



CHAPTER 1

Product Overview

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The Cisco TelePresence Exchange System is an integrated video service-creation platform that enables service providers and strategic partners to offer secure cloud-based managed and hosted Cisco TelePresence and business video services. The Cisco TelePresence Exchange System is a software environment that simplifies end-to-end subscriber service provisioning; optimizes intelligent call routing for endpoints and network bandwidth; manages the call processing and allocation of media resources for conferencing; consolidates a centralized control point for management, billing, and administration; and presents an open application programming interface (API) for application integration such as scheduling and directory services.

Based on proven technology and powered by a fully redundant and horizontally scalable architecture, it delivers an open, scalable, and robust multi-tenant solution that can grow in scale and functions based on service needs. As a result, it accelerates time to market by simplifying the process of setting up new services and promotes service innovation through APIs that support service customization and partner on-boarding.

The following sections provide additional information about the Cisco TelePresence Exchange System:

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Benefits

The Cisco TelePresence Exchange System provides the following benefits to service providers:

- Secure and scalable network-based telepresence services for inter-company conferencing.
- Call admission control and network bandwidth management for inter-company point-to-point meetings.
- A standard interconnect architecture across service providers to facilitate peering.
- Interoperability with legacy video systems to expand the service footprint.
- Organization ports functionality to manage network utilization on a per-customer basis.

- Open application programming interfaces (APIs) to create service differentiation (for scheduling portals and vertical applications) and to facilitate integration with existing billing and operational support systems.
- Call-detail records (CDRs) for calls that are placed on the system, including direct-dial calls between two enterprises that are hosted by the same service provider and direct-dial calls to other service providers. For intra-company direct-dial calls, you can configure the system to pull CDRs from Cisco Unified Communications Manager and generate them locally as if the calls had been processed by the system itself.

Network Architecture

This section describes the network architecture in which the Cisco TelePresence Exchange System operates, and includes the following topics:

- [Overview, page 1-2](#)
- [Cisco TelePresence Exchange System Components, page 1-4](#)
- [Deployment Models, page 1-4](#)

Overview

The Cisco TelePresence Exchange System manages the media resources and the call processing that inter-company telepresence services require. The Cisco TelePresence Exchange System fulfills the following network-level responsibilities:

- Controls the reservation and allocation of media resources.
- Manages the resource usage for organizations.
- Provides connectivity between service provider networks.

The Cisco TelePresence Exchange System consists of a server cluster that is designed to provide carrier-grade availability and reliability. With this implementation, the service provider would typically locate the server cluster in its data center.

To provide Cisco TelePresence services, the Cisco TelePresence Exchange System interacts with the following Cisco platforms:

- **Cisco Session Border Controller (SBC)**—The SBC provides call control and security at the demarcation between enterprises and the service provider. The SBC also provides interconnection to other service providers.

Session border control is integrated into several Cisco IOS routers. For specific models supported by the Cisco TelePresence Exchange System, see the applicable [Release Notes for Cisco TelePresence Exchange System](#), at <http://www.cisco.com/go/ctx-relnotes>.

- **Cisco Application Control Engine (ACE) appliance**—The ACE appliance provides access control, load balancing, and high availability functionality for the Cisco TelePresence Exchange System server cluster.
- **Cisco TelePresence Multipoint Switch**—The Cisco TelePresence Multipoint Switch is a multipoint control unit that provides media switching for multipoint meetings that involve Cisco TelePresence System endpoints.
- **Cisco TelePresence Media Services Engine (MSE) 8000 Series products**—The Cisco TelePresence MSE 8000 Series products support carrier-class telepresence services. The chassis contains a supervisor module and provides nine slots for optional service modules. The Cisco TelePresence Exchange System uses the following types of service modules:
 - **Cisco TelePresence MCU MSE 8510**—Provides inter-working with single-screen telepresence endpoints that support the SIP, H.323, or integrated services digital network (ISDN) standard.
 - **Cisco TelePresence Server MSE 8710**—Provides inter-working with single-screen and multi-screen telepresence endpoints.
 - **Cisco TelePresence ISDN Gateway (GW) MSE 8321**—Provides inter-working with ISDN endpoints.
- **Cisco Router with Integrated Voice Response (IVR)**—The Cisco TelePresence Exchange System uses the IVR router for calls that have a missing or incorrect meeting PIN and for calls that encounter exception conditions. The IVR plays the appropriate prompts and collects the meeting PIN from the customer.

IVR functionality is integrated into several Cisco IOS routers. For specific models supported by the Cisco TelePresence Exchange System, see the applicable [Release Notes for Cisco TelePresence Exchange System](#).

- **Cisco Unified Communications Manager (Unified CM)**—The Unified CM provides configuration, management, and call routing to configure a set of telepresence endpoints. The service provider Unified CM is used to support hosted endpoint deployments.
- **Cisco TelePresence Video Communication Server**—The Cisco TelePresence Video Communication Server (Cisco VCS) extends face-to-face video collaboration across networks and organizations by supporting any-to-any video and telepresence communications. When an enterprise wants to deploy Cisco TelePresence and third-party standards-based H.323 and ISDN endpoints, the enterprise must install at least one Cisco VCS.
- **Cisco TelePresence Manager**—The Cisco TelePresence Manager provides scheduling integration for a cluster of Cisco TelePresence Multipoint Switch resources, and supports One-Button-to-Push (OBTP) session initiation for endpoints on the Cisco TelePresence Exchange System network.

When you enable OBTP on an endpoint, the Cisco TelePresence Manager automatically provisions the information that is necessary to allow an endpoint either to directly dial another endpoint with a simple touch of a button, or authenticate and join a scheduled multipoint conference without any need for additional user interaction.
- **Cisco Catalyst Switch**—The switch provides layer 2 and layer 3 connectivity for the Cisco TelePresence Exchange System and the other Cisco platforms. For specific switch models that the Cisco TelePresence Exchange System supports, see the applicable [Release Notes for Cisco TelePresence Exchange System](#), at <http://www.cisco.com/go/ctx-relnotes>.

Cisco TelePresence Exchange System Components

The Cisco TelePresence Exchange System server cluster includes the following components:

- **Administration Server**—Provides the administration console for configuring and maintaining the Cisco TelePresence Exchange System. The administration server also exposes the APIs.
- **Database Server**—Provides a MySQL database for persistent data.
- **Call Engine Server**—Provides SIP call control for the services that are offered by the Cisco TelePresence Exchange System.

Deployment Models

The Cisco TelePresence Exchange System supports the following deployment models:

- **Hosted endpoint service**—For organizations that want the service provider to host the telepresence service. The organization deploys only the telepresence endpoints. The service provider data center contains the Unified CM cluster and Cisco TelePresence Manager components for hosted organizations. Customer endpoints register with the service provider Unified CM.
- **Enterprise endpoint service**—Enterprise endpoint service enables organizations to own and manage the telepresence service within their enterprise network. The enterprise provides the Unified CM cluster and the Cisco TelePresence Manager. Connectivity with the Cisco TelePresence Exchange System uses SIP trunking from the enterprise to the service provider SBC.

For enterprise deployment of Cisco TelePresence or third-party standards-based endpoints, the enterprise must install at least one Cisco VCS.

Carrier-Grade Availability and Scalability

The Cisco TelePresence Exchange System incorporates the following high-availability features:

- The Cisco TelePresence Exchange System server cluster includes redundant servers for each of the functional components.
- The Cisco Application Control Engine (ACE) provides load balancing to the administration servers and the call engine servers. If one server becomes unavailable, the other server processes the full traffic load. Because ACE provides a single IP address to the server cluster, the service remains available to the users.
- Persistent data is stored in a replicated database on the database servers. If the active database server becomes unavailable, the standby database server becomes active.
- Database backup and restore capability.
- Media resources are provided by clusters of media servers. If a media server becomes unavailable, calls that are using resources on that server are dropped. The remaining active media servers in the cluster handle all new calls.

Licensing

The Cisco TelePresence Exchange System requires the installation of a license to enable Meet-Me, Rendezvous, and direct dial services. The system checks the license before scheduling a meeting or initiating a Meet-Me, Rendezvous, or direct dial call. The system blocks these operations if a valid license is not detected.

The Cisco TelePresence Exchange System comes preinstalled with a 60-day evaluation license. After 60 days, you must install a permanent license to continue to use the Meet-Me, Rendezvous, and direct dial services. The permanent license is perpetual, meaning that it does not expire and does not need to be renewed.

The license is locked to the call engine servers. If you replace a call engine server, you need to request a new license file for the replacement server.

In addition, the use of the active meeting management feature requires a valid active meeting management (ActiveMeetingMgmt) feature license.

Application Programming Interfaces (APIs)

Cisco TelePresence Exchange System includes several application programming interfaces (APIs) that provide provisioning and data access to the system, as follows:

- **Scheduling API**—Provides web services to enable development of third-party scheduling portals. The scheduling API services allow the portal to schedule and manage Meet-Me, Rendezvous, and two-party direct meetings.
The Scheduling API also provides “Get” methods for retrieving configured information about endpoints, regions, organizations, whitelist groups, and other objects.
- **Active Meeting Management API**—Enables real-time management of Meet-Me and Rendezvous meetings that are currently in progress. By using the Active Meeting Management API, you can develop client applications for monitoring and controlling active meetings, typically by concierge or service desk personnel. This API requires a valid ActiveMeetingMgmt feature license.
- **CDR API**—Provides services to retrieve call detail records from the Cisco TelePresence Exchange System.

For more information on the APIs, see the *API User Guide for the Cisco TelePresence Exchange System Release 1.1*, at http://www.cisco.com/en/US/docs/telepresence/tx/exchange_system/1_1/api_guide/api_guide_11.html

Key Concepts

Cisco TelePresence Exchange System uses a set of concepts that are described in the following sections:

- [Service Providers, page 1-6](#)
- [Regions, page 1-6](#)
- [Organizations, page 1-6](#)
- [Meeting Types, page 1-7](#)
- [Service Numbers and Integrated Voice Response \(IVR\), page 1-7](#)

- [Host PINs for Meet-Me or Rendezvous Meetings, page 1-8](#)
- [Meeting Extensions for Meet-Me Meetings, page 1-8](#)
- [Advanced Resource Management, page 1-9](#)
- [Endpoints and Media Profiles, page 1-10](#)
- [Endpoint Capacity, page 1-11](#)
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- [Organization Ports Management, page 1-12](#)
- [Call Routing, page 1-12](#)
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- [Inter/Intra-Service Provider Policy Engine and Whitelist Groups, page 1-13](#)

Service Providers

A service provider offers telepresence services to a set of business customers (organizations) by using media resources that are provisioned at one or more regions in their network.

The Cisco TelePresence Exchange System provides the ability to customize the service greetings and IVR prompts for each service provider.

Regions

A region represents a major geographic region in which a service provider operates.

The region contains one or more resource clusters, which generally include either a Cisco TelePresence Multipoint Switch and/or Cisco TelePresence MSE 8000 Series, Cisco router with integrated voice response (IVR) records, and a Session Border Controller (SBC). A resource cluster is a connected set of resources in one physical data center and is also known as a point of presence (POP).

The system supports multiple points of presence (POPs) within a region—media resources can be configured in more than one data center in a region. All media resources in a region are considered to be equivalent for resource allocation purposes, even if the resources span multiple POPs.

A service provider might have multiple regions configured on a Cisco TelePresence Exchange System, and it is possible for a given region to contain resources for different service providers.

Organizations

An organization is a business customer served by a service provider. An organization controls one or more telepresence rooms (also known as endpoints) that can be included in a meeting. An organization can choose hosted-endpoint service or enterprise-endpoint service.

Meeting Types

The Cisco TelePresence Exchange System supports the following types of meetings:

- **Meet-Me meeting**—A Meet-Me service meeting that is hosted by this Cisco TelePresence Exchange System to provide conferencing for two or more Cisco TelePresence or third-party endpoints. The system reserves and allocates media resources for all of the endpoints in the meeting and provides One-Button-to-Push (OBTP) functionality to the provisioned endpoints. The system also reserves ports of organization bandwidth for the meeting, if applicable.
- **Remote meeting**—A Meet-Me service meeting that is hosted by a remote Cisco TelePresence Exchange System. The Cisco TelePresence Exchange System does not reserve any media resources for a remote meeting. You schedule remote meetings to provide OBTP functionality in the provisioned endpoints and to reserve ports of the organization bandwidth, if applicable.
- **Rendezvous meeting**—Also called a *timeless* or *reservationless* meeting, a Rendezvous meeting is not limited to a single start time. For a Rendezvous meeting, the system starts a new meeting instance and allocates media bridge resources when the first participant joins the meeting. Likewise, the system deallocates resources and ends the current meeting instance when the last participant leaves the meeting.
- **Scheduled two-party direct meeting**—A scheduled direct dialed meeting between two hosted provisioned endpoints. The Cisco TelePresence Exchange System does not reserve any media resources for a direct dial meeting. Two-party direct meetings are scheduled to provide OBTP functionality for those endpoints within the same organization.

Each meeting is associated with a service provider and a region. All media resources for the meeting are allocated from the specified region, even if some participants are from another region or a different service provider. You must specify the region when you schedule the meeting.

If you have the ActiveMeetingMgmt feature license, you can also use the Active Meeting Management collaboration service to make changes to Meet-Me or Rendezvous meetings that are in progress, such as locking or unlocking the meeting to control whether additional participants can join, muting or unmuting participants, increasing the media bridge resource capacity of the meeting, dropping endpoints and redialing them, and increasing the duration of the meeting.

Service Numbers and Integrated Voice Response (IVR)

The service number is the number users call to reach a meeting service such as Meet-Me or Rendezvous. When a user encounters a situation that requires further information or action, such as needing to enter a specific meeting ID, an integrated voice response (IVR) application provides greetings and prompts to collect the information. You configure at least one service number for each service provider on the Cisco TelePresence Exchange System, and you associate a set of IVR prompt files with each service number.

You add IVR prompt sets in the Collaboration Services section of the administration console. When scheduling a meeting, you select a service number for the meeting from among the list of numbers associated with the service provider. Because the service number is tied to a set of prompt files, you can create and use different prompt sets for different meeting scenarios—for example, you can provide prompts for different meetings in different languages.

A Cisco router with IVR provides the IVR services for participants. You configure the router as an IVR resource in the Media Resources section of the Cisco TelePresence Exchange System administration console.

When a participant encounters a situation that requires an IVR prompt, the system forwards the call to the IVR router along with a URL for the prompt. The IVR router sends an HTTP request for the prompt to the system, the system sends a VXML response, and the IVR router plays the prompt audio to the caller.

All meeting participants who interact with the IVR use the prompt set associated with the service number configured for the meeting, including those who dial in by using One-Button-to-Push (OBTP) functionality on their endpoints. If participants attempt to dial a service number that is not associated with the meeting, they hear the prompts associated with the service number that they dialed.

Host PINs for Meet-Me or Rendezvous Meetings

Host PINs enable you to designate a host participant role for a Meet-Me or Rendezvous meeting in order to restrict which participant can start the meeting. More than one participant can be designated as a host. The system categorizes participants as either a host or a guest.

If a guest participant joins the meeting before a host, the system places the participant in a queue and prevents the participant from joining the meeting. Once a host joins the meeting, the meeting starts and all the guests in the queue join the meeting. You can configure whether or not to drop all participants when all the hosts leave the meeting.

You can configure the host settings at the service provider level, organization level, or meeting level. The settings are hierarchical, so you can configure a meeting to inherit its settings from the meeting scheduler organization. In addition, you can configure an organization to inherit its settings from the service provider. If you want a meeting to inherit organization settings, you must enable the inheritance option at the meeting level. Similarly, if you want an organization to inherit service provider settings, you must enable the inheritance option at the organization level.

To use the Host PINs feature, you must enable the host options and create a host personal identification number (PIN) for the meeting. You can choose to have the system generate the host PIN or you can enter a customized host PIN. Host PINs can be reset as many times as needed.

The system designates a participant as a host if one of the following conditions apply:

- A participant manually enters the host PIN when joining the meeting.
- A participant joins the meeting from a provisioned endpoint that has been designated as a host. For this condition, the participant does not need to manually enter a host PIN to join the meeting.

Meeting Extensions for Meet-Me Meetings

When Implicit Meeting Extension is enabled for a Meet-Me meeting, the Cisco TelePresence Exchange System checks for available resources shortly before the two minute end-of-meeting warning. If sufficient resources are available, the system displays a notification indicating to participants that the meeting has been extended, and the meeting continues for a specified length of time. (Participants in meetings hosted on the Cisco TelePresence Multipoint Switch will not see the meeting extension notification, however.)

You can configure the number and length of implicit extensions. The extension length must be in increments of 15 minutes. The maximum number of extensions times the extension length must not exceed 24 hours.

How Implicit Meeting Extension Works

Each time the meeting approaches an extension period, the system checks both currently active and upcoming scheduled meetings to ensure that sufficient resources are available. For example, you can schedule a meeting with a duration of 60 minutes and two 15-minute implicit extensions. The system checks for resources once the meeting has been underway for approximately 58 minutes. If resources are available, the meeting duration is extended to 75 minutes, and the system checks again after the meeting has been underway for approximately 73 minutes. If the extension fails, the system displays the two minute end-of-meeting warning to participants, and ends the meeting after two minutes. Otherwise, the meeting duration is extended to 90 minutes.

You can configure the meeting extension policy at the service provider level, organization level, or meeting level. The policy is hierarchical, so you can configure a meeting to inherit its settings from the meeting scheduler organization. In addition, you can configure an organization to inherit its settings from the service provider. If you want a meeting to inherit organization settings, you must enable the inheritance option at the meeting level. Similarly, if you want an organization to inherit service provider settings, you must enable the inheritance option at the organization level.

Combining Explicit and Implicit Meeting Extension Features

You can also use the Active Meeting Management feature controls to explicitly increase the duration of a Meet-Me meeting that is in progress. You can use both implicit and explicit extensions for the same meeting. After each implicit extension, the system updates the duration of the meeting that is displayed via Active Meeting Management. After each explicit change to the meeting duration, the system resets the number of implicit extensions for the meeting. For example, on an active meeting that was originally scheduled for 60 minutes with two 15-minute implicit extensions enabled, if the system automatically extends the meeting to 75 minutes, and then a service desk user manually changes the meeting duration to 90 minutes, the system could perform two more implicit extensions, if resources are available, for a total duration of up to 120 minutes.

You can use Active Meeting Management to modify the quantity and duration of implicit extensions if implicit extensions were enabled before the meeting began. Changes to the duration of implicit extensions will apply to the next extension period if the system has already checked for resources for an extension or has started the extension. You cannot enable implicit extensions while the meeting is active if they were disabled before the meeting began.

Advanced Resource Management

The Advanced Resource Management feature provides greater flexibility and control of how media bridge resources are allocated for Meet-Me and Rendezvous meetings. This feature introduces the concept of resource groups and reservation types.

Before configuring resource groups or adding Meet-Me or Rendezvous meetings, you must define reservation types. The reservation type determines whether the Cisco TelePresence Exchange System provides a guaranteed or best-effort level of service when reserving a media bridge resource for a Meet-Me or Rendezvous meeting. The reservation type levels of service are defined as follows:

- **Guaranteed**—When you create a guaranteed Meet-Me meeting, the system reserves media bridge resources for the specified meeting duration. For a guaranteed Rendezvous meeting, the system reserves resources for the meeting that can never be used for other meetings.
- **Best-effort**—When you create a best-effort Meet-Me or Rendezvous meeting, the system does not reserve any media bridge resources in advance for the meeting. Instead, the system allocates resources when the first participant joins the meeting and deallocates resources when the last

participant leaves the meeting. For a best-effort meeting, the system may fail to allocate resources to the meeting because all the available resources may be in use by other best-effort meetings for the given time period.

When configuring a resource group, you choose a specific service provider and region and one or more reservation types to be associated with the group. You then configure the allowable amount of dedicated media resources and meeting booking capacity for each reservation type chosen. Assigning both a guaranteed and best-effort reservation type to a single resource group allows you to dedicate a specific percentage of the resources to guaranteed meetings and another percentage to best-effort meetings. For best-effort meetings, you have the capability to overbook the media bridge resources. Overbooking assumes that all Meet-Me and Rendezvous meetings associated with a specific reservation type will not be active at the same time. By having different levels of overbookings, you can provide different service levels (for example, Gold, Silver, and Bronze) whereby the higher service levels have lower overbooking and thus have a lower probability of booking failure.

After the resource group has been created, you configure specific media bridge resources to be associated with the group. Based on the set of requirements configured for a Meet-Me or Rendezvous meeting (such as service provider, region, reservation type, and endpoint requirements), the system selects the best-fit resource group and associated media bridge resources to use for the meeting.

Endpoints and Media Profiles

The Cisco TelePresence Exchange System provides telepresence services for Cisco TelePresence System (CTS) endpoints and third-party endpoints. Cisco TelePresence endpoints include both TIP-based endpoints and standards-based H.323 and ISDN endpoints. Supported third-party endpoints only include select single-screen endpoints that are H.323 and ISDN standards-based.

The Cisco TelePresence Exchange System supports the following types of endpoints:

- **Provisioned endpoints**—Endpoints for which all configuration details (such as name, phone number, number of screens, and organization) are known by the administrator and configured on the Cisco TelePresence Exchange System. If an organization has chosen hosted endpoint service, the endpoints are provisioned endpoints.
- **Unprovisioned endpoints**—Endpoints for which limited configuration details are known by the administrator. Through the administration console, you can add unprovisioned endpoints to participate in meetings hosted by the Cisco TelePresence Exchange System.
- **Remote endpoints**—Endpoints for which none of the configuration details are known by the administrator. Remote endpoints are endpoints that join the meeting from another service provider network. Through the administration console, you can add remote endpoints to participate in meetings hosted by the Cisco TelePresence Exchange System.

Media profiles specify the capabilities supported by each type of endpoint that connects to the system, including the type of signalling protocol used when connecting the endpoint to a meeting. They also specify the amount of media resource capacity required for the endpoint. The system includes built-in (pre-defined) media profiles for Cisco endpoints, as well as generic profiles that can be used with most non-Cisco endpoints. You can also add new media profiles.

When you provision an endpoint in the system, you associate it with a specific media profile. The media profiles of the endpoints that you specify when scheduling a meeting determine which types of media bridge resources are capable of hosting the meeting. When more than one type of bridge is capable of hosting a meeting, the Cisco TelePresence Exchange System uses a bridge selection algorithm in order to make optimum use of bridge resources.

For more details on media profiles and the bridge selection algorithm, see the [“Organization Bandwidth, Endpoint Capacity, Protocols and Bridge Selection”](#) appendix.

Endpoint Capacity

Three factors determine how many segments the Cisco TelePresence Exchange System reserves for an endpoint: the bridge type that handles the call (Cisco TelePresence Multipoint Switch or Cisco TelePresence MSE 8000 Series), the type of call (dial in or dial out), and the number of endpoint screens.

Note that you can specify at an organizational level that either that the smallest amount of capacity possible will be reserved for endpoints that belong to the organization, or the maximum capacity per endpoint, depending on your needs. If you want an organization to have the flexibility to substitute an endpoint with more screens for an endpoint with fewer screens, you can turn off the Minimize Capacity flag for the organization.

For more details on endpoint capacity calculation, see the [“Organization Bandwidth, Endpoint Capacity, Protocols and Bridge Selection”](#) appendix.

Dial Out and Dial In

The Cisco TelePresence Exchange System can dial out to connect provisioned endpoints to a scheduled meeting by using the MUX, TIP, SIP, H.323, or ISDN protocols. The system can dial out to unprovisioned endpoints by using SIP, TIP, H.323 or ISDN. Dial out to unprovisioned endpoints is referred to as Guest Dial Out.

Scenarios in which the system dials out to an endpoint that is configured for dial out include:

- At the start of a meeting, or when the host joins if the Host PINs feature is enabled.
- During an active meeting, at the request of an Active Meeting Management user.
- If the participant is in a meeting, and the resource on which the meeting is allocated fails.
- If the host leaves and later rejoins a Meet-Me meeting and the participant was disconnected because Drop Participants on Host Exit was configured for the meeting.
- If the participant is in a meeting, and the call disconnects abnormally (the endpoint did not hang up, the participant was not dropped from the meeting via Active Meeting Management, and the meeting did not end).

In these dial-out scenarios, the system dials out to the endpoint and attempts to connect for up to 30 seconds, and will retry if necessary up to three more times at 180 second intervals. (If the endpoint rejects a call, the system does not make any further attempts to redial for that scenario.)

The system can accept dial-in calls from endpoints that are using MUX, TIP, SIP, or ISDN protocols. An endpoint can dial in to connect to the meeting by dialing the service number and the conference ID. If the participant dials only the service number, the system sends the call to the IVR service to collect the conference ID. Alternatively, the participant can dial a single digit string, combining the service number and the conference ID with ** in between. For example, for service number 18005551212 and conference ID 12345678, the participant can dial 18005551212**12345678.

One-Button-to-Push (OBTP) functionality is a dial-in scenario; by using the Cisco TelePresence Manager, the system sends the <Service Number>**<Conference ID> string to the endpoint at attend time. When the participant presses the OBTP button, the endpoint dials the string to join the meeting.

For details on protocol selection for dial out and dial in situations, see the [“Organization Bandwidth, Endpoint Capacity, Protocols and Bridge Selection”](#) appendix.

Organization Ports Management

Organization ports management is an optional feature which allows each organization to control the number of organization ports that are consumed by telepresence traffic on the network between the organization and the Cisco TelePresence Exchange System.

When you create an organization in the Cisco TelePresence Exchange System, you specify a value for the Max Ports setting, which determines the sum total amount of bandwidth that the organization's endpoints can consume at a given time.

When you create a Meet-Me or remote meeting, you can choose to reserve an amount of organization bandwidth for each endpoint, which counts toward the total organization bandwidth. When the system schedules the meeting, the port requirement for each organization is calculated, based on the endpoints that are included in the meeting. If the total port capacity for the organization exceeds the Max Ports value (for all meetings that are scheduled in the time slot), the system rejects the attempt to schedule this meeting. You may choose to bypass organization bandwidth management entirely by always specifying 0 (in the administration console) or null (in API calls) for the endpoint bandwidth, effectively disabling the feature.

**Note**

Rendezvous meetings, which cannot have endpoint participants added at scheduling time, do not affect the bandwidth calculation for an organization.

For more details on organization bandwidth, see the [“Organization Bandwidth, Endpoint Capacity, Protocols and Bridge Selection”](#) appendix.

Call Routing

To route calls, the Cisco TelePresence Exchange System first needs to identify the organization or remote service provider for which the call is intended. The system can identify a destination organization if the dial pattern of the call exactly matches the number of a provisioned endpoint. If the dial pattern does not match the number of a provisioned endpoint, the system systematically tries to match the dial pattern of the call with the dial patterns configured on the system for remote service providers and then organizations. If a match is found, the system identifies the associated organization or remote service provider as the destination for the call. If no match is found, the system sends the call to a default route. If you have not configured an active default route, then the system rejects the call.

After the system identifies the destination organization or remote service provider, the system finds the first active route associated with the destination for the call. The route provides a pointer to a resource. The system then forwards the call to the resource associated with the active route. The route also provides a unique tag value that is added to the outgoing SIP message.

In most cases, the resource associated with the active route is a Session Border Controller (SBC). When configured properly, each adjacency on the SBC is also assigned a unique tag value. When the SBC receives a SIP message from the Cisco TelePresence Exchange System, the SBC routes the call to the adjacency whose tag matches the tag on the message.

Dial Patterns

For direct dial and SIP dial out calls, the Cisco TelePresence Exchange System provides call routing capabilities that are based on matching (specifying and recognizing) strings of text called dial patterns. You can specify the rule for dial pattern matching to be based on either a number or domain (the characters that follow the @ symbol in the SIP URI) and then associate the rule to a destination organization or remote service provider.

If the dial pattern rule is specified for a destination number, you can further configure the dial pattern rule to exactly match the dial pattern of the destination number or to match only the prefix, suffix, or regular expression of the destination number. If the dial pattern rule is specified for a destination domain, you can only configure the dial pattern rule to exactly match the characters that follow the @ symbol in the SIP URI.

Inter/Intra-Service Provider Policy Engine and Whitelist Groups

The policy engine enables you to define policies that control incoming and outgoing calls between service providers (also known as inter-service provider calls) or between organizations associated with a single service provider (also known as intra-service provider calls). The policies apply to provisioned and unprovisioned endpoints. The Cisco TelePresence Exchange System call detail records (CDRs) identify calls that are rejected due to policy restriction.

For calls from one service provider to another, a flag at the organization level enables you to allow or deny outgoing calls to other service providers. (This includes Meet-Me, Rendezvous, and direct-dial calls, because the Cisco TelePresence Exchange System cannot determine the type of an outgoing call.) Two additional flags at the organization level enable you to allow or deny incoming direct-dial calls from another service provider and to allow or deny incoming Meet-Me and Rendezvous calls from another service provider.

For calls within a single service provider, you can define whitelist groups that determine which organizations can dial each other directly. (Meet-Me and Rendezvous meeting calls are always allowed between organizations that belong to the same service provider.) A whitelist group can contain more than one organization, and an organization can belong to more than one whitelist group.

