



Design Considerations

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Unified CVP Algorithm for Routing

When you set up a dial plan and call routing, you can combine Unified CVP features (such as Location Based CAC, SigDigits, SendToOriginator, LocalSRV, and Use Outbound Proxy) to achieve the required effect.

The following algorithms are used to formulate the destination SIP URI for the outbound calls from Unified CVP. This description covers CONNECT messages that include labels from the ICM (for example, VXML Gateway, and Unified Communications Manager), as well as calls to the ringtone service, recording servers, and error message playback service.



Note The following algorithm only describes calls using the SIP subsystem, which includes audio only and basic video SIP calls.

The sendtoriginator algorithm is supported only for co-located IOS VoiceXML Gateway and Ingress Voice Gateway. The sendtoriginator algorithm is not supported in Cisco VVB as the co-location concept is not applicable.

The algorithm for creating the destination SIP URI host portion for outbound calls, which include the ICM label, is as follows:

1. The ICM label is provided at the start of the algorithm. It may already have the Location siteID inserted by the ICM subsystem, or SigDigits may be prepended if used. For network VRU labels, the ICM subsystem passes in the entire prefix and correlation ID as the label.
2. If SendtoOriginator is matched for the Unified CCE label, the IP or hostname of the caller (Ingress Voice Gateway) is used by the Unified CVP algorithm, which returns the SIP URI.

The setting for `SendtoOriginator` only applies to callers on Cisco Ingress Voice Gateways (the SIP `UserAgent` header is selected), because non-Cisco IOS Gateways do not have the CVP bootstrap service used by the Cisco IOS VoiceXML Gateway.

3. If **use outbound proxy** is set, then use the host of the proxy and return SIP URI.

4. If **local static route** is found for the label and return the SIP URI.



Note If **local static route** is not found, the algorithm throws **RouteNotFoundException** exception.

The following algorithm describes planning considerations for calls using the SIP subsystem:

- To avoid complex Dialed Number strings, do not use the Sigdigits feature if Locations CAC siteIDs are used.
- An Outbound Proxy FQDN can be specified as a Server Group FQDN (local SRV FQDN). A local static route destination can also be configured as a Server Group FQDN.
- Ringtone DN (91919191), Recording Server (93939393), and Error message services (92929292) follow the same algorithm as mentioned in the procedure.
- `SendToOriginator` can work in conjunction with a REFER label.
- A REFER label can work with the `SigDigits` setting.

Distributed Network Options

After choosing a functional deployment model, you must determine where the Unified CVP components are deployed. Unified CVP deployment can use one of the following primary distributed network options:

- **Combined Branch Gateways**—Enables call treatment at the edge and integration of locally dialed numbers into the enterprise virtual contact center. This option can be either a combined Ingress and IOS VoiceXML Gateway, or separate gateways. Typically, both the Ingress and VoiceXML Gateways are combined when deployed in a branch. Combined Ingress and VoiceXML Gateway is available only on Cisco IOS Voice Gateway.
- **Branch Ingress Voice Gateways with Centralized VoiceXML Gateways**—Enables integration of locally dialed numbers and resource grouping of VoiceXML Gateways. This option can be required for organizations with many medium to large branches, with a few contact center calls in each branches. The VRU announcements in the Centralized VoiceXML Gateways traverse the WAN to the Ingress Gateway.
- **Branch Egress Gateways**—Enables calls to be transferred across the WAN to remote TDM terminations.
- **Branch Agents**—Enables a virtual contact center where agents can be located anywhere on the IP network.

You also can use a combination of these distributed options. For more details and design considerations for each of these distributed network options, see the chapter on [Distributed Deployment](#).

CUBE Deployment with SIP Trunks

The use of third-party SIP trunks with Unified CVP is supported by using the Cisco Unified Border Element (CUBE) product. CUBE performs the role of session border controller (SBC), for SIP normalization and interoperability.

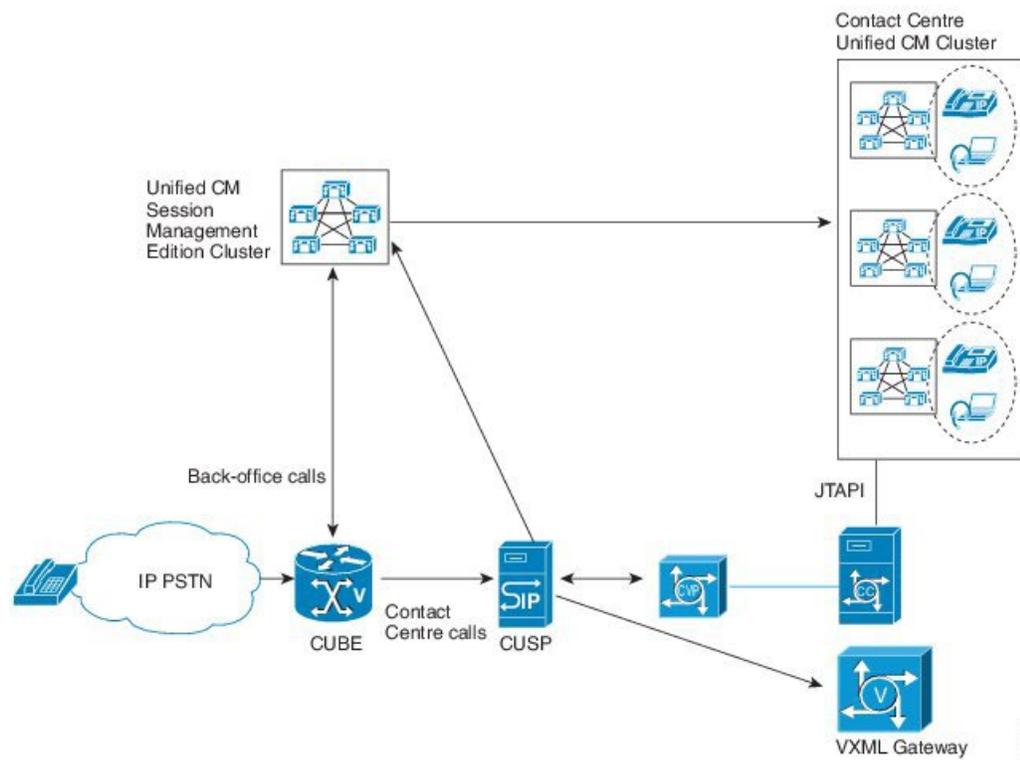
Unified CM SME Deployment

Cisco Unified Communications Manager Session Management Edition (Unified CM SME) integrates with Unified CVP as a dial peer configurator or aggregator to connect to multiple Unified Communications Manager clusters in the Cisco Unified Customer Voice Portal (Unified CVP) and Cisco Unified Contact Center Enterprise (Unified CCE) solution setup.

Unified CM SME as a back-to-back SIP user agent is configured to act as an aggregator that connects to multiple Unified Communications Manager clusters and routes the call to the appropriate cluster based on the dial plan.

The following figure illustrates the Unified CM SME deployment.

Figure 1: Unified CM SME Deployment



Unified CM SME does not support high-availability and is a single source of failure. Following are the design considerations to minimize the effect of Unified CM SME failure (either network connectivity failure or actual component failure).

- Deploy Unified CM SME in redundant clustered mode (at least 1+1 publisher subscriber) at the egress side of Unified CVP.
- Deploy Cisco Unified SIP Proxy Server (CUSP) in the egress leg between Unified CVP and Unified CM SME. This configuration is required to determine the Unified CM SME status and to hold the call session during Unified CM SME failure.
- You must configure **Session Refresh** and **Session Timer** in the Gateway/Cisco UBE. This configuration is required to clear call sessions from the gateway and to release Unified CVP Call Server ports in case of Unified CM SME failure.
- In case of Unified CM SME failure, all the call server ports are cleared after the customer drops the call.



Note Call supplementary services will not work for the already established calls once the Unified CM SME is down.

Momentary network connectivity failure to Unified CM SME results in the following limitations:

- Unified CM SME does not clear the call, when the agent hangs up the call during momentary connectivity failure to Unified CM SME. This results in a stale cached entry and ports hanging in the Unified CVP application. In such cases, the caller should drop the call to clear the stale cached entry.
- The call does not get cleared from the agent desktop and the agent will be unable to receive any incoming calls. As a result the agent remains in the talking state and is unable to clear the call from the desktop. In such cases, the call has to be manually cleared from the device or hard phone.
- Because of a delay in call clearance, the call reporting data may reflect inaccurate details for call duration and reason code.

For more information about Unified CM SME Configuration, see *Configuration Guide for Cisco Unified Customer Voice Portal* available at: <http://www.cisco.com/c/en/us/support/customer-collaboration/unified-customer-voice-portal/products-installation-and-configuration-guides-list.html>.

CUBE or SME Deployment in Between Unified CVP and Unified CM

When CUBE or SME is deployed in between Unified CVP and Unified CM on the outbound leg, all SIP connections between Unified CVP and CUBE or SME must use TCP transport.

Scalability

After choosing the functional model and the distributed and high-availability deployment options, Unified CVP solution designers must then size their solution and select appropriate hardware. To make Unified CVP deployments larger, Unified CVP supports multiple gateways, Unified CVP Servers, and Unified CVP VXML Servers.



Note Unified CVP Servers contain the VXML Server component.

To load balance HTTP requests efficiently to multiple Unified CVP Servers, Unified CVP VXML Servers, and media stores, you can use the Application Control Engine (ACE).

For more details on choosing appropriate hardware for your deployment, see the chapter about Sizing.

Virtualization

Unified CVP may be installed and run on virtual machines (VMs) provided by VMware software. Running in a virtual environment has the potential for reducing the number of hardware equipments needed to run a Unified CVP deployment, to facilitate the deployment's administration, and to leverage your ESX infrastructure.

The following Unified CVP deployments are supported using VMware VMs:

- All SIP call flows, deployments, and features that could be installed on a physical server
- Mixed environments of physical and virtual servers



Note Deployments assume that you do not oversubscribe or overcommit the CPU and memory resources beyond what is available on the host.

For specific information about virtualization with Unified CVP, see <http://www.cisco.com/go/uc-virtualized>.

Quality of Service

The quality of service (QoS) is the measure of transmission quality and service availability of a network. Unified CVP implements Layer 3 QoS defaults on all relevant network paths. Unified CVP provides a management interface through the Unified CVP Operations Console Server to modify QoS settings at each end of specifically designated data paths.



Note For instructions on configuring QoS for Unified CVP, see the *Operations Console Online Help*.

For QoS design information, see the Enterprise QoS in the *Solution Reference Network Design Guide*.
