



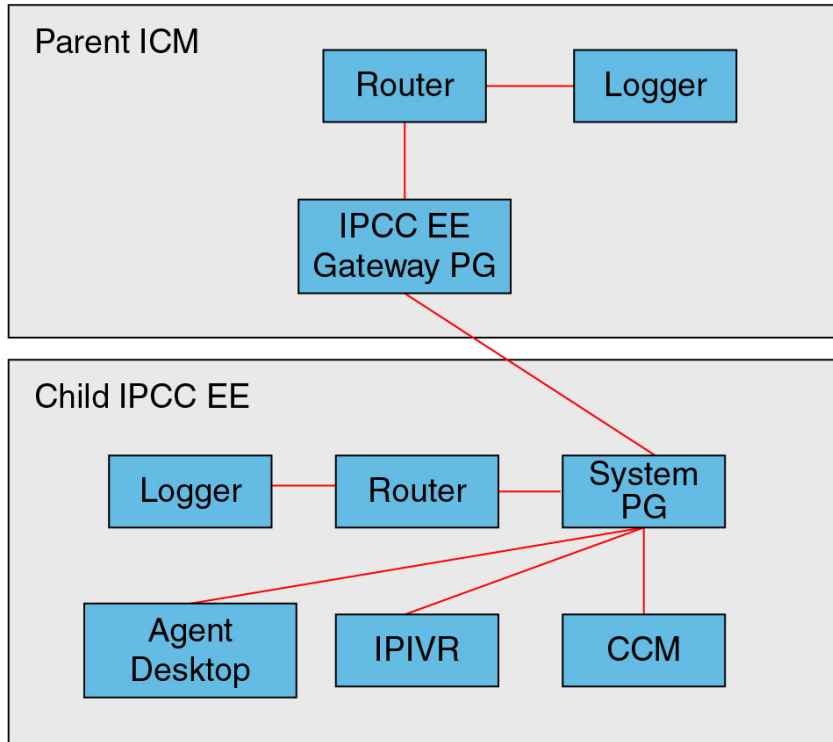
Scripting Specifics in CCE Environment

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Unified CCE Gateway

The Unified CCE Gateway PG allows a site Unified CCE system to connect to a Unified ICM. The Unified ICM parent views the system as an ACD.

Figure 1: Unified CCE Gateway PG



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This view is important because it allows a "parent" Unified ICM to monitor and send calls to a "child" Unified CCE system. Previous to the availability of the Unified CCE Gateway feature, monitoring this using intelligent (PG-based) routing was not possible. This allows improved scaling, resiliency, and simpler, more standardized scripting across sites.

The Unified CCE Gateway PG looks to the Unified ICM like any other PG; it does not look like Unified CCE. The Gateway PG has a Peripheral type to allow connection to a "child" Unified CCE system. The child system is listed as "Unified CCE Gateway" in the setup screen for the PG. The Gateway PG does not support third-party call control (CTI) so that all agent desktops, etc., are connected to the child Unified CCE system. The link supports voice only. The child system may support multi-media but the Unified ICM only routes voice calls to the child.

Object tracking is accomplished the same as on all legacy PIMs, through matching Peripheral Numbers on the agent, skill group, and service table. Routing to the child is to peripheral targets (skill groups/services) as with all legacy TDMs, in contrast to the Unified CCE. The usual TDM functionality is supported: Pre-Routing, Pre-Routing with Translation routing, post routing, etc. Third-party call control is the only exception. Full variable passing is done between the parent and child (you can send/receive call variables 1-10 and ECC variables).

Scripting is consistent with traditional PGs, not Unified CCE. Scripts use LAA, MED, target services, and skill groups; but not agents.



Note NCT is not supported with the Enterprise Gateway because the CTI control is on the ACD (child) rather than on Unified ICM parent.

Deployment of Unified CCE Gateway for Unified CCE

Where to deploy Unified CCE Gateway for Unified CCE:

- The gateway PG is ideal for deployments that have several call centers spread geographically.
- The call centers are independent of the Central Controller so in a WAN outage, the call centers (System PG systems) can operate totally independently of Unified ICM.
- The gateway PG is also an ideal way to integrate new IP call centers into an existing Unified ICM environment with many TDM ACD sites.



Note In a single script node (MED) peripherals that are legacy and gateway type can be used to select the best "site" to send the call to.

How does it work:

- The gateway PG works by monitoring all the events that happen on the child Unified CCE system. This is identical in function to a PG/PIM connected to any other ACD. By knowing the active call and agent states the Unified ICM router can have information available to decide if that "site" is the best to send a call to.
- The child system can also send up route requests to the parent Unified ICM to decide where to send a call (Post/Translation routing).
- The event monitoring is accomplished by the PIM connecting to the child systems CTI Server modified version of the CTI Protocol.

Object Mapping Overview (Enterprise)

- Agents on the child map to agents on the parent
- Skill groups on the child map to skill groups on the parent
- Call Types on the child map to services on the parent.



Note This is due to the child's reporting being based on Call Types and the parents reporting being based on services.

Unified CCE

This topic contains information for writing routing scripts when Unified ICM is part of a Unified CCE environment.

Prioritize Agents

Follow these steps to prioritize agents within a skill group:

Procedure

-
- Step 1** Use a Select node and group the agents that have a higher priority in a skill group in the first Select Longest Available Agent (LAA) node,
- Step 2** Look for available agents in a subsequent Select node that have another lower priority grouping of agents.
-

What to do next

This is done in the case where there are idle agents when a call comes in. The order of the Select nodes within the script determines the agent prioritization.

Call Priority

When a call is queued to a skill group because there are no agents available, the Queue to Skill Group node sets the call's priority. The Queue Priority node can then promote the call's priority based on time the caller has waited. The call can be queued to multiple skill groups with the same or different priorities.

If there are calls in the agent's skill group queues when an agent becomes available, the agent is presented with the highest priority (1-20 with 1 being the highest priority) call that has waited the longest within the skill group(s) that the agent is assigned to.

Check for Available Agents

A script that routes to Unified CCE agents needs to check for an available agent within a skill group. If an agent is not available, then the script should use a Queue to Skill Group node. The script execution ends when an agent becomes available or when the caller disconnects.

Select Node

You can use the Select node to check for the Longest Available Agent (LAA). However, the Select node cannot check for Minimum Expected Delay (MED) of a service, because Unified CCE skill groups do not have a valid expected delay because the calls in the queue are on Unified IP IVR PG service.

By default, the Queue to Skill Group node uses LAA for agent selection. Do not put LAA Select nodes before or after a Queue to Skill Group node for the same skill group. You can only use this node if the call is not already queued to a skill group.

There is, however, a lengthy workaround to determine the MED for a call using an IF node.

Related Topics

[Estimated Wait Time \(EWT\) Queues](#)

Queue to Skill Group Node

If agents are assigned to base skill groups, use base skill groups in this node.

If the script has both Queue to Skill Group and Queue to Enterprise Skill Group nodes, then do not include skill groups defined within the Queue to Skill Group nodes that belong to the enterprise skill groups that are defined within the Queue to Enterprise Skill Group node.

Cancel Queuing Node

If the call needs to be taken out of a skill group, then use the Cancel Queuing node. The Cancel Queuing node takes the call out of all the skill groups it is queued to.

Busy Node

Use the Busy node for initial overflow conditions. Do not use this treatment if the call has already received ringback tone or given announcements or music. If a Busy CTI Route point and CTI port are defined on Unified IP IVR and the Cisco Unified Communications Manager, then Unified IP IVR tells Cisco Unified Communications Manager to return a busy signal. If a Busy CTI Route point and CTI port are not defined on Cisco Unified Communications Manager and Unified IP IVR and the call is already connected to an Unified IP IVR port, then Unified IP IVR port plays a busy tone from a .wav file for 30 seconds and then disconnects the call. If the VRU port plays a busy tone from a .wav file then, answer supervision returns to the far end. This causes charges to occur for the call. If the call is a toll free call (for example, 800#), then the Contact Center accrues the charges; otherwise the caller has to pay.

You must define a Busy CTI route point and one CTI port on the Cisco Unified Communications Manager and associated it with the Unified IP IVR user. The one CTI port can be used for multiple calls. In Unified IP IVR Administration, a new CTI Route point of Type Busy and a CTI port need to be defined whose Dialed Numbers match what was previously defined on the Cisco Communications Manager.

Define a label of type busy with a Label field that corresponds to the aforementioned CTI Route point dialed Number in the Cisco Unified Communications Manager and Unified IP IVR.

If the call is not at a VRU port and the Busy CTI Route point is not defined on the Cisco Unified Communications Manager and the Unified IP IVR, and the Unified ICM returns a busy label to the Cisco Unified Communications Manager, the Cisco Unified Communications Manager returns a fast busy to the caller for 30 seconds and then the call is disconnected.

Ring Node

You can use the Ring node for diverting blocked list callers. It is supported as a post route from the Cisco Unified Communications Manager. The call is given ringback tone until the caller ends the call. No answer supervision is returned for this call because it is not connected to a VRU port. This means that if this is the initial treatment given the caller, then no charges will be accrued for this call.

You need to define a Ring No Answer CTI port group in the Cisco Unified Communications Manager, but you do not have to define CTI ports. In Unified IP IVR Administration, you need to define a new CTI Route Point of Type Ring No Answer whose Dialed Number matches what was previously defined on the Cisco Unified Communications Manager.

Define a label of type Ring with a Label field corresponds to the CTI Route Point Dialed Number in Cisco Unified Communications Manager and Unified IP IVR.

Release Call Node

Use the Release Call node for initial overflow conditions. It is supported as a post route from the Cisco Unified Communications Manager. Do not use this node if the call has already received ringback tone or announcements or music. The call is given busy tone for 30 seconds before it is disconnected on the Cisco Unified Communications Manager. No answer supervision is returned for this call because it is not connected to a CTI port. This means that no charges will be accrued for this call.

No configuration needs to be done within the Cisco Unified Communications Manager or Unified IP IVR. No label needs to be defined within Unified ICM.

End Node

The End node either tries default routing, or if there is no default label, it sends an error (dialog fail) to the routing client.

Call Treatment Comparison

Attributes/Treatment	Busy Node	Ring Node	Release Node	End Node
Answer Supervision	No if Busy CTI Route Point defined Yes if Busy CTI Route Point not defined	No	No	No
Voice port required	Yes (only 1 CTI port needed)	No	No	No
Timing	Initial treatment only	Anytime	Initial treatment only	Initial treatment only
Applications	Overflow Conditions	Blocked list Callers	Overflow Conditions	Overflow Conditions
Treatment provided by Unified IP IVR	Unified IP IVR		Cisco Unified Communications Manager	Cisco Unified Communications Manager

Agent to Agent Node

You can use the Agent to Agent node for agent to agent transfers; the router checks agent availability before sending the call to the agent. If the agent is not available, the script queues the call to a skill group. You can also use the Agent to Agent node to send a call to the agent: the "caller" is not required to be an agent.

For a transfer to a specific target agent, the initiating agent enters the target agent ID. The DNP entry matching the dialed number (agent ID) must have a DNP type of PBX. For this DNP type, the PIM enters the dialed

number (agent ID) into the Caller-Entered Digits (CED) field while sending the route request to the Router. To have the Router handle the call properly, specify the CED field as the location of the agent ID in the Agent to Agent node.

Agent IDs must not match any of the extensions on the Unified Communications Manager cluster. If you make all agent IDs of the same length and begin with the same number, a generic wildcard string can match all agent IDs. With that wildcard string, you need only one entry in the DNP for agent-to-agent routing.

The agent-to-agent node requires that you specify the PIM. If your environment has multiple PIMs, use an agent ID number plan to determine which PIM contains an agent. Agent IDs are associated with a specific PIM and are not unique by themselves. You can set up a consistent agent ID assignment plan (such as, all agent IDs on PIM 1 begin with 1, and so on). That pattern enables you not to repeat agent IDs across the enterprise. Then, you can parse the CED field in the script editor to determine which PIM contains a specific agent.

Service and Enterprise Service Nodes

You do not need the Service node or Enterprise Service node to route calls to Unified CCE agents because services are not required for Unified CCE agents.

Scheduled Select and Divert Label Nodes

Cisco Communications Manager does not support the Scheduled Select node and Divert Label node. You cannot use these nodes to route calls to Unified CCE agents.

Unified IP IVR as a queue point

Unified CCE relies on the Unified IP IVR to queue the call while it is waiting for an available agent.

The Unified ICM sends the call to the VRU port for queuing:

- To provide the call with a termination point that allows the VoIP Gateway to return the correct signals or messages back to the PSTN.
- Provide announcements or music or expected wait time or initial position in queue to the caller while they are waiting for an agent. Allow the caller an option to leave a message if the caller does not want to wait for an agent.
- To obtain further information from the caller that is not sent from the network

The Unified IP IVR lets Unified ICM know when the caller disconnects through the Event Report Message with an Event Type of either DISCONNECT or ABANDON. When an agent becomes available, Unified ICM automatically instructs Unified IP IVR to route the call to the agent through the Connect message.

Interruptible vs. Non-interruptible

If the VRU script is collecting digits from the customer to ascertain information regarding the caller that is crucial for a screen pop or call routing, put the VRU script in a non-interruptible mode.

If a call was queued to a skill group through a Queue to Skill Group or Queue to Enterprise Skill Group node and then sent to VRU to hear a non-interruptible VRU script, if during the time that the caller is interacting and listening to the non-interruptible VRU script, an agent becomes available, the call will not be connected to the agent. The Unified ICM only looks for available agents for that call when the VRU script is finished and the call runs an interruptible node such as a Wait node or a Run External Script node for a VRU script that is interruptible. The call does, however, maintain its place in the queue so when the call does become available for an agent, it is answered before calls that came in afterward it (assuming the same priority).

For announcement and music type of treatments, put the VRU Scripts in interruptible mode. This allows the call to be connected to the first available agent even while the caller is listening to a VRU script.

You set the interruptibility of a VRU script through the Configuration Manager, under the Add Network VRU script configuration. Neither the VRU or the Unified ICM script can overwrite this setting.

VRU (IVR) Types

Listed in the table below are the VRU types that are supported for the Unified CCE. These types are defined in the Unified ICM in the Network VRU Configuration. These VRU types are used by the Unified ICM to determine the routing client, routing type, script node used, and VRU port status. Type 3 and 7 can only be Network VRUs. However, Types 2 and 6 can be Network or On-premise VRUs.

VRU Type	Routing Client	Routing Type	Scripting Node Used to Send to VRU	Unified ICM Knows VRU Port Status
2, 8	Yes	Post-route from Cisco Communications Manager	Translation Route to VRU	Yes
3, 7	No	Pre-route	Send To VRU	No
5, 6	Yes	Post-route from VRU	N/A	Yes

Usually the VRU has been configured to support only one VRU type, although the Unified IP IVR can support both Type 2 and Type 6 based on whether the call is routed directly to the VRU or the call comes into a Translation Route point. In this case, the VRU type must be defined as Type 2.

Translation Route to VRU Node

The Translation Route to VRU node is used by Type 2 VRUs that are post routed from the Cisco Unified Communications Manager, when the call is not at the VRU, but at another routing client. The call can be a pre-route from the IXC or it can be a post route from a Cisco Unified Communications Manager CTI Route point.

The Translation Route to VRU node is used to send the call to the VRU port. Translation routing is needed for:

- Cradle to grave reporting (Termination Call Detail Reporting)
- Ability to send call context data like the calling line ID or Dialed Number to the VRU
- Ability to check if the VRU peripheral is online or if all VRU ports are busy before sending the call

The Translation Route to VRU node is typically followed by a Run External Script node. If some checking is done before the Run External Script node is initiated, the time it takes the Unified ICM to run the nodes in

the script must not exceed the VRU Request Time-out timer. Information obtained from the caller during the VRU session can be passed to the Unified ICM for further processing.

No Default Skill Groups in Routing Scripts

Ensure your Unified ICM routing scripts do not reference the default skill group. This ensures that the default skill group does not capture statistics for any Unified ICM-routed calls.

For more information, see *Cisco Unified Contact Center Enterprise Installation and Upgrade Guide* and *Administration Guide for Cisco Unified Contact Center Enterprise*.

Router Behavior (During PG Failure)

In a Unified CCE environment, if the router is disconnected from the two PGs (available on either side of the network/site between the routers) and the PG fails, the router cannot receive any information about the failure of the peripheral or about agents who are logged out. In such a scenario, the router uses low frequency heartbeats (60 seconds) to determine the failure of the peripheral and declares the peripheral to be offline at this point. The router discards the real time values for the peripheral (including service, skill group, enterprise agent, and agent state at their last known value) and continues to send calls to these agents who were in the “Ready” state before the connectivity to the PGs was lost. After the router suspends the peripheral and declares it offline, you need to use an “IF” node with “Peripheral.online=1” in the script to avoid sending or queuing calls to an offline peripheral. You should make this change manually.

Scripts in an Outbound Environment

Outbound Option only supports both Type 2 (Generic PG environment) and Type 9 (Unified CCE System PG environment). For Unified CVP, Outbound Option supports Type 10, Type 7, and Type 5 (Unified CVP Comprehensive Model).

If using the transfer to VRU feature, create a transfer to VRU campaign. Transfer to VRU campaigns might require translation routes if using a Type 2 VRU. For more information about setting up translation routes, see *Cisco Unified Contact Center Enterprise Installation and Upgrade Guide*. (Note that translation routes are not required when using the Unified CCE System PG.)



Note The transfer to VRU feature is only supported for Outbound Option on Unified CCE. You cannot use this feature in the Direct Preview or the regular Preview modes.

The dynamic routing client feature is used when an outbound agent transfers a call using the Unified CVP to a Type 2 VRU. Make sure the routing client for the translation route labels is the Cisco Unified Communications Manager, which makes the outgoing call.

Control OutboundControl Variable and Skill Group Reservation Percentage with Script

Use the Unified ICM Script Editor application to create an administrative script for each skill group to control the OutboundControl variable and the skill group reservation percentage (you can use one script to control all Outbound Option skill groups or multiple scripts to control multiple Outbound Option skill groups). The Outbound Option Dialer looks at the value of the OutboundControl variable to determine which mode each skill group uses. If the OutboundControl variable is not set, the skill group defaults to inbound. If using the transfer to VRU feature, create a transfer to VRU campaign.



Note The transfer to VRU feature is supported only for the Outbound Option on the Unified CCE. You can not use this feature in the Direct Preview or the regular Preview modes.

How to create an administrative script to control the OutboundControl variable and skill group percentage:

Procedure

- Step 1** Open the Unified ICM Script Editor application.
- Step 2** Create an administrative script using a Start node, a Set node, an End node, and an If node (all required).
- Step 3** Set the OutboundControl variable. OutboundControl Variable Settings:
 - a) INBOUND: Indicates that this skill group is disabled for outbound use and only takes inbound calls.
 - b) PREDICTIVE_ONLY: Dials several customers per agent. After reaching a live contact, the Predictive Dialer transfers the customer to a live agent along with a screen pop to the agent's desk. The predictive algorithm is designed to calculate the number of lines to dial per available agent to keep agent wait time to a minimum.
 - c) PREDICTIVE_BLENDED: Agents receive inbound calls, but could be used for an outbound call when available.
 - d) PREDICTIVE_BLENDED: Agents receive inbound calls, but could be used for an outbound call when available.
 - e) PREVIEW_ONLY: Reserves an agent prior to initiating an outbound call and presents the agent with a screen pop. The agent might then **Accept** the call: Dials the customer and transfers the call to the agent. **Skip** the call: Agent receives another customer call. **Skip-Close** the call: Skips the current preview call and closes the record so it cannot be called again. **Reject** the call: Releases the agent. At this point, the system might deliver the agent another preview outbound call or a new inbound call. **Reject-Close** the call: Rejects the current preview call and closes the record so it cannot be called again.
 - f) PREVIEW_BLENDED: Agents receive inbound calls, but could be used for an outbound preview call when available.
 - g) PREVIEW_DIRECT_ONLY: Agents can only place outbound calls and hear ring tones, such as phone ringing or busy signal.
 - h) PREVIEW_DIRECT_BLENDED: Agents can receive inbound calls, place outbound calls, and hear ring tones, such as phone ringing or busy signal.
 - i) PROGRESSIVE_ONLY: Similar to PREDICTIVE_ONLY; however, lines to dial per agent is not calculated—users configure a fixed number of lines that will always be dialed per available agent.
 - j) PROGRESSIVE_BLENDED: Similar to PREDICTIVE_BLENDED, but a fixed number of lines will always be dialed per available agent.

Note

- Verify that the outbound control variable mode is spelled correctly.
- Make sure that the skill group being controlled is the base skill group, and not the primary or secondary skill groups. Although agents may be logged into just the primary or secondary skill group, the outbound control variable must always be set on the base skill group
- If the administrative script (where the OutboundControl variable or reservation percentage is set) is running, but the modes/percentages are not being updated at the Dialer, perform one of the following tasks:
- Use the Set node to set skill group variables (OutboundControl and OutboundPercent).

Step 4

Set the OutboundPercent variable by entering the agent percentage in the Value field of the Set Properties window. This variable controls the percentage of agents, logged in to a particular skill group, to be used for outbound dialing. For example, if there are 100 agents logged in to skill group N, and the OutboundPercent variable is set to 50%, 50 agents would be allocated for outbound dialing.

Note

- This variable does not allocate specific agents for outbound dialing, just a total percentage.
- Use the Set node to set skill group variables (OutboundControl and OutboundPercent).

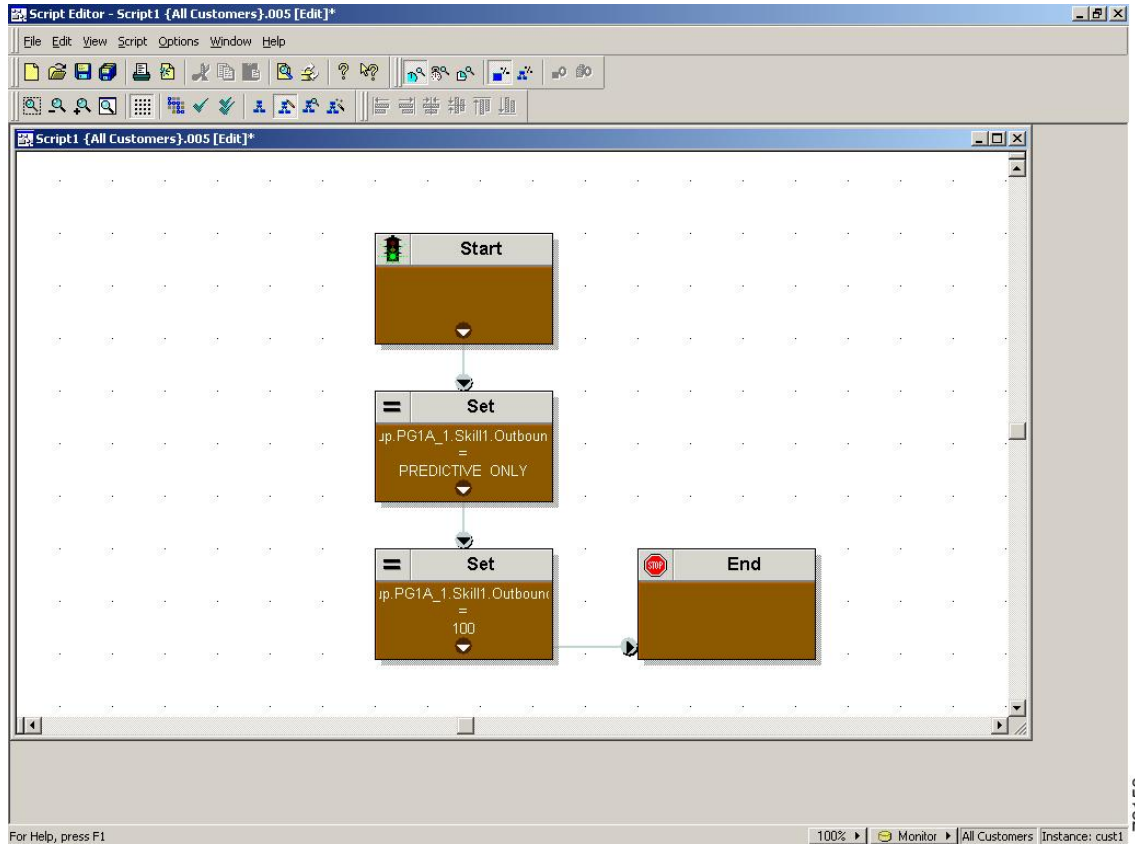
What to do next

The following illustration displays a very simple administrative script where both the OutboundControl variable and the outbound percentage are set for a skill group. A script in a production call center is typically be more complex, perhaps changing these variables due to time of day or service level.

**Note**

- For more information about using the Script Editor, see Unified ICM Script Editor online help.
 - For more information about sample administrative and routing scripts for the Unified CCE System PG, see the section for sample administrative and routing scripts for the Unified CCE System PG.
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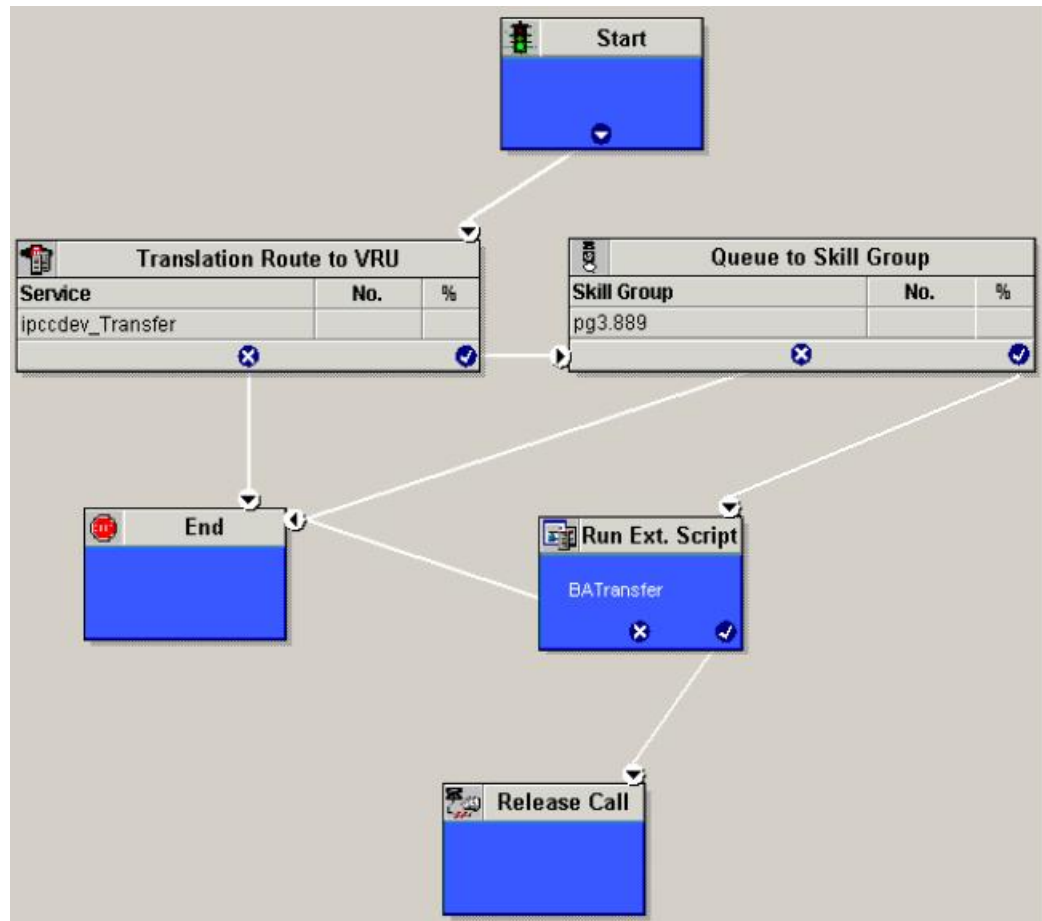
Figure 2: Setting Skill Group Variables (OutboundControl and OutboundPercent)



Transfer to VRU Using Outbound Option with Unified IP IVR

The following illustration displays a routing script for a transfer to VRU campaign using the Outbound Option with the Unified IP IVR. (For more information about configuring a Outbound Option transfer to VRU campaign, see *Outbound Option Guide for Unified Contact Center Enterprise*.)

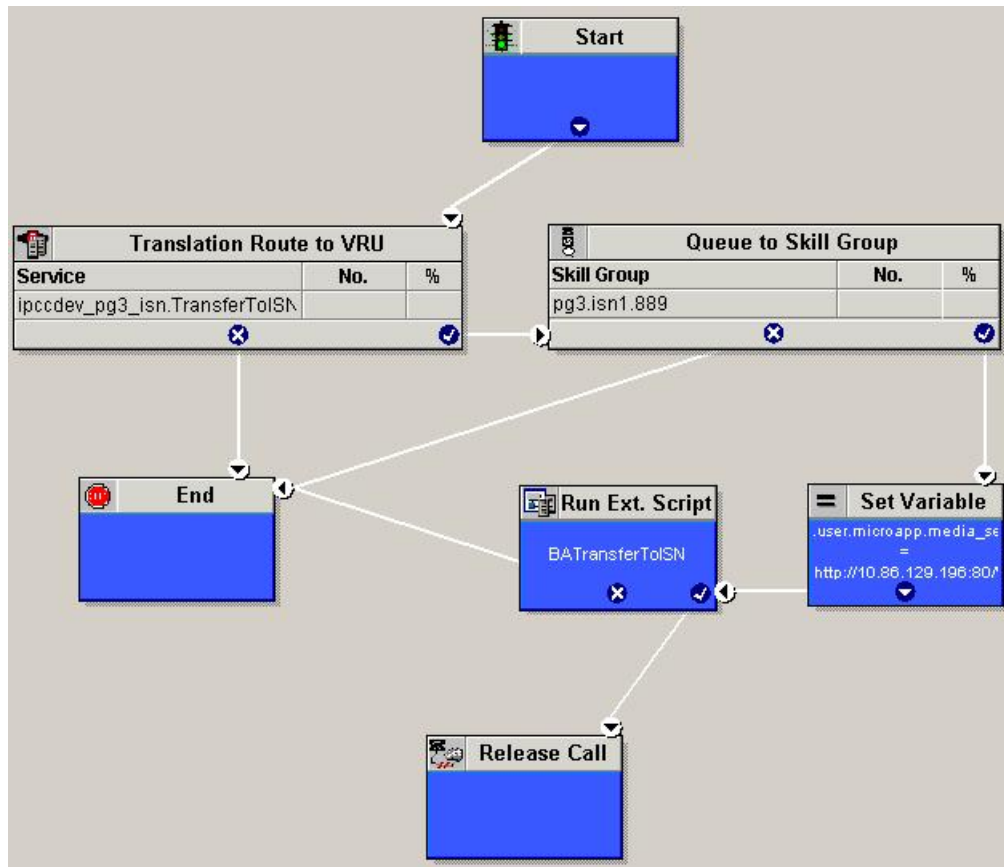
Figure 3: Example Routing Script for a Transfer to VRU Campaign Using Outbound Option with Unified IP IVR



Transfer to VRU Campaign Using Outbound Option with Unified CVP

The following illustration displays a routing script for a transfer to VRU campaign using the Outbound Option with the Unified CVP. (For more information about configuring a Outbound Option transfer to VRU campaign, see *Outbound Option Guide for Unified Contact Center Enterprise*.)

Figure 4: Example Routing Script for a Transfer to VRU Campaign Using Outbound Option with CVP/ISN



Use the Unified ICM Script Editor application to create a routing script that uses the Dialed Number for the MR routing client, and routes through a Select node to the previously configured skill group.

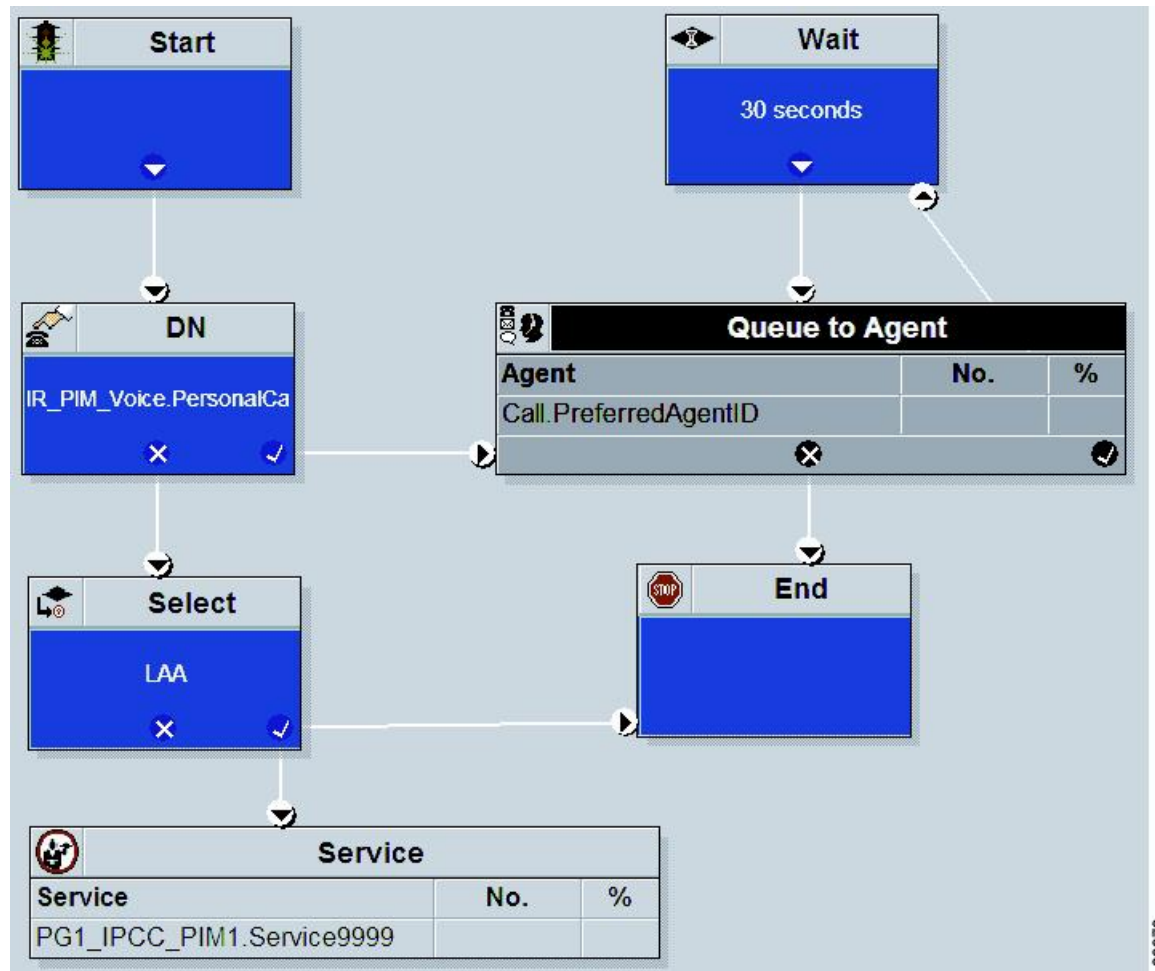
Use the Unified ICM Script Editor Call Type Manager to associate the MR (and Personal Callback, if used) Dialed Number(s) with the configured call type and newly created routing script.



Note For more information about using Unified ICM Script Editor's features, see the *Unified ICM Script Editor online help*.

The following diagram displays an example routing script that uses the objects mentioned above.

Figure 5: Example Routing Script Using the Dialed Number for the MR Routing Client



Note Lines connecting objects cannot appear on top of objects and therefore, partially display under the objects. For example, the line connecting the “X” (output terminal failure) on the Select object to the End object runs partially under the Select object.

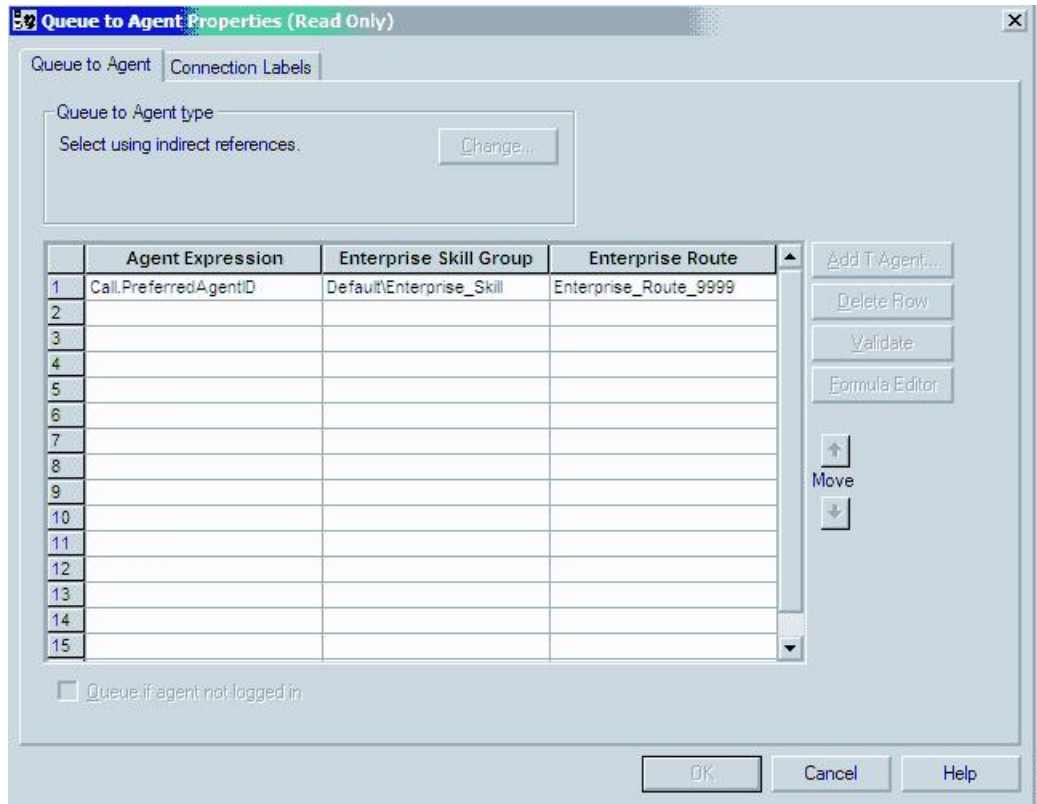


Note Translation routes are not used in the Unified CCE System PG, so routing scripts using this PG do not need to use this object.

Queue to Agent Node Configuration

The following illustration displays the Queue to Agent tab of the Queue to Agent Properties dialog box.

Figure 6: Queue to Agent Properties



Unified CCE System PG for Outbound Option

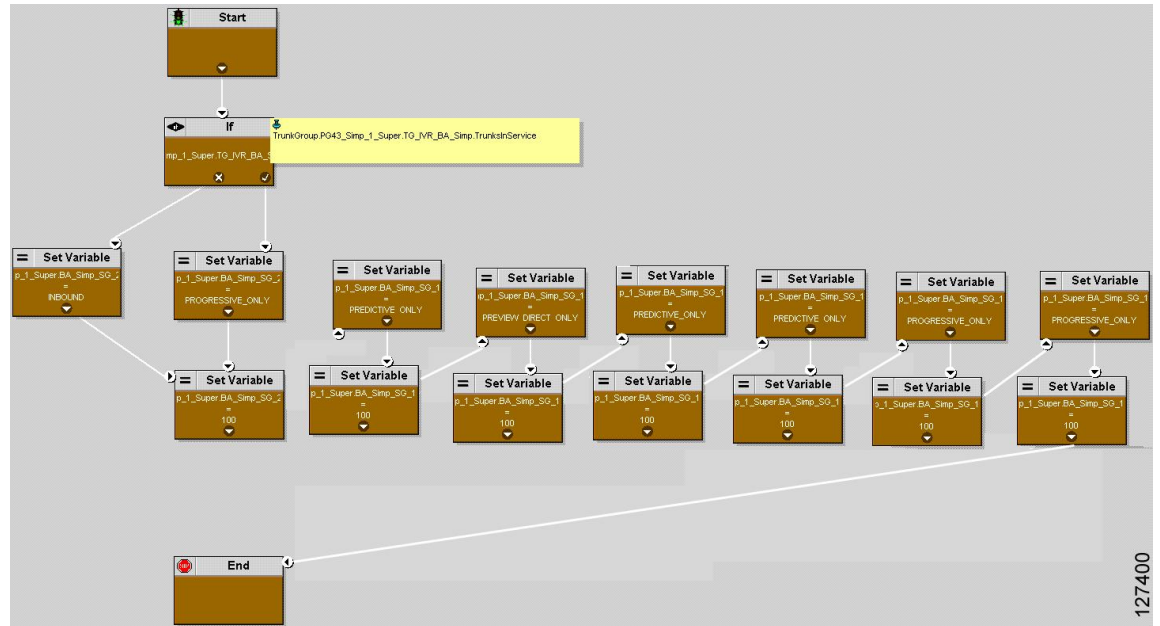
The Unified CCE System PG combines two PGs (Cisco Communications Manager and VRU PGs) into one PG and is only supported with Unified IP IVR.

Setting up an Unified CCE System PG for Outbound Option campaigns consists of two tasks:

- Configuring the Unified CCE System PG.
- Adding the PG.

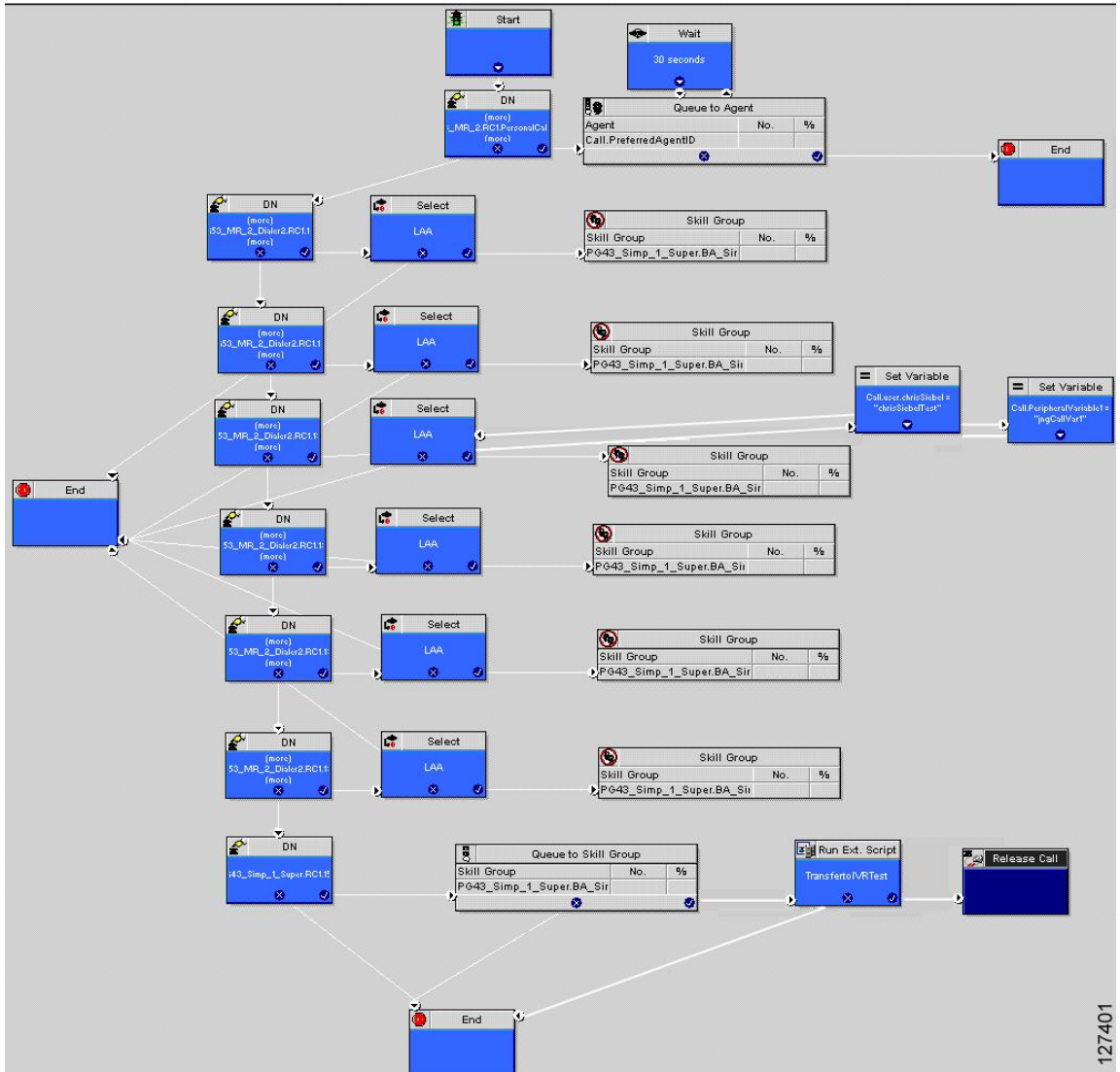
Use the Unified ICM Script Editor and create an administrative script. The following illustration is an example of an administrative script.

Figure 7: Example Unified CCE System PG for Outbound Option Campaign Administrative Script



The following diagram displays an example routing script using the Queue to Skill Group node.

Figure 8: Example Routing Script Using the Queue to Skill Group Node



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