Chapter 3: Performance—Optimizing Installation and Configuration for Your Environment

Determining the Number of Cisco Unity Bridge Ports Needed

Estimating exactly how much traffic to expect to and from the Bridge is a challenge. All of the following information can be used to help calculate useful figures:

- Historical data on network voice message traffic.
- Subscriber population statistics and familiarity with the voice messaging habits of subscribers in various departments or locations.
- A determination of the point in the migration at which the message traffic between the Cisco Unity network and the Octel systems will be the heaviest. Theoretically this point would be reached when the migration is 50 percent complete (when half of the users are on Cisco Unity and half are on Octel).

When you have computed an approximate estimate of the peak traffic levels between Cisco Unity and Octel subscribers, also consider the following:

- Audio of a voice message is played in real time. Thus, a 30-second voice message takes 30 seconds to transmit.
- In addition to the actual recording time for voice message audio (or fax transmission) there is additional time necessary for various processing tasks. For example:
  - Dialing and receiving a connect for each outbound call
  - Servers identifying each other and performing call completion tasks for each call
  - Processing of each recipient of a particular message
- When an Octel subscriber sends a message to an Octel distribution list that includes the network addresses of Cisco Unity subscribers, or when a Cisco Unity subscriber sends a message to a distribution list that includes Bridge subscribers (which represent Octel subscribers), the list is flattened before the message is delivered via Octel analog networking. What this means is that if subscriber X on Cisco Unity sends a message to a distribution list that includes Bridge subscribers A, B, C, D, and E, the message transmission from the Bridge to the Octel includes a single message transmission, with transmission of five recipient addresses. The reverse is also true from Octel to the Bridge.

Analog Message Delivery Call Durations

There is no restriction on the maximum number of messages delivered on a message delivery call, or the total duration of a message delivery call, between the Bridge server and an Octel server.

The number of maximum simultaneous calls placed from the Bridge to the same Octel node, and the threshold at which additional calls are initiated, is determined by the "Queued Call Threshold" and "Max. Ports per Node" settings on the System Settings page of the Bridge server. (Refer to the "System Settings" section of the "Reference: Settings on the Bridge Server" chapter of the *Cisco Unity Bridge Networking Guide* for additional details on these parameters. The *Cisco Unity Bridge Networking Guide* can be found at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/products_installation_and_configuration_guides_list.html.

The number of maximum simultaneous calls placed from an Octel to the same Unity node serial number on the Bridge, and the threshold at which additional calls are initiated, is determined by the settings on the Octel server for the applicable networking node profile. Note that the Bridge can represent multiple node serial numbers, which increases the potential maximum number of simultaneous calls placed from an Octel server to the Bridge.

See Table 1 for details on the analog message delivery call durations.

Table 1. Analog Message Delivery Call Durations

Delivery Call Phase	Duration
Analog call setup: initiate > dial > connect (applicable to outbound calls only)	5–20 seconds
Protocol overhead per message delivery call	30–35 seconds
Message overhead per message	5–10 seconds plus recording audio duration
Recipient overhead per each recipient of message	8–20 seconds

Analog Administrative Call Durations

There is no restriction on the maximum number of tasks performed during an administrative analog call, or the total duration of an administrative analog call, between the Bridge server and an Octel server.

No more than one administrative call at a time will ever be made from the Bridge to the same remote Octel server.

There is no restriction on the number of simultaneous inbound or outbound administrative calls that can be in process at once, other than the fact that the Bridge cannot place more than one call simultaneously to the same remote Octel server.

See Table 2 for details on the analog administrative call durations.

Table 2. Analog Administrative Call Durations

Delivery Call Phase	Duration
Analog call setup: initiate > dial > connect (applicable to outbound calls only)	5–20 seconds
Protocol overhead per administrative call	44–49 seconds
Administrative name retrieval per subscriber	• 16–24 seconds (if there is a recorded name) • 10–14 seconds (if there is no recorded name)

Estimation Example

With the information found in Tables 1 and 2, and in the following list, while taking into consideration all of the information you have about voice network traffic patterns and user message habits, you can begin to estimate the number of Bridge ports that will be necessary to handle the expected traffic.

We recommend you do the following:

- Characterize the typical calls that you expect will occur (see Figures 15 and 16 and for examples).
- Estimate how many of each of these calls you expect will occur during various times of the day, and on various days of the week.
- Consider that one port on the Bridge will provide 60 minutes of call time per hour.
- Consider whether traffic patterns will result in steady traffic to particular nodes, or sporadic traffic to different nodes. Long continuous calls deliver the same messages more efficiently than many calls all at once or sporadic call placement.
- Consider that having enough ports to deliver all messages over a 24-hour period may not be sufficient for timely delivery if the majority of the traffic takes place during the span of a few hours. Consider the typical traffic during the heaviest traffic period of the day, on the busiest day of the week.

Figure 15: Outbound Message Delivery Call—Example 1

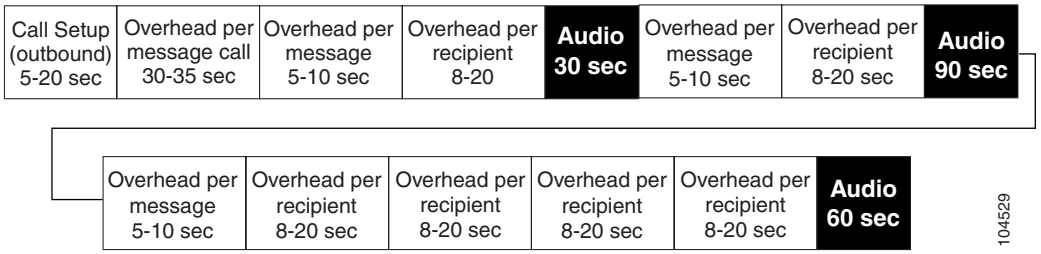


Figure 15 illustrates one outbound message delivery call that includes: one 30-second voice message to one recipient; one 90-second voice message to one recipient; and one 60-second voice message to four recipients. The total time necessary to process this call would be anywhere from 4 minutes and 38 seconds to 6 minutes and 25 seconds.

Figure 16: Outbound Message Delivery Call—Example 2

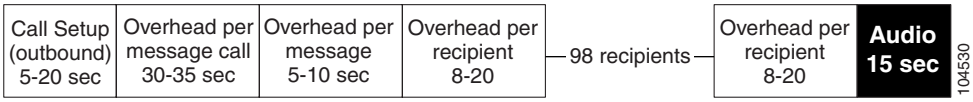


Figure 16 illustrates one outbound message delivery call that includes just one 15-second voice message to one hundred recipients. The total time necessary to process this call would be anywhere from 14 minutes and 15 seconds to 34 minutes and 40 seconds.

Determining How Many Bridges Will Be Needed

When you have estimated the total number of analog Bridge ports that are required to handle the traffic at the heaviest period of the migration, you can use this information to determine how many Bridge servers you will need to deploy for the migration.

The following should be considered when determining how many Bridge servers to deploy:

- Determine the maximum number of Bridge ports configurable on the platform intended for use as the Bridge server. For this information, refer to the applicable *Cisco Unity Bridge System Requirements, and Supported Hardware and Software* document, available at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/products_system_requirements_list.html.
- Even if one Bridge server is sufficient to handle all of the expected traffic, does the geographical layout of the network make it advantageous to deploy multiple Bridge servers? For example, if there were heavy network traffic in one particular campus, it might be most effective to install a Bridge on campus and therefore handle phone calls between the Bridge and those Octel servers within the phone

system, and then locate another Bridge optimally for phone access to the other Octel servers in the network.

- Are there other geographical advantages to deploying more than one Bridge server, even when the traffic load does not appear to require it? For example, there are significant advantages to locating one Bridge in the United States and another in Europe.

Note: **(For Cisco Unity Bridge use with Avaya Interchange**) The Avaya Interchange acts as a single node in the Octel Analog Network, with a single serial number. Because a particular Octel node can only be configured on a single Bridge in the Cisco Unity network, traffic to an Octel node is limited to the maximum capacity of a single Bridge. If the Avaya Interchange is handling network messages for a large number of servers opposite Cisco Unity, this needs to be considered. The maximum analog port capacity on the largest Avaya Interchange platform at the time of this writing is 30 ports.

Voice Connector Considerations

Installing More than One Voice Connector and Installing the Voice Connector on a Dedicated Exchange Server

When deciding whether to install more than one Voice Connector, and whether the Voice Connector should be installed on a dedicated Exchange server, consider the following recommendations:

- If messages processed by the Voice Connector are expected to exceed 2,500 per day, we recommend that you deploy a dedicated Exchange server—on which no other mailboxes will be homed—for the Voice Connector.
- If messages processed by the Voice Connector are expected to exceed 7,500 per day, and if the G.711 codec is used to format messages sent between Cisco Unity and the Bridge, we recommend that the Voice Connector be installed on a server running Exchange 2000 or Exchange 2003 Enterprise edition. (If Exchange Enterprise edition is not an option, we recommend that you deploy an additional dedicated Exchange server for an additional Voice Connector.)
- If messages processed by the Voice Connector are expected to exceed 50,000 per day, regardless of message format, we recommend that you deploy an additional dedicated Exchange server for an additional Voice Connector.

Choosing a Voice Connector Installation Location

The Voice Connector(s) are installed on one or more Exchange 2000 or Exchange 2003 servers within the Cisco Unity network. Note the following considerations:

- The Voice Connector must not be installed on an Exchange cluster server.
- All voice messages sent from Cisco Unity subscribers to remote Octel subscribers via the Bridge will be routed via the Voice Connector.

- All voice messages sent from remote Octel subscribers to Cisco Unity subscribers via the Bridge will be routed via the Voice Connector.
- The Voice Connector registers with Exchange. For the Bridge, the Voice Connector is registered for the OMNI address type. All messages sent between the Cisco Unity network and the Bridge have the OMNI address type. When more than one Voice Connector is installed in the network, Exchange uses the lowest cost route to determine which Voice Connector to route to.
- Bridge servers are outside of the Exchange organization. This means that SMTP traffic to the Bridge servers must enter the Exchange organization via an SMTP host, and must leave the organization via an SMTP host. Often, this SMTP host is the Windows Default SMTP Virtual Server on the Exchange server where the Voice Connector is installed. However, depending on your organization, the network may be configured for mail to route in and out of the organization via other specified SMTP servers.
- Depending on your network, and the physical placement of the Bridge server(s) relative to the server on which the Voice Connector is installed, the routing of messages between these points may traverse long geographic routes. When this occurs, your organization may prefer to configure most of the routing between the points within the Exchange organization, or outside the Exchange organization via the LAN, WAN, or Internet. The Digital Networking ESMTP Server configuration on the Bridge, and the configuration of the Bridge delivery locations on the bridgehead server, are your primary means of configuring the routing of messages to and from the Voice Connector, using the preferred network routes.

Figure 17 shows a generic Exchange network with one Voice Connector installed, one server in the network through which all SMTP traffic in and out of the organization is routed, and two Bridge servers. The illustration shows the flow for an inbound and an outbound voice message via the Bridge.

Figure 17: Inbound and Outbound Voice Message Flow Via the Bridge

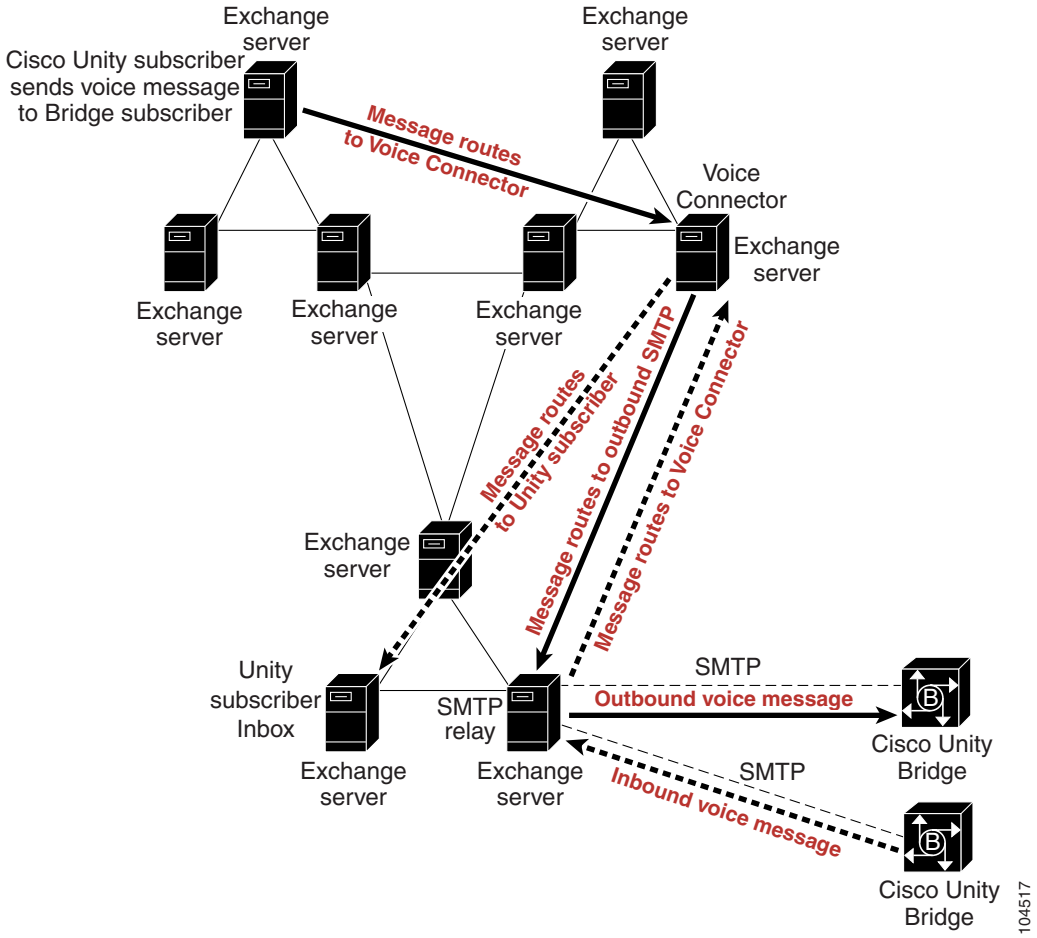
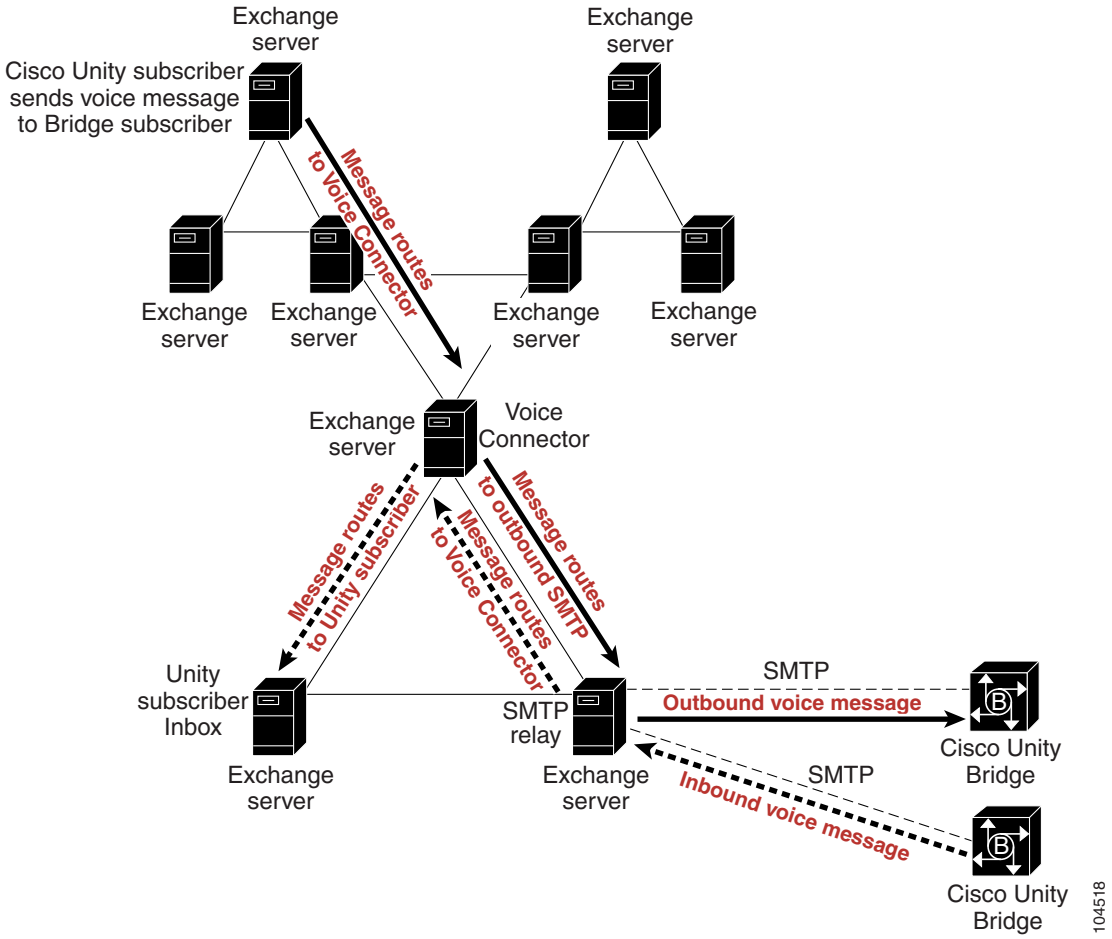


Figure 17 illustrates the considerations for locating the Bridge(s) in relationship to an SMTP relay server for the organization. Locating the Voice Connector within close routing proximity to the point at which SMTP traffic routes in and out of the organization can reduce the amount of intra-Exchange routing that needs to occur. See Figure 18.

Figure 18: Inbound and Outbound Voice Message Flow Via the Cisco Unity Bridge—Sample Route Optimization



Understanding Voice Connector Storage Considerations

Exchange Database Storage

When voice message traffic to and from the Bridge servers is more than a few thousand messages per day, storage space consumed on the Exchange server(s) hosting the Cisco Unity Voice Connector becomes significant as well. This storage issue is related to Exchange and Windows 2000 SMTP Virtual Server processing of messages that are routed to and from destinations external to the organization. If Bridge voice message traffic is expected to exceed 2,000 to 3,000 messages per day, it is important to consider this issue when sizing disk space resources for the Exchange server(s). The additional storage consumed can be characterized as Voice Connector disk space consumption in the message store.

Voice Connector Disk Space Consumption in the Message Store

In order to quantify your database storage needs, calculate the sum of the message file size of all messages expected to be processed by the Voice Connector, making use of data for the heaviest expected 24-hour period (counting the 24-hour period from one daily Exchange online defrag maintenance to the next).

Table 3 shows the recommended storage requirements for the Exchange server priv1.edb and priv1.stm files. This recommendation is specific to the needs of the Voice Connector, and does not include whatever additional storage is required on the server for other activity.

Table 3. Recommended Voice Connector Storage Requirements for Exchange Server Files

Messages Processed per 24-Hour Period	**Average Message Size**	**Recommended Priv* Storage[1]**
20,000	1 minute, G.711: ~640 KB	40 GB
10,000	1 minute, G.711: ~640 KB	20 GB
5,000	1 minute, G.711: ~640 KB	12 GB
20,000	1 minute, G.729a: ~80 KB	10 GB
10,000	1 minute, G.729a: ~80 KB	5 GB
5,000	1 minute, G.729a: ~80 KB	3 GB

The Exchange 2000 Standard Edition maximum database size is 16 GB. This limitation applies to the combined size of the .edb and .stm files for the database. If more than 16 GB is expected, Exchange 2000 Enterprise Server should be used on the server(s) hosting a Cisco Unity Voice Connector. For additional information, refer to the following Microsoft KB articles on the Microsoft Support website: number 296614 and number 322317.

Free space within the store is reclaimed during online defrag, but the overall size does not shrink. Therefore, subsequent 24-hour periods of lesser traffic would not reduce disk space consumption of priv1.edb and priv1.stm. Running an offline defrag will reclaim space, but this would not be considered a permanent solution unless the reclaimed space had been used up during a one-time peak that is not expected to occur again.

[1] To perform an in-place restore, Microsoft recommends that your disks have at least as much free space as the size of the database itself plus a minimum of 10 percent. For example, a 35 GB database would require an 80 GB partition.

Exchange Log File Storage

As with any Exchange server where traffic is heavy, the disk space consumed by Exchange transaction logs must also be considered when Voice Connector traffic is heavy. Note the following recommendations:

- Allow 10 GB of additional disk space for every 15,000 messages processed by the Voice Connector.
- Transaction logs are deleted each time an Exchange backup is run on the server. Schedule daily Exchange backups on the server that hosts the Voice Connector to prevent excessive disk space consumption. (For additional information on how Exchange transaction logs work, refer to the Microsoft Support website.)

Voice Connector Log File Storage—Diagnostic Logs

When the Voice Connector diagnostic log level is set to the default (the setting "3 – Error"), the amount of disk space consumed by the logs is negligible (less than 50 MB for the default 14-day retention period).

When the Voice Connector diagnostic log level is set to the most verbose level (the setting "5 – Function"), the amount of disk space consumed by the logs can be significant in heavy traffic conditions. If you set the diagnostic log level to this verbose setting, we recommend that you allow 100 MB of disk space per 10,000 processed messages.

For example, if the Voice Connector processes 5,000 messages (combined in and out) per day, with a diagnostic log level set to "5 – Function," with the default 14-day log retention, you would need to allow 700 MB of disk space.

Voice Connector Log File Storage—Performance Logs

We recommend that you allow 1 MB disk space per 10,000 messages processed for Voice Connector performance logs.

For example, if the Voice Connector processes 5,000 messages (combined in and out) per day, with the default 14-day log retention, you would need to allow 7 MB of disk space.

Understanding Voice Connector Processing Considerations

When the Voice Connector is installed on a dedicated Exchange server, the impact on memory and CPU resource consumption on the server is relatively minor, even when processing in excess of 10,000 voice messages per 24 hours between the Bridge and Cisco Unity subscribers. However, when a Voice Connector processing an identical amount of traffic is installed on a server that homes thousands of subscriber mailboxes, the impact sometimes appears to be more than cumulative. It appears that more resources are necessary to process the combined activity than the cumulative resource consumption of the same Voice Connector and mailbox processing on independent servers.

Adherence to the guidelines and consideration of storage limitations described in this document will ensure that Voice Connector resource consumption does not become an issue.

Installing Multiple Voice Connectors, and Understanding Associated Routing Considerations

Advantages of Installing Multiple Voice Connectors

- Allows distribution of Voice Connector message processing among multiple Exchange servers. This is sometimes necessary to avoid excessive database storage.
- Allows more strategic placement of Voice Connectors within the network, leading to the streamlining of message routing.

Disadvantages of Installing Multiple Voice Connectors

- Message tracking and troubleshooting become more complex, because you need to know through which Voice Connector a particular message should have been routed.
- The installation of multiple Voice Connectors requires a better understanding of Exchange message routing.

Limitations for Installing Multiple Voice Connectors

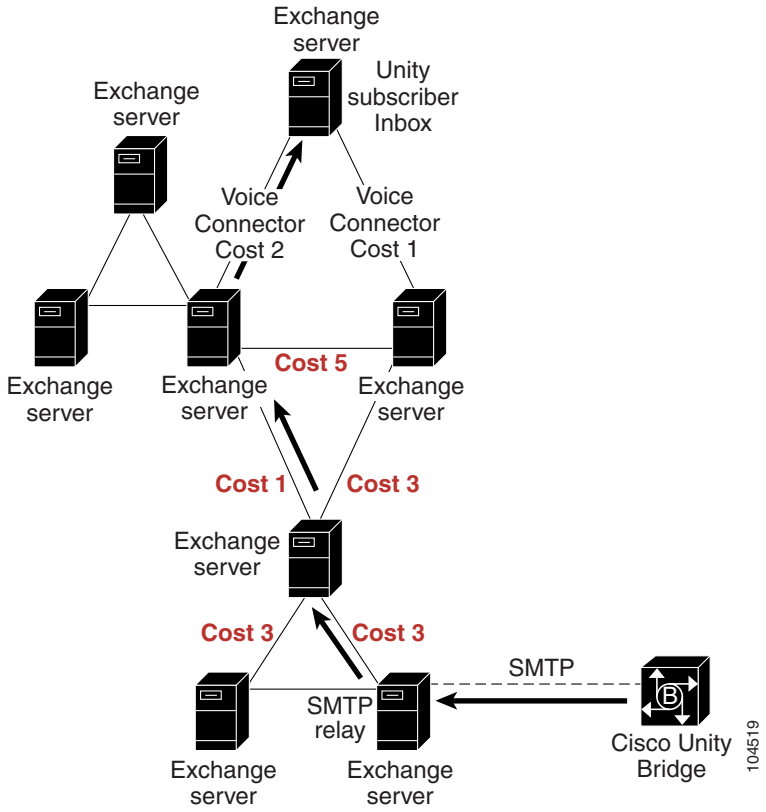
- Multiple Voice Connectors cannot be installed on the same Exchange server.
- Multiple Voice Connectors with the same cost can be installed in the same Exchange routing group. Note, however, that even though the Voice Connectors can be configured to have the same routing costs, the Voice Connector that is used for each message is determined by Exchange, and cannot be manually configured.
- If multiple Voice Connectors in the same routing group are configured with different routing costs, the Voice Connector with the higher cost will never be used, unless the server hosting the lower-cost Voice Connector is down.
- Installing multiple Voice Connectors does not provide full redundancy. Exchange queues messages for a Voice Connector as usual, regardless of whether the Voice Connector is running normally. Exchange will route messages to a secondary Voice Connector only if the server hosting the preferred Voice Connector is completely down. Any messages that have already been queued for a Voice Connector that is on a server that goes down will remain in the queue for that Voice Connector; they are not re-queued to another Voice Connector.

Voice Connector Cost Routing Considerations

When multiple Voice Connectors are installed in different Exchange routing groups, the Voice Connector to which a particular message is routed is determined by Exchange, based on the cumulative cost of routing to the connector, including the cost set on the connector itself. Note that the calculated cost considers only the

cost required to reach the destination of the Voice Connector, not the final destination of the message. Consider the example shown in Figure 19.

Figure 19: Voice Connector Cost Routing



In Figure 19, a voice message is routed from the Bridge to the Exchange organization via the server configured for SMTP relay. When the message enters the Exchange organization, there are two Voice Connectors to which the message could be routed, one with a cost of 1 and one with a cost of 2. Because Exchange determines the route based on the total cost of the route to the Voice Connector (including the Voice Connector cost), in this example the Voice Connector with the higher cost will be used. The total cost of the route to the Voice Connector with a cost of 2 is 3 + 1 + 2 = 6. The total cost of the route to the Voice Connector with a cost of 1 is 3 + 3 + 1 = 7. Therefore, the Voice Connector with the cost of 2 will be chosen. Also note that the connection with cost 5 was not a factor in how Exchange determined where to route the message to the Voice Connector, because this leg of the route is not determined until the Voice Connector processes the message.

Manual Distribution of Traffic to Multiple Voice Connectors

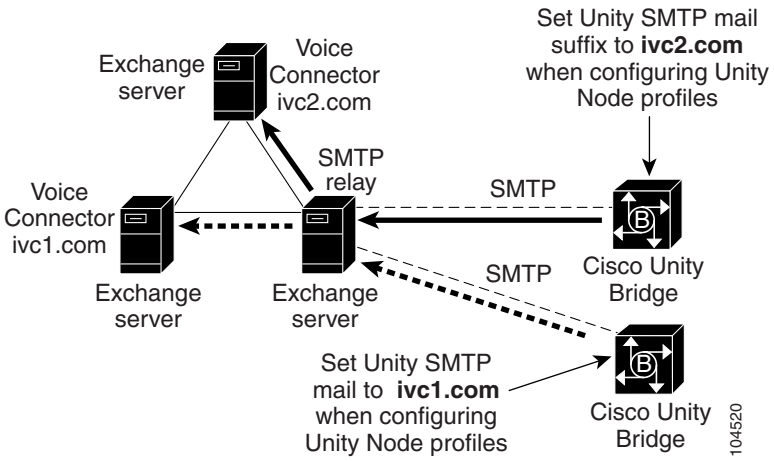
When you have determined that more than one Voice Connector will be needed, due to heavy traffic, there are a number of ways to manually distribute the traffic to best use the Voice Connectors.

One approach is to route message traffic from each Bridge server to a specific Voice Connector. This can be done by using special recipient policies and SMTP connectors (see Figure 20). For detailed information on using special recipient policies, refer to the following procedures in the "Troubleshooting Bridge Networking" chapter of the *Cisco Unity Bridge Networking Guide*:

- "To Create a Special Recipient Policy for the Voice Connector"
- "To Apply the Special Recipient Policy to the Voice Connector"
- "To Configure the Bridge to Use the Special Recipient Policy"
- "To Configure an Exchange SMTP Connector to Route Messages from the Bridge Server Directory to the Voice Connector"

The *Cisco Unity Bridge Networking Guide* is available at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/products_installation_and_configuration_guides_list.html.

Figure 20: Routing Message Traffic to a Specific Voice Connector



Cisco Unity Bridgehead Server Considerations

Configuring More Than One Cisco Unity Bridgehead Server

In most cases, we recommend that you configure only one server in the Cisco Unity network as the bridgehead for networking with the Bridge. Using a single bridgehead server:

- Reduces the complexity of administration
- Eliminates excess directory processing
- Simplifies redistribution of traffic among multiple Bridge servers

However, you may consider configuring an additional bridgehead server when the number of Bridge subscribers is expected to exceed practical administration boundaries. The Active Directory contacts associated with the Bridge subscribers created on the bridgehead are created in the same Active Directory container. If more than 50,000 Bridge subscribers are expected for all Bridge delivery locations, this number of contacts in a single Active Directory container may be unwieldy.

When a second bridgehead server is configured, the contacts associated with the Bridge subscribers that are created on the second bridgehead server can be created in a separate Active Directory container.

Dedicating a Cisco Unity Bridgehead Server Solely for Bridge Networking

If more than 5,000 Bridge subscribers will be homed on the bridgehead server—whether the subscribers are imported manually or auto-created—we recommend that the bridgehead be dedicated for this purpose. In this circumstance, the bridgehead server should not be the home server of regular Cisco Unity subscribers or be used for extensive call processing.

There are no configuration or licensing differences between a Cisco Unity server that is used for multiple purposes, including the bridgehead role, and a Cisco Unity server that is dedicated for use as the bridgehead. When we use the term “dedicated,” we mean simply refraining from using the server for purposes other than networking with the Bridge.

When a Cisco Unity server is dedicated as the bridgehead for the Bridge, its primary purpose is directory synchronization with the Bridge servers and administration of Bridge delivery locations and Bridge subscribers. Actual calls placed or received by this Cisco Unity server will be minimal. Though the server used for this purpose should have substantial processing and storage capabilities, the need for licensed voice ports on this server will be minimal.

Cisco Unity Bridgehead Processing Considerations

The CsBridgeConnector service on the bridgehead is responsible for monitoring changes to Cisco Unity subscriber data in the network, and sending the information to the Bridge. CsBridgeConnector is also the service that processes directory information about Octel subscribers received from the Bridge, including automatic modification of Bridge subscriber objects, when applicable. Directory information is exchanged between the bridgehead and the Bridge server via SMTP messages. These messages are specially formatted e-mails (called vCards) that contain adds, changes, and deletes of record(s). Each record contains the name of the subscriber, the mailbox number, and the voice name, which has been encoded by using the MIME protocol.

CsBridgeConnector Outbound FDD Processing to the Cisco Unity Bridge

Time Needed to Process Cisco Unity Subscriber Records, Outbound to the Cisco Unity Bridge (Full Directory Data)

Full directory data information (vCards) for Cisco Unity subscribers in the network is primarily processed and sent to the Bridge under two conditions:

- The administrator initiates a full directory synchronization of Cisco Unity subscriber data to the Bridge via the Bridge Options > Synchronization page of the Cisco Unity Administrator.
- The administrator configures a new Unity Node profile on the Bridge server, and the Bridge sends a full directory data request to the bridgehead for all Cisco Unity subscribers that are configured with the serial number that matches the newly added Unity Node.

The maximum rate for processing these records and sending them to the Bridge is approximately 3,600 records per hour. This approximation is based on a bridgehead platform with a single 1 GHz CPU, and Cisco Unity subscribers who have 5-second recorded voice names.

Maximum Records Per Outbound Directory Message

To ensure dependable processing and delivery of outbound directory messages, the maximum size of each message is regulated by the CsBridgeConnector service. By default, the maximum file size of directory messages sent from the bridgehead to the Bridge server(s) is approximately 500 KB.

Assuming a 5-second recorded voice name for each Cisco Unity subscriber:

- When the voice names are recorded with the G.711 codec, a maximum of approximately 10 records are included per outbound SMTP directory message from the bridgehead to the Bridge server.
- When the voice names are recorded with the G.729a codec, a maximum of approximately 70 records are included per outbound SMTP directory message from the bridgehead to the Bridge server.

Directory Synchronization Performance on the Cisco Unity Bridgehead

Table 4. Directory Sync Performance Issues

Records Processed	Approximate Increase in CsBridge-Connector Service Physical Memory Processing	Approximate Increase in CsBridge-Connector Service Virtual Memory Processing	CsBridge-Connector CPU Percentage Increase	Total Percentage Increase in Bridgehead Processing
3,000 vCards per hour, from the Bridge	1 MB	2 MB	2 percent	25 percent The significant increase in total processing of the bridgehead server in this condition is due the database processing performed by other Cisco Unity services when modifying or creating subscriber objects.
3,000 vCards per hour, to the Bridge	1 MB	2 MB	2 percent	2 percent

Subscriber Object Presence on Various Servers During the Migration

To calculate how many subscriber or directory objects of any type will be present on a server at any point during the course of the migration, use the guidelines shown in Table 5. These guidelines will provide you with conservative estimates.

Note: When planning Cisco Unity server resources for any server in the network, keep in mind the importance of basing your figures on the total number of Octel and Cisco Unity subscribers, even early in the migration when most subscriber mailboxes are still homed on the Octel servers.

Table 5. Guidelines for Calculating Server Resources Needed per Subscriber and Directory Object

Object	Numbers to Calculate
Unity Bridgehead Server	
Subscriber objects in the local subscriber table of the UnityDb SQL database	All Octel subscribers in the voice network plus regular Cisco Unity subscribers that are homed locally
Subscriber objects in the global subscriber table of the UnityDb SQL database	All Octel and Cisco Unity subscribers in the voice network
Recorded voice name WAV files stored in \CommServer\Streamfiles (storage size based on codec used for recording)	All Octel and Cisco Unity subscribers in the voice network
Any Other Cisco Unity Server in the Network	
Subscriber objects in the local subscriber table of the UnityDb SQL database	Regular Cisco Unity subscribers that are homed locally
Subscriber objects in the global subscriber table of the UnityDb SQL database	All Octel and Cisco Unity subscribers in the voice network
Recorded voice name WAV files stored in \CommServer\Streamfiles (storage size based on codec used for recording)	All Octel and Cisco Unity subscribers in the voice network
Active Directory	
User objects	All Cisco Unity subscribers in the voice network
Contact objects	All Octel subscribers in the voice network

Object	Numbers to Calculate
Recorded voice name storage on User or Contact objects (storage size based on codec used for recording)	All Octel and Cisco Unity subscribers in the voice network
Bridge server	
Octel Node directory entries	All Octel subscribers homed on Octel servers with which this Bridge communicates
Unity Node directory entries	All Cisco Unity subscribers in the voice network
Recorded voice name file (storage size for all names based on G.711 or equivalent)	All Octel subscribers homed on Octel servers with which this Bridge communicates, multiplied times 2, plus all Cisco Unity subscribers in the voice network

For additional information on Cisco Unity server and Active Directory data storage considerations, refer to the *White Paper: Active Directory Capacity Planning, Cisco Unity Version 3.0(3) and Later (With Microsoft Exchange)* and the *White Paper: Cisco Unity Data and the Directory (With Microsoft Exchange)*. Both white papers are available at http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_white_papers_list.html.

The sequence of illustrations below (see Figures 21 through 27) shows how subscriber object distribution will change during an Octel to Cisco Unity migration. Observe how and where the object totals change at each phase. The illustrations assume the maximum possible number of Bridge subscribers on the bridgehead server and Octel Node directory entries on the Bridge server(s) that will exist at any point. For example, if all Octel subscribers are imported as Bridge subscribers and/or Octel Node directory entries at the onset of the migration, the maximum totals are likely to be reached. If Bridge subscriber and Octel Node directory entries will only be created due to name propagation, based on voice messages sent from Cisco Unity to Octel, the number of Bridge subscribers and Octel Node directory entries at any point may be less.

Figure 21: Initial Cisco Unity Deployment with 1,000 Cisco Unity Subscribers

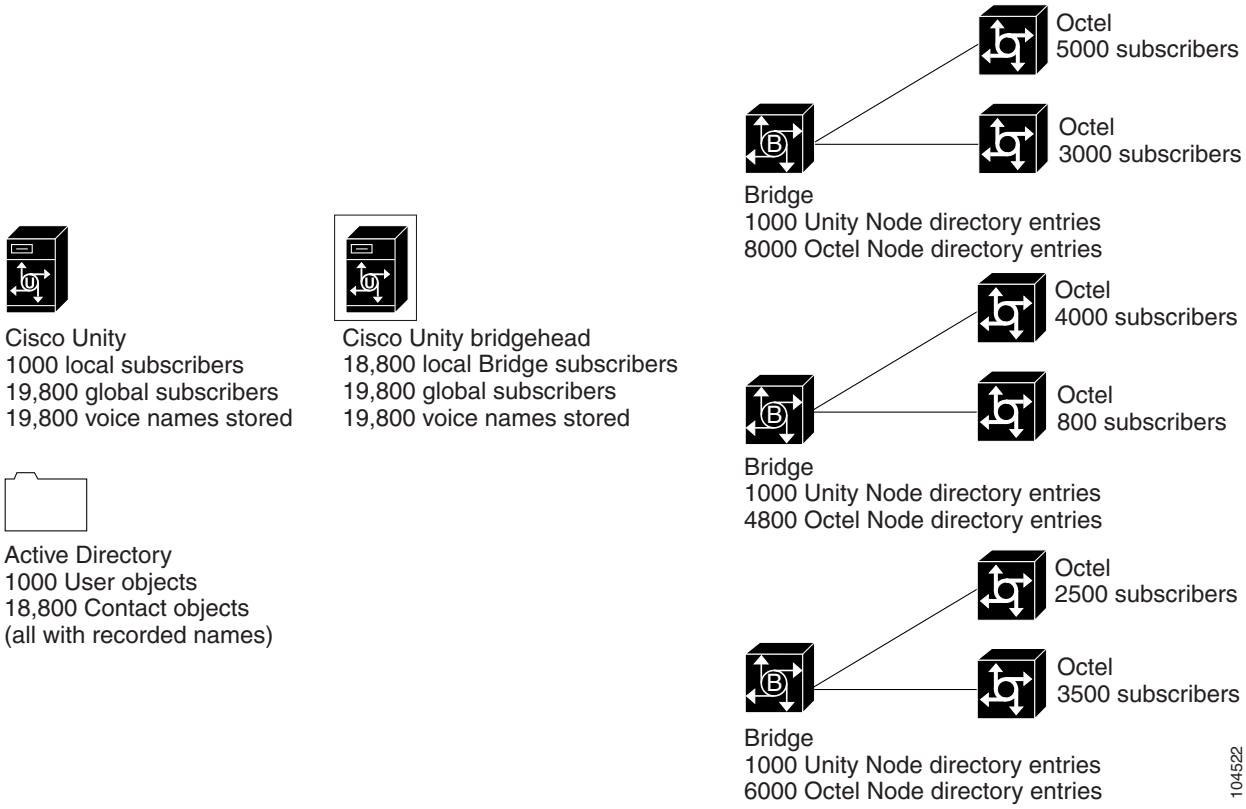


Figure 22: Migration of an Octel Node of 800 Subscribers to an Existing Cisco Unity Server

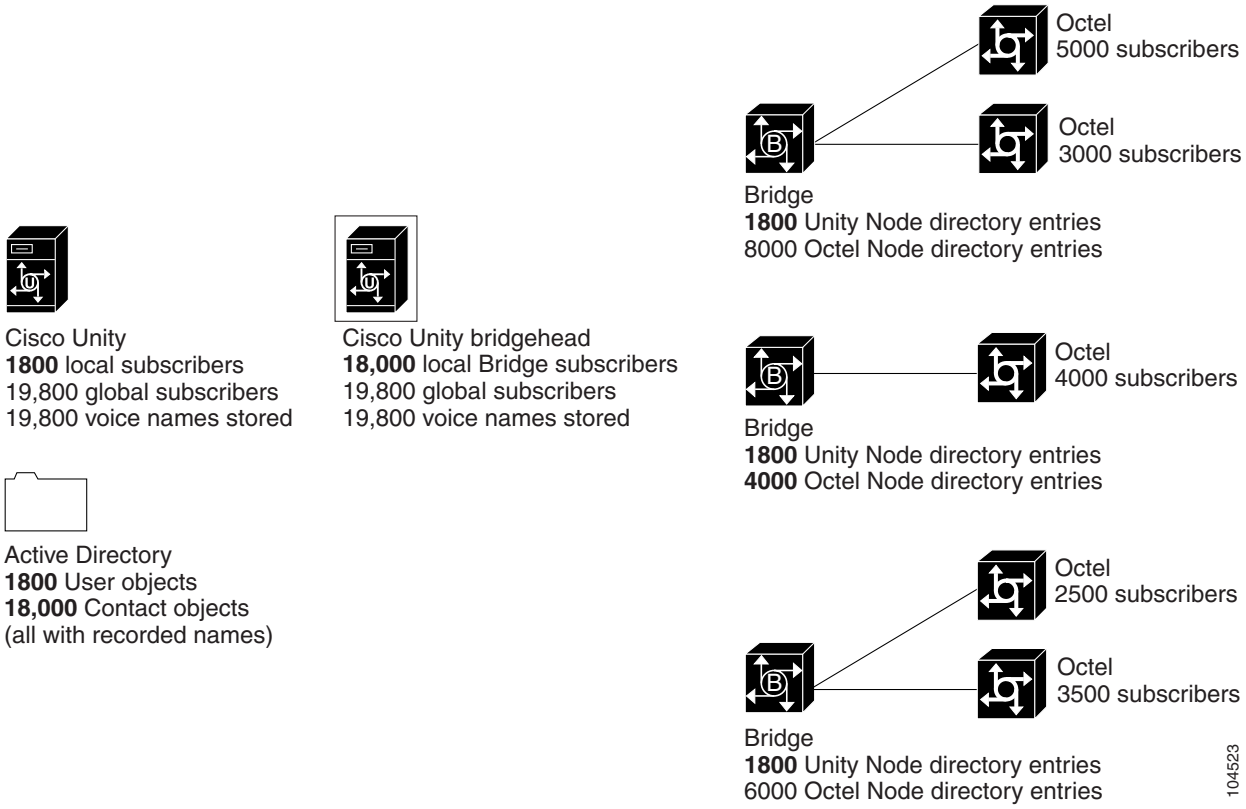


Figure 23: Migration of an Octel Node of 5,000 Subscribers to Two New Cisco Unity Servers

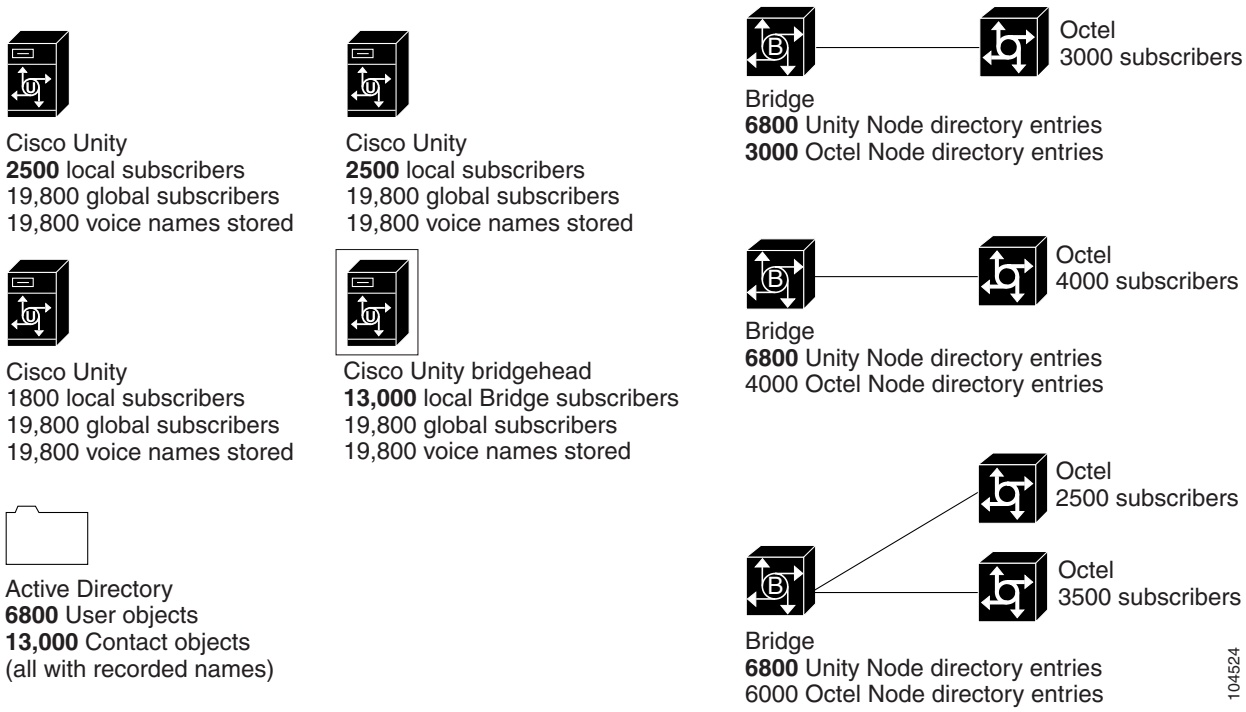


Figure 24: Migration of an Octel Node of 3,000 Subscribers to a New Cisco Unity Server

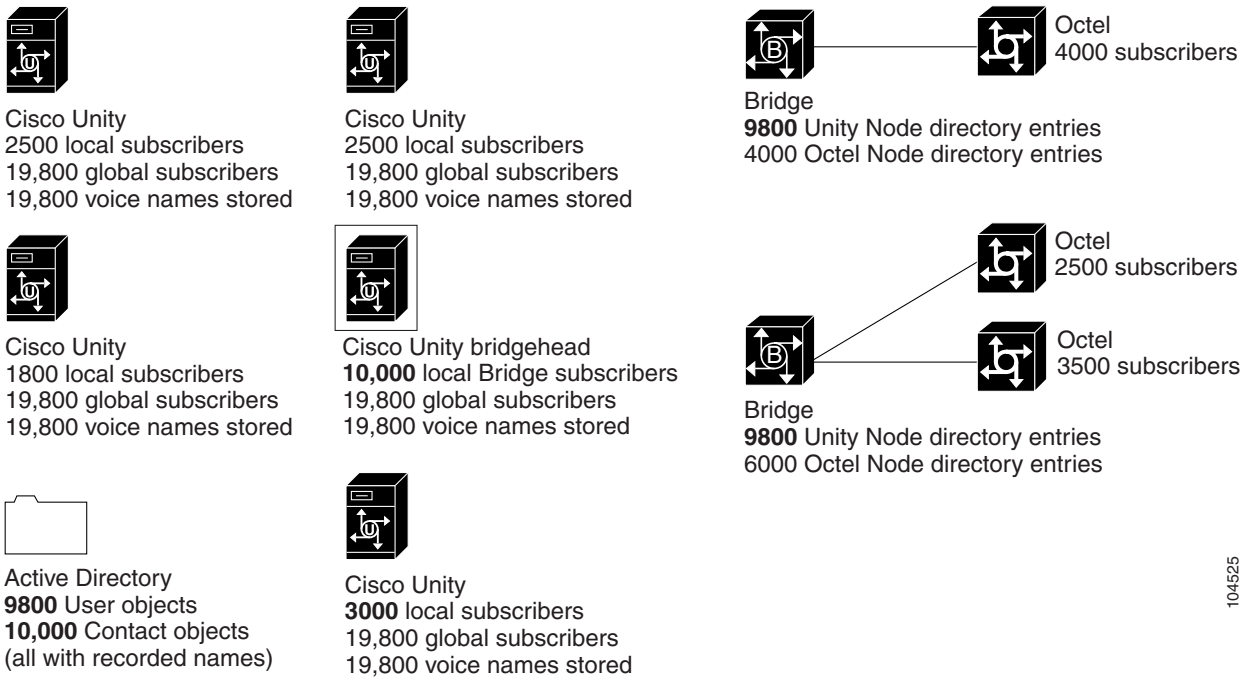


Figure 25: Migration of an Octel Node of 4,000 Subscribers to Two New Cisco Unity Servers

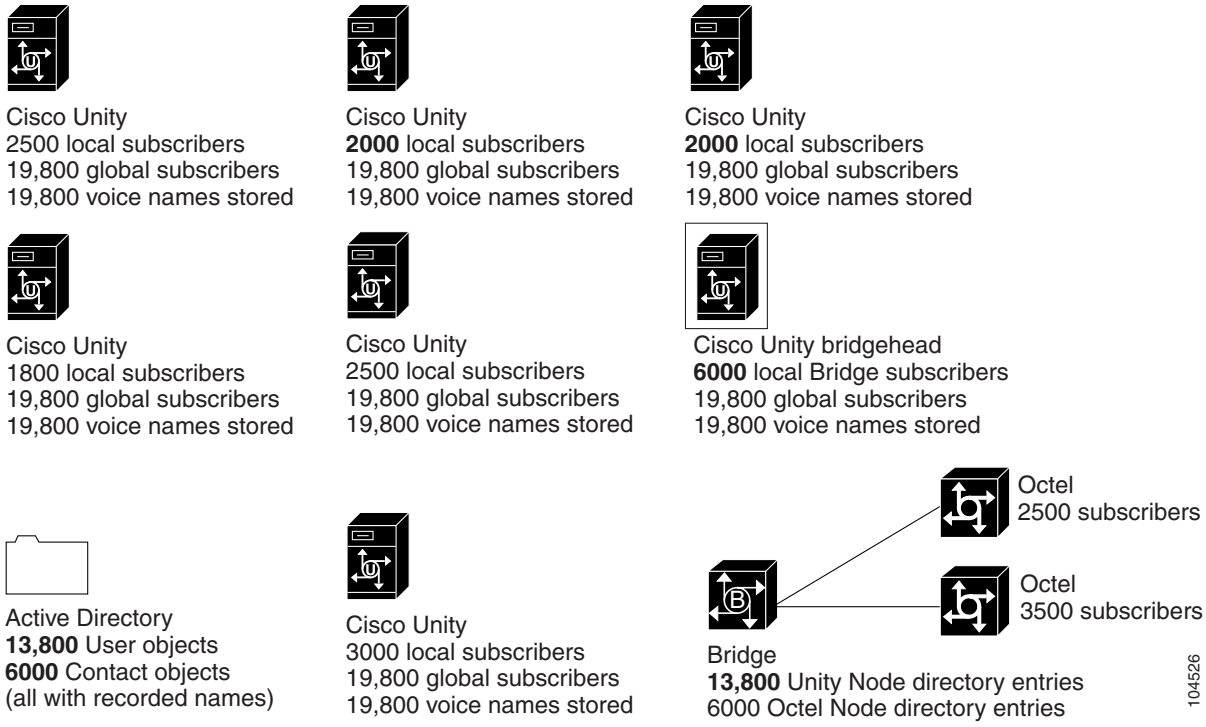


Figure 26: Migration of an Octel Node of 2,500 Subscribers to a New Cisco Unity Server

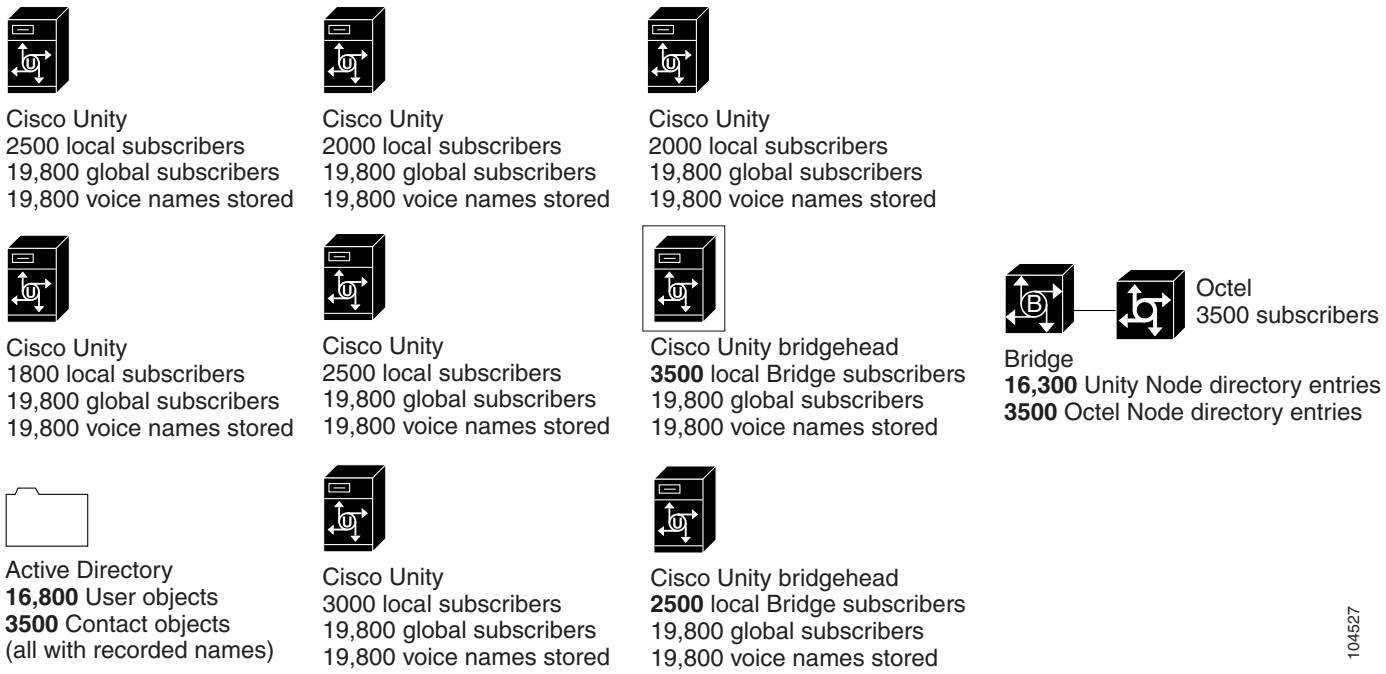


Figure 27: Migration of the Final Octel Node of 3,500 Subscribers to a New Cisco Unity Server