



Multichannel Routing

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Overview of Multichannel Services

When your system is integrated with multichannel features, you write routing scripts to route contacts that these features handle. Multichannel features include Enterprise Chat and Email, and third-party multichannel applications that use the Task Routing APIs.

Enterprise Chat and Email

You can configure CCE deployments with Enterprise Chat and Email to use independent media queues, in which an agent can handle tasks for a single media channel. You can also use Task Routing, in which an agent can handle tasks for several media channels.

Supported Route Requests for ECE Web Request

Unified CCE supports the following types of multichannel route requests when integrated with ECE:

- **Web callback** - A web callback request is a request that does not involve ECE. You click a button on a website that says, "Call me back." Then the caller and agent simply talk on the phone.

- **Text chat** - The caller and agent can conduct a text chat session when a phone call is not desired or not possible. They can both chat and collaborate on the web.
- **Email message** - The customer and agent communicate using electronic mail.

Application Request Routing with ECE Web Request

The ECE routes requests to a Media Routing Peripheral gateway (MR-PG). The Media Routing Peripheral Interface Manager (MR-PIM) on the MR-PG provides a generic interface to queue and route requests. The MR-PIM communicates with the Router, which runs a routing script to determine how best to handle the request.

Unified CCE uses a media class ID to identify the type of media or channel. A media class is a communication channel that correlates to an application. Following are the predefined media classes in Unified CCE:

- **Cisco_Chat** - chat requests
- **Cisco_Voice** - web and delayed callbacks requests, and basic Unified CCE inbound and outbound voice calls
- **Cisco_Email** - email requests

Each media class has at least one Media Routing Domain (MRD), which is a collection of skill groups and services that are associated with a medium. The Unified CCE uses the MRD to route a task to an agent who is associated with a skill group and a particular medium. Each MRD requires a Unified CCE script, but it is possible to route requests from different MRDs using one script.

Synchronized Agents and Skill Groups for ECE

Agents are common across the multichannel software, but skill groups are application-specific. You can create agents using ECE or in contact center enterprise solutions and share the agents across applications. When agents or skill groups are created in ECE, they are simultaneously created in contact center enterprise solutions. If an agent is created in contact center enterprise solutions, you must enable the agent in ECE before the agent can work on those applications.

Only create, modify, or delete ECE skill groups in ECE. Skill groups are application-specific. When you create a skill group in ECE, the skill group is simultaneously created in the contact center enterprise solutions. But, you cannot enable that skill group in the core contact center enterprise applications.

Independent Media Queues for ECE

You can configure the multichannel software to route all media through independent queues that are defined by media class. You can configure agents to log in to only one media type to take either email, text chat, or voice. In this configuration, requests are queued only to agents who have signed in to the corresponding media application.

You can use independent media queues in both the Unified CCE and ACD environments.

Task Routing

Task Routing describes the system's ability to route requests from different media channels to agents who work with customer contacts in multiple media. Routing scripts can send requests to agents based on business rules regardless of the media channel from which the request came. For example, based on an agent's skills and current tasks, Unified CCE can route phone, chat, and email message requests to an agent who works with all these media. The agent can switch media on a task-by-task basis.

You can set up routing scripts so that multichannel tasks are assigned to the longest available agent in a skill group or precision queue in same Media Routing Domain as the task. You can also prioritize multichannel tasks using skill group and precision queue routing, as you would voice calls.

Because Task Routing must coordinate an agent's work on multiple tasks across different channels, Task Routing requires that Unified ICM have complete control over how agents are assigned tasks. Therefore, Task Routing requires that you use the Unified ICM in a Unified CCE environment. Task Routing is not supported in legacy ACD environments.

Digital Routing using Webex Connect

You can configure the Contact Center Enterprise (CCE) deployments with Webex Connect using the Digital Routing service, in which agents can handle tasks for several digital channels such as SMS, chat, and email.

Digital Routing Task Requests

The Digital Routing service that is installed on Cloud Connect routes the digital channel tasks to the router through a Media Routing Peripheral Gateway (MR-PG). The Media Routing Peripheral Interface Manager (MR-PIM) on the MR-PG provides a generic interface to queue and route requests. The MR-PIM communicates with the Router, which runs a routing script to determine how best to handle the request. You must have certain mandatory ECC variables defined in CCE for the Digital Routing tasks to be routed successfully. For the list of mandatory ECC Variables that must be configured for the Digital Routing Tasks, see [ECC Variables for Digital Routing Tasks, on page 4](#). For instructions about how to add the ECC variables in CCE, see the *Define ECC variables* section in the [Cisco Unified Contact Center Enterprise Features Guide](#).

If you are using ECC payloads, you must associate the ECC payloads that you created for the Digital Routing service to the Network VRU using the Network VRU Explorer tool in the Unified ICM Configuration Manager. You must then associate the Network VRU to the MR-PG using the PG Explorer tool in the Unified ICM Configuration Manager. For instructions about how to associate ECC payloads to Network VRU and the Network VRU to the MR-PG, see the *Configure MR PG* section in the [Configuration Guide for Cisco Unified ICM Enterprise](#).

In case you use different ECC payloads, that is one for receiving task context data from MR-PG to the Router and another to route the tasks to Finesse through Agent PG, ensure that the ECC variables defined for Digital Routing tasks are part of both the ECC payloads. If you use the system's "Default" payload, ensure that the ECC variables are part of the "Default" payload. These ECC variables carry task metadata that the Agent Desktop uses to identify a task as the digital channel task and to interact with Webex Engage to load the media pane. If you do not define these variables and add them in the Unified CCE Administration portal, the tasks do not appear in the Agent Desktop correctly. You can create and modify ECC payloads in the Configuration Manager > List Tools > Expanded Call Variable Payload List tool. For more information about *ECC variables and payloads*, see [Expanded Call Context \(ECC\) Variables](#).

ECC Variables for Digital Routing Tasks

This section provides the list of ECC Variables that you must configure for the Digital Channel interaction. All ECC variables are of type scalar and they are case-sensitive.

Table 1: ECC Variables

Variable	Table Size	Length	Mandatory / Optional
user_DR_Primary	Used to hold the FQDN of either the publisher node or the subscriber node of Cloud Connect. The FQDN denotes the Digital Routing service node that injected the task into CCE.	1 character + the length of the Cloud Connect FQDN.	Mandatory
user_DR_Backup	Used to hold the FQDN of either the publisher node or the subscriber node of Cloud Connect. The FQDN denotes the peer node of the Digital Routing service, which can be used as a backup, in case the Primary node is unavailable.	1 character + the length of the Cloud Connect FQDN.	Mandatory
user_DR_MediaResourceID	Used to hold the Conversation ID of Webex Engage, which the Webex Connect injects. The Cisco Finesse uses this conversation ID to load the media in the Manage Digital Channels gadget.	16 characters	Mandatory
user_DR_CustomerName	Used to display the customer name in the pop-over notification that an agent views when a task is received in the Manage Digital Channels gadget.	Up to a maximum of 210 characters.	Optional

Variable	Table Size	Length	Mandatory / Optional
user_DR_MediaChannelName	Used to populate the media channel name for the task, if you configure and add this ECC variable in the Unified Contact Center Enterprise Management portal. See the <i>Define ECC variables</i> section in the Cisco Unified Contact Center Enterprise Features Guide . This is typically required if you have mapped more than one Digital Routing media channel to the same MRD but still want unique task icons to appear on the agent desktop. For example, in CCE, the system-defined media channels, chat and SMS are both mapped to the same MRD. If there is a 1:1 mapping between the media channel and MRD, the system automatically identifies the icon to be displayed on the desktop based on the media channel with which the task was associated.	8 character	Optional

- ¹ If there are lengthy FQDNs, the Digital Routing service compresses the FQDN such that it is below 100 characters, and thereby allow ECC variable some space out of the 2000 bytes limit per call / task to be saved by not having to send the long name. In such cases, the variable can be defined as 100 characters long in CCE. The Digital Routing service automatically fills in the first character to indicate whether the following data is compressed or uncompressed. A prefix of 1 denotes compressed data, while a prefix of 0 denotes uncompressed data.

Media Routing Domains

Media Routing Domains (MRDs) organize how requests for each communication medium, such as voice and email, are routed to agents. For example, the Enterprise Chat and Email uses a Unified CCE MRD to route a task to an agent who is associated with a skill group or precision queue and a particular channel.

For Enterprise Chat and Email, configure MRDs in Configuration Manager. For custom multichannel applications that use the Task Routing APIs, configure MRDs in Unified CCE Administration.

For Digital Channel tasks that are initiated from Webex Connect, you can create MRDs either using the Media Routing Domain List tool in Configuration Manager, or through Unified CCE Administration tool. If you create the MRDs through the Unified CCE Administration portal, the MRDs get automatically associated to the system-defined application paths. If you have created the MRDs using the Media Routing Domain List tool in Configuration Manager, you must explicitly associate the MRD with the application path.

For every agent peripheral gateway, there is a system-defined application path that gets created with a suffix "UQ.Desktop". There is also an associated system-defined application called UQ.Desktop that automatically gets created in the system and identifies the Cisco Finesse server as a client to the Agent PG, to control Agent states in MRDs created for digital channels. The first number in the application path identifies the Logical Controller ID of the Agent PG. An example of the system-defined application path is 5000.UQ.Desktop.

Media Routing Domains and Interruptibility

When you configure MRDs, you indicate whether tasks for the MRD are interruptible. If the MRD is not interruptible, an agent working on tasks for that MRD is not assigned tasks from other MRDs. If the MRD is interruptible, the agent may be assigned tasks from another MRD.

Typically, tasks in which the agent and customer interact synchronously, such as voice calls and chats, are not interruptible. Email messages are typically interruptible because contact with the customer is asynchronous. Therefore, an agent responding to an email message may be interrupted by a phone call or chat session.

Use Media Routing Domains to Categorize Contacts

You can categorize contacts based on the MRD of the route request.

For example, you can have different MRDs for email and chat. You can have a single script for both types of requests that branches so that it routes email messages and chats to different targets.



Note For multichannel tasks submitted by applications using the Task Routing APIs, Unified CCE determines the MRD based on the dialed number/script selector in the task request.

Use the **Media Routing Domain** node (in the Routing tab of the Palette).

Figure 1: MRD Domain Icon



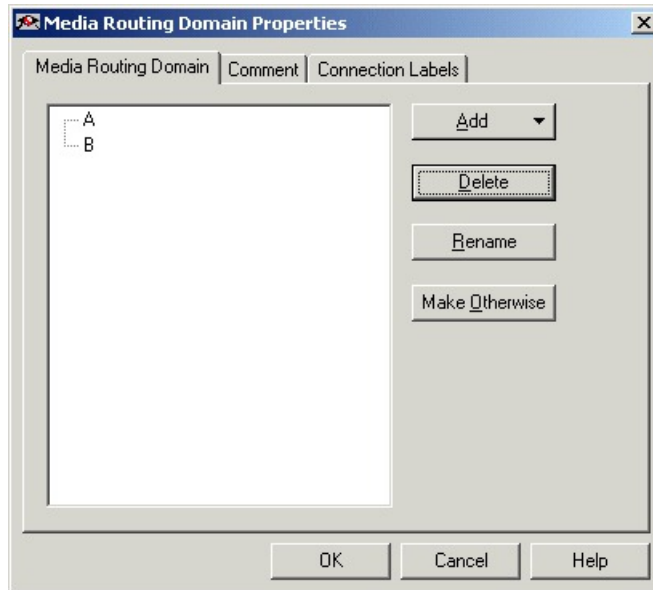
Insert targets and connections from the MRD node before you define the node's properties.



Note A branch can include multiple MRDs, but you can associate a single MRD with only one branch.

Following is the properties dialog box for the Media Routing Domain node:

Figure 2: Media Routing Domain Properties



Define Media Routing Domain node properties as follows:

Procedure

-
- Step 1** To associate an MRD with a branch, select the branch:
- Click **Add**.
 - Choose an MRD from the drop-down list.
- Step 2** To delete a branch, select it and click **Delete**.
- Step 3** To rename a branch, select it, click **Rename**, and type the new name.
- Step 4** You can define a branch as Otherwise by selecting the branch and clicking **Make Otherwise**. Execution follows this branch if none of the specified time ranges apply. You can specify only one Otherwise branch for the node.
-

Pick / Pull Node



The **Pick / Pull** node is available from the **Routing** tab **Object Palette**.

Pick / Pull node verifies that the route request is a valid pick or pull request for the specified MRD. The node checks that *serviceRequested* is one of the following:

- 4 = ROUTE_SERVICE_REQUEST_PICK_EXT_QUEUE
- 5 = ROUTE_SERVICE_REQUEST_PULL_EXT_QUEUE
- 6 = ROUTE_SERVICE_REQUEST_PICK_UCCE_AGENT

- 7 = ROUTE_SERVICE_REQUEST_TRANSFER_PICK

For these values, the script proceeds and terminates after the pick or pull is completed. For any other value of *serviceRequested*, the request flows through the node's failure branch. Check the error code in *VRUStatus*.

The node provides real-time monitoring of the following:

- Pick successes.
- Pull successes.
- Pick errors.
- Pull errors.

The following meters are applicable for the Pick/Pull node.

- Pick meter - Displays the number of nonvoice task pick requests that were successful.
- Pull meter - Displays the number of nonvoice task pull requests that were successful.
- Pick error meter - Displays the number of nonvoice task pick requests that failed.
- Pull error meter - Displays the number of nonvoice task pull requests that failed.



Note All **Pick / Pull** routing works for agents in the **Ready** or **Available** state. To be able to do this in **Not Ready** state, enable the Registry key. The Registry key that needs to be enabled on the CCE Router is `EnablePickPullWhileInNotReady`. This is located under the following registry hive on the CCE Router VM

```
HKEY_LOCAL_MACHINE\SOFTWARE\Cisco
Systems, Inc.\ICM\ucce\RouterA\Router\CurrentVersion\Configuration\Config.
```

The Registry key is dynamic and doesn't require a restart of the router, for changes to take effect. The default value is 0 or disabled. To enable the Registry key, set the value to 1.

Skill Group and Precision Queue Routing for Nonvoice Tasks

Routing to skill groups and precision queues is largely the same for voice calls and nonvoice tasks. However, the way that contact center enterprise distributes tasks has the following implications for agents who can handle multiple concurrent tasks:

- **Precision queues**—In precision queue routing, Unified CCE assigns tasks to agents in order of the precision queue steps. Unified CCE assigns tasks to agents who match the attributes for step one, up to their task limit, until all those agents are busy. Unified CCE then assigns tasks to agents who match attributes for step two, and so on. If you configure agents to handle three concurrent tasks, Unified CCE assigns three tasks to each agent in the first step. It then moves on to the second step and assigns any remaining tasks to those agents.
- **Overflow skill groups**—Routing scripts can specify a preferred skill group and an overflow skill group. Unified CCE assigns tasks to all agents in the preferred skill group, up to their task limit, before assigning any tasks in the overflow skill group. If you configure agents to handle three concurrent tasks, Unified CCE assigns three tasks to each agent in the preferred skill group. It then moves on to the overflow skill group and assigns any remaining tasks to those agents.



Note The number of available slots is an important factor in the Longest Available Agent (LAA) calculation.

The number of available slots = The maximum concurrent task limit for the MRD that an Agent has logged into - Current tasks being handled by the Agent or routed to the Agent.

If there are multiple skill groups that are part of the queue node, then the skill group that has the higher LAA is picked. Then, the agents within the picked skill group (or the Precision Queue) who have the highest number of available slots for non-voice tasks get prioritised.

Agents with the same number of available slots get prioritized based on the time in the available state or the LAA mechanism.

Related Topics

[Precision Queue Script Node](#)

[Selection of Agents from Skill Groups](#)

[Categorization by Media Routing Domain with Skill Groups](#)

[Categorization by Media Routing Domain with Precision Queues](#)

[List of Monitor Labels](#)

Queue to Agent Node

You can queue a contact directly to an agent by using the **Queue to Agent** node (in the Queue tab of the Palette).



You can change the **Queue to Agent** type to:

- Specify an agent directly
- Select an agent by expression

Related Topics

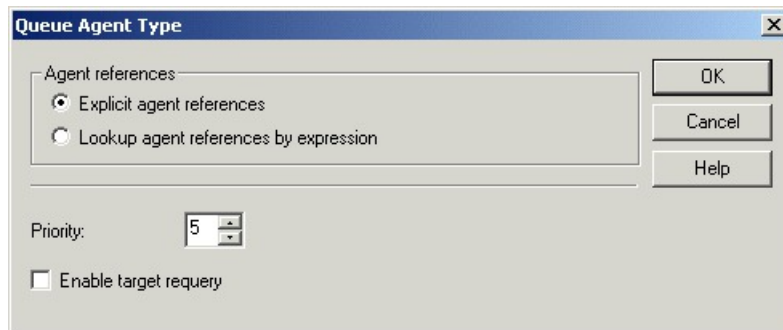
[Target Requery](#)

Change Queue to Agent Type

Procedure

Step 1 In the **Queue to Agent** properties dialog box, click **Change**. The **Queue Agent Type** dialog box opens:

Figure 3: Queue Agent Type



- Step 2** To select a specific agent, select **Explicit agent references**.
- Step 3** To select and agent by an expression, select **Lookup agent references by expression**.
- Step 4** Select a **Priority** between 1 (the highest) and 20 (the lowest).
- Step 5** Optionally, select **Enable target requery**.
-

Specify an Agent Directly

Following is the properties dialog box of the **Queue to Agent** node when you select to specify agents directly:

Figure 4: Agent Direct Properties

Queue to Agent Properties

Queue to Agent | Connection Labels

Queue to Agent type
Select using direct references. Change...

	Agent	Media Routing Do	Skill Group	Route
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Queue if agent not logged in

Buttons: Add Target..., Delete Row, Validate, Formula Editor..., Move (up/down arrows), OK, Cancel, Help

To specify agents directly:

Procedure

-
- Step 1** If necessary, change the Queue to Agent type to **Explicit agent references**.
 - Step 2** In the **Agent** column, select an agent.
 - Step 3** In the **Media Routing Domain** column, select the media routing domain for the selected agent.
 - Step 4** In the **Skill Group** column, select the skill group for the selected agent and media routing domain.
 - Step 5** In the **Route** column, select the route for the selected agent and media routing domain.
 - Step 6** Optionally, select **Queue if agent not logged in**, to have the contact queued to the agent even if the agent is not currently logged in.
 - Step 7** To test the data you entered, click **Validate**.
 - Step 8** Optionally, modify **Connection Labels**.
-

Select an Agent by an Expression

Following is the properties dialog box of the **Queue to Agent** node when you select to use an expression:

Figure 5: Queue to Agent Properties

Queue to Agent Properties

Queue to Agent | Connection Labels

Queue to Agent type
Select using indirect references.

Target Requery Disabled

	Peripheral	Agent Expressio	Consider If	Enterprise Skill G	Enterprise Route	Route
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Queue if agent not logged in

Buttons: Add Target..., Delete Row, Validate, Formula Editor..., Move (up/down), OK, Cancel, Help

To specify agents by expression:

Procedure

- Step 1** If necessary, change the **Queue to Agent** type to **Lookup agent references by expression**.
- Step 2** In the **Peripheral** column, to choose an agent by Peripheral number, choose a peripheral and provide a formula in the Agent Expression that translates to the Agent's Peripheral number. If no peripheral is chosen, the agent expression should translate to the SkillTargetID or Enterprise Name of the agent.
- Step 3** In the **Agent Expression** column, provide a formula using the formula editor that translates to the agent's Peripheral number or SkillTargetID or agent Enterprise Name. To choose a peripheral (in Peripheral) and provide a formula that translates to an agent's Peripheral number.
- Note** The Peripheral column controls how the AgentExpression column is evaluated as an ICM ID. However, if you select a Peripheral from the Peripheral column, then the Agent Expression column is evaluated as an Agent Peripheral number.
- Step 4** Optionally, in the **Consider if** column, enter the formula that evaluates to true for the target when the ICM system runs the Queue to Agent node, or that target will not be selected. For help in creating a formula, put the cursor in this field and then click the **Formula Editor** button.
- Step 5** Select the **Enterprise Skill Group** that includes the appropriate skill groups to cover all media routing domain cases for the selected Agent.
- Step 6** Select the **Enterprise Route** that has an appropriate collection of routes, or the **Route**, matching the agent and media routing domain.

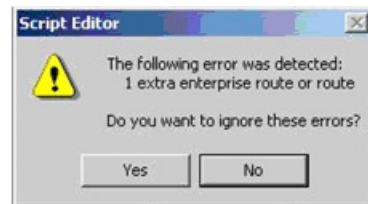
If you do not select either an **Enterprise Route** or a **Route**, the following error message appears:

Figure 6: No Enterprise Route or Route Chosen



If you select both **Enterprise Route** and **Route**, the following error message appears:

Figure 7: Both an Enterprise Route and a Route Chosen



The specified **Enterprise Route** or **Route** is used to send the call to an agent.

- Step 7** Optionally, select **Queue if agent not logged in**, to have the contact queued to the agent even if the agent is not currently logged in.
- Step 8** To test the data you entered, click **Validate**.
- Step 9** Optionally, modify connection labels.

RONA and Transfer Scripting for Task Routing and Digital Routing



Note This section applies to the following:

- Tasks submitted by third-party multichannel applications that use the Task Routing APIs.
- Tasks submitted by Webex Connect that use the Digital Routing APIs.

The *ServiceRequested* call variable is set when tasks are transferred or RONA. You can determine the value of the *ServiceRequested* call variable in an **If** node in the routing script. Based on the value of this field, the script can take different actions. For example, the script can raise the priority of the task so that it goes to the front of the queue.

The relevant *ServiceRequested* values are:

- 2: This value identifies a transferred task.
- 3: This value identifies a RONA task.

Related Topics[RONA and Transfer Script](#)

Estimated Wait Time Scripting for Task Routing and Digital Routing



Note This section applies to the following:

- Tasks submitted by third-party multichannel applications that use the Task Routing APIs.
 - Tasks submitted by Webex Connect that use the Digital Routing APIs.
-

Customers submitting a task request might want to know approximately how long they will wait for an agent. You can configure the routing script to provide the customer with an estimate of the wait time. The estimated wait time is calculated once, when the task enters the queue. The time is not updated as the position in the queue changes.

The default estimated wait time algorithm is based on a running five minute window of the rate of tasks leaving the queue. Any tasks that are routed or abandoned during the previous 5 minutes are considered as part of the rate leaving queue. For Precision Queues, the rate leaving the queue represents the rate at which tasks are delivered or abandoned from the entire precision queue, not any individual Precision Queue steps. The algorithm computes the wait time for each of the queues against which the task is queued (Skill Groups or Precision Queues) and then returns the minimum estimated wait time.



Note Queue to Agent is not supported.

While the queue builds, the small number of tasks in the queue makes the estimated wait time less accurate and the value fluctuates rapidly. As the queue operates with more tasks over time, the estimated wait time is more accurate and consistent.

Scripts for estimated wait time include:

- A **Set Variable** node, `Call.EstimatedWaitTime` to set the estimated wait time.
- A **Run External Script** node to apply a Network VRU script that returns the estimated wait time to the customer.

Related Topics[Estimated Wait Time Script](#)