Configure Location Bandwidth Manager and Related Alerts

Contents

Introduction

This document describes the configuration and alerts related to Location Bandwidth Manager (LBM).

Prerequisites

Requirements

Cisco recommends that you have knowledge of Cisco Unified Communications Manager (CUCM) version 11.5.

Components Used

The information in this document is based on Cisco Call Manager (CCM) version 11.5.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

The LBM service computes the effective path from source location to destination location. It provides useful functions behind the scenes, such as handling bandwidth requests from Unified Communications Manager call control and replicating bandwidth information within the cluster and between clusters. You can find the configured and real-time information this function provides in Serviceability Administration.

Configure

1. Activate LBM Service

Verify whether the Cisco LBM service is activated. For a new system install, you must manually enable the service on the desired nodes. For enhanced locations CAC to work properly, one instance of this service must run on each cluster.

Procedure

Step 1 From Cisco Unified Serviceability, navigate to **Tools > Service Activation**.
Step 2 From the **Server** drop-down list, choose a server, and then click **Go** as seen in the image.
Step 3 If needed, check the **Cisco Location Bandwidth Manager** check box.
Step 4 Click **Save**.
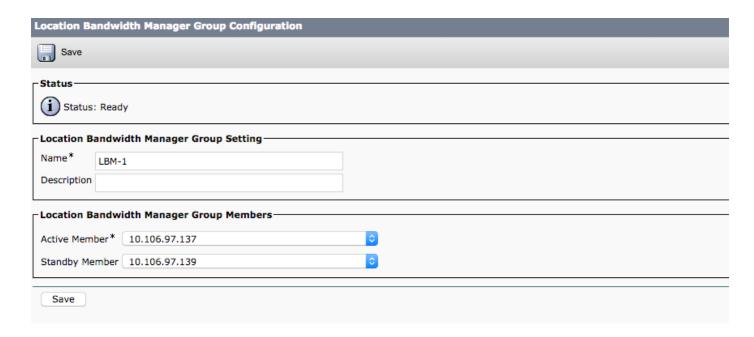

2. Create LBM Group

If LBM is not running on the same node, configure an LBM group and assign the LBM group to the server. The LBM group lets you optimize network delay and performance. Each server must communicate with an LBM service in order to determine the available bandwidth for each call and to deduct bandwidth for the duration of each call.

Procedure

Step 1 From Cisco Unified CM Administration, navigate to **System > Location Info > Location Bandwidth Manager Group**.

Step 2 Perform one of these tasks:
- In order to modify the settings for an existing LBM group, enter search criteria, click **Find**, and then choose an existing LBM group from the resulting list.
- In order to add a new LBM group, click **Add New**.

Step 3 Configure the fields on the Location Bandwidth Manager Group Configuration window. See the online help for more information about the fields and their configuration options.

Step 4 Click **Save** as seen in this image.

Location Bandwidth Manager Group Configuration

[Save icon] Save

Status

(i) Status: Ready

Location Bandwidth Manager Group Setting

Name* [LBM-1]

Description [ ]

Location Bandwidth Manager Group Members

Active Member* [10.106.97.137] ◇
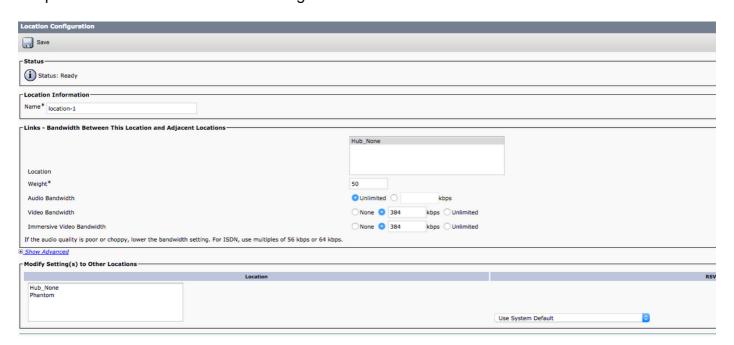
Standby Member [10.106.97.139] ◇

[Save]

3. Configure Locations and Location Links

Configure locations in order to implement call admission control in a centralized call-processing system. A location represents a Local Area Network (LAN), and can contain endpoints or simply serve as a transit location between links for Wide Area Network (WAN) network modeling. Locations provide bandwidth accounting within a location as well as in or out of a location. Links provide bandwidth accounting between locations and interconnect locations.

Procedure

Step 1 From Cisco Unified CM Administration, navigate to **System > Location Info > Location**. Perform these tasks:

Step 2 - In order to modify the settings for an existing location, enter search criteria, click **Find**, and then choose an existing location from the resulting list.
- In order to add a new location, click **Add New**.

Step 3 Configure the fields on the Location Configuration window as per requirements

Step 4 Click **Save** as shown in this image.

Location Configuration

[Save icon] Save

Status

(i) Status: Ready

Location Information

Name* [location-1]

Links - Bandwidth Between This Location and Adjacent Locations

	Hub_None
Location	
Weight*	50
Audio Bandwidth	● Unlimited ○ [ ] kbps
Video Bandwidth	○ None ● 384 kbps ○ Unlimited
Immersive Video Bandwidth	○ None ● 384 kbps ○ Unlimited

If the audio quality is poor or choppy, lower the bandwidth setting. For ISDN, use multiples of 56 kbps or 64 kbps.

⊞ Show Advanced

Modify Setting(s) to Other Locations

Location	RSV
Hub_None Phantom	
	Use System Default ◇

Note: If the inter audio bandwidth for 2 locations has been specified to be 1080kbps and if the inter region codec is G711ulaw (64kbps) then approx 16 calls can be active simultaneously (1080/64). Considering this, you can accordingly set the audio and video bandwidth relation.
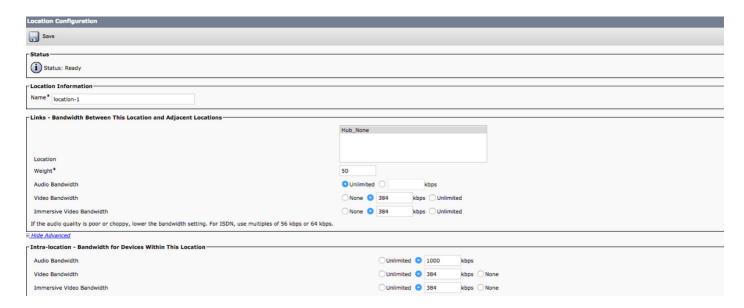
4. Assign Intra-Location Bandwidth

Assign intra-location bandwidth to the location, if you do not want to use the default of unlimited bandwidth. By default, when you create a new location, a link from the newly added location to the Hub_None is added as well, with unlimited audio bandwidth, 384 kbps video bandwidth and 384 kbps immersive video bandwidth. You can adjust this allotment to match your network model.

Note: If the audio quality is poor or choppy, lower the bandwidth setting. For example, for ISDN use multiples of 56 kbps or 64 kbps.

Procedure

Step 1 From Cisco Unified CM Administration, navigate to **System > Location Info > Location**.
Step 2 Enter search criteria, click **Find**, and then choose a location from the resulting list.
Step 3 Click **Show Advanced** in order to show the intra-location bandwidth fields.
Step 4 If required, choose the **kbps** radio button for **Audio Bandwidth**, and then enter a bandwidth value the text box.
Step 5 If required, choose the **kbps** radio button for **Video Bandwidth**, and then enter a bandwidth value the text box.
Step 6 If required, choose the **kbps** radio button for **Immersive Video Bandwidth**, and then enter a band value in the text box.
Step 7 Click **Save** as shown in this image.
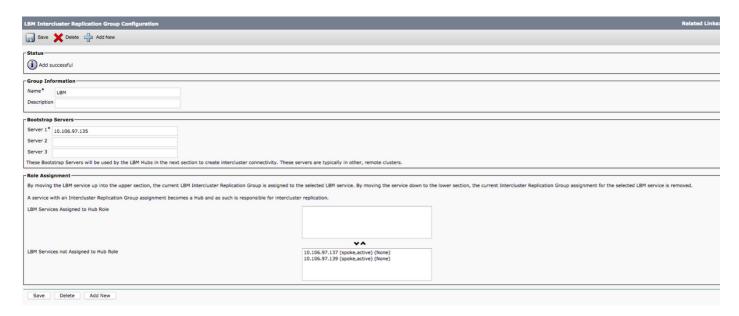

5. Establish External Communication

Configure the LBM hub group to allow the LBM servers acting as hubs to find LBM servers in remote clusters. This step establishes external communication with those clusters. An LBM service becomes a hub when an LBM hub group is assigned to it. Any LBM servers that are assigned an LBM hub group establish communication with all other LBM servers that are assigned the same or an overlapping LBM hub group.

Procedure

Step 1 From Cisco Unified CM Administration, navigate to **System > Location Info > Location Bandwid** **Manager (LBM) Intercluster Replication Group**.

Perform one of these tasks:

Step 2 - In order to modify the settings for an LBM intercluster replication group, enter search criteria, click **Find**, and choose an existing LBM intercluster replication group from the resulting list.
- In order to add a new LBM intercluster replication group, click **Add New**.

Step 3 Configure the fields on the Location Bandwidth Manager Intercluster Replication Group Configurat window. See the online help for more information about the fields and their configuration options.

Step 4 Click **Save** as shown in this image.

6. Configure SIP Intercluster Trunk for Enhanced Location Call Admission Control

Assign a SIP Intercluster Trunk (ICT) to the shadow location to establish proper intercluster operation. SIP trunks that are linked to devices with a specific location, such as SIP gateways, can be assigned to ordinary locations. A shadow location is a special location that contains no links to other locations and no bandwidth allocations.

Procedure

Step 1 From Cisco Unified CM Administration, navigate to **Device > Trunk**.

Step 2 Enter search criteria, click **Find**, and then choose an existing SIP intercluster trunk from the resulti list.

Step 3 From the Location drop-down list, choose **Shadow**.

Step 4 Click **Save**.

7. Deduct Audio Bandwidth from Audio Pool for Video Calls

Use this procedure if you want to split the audio and video bandwidth deductions into separate pools for video calls. By default, the system deducts the bandwidth requirement for both the audio stream and video stream from the video pool for video calls.

Note: When you enable this feature, CAC includes the bandwidth required for the IP/UDP

network overhead in the audio bandwidth deduction. This audio bandwidth deduction equates to the audio bit rate plus the IP/UDP network overhead bandwidth requirement. The video bandwidth deduction is the video bit rate only.

Procedure

Step 1 From Cisco Unified CM Administration, navigate to **System > Service Parameters**.
Step 2 From the **Server** drop-down list, choose the publisher node.
Step 3 From the **Service** drop-down list, choose **Cisco Call Manager**.
Step 4 From the Clusterwide Parameters (Call Admission Control) area, set the value of the **Deduct Audi**
Step 5 Click **Save**.

Verify

Use this section to confirm that your configuration works properly.

RTMT Alerts

```
Name : Hub_None->Tampa-MLK
ResourceType : 2
AppID : Cisco Location Bandwidth Manager ClusterID : PUB01-Cluster NodeID : SUB01 TimeStamp :
Tue Aug 01 11:15:25 EDT 2018.
The alarm is generated on Tue Aug 01 11:15:25 EDT 2018
```
Alert Definition:

LocationOutOfResources: This counter represents the total number of times that a call through Locations failed due to the lack of bandwidth.

Explanation: The Location or Link connecting locations has run out of audio/video/immersive bandwidth and hence no further calls can originate or pass through the location/link. The out of resource condition may be temporary due to high number of calls during peak hours and may correct by itself when calls terminate and bandwidth is freed up.

Recommended Action: Consider adding additional bandwidth to the location/link under below option:

System > Location info > Location.

```
Enum Definitions - ResourceType
Value           Definition
1                 Audio bandwidth out of resource
2                 Video bandwidth out of resource
3                 Immersive bandwidth out of resource
```
You can also monitor this instance from CLI:

```
show perf query class "Cisco Locations LBM"
show perf query counter "Cisco Locations LBM" "BandwidthMaximum"
show perf query counter "Cisco Locations LBM" "BandwidthAvailable"
show perf query counter "Cisco Locations LBM" "CallsInProgress
```

Note: In case video bandwidth, you would need to increase by at least 384 kbps in order to allow one more video call to traverse this path. It might be set as high as the your network design supports.

You can also monitor the instances from RTMT as well:

Configure Alerts on RTMT

Ref Guide :   RTMT Guide

Cisco Locations LBM

The Cisco Location LBM object provides information about locations that are defined in Cisco Unified Communications Manager clusters. The following table contains information on Cisco location counters.

Table 34 Cisco Locations LBM

Counters	Counter Description
BandwidthAvailable	This counter represents the current audio bandwidth in a location or a link between two locations. A value of 0 indicates that no audio bandwidth is available.
BandwidthMaximum	This counter represents the maximum audio bandwidth that is available in a location or a link between two locations. A value of 0 indicates that no audio bandwidth is available.
BandwidthOversubscription	This represents the current oversubscribed audio bandwidth in a location or link between two locations. A value of zero indicates no bandwidth oversubscription.
CallsInProgress	This counter represents the number of calls that are currently in progress on a particular Cisco Location Bandwidth Manager.
ImmersiveOutOfResources	This represents the total number of failed immersive video call bandwidth reservations associated with a location or a link between two locations due to lack of immersive video bandwidth.
ImmersiveVideoBandwidthAvailable	This counter represents the maximum bandwidth that is available for video in a location or a link between two locations. A value of 0 indicates that no bandwidth is allocated for video.
ImmersiveVideoBandwidthMaximum	This counter represents the bandwidth that is currently available for video in a location or a link between two locations. A value of 0 indicates that no bandwidth is available.
ImmersiveVideoBandwidthOversubscription	This represents the current immersive video oversubscribed bandwidth in a location or link between two locations. A value of zero indicates no bandwidth oversubscription.
OutOfResources	This counter represents the total number of failed audio call bandwidth reservations associated with a given location or a link between two locations due to lack of audio bandwidth.
VideoBandwidthAvailable	This counter represents the bandwidth that is currently available for video in a location or a link between two locations. A value of 0 indicates that no bandwidth is available.
VideoBandwidthMaximum	This counter represents the maximum bandwidth that is available for video in a location and a link between two locations. A value of 0 indicates that no bandwidth is allocated for video.
VideoOversubscription	This represents the current video oversubscribed bandwidth amount in a location and a link between two locations. A value of zero indicates no bandwidth oversubscription.
VideoOutOfResources	This counter represents the total number of failed video call bandwidth reservations associated with a given location or a link between two locations due to lack of video bandwidth.

Error Message:

```
%UC_Location Bandwidth Manager-5-LBMLinkISV:
%[RemoteIPAddress=String][LinkID=String][LocalNodeId=UInt][LocalApplicationId=Enum][RemoteApplic
ationId=Enum][AppID=String][ClusterID=String][NodeID=String]: LBM link to remote application
restored.
```
Explanation: This alarm indicates that the LBM has gained communication with the remote LBM. Note that the remote LBM should also indicate LBMLinkISV.

Recommended Action: Informational only; no action is required.

```
Reason Code - Enum Definitions
```

```
Enum Definitions - LocalApplicationId
```

```
Value        Definition
700            LocationBandwidthManager
```

```
Enum Definitions - RemoteApplicationId
```

```
Value        Definition
700            LocationBandwidthManager
```

Error Message:

```
%UC_Location Bandwidth Manager-1-LBMLinkOOS:
%[RemoteIPAddress=String][LinkID=String][LocalNodeId=UInt][LocalApplicationID=Enum][RemoteNodeID
=UInt][RemoteApplicationID=Enum][AppID=String][ClusterID=String][NodeID=String]: LBM link to
remote application is out of service.
```

Explanation: This alarm indicates that the local LBM has lost communication with the remote LBM.
This alarm usually indicates that a node has gone out of service (whether intentionally for
maintenance or to install a new load for example; or unintentionally due to a service failure or
connectivity failure).

Recommended Action: In the Cisco Unified Reporting tool, run a CM Cluster Overview report and
check to see if all servers can communicate with the Publisher. Also, check for any alarms that
might have indicated a CallManager OR location bandwidth manager failure and take appropriate
action for the indicated failure. If the node was taken out of service intentionally, bring the node
back into service.

```
Reason Code - Enum Definitions
```

```
Enum Definitions - LocalApplicationID
```

```
Value          Definition
700            LocationBandwidthManager
```

```
Enum Definitions - RemoteApplicationID
```

```
Value          Definition
700             LocationBandwidthManager
```

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

In order to troubleshoot further you need these logs from Call manager with the use of RTMT:

- Call Manager Detailed level traces
- Location bandwidth manager traces