



Setting Up a Messaging Network Controlled by Cisco UMG Using a Distributed Model

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This chapter describes how to set up a complete Cisco UMG controlled messaging network using a distributed model. The following topics are discussed:

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- [Managing the Avaya Interchange Endpoint on Cisco UMG with Manual Provisioning, page 49](#)
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- [Setting Up Spoken-Name Confirmation Across AutoRegistered Cisco Unity Express Endpoints, page 58](#)
- [Using System Distribution Lists Across Cisco Unity Express Systems, page 58](#)
- [Setting Up NAT Tables on Cisco UMG, page 61](#)
- [Setting Up Backup and Restore for Cisco UMG, page 63](#)

Overview

In this messaging network, Cisco Unity Express, Cisco Unity, and Avaya Interchange are all present as endpoints, the Cisco UMGs are setup with full active-standby redundancy. [Figure 1](#) shows a network diagram and [Table 1](#), [Table 2](#), [Table 3](#), and [Table 4](#) contain detailed information about the topology.

Figure 1 Cisco UMG Network Setup Case Study Topology

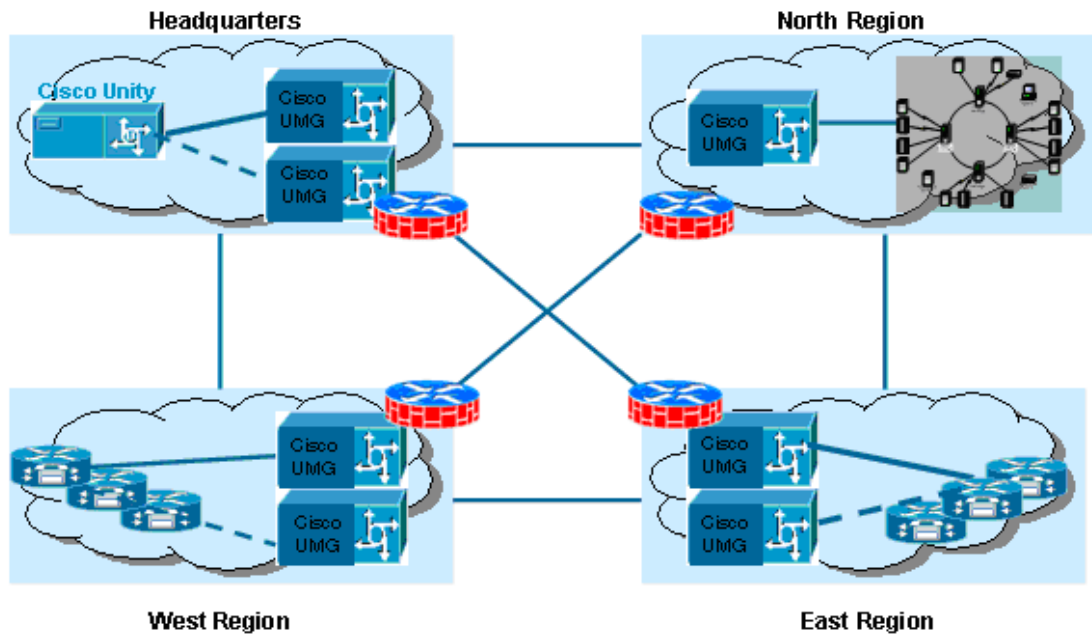


Table 1 Headquarters Information

Node	Location ID	IP Address	Host	Prefix	SMTP domain
Umg-P	500	10.60.80.200	Umgrtp	—	Umgrtp.headquarters.com
Umg-S	500	10.60.80.201	Umgrtp	—	Umgrtp.headquarters.com
Unity	510/511	10.60.80.11	HQunity	919/704	HQunity.headquarters.com
NTP	—	10.60.80.254	HQntp	—	—



Note

For the west region, assume all the Cisco Unity Express nodes were upgraded to 3.1.

Table 2 West Region Information

Node	Location ID	IP Address	Name	Prefix
Umg-P	400	10.60.70.200		n/a
Umg-S	401	10.60.70.201		n/a
CUE-1	410	10.60.70.11		408
CUE-2	411	10.60.70.21		408
CUE-3	412	10.60.70.31		650
NTP	n/a	10.60.80.254	HQntp	n/a

**Note**

For the east region, assume none of Cisco Unity Express nodes was upgraded to version 3.1.

Table 3 East Region Information

Node	Location ID	IP Address	Name	Prefix
Umg-P	300	10.60.30.200		n/a
Umg-S	301	10.60.30.201		n/a
CUE-1	310	10.60.30.11		716
CUE-2	311	10.60.30.21		716
CUE-3	312	10.60.30.31		917
NTP	n/a	10.60.80.254	HQntp	n/a

Table 4 North Region Information

Node	Location ID	IP Address	Host	Prefix	SMTP domain
Umg-P	600	10.60.60.200		N/A	
Interchange	610	10.60.60.11	interchange	203	Interchange.headquarters.com
NTP	n/a	10.60.80.254	HQntp	n/a	n/a

**Note**

This document does not cover how to set up the domain and NTP. For information on this topic, see the [Cisco UMG System Administrator Guide](#). Ensure the system time is synchronized in the Cisco network.

Building Up a Fully Meshed Network Between Cisco UMGs

The following example is for the west region Cisco UMG-P. The configuration for the other Cisco UMGs is similar.

```
umg-w-1(config)# network local messaging-gateway 400
```



Note

Configure the network local ID on all the Cisco UMGs.

```
umg-w-1(config)# network messaging-gateway 401 10.60.70.201
umg-w-1(config)# network messaging-gateway 500 10.60.80.200
umg-w-1(config)# network messaging-gateway 501 10.60.80.201
umg-w-1(config)# network messaging-gateway 300 10.60.30.200
umg-w-1(config)# network messaging-gateway 301 10.60.30.201
umg-w-1(config)# network messaging-gateway 600 10.60.60.200
umg-w-1(config)#exit
```

To verify the full meshed network:

```
umg-w-1# show messaging-gateway
LocationID      Hostname                NAT
-----
401             10.60.70.201           disabled
500             10.60.80.200           disabled
501             10.60.80.201           disabled
300             10.60.30.200           disabled
301             10.60.30.201           disabled
600             10.60.60.200           disabled
```

Local Gateway ID: 400

Managing Endpoints with One-to-One Cisco UMG Redundancy

Managing Cisco Unity 3.1 and Later Versions

Endpoint autoregistration involves configuration on both Cisco Unity Express and Cisco UMG. This example of the west region in this case, uses cue-w-1 as an example. The configurations for cue-w-2 and cue-w-3 are similar.

Registration Configuration on Cisco Unity Express

- Cisco Unity Express prerequisite configuration of the network Location ID

```
Cue-w-1(config)# network location id 410
Cue-w-1(config-location)# abbreviation cueW1
Cue-w-1(config-location)# email domain 10.60.70.11
cue(config-location)# voicemail phone-prefix 408
cue(config-location)# enable
cue(config-location)# exit
```

```
cue(config)# network local location id 410
```

Primary gateway IP address, registration listening port number, and username/password

```
Cue-w-1(config)# messaging-gateway primary 400 10.60.70.200
Cue-w-1(config-messaging-gateway)# username cue_410 password text pswd
Cue-w-1(config-messaging-gateway)# exit
```

- Secondary gateway IP address and registration listening port number

```
Cue-w-1(config)# messaging-gateway second 401 10.60.70.201
Cue-w-1(config-messaging-gateway)# username cue_410 password text pw1
Cue-w-1(config-messaging-gateway)# exit
```

- Registration command that starts the process

```
cue(config)# messaging-gateway register
```

Corresponding Configurations on Cisco UMG

- Registration authentication username and password

```
Umg-w-1(config-reg)# username cue_410 password text pw1
Umg-w-1(config-reg)# username cue_410 password text pw1
Umg-w-1(config-reg)# exit
```



Note

For other Cisco Unity Express endpoints in the west region, configure similar credentials.

For the secondary Cisco UMG in the west region, use the same configuration.

- Block any Cisco Unity Express endpoint on the restricted list if any (optional). In this case, the Cisco UMG in the west region rejects all the Cisco Unity Express endpoints in the east region.

```
Umg-w-1(config-reg)> block location-id 310
Umg-w-1(config-reg)> block location-id 311
Umg-w-1(config-reg)> block location-id 312
```

Verifying Registration Status

```
umg-w-1# show registration users|status
umg-w-1# show endpoint local
cue-w-1# show messaging-gateway
```

Managing Cisco Unity Express Versions Earlier Than 3.1

This scenario requires manual provisioning on Cisco UMG.

(The east region in this case, covers all three Cisco Unity Express configurations on UMG-e-1)

- Cisco Unity Express prerequisite configuration

This example is for cue-e-1. The configurations for cue-e-2 and cue-e-3 are similar.

```
Cue-e-1(config)# network location id 310
Cue-e-1(config-location)# abbreviation cueE1
Cue-e-1(config-location)# email domain 10.60.30.11
Cue-e-1(config-location)# voicemail phone-prefix 716
Cue-e-1(config-location)# enable
Cue-e-1(config-location)# exit
```

```
Cue-e-1(config)# network local location id 310
```

```
Cue-e-1(config)# network location id 300
Cue-e-1(config)# email domain 10.60.30.200
Cue-e-1(config)# exit
```

- Configuration for cue-e-3 on umg-e-1

```
Umg-e-1(config)> endpoint 312 cue
Umg-e-1(config-endpoint)> broadcast-id 312
Umg-e-1(config-endpoint)> domain cue-e-1.cueE.headquarters.com
Umg-e-1(config-endpoint)> hostname 10.60.30.31
Umg-e-1(config-endpoint)> messaging-gateway secondary 301
Umg-e-1(config-endpoint)> prefix 917
Umg-e-1(config-endpoint)> enable
```



Note

The domain on the above can be the IP address of Cisco Unity Express, in this case, 10.60.30.31.

- Configuration for cue-e-1 and cue-e-2 on umg-e-1

Both cue-e-1 and cue-e-2 have the same prefix 716.

```
Umg-e-1(config)> endpoint 310 cue
Umg-e-1(config-endpoint)> broadcast-id 311
Umg-e-1(config-endpoint)> domain 10.60.30.11
Umg-e-1(config-endpoint)> hostname 10.60.30.11
Umg-e-1(config-endpoint)> messaging-gateway secondary 301
Umg-e-1(config-endpoint)> prefix 716 number-only
Umg-e-1(config-endpoint-extension)> extension 8561001
Umg-e-1(config-endpoint-extension)> extension 3241002
Umg-e-1(config-endpoint)> enable
```

```
Umg-e-1(config)> endpoint 311 cue
Umg-e-1(config-endpoint)> broadcast-id 311
Umg-e-1(config-endpoint)> domain 10.60.30.21
Umg-e-1(config-endpoint)> hostname 10.60.30.21
Umg-e-1(config-endpoint)> messaging-gateway secondary 301
Umg-e-1(config-endpoint)> prefix 716 number-only
Umg-e-1(config-endpoint-extension)> extension 1241001
Umg-e-1(config-endpoint-extension)> extension 5321002
Umg-e-1(config-endpoint)> enable
```



Note

For older versions of Cisco Unity Express, you must enter prefix-number-only mode with extension information only if multiple endpoints are sharing the same prefix.

- Check the registration information on umg-e-1:

```
umg-e-1> show endpoint local
A total of 3 local endpoint(s) have been found:
Location      Location      Endpoint      Endpoint      Primary      Secondary
ID            Prefix        Type          Status        Gateway      Gateway
-----
310           716           CUE           Enabled       300          301
311           716           CUE           Enabled       300          301
312           917           CUE           Enabled       300          301
```

```
umg-e-1> show mailbox 311
2 mailbox(s) has been found for location 311
7161241001
7165321002
```

```
umg-e-1> show mailbox 310
2 mailbox(s) has been found for location 310
7165550111
7165550112
```

```
umg-e-1> show mailbox 312
No mailbox has been found for location 312
```

**Note**

Only those manual endpoints with prefix-number-only extension configured have subscriber information on Cisco UMG's directory database.

Managing Cisco Unity and Manually Provisioning Cisco UMG

**Note**

Manually provision Cisco UMG only if needed.

In this example of the headquarters configuration, Cisco Unity has multiple prefixes. This example includes the configuration for both Cisco UMG and Cisco Unity.

Configuration for HQunity on umgrtp

```
Configure on umgrtp-1:
Umgrtp-1(config)> endpoint 510 unity
Umgrtp-1(config-endpoint)> domain headquarters.com
Umgrtp-1(config-endpoint)> hostname HQunity.headquarters.com
Umgrtp-1(config-endpoint)> messaging-gateway secondary 501
Umgrtp-1(config-endpoint)> prefix 919
Umgrtp-1(config-endpoint)> enable

Umgrtp-1(config)> endpoint 511 unity
Umgrtp-1(config-endpoint)> domain headquarters.com
Umgrtp-1(config-endpoint)> hostname HQunity.headquarters.com
Umgrtp-1(config-endpoint)> messaging-gateway secondary 501
Umgrtp-1(config-endpoint)> prefix 714
Umgrtp-1(config-endpoint)> enable
```

**Note**

Every prefix on Cisco Unity is counted as an individual endpoint on Cisco UMG, which means you must assign different Location ID.

Configuration for Cisco Unity

Defining the Cisco UMG Host Information on Cisco Unity DNS Server

Figure 2 Configuring the Cisco UMG Host (umgrtp) with a Primary IP Address (10.60.80.200)

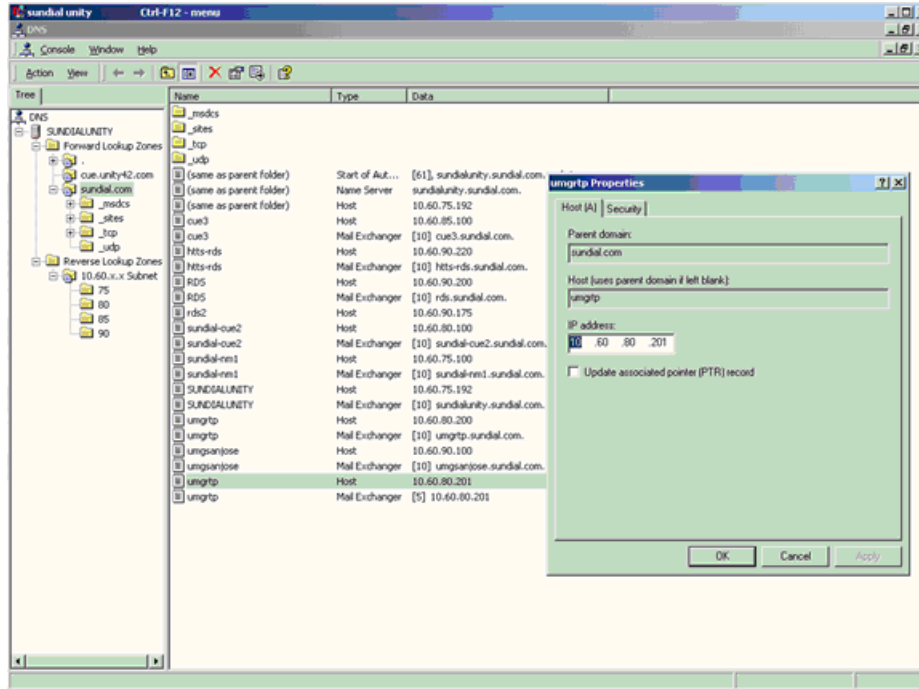
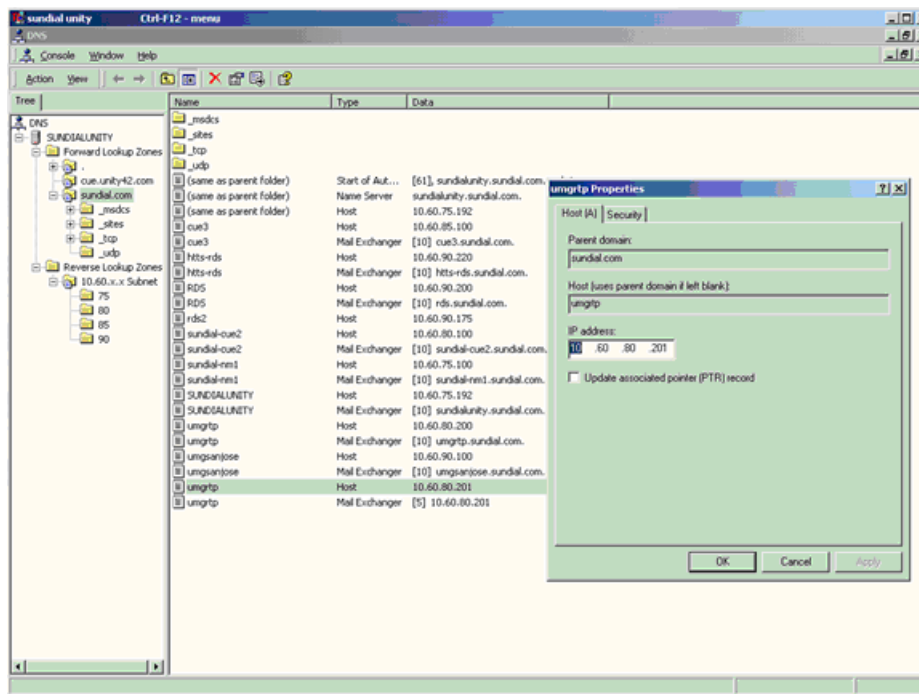


Figure 3 Configuring the Cisco UMG Host (umgrtp) with a Secondary IP Address (10.60.80.201)



Creating a Mail Exchange Record on Cisco Unity for Cisco UMG 1-1 Redundancy

Figure 4 Create MX Record for Primary Cisco UMG with Priority 10

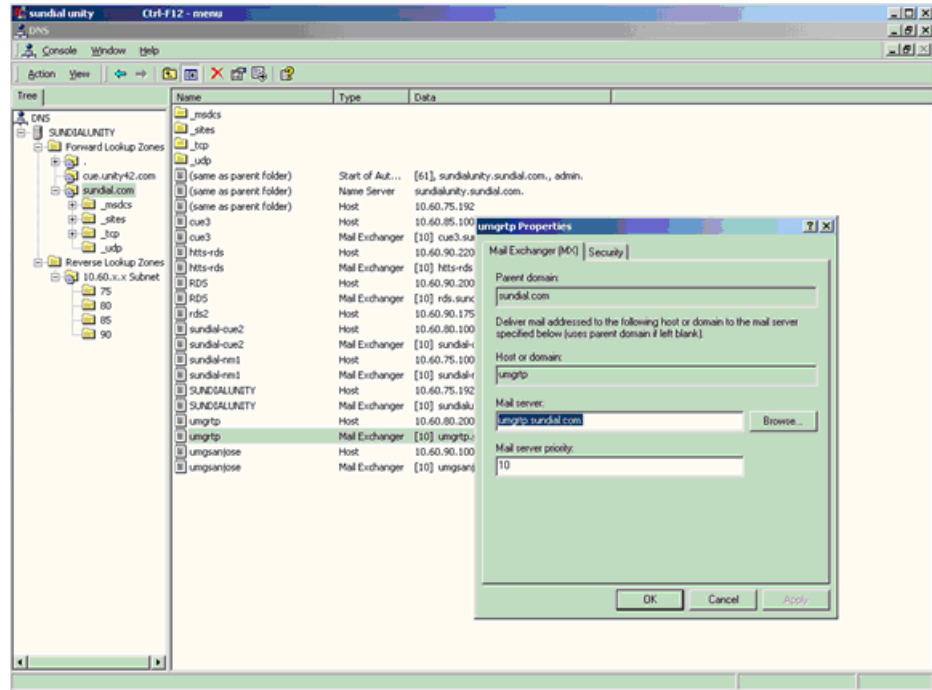
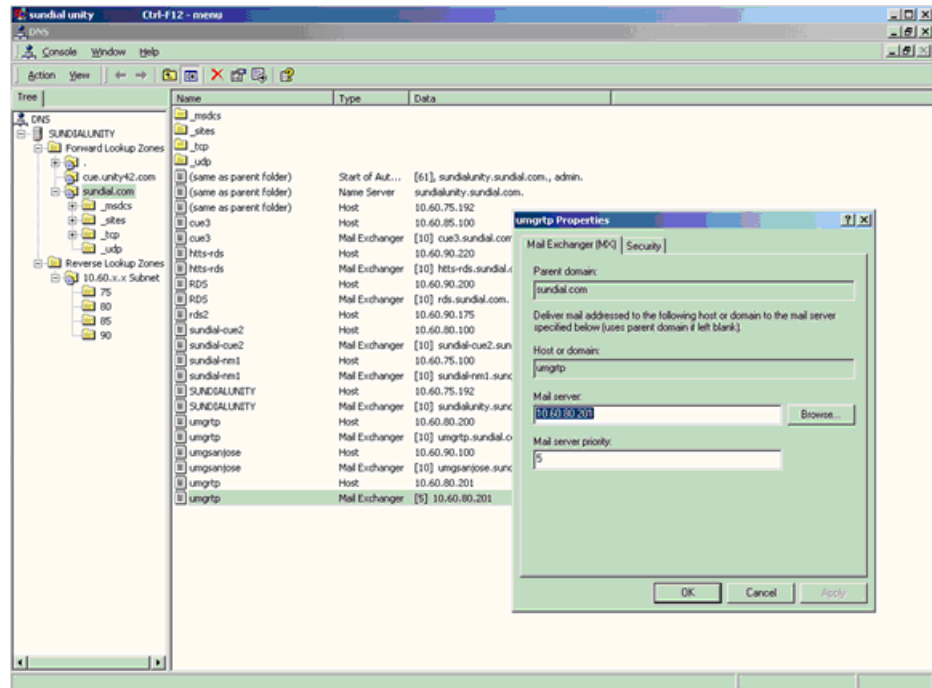


Figure 5 Create MX Record for Secondary Cisco UMG with Priority 5



**Note**

Cisco UMG redundancy is transparent for Cisco Unity. Cisco Unity relies on the DNS server to map the primary or secondary Cisco UMG host to the IP address depending on the Cisco UMG status and priority setup. (See [Figure 6](#))

Figure 6 *MX-records from Cisco Unity with Primary and Secondary Cisco UMG Information*

Name	Type	Data
_msdcs		
_sites		
_tcp		
_udp		
(some as parent folder)	Start of Aut...	[61] sundialunity.sundial.com., admin.
(some as parent folder)	Name Server	sundialunity.sundial.com.
(some as parent folder)	Host	10.60.75.192
cue3	Host	10.60.85.100
cue3	Mail Exchanger	[10] cue3.sundial.com.
hts-rds	Host	10.60.90.220
hts-rds	Mail Exchanger	[10] hts-rds.sundial.com.
RDS	Host	10.60.90.200
RDS	Mail Exchanger	[10] rds.sundial.com.
rds2	Host	10.60.90.175
sundial-cue2	Host	10.60.80.100
sundial-cue2	Mail Exchanger	[10] sundial-cue2.sundial.com.
sundial-mx1	Host	10.60.75.100
sundial-mx1	Mail Exchanger	[10] sundial-mx1.sundial.com.
SUNDIALUNITY	Host	10.60.75.192
SUNDIALUNITY	Mail Exchanger	[10] sundialunity.sundial.com.
umgrp	Host	10.60.80.200
umgrp	Mail Exchanger	[10] umgrp.sundial.com.
umgsanjose	Host	10.60.90.100
umgsanjose	Mail Exchanger	[10] umgsanjose.sundial.com.
umgrp	Host	10.60.80.201
umgrp	Mail Exchanger	[0] 10.60.80.201

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Setting Up Cisco UMG on Cisco Unity as a Delivery Location with a Dial-ID

Figure 7 Add the Delivery Location on Cisco Unity to umgrtp

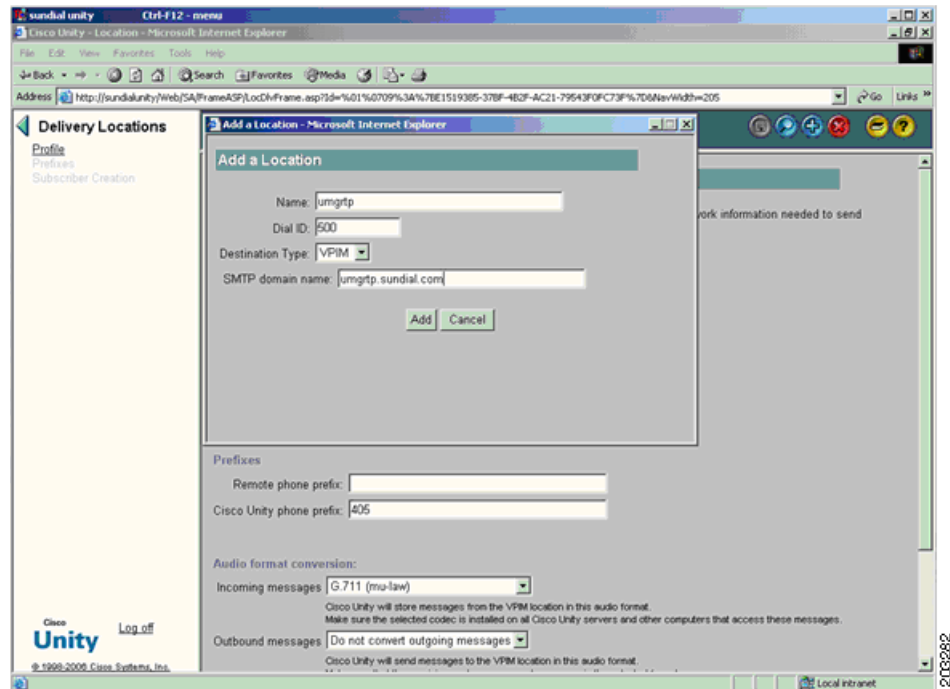
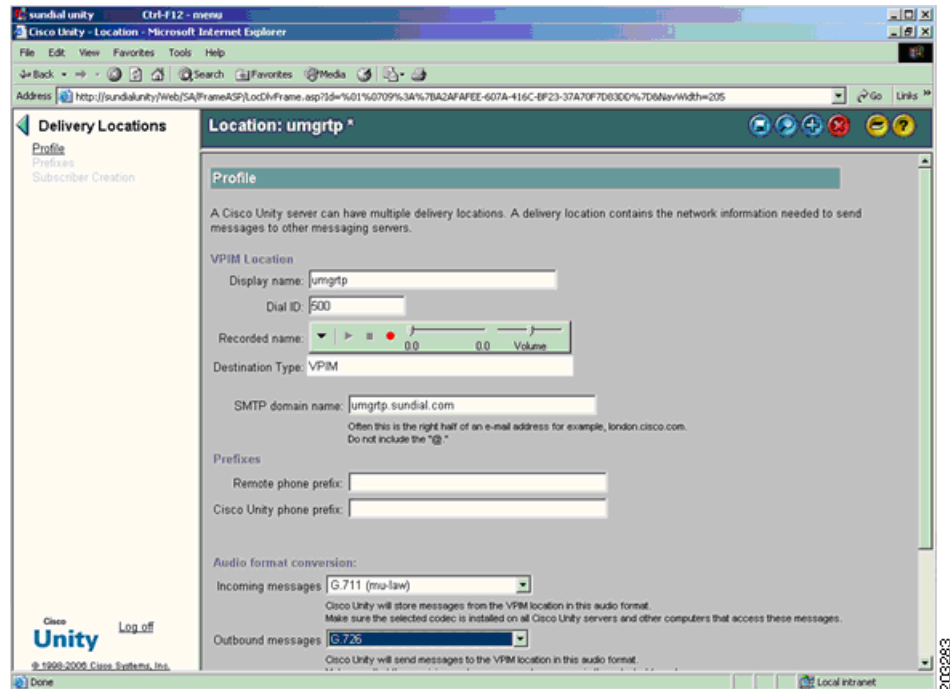


Figure 8 Delivery Location Setup with Other Parameters



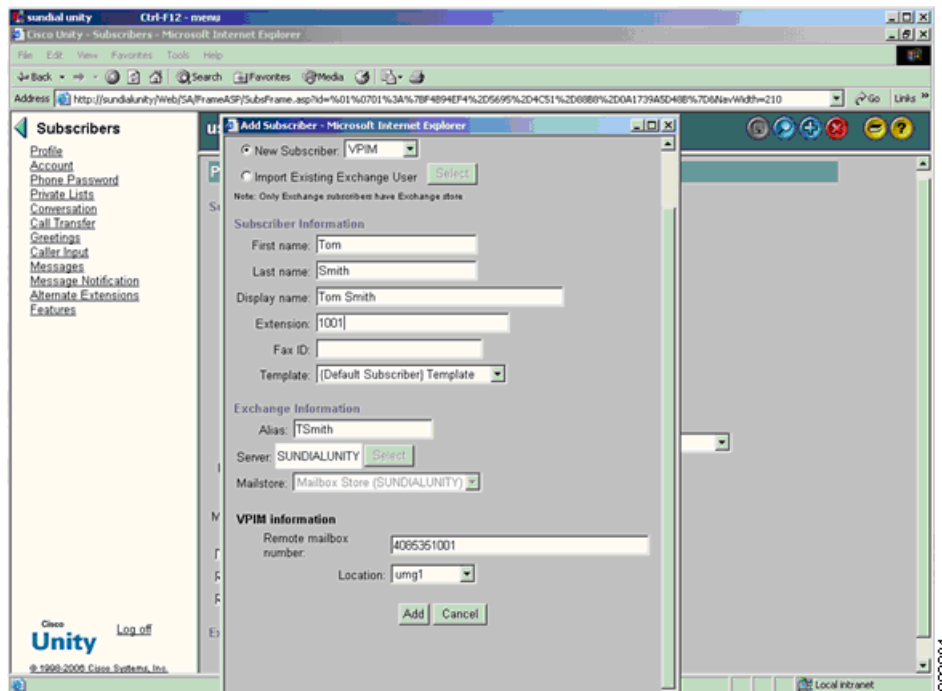
**Note**

When adding the Cisco UMG host as the Delivery location, the Dial ID field on Cisco Unity is the Location ID of the Primary Cisco UMG to which Cisco Unity registered. Leave the Remote Phone Prefix field empty to indicate that any subscriber on Cisco Unity can dial any number outside by dialing the dial_ID followed with the real remote number. Depending on the Cisco Unity dial plan, you can leave the Cisco Unity Phone Prefix field empty or enter the prefix of the Cisco Unity endpoint on Cisco UMG.

Optionally Deploying VPIM Network Using Remote VPIM Subscribers Instead of Delivery Location

In this model, the customer has imported all the remote subscriber information into the Cisco Unity database. When Cisco UMG is inserted into the VPIM network with all remote subscribers registered, the customer can either move from a Remote VPIM subscriber setup to a delivery location setup or stay with a Remote VPIM subscriber setup by setting the VPIM location to the primary Cisco UMG Location ID.

Figure 9 Remote Subscriber VPIM Location Setup on Cisco Unity

**Note**

The deployment involves the information change on every remote VPIM subscriber's setup.

Verifying the Cisco Unity Endpoints on Cisco UMG

```
umgrtp-1> show endpoint local
```

A total of 2 local endpoint(s) have been found:

Location ID	Location Prefix	Endpoint Type	Endpoint Status	Primary Gateway	Secondary Gateway
510	919	Unity	Enabled	500	501
511	704	Unity	Enabled	500	501

Managing the Avaya Interchange Endpoint on Cisco UMG with Manual Provisioning

The following example is for the north region.

Configuration on umg-n-1

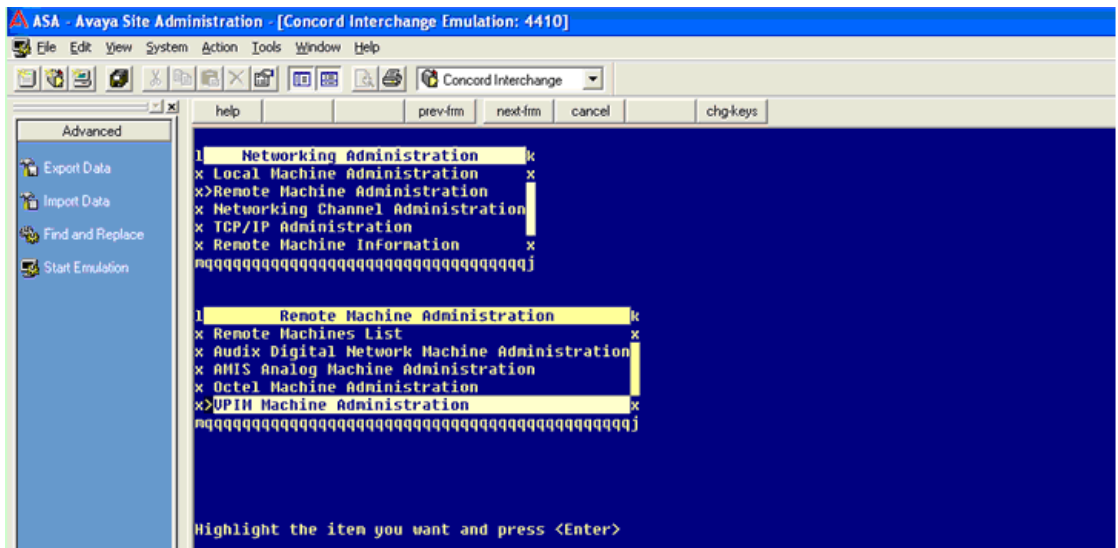
In this example, there is only one Cisco UMG connected to Avaya Interchange, no failover is supported with Avaya Interchange because of the limitation on Avaya Interchange VPIM support.

```
Um-g-n-1(config)> endpoint 610 unity
Um-g-n-1(config-endpoint)> domain avaya.headquarters.com
Um-g-n-1(config-endpoint)> hostname interchange.headquarters.com
Um-g-n-1(config-endpoint)> prefix 203
Um-g-n-1(config-endpoint)> enable
```

Configuration on Avaya Interchange

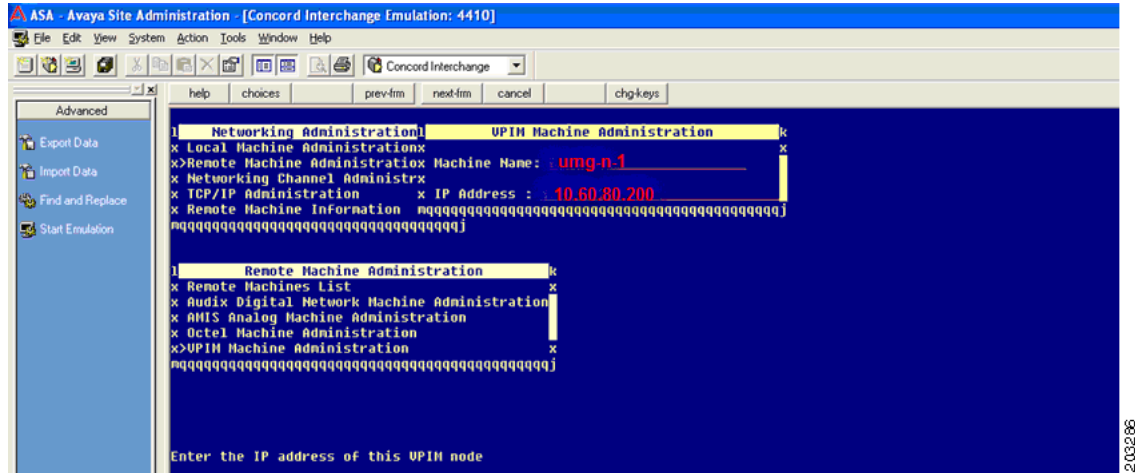
- Step 1** From the Avaya Interchange Main Menu, choose **Network Administration > Remote Machine Administration > VPIM Machine Administration**.

Figure 10 VPIM Machine Administration Mode



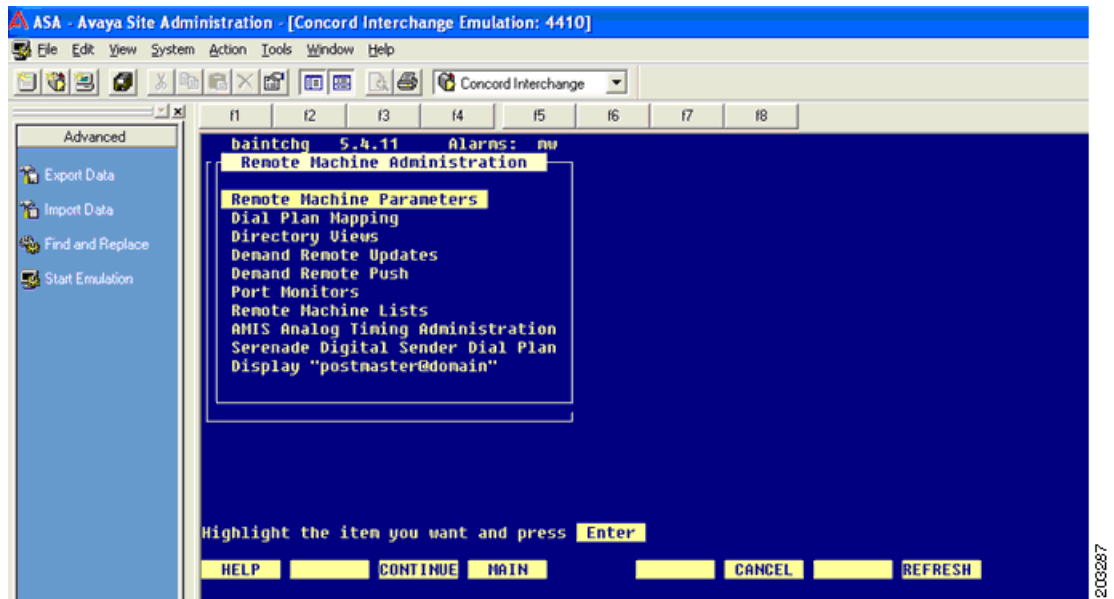
- Step 2** On the VPIM machine administration screen, insert the Cisco UMG host name and IP address
 In this example, the Machine Name could be umg-n-1 and the IP address should be 10.60.60.200.

Figure 11 Cisco UMG Configuration on Remote-Machine Configuration Window



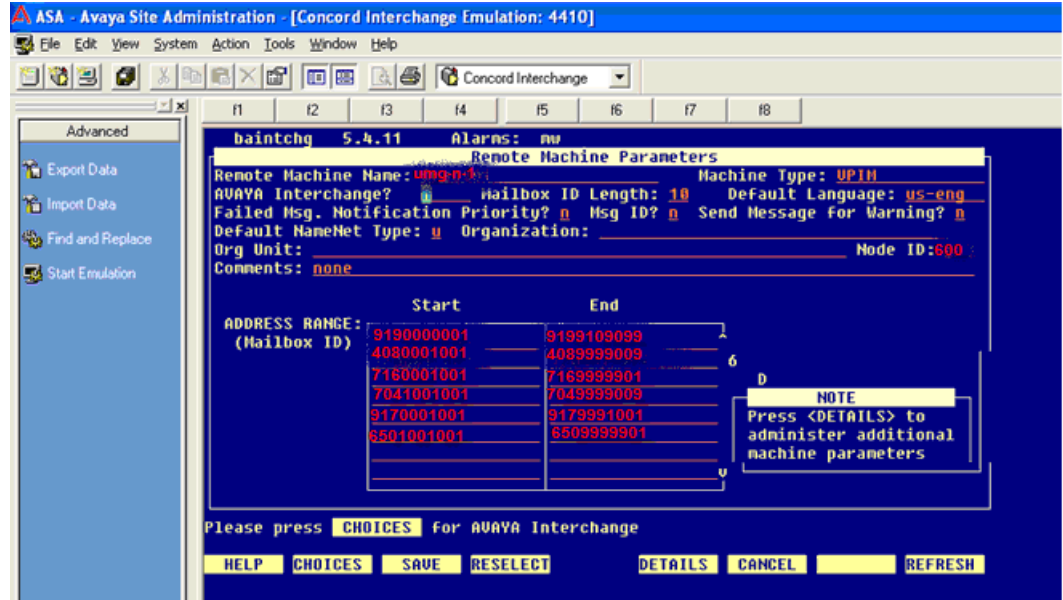
- Step 3** From the Avaya Interchange Main menu, choose **Interchange Administration > Remote Machine Administration > Remote Machine Parameters**.

Figure 12 Remote Machine Parameter Configuration Mode



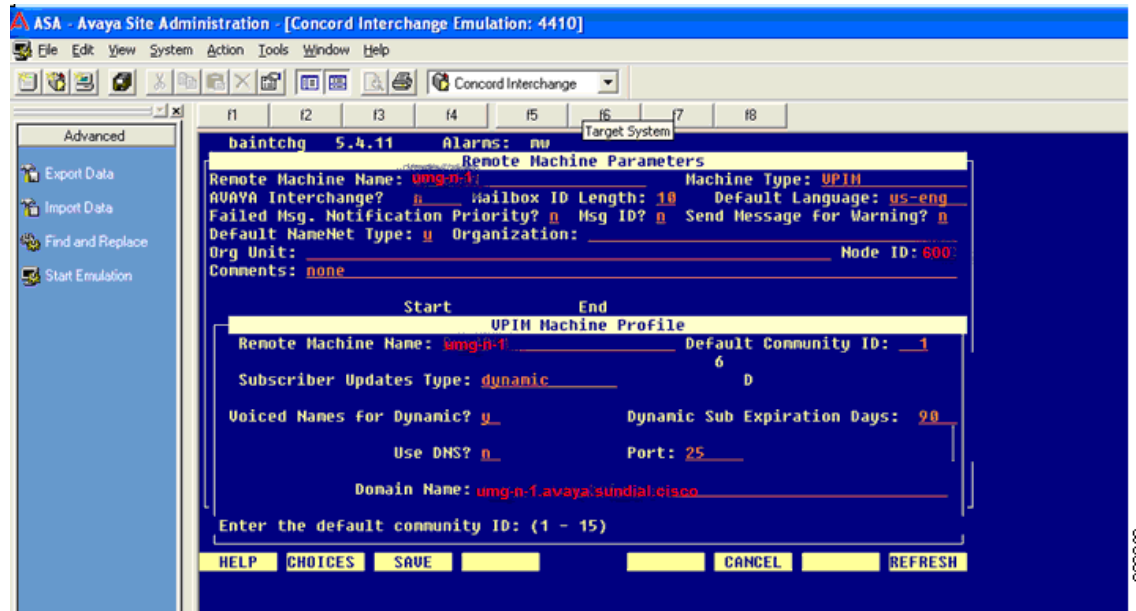
- Step 4** On the Remote Machine Parameters screen configure the following:
- Cisco UMG name
 - Location ID
 - E164 numbers.

Figure 13 Basic Remote Machine Parameters Configuration



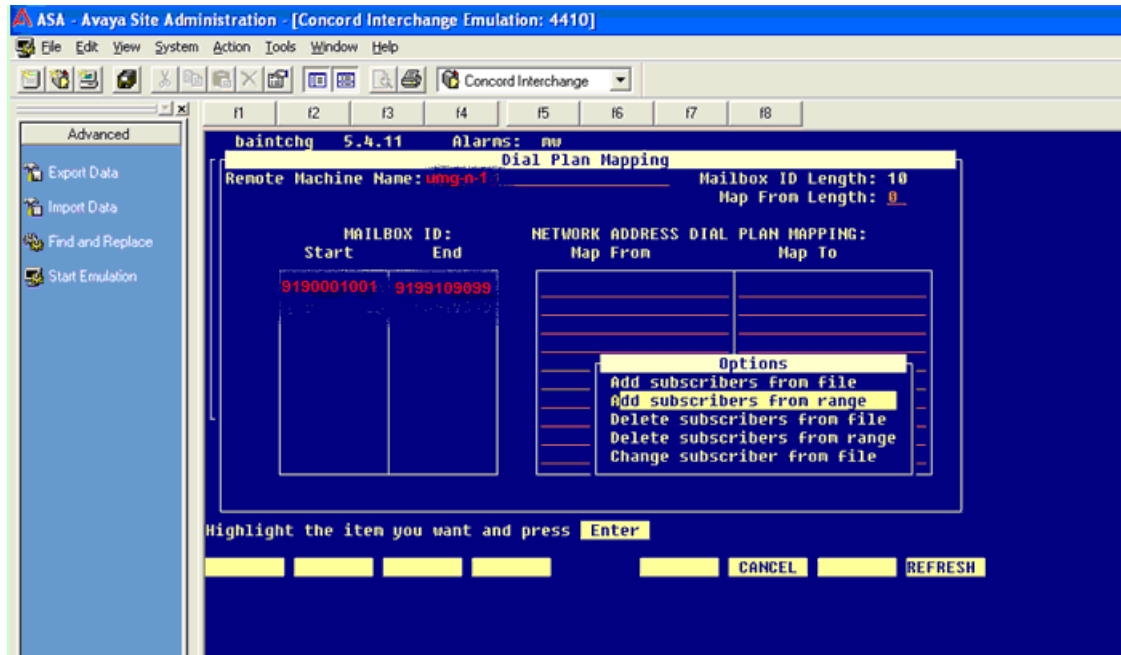
- Step 5** Continue on the Remote Machine Parameters screen.

Figure 14 Detailed Remote Machine Parameters Configuration



- Step 6** If you must map the dial plan with network dial plan, exit from the Remote Machine Parameters screen and choose **Interchange Administration > Remote Machine Administration > Dial-Plan Mapping**.

Figure 15 Dial-Plan Mapping Configuration



Note

The configuration of other Customer Service parameters, such as Queue and CDR, is not within the scope of this document.

Verifying from umg-n-1

```
Um-g-n-1> show endpoint local
```

```
A total of 1 local endpoint(s) have been found:
```

Location ID	Location Prefix	Endpoint Type	Endpoint Status	Primary Gateway	Secondary Gateway
510	919	Interchange	Enabled	600	N/A

Monitoring and Manually Synchronizing Cisco UMG Directory Exchange

The Cisco UMG is an intelligent agent that handles directory information exchange automatically without any manual provisioning effort. The directory exchange can happen between:

- Multiple Cisco UMGs
- Cisco UMG and Cisco Unity Express systems

However, the directory exchange is limited with the autoregistered endpoints, so the directory exchange on Cisco Unity, Cisco Unity Express earlier than version 3.0, and Avaya Interchange is not supported. If you want subscriber level information on the Cisco UMG for those manual endpoints, you can configure the Cisco UMG to use prefix-number-only mode.

During a directory exchange, the following events will occur:

- When the Cisco UMG is first time inserted into a Cisco UMG-controlled messaging network, a full directory exchange is triggered between Cisco UMGs.
- When a Cisco Unity Express first time registers with its primary Cisco UMG, a full directory exchange is triggered between the Cisco Unity Express and its primary Cisco UMG. The secondary Cisco UMG gets information updates from the primary Cisco UMG.
- When any subscriber information is changed on Cisco Unity Express, a directory update occurs between Cisco Unity Express and its primary Cisco UMG. Next a directory exchange occurs between the primary Cisco UMG and all its peer gateways through the fully meshed unicast network.
- When Cisco Unity Express or Cisco UMG goes down and comes back online, a directory exchange is triggered on Cisco Unity Express and Cisco UMG, and across all the Cisco UMGs in the network.
- When a Cisco UMG detects out-of-sync data either from its endpoints or its peer Cisco UMGs, it tries to perform a directory update to recover. If it cannot recover, a full directory exchange is triggered.

Although the Cisco UMG can synchronize the directory information across your entire network, a set of CLI commands for Cisco Unity Express 3.1 and Cisco UMG 1.0 enable you to manually perform a directory exchange if the automatic resynchronization takes too long or is not invoked.

To manually perform a directory exchange, configure both Cisco Unity Express and the Cisco UMG as described below.

Manually Synchronizing Cisco UMG Directory Exchange on Cisco Unity Express

To synchronize directory exchange for Cisco Unity Express, use the following command:

```
messaging-gateway directory exchange [full | update]
```

Manually Synchronizing Cisco UMG Directory Exchange on Cisco UMG

To synchronize directory exchange on Cisco UMG, use the following commands:

```
directory exchange endpoint request [full | update]
directory exchange endpoint request [full | update] LOCATIONID
directory exchange messaging-gateway request [full | update]
directory exchange messaging-gateway request [full | update] LOCATIONID
directory exchange messaging-gateway send [full | update]
directory exchange messaging-gateway send [full | update] LOCATIONID
```



Note

Use the manual directory-exchange only when out-of-sync directory information cannot be fixed by the automatic directory-exchange processes.

When applying the CLI commands shown above, examine the available bandwidth before flooding all the directory exchange information to endpoints or Cisco UMGs. If possible, use the commands only for certain nodes, during off-peak hours.

Verifying the Directory Information Exchange on the Cisco UMGs in the Network

Verifying the Endpoint

This example is for the Cisco UMG on East Region, umg-e-1.

```
umg-e-1> show endpoint local
```

A total of 3 local endpoint(s) have been found:

Location ID	Location Prefix	Endpoint Type	Endpoint Status	Primary Gateway	Secondary Gateway
310	716	CUE	Enabled	300	301
311	716	CUE	Enabled	300	301
312	917	CUE	Enabled	300	301

```
umg-e-1> show endpoint network
```

A total of 6 network endpoint(s) have been found:

Location ID	Location Prefix	Endpoint Type	Primary Gateway	Secondary Gateway
510	919	Unity	500	501
511	704	Unity	500	501
410	408	CUE	400	401
411	408	CUE	400	401
412	650	CUE	400	401
610	203	Interchange	600	n/a

Verifying the Subscriber

This example is for umg-e-1 and umg-w-1.

```
Um-g-e-1# show mailbox 410
2 mailbox(s) has been found for location 410

4085550101
4085550102
```

The two subscriber numbers are exchanged from automatic directory exchange.

```
Um-g-w-1# show mailbox 310
2 mailbox(s) has been found for location 310

7165550101
7165550102
```

The 2 subscriber numbers are exchanged by manual provisioning.

```
Um-g-w-1# show mailbox 510
No mailbox has been found for location 510
```

No automatic directory exchange and manual provisioning.



Note

All the Cisco UMGs in the network must have identical directory tables.

For autoregistered endpoints, the directory table contains the subscriber level information.

For manually provisioned endpoints, the directory table contains the subscriber level information only if prefix-number-only mode is enabled and the extensions are manually configured.

For manually provisioned endpoints without prefix-number-only sub mode enabled, no subscriber level information is in the directory table.

Message Routing and Delivery on Cisco UMG

The Cisco UMG (primary or secondary) that hosts an endpoint is responsible for routing the messages from that endpoint. The Cisco UMG utilize information from the directory table to route messages. Messages are routed differently, depending on the registration method of the destination endpoint.

If the destination endpoint is an autoregistered endpoint, the Cisco UMG routes on the subscriber level, which means the Cisco UMG searches for the destination number in its directory table to find the termination node.

If the destination endpoint is a manually provisioned endpoint, the Cisco UMG first routes using the prefix. If only one location with the prefix is found in the directory table, the routing is complete. If more than one location is found with the prefix, the Cisco UMG next looks at the prefix + extension level, which is configured under prefix-number-only mode.

For any VPIM message received on the Cisco UMG, the message destination “To” field could be a System Distribution List (SDL), SBM, or a subscriber number (E.164 phone number scheme). SDLs are matched first. If an SDL overlaps any other number, the SDL masks that number. All SDLs must begin with a numerical sequence that is unique to the system.

The Cisco UMG resolves the destination in the precedence of SDL, SBM, and subscribers. If the message destination does not match any of the existing SDLs, the Cisco UMG searches for a match in the list of configured broadcast endpoints. If no match is found, the Cisco UMG tries to resolve the message destination as a subscriber. If a match is still not found, the message is dropped, resulting in a Non-Delivery-Receipt (NDR).

You can configure a default route on Cisco UMG in case no destination is matched in Cisco UMG's database. For example, in the west region, the default route can be set up to point to cue-w-1, as shown below:

```
Umg-w-1(config)# network default-route 410
Umg-w-1> show network default-route
```

**Note**

In Cisco UMG 1.0, The default route can be a local endpoint or a peer Cisco UMG. However, to avoid looping, there must be a default route plan, such that no message ever gets passed to more than two Cisco UMGs. In other words, if at any time an originating Cisco UMG specifies another Cisco UMG as a default route, that Cisco UMG must be the terminating Cisco UMG and therefore should have its default route set to a local endpoint.

When the address and route are resolved, the message is inserted into delivery queue and is ready to deliver. You can configure DDR and NDR timers to handle any delivery retry and failure cases.

Table 5 lists the DDR reason codes from Cisco UMG 1.0:

Table 5 Cisco UMG NDR reason codes

NDR Code	Cisco Unity Express	Cisco Unity
4.2.1	The remote voice mail system did not accept the message	The recipient's mailbox is not accepting network messages.
4.2.2	The recipient's mailbox is full	The message format is not allowed for delivery to the remote voice mail system.
4.3.1	The remote voice mail system did not accept the message	The message format is not allowed for delivery to the remote voice mail system.
4.3.2	The remote voice mail system did not accept the message	The recipient's mailbox is not accepting network messages.
5.1.1	The recipient's mailbox does not exist	The remote voice mail system was not able to accept the message.
5.2.0	The message format was not accepted by the remote voice mail system	Network problems prevented routing to the remote voice mail server
5.3.2	Networking is disabled	The recipient's mailbox is not accepting network messages.
5.4.1	Could not contact the remote voice mail system	The remote voice mail system could not be contacted.
5.7.9	The message format was not accepted by the remote voice mail system	The message format was not accepted by the remote voice mail system

To check the Cisco UMG messaging routing and delivery statistics, use the **show statistics** command on the Cisco UMG, as shown below:

```
Umg-w-1> show statistics

SMTP Receive Failure:      0
SMTP Sent Failure:        0
SMTP Rejected:            2
NDR Message Generated:    0
DDR Message Generated:    0
Number of Lookup Request: 0
SDL Message Received:     0
SDL Message Sent:         0
SBM Message Received:     0
DirEx Message Received:   14
DirEx Message Send:       12
VPIM Message Received:    0
VPIM Message Sent:        0
Total SMTP Message Received: 14
Total SMTP Message Sent:  12
```

Setting Up Directory Lookup with TUI or VVE Interface

In Cisco UMG 1.0, a global search option is available to the end users when no match is found in the endpoint's local database (Cisco Unity Express).

You must enable the feature on the endpoint during the registration process. After configuring the hosting message gateway username and password, use the following command before starting the registration process.

```
cue(config)# messaging-gateway directory lookup tui-prompt
```

To check the feature's availability on the endpoint:

```
cue# show messaging-gateway
Messaging gateways:

AutoRegister to gateway(s) : Enabled
Remote directory lookup : Enabled (with TUI prompt)
```



Note

To use the Cisco VVE interface, VoiceView Service must be enabled on Cisco Unity Express and a URL must be defined on the Cisco Unified CME telephony-interface. For detailed configuration information, see the [Cisco Unified CME System Administrator's Guide](#) and the [Cisco Unity Express Administrator's Guide](#).

Directory lookup can be enabled with or without TUI confirmation.

Setting Up Spoken-Name Confirmation Across AutoRegistered Cisco Unity Express Endpoints

By default, spoken name is disabled on the Cisco UMG, which means that the spoken names received from Cisco Unity Express endpoints are not stored in the Cisco UMG directory database, and the spoken name are not part of the directory exchange with its peers. When this feature is enabled, Cisco Unity Express caches the location spoken names and plays them back to the end user.

To invoke this feature, you must configure both Cisco Unity Express and Cisco UMG:

On Cisco Unity Express:

```
Cue-w-1(config)# remote cache enable
```



Note

Remote cache is mandatory for the Cisco UMG spoken-name feature.

On Cisco UMG

```
umg-w-1(config)# spoken-name enable
```

```
umg-w-1# show spoken-name
Spoken name is enabled.
```

If Cisco Unity Express already registered with the Cisco UMG before spoken-name is enabled, you must use the following CLI to trigger directory exchange to update spoken-name information:

```
Cue-w-1(config)# no messaging-gateway registration
Cue-w-1(config)# messaging-gateway registration
```

If spoken-name is already stored in the Cisco UMG database, disabling spoken-name does not delete the entry from the directory table until the new directory updates occurs.

Using System Distribution Lists Across Cisco Unity Express Systems

System Distribution Lists (SDLs) are created and managed in EXEC mode, not configuration mode. Each SDL can have one or more members, each of which could be one of the following entities:

- A subscriber
- Another SDL list

SDLs are shared among Cisco UMGs and can be managed on any Cisco UMG in a network. SDLs are created and edited in list-management mode, which is the submode of EXEC mode. When list-management mode is exited on one Cisco UMG, all SDL changes are pushed out to all other Cisco UMGs in the network. At any time, only one Cisco UMG can manage the SDL information. Other Cisco UMGs are not able to enter list-management mode to manage SDLs until the Cisco UMG that was in the list-management mode exits from that mode or a 5-minute timeout when there is no exit request from the Cisco UMG that is currently in list-management mode.

As an example, the following sections show how to create three SDLs. These SDLs are for:

- West region
- East region
- Both west region and the east region

In this example, umg-w-1 is the master Cisco UMG.

Creating an SDL with Privileges

```
umg-w-1# list-manager
Locking system distribution lists...[OK]--> The umg-w-1 declare itself as the master UMG

## The following is the SDL list of the west region ##
Um-g-w-1(listmgr)# list number 900 --> The list number must be a unique number
Um-g-w-1(listmgr-edit)# name SDL_WEST

umg-w-1(listmgr-edit)# member 4085550101 type sub
umg-w-1(listmgr-edit)# member 4085550102 type sub
umg-w-1(listmgr-edit)# member 4085550001 type sub
umg-w-1(listmgr-edit)# member 4085550003 type sub

umg-w-1(listmgr-edit)# privilege 4085550101 --> Assign the authority to 2 members
umg-w-1(listmgr-edit)# privilege 4085550001

## The following is the SDL list of the east region ##
Um-g-w-1(listmgr)# list number 910 --> The list number must be a unique number
Um-g-w-1(listmgr-edit)# name SDL_EAST

umg-w-1(listmgr-edit)# member 7165550021 type sub
umg-w-1(listmgr-edit)# member 7165550042 type sub
umg-w-1(listmgr-edit)# member 7165550061 type sub
umg-w-1(listmgr-edit)# member 7165550082 type sub

umg-w-1(listmgr-edit)# privilege 7165550021 --> Assign the authority to 2 members
umg-w-1(listmgr-edit)# privilege 7165550082

## the following is the SDL list of west and east regions

Um-g-w-1(listmgr)# list number 999 --> The list number must be a unique number
Um-g-w-1(listmgr-edit)# name SDL_E_W

umg-w-1(listmgr-edit)# member 900 type list
umg-w-1(listmgr-edit)# member 910 type list

umg-w-1(listmgr-edit)# privilege 7165550021 --> Assign the authority to 2 members
umg-w-1(listmgr-edit)# privilege 4085550101
```

Publishing the SDLs to All Peer Cisco UMGs in the Network

Use either the manual **list publish** command or exit from SDL configuration mode.

```
umg-w-1(listmgr)# list publish --> This is optional CLI, SDL will get automatically
published when exiting from listmgr mode
LocationID      Status      Description
-----
500             Published
501             Published
401             Published
300             Published
301             Published
600             Published
601             Published

# of network gateways published:      7
# of network gateways failed to publish:0
```

Unlocking the SDL Configuration

```
umg-w-1(listmgr-edit)# exit
umg-w-1(list)# exit
auto publishing to all ...
LocationID      Status      Description
-----
500             Published
501             Published
401             Published
300             Published
301             Published
600             Published
601             Published

# of network gateways published:      7
# of network gateways failed to publish:0
```

Verifying the SDL Configuration on Any Cisco UMG in the System

```
umg-e-1(listmgr)# show list 900
Extension:      000
Name:          SDL_WEST
Member(s):      4085550101 (subscriber)
                4085550102 (subscriber)
                4085550001 (subscriber)
                4085550003 (subscriber)
                -----
                # of members: 4

umg-e-1# show list 900 privilege --> Under UMG exec mode
2 authorized sender(s) has been found for system distribution list 900:

4085550101
4085550001
```

Verifying that SDL is Synchronized Between Cisco UMGs

Use these commands to check the SDL versions on Cisco UMGs and verify that SDL is synchronized:

```
Um-g-e-1 > show list tracking version
The version of system distribution list is 70173_04062007030517.

Um-g-w-1 > show list tracking version
The version of system distribution list is 70173_04062007030517.
```



Note

In a Cisco UMG network, only one Cisco UMG can create, modify, or delete the SDL at any time. When you enter list-manager mode, the SDL is automatically locked and it cannot be managed by other Cisco UMGs. The **exit** command from list-management mode automatically enables other Cisco UMGs in the network to access SDL list-management mode for SDL creation/Modification/Deletion.

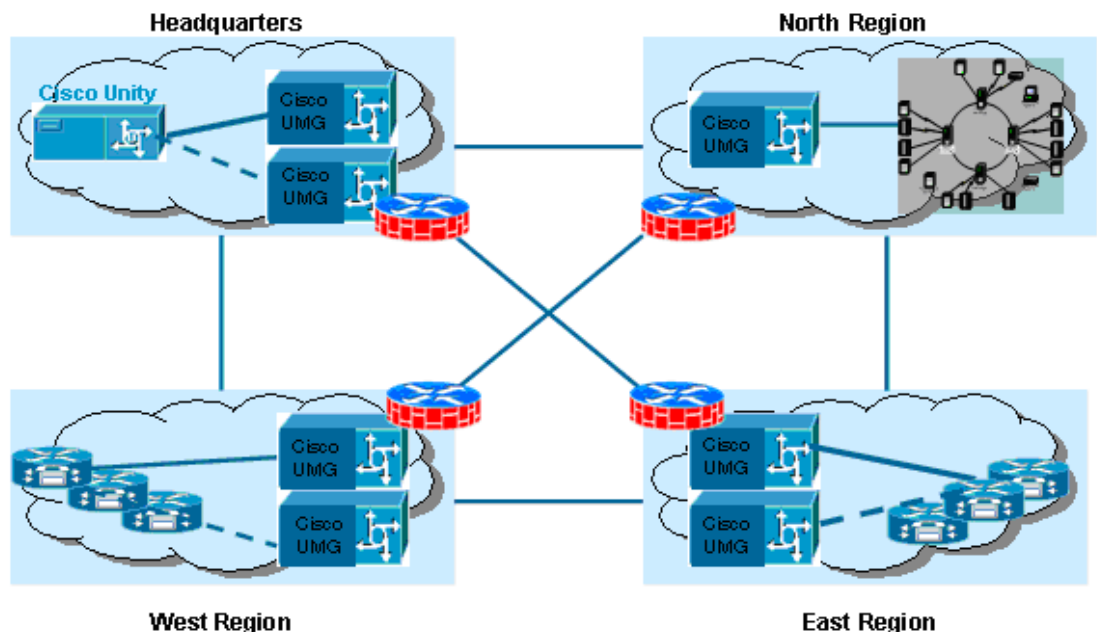
The SDL information is published across all Cisco UMGs in the network when the Cisco UMG that manages the SDLs exits from list-management mode.

Subscribers of SDLs must have the correct privileges setup to send SDL messages. A subscriber without a correct SDL privilege receives a NDR from the Cisco UMG when sending out an SDL message.

Setting Up NAT Tables on Cisco UMG

Figure 16 shows an example of a Network Address Translation (NAT) device used on the edge of every region. In this example, the NAT is required during directory exchange between Cisco UMGs and message delivery across the regions.

Figure 16 NAT Configuration Example in a Cisco UMG Network



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The headquarters Cisco UMG and west region Cisco UMG are used as the sample configuration here.

```
On umg-h-1:
Um-g-h-1(config)> nat location 400
Um-g-h-1(config-nat)> vpim external 128.1.2.3 26
Um-g-h-1(config)> nat location 401
Um-g-h-1(config-nat)> vpim external 128.1.2.3 27
```

Table 6 shows what the NAT table may look like on the headquarters Cisco UMG.

Table 6 NAT Table on Central Cisco UMG

Peer	Internal IP	External IP	External SMTP Port
400 (UMG-W-1)	10.60.70.200	128.1.2.3	26
401(UMG-W-2)	10.60.70.201	128.1.2.3	27



Note

On the umg-h-2, the same NAT configuration must be duplicated.

The VPIM port 26 and 27 are specified to umg-w-1 and umg-w-2, because they share the same external IP address: 128.1.2.3.

The above configuration is the NAT table for only the west region configured on UMG-H-1, the rest of regions are not covered.

The forwarding table on the headquarters NAT device might have a mapping table like this:

```
Forward 128.1.1.3:26 10.60.80.200:25 for UMG-H-1
Forward 128.1.1.3:27 10.60.80.201:25 for UMG-H-2
On umg-w-1:
Um-g-w-1(config)> nat location 500
Um-g-w-1(config-nat)> vpim external 128.1.1.3 26
Um-g-w-1(config)> nat location 501
Um-g-w-1(config-nat)> vpim external 128.1.1.3 27
```

Table 7 shows what the NAT table might look like on the headquarters Cisco UMG.

Table 7 NAT Table on the West Region Cisco UMG

Peer	Internal IP	External IP	External SMTP Port
500 (UMG-h-1)	10.60.80.200	128.1.1.3	26
501(UMG-h-2)	10.60.80.201	128.1.1.3	27

**Note**

On the umg-w-2, the same NAT configuration must be duplicated.

The VPIM port 26 and 27 are specified to umg-h-1 and umg-h-2, since they share the same external IP address: 128.1.1.3.

The above configuration is the NAT table for the headquarters on UMG-w-1 only. The rest of regions are not covered.

The forwarding table on the west region NAT device might have the mapping table like this:

```
Forward 128.1.2.3:26 10.60.70.200:25 for UMG-W-1
Forward 128.1.2.3:27 10.60.70.201:25 for UMG-W-2
```

Setting Up Backup and Restore for Cisco UMG

In this example, configuration and data backup is configured on umg-w-1. We do not recommend data-only backup and restore.

Ensuring the System Consistency Across Backup and Restore

Use the **copy running-config startup-config** command to write to memory before backup:

```
Umg-w-1> copy running-config startup-config
```

Setting Up the Backup Version and FTP server

```
Umg-w-1(config)> backup server url ftp://10.60.70.100/umg-backup username test password
test
Umg-w-1(config)> backup revisions 1
```

Take the Cisco UMG Offline and Choose Backup Category All

**Note**

The backup and restore must be done in offline mode!

```
Umg-w-1(config) > offline
!!!WARNING!!!: If you are going offline to do a backup, it is recommended that you save
the current running configuration using the 'write' command, prior to going to the offline
state.
Putting the system offline will terminate all end user sessions.
Are you sure you want to go offline[n]? : y
UMG(offline) > backup category all
```

Check the Backup_ID to Decide which Revision to Restore

Go to the backup location on the FTP server and verify that the backup files are there. You can retrieve the backup ID using the **show backup server** command which lists all available back copies on the remote backup server.

Take the Cisco UMG Offline and Choose Backup_ID to Complete the Restore

```
UMG(config) > offline
!!!WARNING!!!: If you are going offline to do a backup, it is recommended that you save
the current running configuration using the 'write' command, prior to going to the offline
state.
Putting the system offline will terminate all end user sessions.
Are you sure you want to go offline[n]? : y
UMG(offline) > restore id data1 category all
UMG(offline) > continue
```