



# CHAPTER 5

## Cisco Unified Outbound Option

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Last revised on: October 10, 2008

The Cisco Unified Outbound Option, formerly Outbound Option and Blended Agent, was introduced on the Unified CCE platform in Unified CCE 5.0. This product allows Unified CCE agents to participate in outbound campaigns in addition to handling inbound calls. Version 6.0 of the Unified Outbound Option adds several important features, including software based Call Progress Analysis (including answering machine detection), Transfer to IVR mode, and Direct Preview mode. Version 7.0 provides enhancements, including sequential dialing and in-memory support of the Do-Not-Call list.

This chapter provides guidelines on deploying the Unified Outbound Option in the context of Cisco Unified Communications Manager (Unified CM) and the PG.

### What's New in This Chapter

[Table 5-1](#) lists the topics that are new in this chapter or that have changed significantly from previous releases of this document.

**Table 5-1** *New or Changed Information Since the Previous Release of This Document*

New or Revised Topic	Described in:
Removed references to tested gateways.	<a href="#">Best Practices, page 5-2</a>

### High-Level Components

The Unified Outbound Option uses virtual Unified IP phones to place outbound calls through a voice gateway configured in Unified CM. The dialer is a software solution that does not require telephony cards for tone generation or tone/voice detection.

The Outbound solution involves the following processes:

- The Campaign Manager process is responsible for sending configuration and customer records to all the Dialers in the enterprise. It is always installed on the Side-A Logger, and it services only one customer instance.
- The Import process is responsible for importing customer records. It runs on the Side-A Logger.

- The Dialer process is responsible for dialing customers and connecting them with properly skilled agents or available IVRs. It reports the results of all contact attempts back to the Campaign Manager. All Dialer processes are managed by the central Campaign Manager. The Dialer is installed on the same platform as the Agent PG.

A Media Routing Peripheral Gateway and PIM are required for each Dialer to reserve agents for outbound use. The Media Routing PG can be shared with other media routing applications, such as the Web Collaboration or e-Mail Option. It can also be co-loaded on other servers in a Unified CCE deployment. See [Sizing Unified CCE Components and Servers, page 10-1](#).

## Characteristics

The Unified Outbound Option solution allows an agent to participate in outbound campaigns and inbound calls through a software IP-based dialer.

The Unified Outbound Option provides the following benefits:

- Enterprise-wide dialing, with IP Dialers placed at multiple call center sites. The Campaign Manager server is located at the central site.
- Centralized management and configuration via the Unified ICM Admin workstation.
- Call-by-call blending of inbound and outbound calls.
- Flexible outbound mode control by using the Unified ICM script editor to control type of outbound mode and percentage of agents within a skill to use for outbound activity.
- Integrated webview reporting with outbound specific reporting templates.

## Best Practices

Follow these guidelines and best practices when implementing the Unified Outbound Option:

- Use a media routing PG and a media routing PIM for each Dialer. The Media Routing PG can be configured for multiple PIMs to support multiple dialers.
- For high availability, deploy multiple dialers at a single Unified CM cluster. See [High Availability, page 5-12](#).
- Deploy dialers in close proximity to the Unified CM cluster where the Dialers are registered.
- Do not use the G.729 codec in cases where transfer times of one second or less are required. IP Dialers support only the G.711 audio codec for customer calls. Although Unified Outbound Options may be placed within a region that uses the G.729 codec, the codec switchover lengthens the transfer time between customer and agent.
- Be aware that using IP Communicator softphone for the Unified Outbound Option agents can introduce an additional delay in transferring customer calls to the agent.
- Do not use more than two Dialers per Unified CM PG pair.
- Configure each Dialer in its own device pool, and register all ports for that dialer in a single Unified CM node.
- Configure the Unified CM node to keep Unified Outbound Option traffic localized to one subscriber as much as possible. See [Dialer Throttling and Unified CM Considerations, page 5-10](#), for more details.
- Configure the same number of ports for Unified Outbound Options at a specific peripheral.

- Ensure proper Unified CM server sizing when installing Unified Outbound Options. The Unified Outbound Option places a large strain on Unified CM. See [Dialer Throttling and Unified CM Considerations, page 5-10](#), for more details.
- Enable Dialer call throttling to prevent overloading the Unified CM server. See [Dialer Throttling and Unified CM Considerations, page 5-10](#).

The Unified CM routing and dial plans are used for outbound calls. This allows calls to be placed using gateways that are deployed to leverage toll-bypass and lower local calling rates.

## Functional Description

The Unified Outbound Option Dialer is a software-only process that is co-located on the Unified CM PG. The dialer process has communication sessions with Unified CM, Outbound Campaign Manager, CTI Server, and MR PIM. The Dialer process communicates with the Outbound Campaign Manager to retrieve outbound customer contact records and to report outbound call disposition (including live answer, answering machine, RNA, and busy). The Dialer process communicates with Unified CM to place outbound customer calls and agent reservation calls from the dialer ports and thus has an impact on the Unified CM cluster. The Dialer process communicates with the CTI Server to monitor skill group activity and to perform third-party call control for agent phones. The Dialer process communicates with the MR PIM to submit route requests to select an available agent.

The Unified Outbound Option Dialer can dial customers on behalf of all agents located on its peripheral. The Dialer is configured with routing scripts that enable it to run in full blended mode (an agent can handle inbound and outbound calls alternately), in scheduled modes (e.g. 8:00am to 12:00pm in inbound mode and 12:01pm to 5:00pm in outbound mode), or completely in outbound mode. If blended mode is enabled, the Dialer competes with inbound calls for agents. The Dialer does not reserve more agents than are configured in the administrative script Outbound Percent variable. If all agents are busy, then the Dialer does not attempt to reserve any additional agents.

Multiple dialers are used to achieve high availability. See [High Availability, page 5-12](#).

The Unified Outbound Option supports Call Progress Analysis configuration on a campaign basis. When this feature is enabled, the dialer analyzes the media stream to determine the nature of the call (such as voice, answering machine, modem, or fax detection).

Campaigns are run as agent-based campaigns or IVR based campaigns. An IVR is generally configured in an agent-based campaign to allow for handling of overflow calls when all agents are busy. Including an IVR in an agent based campaign permits compliance with the FTC/FCC telemarketing regulations. If an IVR is not configured, over-dialed calls are cancelled, unless you configure overflow agents. Overflow agents are agents that are available to receive outbound calls but are not considered when calculating the number of lines to dial per agent. In a transfer to IVR based campaign, all of the calls are transferred to an IVR application after the outbound call is answered.

## Outbound Dialing Modes

The Unified Outbound Option initiates calls using any of several modes, depending on the skill group:

- Predictive Mode—Dynamically calculates the number of lines to dial per agent
- Progressive Mode—Uses a fixed number of lines per agent set by administrator
- Preview Mode—Agent manually accepts, rejects or skips customer calls (through enabled desktop buttons). Dials one line per agent.

- **Direct Preview Mode**—Allows the agent to hear the call ring-out from the desktop; Similar to having the call placed by the agent directly. Dials one line per agent.
- **Personal Callback Mode** —The agent can specify that a callback at a later time will be directed to the same agent. Agent calls the customer back at a pre-arranged time established between the agent and the customer.

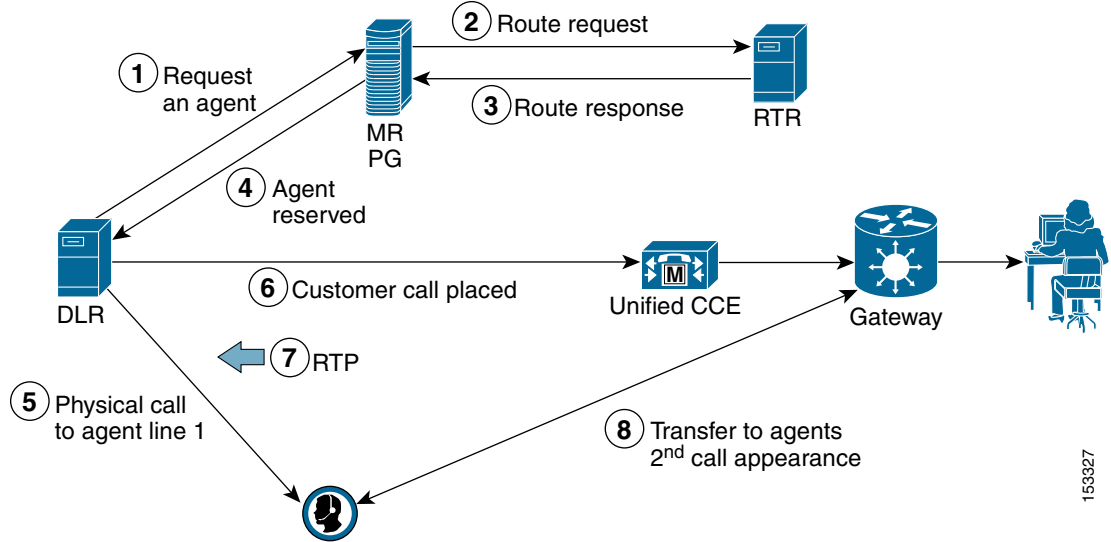
## Call Flow Description - Agent Based Campaign

In an agent-based campaign, completed Dialer calls are routed to a live agent using a Unified IP phone and desktop. The call flow for predictive/progressive dialing proceeds as follows (Figure 5-1):

1. The dialer process continually monitors peripheral skill group statistics from the CTI server for an available agent. Concurrently the campaign manager monitors the database for customer records and forwards active records to the dialer. When the dialer identifies an available agent for use in an outbound campaign, it sends a route request to the MR PIM.
2. The MR PIM forwards the route request to the router.
3. The Unified ICM router executes a routing script, selects an available agent, reserves that agent, and then returns a routing label (phone extension) identifying the reserved agent.
4. The MR PG returns the label for an available agent to the dialer.
5. The dialer then places a reservation phone call to the agent's phone extension. The dialer auto-answers the reservation call for the agent via the CTI server and then automatically places that reservation call on hold.
6. The dialer initiates the customer call via Unified CM and the voice gateway.
7. If call progress analysis is configured the dialer process will analyze the RTP stream to detect a live answer (or answering machine detection). When a live answer is detected, the dialer immediately initiates a transfer of the call (along with call context for screen pop) to the next reserved agent extension from the list maintained by the dialer. Similarly, if answering machine detection is enabled, the call can be transferred to the agent, to an IVR or dropped. The transferred call will arrive on a second line appearance on the agent IP phone (thus call-waiting and a second line appearance for the Unified CCE extension in Unified CM must be enabled for Unified Outbound Options).
8. The dialer auto-answers the transferred call for the agent via the CTI server so that the voice path between the customer and the agent can be quickly established. This releases the dialer port used to call the customer. The dialer then hangs up the reservation call to this agent. The dialer also updates the Campaign Manager to indicate a live answer was detected for this call. After the agent completes handling the outbound call, the agent can be reserved for another outbound call via the same message flow.

The message flow above describes the flow for predictive or progressive mode dialing. The only difference in these two dialing modes is how the dialer determines its outdial rate (dynamic or fixed). For preview dialing, the agent will receive a customer record screen pop. If the agent wishes to place this call, the agent must click accept on the agent desktop. This generates a CTI event, which triggers the dialer to make a call to this customer.

**Figure 5-1 Call Flow for Agent-Based Campaigns**



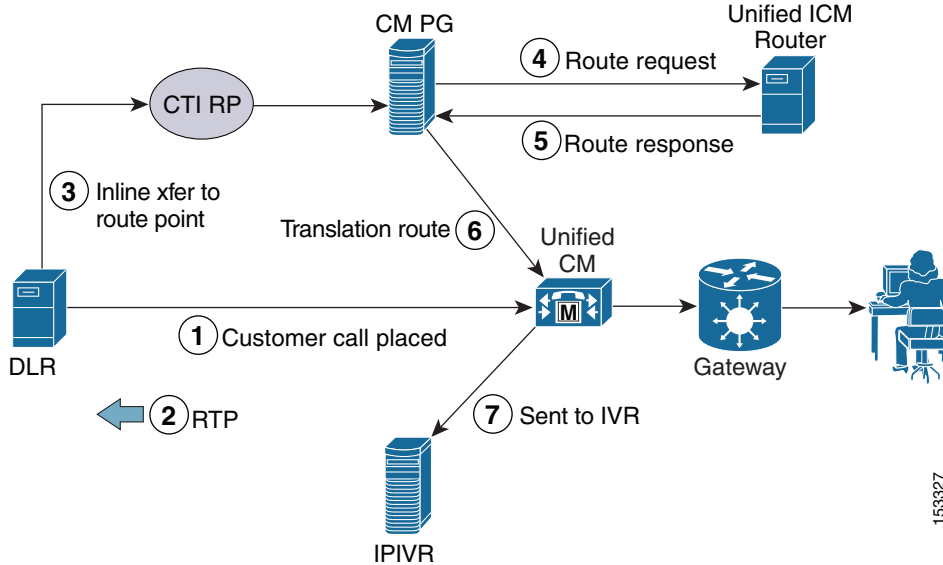
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## Call Flow Description - Transfer to IVR Campaign

In a IVR-based campaign, the live call is transferred to an IVR system according to the following process (Figure 5-2):

1. The Dialer initiates a call to the customer.
2. The RTP stream is analyzed and voice is detected.
3. The Dialer requests an in-line transfer to a pre-configured route point.
4. The Unified CM PG requests translation route for the router.
5. The router responds.
6. The response is translated and sent to Unified CM.
7. Unified CM transfers the call to the IVR.

Figure 5-2 Call Flow for IVR-Based Campaigns



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## Campaign Manager

The Campaign Manager, which resides on the Side-A Logger, is responsible for the following tasks:

- Managing the campaign schedule
- Maintaining system and dialer configurations
- Deciding which contact records to retrieve from a campaign based upon configurable query rules, and delivering contact records to dialers
- Distributing configuration data to the import process and all available dialers in the system
- Collecting real-time and historical data and sending it to the Unified ICM Call Router
- Maintaining an in-memory copy of the Do-Not-Call list and refreshing it when it has changed
- Marking customer records found in the Do-Not-Call list in the database so that no further action is taken on those records

Because the Campaign Manager runs on the same system as the Side-A Logger, it is important to schedule large imports of the contact list and Do-Not-Call list during off-hours.

# Unified Outbound Option Deployment

This section describes deployment models for the Unified Outbound Option.

## Enterprise Deployment

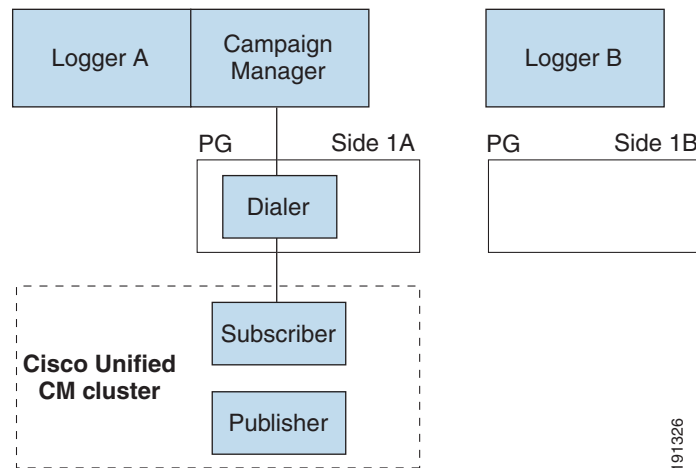
Run Unified Outbound Option on a Windows server that meets the minimum requirements specified in the latest version of the *Hardware and System Software Specification (Bill of Materials) for Cisco ICM/IPCC Enterprise & Hosted Editions*, available at

[http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products\\_implementation\\_design\\_guides\\_list.html](http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html)

## Single Dialer Deployment

Figure 5-3 shows the installation of a single dialer. The Dialer is shown to be installed on side A of the duplexed PG; however, this is not a requirement. The single dialer configuration provides capacity for 96 ports. This deployment model is used when scaling and high availability are not factors.

**Figure 5-3** Single Dialer Deployment



In a simplex Agent PG deployment, only one Dialer process is supported per Agent PG and Unified CM cluster.

For Cisco Unified Contact Center Enterprise deployments, the Unified Outbound Option Dialer and Media Routing PG processes run on the same physical server as the Agent PG. For System Unified CCE deployments, the Dialer and Media Routing PG processes run on a separate physical server from the Agent PG (see [System Unified CCE Configuration](#), page 5-10). In a two-dialer deployment on a duplex PG pair, the Media Routing PG will have two PIMs because each dialer gets its own Media Routing PIM.

The connection between the Dialer and the Unified CM cluster consists of multiple Skinny Client Control Protocol (SCCP) sessions, one for each dialer port. The duplexed PGs (Side A and Side B) shown in Figure 5-3 are composed of a Generic PG (with Unified CCE PIM and a Unified IP IVR PIM), MR PG, CTI server, and CTIOS server process. The connection between the duplexed PG and the Unified CM cluster is the JTAPI link.

**Note**

The G.711 protocol is required between the Dialer and the IP endpoint (for example, the voice gateway or IP phone).

## Multiple Dialer Deployment

Figure 5-4 shows the deployment model for two dialers. Each dialer is associated with the Unified CM subscriber on its respective side and has all of its ports in one device pool for that subscriber. This configuration that is shown provides 192 dialer ports. To scale upward, you can add more pairs of dialers (PG sides A and B) and subscribers, for up to four pairs (or eight dialers, PG sides, and subscribers) per Unified CM cluster (see Figure 5-5). The use of multiple dialers provides high availability for this deployment model. For more details on high availability, see the section on [High Availability](#), page 5-12.

**Figure 5-4 Multiple Dialer Deployment (Two Dialers)**

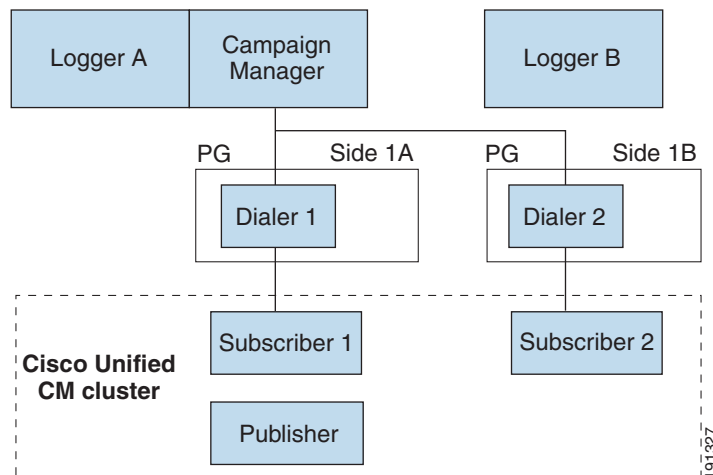
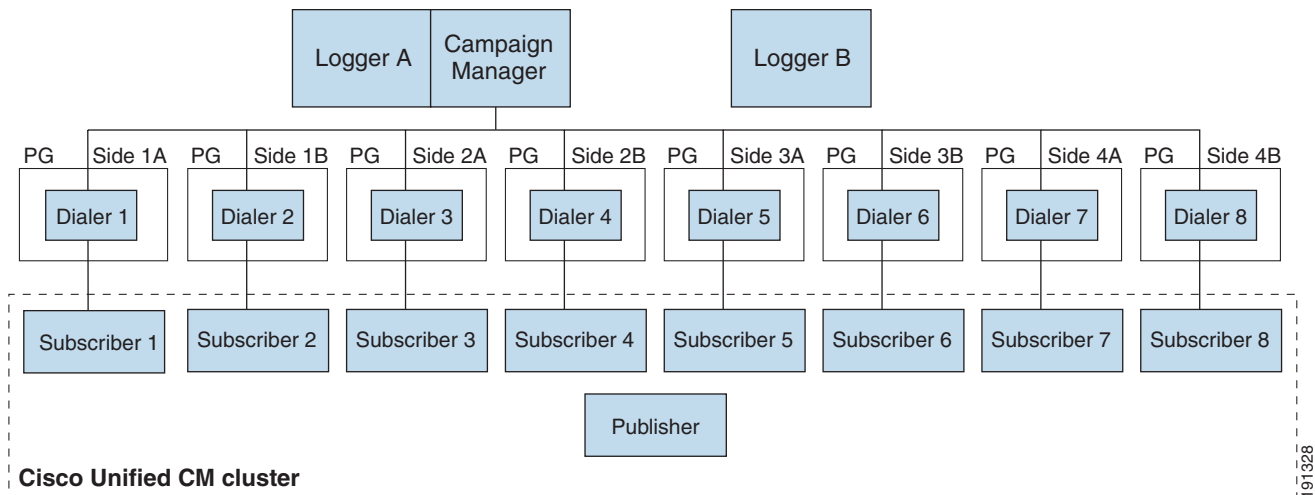


Figure 5-5 Multiple Dialer Deployment (Eight Dialers)



## Clustering Over the WAN

The deployment model for clustering Unified CCE over the WAN allows for improved high availability by deploying redundant components on the other end of the WAN ([Deployment Models, page 2-1](#)). The Unified Outbound Option high-availability model differs from that used in clustering over the WAN; therefore, when deploying a cluster over the WAN, keep in mind that its benefits are for inbound traffic only.

## Distributed Deployment

A distributed deployment model involves a central Unified ICM system and Unified CM located at one site, with the Campaign Manager installed on the logger at this site, and a second site reachable over a WAN, which consists of the dialer, a PG, and a second Unified CM system with Unified Outbound Options. The Campaign Manager sends dialer records over the WAN, and the dialer places calls to local customers. The second site would support inbound agents as well. See [IPT: Multi-Site with Distributed Call Processing, page 2-18](#).

## Voice Gateway Proximity

The Unified Outbound Option Dialer should be co-located with the Unified CCE PG and the Unified CM cluster (including the voice gateway). Because the Dialer supports only G.711 mu-law, you might have to allocate large blocks of WAN bandwidth. Even though the dialer does not support G.729, it is possible to support G.729 for the customer-to-agent portion of the call. This type of configuration is supported without requiring the use of transcoders.

In this deployment, the Dialer advertises G.729 capability (although the Dialer does not truly support G.729). This permits the reservation call from the Dialer to the agent to be completed. The call from the Dialer to the customer must be G.711; however, the customer call is then transferred to the agent and the call is renegotiated to G.729.

**Note**

The use of re-negotiation is not recommended when the voice gateway is located remotely over a WAN, due to the added delay in the call transfer. In these configurations the G.711 codec is recommended.

## Unified Outbound Option Configuration

This section describes configuration considerations for Unified Outbound Option.

### Blended Configuration

The Unified Outbound Option option is capable of running campaigns in a fully blended fashion. Agents can handle inbound calls alternately with outbound calls. See [Sizing Unified CCE Components and Servers, page 10-1](#) for information regarding the MCS inbound capacity. See [Unified Outbound Option Sizing, page 5-10](#).

### System Unified CCE Configuration

System Unified CCE is a deployment model that provides a simplified installation and configuration of Enterprise Unified CCE. The Unified Outbound Option option is installed on a separate machine that includes the Dialer and Media Routing PG components. Only one Dialer process is supported with System Unified CCE; therefore, high availability is not supported.

## Unified Outbound Option Sizing

When sizing your deployment, do not use the maximum number of outbound agents allowed on a PG without also looking at the other key factors of expected hit rate, lines dialed per agent, and average handle times. An outbound campaign with a 10 second average handle time and dialing 10 lines per agent will be able to support only about 20 agents while fully occupying 192 ports on 2 dialers. However, a campaign with an average 2 minute handle time dialing 3 lines per agent for a 30% hit rate is likely to keep the maximum number of agents allowed on the PG busy.

For sizing Unified Outbound Option, use the *Cisco Unified Contact Center Enterprise Sizing Tool* (accessible to Cisco internal employees and Cisco partners with proper login authentication), available at

[http://www.cisco.com/web/partners/sell/technology/ipc/integrated-solutions/customer\\_contact\\_center.html](http://www.cisco.com/web/partners/sell/technology/ipc/integrated-solutions/customer_contact_center.html)

The output of this tool is also used as input to assess the capacity requirements of Unified CM.

## Dialer Throttling and Unified CM Considerations

Throttling is controlled by a pair of registry keys at the Dialer level (*/icm/<custname>/Dialer*), *PortThrottleCount* and *PortThrottleTime*. *PortThrottleCount* indicates the number of ports to throttle, and *PortThrottleTime* indicates the amount of time (in seconds) to throttle them. For Cisco MCS-7845

and MCS-7835 servers, Cisco recommends that you set these values to count = 10 and time = 2 seconds. With these settings, the Dialer will initiate calls on only ten ports during the first two seconds of the campaign, and then the next ten ports for the next two seconds, and so forth, until all 96 ports are utilized.

The PortThrottleCount of 10 will allow dialing at a rate of 5 calls per second per Dialer, which should give Unified CM sufficient headroom to allow for other incoming traffic and even allow for some shared resources. It is a setting that works well for most situations. If your deployment requires a higher call rate, ensure that the call rate for all traffic for any one subscriber will not exceed 10 calls per second at any time. You need to be vigilant to make sure that traffic is not shared across subscribers.

Currently, a Unified CM subscriber node running on a dual-processor MCS-7845 server has a maximum capacity at 10 calls per second. Each Dialer is capable of dialing at a rate of 10 calls per second or greater. If the solution is deployed in a way that allows for the Unified CM subscribers to be overloaded, then there is a risk of causing dropped customer calls and inefficient dialing.

The throttling mechanism is in each Dialer process, and it is not aware if another Dialer is sharing Unified CM resources. Therefore, if two Dialers share the same device pool or trunk, then there is a risk of dropped calls and inefficient dialing. This risk especially applies to failover. If the ports belonging to one Dialer fail-over to another Unified CM subscriber that is already occupied by another Dialer, again there is risk of dropped calls and inefficient dialing.

The Unified CM configuration must be designed and implemented to limit all traffic for a given Dialer to a distinct Unified CM subscriber node to prevent two Dialers from overwhelming any shared resources. This means that each Dialer requires separate device pools that point to one and only one subscriber. Each Dialer also needs its own calling search space, partition, translation pattern, and trunk configured on its Unified CM subscriber.

#### **Transferring to Unified CVP using H.323 and MTP Resources**

In cases where the customer is reached but no agents are currently available, or in cases where unattended campaigns are implemented, calls will be transferred to an IVR. If the solution design uses Unified CVP with the H.323 protocol, then media termination point (MTP) resources are required when transferring calls to the IVR. To minimize MTP requirements, the trunks configured for calls transferred to Unified CVP should be separate from the trunks used for external gateways.

## **Call Transfer Timelines**

The length of time required to complete call transfer of a customer call to an agent is highly dependent on the telephony environment. The following factors can add to transfer times:

- Improperly configured Cisco Unified Communications infrastructure.—Port speed mismatches between servers or inadequate bandwidth.
- WAN—WAN unreliable or not configured properly.
- IP Communicator—Media termination running on a desk top does not have the same system priority as software running on its own hardware platform like a hard phone. This is not recommended for Unified Outbound Option usage unless the customer is clearly taking an inexpensive route and is OK with a less reliable solution.
- Call Progress Analysis—When you enable Call Progress Analysis for the campaign, it takes on an order of a half second or so to differentiate between voice and an answering machine, if the voice quality is good. When calling cell phones, the voice quality is quite often less than optimal so it might take the dialer a bit longer to differentiate.

# High Availability

The Unified Outbound Option option provides high availability through multiple dialers per Unified CM cluster. Calls are distributed evenly among the dialers. If a dialer fails, the calls are re-routed to the other dialers throughout the enterprise that are configured to support the remaining campaign contacts. The calls that were in progress on the failed dialer are marked for retry.

**Note**

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The Campaign Manager and Import process components of the Unified Outbound Option are simplex components and are required to be co-located with the Logger (Side A).

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In a System Unified CCE deployment model, configuration support is currently provided for one dialer for the single PG. If more dialers are required, then the System PG or Enterprise deployment models are recommended.

It is normal practice to set up Unified IP phones to be able to fail over to another Unified CM in case of a Unified CM node failure in which phones are distributed across the cluster. The Dialer is not a normal phone, and the ports for a dialer should not be distributed across multiple nodes within the cluster.

Give careful consideration before configuring a dialer to fail-over to a back up subscriber. The dialer can tax the Unified CM node when starting a campaign or whenever resources are available (agents or IVR ports for transfer to IVR campaign). If two dialers are configured to share the Unified CM as part of distribution or node failure, a high-availability attempt can have a negative performance impact on the rest of the system. Each dialer has its own port throttling mechanism, and is not aware that another dialer may be sharing the same Unified CM. With two dialers competing, the subscriber might enter into a code yellow condition. However, the dialer can fail over to a back up subscriber provided that the subscriber is completely idle and allocated for back up activities only.

The general rule in configuring the dialers for high availability is to do no harm. As part of this guideline, be aware that dialers significantly affect Unified CM performance, and therefore it is advisable to validate the deployment design by running the resource calculators available (with appropriate login authentication) at

[http://www.cisco.com/web/partners/sell/technology/ipc/integrated-solutions/customer\\_contact\\_center.html](http://www.cisco.com/web/partners/sell/technology/ipc/integrated-solutions/customer_contact_center.html).

## Cisco Unified Mobile Agent

Mobiles agents are supported for outbound campaigns. However, only a nailed-up connection is supported. For more details regarding Cisco Unified Mobile Agent, see the chapter on [Cisco Unified Mobile Agent, page 6-1](#).

## References

For more information on the Unified Outbound Option feature, refer to the Cisco Unified Outbound Option documentation available at

[http://www.cisco.com/en/US/products/sw/custcosw/ps524/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/sw/custcosw/ps524/tsd_products_support_series_home.html)