



## Location

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Use locations to implement call admission control in a centralized call processing system. Call admission control enables you to regulate voice quality by limiting the amount of bandwidth available for calls over links between the locations. For more information, see the “Call Admission Control” section on page 4-1.



**Note**

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If you do not use call admission control to limit the voice bandwidth on an IP WAN link, an unlimited number of calls can be active on that link at the same time. This can cause the voice quality of each call to degrade as the link becomes oversubscribed.

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Cisco CallManager requires that you arrange the locations in a hub-and-spoke topology (also known as a star topology). The hub is the location of the primary Cisco CallManager that controls call processing on the network. The spokes are remote locations that contain other devices (such as phones and gateways) on the same network. The spoke locations may also contain additional Cisco CallManagers that serve as backups for the primary.



**Note**

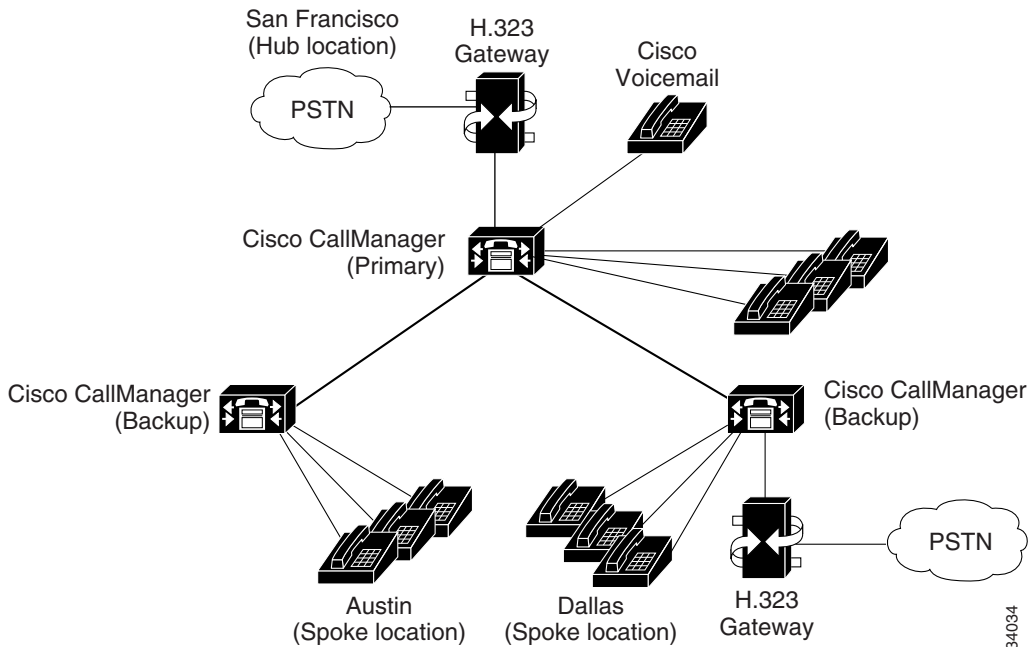
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Locations are designed to work in a non-distributed system that uses a single primary Cisco CallManager. In general, you cannot use locations within a cluster of Cisco CallManagers. (A cluster is a set of Cisco CallManagers that share the same database.)

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Figure 16-1 illustrates the hub-and-spoke topology and its use with Cisco CallManager admission control.

**Figure 16-1 Example of Hub-and-Spoke Topology for Locations**



The following sections explain locations in more detail:

- Understanding Locations, page 16-2
- Adding a Location, page 16-5
- Updating a Location, page 16-7
- Deleting a Location, page 16-7

## Understanding Locations

For calls between devices on the same LAN, the available bandwidth is considered to be unlimited, and call admission control does not apply in those cases. However, calls between locations travel over a WAN link that has limited available bandwidth. As more active calls are placed over the WAN link, the audio

quality of each call can begin to degrade. To avoid this degradation in audio quality, you can use the locations feature to decrease the amount of available bandwidth and thereby decrease the number of active calls on the link.

Cisco CallManager uses a hub-and-spoke topology for locations. The main location, or hub, is the location of the primary Cisco CallManager controlling the network. Using Cisco CallManager Administration, you can define the spoke locations and assign devices to those locations. You can also specify how much bandwidth to allocate for calls between each spoke location and the hub.

For example, assume that the locations in Figure 16-1 are configured as follows:

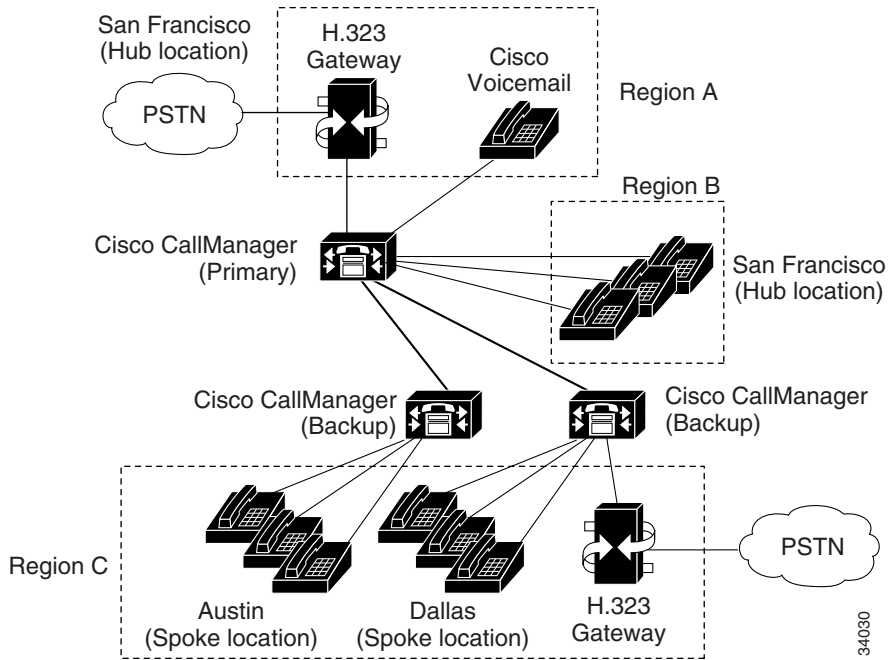
<b>Location</b>	<b>Bandwidth to Hub (kbps)</b>
Hub	Unlimited
Austin	100
Dallas	200

For calculation purposes, assume that calls using G.711 compression consume 80 kbps of bandwidth and calls using G.723 or G.729 compression consume 24 kbps. Cisco CallManager continues to admit new calls to a link until the available bandwidth for that link drops below zero. Thus, the link to the Austin location could support two G.711 calls at 80 kbps each, five G.723 or G.729 calls at 24 kbps each, or one G.711 call and one G.723 (or G.729) call. Any additional calls that try to exceed the bandwidth limit are rejected, and the calling party receives reorder tone.

## Locations and Regions

In Cisco CallManager, locations work in conjunction with regions to define the characteristics of a network link. Regions define the type of compression (G.711, G.723, or G.729) used on the link, and locations define the amount of available bandwidth for the link. You must assign each device on the network to both a region (by means of a device pool) and a location. As illustrated in Figure 16-2, the regions and locations can overlap and intersect in various ways, depending on how you define them. For more information, see the “Region” section on page 13-1.

Figure 16-2 Interaction Between Locations and Regions



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## Bandwidth Calculations

In performing bandwidth calculations for purposes of admission control, Cisco CallManager assumes that all calls are full-duplex connections. Cisco CallManager also assumes that calls using G.723 or G.729 protocol consume 24 kbps of bandwidth and calls using G.711 protocol consume 80 kbps.



### Note

Actual bandwidth consumption per call will vary, depending on factors such as data packet size. Cisco CallManager uses the values of 24 kbps and 80 kbps to simplify the bandwidth calculations for purposes of call admission control only.

Cisco CallManager continues to allow calls to complete over a link until the available bandwidth for that link goes negative (drops below zero). For example, if a particular link has only 15 kbps of bandwidth left, one more call (either G.729, G.723, or G.711) can be made over that link. If another G.711 call is made, the available bandwidth for that link becomes -65 kbps. At that point, any additional calls fail, and the calling party receives reorder tone.

The following situations are exceptions to the above bandwidth rules. In these cases, additional calls can complete even though the available bandwidth has gone negative:

- Calls made through a Media Termination Point (MTP) can complete even if they exceed the available bandwidth limit.
- If a feature temporarily stops call streaming, the bandwidth from that call is temporarily available for use on another call. For example, when a user places a call on hold, the bandwidth from that call becomes available again. If new calls consume all the available bandwidth while the original call is on hold, the user can still retrieve the held call even though it exceeds the available bandwidth limit.
- Calls placed simultaneously on the same link can exceed the available bandwidth limit because their bandwidth is not subtracted from the available limit until the calls complete.

**Caution**

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In the United States and Canada, an emergency 911 call can be blocked if you route it to a link that has no more available bandwidth. For each location on your network, always route 911 calls to the local Public Switched Telephone Network (PSTN).

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## Adding a Location

This section describes how to add a new location to the Cisco CallManager database.

### Before You Begin

Before configuring a location, you must configure the primary Cisco CallManager that controls the location. For details, see

- Adding a Cisco CallManager, page 9-1

## Procedure

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- Step 1** Open Cisco CallManager Administration.
- Step 2** Select **System > Location**.
- Step 3** If there is an existing location with settings that are similar to the new location you want to configure, select the existing location to display its settings. If you want to use a copy of the existing location to configure the new one, click **Copy**.
- Step 4** In the Location Name box, type the name of the new location you are creating.
- Step 5** In the bandwidth box, enter the maximum amount of voice bandwidth (in kbps) available for all calls on the link between this location and the hub. The hub is the location of the primary Cisco CallManager that controls call processing for your network.

For purposes of these bandwidth calculations only, assume that each G.711 call uses 80 kbps of bandwidth and each G.723 or G.729 call uses 24 kbps.



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**Note** To improve voice quality, lower the bandwidth setting so that fewer active calls are allowed on the link to this location. If you enter a value of zero, this allocates infinite bandwidth and allows an unlimited number of calls on the link.

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- Step 6** Click **Insert** to save the location information in the database.
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## Additional Information

For additional information on call admission control, see:

- Call Admission Control, page 4-1
- Region, page 13-1

## Related Procedures

After adding a new location to the database, you can use it to configure a Cisco IP Phone, an H.323 gateway, or other devices. For more information, see:

- Gateways, page 38-1
- Cisco IP Phones, page 39-1

# Updating a Location

This section describes how to modify the configuration of a location.

## Procedure

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- Step 1** Open Cisco CallManager Administration.
  - Step 2** Select **System > Location**.
  - Step 3** From the location list, select the location you want to update.
  - Step 4** Make the desired changes in the fields you want to update. Before saving the changes, you can click **Cancel** to reset all fields to their original value.
  - Step 5** Click **Update** to save the changes in the database.
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# Deleting a Location

This section describes how to delete a location from the Cisco CallManager database.

## Before You Begin

You cannot delete a location that has any devices assigned to it. If you try to delete a location that is in use, Cisco CallManager displays an error message. Before deleting a location that is currently in use, you must perform either or both of the following tasks:

- Update the devices to assign them to a different location. For example, see “Updating a Gateway”.
- Delete the devices assigned to the location you want to delete. For example, see “Deleting a Gateway”.



### Note

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Deleting a location is equivalent to setting the bandwidth to zero for the links connected to that location. This allows an unlimited number of calls on those links, and it can cause the voice quality to degrade.

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**Procedure**

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- Step 1** Open Cisco CallManager Administration.
  - Step 2** Select **System > Location**.
  - Step 3** From the location list, select the location you want to delete.
  - Step 4** Click **Delete**.
  - Step 5** When asked to confirm the delete operation, click either **OK** to delete or **Cancel** to cancel the delete operation.
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