to-end customer interactions with the system and with agents by providing data such as Service Level adherence, transfers, average speed of answer, calls handled, and calls abandoned.
General Call Type Report Data Balancing

Data within call type reports balance for the following:

- Calls answered by agents
- Calls abandoned at the VRU
- Calls that abandon while en-route to an agent or while being offered to an agent's phone
- Short calls
- Calls that are given busy, ring, default routed or network routed treatment
- Calls that go to another call type within a routing script using the Call Type or Requalify node
- Calls that abandon en-route to the VRU
- Calls that have a bad label
- Calls that re-route on no answer from the agent’s phone
- Calls that terminate the script using the Label node to a non-monitored device, such as voice mail

How Calls that Encounter Error Conditions Affect Call Type Reporting

Call Errors are counted in the database as either Agent errors (AgentErrorCount) or Scripting errors (ErrorCount). The way call errors increment the database depends on whether the call abandons en-route to the VRU/ICM/IPCC scripts and or abandon en-route to agents:

- Calls that abandon en-route to the VRU/ICM/IPCC scripts are calls that abandon in the network while they are being sent to the VRU. An example of this is if a call abandons while it is being sent to the VRU from a CTI Route point in CallManager. These calls are counted as part of the ErrorCount at the Call Type and included in the "Call Errors" column in the call type report. This field is included in the call type all fields report. CallErrors also includes default routed calls as well as the other call scenarios listed below.

Calls that abandon en-route to the VRU might be counted as short calls, instead of errors, if the caller abandons within the Abandon Wait Time set for the call type. See the next section for more information on abandoned short calls.

If an on-premise VRU is used, then the probability of calls abandoning en-route to the VRU is very low.

- Calls that abandon en-route to agents are calls that encounter an error when the call is at the agent desktop. This call is counted as part of the AgentErrorCount at the Call Type, and is included in the "Call Errors" column in the call type report.
How Calls that Abandon Affect Call Type Reporting

There are three types of abandon metrics: abandon at the VRU (prompt or self service), abandon in queue, and abandon at the agent.

ICM/IPCC tracks the abandon counts for each of these abandons separately. The time spent by these abandoned calls before abandoning is also tracked.

The value represented by the “Aban” column on the Call Type reports provides total abandon count for the call type, that includes calls that abandoned while at the VRU (prompting or self service), calls that abandon in queue and calls that abandoned while ringing at the agent’s phone or en route to the agent’s phone. This is derived from the TotalCallsAbandToHalf database field.

Reports also provide average time spent by these abandoned calls in the “Avg Aban Delay Time” field. This field represents the average delay time of all abandoned calls that ended in this call type during the current half hour interval. This is derived from Call_Type_Half_Hour.CallDelayAbandTimeToHalf / Call_Type_Half_Hour.TotalCallsAbandToHalf.

To separate information gathering and queuing statistics, you can also determine the time spent by a call only in the call type where the call abandoned. This is tracked in the CTDelayTotalAbanTimeToHalf database field. This includes only the time spent in the call type where the call abandoned and not all call types.

Consider this example:

- A call spends 30 seconds in the information gathering call type, “Info_Call_Type”.
- The script then changes the call type to the queuing call type say Queue_Call_Type and the call is queued.
- After 15 seconds waiting in queue the call is abandoned.

In this case the total time spent by the call before abandoning will be 45 seconds. However the time spent by the call in the “Queue_Call_Type” where the call abandoned will be 15 seconds. The Call Type statistics for the “Queue_Call_Type” will be updated as follows:

- CallDelayAbandTimeToHalf = 45 seconds
- CTDelayTotalAbanTimeToHalf = 15 seconds.

**Note:** You could write custom reports to able to report on the different abandons and the time spent by these abandons. To determine the counts and the time associated with the abandoned calls, for calls in the script, or at the VRU (prompt or Self service), subtract Agent Abandons and Queue abandons from Total Abandons.
How Abandoned Short Calls Affect Call Type Reporting

A short call at the call type is a call that abandons within the call type's Abandon Wait Time threshold. By defining what you believe to be a short call, you can filter out those calls that you believe did not stay in the system long enough to be counted as a real call. You can define short calls for call types and services. Note that short calls are configured globally for all call types.

The short call timer starts as soon as the route request is received for the call. The CallsOffered field is updated when the route request is received. If the call abandons within the Abandon Wait Time threshold, the ShortCalls field is updated, but the number of calls abandoned is not updated. Since the call type is the highest level reporting entity, calls that abandon at the VRU or at the agent's phone can also be considered short calls at the call type if they abandon within the call type's Abandon Wait Time threshold.

If you do not want to count any abandoned calls as short calls regardless of how quickly they abandon, you can disable abandoned short calls by leaving the Abandon Wait Time field for the Call Type blank.

For more information about short calls and configuring short calls, see Reporting on Short Calls (page 108).

How Calls that Have a Bad Label Affect Call Type Reporting

A bad label refers to an incorrectly configured label or missing label. It is always good practice to define a default label, so that calls that do encounter an incorrectly configured label can at least go to the default label and get handled as well as get accounted for in the call type report.

Labels might be configured incorrectly in the following ways:

- The label specified in the script node might not exist on the routing client: In this case, label specified in the script node might not exist on the routing client.

- The label points to the wrong agent: In this case, the pre-call message is sent to one agent, but the actual call is sent to a different agent. This call is reported as an incomplete call.

If the node does not define a label, the call encounters error conditions and is reported as an error.

How Calls that Experience Redirection on No Answer with IP IVR Affect Call Type Reporting

Redirection on No Answer calls are calls that redirect off the agent’s phone because the ring time exceeds the Ring No Answer timer defined in the agent desktop settings. For Redirection on No Answer situations, you configure a separate call type and routing script to be used if agents do not answer ringing calls within the ring no answer time. In the Redirection on No Answer script, you queue the call at a higher priority so that the call does not fall to the bottom of the queue.
In an IPCC Enterprise environment, Redirection on No Answer situations increment call type statistics as follows:

- For the initial call type, CallsOffered is incremented. When the call redirects, the CallsRONA field is incremented.

- For the Redirection on No Answer call type, CallsOffered is incremented as well as fields related to the completion of the call. For example, if the call is handled the CallsHandled field is incremented.

Because CallsOffered is incremented twice for the call, use a different call type for Redirection on No Answer calls to ensure that the call does not peg the same call type twice.

In call type reports, these calls are grouped into the "Other" column. You can also view a count of Redirection on No Answer calls in agent and skill group reports.

How Calls that Experience Redirection on No Answer with CVP Affect Call Type Reporting

The Redirection on No Answer feature, configured in Agent Desk Settings in ICM/IPCC configuration tool and in CVP, ensures that when an agent does not answer a call, the call is taken away from the agent after a specified number of seconds and re-assigned to another agent or requeued. Redirection on No Answer is also used to change the agent state to Not Ready when a call is rerouted from the agent's phone. When the Ring No Answer time in the Agent Desk Settings expires, ICM/IPCC software makes the agent unavailable for routing requests. When the CVP Ring No Answer timeout expires, the call is requeried for routing to a different skill group or agent. You configure the CVP Ring No Answer timer to be approximately 2 seconds longer than the Agent Desk Settings Ring no answer time so that the agent is made Not Ready before the call is requeried. If the agent is not made unavailable first, the script might reassign the call to the same agent.

Note: The CVP Ring No Answer timeout must be less than 30 seconds because the ICM/IPCC Central Controller waits up to 30 seconds for a response from the CVP. If the response is not received within 30 seconds, the call fails.

Because the Ring No Answer time and CVP Ring No Answer timeout are several seconds apart, it is possible that the call will continue to ring on the agent's phone after the agent is made Not Ready. If the agent answers the phone in this brief interval, the context of the call will not be reported and reports will show that the agent went directly into Active state from Not Ready state.

You can configure the routing script to handle Redirection on No Answer situations in two ways: the script can change the call type when the calls is requeried, or the script can continue to use the same call type.

The manner in which you script for Redirection on No Answer affects the report data that you see, as follows:

- If you change the call type (recommended), CallsOffered, CallsRequeried, and OverflowOut is updated for the initial call type. CallsOffered and fields related to the completion of the call, such as CallsHandled, are incremented for the second call type.
Using two call types enables you to identify Redirection on No Answer occurrences in call type reports. For example, if you create a specific call type for use in Redirection on No Answer situations, then you can see whether calls are redirecting by monitoring the calls offered to that call type. You can also see whether the Flow Out field is incremented for other call types.

- If you do not change the call type, CallsOffered and fields related to the completion of the call, such as CallsHandled, are incremented. FlowOut is not incremented. You will not be able to tell without looking at agent or skill group reports whether calls are redirecting on no answer. (You could write a custom report to see values for CallsRequeried.)

**Note:** Because the CVP application performs a requery to redirect the call to a different agent or skill group instead of branching to another script, the CallsRONA field is not incremented for the call type.

**How Calls that Terminate Label Node and Route to Non-Monitored Devices Affect Reporting**

The Label node is used to divert a call to voice mail or web attendant or some other device that is not monitored by ICM/IPCC because of digits collected by the caller during a voice menu or due to some other conditions. These calls are counted as RoutedNonAgent and appear in the "Other" column of call type reports.

**Note:** Use an ICM/IPCC routing scripting script, not a VRU script, to route calls to non-monitored devices. If you use the VRU script, calls are reported as abandoned at the call type.

**Configuration and Scripting Considerations for Call Type Reporting**

When configuring and scripting for call type reporting, you must consider call type bucket intervals, Redirection on No answer situations, calls that route to non-monitored devices, and abandoned short calls.

**Configuration and Scripting Considerations for Redirection on No Answer with IP IVR Reporting**

Follow these guidelines when configuring and scripting for Redirection on No Answer

- Ensure that a CTI route point is defined to use for Redirection on Ring No Answer.

- Configure the Ring no answer settings in the Agent Desk Settings in the ICM/IPCC configuration tool. Enter a Ring no answer time. If you use Service Level metrics within your reports and you want Reroute on Ring No Answer calls to adversely affect the Service Level, set the Service Level Threshold time below the Ring No Answer time. Enter a Ring no answer dialed number to which to redirect calls that are not answered by agents within the Ring No Answer time.

- Create a separate script for Redirection on No Answer. In the initial script, change the call type to direct the call to the Redirection on No Answer script. This ensure that the call is not
recorded twice for the same call type. In the Redirection on No Answer Script, queue the calls at a higher priority.

See Configuration and Scripting Recommendations for Task Reporting (page 64) for additional considerations for configuring and scripting for Reroute on Ring No Answer situations.

Configuration and Scripting Considerations for Redirection on No Answer with CVP Reporting

Follow these guidelines when configuring and scripting for Redirection on No Answer:

• Configure the Ring no answer time in the Agent Desk Settings in ICM/IPCC configuration tool. This timer will be used to make an agent Not Ready if the agent does not answer a ringing call within the Ring no answer time.

• Configure the CVP Ring No Answer timeout in the CVP Voice Browser Administration application. This timer will be used to requery the call if the call is not answered within the Ring No Answer time. This number be approximately 2 seconds higher than the Ring no answer time configured in Agent Desk Settings and be less than 30 seconds. This ensure that the agent is made Not Ready so that the same agent does not receive the call.

• Within the routing script, check the Target Requery option on the Set, Queue, or Select node, as appropriate for the script and create a path for calls that requeried with the script. Queue calls that are requeried at a higher priority.

See Configuration and Scripting Recommendations for Task Reporting (page 64) for additional considerations for configuring and scripting for Reroute on Ring No Answer situations.

Configuration and Scripting Considerations for Reporting on Calls that Route to Non-Monitored Devices

Use an ICM/IPCC routing scripting script, not a VRU script, to route calls to non-monitored devices. If you use the VRU script, calls are reported as abandoned at the call type.

Configuration and Scripting Recommendations for Reporting on Abandoned Short Calls for the Call Type

See Configuration and Scripting Recommendations for Reporting on Short Calls (page 110) for considerations for configuring short calls for IPCC Enterprise.

See Also

IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise & Hosted Editions
Reporting on Average Speed of Answer

Average Speed of Answer (ASA) is the total wait time of a call before being answered divided by the number of answered calls.

ASA is set at these levels:

- Call type
- Skill group
- Agent

For measuring overall customer experience, the ASA for the call type provides the most insight into overall call treatment. At the skill group and agent level, the ASA metric is more useful for monitoring agent and skill group performance than for obtaining insight into how callers are experiencing the system.

ASA for the Call Type

The ASA is calculated for the call type at the ICM/IPCC Central Controller. ASA is AnswerWaitTime divided by CallsAnswered. The ICM/IPCC Central Controller can determine the complete AnswerWaitTime only when it receives the answer event from the Cisco CallManager peripheral. When the answer event is received, the ICM/IPCC Central Controller adds the AnswerWaitTime it calculates into the AnswerWaitTimeToHalf in the CallType Half Hour table. The Answer wait time starts at the first Queue to Skill Group node that was executed for the call and ends when the call was answered.

You can find ASA information for the call type in real-time and historical Call Type WebView reports.

ASA for the Skill Group

The ASA is calculated for the skill group at the PG level. ICM/IPCC sends the queue time to the PG when the agent becomes available for the call. This queue time is the total queuing time of the call, beginning when the first queue to skill group node is executed in the routing script for the call. This time is sent to the PG by ICM/IPCC when the agent becomes available for the call.

Consider this example:

- A call is queued at Skill Group X
- At Time T the call is then queued at Skill Group Y at time T+30 seconds
- An additional 10 seconds transpire before the call is answered by an agent at Skill Group Y
In this case, the internal queuing time will be 40 seconds. This is the total length that the call has been queued even though it was only queued at Skill Group Y for 10 seconds.

The agent’s PG adds the internal queue time, ring time, network time to create the total answer wait time for the call and adds it to AnswerWaitTimetoHalf in the skill group table. AnswerWaitTime is then divided by CallsAnswered within the skill group table to arrive at the ASA for the skill group.

You can find ASA information for the skill group in real-time and historical Skill Group WebView reports.

ASA for the Agent

The ASA is calculated for the agent at the PG level. The internal queuing time is sent to the PG by ICM/IPCC when an agent becomes available for their call. The agent’s PG adds up the internal queue time, ring time and network time and adds it into AnswerWaitTimetoHalf in the agent skill group table. AnswerWaitTime is then divided by the CallsAnswered for the agent.

You can find ASA information for the agent in real-time and historical Agent WebView reports.

Service Level Reporting

Service Levels help you to set and measure goals for answering calls. Service Levels are configurable; that is you can define them in different ways, depending on the kind of information you want them to provide.

How Service Levels are Calculated

Two important configuration parameters contribute to the calculation of Service Level:

- Service Level type
- Service Level threshold

**Service Level type** determines how calls that abandon before Service Level threshold impact the Service Level. Some contact centers want abandoned calls to positively impact the Service Level. These contact centers consider a call abandoned within the Service Level threshold time a treated call (abandoned calls positively impact the Service Level). Other contact centers consider only those calls answered within the Service Level threshold time treated calls. These contact centers might want the Service Level to be detrimentally affected by calls that abandon within the Service Level time (abandoned calls negatively impact the Service Level. Others might choose to exclude the abandoned calls from the Service Level calculation (Abandoned Calls Ignored).

You can specify the Service Level type by choosing one any of the following options:

- Abandoned Calls Ignored
- Abandoned Calls negatively impact Service Level
- Abandoned calls positively impact Service Level

A Service Level threshold is the number of seconds you set as a goal to treat a call. To calculate the Service Level for a period of time, ICM/IPCC software determines the number of calls that have had a Service Level event within that interval.

A Service Level event occurs when one of three things happen to the call:

- The call is answered by an agent before the Service Level threshold expires. In this case, the ServiceLevelsCallsOffered and ServiceLevelCalls database fields are incremented.
- The call abandons before the Service Level threshold expires. In this case, the ServiceLevelCallsOffered and ServiceLevelAband database fields are incremented.
- The call redirects on no answer before the Service Level threshold expires. In this case, the ServiceLevelCallsOffered database field is incremented.
- The Service level threshold timer expires. The call reaches the Service Level threshold without being answered by an agent or abandoned. In this case, the ServiceLevelCallsOffered database field is incremented.

Note: Service Level is not affected for calls that are neither answered nor abandoned within the Service Level time. For example, calls that encounter an error condition or are sent to non-monitored devices (using the label node) within the Service Level threshold do not affect the Service Level.

There are three different ways to calculate Service Level based on the Service Level type defined for the Service Level configuration parameter, described in the following table.

Note that RouterCallsDequeued, used in the skill group Service Level calculation refers to the number of tasks that are dequeued from a skill group. Calls may be dequeued using Cancel Queue node or when they are dequeued from the skill group to be routed to a different skill group. For example, if a call is queued to two skill groups, and was answered by one of the skill groups, the call is considered dequeued in other skill group.

**Table 31: Service Level Formulas**

<table>
<thead>
<tr>
<th>Service Level Type</th>
<th>Formula Used to Determine Service Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignore Abandoned Calls</td>
<td>For call type and service: ServiceLevelCalls/(ServiceLevelCallsOffered - ServiceLevelAband)</td>
</tr>
<tr>
<td></td>
<td>For skill group: ServiceLevelCalls/(ServiceLevelCallsOffered - ServiceLevelAband - RouterCallsDequeued)</td>
</tr>
<tr>
<td>Negative impact of abandoned calls</td>
<td>For call type and service: ServiceLevelCalls/ (ServiceLevelCallsOffered )</td>
</tr>
<tr>
<td></td>
<td>For skill group: ServiceLevelCalls/ (ServiceLevelCallsOffered - RouterCallsDequeued )</td>
</tr>
</tbody>
</table>
For an example of how call type Service Level and Service Level are calculated, consider the following call counts:

- Answered within Service Level threshold (ServiceLevelCalls) = 70
- Abandoned within Service Level threshold (ServiceLevelAband) = 10
- Exceeded Service Level threshold (ServiceLevelCallsOffered – (ServiceLevelCalls + ServiceLevelAband)) = 20
- Total Service Level events (ServiceLevelCallsOffered) = 100

The following table shows the different Service Levels calculated, based on the effect of abandoned calls on Service Level setting.

**Table 32: Service Levels Based on Different Calculations**

<table>
<thead>
<tr>
<th>Effect of abandoned calls on Service Level setting</th>
<th>Calculated Service Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abandoned Calls ignored</td>
<td>70/ (100-10)=77%</td>
</tr>
<tr>
<td>Abandoned Calls negatively impact</td>
<td>70/100=70%</td>
</tr>
<tr>
<td>Abandoned calls positively impact</td>
<td>(70 + 10)/100=80%</td>
</tr>
</tbody>
</table>

For an example of how skill group Service Level is calculated, consider the following call counts where type is set to Ignore Abandoned Calls:

- Twenty calls queued to two skill groups using one Queue to Skill Group Node
- Ten calls answered by skill group 1. Answered within Service Level threshold (ServiceLevelCalls) = 4
  
  Ten calls are answered by skill group 2. Answered within Service Level threshold (ServiceLevelCalls) = 3

- Total number of CallsDequeued for skill group 1 = 10

  Total number of CallsDequeued for skill group 2 = 10

- Service Level events for each skill group (ServiceLevelCallsOffered) = 20

- Total Service Level events for each skill group (ServiceLevelCallsOffered) = 20
• Service Level for skill group 1
  \[(ServiceLevelCalls/(ServiceLevelCallsOffered-ServcieLevelCallsAband - RouterCallsDequeued) = 40\% \quad (4/(20-0-10))\]

Service Level for skill group 2
\[(ServiceLevelCalls/(ServiceLevelCallsOffered-ServcieLevelCallsAband - RouterCallsDequeued) = 30\% \quad (3/(20-0-10))\]

**Service Levels per Reporting Entity**

Service levels can be defined for:

- Call type
- Skill Group
- Peripheral VRU service

For measuring overall customer experience, the service level for the call type provides the most insight into overall call treatment. At the skill group level, the service level metric is more useful for monitoring agent and skill group performance than for obtaining insight into how callers are experiencing the system.

For each of these entities, you can configure either global service levels or individual service levels.

**Service Level at the Call Type**

The service level threshold timer at the call type starts as soon as the call enters the call type that has a service level defined. When the service level timer expires, the service level is applied to the current call type associated with the call.

If a call type is changed using the Requalify or Call type nodes, then the service threshold timer is reset.

Only Call Types that are associated with scripts that use the Queue To and LAA Select nodes in them define service levels.

There are four service level events that can occur for the call type:

- The call is answered by an agent before the Service Level threshold expires. In this case, the ServiceLevelsCallsOffered and ServiceLevelCalls database fields are incremented.
- The call abandons while in the VRU (prompt or queue) or at the agent’s phone before the Service Level threshold expires. In this case, the ServiceLevelCallsOffered and ServiceLevelAband database fields are incremented.
- The call redirects on no answer before the Service Level threshold expires. In this case, the ServiceLevelCallsOffered and ServiceLevelRONA database field is incremented.
• The Service level threshold timer expires. Example: the call reaches the Service Level threshold without being answered by an agent or abandoned. In this case, the ServiceLevelCallsOffered database field is incremented.

If calls encounter an error before the Service Level threshold expires, ServiceLevelError database field is incremented but ServiceLevelOffered is not incremented. However if the call encounters an error after the Service Level threshold expires, ServiceLevelOffered is incremented.

As seen above ICM/IPCC gathers metrics for calls that RONA (if you are using IP IVR as the VRU) and for several types of errors at the call type. You could write a custom report to exclude these from call type Service Level.

To exclude calls that RONA:

• If you would like to exclude only calls that redirect on no answer before the Service Level threshold expires, adjust the ServiceLevelCallsOffered by excluding the ServiceLevelRONA calls. In this example, abandoned calls have a negative impact.

  \[ \text{ServiceLevel} = \frac{\text{ServiceLevelCalls}}{\text{ServiceLevelCallsoffered} - \text{ServiceLevelRONA}} \]

• If you would like to exclude all calls that redirect on no answer irrespective of the Service Level threshold then adjust the ServiceLevelCallsOffered by excluding all RONA calls. In this example, abandoned calls have a negative impact.

  \[ \text{ServiceLevel} = \frac{\text{ServiceLevelCalls}}{\text{ServiceLevelCallsoffered} - \text{CallsRONA}} \]

To exclude errors from your Service Level calculation

• Adjust the ServiceLevelCallsOffered by excluding error calls. Adjusted SL Offered calls = SL Offered calls – (Total Error calls - ServiceLevelError)

  \[ \text{For example, if abandoned calls have Negative Impact, ServiceLevel} = \frac{\text{ServiceLevelCalls}}{\text{ServiceLevelCallsoffered} - (\text{AgentErrorCount + ErrorCount} - \text{ServiceLevelError})} \]

Service Level at the Skill Group

The service level threshold timer at the skill group starts as soon as the call is queued to a skill group.

There are five service level events that can occur for the call type:

• The call is answered by an agent before the Service Level threshold expires. In this case, the ServiceLevelsCallsOffered and ServiceLevelCalls database fields are incremented and ServiceLevelCallsDequeued database fields are incremented for the skill group that answered the call. If the call is queued to more than one skill group, then ServiceLevelsCallsOffered and ServiceLevelCallsDequeued database fields are incremented for the other skill groups

• The call is dequeued from a skill group before the Service Level threshold expires. In this case ServiceLevelsCallsOffered and ServiceLevelCallsDequeued database fields are
incremented. Calls may be dequeued using Cancel Queue node, when they are de-queued from the skill group to be routed to a different skill group.

- The call abandons while in the VRU (queue) or at the agent’s phone before the Service Level threshold expires. In this case, the ServiceLevelCallsOffered and ServiceLevelAband database fields are incremented.

- The call redirects on no answer before the Service Level threshold expires. In this case, the ServiceLevelCallsOffered and ServiceLevelRONA database field is incremented.

- The Service level threshold timer expires. Example: the call reaches the Service Level threshold without being answered by an agent or abandoned. In this case, the ServiceLevelCallsOffered database field is incremented.

In ICM/IPCC calls can queue to more than one skill group depending on your scripting, and therefore Service Level metrics are updated for each skill group to which a single call queues. Therefore, it is important to understand how Service Levels are impacted in such cases.

- If a call is queued to more than one skill group and then the call is answered before the Service Level threshold expires ServiceLevelsCallsOffered and ServiceLevelCalls database fields are incremented for the skill group that answered the call. For the other skill groups ServiceLevelCallsOffered and ServiceLevelCallsDequeued database fields are incremented.

- If a call is queued to more than one skill group and the call abandons in queue before the Service Level threshold expires then ServiceLevelsCallsOffered and ServiceLevelCallsAband database fields are incremented for all the skill groups. This will have a negative or positive impact on Service Levels in all the skill groups depending on how you have decided to treat abandon calls for Service Level calculations in your configuration for the individual skill groups.

- If a call is queued to more than one skill group and the call abandons in queue after the Service Level threshold expires then ServiceLevelsCallsOffered database field is incremented for all the skill groups. This will adversely affect your Service Level.

- If a call is queued to more than one skill group and the call abandons after it was routed to a skill group (example: Abandon while ringing at the agent) before the Service Level threshold expires, ServiceLevelCallsOffered and ServiceLevelCallsAband database fields are incremented for the skill group that had the abandon, while other skill groups have ServiceLevelCallsOffered and ServiceLevelCallsDequeued database fields incremented.

As seen above ICM/IPCC gathers metrics for calls that RONA (if you are using IP IVR as the VRU) and for several types of errors at the skill group. You could write a custom report to exclude these from skill group Service Level.

To exclude calls that RONA:

- If you would like to exclude only calls that redirect on no answer before the Service Level threshold expires, adjust the ServiceLevelCallsOffered by excluding the ServiceLevelRONA calls. In this example, abandoned calls have a negative impact.
Service Level Reporting

ServiceLevel = ServiceLevelCalls / (ServiceLevelCallsoffered – RouterCallsDequeued - ServiceLevelRONA)

- If you would like to exclude all calls that redirect on no answer irrespective of the Service Level threshold then adjust the ServiceLevelCallsOffered by excluding all RONA calls. In this example, abandoned calls have a negative impact.

ServiceLevel = ServiceLevelCalls / (ServiceLevelCallsoffered – RouterCallsDequeued - CallsRONA)

If you want to remove errors from SLCallsOffered, you can use this formula in a custom report: SLCallsOffered – (Errors – SLErrors).

Service Level at the Peripheral VRU Service - Not Applicable for System IPCC Deployments

The service level threshold timer at the VRU service starts as soon as the call arrives at the VRU service.

There are three service level events that can occur for the peripheral VRU service:

- Call is routed to an agent before service level timer expires. In this case the ServiceLevelCallsOffered and ServiceLevelCalls database fields are incremented.

- Call abandons while in the VRU before service level timer expires. In this case the ServiceLevelAband and ServiceLevelCallsOffered database fields are incremented.

- Service level threshold timer expires. In this case the ServiceLevelCallsOffered database field is incremented.

The VRU Service does not detect abandons that happen at the peripheral agent service, so these will not be part of the service level for the VRU service. The VRU service does not detect when the call is physically answered by the agent; it only knows when the call is routed to the agent.

Using Call Type Interval Reporting to Monitor Service Level

You can use call type interval reports to see data for abandoned and answered calls within specific time increments, such as between 0 and 5 seconds, or within specific time boundaries, such as under 10 seconds. You might want to configure the intervals in relation to your Service Levels. For example, if your Service Level threshold is 60 seconds and you want to see when callers are abandoning in relation to your Service Level you might set intervals of 20 seconds, 40 seconds, 60 seconds, 80 seconds, and 100 seconds. Using these intervals, you can see how closely to the Service Level calls are abandoning. You configure call type intervals using the Bucket Interval configuration tool and then assign these intervals to individual call types using the Call Type configuration tool or to the system using the System Information tool. If you do not configure intervals at the call type level, the system level intervals are used.

Reports show up to ten intervals. You can configure up to nine intervals; the tenth interval shows all remaining data.
Consider this example:

- Upper bound 1 is set to 20 seconds
- Upper bound 2 is set to 40 seconds
- Upper bound 3 is set to 60 seconds
- Upper bounds 4-9 are not set

In your reports, you see intervals of data for answered and abandoned calls from 0-20 seconds, 20-40 seconds, 40-60 seconds, and greater than 60 seconds. If you run a cumulative report, you see data for less than 20 seconds, less than 40 seconds, less than 60 seconds, and the total number of calls.

WebView provides two call type interval reports that measure answered and abandoned calls for specific increments:

- caltyp31: Call Type Abandon/Answer Distribution by Half Hour
- caltyp32: Call Type Abandon/Answer Distribution.

These reports show calls that abandoned and were answered within the increments that you set: for example, 0-20 seconds, 20-40 seconds, etc.

WebView also provides two call type interval reports that provide cumulative data based on the intervals you configured:

- caltyp33: Call Type Abandon/Answer Cumulative Distribution by Half Hour
- caltyp34: Call Type Abandon/Answer Cumulative Distribution

These reports show cumulative data for calls that abandoned and were answered for the increments that you set: for example, less than 20 seconds (<00:20), less than 40 seconds (<00:40), less than 60 seconds (<00:60), etc.

Configuration and Scripting Recommendations for Service Level Reporting

Configuring and scripting for service level reporting involves configuring the service level type and threshold for the call type, skill group and enterprise and creating routing scripts that gather the correct statistics.

Follow these guidelines when configuring service level:

- You can configure the Service Level settings for all call types. You can override these settings for individual call types using the ICM/IPCC configuration tools.
Service level time begins as soon as the call enters a call type. Therefore set up call types/scripts used specifically to collect queue and agent statistics such that service level time begins once a call is queued to a skill group. Define service levels only for call types that point to a script that includes a Queue to Skill Group Node.

- You can configure the Service Level settings for all skill groups in the Media Routing Domain using the ICM/IPCC configuration tool. You can override these settings for individual skill groups using the ICM/IPCC configuration tools.

- Configure the Service Level settings for all VRU services on a VRU peripheral. This is not applicable for System IPCC or ARI deployments. You can override these settings for individual services.

Note that the service level defined at the service (VRU) takes precedence over the service level defined at the peripheral (VRU).

Follow these guidelines when scripting for service level:

- Set up a call type to collect statistics prior to the queue (that is, the initial call type designated for the script using call type mapping.

- Set up other call types used specifically to collect queue and agent statistics.

- In your routing scripts, include the Requalify or Call Type nodes to submit the call to the call type used to collect queuing information.

- If you want to use call type interval reporting, configure Bucket Intervals. You can create more than one group of intervals. You can assign these intervals at either the call type level or the system level.

- In ICM/IPCC calls can queue to more than skill group and service level metrics are updated for each skill group to which a single call queues. Service Levels could be adversely affected if calls abandon within or outside the service level threshold in such cases. Consider queuing to a single skill group if you include abandons in your Service Level calculations and don’t want abandons to affect Service Levels adversely.

If you follow these recommendations, the first call type (to which the call was initially mapped) will gather statistics before the call is queued to the skill group. The script will then pass the call to the call type set up specifically to collect information after the call is queued to the skill group.

See Also

IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise & Hosted Editions
Chapter 5

Monitoring Operations, Configuration, and Scripting

Monitoring operations, configuration, and scripting involves monitoring VRU applications, Outbound Option calls, and script efficiency. This might include the number of short calls, how many calls are pegging the default skill groups, how many outbound campaign calls are being made, how you are utilizing the agents, and how customers are using self-service and information gathering VRU applications. IPCC Enterprise WebView reports provide metrics that enable you to monitor real-time operational activity and review historical trends in contact center operations.

This section explains the reporting metrics useful for monitoring operations, configuration, and scripting in an IPCC Enterprise system. It also lists the report templates that contain these metrics. This section also describes how the system gathers operational information and explains how to configure and script your system so that your reports contain appropriate and accurate data.

This chapter contains the following topics:

- Useful Operational, Configuration, and Scripting Statistics and Report Templates, page 98
- The Role of the Default Skill Group in Reporting, page 105
- Configuration and Scripting Recommendations for Default Skill Group Reporting, page 107
- Reporting on Outbound Dialing Campaign Effectiveness, page 107
- Configuration and Scripting Recommendations for Reporting on Outbound Dialing Campaigns, page 108
- Reporting on Short Calls, page 108
- Configuration Recommendations for Reporting on Short Calls, page 110
- Determining Full-Time Equivalents and Percent Utilization, page 110
- Understanding VRU Application Reporting, page 111
- Determining Self-Service Application and Information Gathering Application Effectiveness, page 115
- Configuration and Scripting Recommendations for Self-Service Applications, Information Gathering Applications, and Queue Applications Reporting, page 118
- Translation Route Reporting, page 119
Useful Operational, Configuration, and Scripting Statistics and Report Templates

WebView reports enable you to monitor real-time operational activity and review historical operational performance trends. This information helps you identify how well your configuration and scripts are performing and helps you determine when modifications are required to improve operational performance.

These factors determine the reports that you use to monitor operations, configuration, and scripting:

- Whether you need to view current activity or past performance data
- Whether you want to monitor agent utilization, default skill group, Outbound Option calls, queue, VRU capacity, or VRU Self-Service application information

How Do You Want to Report on Operations, Configuration, and Scripting?

The reporting templates that you use to monitor operational performance depend on several factors, including your role in the contact center and the type of data that you want to see.

First, determine whether you want to view real-time operational data or past performance trends. For real-time activity, such as current Outbound Option campaign details and agent utilization information, use the real-time templates. Real-time templates are designated by the words "Real Time" or "Rolling 5 Minute" in their titles. "Real Time" indicates that the data is current within the last 15 seconds. "Rolling 5 Minute" indicates that the data is for the past five minutes, up to the time at which the report is run. This data is updated every three seconds.

For past performance trends, such as the number of tasks abandoned in queue, how many calls were successfully handled by the VRU Self-Service application and how many Outbound campaign calls were answered by customers, use the historical templates. Historical templates are designated by the words "Half Hour", "Summary" or "Daily" in their titles.

Once you have determined whether you want to view real-time or historical templates, you decide which area of operations you want to monitor: staffing requirements, default skill group usage, Outbound Option campaigns, queue information, VRU capacity, or Self-Service application effectiveness. The following table describes the WebView options for monitoring these operations.

**Table 33: Report Categories for Monitoring Operations, Configuration, and Scripting**

<table>
<thead>
<tr>
<th>Reporting Needs</th>
<th>Report Category</th>
<th>Who Use this Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>You want to view current Full-time Equivalents (FTE) and percent utilization of</td>
<td>Skill Group &gt; Peripheral</td>
<td>This category is useful to Contact Center Administrators with global responsibility for</td>
</tr>
<tr>
<td>agents to monitor real-time operations or measure trends in FTE and percent</td>
<td>Skill Group</td>
<td>staffing and operational monitoring.</td>
</tr>
<tr>
<td>utilization for planning purposes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Reporting Needs

<table>
<thead>
<tr>
<th>Reporting Needs</th>
<th>Report Category</th>
<th>Who Use this Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>You want to view the number of short calls to determine whether the short calls configuration is correct.</td>
<td>Agent &gt; By Peripheral</td>
<td>This category is useful to Contact Center Administrators responsible for IPCC Enterprise configuration.</td>
</tr>
<tr>
<td>You want to view current activity for the default skill group to monitor when the default system behavior is used or monitor trends in default skill group usage to modify scripts or configuration.</td>
<td>Skill Group &gt; Peripheral Skill Group</td>
<td>This category is useful to Contact Center Administrators who are responsible for the IPCC Enterprise configuration and scripts.</td>
</tr>
<tr>
<td>You want to view current activity Outbound Option dialing campaigns or review trends in the performance of these campaigns.</td>
<td>Outbound Option</td>
<td>This category is useful to Contact Center Administrators or Supervisors who manage outbound dialing campaigns. It is also useful for Administrators responsible for the Outbound Option Dialer, query rules, and record import configuration.</td>
</tr>
<tr>
<td>You want to view current queue activity or review trends in queue performance.</td>
<td>Service &gt; Peripheral Service</td>
<td>This category is useful to Contact Center Administrators or Supervisors who monitor queueing success and abandons. This information is useful to identify training or staffing needs and necessary script or configuration modifications.</td>
</tr>
<tr>
<td>You want to view historical VRU peripheral usage to identify whether the call volume is below or exceeding VRU capacity.</td>
<td>Peripheral</td>
<td>This category is useful to Contact Center Administrators responsible for VRU performance, configuration, and scripting.</td>
</tr>
<tr>
<td>You want to view trends in VRU Self-Service application usage to identify whether these applications are successfully meeting caller’s needs or require modification.</td>
<td>Call Type and Service &gt; Peripheral Service</td>
<td>These categories are useful to Contact Center Administrators responsible for configuring and maintaining VRU Self-Service applications.</td>
</tr>
</tbody>
</table>

### What Data Do You Want to See?

The reports you use depend on whether you are monitoring real-time operational status or historical performance.

Real-time agent data helps you identify immediate issues with configuration and scripts.

If you are monitoring operations in real-time, you might be interested in these types of statistics:

- Current full-time equivalent information for agents, which is the number of full-time agents required to handled the current volume of work. This information might help to identify staffing needs.
- Percent utilization of agents. This information might help to identify staffing needs.
• Number of short calls, which identifies whether short calls are configured and behaving appropriately. For example, if you notice that a large number of calls are abandoning within the short call timer, you might have the timer set too low.

• Current default skill group activity, which indicates that a call came in directly to an agent's extension, an outgoing call was placed by an agent, or agents are calling each other directly. Default skill group activity might indicate improper scripting to track these calls against the right skill group.

• Current Outbound Option campaign activity, including the status of campaigns, the dialer, and record import.

The following table describes suggested IPCC Enterprise report templates that provide real-time operational statistics. For details of all IPCC Enterprise report templates, refer to the *Cisco IP Contact Center Enterprise Edition WebView Template Reference Guide*.

**Table 34: Report Templates for Real-time Monitoring**

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>agtskg06: Outbound Option Status</td>
<td>Reports on the Outbound Option call status, the current state of the agents (talking, active, work ready, work not ready, hold, paused), the campaign name, the telephone and account number of the customer contacted.</td>
</tr>
<tr>
<td>perskg05: Peripheral Skill Group % Utilization of Ready Agents</td>
<td>Reports on current percent utilization of agents who are logged into the system and are able to handle requests.</td>
</tr>
<tr>
<td>perskg11: Outbound Option Statistics</td>
<td>Reports on the Outbound Option status of the selected peripheral skill group, the number of agents on predictive/progressive tasks, preview tasks, reserved tasks.</td>
</tr>
<tr>
<td>perskg14: IPCC Rolling 5-minute Peripheral Skill Group Status</td>
<td>Reports on current full-time equivalents for agents logged on and in Not Ready, Available, Active, Wrap Up, Reserved, Hold, and Busy Other states.</td>
</tr>
<tr>
<td>camqry01: Status of Each Query Rule within a Campaign Real Time</td>
<td>Reports on current available phone numbers, number of calls closed, number of customers contacted, number of customers who requested callback, average talk time, and average wrap up time for each query in an Outbound Option campaign.</td>
</tr>
<tr>
<td>camqry02: Status of all Campaigns Real Time</td>
<td>Reports on current available phone numbers, number of calls closed, number of customers contacted, number</td>
</tr>
</tbody>
</table>
### Template | Statistics Provided
--- | ---
 | of customers who requested callback, average talk time, and average wrap up time for all Outbound Option campaigns.
dialer01: Dialer Real Time | Reports on current number of customers dialed, contacted, not answered, and abandoned for Outbound Option campaigns. Also reports on the detection of busy, voice, answering machine, and SITTones.
dialpr01: Dialer Port Status Real Time | Reports on the status of each Outbound Option dialer port and dialer activity on a port by port basis.
imprul01: Import Status Real Time | Reports on the status of record importing, including the start time of the import, status of the import, number of good and bad records imported, and the total number of records imported/to be imported for Outbound Option campaigns.

Historical agent data helps you identify historical performance trends and whether script or configuration modification is required to enhance operational effectiveness.

If you are measuring performance trends, you might be interested in these types of statistics:

- Historical full-time equivalent information for agents, which is the number of full-time agents required to handled the current volume of work. This information might help to identify staffing needs.

- Number of short calls, which identifies whether short calls are configured and behaving appropriately. For example, if you notice that a large number of calls are abandoning within the short call timer, you might have the timer set too low.

- Historical default skill group activity, which indicates that a call came in directly to an agent's extension, an outgoing call was placed by an agent, agents are calling each other directly, or calls are being transferred directly to other agents without using the dialed number. Default skill group activity might indicate improper scripting to track these calls against the right skill group.

- Historical performance of Outbound Option campaigns, including trends in number of calls made and average talk time.

- Historical performance of Outbound Option dialer activity, including number of calls dialed, answered, and abandoned, and whether voice, answering machine, or SITTones were detected for the calls.
- Historical performance of Outbound Option import activity, including the number of good and bad record imports.
- Number of calls that are being successfully handled by VRU Self-Service applications and the number that are transferred to agents.
- Whether the VRU activity is below or over capacity.
- Queue trends, such as number of calls that abandon while in queue and the average abandon wait time.

The following table describes suggested IPCC Enterprise report templates that provide historical operational statistics. For details of all IPCC Enterprise report templates, refer to the Cisco IP Contact Center Enterprise Edition WebView Template Reference Guide.

**Table 35: Report Templates for Historical Reporting**

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>perskg08: FTE for Peripheral Skill Group Half Hour</td>
<td>Reports on full-time equivalents for agents logged on and in Not Ready, Available, Active, Wrap Up, Reserved, Hold, and Busy Other states for half-hour intervals. Summaries on this report provide FTE values based on an 8 hour shift calculation (Assume that agents work an 8-hour shift).</td>
</tr>
<tr>
<td>perskg12: Outbound Option Call Detail Performance in Skill Groups Half Hour</td>
<td>Reports on the percentage of time spent for predictive and progressive calls by the outbound option agents in the signed on state, handle state, talk and hold states, gathered in half hour increments.</td>
</tr>
<tr>
<td>caltyp21: Call Type Half Hour</td>
<td>In addition to other call type data, reports on the number of tasks offered, number of abandoned short tasks, number and percentage of abandoned tasks, average abandon wait time and service levels.</td>
</tr>
<tr>
<td>agtskg10: Outbound Option Predictive and Progressive Calls Detail Performance</td>
<td>Reports on the Outbound Option call detail performance on predictive and progressive calls by skill group like total handle time, total tasks, total talk time, average talk time, average reserve time.</td>
</tr>
<tr>
<td>agtskg11: Outbound Option Preview Call Detail Performance</td>
<td>Reports on the Outbound Option call detail performance on preview calls by skill group like total handle time, Total</td>
</tr>
<tr>
<td>Template</td>
<td>Statistics Provided</td>
</tr>
<tr>
<td>--------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>agtskg12: Outbound Option Reservation Call Detail Performance</td>
<td>Reports on the Outbound Option task detail performance on reservation calls by skill group like total handle time, total number of completed agent reservation calls, average reservation time.</td>
</tr>
<tr>
<td>agtper27: Agent Peripheral Historical All Fields</td>
<td>In addition to other agent data, reports on the number of short calls for half-hour intervals.</td>
</tr>
<tr>
<td>camqry10: Status of Each Query Rule within a Campaign Half Hour</td>
<td>Reports on number of calls closed, number of customers contacted, average talk time, and average wrap up time for each query in a campaign for half-hour intervals for Outbound Option campaigns.</td>
</tr>
<tr>
<td>camqry11: Status of All Campaigns Half Hour</td>
<td>Reports on number of calls closed, number of customers contacted, average talk time, and average wrap up time for all Outbound campaigns for half-hour intervals for Outbound Option campaigns.</td>
</tr>
<tr>
<td>camqry12/13: Summary of Attempts per Campaign Half Hour/ Daily</td>
<td>Reports on the number of calls attempted, closed, and rejected by the agent, the number of calls answered and unanswered by the customer, and the number of calls abandoned to IVR in a campaign for the selected time period for Outbound Option campaigns.</td>
</tr>
<tr>
<td>camqry14/15: Breakdown of Attempts (%) per Campaign Half Hour/ Daily</td>
<td>Reports on the number calls not answered, canceled, number of customers contacted, number of calls abandoned by the agent and abandoned to IVR, the number of call backs requested by the customer and the number of contacts that encountered network errors in a campaign for the selected time period for Outbound Option campaigns. This report also provides the summary of attempts (in percentage) for each type of result in a campaign during the selected time period.</td>
</tr>
<tr>
<td>Template</td>
<td>Statistics Provided</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Camqry16/17: Summary of Attempts per Query Rule Within Campaign Half</td>
<td>Reports on the number calls closed, rejected by the agent, the number of calls answered and not answered by the customer, the number of calls abandoned by the agent or abandoned to IVR, and the total of calls attempted for in a campaign for the selected time period for Outbound Option campaigns.</td>
</tr>
<tr>
<td>Hour Report/ Daily</td>
<td></td>
</tr>
<tr>
<td>Camqry18/19: Breakdown of Attempts (%) per Query Rule Within Campaign</td>
<td>Reports on the number of calls canceled by the agent, number of calls abandoned by the agent and abandoned to IVR, the number of call backs requested by the customer the number of contacts that encountered network errors in a campaign for the selected time period for Outbound Option campaigns.</td>
</tr>
<tr>
<td>Half Hour Report/ Daily</td>
<td></td>
</tr>
<tr>
<td>camqry20/21: Campaign Consolidated Half Hour Report/ Daily</td>
<td>Table that shows the percentage wrap up time, idle time, talk time, total number of calls attempted, number of calls closed, the average call handled time, number of customers contacted, the number of calls abandoned by the agent and the number of calls abandoned to IVR in a campaign for the selected time period for Outbound Option campaigns. This report combines the campaign data with skill group data to show how the calls are treated for this campaign.</td>
</tr>
<tr>
<td>camqry22/23: Campaign Consolidated Detailed Half Hour Report/ Daily</td>
<td>Reports on the breakdown of completed calls (outbound calls, inbound calls and/or calls transferred to the campaign's skill group) for the selected campaigns and their skill groups for the selected time period.</td>
</tr>
<tr>
<td>dialer10: Status of Each Dialer Half Hour</td>
<td>Reports on current number of customers dialed, not answered, and abandoned for half-hour intervals for Outbound Option campaigns. Also reports on the detection of busy, voice, answering machine, and SITTones.</td>
</tr>
<tr>
<td>dialer11/12: Dialer Capacity Half Hour/ Daily</td>
<td>Reports on the number of free ports, total number of reservation calls, average reservation calls, average attempt time, total time spent by the dialer ports for reserving agents and</td>
</tr>
</tbody>
</table>

Chapter 5: Monitoring Operations, Configuration, and Scripting
### The Role of the Default Skill Group in Reporting

The default skill group acts as a bucket to capture information about voice calls not routed by IPCC routing scripts or if a skill group is not specified in a routing script. A default skill group captures call statistics for calls that are not routed by an IPCC routing script. For example, if...
the Agent to Agent node is used in a routing script for agent to agent dialing, data is gathered for the default skill group.

For non-voice tasks, the default skill group is also used when the Queue to Agent node is used to queue a task to an agent if the agent is not logged into the skill group specified in the Queue to Agent node.

Using a default skill group helps to:

- Ensure the agent/skill group reports balance with the service and call type reports, since service and call type reports include only ICM-routed calls
- Isolate/identify non-ICM-routed calls within the agent and skill group report

You do not have to create a default skill group—it is automatically created when you establish MRD/Peripheral Gateways pairs. The default skill group has a peripheral number of 0.

Statistics for the default skill group are affected by different types of calls, including new calls, agent-to-agent-dialing, and transferred and conferenced calls.

If you deploy Multichannel options in an IPCC Enterprise system, default skill groups are created for each Media Routing Domain that is configured. Refer to the Reporting in a MultiChannel Environment (page 37) for more information bout Multichannel options.

How New Calls Increment Default Skill Group Statistics

Call statistics for all new outbound and incoming direct calls are incremented for the default skill group as follows:

- AgentOutCalls for external outbound calls
  
  **Note:** When an agent makes an outbound call as part of a consult call, the call is not attributed to the Default Skill Group. It is attributed to the skill group for the consulting agent on the original call.

- InternalCalls for the internal outbound calls

- InternalCallRcvd for the direct incoming calls

  **Note:** CallsHandled is not incremented for the default skill group, since the default skill group not be referenced in any script.

How Agent to Agent Dialing Increments the Default Skill Group Statistics

Agent-to-Agent dialing using the Agent-to-Agent node in the script also affects the default skill group. OutgoingExternal or OutgoingInternal are incremented for the default skill group of the agent initiating the agent-to-agent call. The default skill group InternalCallsReceived is incremented for the default skill group of the agent receiving the agent-to-agent call.
How Transferred and Conferenced Calls Increment the Default Skill Group

The default skill group is also affected by transferred and conferenced calls. If Agent A transfers or conferences an ICM/IPCC routed call to another agent directly without using a script, OutgoingExternal or OutgoingInternal for Agent A are incremented against the skill group of the ICM-routed call. However, IncomingDirect calls for Agent B is incremented against the default skill group.

However, if the agent (Agent A) transfers or conferences an ICM/IPCC routed call to a dialed number that accesses a transfer or conference script that has an Agent-to-Agent node, OutgoingExternal or OutgoingInternal for the Agent A is incremented for the skill group of the ICM/IPCC routed call. Incoming Direct calls for agent B are incremented for the default skill group.

The default skill group will also be incremented for emergency and supervisor assist calls when there is no existing call.

Configuration and Scripting Recommendations for Default Skill Group Reporting

Do not reference the default skill group in ICM/IPCC routing scripts. This ensures that the default skill group does not capture statistics for ICM-routed calls.

Reporting on Outbound Dialing Campaign Effectiveness

You can determine the effectiveness of Outbound dialing campaigns using the Outbound Option reporting category. This category provides reports for the campaigns, the query rules used in those campaigns, Outbound Option record imports, and Outbound Option Dialer activity.

The campaign query rule reports are the most useful reports for measuring campaign effectiveness. These reports show you what is happening in each campaign, including the number of calls closed, number of customers contacted, average talk time, and average wrap up time for each query in the campaigns.

You can report on campaigns on a higher level using the dialer reports. Each campaign is associated with a dialer. By reporting on a dialer, you view statistics that span all of the campaigns associated with the dialer. These reports show you the number of customers dialed, the number of calls that were not answered, the number of calls that were abandoned, and detection of busy, voice, answering machine, and SITTones.

Outbound Option reports also enable you to view the success of record importation. Using the import reports, you can monitor whether records being added successfully (good records) or are failing (bad records). Also, you can monitor how long it takes to import the records so that you can plan for future record importation.

If you want to view data for Outbound calls that are transferred to the VRU, use the peripheral service IVR reports.
Use **agent skill group** reports (which are Outbound Option reports but not listed under Outbound Option reporting category) to monitor agent talk time for Outbound Dialer calls.

### Configuration and Scripting Recommendations for Reporting on Outbound Dialing Campaigns

When configuring Outbound Option, create a separate call type for Outbound Option calls.

Outbound Option uses a routing script in addition to a physical call to reserve agents, and therefore WebView Call Type real-time and half hour reports contain data for the call type associated with the routing script.

**See Also**

*Outbound Option User Guide for Cisco ICM/IPCC/IPCC Enterprise & IPCC Hosted Editions*

### Reporting on 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. Note that for call types, you configure only abandoned short calls; answered short calls are not reported for call types. Short calls are configured globally for call types.

Short calls apply only to voice calls. You do not define short calls for non-voice tasks, such as single-session chat tasks.

You can configure two types of short calls:

- Abandoned short calls
- Answered short calls (for the peripheral only). You cannot configure these for System IPCC deployments.

If you do not want to count any abandoned calls as short calls regardless of how quickly they abandon, you can disable abandoned short calls by leaving the Abandon Wait Time field blank for the Call Type.

#### Abandoned Short Calls

A call is considered abandoned if it abandons after the value set for the Abandon Call Wait time threshold. This is set globally. If the call abandons before the Abandon Call Wait Time threshold, the call is reported as a short call. Abandoned short calls affect reporting because they update the CallsOffered field, but not the CallsAbandon field. Reports contain a Short Calls column to enable you to track calls that are offered but are neither handled nor abandoned.

Short calls can abandon at the following:
• Call type
• VRU
• While ringing on an agent's phone

The following table describes how abandoned short calls affected reporting depending on where they abandon.

**Table 36: Abandoned Short Calls**

<table>
<thead>
<tr>
<th>Where Short Call Abandons</th>
<th>Effect on Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short call abandoned at call type</td>
<td>The short call timer starts as soon as the route request is received for the call. The CallsOffered field is updated when the route request is received. If the call abandons within the Abandon Wait Time threshold, the ShortCalls field is updated, but the number of calls abandoned is not updated. Since the call type is the highest level reporting entity, calls that abandon at the VRU or at the agent's phone can also be considered short calls at the call type if they abandon within the call type's Abandon Wait Time threshold.</td>
</tr>
<tr>
<td>Short call abandoned at the VRU This does not apply for System IPCC Enterprise.</td>
<td>Calls that abandon at the VRU are calls that abandon while connected to the VRU. The short call timer starts as soon as the call arrives at the VRU. If the call is considered a short call at the VRU service, then CallsOffered will be pegged, but not calls abandon. The short calls field will also be incremented for the VRU service.</td>
</tr>
<tr>
<td>Short calls abandoned at the agent's phone</td>
<td>For calls that abandon while ringing on the agent’s phone, the short call timer starts as soon as the call enters the queue in the “Queue-To-SkillGroup” node. If the call abandons within the Abandon Wait Time threshold, the CallsOffered is incremented, but not CallsAbandon.</td>
</tr>
</tbody>
</table>

**Answered Short Calls - Not Applicable for System IPCC Deployments**

For IPCC Enterprise, answered short calls apply to the skill group and the agent skill group. 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 if the Talk Time is less than the Answered short call threshold. The call is reported both as handled and as a short call.

If auto-answer is enabled for the agent, and if there is a high number of short calls within a certain interval, short calls could be used to determine which agents were not at their station when a call was automatically answered. This assumes that the caller hangs up quickly when there is no agent on the phone.
Configuration Recommendations for Reporting on Short Calls

You consider both abandoned short calls and answered short calls when configuring short calls.

Configuring Abandoned Short Calls

Follow these guidelines when configuring abandoned short calls:

- Configure short calls for the call type using the ICM/IPCC configuration tools. You set this value globally for all call types. Set the Abandon Call Wait Time to the number of seconds that you want. If you do not want abandoned short calls to impact service level, set the value to less than the service level threshold.

  If you do not want to count any abandoned calls as short calls regardless of how quickly they abandon, you can disable abandoned short calls by leaving the Abandon Wait Time field for the Call Type blank.

- Configure short calls for each peripheral using the ICM/IPCC configuration tools. Set the Abandon Call Wait Time to the number of seconds that you want. If you do not want abandoned short calls to impact service level, set the value to less than the service level threshold.

Configuring Answered Short Calls - Not Applicable for System IPCC Deployments

Configure answered short calls in the ICM/IPCC configuration tools when configuring the peripheral. If you do not want answered short calls to impact Service Level, set the Answer Short Call Threshold to a value less than your service level threshold but greater than zero.

If you do not want to count any answered calls as short calls, regardless of how quickly they terminate, you can disable answered short calls by leaving the Answered Short Call Threshold field blank.

Answered short calls can be configured for agent and skill groups, not for call types.

See Also

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

Determining Full-Time Equivalents and Percent Utilization

Because agents can work on multiple media and in multiple skill groups, they typically do not spend all of their time handling tasks for a single skill group. Determining staffing needs based on agents whose time is divided between skill groups and media can be difficult. WebView provides two types of statistics that give you a better view of how agents are being utilized and
how many full-time agents would be required to handle the amount of work performed during an interval for a particular skill group.

These statistics are:

• % Utilization (percent utilization)

• FTE (full-time equivalent)

You can use these statistics when determining staffing requirements for the contact center and individual skill groups.

Percent utilization (% Utilization in reports) is computed in WebView by dividing the total time agents spend handling calls in a skill group by the total time agents were ready to handle tasks, based on an 8 hour shift. To calculate the time that an agent was ready, WebView subtracts the Not Ready time from the total time that agents were logged on. Percent utilization shows you how well agents are being utilized within a skill group. For example, if the agent spent 20 minutes of the log on duration handling calls and was available to handle calls for 40 minutes, the percent utilization is 50%.

The full-time equivalent (FTE in reports) is the number of full-time agents that would be required to perform the work done during that interval for a skill group. To calculate the FTE, WebView divides the total time that work was performed by the total time in the interval. For example, if agents spent a total of 3 hours (180 minutes) handling tasks during a half-hour interval (30 minutes), the FTE for task handling during the interval is 180 minutes/30 minutes, which equals 6 full-time persons. This means that if all agents handled tasks full-time, the work could have been done by 6 agents.

Reports also provide FTE values based on an 8 hour shift calculation. It is assumed that agents work an 8 hour shift for the day. To calculate the FTE, WebView divides the total time that work was performed by 8 hours. For example, if agents spent a total of 48 hours (2880 minutes) handling tasks during an 8 hour work shift (480 minutes), the FTE for task handling during the interval is 2880 minutes/480 minutes, which equals 6 full-time persons. This means that if all agents handled tasks full-time, the work could have been done by 6 agents.

Note: If you select a report interval that is less than 8 hours, the value will be lower than expected.

Understanding VRU Application Reporting

You can use a VRU in IPCC Enterprise for a number of different purposes, including queuing, customer self-service, and information gathering.

You can identify the VRU service by the Peripheral Number field in the Service database tables as follows. VRU services are not applicable for System IPCC or ARI deployments. For System IPCC and ARI, use skill group reports to view queuing metrics.

• If you are using IP-IVR as the VRU, the Peripheral Number of the service matches the ICM/IPCC post routing ID set in the CRA Application Administration for IP-IVR.
Understanding VRU Application Reporting

- If you are using CVP as the VRU, the Peripheral Number of the service is 1 if the CVP is the routing client (VRU type 5) or 2 if the CVP receives pre-routed calls (VRU type 2, 3, 7, and 8).
- For both CVP and IP-IVR, if you are performing translation routes from the CTI route point to the VRU, the VRU service is the service defined in the TranslationRtetoVRU script node.

Self-Service, Information Gathering, and Queuing VRU Applications

VRU applications include Self-Service, Information Gathering, and queuing.

A self-service application is designed for callers to obtain routine information using VRU menu options. Only for exceptional cases would the call be routed to an agent.

You must be able to determine the following from an IVR service used for customer self-service:

- How many calls traversed the application
- How long each call remained in the self-service application
- How many calls did not require agent intervention
- How many calls were eventually routed to agents

Information Gathering VRU applications are used to decide what skill group to queue the call to by walking the caller through a series of voice prompts. The Caller Entered Digits (CED) are passed back to ICM/IPCC from the VRU to be used within the ICM/IPCC routing script, to decide the optimal skill group to answer the call.

You must be able to determine the following from an IVR service used for information gathering:

- How many calls traversed the application
- How long each call remained in the information gathering application
- How many calls disconnected before being routed to an agent
- How many calls were eventually routed to agents

Several applications can reside on the same VRU PG; Self-Service and queuing can reside on the same VRU PG and Information Gathering and queuing can reside on the same VRU PG. This means that all of the applications on that PG belong to the same VRU service. The VRU service cannot be changed once the call is sent to the VRU. However, the call type can be changed using the Requalify or Call Type node. In the following script, the call type is changed using the Call Type node once it has been queued to separate Information Gathering (CollectDigits) and queuing.
Although a service level can be defined for both call types, it is better to define a service level for the call type that has the Queue to Skill Group node in it.

Calls that disconnect while in the Self-Service or Information Gathering application are considered abandoned calls since both Service Control and Queue reporting must be turned on for VRU Queuing applications. However, you can extract queuing metrics from information-gathering metrics by defining a separate call Type for each, and then changing the call Type in the routing script.

Note: If the VRU performing Self-Service does not also provide queuing, you can enable Service Control reporting and disable Queue reporting. If the caller opts to speak to an agent, then the Self-Service VRU transfers the call to the IP-IVR or CVP that performs queuing and the call does not appear abandoned from the Self-Service application. This means that the call is considered answered when received by the VRU, not offered. When the call ends, it is counted as handled. If you implement this configuration, you will only be able to see in reports the number of calls that were answered and terminated, and time spent on terminated calls.

The following illustration shows how a call moves from the Information Gathering application to the queuing applications.

In this example, 20 seconds is used to calculate ASA and to decide the service level—and not 50 seconds (30+20 seconds).
Note that if the call abandons before being requalified to the Call Type that handles queuing, the Call Abandon Wait time is not reset. Therefore, the Abandon Wait time for the information gathering call type starts when the call enters the first call type and ends when the call abandons, as illustrated below:

Figure 9: Call Type Data for Calls that Abandon before Call Type is Changed

The following table illustrates how some basic metrics are broken up at the CallType and the IVR Service.

Table 37: Self-Service and Information Gathering Application Metrics

<table>
<thead>
<tr>
<th>Report Metric</th>
<th>Call Type</th>
<th>VRU Service Not applicable for System IPCC deployments or ARI.</th>
<th>Skill Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abandon Wait Time</td>
<td>Starts when a call first enters a call type and ends when it abandons.</td>
<td>Starts when the call enters the service.</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Average Speed of Answer (ASA)</td>
<td>Starts at the first Queue to Skill Group node in the routing script.</td>
<td>Starts at the first Queue to Skill Group node in the routing script.</td>
<td>Starts at the first Queue to Skill Group node in the routing script.</td>
</tr>
<tr>
<td>Service Level</td>
<td>Starts as soon as the call enters the call type that has the service level defined.</td>
<td>Starts when the call enters the service.</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Measuring VRU Utilization - Not Applicable for System IPCC or ARI Enterprise Deployments

You can monitor the number of calls that are being handled by VRU services using the periph06: VRU Peripheral Capacity WebView report.

This report provides metrics including:

- Number of calls offered to the VRU.
- Average number of calls serviced by the VRU simultaneously.
• Maximum number of calls in progress simultaneously.

If you are using CVP as the VRU and have deployed CVP in the Comprehensive Model, note that the number of calls in progress refers to the number of Routing Client ports and the number of VRU ports in use on this peripheral. See the Cisco Internet Service Node (CVP) Configuration and Administration Guide for more information about the Comprehensive Model.

• Amount of time that the VRU peripheral has been sending data.

• Amount of time that the VRU peripheral has been active as a routing client.

You can use the data in this report to determine if the VRU is capable of handling the amount of calls it is receiving or if the VRU is not being utilized effectively by your routing scripts.

Determining Self-Service Application and Information Gathering Application Effectiveness

You can monitor the effectiveness of Self-Service and Information Gathering applications to determine whether the application needs to be modified to better meet customer needs and decrease the amount of agent intervention.

Monitoring Self-Service and Information Gathering Application Progress

You might determine the effectiveness of a Self-Service application in several ways:

• Monitoring the effectiveness of the application as a whole. For example, you might only want to monitor whether a customer's need was satisfied through the VRU application and that the caller did not need to be transferred to an agent.

• Monitoring the effectiveness of individual transactions within the application. For example, in a banking application a customer might have the ability to perform multiple transactions, such as account lookup, obtaining balance information, and learning about recent payments. You might want to see which of these transactions was used and whether the caller successfully completed the transaction.

• Monitoring failure cases in which a system error, such as a failed database lookup, caused the caller to be transferred by an agent instead of continuing through the VRU application.

Similarly, you might determine the effectiveness of an Information Gathering application in several ways:

• Monitoring whether the caller used the system prompts to be routed to an appropriate resource or used a failout path, such as pressing "0", to be routed directly to an agent.

• Monitoring failure cases in which system errors, such as a failed database lookup, caused the caller to be transferred to an agent instead of continuing through the digit collection prompts for more appropriate routing.
You can obtain information about application effectiveness as a whole, effectiveness of individual transactions within the application, and failure cases using the VRUProgress variable available in the Set script node. The VRUProgress variable enables you to set the status of the VRU call at any point in the application. For example, if you consider a call handled by the VRU when the caller completes a certain node, such as an account balance lookup node, then you can set the variable to 2, indicating that the call be reported as VRU Handled for the appropriate call type.

These VRUProgress variables map to columns that appear in VRU Activity WebView reports, enabling you to see how many calls were counted for each variable per call type. You can use this data to modify applications if needed. For example, if you see that many callers are experiencing error conditions that cause a forced transfer you could correct the function of that node. If you see that many callers are opting to be transferred to an agent before being handled by the application, you might want to add functionality to the application.

The following table describes the VRUProgress variables that you can use in your VRU script applications and how they map to report columns.

### Table 38: VRUProgress Script Variable

<table>
<thead>
<tr>
<th>Variable Setting in Script</th>
<th>Show in Reports as</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not a VRU call - does not appear in reports</td>
<td>Indicates that this call is not a VRU call. It is the default value.</td>
</tr>
<tr>
<td>1</td>
<td>VRU Unhandled</td>
<td>Indicates that the caller's needs have not been met at this point in the application.</td>
</tr>
<tr>
<td>2</td>
<td>VRU Handled</td>
<td>Indicates that the caller's needs have been met by this point in the application. For example, the caller successfully received an account balance.</td>
</tr>
<tr>
<td>3</td>
<td>VRU Assisted</td>
<td>Indicates that this call was transferred to an agent after the caller's needs were met with the application. For example, the caller successfully received account information and then requested to speak to an agent for a different reason or for additional information not available through automatic means.</td>
</tr>
<tr>
<td>4</td>
<td>VRU Opt Out Unhandled</td>
<td>Indicates that the call was transferred to an agent at the caller's request before the caller's needs were met by the application. For example, the caller pressed &quot;0&quot; to be transferred to an agent before performing automated transactions or while in the process of completing a transaction.</td>
</tr>
<tr>
<td>5</td>
<td>VRU Scripted Transfer</td>
<td>Indicates that the call was transferred to an agent as part of the application design. For example, after the caller checked an account balance the application transferred the caller to agent to discuss new account options. Another example is that after a caller entered digits to request a particular type of service the call was transferred to an available agent to handle the request.</td>
</tr>
</tbody>
</table>
### Variable Setting in Script | Show in Reports as | Description
--- | --- | ---
6 | VRU Forced Transfer | Indicates that the caller was transferred to an agent because of a system error. For example, a failure at a particular node in the application could lead to the call being transferred to the agent.
7 | VRU Other | Indicates that the call disposition does not match any of the other VRUProgress variables.

You can use the VRUProgress variable to indicate the final VRU status at the end of the application or to indicate changes in VRU status through the different transactions in the application.

The VRUProgress variable is associated with a specific call type. If you want to report only the final status of the call, then you can use a single call type in the application and set the VRUProgress variable at any point in the application. Note that while you can change the VRUProgress variable throughout the application, only the final status is reported for the call type. The value of the VRUProgress variable is written to the database when the routing script terminates. You can report on the VRU status of the application as a whole using the Call Type VRU Activity WebView reports by monitoring statistics for the call type associated with the script.

If you want to report on individual transactions within the application, change the VRUProgress variable and then the call type at the end of each transaction. You have a different call type for each transaction with a related VRUProgress variable. This ensures that the value of the VRUProgress variable is captured for that particular transaction, not just at the end of the routing script. The value is written to the database for the call type associated with that transaction when the call types changes. You can report on individual transactions using the Call Type VRU Progress WebView reports by monitoring statistics for the call types associated with those transactions.

See IPCC Enterprise Voice Call Reporting Data (page 125) for a sample script and call flow for Self-Service and Information Gathering applications that use the VRUProgress variable.

### Capturing Script Application Data (CVP only)

If you have deployed CVP as the VRU in your IPCC Enterprise system, you can use two advanced features to gather additional details about calls' progress through Self-Service and Information Gathering applications: Capture microapplication and metadata ECC variable. The details provided by these microapplications can be used only in custom reports; standard WebView reports do not provide this information.

The Capture microapplication enables you to cause a Termination_Call_Detail (TCD) record to be written at any point in the script. This record includes information such as the current call variables, router call keys, date and time, caller entered digits, and metadata ECC variables.

The metadata ECC variable captures high level details about a call's progress through a script, including whether the caller is using voice or digit dialing, percent confidence for Automatic
Speech Recognition, number of attempts a user made before entering a prompt successfully, number of timeouts, number of invalid entries, microapplication duration, and the routing script used. This information is written to TCD records. If you plan to use the metadata ECC variable, you must configure the ECC variables in the ICM/IPCC configuration tools.

Using the VRUProgress variable, the Capture microapplication, and the metadata ECC variable microapplication together in a script provides you with the ability to monitor details about the transactions performed by the caller and the VRU application’s interface to caller. For example, you could use the Capture microapplication to create a TCD each time the VRUProgress variable changes in the script. The TCD is written for that particular point in the application, which includes the information gathered by the metadata ECC variable. A custom report could show how many callers experienced timeouts at different points in the application, how many attempts callers made before successfully completing a transaction, and how long it took a caller to complete each transaction. This data could indicate problems with the VRU application. You could also run a custom report on an individual call to see how a particular caller used the application and whether he or she encountered difficulties.

Configuration and Scripting Recommendations for Self-Service Applications, Information Gathering Applications, and Queue Applications Reporting

Follow these guidelines when configuring Self-Service applications, Information Gathering applications, and queue applications:

- Enable Service Control and Queue Reporting at the VRU peripheral. This does not apply to System IPCC or ARI Enterprise deployments.

- If you have Self-Service or Information Gathering IVR applications and want to separate self-service/digit collection metrics from queuing metrics, change the call type in the routing script before the call is queued. This ensures that you can report on both the self-service/digit collection section of the call and the queuing section of the call using Call Type reports.

- If you want to track a call’s progress through a Self-service or Information Gathering IVR Application, use the VRUProgress variable in the Set node of the routing script to indicate the status of the call at different points in the routing script. Use the VRU Activity reports to view how caller’s are progressing through the VRU script. You can set the status to VRU unhandled, VRU handled, VRU assisted, VRU opt out unhandled, VRU script handled or VRU forced transfer.

For each transaction in the VRU Self-Service or Information Gathering application for which you plan to change the VRUProgress variable, create a separate call type. In the script, change the call type when a call reaches the end of a transaction and then change the VRUProgress variable. This enables you to report on each transaction separately using the call type VRU Activity reports.

- Optionally, if you are using CVP as your VRU and want to perform advanced custom reporting on VRU application details, configure the following:

  - Capture microapplication, which you can include in a script to trigger the creation of a TCD record at any point in a routing script. Configure the Capture microapplication as a
VRU script; execute the application using the RunExternalScript node. You must name the script "CAP" or "CAP, xxx", where xxx is any string that makes the script name unique. (For example CAP, bankingApplication).

– Metadata ECC variable microapplication, which collects high-level details about the script application. Configure an ECC variable in ICM/IPCC Expanded Call Center Variables configuration tool. The variable length normally be 62 bytes but can be as low as 21 bytes to save space if needed.

– Use these microapplications in your scripts to trigger TCD creation at points in the script for which you want to capture data, such as when a transaction completion. Using the metadata ECC variable in conjunction with the Capture microapplication enables you to capture additional details about the performance of the script and the customer's experience for each point in the script for which a TCD record is created.

• There might be cases when a call is not queued, but instead sent to the agent directly (using the LAA Select node) from the VRU. You must ensure the VRU PG is configured correctly to ensure that such a call is considered answered at the VRU service rather than abandoned.

• If you are using IP-IVR as the VRU, set the Configuration parameter in the VRU PG record to /ASSUME_ANSWERED to ensure that calls sent from the VRU to an agent without being queued are reported as Answered.

See Also

IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
System IPCC Installation and Configuration Guide for Cisco IPCC Enterprise Edition
ICM Scripting and Media Routing Guide for Cisco ICM/IPCC Enterprise & Hosted Editions

Translation Route Reporting

Translation routes are used to transfer a call from one routing client to another and retain the details about call tracking, call data and cradle to grave reporting. They form an intermediate destination which is allocated when a script sends a call from a source routing client to a destination. After the call reaches the destination, the translation route is available for reuse as the route is not busy for the entire duration of the call.

Translation routes use a 'pool' of DNIS's. These DNIS serve as the intermediate targets of the calls on each possible destination. For any given translation route, one pool is used. The size of this pool is set by using a formula defined in the ICM documentation. If the pool is too large, ACD or VRU resources are wasted (These numbers are PSTN exposed). If the pool is too small, few calls are lost as these calls cannot be sent when the entire pool is in use.

The following table describes the new IPCC Translation Route report templates which are used to track the route usage and/or the overflow conditions:
### Table 39: Report Templates for Historical Reporting

<table>
<thead>
<tr>
<th>Template</th>
<th>Statistics Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>trroute11/trroute12: Translation Route Counts Half Hour Report/ Daily Report</td>
<td>Reports on the maximum number of routes used in a translation route, average and maximum time taken to complete a translation route, the average number of routes in use, the number of PG time-outs, the number of configuration errors encountered during the translation route and the number of translation routes occurred during the selected time period.</td>
</tr>
</tbody>
</table>
Chapter 6

Implications of Fail-over for Reporting

System fail-over affects data that appears in IPCC WebView reports.

This section describes the effects on reporting when the following system components fail-over:

- Peripheral Gateway/CTI Manager Service
- Agent Desktop/CTI OS Server
- Cisco CallManager
- Application Instance/MR PG
- Application Instance/Agent PG CTI Server/PIM

This chapter contains the following topics:

- About Peripheral Gateway/CTI Manager Service Fail-over, page 121
- About Agent Desktop/CTI OS Server Fail-over, page 122
- About Cisco CallManager Fail-over, page 123
- About Application Instance/MR PG Fail-over, page 123
- About Application Instance/Agent PG CTI Server/PIM Fail-over, page 124

About Peripheral Gateway/CTI Manager Service Fail-over

If the agent’s PG (PIM or JTAPI Gateway components on the Cisco CallManager PG) shuts down or the CTI Manager service on CallManager shuts down, the agent is momentarily logged out. The agent might be logged in again automatically once the backup PG or CTI Manager comes into service. The agent Media Logout Status reports for the agent, agent skill group, agent team, and agent peripheral show a logout reason code of 50002.
About Agent Desktop/CTI OS Server Fail-over

If the agent desktop (CTI OS or Cisco Agent Desktop) shuts down or loses communication with CTI OS Server, or if the CTI OS Server shuts down, the agent is logged out all Media Routing Domains supported by the peripheral that has lost communication with ICM/IPCC software.

The agent is logged in again automatically when one of the following occurs:

- The agent desktop comes back up or resumes communication with CTI OS Server
- The agent is connected to the backup CTI OS server

The agent **Media Logout Status** reports for the agent, agent skill group, agent team, and agent peripheral show a logout reason code of 50002.

The state to which the agent reverts after fail-over depends on the agent's state when the fail-over occurred, as described in the following table.

### Table 40: Agent State Before and After Peripheral Gateway/CTI Manager Service Fail-over

<table>
<thead>
<tr>
<th>Agent State at Fail-Over</th>
<th>Agent State after Fail-over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Not Ready</td>
<td>Not Ready</td>
</tr>
<tr>
<td>Wrap-up</td>
<td>Available, if in Available state before the call. Otherwise, the agent reverts to Not Ready.</td>
</tr>
</tbody>
</table>

### Table 41: Agent State Before and After Agent Desktop/CTI OS Server Fail-over

<table>
<thead>
<tr>
<th>Agent State at Fail-Over</th>
<th>Agent State after Fail-over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Not Ready</td>
<td>Not Ready</td>
</tr>
<tr>
<td>Reserved</td>
<td>Available</td>
</tr>
<tr>
<td>Wrap-up</td>
<td>Available, if in Available state before the call. Otherwise, the agent reverts to Not Ready.</td>
</tr>
</tbody>
</table>
About Cisco CallManager Fail-over

If a Cisco CallManager that is not directly connected to the agent’s phone shuts down, the agent is not affected. However, if the agent’s phone loses connectivity with its Cisco CallManager (because either its Cisco CallManager went down or the agent’s phone restarted) or if there are network problems between the agent’s phone and its Cisco CallManager, the agent is logged out automatically. The agent must manually log in again once the phone has connected to the back up Cisco CallManager.

When the agent is logged out, the agent is removed from the real-time status reports until the agent logs back in again. The historical information restarts when the agent logs back in again. The agent Media Logout Status reports for the agent, agent skill group, agent team, and agent peripheral show a logout reason code of 50003. The previous state that the agent was in before the fail-over or recovery condition is not maintained.

If the agent is on a call when this fail-over or recovery condition occurs, the agent does not fail-over or revert to the back up or primary Cisco CallManager until the call is disconnected. The agent might be able to stay on the call, but does not get credit for that call within the historical reports because signaling to the PG stops until the agent fails-over or reverts to the back up or primary Cisco CallManager. Once the agent has connected to its back up CallManager, the agent must log in again. The previous state that the agent was in before the fail-over or recovery condition is not maintained.

About Application Instance/MR PG Fail-over

If the connection between the Application Instance and MR PG shuts down or either component shuts down, the ICM/IPCC Central Controller discards all pending NEW_TASK requests received from the application. The Application Instance waits for the connection to be restored and continues to send messages regarding existing tasks and new tasks assigned by the Application Instance to the Agent PG CTI server. When the connection, MR PIM, or Application Instance is restored, the Application Instance resends any pending NEW_TASK requests for which it has not received a response from the ICM/IPCC Central Controller. The tasks that are assigned to the agent by the Application Instance while the connection is down and completed before the connection is restored do not appear in WebView reports.

Note: If the Application Instance shuts down, this also affects Agent PG CTI server connections.

If the connection between the MR PIM and the ICM/IPCC Central Controller shuts down or the ICM/IPCC Central Controller shuts down, the MR PIM sends a ROUTING_DISABLED message to the Application Instance that causes the Application Instance to stop sending routing requests to the ICM/IPCC Central Controller. Any request that is sent while the connection is down is rejected with a NEW_TASK_FAILURE message. The Application Instance continues to send messages regarding existing tasks and new tasks assigned by the Application Instance to the Agent PG CTI server. When the connection or ICM/IPCC Central Controller is restored, the MR PIM sends the Application Instance a ROUTING_ENABLED message that causes the Application Instance to start sending routing requests to the ICM/IPCC Central Controller again. The tasks that are assigned to the agent by the Application Instance while the connection is
down and completed before the connection is restored do not appear in reports. If the connection between the ICM/IPCC Central Controller and the MR PG fails, the ICM/IPCC router deletes all pending new tasks. When the connection is restored, the application connected to MR PG will resubmit all the tasks.

Note: If the ICM/IPCC Central Controller shuts down, this also affects the application instance/Agent PG CTI server interface.

### About Application Instance/Agent PG CTI Server/ PIM Fail-over

If the connection between the Application Instance and Agent PG CTI server shuts down or either component shuts down, agents stay logged in. Tasks remain for a time, based on the task life attribute of the MRD. If the task life expires while the connection is down, tasks are terminated with the disposition code of 42 (DBCD_APPLICATION_PATH_WENT_DOWN).

Note: For the E-Mail MRD, agents are not logged out automatically when the Agent PG CTI server or connection to CTI server shuts down. Instead the E-Mail Manager continues to record agent state and assign tasks to agents. When the connection is restored, the E-Mail Manager sends the updated agent state information on the peripherals serviced by the Agent PG CTI server to the CTI server, which sends the information to ICM/IPCC software. ICM/IPCC software attempts to recreate historical data and corrects current agent state. If the connection or Agent PG CTI server is down for more than the time limit configured for the MRD, reporting on tasks might be ended prematurely by ICM/IPCC software and restarted with the connection is reestablished.

The application instance can assign tasks to agents while the connection or CTI server is down and, if the connection to the MR PG is up, can continue to send routing requests to the ICM/IPCC central controller and receive routing instructions. However, no reporting data is stored for the tasks while the connection is down. Also, any tasks that are assigned and completed while the connection or CTI server is down do not appear in reports. If the connection between the Agent PG CTI server and the router shuts down or if the router shuts down, the application instance continues to send messages to the CTI server and agent activity is tracked. However, this information is not sent to the router until the connection or the router is restored, at which time the cached reporting information is sent to the ICM/IPCC central controller.

Note: If the ICM/IPCC central controller shuts down, this also affects the application instance/MR PG interface.

If the Cisco CallManager PIM shuts down, voice media routing is unavailable for agents associated with the PIM. However, the ICM/IPCC Central Controller can continue to assign non-voice tasks to agents associated with the PIM, and the CTI server can continue to process messages and requests about agents associated with the PIM for non-voice Media Routing Domains. When the connection is restored, voice media routing is available again.
Sample Calls and Report Data

This section describes sample voice calls and the historical report fields for several templates that are updated for these calls. For each call, the routing script is provided.

IPCC Enterprise Voice Call Reporting Data

This section provides sample call flows in the IPCC Enterprise system and the report data generated for agent, skill group, and call type reports.

For these call flows, the following settings are configured for IPCC Enterprise:

- Service Level threshold for services is 90 seconds; abandoned calls impact Service Level negatively.
- Service Level threshold for call types is 90 seconds; abandoned calls impact Service Level negatively.
- Service Level threshold for skill groups is 90 seconds; abandoned calls impact Service Level negatively.
- Ring No Answer time is set to 20 seconds in the Agent Desk Settings.
- Four call type intervals are set:
  - Upper bound 1 is set to 60 seconds
  - Upper bound 2 is set to 90 seconds
  - Upper bound 3 is set to 120 seconds
  - Upper bound 4 is set to 150 seconds
• The predefined Not Ready reason codes have been entered in the Reason Code List Tool and associated with text. The text for Not Reason Code 32767 is "Ring No Answer".

Voice Call without Queuing

The following script is used for this example:

Figure 10: Routing Script for Voice Call without Queuing

Note: For IPCC Enterprise with System IPCC PG and System IPCC deployments, the Translation Route to VRU node is not needed.

In this example, the script first tries to select an available agent using the LAA (Longest Available Node) from the appropriate skill groups. If an agent is not available, the script then performs a translation route to VRU and queues the call to the appropriate skill groups. During queuing, the VRU plays music on hold. Labels are used for default routing in case the Translation Route to VRU, Queue to Skill Group, or Run Ext. Script nodes fail.

The following events occur:

1. A customer calls the contact center at 9:05:01 a.m.
2. The script uses the LAA (longest available agent) node to select an available agent.
3. The agent's phone rings at 9:05:05 a.m.
4. The agent answers the phone at 9:05:10 a.m.
5. The caller hangs up at 9:16:03 a.m.
6. The agent enters wrap up and completes wrap up at 9:20:04 a.m.

For this call flow, all events occur within the 09:00:00 to 09:29:59 reporting interval. Reports run from 09:00:00 to 09:29:59 display all of the data for this call.
### Table 42: Sample Agent Reports

<table>
<thead>
<tr>
<th>Agent Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent04: Agent Task Detail Report</td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Total Tasks. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Avg Time. The handle time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• % Wrap Up. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>agent25: Agent Consolidated Half Hour Report</td>
<td>This call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Active Time. The agent's active time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Wrap Up. The agent's wrap up time for call is used in the calculation.</td>
</tr>
</tbody>
</table>

### Table 43: Sample Skill Group Reports

<table>
<thead>
<tr>
<th>Skill Group Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>perskg31: IPCC Peripheral Skill Group Task Summary Half Hour Report</td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: % Handled. This call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td>perskg35: IPC Peripheral Skill Group Consolidated Half Hour Report</td>
<td>This call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: AHT. The handle time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Avg Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: Active Time. The active time is displayed (10 minutes and 53 seconds).</td>
</tr>
</tbody>
</table>
**Skill Group Report** | **Fields Affected by Call Flow**
---|---
| • Agent State Times: % Active Time. The agent's active time for this call is used in the calculation.  
• Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.  
• Agent State Times: % Wrap Up Time. The agent's wrap up time for this call is used in the calculation.  
• ASA. This call is used in the Average Speed of Answer calculation.

**Table 44: Sample Call Type Reports**

<table>
<thead>
<tr>
<th>Call Type Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp05: Analysis of Calls Half Hour Report</td>
<td>The Tasks Routed field is incremented for this call.</td>
</tr>
</tbody>
</table>
| caltyp21: Call Type Half Hour Report | This call affects the following fields  
• Service Level. This call is used in the Service Level calculation. Because the call was answered within the service level threshold, it affects the Service Level positively.  
• ASA. This call is used in the Average Speed of Answer calculation.  
• Tasks: Offered. This field is incremented.  
• Tasks: Answered. This field is incremented.  
• Tasks: Answer Wait Time. This field is incremented.  
• Completed Tasks: Total. This field is incremented.  
• Completed Tasks: Handled. This field is incremented. |
| caltyp31: Call Type Abandon/Answer Distribution by Half Hour Report | This call affects the following fields  
• ASA. This call is used in the Average Speed of Answer calculation.  
• 00:00:00 - 00:01:00: Ans. This field is incremented. |

**Voice Call with Queuing**

The following script is used for this example:
Note: For IPCC Enterprise with System IPCC PG and System IPCC deployments, the Translation Route to VRU node is not needed.

In this script, the script first tries to select an available agent using the LAA (Longest Available Node) from the appropriate skill groups. If an agent is not available, the script then performs a translation route to VRU and queues the call to the appropriate skill groups. During queuing, the VRU plays music on hold. Labels are used for default routing in case the Translation Route to VRU, Queue to Skill Group, or Run Ext. Script nodes fail.

The following events occur:

1. A customer calls the contact center at 9:05:07 a.m.
2. An agent is not available. The script uses the Transfer to IVR node and then the Queue to Skill Group node to queue the call to the appropriate skill group.
3. An agent becomes available at 9:11:13 a.m.
4. The call is assigned to the agent.
   The agent answers the phone at 9:11:17 a.m.
5. The caller hands up at 9:27:01 a.m.
6. The agent enters wrap up and completes wrap up at 9:29:25 a.m.

For this call flow, all events occur within the 09:00:00 to 09:29:59 reporting interval. Reports run from 09:00:00 to 09:29:59 display all of the data for this call.

Table 45: Sample Agent Reports

<table>
<thead>
<tr>
<th>Agent Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent04: Agent Task Detail Report</td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Total Tasks. This field is incremented.</td>
</tr>
</tbody>
</table>
### Field Affected by Call Flow

<table>
<thead>
<tr>
<th><strong>Agent Report</strong></th>
<th><strong>Fields Affected by Call Flow</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>agent25: Agent Consolidated Half Hour Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Avg Time. The handle time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• % Wrap Up. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>This call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Active Time. The agent's active time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Wrap Up. The agent's wrap up time for call is used in the calculation.</td>
</tr>
</tbody>
</table>

### Table 46: Sample Skill Group Reports

<table>
<thead>
<tr>
<th><strong>Skill Group Report</strong></th>
<th><strong>Fields Affected by Call Flow</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>perskg31: IPCC Peripheral Skill Group Task Summary Half Hour Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Queued. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: % Handled. This call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td>perskg35: IPCC Peripheral Skill Group Consolidated Half Hour Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Queued. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: AHT. The handle time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Avg Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: Active Time. The active time is displayed (15 minutes 46 seconds).</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
</tbody>
</table>
### Skill Group Report

<table>
<thead>
<tr>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Agent State Times: % Reserved Time. The agent’s reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• Agent State Times: % Wrap Up Time. The agent’s wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
</tbody>
</table>

**Table 47: Sample Call Type Reports**

<table>
<thead>
<tr>
<th>Call Type Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp05: Analysis of Calls</td>
<td>This call affects the following fields</td>
</tr>
<tr>
<td>Half Hour Report</td>
<td>• Tasks Routed. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Assigned from Queue. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Avg Wait Time in Queue. This call is used in the calculation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Call Type Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp21: Call Type Half Hour</td>
<td>This call affects the following fields</td>
</tr>
<tr>
<td>Report</td>
<td>• Service Level. This call is used in the Service Level calculation. Because the call was not answered within the service level threshold, it affects the Service Level negatively.</td>
</tr>
<tr>
<td></td>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answer Wait Time. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Assigned from Queue. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
</tbody>
</table>

**Table 48: Sample VRU Service Reports - Not Applicable for System IPCC or ARI**

<table>
<thead>
<tr>
<th>Service Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>persvc20: Peripheral Service for IVR Queue Half Hour Report</td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Service Level. This call is used in the Service Level calculation. Because the call was not answered within the service level threshold, it affects the Service Level negatively.</td>
</tr>
</tbody>
</table>
Voice Call with Agent Consultative Transfer

The following script is used for the consultative transfer in this example:

*Figure 12: Routing Script for Voice Call without Queuing*

Note: For IPCC Enterprise with System IPCC PG and System IPCC deployments, the Translation Route to VRU node is not needed.

In this script, the script first tries to select an available agent for the consultative transfer using the LAA (Longest Available Node) from the appropriate skill groups. If an agent is not available, the script then performs a translation route to VRU and queues the agent's call to the appropriate skill groups. During queuing, the VRU plays music on hold. Labels are used for default routing in case the Translation Route to VRU, Queue to Skill Group, or Run Ext. Script nodes fail.

The following events occur:

1. A customer calls the contact center at 9:05:09 a.m.
2. The script uses the LAA (longest available agent) node to select an available agent.
3. The agent's phone rings.
4. The agent answers the phone at 9:05:11 a.m.
5. The agent decides that the caller needs to be transferred to a different agent.
6. The agent puts the caller on hold at 9:10:53 a.m.
7. The agent presses the consult button on the desktop and enters the dialed number for the skill group.
8. The dialed number is associated with a call type for transfer and conference. The call type invokes a routing script that uses the LAA node to select an available agent in that skill group.

9. The second agent answers the call at 9:11:02 a.m. and consult with the first agent.

10. The first agent transfers the call to the second agent at 9:22:46 a.m.

11. The second agent talks to the caller and ends the call at 9:32 a.m.

12. The second agent enters wrap up and completes wrap up at 9:40:14 a.m.

For this call flow, events occur within the 09:00:00 to 09:29:59 reporting interval and the 09:30:00 to 09:59:59 reporting interval. Reports run from 09:00:00 to 09:59:59 display all of the data for this call.

Table 49: Sample Agent Reports

<table>
<thead>
<tr>
<th>Agent Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent04: Agent Task Detail Report</td>
<td>For both Agent 1 and Agent 2, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Total Tasks. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Avg Time. The handle time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• % Wrap Up. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>agent25: Agent Consolidated Half Hour Report</td>
<td>For Agent 1, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Transfer Out. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Active Time. The agent's active time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Wrap Up. The agent's wrap up time for call is used in the calculation.</td>
</tr>
</tbody>
</table>

For Agent 2, this call affects the following fields

• Completed Tasks: Handled. This field is incremented.

• Transfer In. This field is incremented.

• Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.
Agent Report | Fields Affected by Call Flow
--- | ---
| • Agent State Times: % Active Time. The agent's active time for call is used in the calculation.
| • Agent State Times: % Wrap Up. The agent's wrap up time for call is used in the calculation.

**Table 50: Sample Skill Group Reports**

<table>
<thead>
<tr>
<th>Skill Group Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
</table>
| perskg31: IPCC Peripheral Skill Group Task Summary Half Hour Report | For Agent 1’s skill group, this call affects the following fields:
| | • Completed Tasks: Handled. This field is incremented.
| | • Completed Tasks: % Handled. This call is used in the calculation.
| | • Completed Tasks: Total. This field is incremented.
| | • Transfer Out. This field is incremented.
| | For Agent 2’s skill group 2, this call affects the following fields:
| | • Completed Tasks: Handled. This field is incremented.
| | • Completed Tasks: % Handled. This call is used in the calculation.
| | • Completed Tasks: Total. This field is incremented.
| | • Transfer In. This field is incremented.
| perskg35: IPCC Peripheral Skill Group Consolidated Half Hour Report | For Agent 1’s skill group 1, this call affects the following fields:
| | • Completed Tasks: Handled. This field is incremented.
| | • Completed Tasks: Total. This field is incremented.
| | • Completed Tasks: AHT. The handle time for this call is used in the calculation.
| | • Transfer Out. This field is incremented.
| | • Completed Tasks: Avg Active Time. The agent's active time for this call is used in the calculation.
| | • Agent State Times: Active Time. The active time for this call is included in this value.
| | • Agent State Times: % Active Time. The agent's active time for this call is used in the calculation.
| | • Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.
### Skill Group Report

<table>
<thead>
<tr>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Agent State Times: % Wrap Up Time. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>For Agent 2's skill group, this call affects the following fields</td>
</tr>
<tr>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td>• Completed Tasks: AHT. The handle time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• Transfer In. This field is incremented.</td>
</tr>
<tr>
<td>• Completed Tasks: Avg Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• Agent State Times: Active Time. The active time for this call is included in this value.</td>
</tr>
<tr>
<td>• Agent State Times: % Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• Agent State Times: % Wrap Up Time. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
</tbody>
</table>

### Table 51: Sample Call Type Reports

<table>
<thead>
<tr>
<th>Call Type Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp05: Analysis of Calls Half Hour Report</td>
<td>For both the original call type and the transfer and conference call type, the Tasks Routed field is incremented.</td>
</tr>
<tr>
<td>caltyp21: Call Type Half Hour Report</td>
<td>For both the original call type and the transfer and conference call type, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Service Level. This call is used in the Service Level calculation. Because the call was answered within the service level threshold, it affects the Service Level positively.</td>
</tr>
<tr>
<td></td>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answer Wait Time. This field is incremented.</td>
</tr>
<tr>
<td>Call Type Report</td>
<td>Fields Affected by Call Flow</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>calyp31: Call Type Abandon/Answer Distribution by Half Hour Report</th>
<th>For both the original call type and the transfer and conference call type, this call affects the following fields</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
<tr>
<td></td>
<td>• 00:00:00 - 00:01:00: Ans. This field is incremented.</td>
</tr>
</tbody>
</table>

**Voice Call with Redirection on No Answer with IP-IVR**

The following scripts are is used when the call Redirects on No Answer.

**Initial script:**

![Routing Script for Redirection on No Answer with IP-IVR](image)

**Script used when call Redirects on No Answer:**
The second script is associated with the Redirection on No Answer Call Type and is run when an agent does not answer a call within the ring no answer time specified in Agent Desk Settings. The script performs a translation route to VRU and queues the agent's call to the appropriate skill groups at a higher priority. During queuing, the VRU plays music on hold. Labels are used for default routing in case the Translation Route to VRU, Queue to Skill Group, or Run Ext. Script nodes fail.

The following events occur:

1. Call enters script at 4:03:01 p.m.
2. Call is transferred to the IVR and queued using the Queue to Skill Group node.
3. An agent becomes available at 4:04:04 p.m.
4. The call is assigned to the agent. The call rings on the agent desktop. The ring time exceeds agent desk settings. The agent is made Not Ready with a reason code 32767 (Ring No Answer).
5. The router runs the routing script associated with the call type for the ring no answer dialed number. The script attempts to select the first available agent from a skill group.
6. No agents are ready, so the script performs a transfer to IVR and then uses Queue to Skill Group node to queue to Skill Group 2. The call begins to queue at 4:04:05 p.m.
7. Agent 2 becomes Ready at 4:05:02 p.m.
8. The call is assigned to the agent and rings on the agent's desktop.
9. The agent answers call at 4:05:04 p.m.
10. The caller ends the call at 4:10:37 p.m.

11. The agent performs Wrap up work until 4:12:59 p.m.

For this call flow, events occur within the 16:00:00 to 16:29:59 reporting interval. Reports run from 16:00:00 to 16:29:59 display all of the data for this call.

**Table 52: Sample Agent Reports**

<table>
<thead>
<tr>
<th>Agent Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>agent04: Agent Task Detail Report</td>
<td>For Agent 1, this call does not affect any fields.</td>
</tr>
<tr>
<td></td>
<td>For Agent 2, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Total Tasks. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks Handled: Avg Time. The handle time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• % Wrap Up. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>agent25: Agent Consolidated Half Hour Report</td>
<td>For Agent 1, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Redirect No Answer. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Not Ready. The agent's Not Ready time after this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>For Agent 2, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Active Time. The agent's active time for call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Wrap Up. The agent's wrap up time for call is used in the calculation.</td>
</tr>
<tr>
<td>agent 31: Agent Not Ready Detail Report</td>
<td>For Agent 1, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Reason Code. This field displays &quot;Ring No Answer [32767]&quot;.</td>
</tr>
<tr>
<td></td>
<td>• Duration. This field displays the amount of time that the agent remained in Not Ready state.</td>
</tr>
</tbody>
</table>

IPCC Enterprise Voice Call Reporting Data

Chapter 7: Sample Calls and Report Data

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Reporting Guide for Cisco Unified Contact Center Enterprise & Hosted 7.5(1)
### Agent Report

<table>
<thead>
<tr>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• % Logon Duration. This field displays the percent of the agent's logon duration in which the agent was in Not Ready state with this reason code.</td>
</tr>
<tr>
<td>• % Not Ready. This field displays the percent of the agent's entire Not Ready duration in which the agent was in Not Ready state with this reason code.</td>
</tr>
</tbody>
</table>

**Table 53: Sample Skill Group Reports**

<table>
<thead>
<tr>
<th>Skill Group Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>perskg31: IPCC Peripheral Skill Group Task Summary Half Hour Report</td>
<td>For Agent 1's skill group, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Redirect No Answer. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>For Agent 2's skill group, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Total Queued. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: % Handled. This call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Transfer In. This field is incremented.</td>
</tr>
<tr>
<td>perskg35: IPCC Peripheral Skill Group Consolidated Half Hour Report</td>
<td>For Agent 1's skill group, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Redirect No Answer. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Not Ready Time. The agent's Not Ready time after this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>For Agent 2's skill group, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Total Queued. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: AHT. The handle time for this call is used in the calculation.</td>
</tr>
</tbody>
</table>
Skill Group Report | Fields Affected by Call Flow
--- | ---
- Completed Tasks: Avg Active Time. The agent's active time for this call is used in the calculation.
- Agent State Times: Active Time. The active time for this call is included in this value.
- Agent State Times: % Active Time. The agent's active time for this call is used in the calculation.
- Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.
- Agent State Times: % Wrap Up Time. The agent's wrap up time for this call is used in the calculation.
- ASA. This call is used in the Average Speed of Answer calculation.

Table 54: Sample Call Type Reports

<table>
<thead>
<tr>
<th>Call Type Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
</table>
| caltyp05: Analysis of Calls Half Hour Report | For the original call type, the Tasks Routed field is incremented. For the RONA call type, this call affects the following fields:
- Tasks Routed. This field is incremented.
- Assigned from Queue. This field is incremented.
- Avg Wait Time in Queue. This call is used in the calculation. |
| caltyp21: Call Type Half Hour Report | For the original call type, this call affects the following fields
- Tasks: Offered. This field is incremented.
- Tasks: Answer Wait Time. This field is incremented.
- Completed Tasks: Total. This field is incremented.
- Completed Tasks: Other. This field is incremented. For the RONA call type, this call affects the following fields
- Service Level. This call is used in the Service Level calculation. Because the call was answered within the service level threshold, it affects the Service Level positively.
- ASA. This call is used in the Average Speed of Answer calculation.
- Tasks: Offered. This field is incremented.
- Tasks: Answered. This field is incremented. |
### Call Type Report

<table>
<thead>
<tr>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Tasks: Answer Wait Time. This field is incremented.</td>
</tr>
<tr>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td>• Completed Tasks: % Queued. This call is included in the calculation.</td>
</tr>
</tbody>
</table>

**caltyp31: Call Type Abandon/Answer Distribution by Half Hour Report**

For the RONA call type, this call affects the following fields:

- ASA. This field is incremented.
- 00:01:00 - 00:01:30: Ans. This field is incremented.

### Table 55: Sample VRU Service Reports - Not Applicable for System IPCC or ARI

<table>
<thead>
<tr>
<th>Service Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>persvc20: Peripheral Service for IVR Queue Half Hour Report</td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Service Level. This call is used in the Service Level calculation. Because the call was answered within the service level threshold, it affects the Service Level positively.</td>
</tr>
<tr>
<td></td>
<td>• Tasks Routed. This field is incremented.</td>
</tr>
</tbody>
</table>

### Voice Calls that Redirect on No Answer with CVP

The following script is used for this example:

---

**Reporting Guide for Cisco Unified Contact Center Enterprise & Hosted 7.5(1)**
The following events occur:

1. Agent 1 is available.

2. The call enters script at 4:03 p.m.

3. The call is assigned to Agent 1 using the Queue to Skill Group node at 4:03 p.m.

4. The call rings on the agent desktop. The ring time exceeds agent desk settings. The agent is made Not Ready, reason code 50010 at 4:03:30 p.m.

5. The ring time exceeds CVP timeout at 4:03:32 p.m. The call is requeried. The call then goes through the failure path of the first Queue to Skill Group node.

6. The Call Type is changed in the script for tracking purposes.

7. The script then goes to the second Queue to Skill Group node. No agents are ready, so the call is queued.

8. Agent 2 becomes Ready at 4:06:10 p.m. The call is assigned to agent.

9. The agent answers call at 4:06:39 p.m.

10. The caller ends call at 4:10 p.m.

11. The agent performs Wrap up work until 4:12 p.m.
For this call flow, events occur within the 16:00:00 to 16:29:59 reporting interval. Reports run from 16:00:00 to 16:29:59 display all of the data for this call.

**Table 56: Sample Agent Reports**

<table>
<thead>
<tr>
<th>Agent Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
</table>
| agent04: Agent Task Detail Report | For Agent 1, this call does not affect any fields. For Agent 2, this call affects the following fields:  
- Tasks Handled: Total Tasks. This field is incremented.  
- Tasks Handled: Avg Time. The handle time for call is used in the calculation.  
- % Wrap Up. The agent's wrap up time for this call is used in the calculation. |
| agent25: Agent Consolidated Half Hour Report | For Agent 1, this call affects the following fields  
- Completed Tasks: Redirect No Answer. This field is incremented.  
- Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.  
- Agent State Times: % Not Ready. The agent's Not Ready time after this call is used in the calculation.  

For Agent 2, this call affects the following fields  
- Completed Tasks: Handled. This field is incremented.  
- Agent State Times: % Reserved Time. This agent's reserved time for this call is used in the calculation.  
- Agent State Times: % Active Time. The agent's active time for call is used in the calculation.  
- Agent State Times: % Wrap Up. The agent's wrap up time for call is used in the calculation. |
| agent31: Agent Not Ready Detail Report | For Agent 1, this call affects the following fields  
- Reason Code. This field displays "Ring No Answer [32767]".  
- Duration. This field displays the amount of time that the agent remained in Not Ready state.  
- % Logon Duration. This field displays the percent of the agent's logon duration in which the agent was in Not Ready state with this reason code.  
- % Not Ready. This field displays the percent of the agent's entire Not Ready duration in which the agent was in Not Ready state with this reason code. |
### Table 57: Sample Skill Group Reports

<table>
<thead>
<tr>
<th>Skill Group Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>perskg31: IPCC Peripheral Skill Group Task Summary Half Hour Report</td>
<td>For Agent 1's skill group, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Redirect No Answer. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>For Agent 2's skill group, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Total Queued. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: % Handled. This call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Transfer In. This field is incremented.</td>
</tr>
<tr>
<td>perskg35: IPCC Peripheral Skill Group Consolidated Half Hour Report</td>
<td>For Agent 1's skill group, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Redirect No Answer. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Not Ready Time. The agent's Not Ready time after this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>For Agent 2's skill group, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Queued. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: AHT. The handle time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Avg Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: Active Time. The active time for this call is included in this value.</td>
</tr>
<tr>
<td></td>
<td>• Agent State Times: % Active Time. The agent's active time for this call is used in the calculation.</td>
</tr>
</tbody>
</table>
### Skill Group Report

<table>
<thead>
<tr>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Agent State Times: % Reserved Time. The agent's reserved time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• Agent State Times: % Wrap Up Time. The agent's wrap up time for this call is used in the calculation.</td>
</tr>
<tr>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
</tbody>
</table>

### Table 58: Sample Call Type Reports

<table>
<thead>
<tr>
<th>Call Type Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>caltyp05: Analysis of Calls Half Hour Report</td>
<td>For the original call type, the Tasks Routed field is incremented. For the RONA call type, this call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Routed. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Assigned from Queue. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Avg Wait Time in Queue. This call is used in the calculation.</td>
</tr>
<tr>
<td>caltyp21: Call Type Half Hour Report</td>
<td>For the original call type, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answer Wait Time. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Overflow Out. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>For the RONA call type, this call affects the following fields</td>
</tr>
<tr>
<td></td>
<td>• Service Level. This call is used in the Service Level calculation. Because the call was answered within the service level threshold, it affects the Service Level positively.</td>
</tr>
<tr>
<td></td>
<td>• ASA. This call is used in the Average Speed of Answer calculation.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Tasks: Answer Wait Time. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Total. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: Handled. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Completed Tasks: % Queued. This call is included in the calculation.</td>
</tr>
</tbody>
</table>
### Table 59: Sample VRU Service Reports - Not Applicable for System IPCC or ARI

<table>
<thead>
<tr>
<th>Service Report</th>
<th>Fields Affected by Call Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>persvc20: Peripheral Service for IVR Queue Half Hour Report</td>
<td>This call affects the following fields:</td>
</tr>
<tr>
<td></td>
<td>• Tasks Offered. This field is incremented.</td>
</tr>
<tr>
<td></td>
<td>• Service Level. This call is used in the Service Level calculation. Because the call was answered within the service level threshold, it affects the Service Level positively.</td>
</tr>
<tr>
<td></td>
<td>• Tasks Routed. This field is incremented.</td>
</tr>
</tbody>
</table>
Chapter 8

Troubleshooting Report Data

This section provides troubleshooting information for IPCC Enterprise report data.

This chapter contains the following topics:

- Troubleshooting Agent Reporting, page 147
- Troubleshooting Call Type and Skill Group Reporting, page 150
- Troubleshooting Queue Reporting, page 155
- Troubleshooting VRU Application and Trunk Group Reporting (Not applicable to System IPCC or ARI), page 156
- Troubleshooting Historical Data Server Data, page 157
- Troubleshooting Application Gateway Reporting, page 159

Troubleshooting Agent Reporting

Agent data does not appear in reports

Symptom:

Agent data does not appear in WebView agent reports.

Message:

None

Cause:

This might occur if the enable agent reporting option is disabled for the Cisco CallManager peripheral.

Action:
If you are using any deployment other than System IPCC, in the PG Explorer tool of the ICM Configuration Manager, open the Cisco CallManager peripheral (either the CallManager PG or IPCC PG depending on your configuration). Check the **enable agent reporting** option on the Agent Distribution tab.

If you are using System IPCC, this is enabled by default.

**Agent Not Ready reason code text does not appear in reports**

**Symptom:**

The **WebView Agent Not Ready** reports (agent30: Agent Not Ready Summary and agent31: Agent Not Ready Detail) show only the numeric Not Ready reason code, not the textual code.

**Message:**

None

**Cause:**

This might occur if you either have not configured the Not Ready reason codes with associated text in the ICM/IPCC configuration tool or the agent event detail option is disabled for the Cisco CallManager peripheral. For System IPCC, agent event detail is enabled by default and cannot be disabled.

**Action:**

If Not Ready reason codes are not configured in the ICM/IPCC configuration, configure the Not Ready reason codes and their textual equivalents using the Reason Code List tool. These reason codes match the Not Ready reason codes configured in the agent desktop software.

**Note:** The IPCC Enterprise system uses several predefined Not Ready reason codes (50002, 50010, and 32767) that do not have associated text. If you want a textual reason code to appear in reports for these Not Ready reason codes, you must configure them in the Reason Code List Tool.

If Not Ready reason codes are configured in ICM Configuration Manager, open the Cisco CallManager peripheral (either the CallManager PG or IPCC PG depending on your configuration). Check the **agent event detail** option on the Agent Distribution tab.

**Agent state does not appear in Agent State Trace reports**

**Symptom:**

Agent state information does not appear in WebView real-time agent state trace report.

**Message:**

None
Cause:

This might occur if the agent state trace option is disabled for the agent.

Action:

In the ICM/IPCC configuration tool, open the agent's record. Check the agent state trace option.

Note: Enabling agent state trace for many agents might impact system performance as the option causes more records to be written to the database. If you notice a performance problem, you might want to disable agent state trace, or only enable agent state trace for those agents on whom you are reporting.

Agent Desktop Statistics for LoggedOnTimeSession do not appear to report accurately

Symptom:

For agents who log in at a CTI OS desktop, the LoggedOnTimeSession is sometimes smaller than the summary of AvailTimeSession and HandledCallsTalkTimeSession in WebView reports.

The Handled Calls and AvailTime summary might differ from the logged on time by as much as 18 seconds over a half hour period (about 1%).

Message:

N/A

Cause:

This is a rounding issue and is to be expected. Although the Handled Calls and AvailTime summary might differ by about 1% over a half-hour period, the HandledCallsTalkTimeSession will correlate with a summary of Termination Call Detail data at the end of the day.

Action:

N/A

Agent-initiated Outbound calls appear as Inbound/Internal

Symptom:

When an agent makes an outbound call, the call appears as an internal outbound call in reports and statistics. Call counts appear in the 'Internal Out' column in WebView reports, and do not appear in the 'External Out Task' field as expected.

Message:

N/A

Cause:
In the configuration for Call Manager, under Route Pattern Configuration, the check box for 'Allow Overlap Sending' is not selected.

**Action:**

To resolve this, make sure that in the configuration for Call Manager, under Route Pattern Configuration, the check box for 'Allow Overlap Sending' is selected.

## Troubleshooting Call Type and Skill Group Reporting

### Call Type ErrorCount incremented if Caller disconnects when call is translation routed

**Symptom:**

During a transfer, the caller hangs up while the call is being transferred. The call is reported as an error.

**Message:**

None

**Cause:**

IP IVR cannot notify ICM that the call abandoned because it does not yet have the call object information. For reporting, the call is reported as an error, and a Route_Call_Detail record is cut for the call.

**Action:**

The call flow was that the call was translation routed to the IVR, but it did not get there. The Router encountered a translation route time out.

### Call Type reports and Overflow Out Column

**Symptom:**

Call Types reports, both real time and Historical, might seem to not peg correctly, based on the call counts in the "overflow out" column.

The reports affected are caltyp20, caltyp21, caltyp22, caltyp23, caltyp24, caltyp35, and caltyp36.

**Message:**

None

**Cause:**

Overflow Out is incremented when one of the following occurs:
1. The Call Type associated with the current call is changed through use of a Call Type or Requalify node.

2. The call is redirected.

   When a call is redirected, the PIM no longer can receive events for the call and has no way of referencing or tracking the call. For example, the call might have been redirected to a non-ICM monitored device and then returned to the switch with a different call ID. The ICM generates the termination call detail record with only the data originally tracked for the call. Calls marked as Redirected are counted as OverflowOut calls in the ICM service and route tables.

3. The call is sent to a label using a label node. The call was not default-routed, and the label was not a ring, busy, or announcement label.

4. The call hits a release node.

**Action:**

Consider these conditions by which Overflow Out is incremented when you analyze the Overflow Out columns in Call Type reports.

Calls Offered for call type does not seem correct over a half-hour interval

**Symptom:**

Calls Offered for the Call Type WebView reports is calculated as Calls Handled + Calls Abandoned + Return Busy + Return Ring + Default Treatment + Network Routed + Overflow Out + Call Errors + Announcement Calls + Short Calls. However, in a half-hour interval, this equation might not provide the report value for Calls Offered.

**Message:**

None

**Cause:**

Calls might change state in different half-hour intervals. For example, if a call is offered at 10:59 AM but is not handled until 11:01 AM, the Call Type data for the 10:30:00 to 10:59:59 interval is incremented for calls offered, but not calls handled. Calls handled is incremented in the next half-hour interval.

**Action:**

None required

Total number of calls queued to each skill group is greater than the number of calls offered for the day

**Symptom:**
The total number of calls queued to each skill group is greater than the number of calls offered to the skill groups over a day. For example, 800 calls are queued to skillgroup1 and 700 calls queued to skillgroup2, but the total number of calls queued is 900, not 1500.

**Message:**

None

**Cause:**

When a call is queued to more than one skill group, the call is counted as queued in each skill. Therefore, it appears that the call is being counted more than once. At the Call Type level, these calls are correctly counted as only one call. Similarly, if the call abandons while queued, it is counted as an abandon in each skill group to which it is queued but is counted correctly as one call at the Call Type level.

**Action:**

None required

**Calls counted as errors in call type reports**

**Symptom:**

Call type reports show calls being counted as errors.

**Message:**

None

**Cause:**

This is expected behavior. The error count for the call type is incremented for three events. These events include:

- An error occurs in the ICM script and a default route is not configured.

  Examples of script errors include:
  
  - The calls enters a loop in the script and is executed in more script nodes than the configuration allows and a default label does not exist.
  
  - A call is queued for longer than the maximum queue time configured and a default label does not exist.
  
  - A terminating node does not lead to a label and a default label does not exist.

- A TCD record is written with a CallTypeID that has a Call Disposition that is unexpected or not counted elsewhere (The CallDispositionFlag will be 4). For Router errors, this includes
calls with RouterErrorCode in RCD which is greater than 0 but not 448. For Agent errors, this includes Call Dispositions 1, 4, 8-12, 16-18, 20-27, 31-33, 39, 42, 44-51.

• An error occurs at the VRU or CallManager that causes the call to fail before the router has completed the call routing.

Action:

To avoid script errors from being reported as errors of the call type, configure default labels and default routes for scripts.

See Also


Calls counted as incomplete in call type reports

Symptom:

Call type reports show calls being counted as incomplete.

Message:

None

Cause:

An incomplete call is a call that was routed to an agent, but failed to arrive. Incomplete calls have a Call Disposition of 1 in the Terminiation_Call_Detail record.

Calls are counted as incomplete under these conditions:

• The agent presses the head set button to enable the headset while in the Available state as the ICM Router is attempting to send the agent a call.

• The agent attempts to make a call from the hard phone as the ICM Router is attempting to send the agent a call.

• An agent in the Available state is direct dialed as the ICM router is attempting to send the agent a call.

• Network problems occur, such as traffic congestion.

• The call disconnects en route to the agent.

• An incorrect label is configured for the device target. Therefore, the call is sent to the wrong number and the agent never receives the call.

Action:
None required

Calls offered to the call type is greater than total calls offered to skill group

**Symptom:**

Two call types, Call Type 1 and Call Type 2, are configured. All of the calls for these call types are offered to the same skill group. The total number of calls offered to Call Type 1 and Call Type 2 is greater than the total calls offered to the skill group.

**Message:**

None

**Cause:**

Skill group Calls Offered and call type Calls Offered are not equivalent, even if all calls for the call types are sent to the same skill group. If a call disconnects for any reason before it reaches the Queue to Skill Group script node, Calls Offered is incremented for the call type, but is not incremented for the skill group.

**Action:**

None required

Number of calls that abandon while ringing for the skill group does not equal the number of calls that abandon for the call type

**Symptom:**

A call type report displays a larger number of calls that abandon than the number of calls that are shown as abandon ring in a skill group report.

**Message:**

None

**Cause:**

There is no correlation between calls that abandon and calls that abandon while ringing. Abandon Ring calls are calls that are routed by ICM software to a skill group and were abandoned while ringing at an agent's phone. Abandon Ring is incremented only when this specific event occurs. The call type Calls Abandoned is incremented every time a call abandons, including while the call is in queue and at any point in the ICM routing script before the call rings at an agent.

**Action:**

None required
Abandon delay time when caller abandons in queue is different than average abandon delay time when call abandons while ringing for the call type

**Symptom:**

abandon delay time when caller abandons in queue is different than average abandon delay time when call abandons while ringing for the call type.

**Message:**

None

**Cause:**

The average abandon delay time is calculated for calls that abandoned in the half-hour interval (CallsAbandonQToHalf). The CallsAbandonQToHalf database field is incremented for calls that were abandoned while in queue, while ringing, or while in a script node.

For calls that abandon in the routing script, the average abandon delay time is the average time that calls spend in the ICM script before being abandoned. This time includes any time that the call spent in the script before being queued.

For calls that abandon while ringing, the average abandon delay time is the average of Queue Time + Ring Time + Delay Time. The average abandon delay time does not include the time that the call spent in the ICM script before being queued.

**Action:**

None required

---

**Troubleshooting Queue Reporting**

Queue information does not appear in reports (Not applicable to System IPCC or ARI)

**Symptom:**

Data relating to queued calls does not appear in reports; fields related to queued tasks are 0.

**Message:**

None

**Cause:**

This can occur if you have not enabled Queue reporting for the VRU peripheral.

**Action:**
In the ICM Configuration Manager, open the VRU peripheral. Select the **Queue reporting** option.

**Missing call in queue information in the WebView Service real-time and historical templates (Not applicable to System IPCC or ARI)**

**Symptom:**

In the WebView Service templates, the value of "Calls Q Now" and "Calls Q Now Time" are 0.

**Message:**

None

**Cause:**

This can occur when the route links to the skill group because it causes a lack of visibility for the "Longest Call Queued" values.

**Action:**

For IPCC Enterprise, use the Call Type or Skill Group templates to report on the "Calls Q Now" and "Calls Q Now Time" fields, as these fields are updated correctly for the skill group for every call in the Queue.

**Troubleshooting VRU Application and Trunk Group Reporting (Not applicable to System IPCC or ARI)**

VRU Application information does not appear in Call Type or Service reports

**Symptom:**

Data relating to VRU applications, such as the number of VRU Handled tasks or data for VRU services, does not appear in reports; fields related to VRU applications are 0.

**Message:**

None

**Cause:**

This can occur if you have not enabled Service Control reporting for the VRU peripheral.

**Action:**
In the ICM Configuration Manager, open the VRU peripheral. Select the **Service Control** option.

Information for Trunk Groups associated with VRU ports does not appear in trunk group reports (Not applicable to System IPCC or ARI)

**Symptom:**

Data relating to VRU ports does not appear in trunk group reports.

**Message:**

None

**Cause:**

This can occur if you have not enabled Service Control reporting and queue reporting for the VRU peripheral.

**Action:**

In the ICM Configuration Manager, open the VRU peripheral. Select the **Service Control** option and the **Queue reporting** option.

**Troubleshooting Historical Data Server Data**

**Historical Data Server is losing the oldest data**

**Symptom:**

Historical Data Server (HDS) data that is within the data retention time set for the HDS is being purged from the database.

**Message:**

None

**Cause:**

This could occur because the database has reached 80% capacity and is therefore performing purge adjustment each night to reduce the size to 80%. Unlike scheduled purges, in which data is purged nightly to remove all records older than the data retention time you specified, purge adjustment removes the last record from each table in the database until 80% capacity is reached. Purge adjustment continues to reduce the size of the database to 80% until the database size is increased.

**Action:**
To correct this, increase the size of the database.

Historical report is missing data for a recent interval

**Symptom:**

A historical report is missing data for a recent interval.

**Message:**

None

**Cause:**

This could occur because you are running the report at the end of the last interval (for example it is 12:31 and you are running a report from the 12:00:00 to 12:29:59 interval). Data replication from the Logger to the Historical Data Server can be delayed by 1 to 5 minutes. The data for the last interval might not be in the HDS yet.

This could also be because the Logger connected to the HDS has gone offline or because the Logger went offline and is now in the process of recovering. When the Logger fails, the HDS does not switch to the backup Logger. Instead, it waits for its Logger to recover. When the Logger recovers, it begins receiving current data and recovers data from the backup Logger for the time it was down. Once data recovery is complete, the Logger begins to send the recovery data to the HDS. Report data for the selected interval is available once the Logger has completed recovery and the data is replicated to the HDS.

This problem could also occur if the HDS has gone offline or because the HDS went offline and is now in the process of recovering. If it is recovering, data for the selected interval will be available when recovery for that interval is complete. If the HDS has failed, the data for that interval will be available when the HDS comes back up and completes recovery for that interval. In either case the data is still on the logger and is not lost.

**Action:**

No action is necessary; the data will appear in reports when the recovery and replication processes are complete. Try running the report again in several minutes.

Data is missing from the Historical Data Server after it has recovered from a failure

**Symptom:**

Historical data is missing from the HDS.

**Message:**

None

**Cause:**
This could be because your logger data retention and Historical Data Server backup schedule are not in sync. You plan these two schedules together so that you retain data on the logger for the period in which the HDS is not backed up. For example, if you are retaining data on the logger for 2 weeks, you back up the HDS, at the minimum, once every two weeks. This way, if the HDS fails, it can recover past data up to the last two weeks from a previous HDS back up and data for the last two weeks from the logger. If you are backing up the HDS every two weeks but storing data on the logger for only a week, you will be missing a week of historical data if the HDS fails or the database has become corrupted.

**Action:**

Change the data retention on the logger or backup schedule for the HDS to avoid this issue.

Troubleshooting Application Gateway Reporting

The number of Application Gateway requests in reports is larger than the number of Router Call Detail records

**Symptom:**

The number of Application Gateway requests shown in the **WebView Application Gateway Half Hour Status** report is larger than the number of Router Call Detail (RCD) records in the database.

**Message:**

None

**Cause:**

This might occur if the router has sent an Application Gateway request and has not yet received a response. An RCD record is written when a call completes routing according to the router. The Application Gateway request is incremented when the router sends an Application Gateway request. For these calls, the number of Application Gateway requests has been incremented, but the RCD has not been written.

**Action:**

If you run the report at the end of the day, the two numbers be very close, if the contact center does not receive calls 24 hours a day.
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