

Interoperability Guide

GroupWise 8

June 26, 2012

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About This Guide

This Novell *GroupWise 8 Interoperability Guide* helps you use GroupWise in the context of other software products. The guide provides assistance with Novell products and third-party products:

Novell Products	<ul style="list-style-type: none">◆ Part I, "Novell Cluster Services on NetWare," on page 15◆ Part II, "Novell Cluster Services on Linux," on page 117◆ Part III, "Novell Vibe," on page 231◆ Part IV, "Novell Conferencing," on page 243◆ Part V, "Novell ZENworks," on page 249◆ Part VI, "Other Novell Products," on page 269
Third-Party Products	<ul style="list-style-type: none">◆ Part VII, "Microsoft Clustering Services on Windows," on page 279◆ Part VIII, "Non-GroupWise E-Mail Clients," on page 345◆ Part IX, "Mobile Devices," on page 355

For information about additional GroupWise-related software from GroupWise partners, see the [Novell Partner Product Guide \(http://www.novell.com/partnerguid\)](http://www.novell.com/partnerguid).

For troubleshooting assistance, see:

- ◆ [GroupWise 8 Troubleshooting 1: Error Messages](#)
- ◆ [GroupWise 8 Troubleshooting 2: Solutions to Common Problems](#)
- ◆ [GroupWise 8 Troubleshooting 3: Message Flow and Directory Structure](#)
- ◆ [Novell Support and Knowledgebase \(http://www.novell.com/support\)](http://www.novell.com/support)

To search the GroupWise documentation from the Novell Support Web site, click *Advanced Search*, select *Documentation* in the *Search In* drop-down list, select *GroupWise* in the *Products* drop-down list, type the search string, then click *Search*.
- ◆ [GroupWise Support Forums \(http://forums.novell.com/forumdisplay.php?&f=356\)](http://forums.novell.com/forumdisplay.php?&f=356)
- ◆ [GroupWise Support Community \(http://www.novell.com/support/products/groupwise\)](http://www.novell.com/support/products/groupwise)
- ◆ [GroupWise Cool Solutions \(http://www.novell.com/coolsolutions/gwmag/index.html\)](http://www.novell.com/coolsolutions/gwmag/index.html)

Audience

This guide is intended for network administrators who install and administer GroupWise.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the User Comment feature at the bottom of each page of the online documentation, or go to [Novell Documentation Feedback \(http://www.novell.com/documentation/feedback.html\)](http://www.novell.com/documentation/feedback.html) and enter your comments there.

Additional Documentation

For additional GroupWise documentation, see the following guides at the [Novell GroupWise 8 documentation Web site \(http://www.novell.com/documentation/gw8\)](http://www.novell.com/documentation/gw8):

- ◆ *Installation Guide*
- ◆ *Administration Guide*
- ◆ *Multi-System Administration Guide*
- ◆ *Troubleshooting Guides*
- ◆ *GroupWise Client User Guides*
- ◆ *GroupWise Client Frequently Asked Questions (FAQ)*

Novell Cluster Services on NetWare

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- ♦ Chapter 7, "Monitoring a GroupWise System in a NetWare Cluster," on page 99
- ♦ Chapter 8, "Backing Up a GroupWise System in a NetWare Cluster," on page 101
- ♦ Chapter 9, "Updating a GroupWise System in a NetWare Cluster," on page 103
- ♦ Chapter 10, "Moving an Existing GroupWise 8 System into a NetWare Cluster," on page 105
- ♦ Chapter 11, "Implementing Messenger in a NetWare Cluster," on page 107

1 Introduction to GroupWise 8 and Novell Cluster Services on NetWare

Before implementing GroupWise 8 with Novell Cluster Services, make sure you have a solid understanding of Novell Cluster Services by reviewing the following information resources:

- ♦ **AppNote:** *An Introduction to Novell Cluster Services* (http://developer.novell.com/research/appnotes/1999/may/01/a990501_.pdf)
- ♦ **Novell Open Enterprise Server (OES) Product Documentation:** *OES Novell Cluster Services 1.8 Administration Guide for NetWare* (http://www.novell.com/documentation/oes/cluster_admin/data/h4hgu4hs.html#bktitle)
- ♦ **NetWare 6.5 Product Documentation:** *Novell Cluster Services* (<http://www.novell.com/documentation/ncs65>)

When you review the information resources recommended above, you discover that clustering employs very specialized terminology. The following brief glossary provides basic definitions of clustering terms and relates them to your GroupWise system:

cluster: A grouping of from 2 to 32 NetWare servers configured using Novell Cluster Services so that data storage locations and applications can transfer from one server to another without interrupting their availability to users.

node: A clustered server; in other words, a single NetWare server that is part of a cluster.

resource: An IP address, volume, application, service, and so on, that can function successfully anywhere in the cluster. The volumes where domains and post offices reside are a specific type of cluster resources termed “volume resources.” In this section, the terms “cluster resource” and “volume resource” are used instead of “resource” to avoid confusion with GroupWise resources (such as conference rooms and projectors).

failover: The process of moving cluster resources from a failed node to a functional node so that availability to users is uninterrupted. For example, if the node where the POA is running goes down, the POA and its post office fail over to a secondary node so that users can continue to use GroupWise. When setting up cluster resources, you need to consider what components need to fail over together in order to continue functioning.

fan-out-failover: The configuration where cluster resources from a failed node fail over to different nodes in order to distribute the load from the failed node across multiple nodes. For example, if a node runs a cluster resource consisting of a domain and its MTA, another cluster resource consisting of a post office and its POA, and a third cluster resource for WebAccess, each cluster resource can be configured to fail over separately to different secondary nodes.

failback: The process of returning cluster resources to their preferred node after the situation causing the failover has been resolved. For example, if a POA and its post office fail over to a secondary node, that cluster resource can be configured to fail back to its preferred node when the problem is resolved.

migration: The process of manually moving a cluster resource from its preferred node to a secondary node for the purpose of performing maintenance on the preferred node, temporarily lightening the load on the preferred node, and so on.

shared disk system: The hardware housing the physical disk volumes that are shared among the cluster nodes.

shared volume: A volume in a shared disk system that can be accessed from any cluster node that needs the data stored on it.

cluster-enabled shared volume: A shared volume for which a Volume Resource object has been created in Novell eDirectory. The properties of the Volume Resource object provide load and unload scripts for programs installed on the volume, failover/failback/migration policies for the volume, and the failover path for the volume. Cluster-enabling is highly recommended for GroupWise.

GroupWise volume: As used in this section, a cluster-enabled shared volume that is used for GroupWise, such as for storing a domain, post office, software distribution directory, and so on. This section also uses the terms Internet Agent volume, WebAccess Agent volume, Messenger volume, and gateway volume in a similar manner.

storage area network (SAN): The cluster nodes together with their shared disk system and shared volumes.

virtual server: A logical server, rather than a physical server, to which cluster-enabled shared volumes are tied.

active/active mode: The configuration of a clustered application where the application runs simultaneously on multiple nodes in the cluster. Active/active mode is recommended when the GroupWise MTA, POA, Internet Agent, and WebAccess Agent run in protected memory because protected memory isolates them from each other, even if they are running on the same node.

active/passive mode: The configuration of a clustered application where the application runs on only one node at a time in the cluster. The GroupWise MTA, POA, Internet Agent, and WebAccess Agent must run in active/passive mode if they are not running in protected memory because only one instance of each agent/database combination can be running at the same time in the cluster.

2 Planning GroupWise in a NetWare Cluster

The majority of this part of the *GroupWise 8 Interoperability Guide* (Chapter 2, “Planning GroupWise in a NetWare Cluster,” on page 19 through Chapter 8, “Backing Up a GroupWise System in a NetWare Cluster,” on page 101) is designed for those who are creating a new GroupWise system, or at least new domains and post offices, in the context of Novell Cluster Services. If you already have an existing GroupWise 8 system and need to configure it to work in a newly installed cluster, see Chapter 10, “Moving an Existing GroupWise 8 System into a NetWare Cluster,” on page 105.

When you implement a new GroupWise system or a new domain or post office in a clustering environment, overall GroupWise system design does not need to change substantially. For a review, see “Installing a Basic GroupWise System” in the *GroupWise 8 Installation Guide*. However, the configuration of individual components of your GroupWise system will be significantly different. This section helps you plan the following GroupWise components in a cluster:

- ◆ A new GroupWise system consisting of the primary domain and the initial post office
- ◆ A new secondary domain
- ◆ A new post office
- ◆ The GroupWise agents (MTA and POA)

During the planning process, component configuration alternatives are explained. For example, you might want the domain and post office together on the same shared volume or on different shared volumes. You might want to install the agents to standard `sys:\system` directories or to manually created `vol:\system` directories on shared volumes where domains and post offices reside. You might or might not need to run the agents in protected memory.

The “System Clustering Worksheet” on page 33 lists all the information you need as you set up GroupWise in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ◆ Section 2.1, “Meeting Software Version Requirements,” on page 20
- ◆ Section 2.2, “Installing Novell Cluster Services,” on page 20
- ◆ Section 2.3, “Planning a New Clustered Domain,” on page 21
- ◆ Section 2.4, “Planning a New Clustered Post Office,” on page 22
- ◆ Section 2.5, “Planning a New Library for a Clustered Post Office,” on page 23
- ◆ Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,” on page 23
- ◆ Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,” on page 25
- ◆ Section 2.8, “Deciding How to Install and Configure the Agents in a Cluster,” on page 26
- ◆ Section 2.9, “GroupWise Clustering Worksheets,” on page 32

After you have completed the tasks and filled out “[System Clustering Worksheet](#)” on page 33, you are ready to continue with [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39.

2.1 Meeting Software Version Requirements

GroupWise 8 can be clustered on a system that meets the following requirements:

- GroupWise 8
- A supported version of NetWare with the latest Support Pack
 - ◆ OES NetWare
 - ◆ NetWare 6.5

IMPORTANT: Novell Cluster Services does not support mixed NetWare versions within a cluster.

SYSTEM CLUSTERING WORKSHEET

Under [Item 1: Software Version Updates for Cluster](#), mark any updates required for nodes in the cluster to ensure that all nodes in the cluster are running the same version of NetWare.

2.2 Installing Novell Cluster Services

Install Novell Cluster Services by following the instructions provided in the documentation for your version of NetWare, as listed in [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,”](#) on page 17.

The installation process includes:

- ◆ Meeting hardware and software requirements
- ◆ Setting up a shared disk system
- ◆ Creating a new NetWare Cluster object to represent the cluster in Novell eDirectory
- ◆ Adding nodes to the cluster
- ◆ Installing the Novell Cluster Services software on all nodes in the cluster
- ◆ Mounting the shared volumes where you will set up GroupWise domains and post offices and install the GroupWise agents

As you install Novell Cluster Services, record key information about the cluster on the System Clustering Worksheet:

SYSTEM CLUSTERING WORKSHEET

Under [Item 2: eDirectory Tree for Cluster](#), record the name of the eDirectory tree where the new NetWare Cluster object has been created.

Under [Item 3: Cluster Name](#), record the name of the NetWare Cluster object that you created for your GroupWise system.

Under [Item 4: Cluster Context](#), record the full context of the NetWare Cluster object.

Under [Item 5: Nodes in Cluster](#), list the nodes that you have added to the cluster.

The number of nodes and shared volumes that are available in the cluster strongly influences where you place GroupWise domains and post offices. You have several alternatives:

- ◆ Your whole GroupWise system can run in a single cluster.
- ◆ Parts of your GroupWise system can run in one cluster while other parts of it run in one or more other clusters.
- ◆ Parts of your GroupWise system can run in a cluster while other parts run outside of the cluster, on non-clustered servers.

If you do not have the system resources to run all of your GroupWise system in a clustering environment, you must decide which parts have the most urgent need for the high availability provided by clustering. Here are some suggestions:

- ◆ Post offices and their POAs must be available in order for users to access their GroupWise mailboxes. Therefore, post offices and their POAs are excellent candidates for the high availability provided by clustering.
- ◆ In a like manner, WebAccess provides user access to GroupWise mailboxes across the Internet through users' Web browsers. It is another good candidate for clustering.
- ◆ Domains and their MTAs are less noticeable to users when they are unavailable (unless users in different post offices happen to be actively engaged in an e-mail discussion when the MTA goes down). On the other hand, domains and their MTAs are critical to GroupWise administrators, although administrators might be more tolerant of a down server than end users are. Critical domains in your system would be the primary domain and, if you have one, a hub or routing domain. These domains should be in the cluster, even if other domains are not.
- ◆ The Internet Agent might or might not require high availability in your GroupWise system, depending on the importance of immediate messaging across the Internet and the use of POP3 or IMAP4 clients by GroupWise users.

There is no right or wrong way to implement GroupWise in a clustering environment. It all depends on the specific needs of your particular GroupWise system and its users.

2.3 Planning a New Clustered Domain

The considerations involved in planning a new domain in a clustering environment are essentially the same as for any other environment.

- ◆ **Primary Domain:** If you are setting up a new GroupWise system in a clustering environment, you will be creating the primary domain as you complete the tasks in this section. In preparation, review [“Planning a Basic GroupWise System”](#), then print and fill out the [“Basic GroupWise System Summary Sheet”](#) in [“Installing a Basic GroupWise System”](#) in the *GroupWise 8 Installation Guide*. This covers planning the primary domain and an initial post office in the primary domain.
- ◆ **Secondary Domain:** If your GroupWise system already exists, you will be creating a new secondary domain. In preparation, review [“Planning a New Domain”](#), then print and fill out the [“Domain Worksheet”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.

Regardless of the type of domain you are creating, keep in mind the following cluster-specific details as you fill out the worksheet you need:

- ◆ When you specify the location for the domain directory (and for a new GroupWise system, the post office directory) on the worksheet, include the shared volume where you want the directory to reside.
- ◆ Do not concern yourself with the GroupWise agent information on the worksheet. You will plan the agent installation later. If you are filling out the Basic GroupWise System Worksheet, stop with [Post Office Settings](#). If you are filling out the Domain Worksheet, stop with [Domain Administrator](#).

When you have completed the worksheet, transfer the key information from the Basic GroupWise System Worksheet or the Domain Worksheet to the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 10: Domain Name](#), transfer the domain name and database directory to the System Clustering Worksheet.

Under [Item 7: Shared Volume for Domain](#), transfer the domain location to the System Clustering Worksheet. You will fill out the rest of the information under item 7 later.

IMPORTANT: Do not create the new domain until you are instructed to do so in [Chapter 3, "Setting Up a Domain and Post Office in a NetWare Cluster,"](#) on page 39.

2.4 Planning a New Clustered Post Office

The considerations involved in planning a new post office in a clustering environment are essentially the same as for any other environment. The initial post office in a new GroupWise system is planned on the Basic GroupWise System Worksheet. To plan additional new post offices, review "[Planning a New Post Office](#)", then print and fill out the "[Post Office Worksheet](#)" in "[Post Offices](#)" in the [GroupWise 8 Administration Guide](#). When you specify the locations for the post office directories, include the shared volumes where you want the post office directories to reside.

When you have completed the worksheet, transfer key information from the Basic GroupWise System Worksheet or the Post Office Worksheet to the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 11: Post Office Name](#), transfer the post office name and database location to the System Clustering Worksheet.

If you will create the post office on a different shared volume from where the domain is located, under [Item 8: Shared Volume for Post Office](#), transfer the post office location to the System Clustering Worksheet. You will fill out the rest of the information under item 8 later.

IMPORTANT: Do not create the new post office until you are instructed to do so in [Chapter 3, "Setting Up a Domain and Post Office in a NetWare Cluster,"](#) on page 39.

2.5 Planning a New Library for a Clustered Post Office

The considerations involved in planning a new library in a clustering environment are essentially the same as for any other environment. You can plan a library for a clustered post office by following the standard instructions provided in “[Creating and Managing Libraries](#)” in the *GroupWise 8 Administration Guide* and filling out the “[Basic Library Worksheet](#)” or the “[Full-Service Library Worksheet](#)”. Then provide the library information on the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 14: Library Location](#), mark where you want to create the library’s document storage area.

If the document storage area will be located outside the post office directory structure, specify a user name and password that the POA can use to access the volume where the document storage area will reside.

IMPORTANT: Do not create the new library until you are instructed to do so in [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39.

2.6 Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise




Cluster-enabling the shared volumes where domains and post offices reside greatly simplifies GroupWise administration. If you are creating a new GroupWise system, you might also want to cluster-enable shared volumes for the GroupWise administration snap-ins to ConsoleOne and for the GroupWise software distribution directory so that these locations are always available within the cluster. To review the concept of cluster-enabled shared volumes, see the applicable section of clustering documentation for your version of NetWare, as listed in [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,”](#) on page 17.

The advantages of cluster-enabling GroupWise volumes include:

- ◆ Drive mappings always occur through the virtual server associated with the cluster-enabled volume, rather than through a physical server. This guarantees that you can always map a drive to the domain or post office database no matter which node it is currently located on.
- ◆ The GroupWise snap-ins to ConsoleOne always work no matter which node is running ConsoleOne.
- ◆ Cluster-enabling the domain volume and installing the GroupWise agents to this volume guarantees that the GroupWise snap-ins to ConsoleOne can always find the configuration files that they need to access.
- ◆ When you rebuild a domain database or a post office database, you do not need to determine which node the database is currently located on.
- ◆ Help desk personnel do not need to be trained to determine where GroupWise is running before they connect to a domain to create a new GroupWise user.

When you cluster-enable a volume, additional eDirectory objects are created:

Table 2-1 eDirectory Objects Used in a Cluster

eDirectory Object	Object Name and Description
	<p>clustername_volumename (default object name) A new Volume object represents the cluster-enabled volume. It is created by renaming the original Volume object that was tied to a physical server and associating it with a virtual server instead.</p> <p>For example, if your cluster name is GWCLUSTER and your original volume name is gwvol1, the new Volume object representing the cluster-enabled volume is named gwcluster_gwvol1.</p>
	<p>clustername_volumename_SERVER (default object name) A new Server object represents the virtual server to which the new cluster-enabled volume is tied.</p> <p>Continuing with the above example, the new Server object representing the virtual server is named GWCLUSTER_GWVOL1_SERVER.</p>
	<p>volumename_SERVER.clustername (default object name) A new Volume Resource object stores property information for the cluster-enabled volume, such as start, failover, and failback mode information and load/unload scripts. These modes and scripts enable the cluster-enabled volume to function much like an independent server; hence, the SERVER portion of its name. The Volume Resource object is created in the Cluster container object.</p> <p>Continuing with the above example, the new Volume Resource object is named GWVOL1_SERVER.GWCLUSTER.</p>

IMPORTANT: Notice that the default object names include the underscore (_) character. Some DNS name servers cannot resolve object names that include underscore characters. If you have met the system requirements described in [Section 2.1, “Meeting Software Version Requirements,” on page 20](#), you can rename these objects as needed when you cluster enable the volume.

Cluster-enabling the shared volumes used by GroupWise is highly recommended. Throughout the rest of this document, the term “GroupWise volume” means “a cluster-enabled shared volume used by GroupWise.”

SYSTEM CLUSTERING WORKSHEET

Under [Item 6: Shared Volumes for GroupWise Administration](#), list any shared volumes you want to use for GroupWise administration purposes. For example, you might have a shared pub: volume with a public directory where you install the GroupWise snap-ins to ConsoleOne instead of installing them on multiple administrator workstations. You might have a shared apps: volume where you create the GroupWise software distribution directory. Mark whether or not you want to cluster-enable the GroupWise administration volumes.

Under [Item 7: Shared Volume for Domain](#), specify the name of the shared volume where you will create the domain. Mark whether or not you want to cluster-enable the domain volume. Also mark whether you will place the post office on the same volume with the domain.

If you want the post office on a different volume from where the domain is located, under [Item 8: Shared Volume for Post Office](#), specify the name of the shared volume where you will create the post office. Mark whether or not you want to cluster-enable the post office volume.

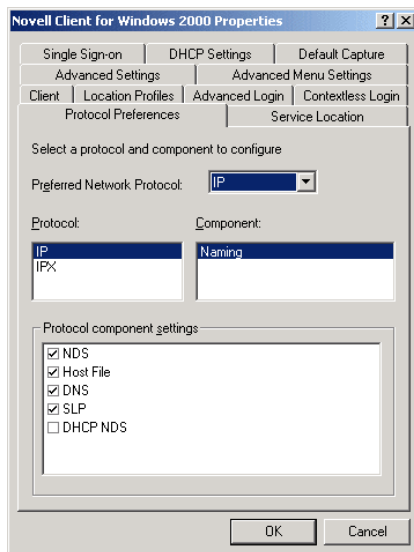
IMPORTANT: Because cluster-enabling the volumes where domains and post offices reside is so strongly recommended, this documentation does not include the steps for setting up domains and post offices on non-cluster-enabled volumes. If you decide not to cluster-enable GroupWise volumes, you should adjust the steps presented in this documentation for your system's specialized needs. Novell Cluster Services does provide a GroupWise Mail Server template for use when creating GroupWise Cluster Resource objects instead of cluster-enabled Volume Resource objects.

2.7 Ensuring Successful Name Resolution for GroupWise Volumes

Because you are using cluster-enabled volumes for GroupWise domains and post offices, you must ensure that short name resolution is always successful. For example, in ConsoleOne, if you right-click a Domain object in the GroupWise View and then click *Connect*, ConsoleOne must be able to resolve the domain database location, as provided in the *UNC Path* field, to the network address of the current, physical location of that domain within your cluster. It is through short name resolution that all GroupWise cluster resources (such as domain and post office volumes) are accessed and managed in ConsoleOne.

A client program (such as ConsoleOne) that runs on a Windows workstation, can be configured to use several different short name resolution methods. To see which methods are in use at a particular workstation, view the protocol preferences for the Novell Client that is installed on the Windows workstation:

Figure 2-1 Novell Client Preferences Property Page



Short name resolution methods that pertain to clustering your GroupWise system are discussed below:

Table 2-2 Short Name Resolution Methods

Short Name Resolution Method	Description
eDirectory	You can use eDirectory to resolve short names into specific network addresses. However, when using eDirectory for short name resolution, you must remember to consider current context in the name resolution process. eDirectory short name resolution works only if your current context is the same as the context of the eDirectory object you need to access.
Hosts File	Windows uses the following files when performing short name resolution at the workstation: <ul style="list-style-type: none">♦ Windows XP/Vista: <code>\winnt\system32\drivers\etc\hosts</code> Using these files at the Windows workstation is not a preferred method for TCP/IP name resolution (except perhaps for the administrator's workstation). However, whenever you cluster-enable a volume, you should add its virtual server to the <code>sys:\etc\hosts</code> file of all nodes in the cluster.
DNS	Perhaps the most common short name resolution option is Domain Name Service (DNS). As with the <code>hosts</code> file, it is good practice to place all of your virtual servers into DNS. For short name resolution to work using DNS, the client workstation must either belong to the same DNS zone (such as <code>provo.novell.com</code>) as the cluster resource, or the cluster resource zone must be configured in the client's DNS suffix search path under TCP/IP settings for the workstation. The underscore (<code>_</code>) character is part of default cluster-related object names. Because it is not supported by the DNS RFC, some DNS name servers cannot resolve default cluster-related object names.
SLP	NetWare 6.5 uses Service Location Protocol (SLP) to advertise service information across TCP/IP-based networks, which provides short name resolution of TCP/IP-based cluster resources within the network. On NetWare 6.5, Novell Cluster Services propagates virtual server information into SLP by default.

Specific setup instructions for each of these short name resolution methods will be provided in [Chapter 3, "Setting Up a Domain and Post Office in a NetWare Cluster,"](#) on page 39.

2.8 Deciding How to Install and Configure the Agents in a Cluster

There are several cluster-specific issues to consider as you plan to install the NetWare MTA and POA in your clustered GroupWise system:

- ♦ [Section 2.8.1, "Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster,"](#) on page 27
- ♦ [Section 2.8.2, "Determining Appropriate Failover Paths for the Agents,"](#) on page 29
- ♦ [Section 2.8.3, "Deciding Where to Install the Agent Software,"](#) on page 29
- ♦ [Section 2.8.4, "Deciding Whether to Run the Agents in Protected Memory,"](#) on page 31
- ♦ [Section 2.8.5, "Planning the NetWare Agent Installation,"](#) on page 32

2.8.1 Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster

The GroupWise agents listen on all IP addresses, both primary and secondary, that are bound to the server on their specified port numbers. This means that any time there is a possibility of two of the same type of agent loading on the same node, it is important that each agent use a cluster-unique port number, even though each agent is using a unique secondary IP address. The best way for you to avoid port conflicts is to plan your cluster so that each agent in the cluster runs on a cluster-unique port. Print out a copy of the [“IP Address Worksheet”](#) on page 35 to help you plan secondary IP addresses and cluster-unique port numbers for all GroupWise agents.

The following filled-out version of the IP Address Worksheet illustrates one way this can be done:

Domain Information

Domain	MTA IP Address	MTA MTP Port	MTA HTTP Port
Provo1	172.16.5.81	7100	7180

Post Office Information

Post Office	POA IP Address	POA C/S Port	POA MTP Port	POA HTTP Port
Development	(same as MTA)	1677	7101	7181
Manufacturing	172.16.5.82	1678	7102	7182

Internet Agent Information

Internet Agent	GWIA IP Address	MTA MTP Port	MTA Live Remote Port	MTA HTTP Port	GWIA HTTP Port
GWIA Domain MTA	172.16.5.83	7110	7677	7183	N/A
Internet Agent (GWIA)	(same as MTA)	N/A	N/A	N/A	9850

WebAccess Information

WebAccess Agent	WebAccess IP Address	MTA MTP Port	MTA HTTP Port	WebAccess Agent Port	WebAccess HTTP Port
WebAccess Domain MTA	172.16.5.84	7120	7184	N/A	N/A
WebAccess Agent (GWINTER)	(same as MTA)	N/A	N/A	7205	7205 (same as agent)

This example places the Development post office on the same node and on the same GroupWise volume with the Provo1 domain; therefore, the Provo1 MTA and the Development POA can use the same secondary IP address. The Manufacturing post office is placed on a different node on a different GroupWise volume, so that the Manufacturing post office has a different secondary IP address.

The example also illustrates that the MTA, the POA, and the Internet Agent use different port numbers for agent ports and HTTP ports. In contrast, the WebAccess Agent uses the same port number for the agent port and the HTTP port.

The example uses default port numbers where possible. For example, the default MTA message transfer port is 7100 and the default POA client/server port is 1677. Incrementing port numbers are used in the example when multiple components have the same type of ports. For example, port numbers 1677 and 1678 are both POA client/server ports and port numbers 7180 through 7184 are all HTTP ports. Incrementing from the default port numbers generates unique, though related, port numbers.

If you are going to set up a GroupWise name server to help GroupWise clients locate their post offices, make sure that the default POA port number of 1677 is used somewhere in the cluster. For more information, see [“Simplifying Client/Server Access with a GroupWise Name Server”](#) in [“Post Office Agent”](#) in the *GroupWise 8 Administration Guide*.

IP ADDRESS WORKSHEET

Fill out the [“IP Address Worksheet”](#) on page 35 to help you plan secondary IP addresses and cluster-unique port numbers for all GroupWise agents in the cluster. (MTA, POA, Internet Agent, WebAccess Agent).

After you have filled out the IP Address Worksheet, transfer the secondary IP addresses and cluster-unique port numbers from the IP Address Worksheet to the System Clustering Worksheet and the Agent Clustering Worksheet so that they are available in the sequence in which you will need them as you set up GroupWise in a cluster.

SYSTEM CLUSTERING WORKSHEET

If you are setting up a new GroupWise system, under [Item 6: Shared Volumes for GroupWise Administration](#), specify secondary IP addresses for your GroupWise administration volumes.

Under [Item 7: Shared Volume for Domain](#), use the domain MTA secondary IP address from the IP Address Worksheet as the domain volume IP address.

If you are planning the post office on a different volume from the domain, under [Item 8: Shared Volume for Post Office](#), use the post office POA secondary IP address from the IP Address Worksheet as the post office volume IP address.

AGENT CLUSTERING WORKSHEET

Under [Item 4: MTA Network Information](#), transfer the secondary IP address and cluster-unique port numbers for the MTA from the IP Address Worksheet to the Agent Clustering Worksheet.

Under [Item 7: POA Network Information](#), transfer the secondary IP address and cluster-unique port numbers for the POA from the IP Address Worksheet to the Agent Clustering Worksheet.

2.8.2 Determining Appropriate Failover Paths for the Agents

By default, a GroupWise volume is configured to have all nodes in the cluster in its failover path, organized in ascending alphanumeric order. Only one node at a time can have a particular GroupWise volume mounted and active. If a GroupWise volume's preferred node fails, the volume fails over to the next node in the failover path. You will want to customize the failover path for each GroupWise volume based on the fan-out-failover principle.

When a node fails, its volumes should not all fail over together to the same secondary node. Instead, the volumes should be distributed across multiple nodes in the cluster. This prevents any one node from shouldering the entire processing load typically carried by another node. In addition, some volumes should never have the potential of being mounted on the same node during a failover situation. For example, a post office and POA that service a large number of very active GroupWise client users should never fail over to a node where another very large post office and heavily loaded POA reside. If they did, users on both post offices would notice a decrease in responsiveness of the GroupWise client.

AGENT CLUSTERING WORKSHEET

Under [Item 3: Domain Failover Path](#), list the nodes that you want to have in the domain volume failover path. The MTA might need to run on any node that the domain volume fails over to.

If you are planning the post office on a different GroupWise volume from where the domain is located, under [Item 6: Post Office Failover Path](#), list the nodes that you want to have in the post office volume failover path. The POA might need to run on any node that the post office volume fails over to.

2.8.3 Deciding Where to Install the Agent Software

When you install the NetWare MTA and POA in a clustering environment, you can choose between two different installation locations:

Table 2-3 Agent Software Installation Locations

Location	Description
sys:\system on each node in the cluster	<p>This is the default location provided by the Agent Installation program. Because the agents must be installed on each node where they might need to run during a failover situation, you need to do one of the following if you select this alternative:</p> <ul style="list-style-type: none">◆ Run the Agent Installation program multiple times in order to install the agent software and to create the agent startup files on each node that is on a GroupWise volume failover path.◆ Run the Agent Installation program, then copy the agent software and startup files to each node that is on a GroupWise volume failover path.

Location	Description
system directory on each GroupWise volume	<p>If you create a <code>vol:\system</code> directory on a GroupWise volume, the agent software and startup files fail over and back with the domains and post offices that the agents service.</p> <p>Unless you have a very small GroupWise system with all domains and post offices on a single GroupWise volume, you still need to install the agent software multiple times, once to each GroupWise volume.</p>

A simple way to look at the agent location alternatives would be that if you have fewer nodes on failover paths than you have GroupWise volumes for domains and post offices, then it would be most efficient to install the agent software to the nodes. Conversely, if you have fewer GroupWise volumes than you have nodes on failover paths, then it would be most efficient to install the agent software to the GroupWise volumes. However, there are issues to consider that extend beyond efficiency during installation.

The following sections can help you choose which installation location would be best for your clustered GroupWise system:

- ◆ [“Advantages of a vol:\system Directory on Each GroupWise Volume” on page 30](#)
- ◆ [“Disadvantages of a vol:\system Directory on Each GroupWise Volume” on page 30](#)
- ◆ [“Recommendation” on page 31](#)

Advantages of a vol:\system Directory on Each GroupWise Volume

Using a `vol:\system` directory on each GroupWise volume has several advantages:

- ◆ If you change information in the agent startup files, you only need to change it in one place, not on every node on any GroupWise volume failover path.
- ◆ Having the agent startup files on the same GroupWise volume as the domain or post office makes them easy to find.
- ◆ When you update the agent software, you only need to update it in one place for a particular domain or post office, not on every node on a GroupWise volume failover path. This prevents the potential problem of having a domain or post office fail over to a location where a different version of the agent software is installed.
- ◆ If you ever need to add or replace a physical server in the cluster, you only need to install NetWare and Novell Cluster Services to the new server, then add that node to the appropriate failover paths. No extra GroupWise configuration is necessary because there are no `sys:\system` dependencies for the GroupWise agents.
- ◆ If you want to back up the GroupWise software, you do not have to include the `sys:\system` directory in the backup.

Disadvantages of a vol:\system Directory on Each GroupWise Volume

Installing the agents on a GroupWise volume does have some disadvantages:

- ◆ GroupWise administrators who are used to the GroupWise agents being installed in `sys:\system` might be confused by not finding them there in the clustered GroupWise system.
- ◆ You must remember where you installed the GroupWise agents when you update the agent software. Accidentally installing a GroupWise Support Pack to the default location of `sys:\system` would not have the desired results if the original agent software was installed to the `vol:\system` directory on a GroupWise volume.

Recommendation

Whichever method you choose, be consistent throughout the entire cluster. Either put all the GroupWise agents on the GroupWise volumes with the domains and post offices they service, or put them all in `sys:\system` directories. If you put them on GroupWise volumes, make sure there are no agent files in `sys:\system` directories to confuse the issue at a later time.

Even if you choose to install the agents to multiple `sys:\system` directories, you can still store the agent startup files on the GroupWise volumes. The significant advantage of this approach is that you only have one startup file to modify per agent.

AGENT CLUSTERING WORKSHEET

Under [Item 1: Agent Installation Location](#), mark whether you will install the agent software to a `vol:\system` directory on a GroupWise volume or to `sys:\system` on each node in the cluster. If necessary, specify where the agent startup files will be stored.

Under [Item 2: Domain Name](#), transfer the domain name and location from the System Clustering Worksheet to the Agent Clustering Worksheet.

Under [Item 5: Post Office Name](#), transfer the post office name and location from the System Clustering Worksheet to the Agent Clustering Worksheet.

2.8.4 Deciding Whether to Run the Agents in Protected Memory

On a NetWare server, using protected memory allows you to create isolated memory spaces where NLM programs can run without affecting other NLM programs running on the same node. This contributes to the high availability of the cluster. Using protected memory has the following advantages:

- ◆ When using protected memory, the node can restart a specific memory space if any NLM program within that memory space abends. This allows for recovery without failing the entire node, which enhances both up time and database integrity.
- ◆ Using protected memory gives you the ability to unload a single instance of an agent, rather than all instances.
- ◆ If you use protected memory, you can run the agents in active/active mode, rather than active/passive mode.

If you have any possibility of the same type of GroupWise agent loading multiple times on any node in the cluster, you must use protected memory so that you can unload agents individually. Check your failover paths ([Agent Clustering Worksheet items 3 and 6](#)) for failover combinations where multiple instances of the same type of agent might need to run on the same node.

Protected memory does result in higher memory utilization (about 5% to 10%) and a slight performance penalty. Make sure your nodes have sufficient memory to handle the number of memory spaces that might reside on them. Keep in mind that if you load the MTA and the POA in different memory spaces, the agent engine (`gwenn5.nlm`) will load twice on the node. Remember to provide memory for any GroupWise volumes that could fail over to a node, in addition to that node's regular processing load.

IMPORTANT: For optimum stability, we strongly recommend that you run the agents in protected memory, with one agent per memory space.

AGENT CLUSTERING WORKSHEET

Under [Item 8: Load Agents in Protected Memory?](#), mark whether or not you need to run the GroupWise agents in protected memory.

If you will use protected memory, provide one or two unique protected memory space names. If you will create the domain and post office on the same GroupWise volume, the MTA and POA can use the same memory space, although this is not recommended. If you will create the domain and post office on different GroupWise volumes, the MTA and POA must use different memory spaces.

2.8.5 Planning the NetWare Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the GroupWise NetWare agents are the same in a clustering environment as for any other environment. Review [“Planning the GroupWise Agents”](#), then print and fill out the [“GroupWise Agent Installation Summary Sheet”](#) in [“Installing GroupWise Agents”](#) in the [GroupWise 8 Installation Guide](#) for each location where you will install the NetWare MTA and/or POA.

Fill out the NetWare Agent Worksheet, taking into account the following cluster-specific issues:

GROUPWISE AGENT INSTALLATION WORKSHEET

Under [Agents and Locations](#), mark POA Local to Post Office and MTA Local to Domain. In a clustering environment, a domain or post office and its agent must reside on the same GroupWise volume in order to fail over together.

Under [Installation Path](#), take into account your decision based on [“Deciding Where to Install the Agent Software”](#) on page 29.

Under [Installation Options](#) for your agent platform, mark Yes for Configure the GroupWise Agents for Clustering. This will cause the Agent Installation program to customize the agent startup files for clustering.

Under [Domain Information](#) and [Post Office Information](#), refer to the Domain and Post Office Worksheets you filled out in [Section 2.3, “Planning a New Clustered Domain,”](#) on page 21 and [Section 2.4, “Planning a New Clustered Post Office,”](#) on page 22, and to the IP Address Worksheet you completed during [“Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster”](#) on page 27.

Under [Launch GroupWise Agents Now](#), mark No.

IMPORTANT: Do not install the NetWare agent software until you are instructed to do so in [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39.

Skip to [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39.

2.9 GroupWise Clustering Worksheets

- ◆ [Section 2.9.1, “System Clustering Worksheet,”](#) on page 33
- ◆ [Section 2.9.2, “IP Address Worksheet,”](#) on page 35
- ◆ [Section 2.9.3, “Agent Clustering Worksheet,”](#) on page 36

2.9.1 System Clustering Worksheet

Item	Explanation
1) Software Version Updates for Cluster:	<p>List any servers that need to be updated so that all nodes in the cluster are running the same version of NetWare.</p> <p>For more information, see Section 2.1, "Meeting Software Version Requirements," on page 20.</p>
2) eDirectory Tree for Cluster:	<p>Record the eDirectory tree where you created the new Novell Cluster object when you installed Novell Cluster Services.</p> <p>For more information, see Section 2.2, "Installing Novell Cluster Services," on page 20</p>
3) Cluster Name: Cluster IP Address:	<p>Record the name of the new NetWare Cluster object that you created for your GroupWise system. Also record the virtual IP address of the cluster that will remain constant regardless of which node is currently active.</p> <p>For more information, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
4) Cluster Context:	<p>Record the full context where you created the new NetWare Cluster object.</p> <p>For more information, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
5) Nodes in Cluster	<p>List the nodes that are part of the cluster that you set up for your GroupWise system.</p> <p>For more information, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
6) Shared Volumes for GroupWise Administration: Cluster Enabled?	<p>Specify the names (<i>cluster_volume</i>) of the shared volumes where the GroupWise administration snap-ins to ConsoleOne and the GroupWise software distribution directory will reside.</p> <p>For cluster-enabling, specify the IP addresses of the virtual servers (<i>volume_SERVER.cluster</i>) to which the cluster-enabled volumes are tied.</p> <p>For more information, see Section 2.6, "Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise," on page 23.</p>
<ul style="list-style-type: none"> ◆ Yes (highly recommended) <ul style="list-style-type: none"> Cluster volume IP addresses ◆ No 	
GroupWise Administration Snap-ins to ConsoleOne	<ul style="list-style-type: none"> ◆ public directory ◆ Other
GroupWise Software Distribution Directory	<ul style="list-style-type: none"> ◆ \grpwise\software directory ◆ Other

Item	Explanation
7) Shared Volume for Domain: Cluster Enabled?	Specify the name (<i>cluster_volume</i>) of the shared volume where the GroupWise domain will reside.
<ul style="list-style-type: none"> ◆ Yes (highly recommended) <p style="margin-left: 20px;">Cluster volume IP address</p>	For cluster-enabling, specify the IP address of the virtual server (<i>volume_SERVER.cluster</i>) to which the cluster-enabled volume is tied.
<ul style="list-style-type: none"> ◆ No 	For more information, see Section 2.4, "Planning a New Clustered Post Office," on page 22 and Section 2.6, "Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise," on page 23.
Post Office on Same Volume as Domain?	
<ul style="list-style-type: none"> ◆ Yes 	
<ul style="list-style-type: none"> ◆ No 	
8) Shared Volume for Post Office: Cluster Enabled?	Specify the name (<i>cluster_volume</i>) of the shared volume where the GroupWise post office will reside.
<ul style="list-style-type: none"> ◆ Yes (highly recommended) <p style="margin-left: 20px;">Cluster volume IP address</p>	For cluster-enabling, specify the IP address of the virtual server (<i>volume_SERVER.cluster</i>) to which the cluster-enabled volume is tied.
<ul style="list-style-type: none"> ◆ No 	For more information, see Section 2.4, "Planning a New Clustered Post Office," on page 22 and Section 2.6, "Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise," on page 23.
9) IP Address Resolution Methods:	Mark the short name address resolution methods you want to implement to ensure that the UNC paths stored in ConsoleOne can be successfully resolved into physical network addresses.
<ul style="list-style-type: none"> ◆ eDirectory ◆ hosts file ◆ DNS ◆ SLP (highly recommended) 	For more information, see Section 2.7, "Ensuring Successful Name Resolution for GroupWise Volumes," on page 25
10) Domain Name: Domain Database Location:	Specify a unique name for the domain. Specify the directory on the GroupWise volume where you want to create the new domain.
	For more information, see Section 2.3, "Planning a New Clustered Domain," on page 21.
11) Post Office Name: Post Office Database Location:	Specify a unique name for the post office. Specify the directory on the GroupWise volume where you want to create the post office.
	For more information, see Section 2.4, "Planning a New Clustered Post Office," on page 22.

Item	Explanation
12) Document Storage Area Location:	If you need a library for a clustered post office, mark where you want to create its document storage area and provide a directory if necessary.
<ul style="list-style-type: none"> ◆ At the post office ◆ Outside the post office ◆ Separate post office 	For more information, see Section 2.5, "Planning a New Library for a Clustered Post Office," on page 23.
Document Storage Area Access	
<ul style="list-style-type: none"> ◆ POA /user startup switch setting ◆ POA /password startup switch setting 	

2.9.2 IP Address Worksheet

- ◆ ["Domain Information" on page 35](#)
- ◆ ["Post Office Information" on page 35](#)
- ◆ ["Internet Agent Information" on page 35](#)
- ◆ ["WebAccess Information" on page 36](#)

Domain Information

Domain	MTA IP Address	MTA MTP Port	MTA HTTP Port

Post Office Information

Post Office	POA IP Address	POA C/S Port	POA MTP Port	POA HTTP Port

Internet Agent Information

Internet Agent	GWIA IP Address	MTA MTP Port	MTA Live Remote Port	MTA HTTP Port	GWIA HTTP Port
GWIA Domain MTA					N/A
Internet Agent (GWIA)	(same)	N/A	N/A	N/A	

WebAccess Information

WebAccess Agent	WebAccess IP Address	MTA MTP Port	MTA HTTP Port	WebAccess Agent Port	WebAccess HTTP Port
WebAccess Domain MTA				N/A	N/A
WebAccess Agent (GWINTER)	(same)	N/A	N/A		

2.9.3 Agent Clustering Worksheet

Item	Explanation
<p>1) agent installation location:</p> <ul style="list-style-type: none"> ◆ <code>vol:\system</code> on the GroupWise volume ◆ <code>sys:\system</code> on each node <p>Consolidate multiple startup files on GroupWise volume?</p>	<p>Mark the location where you will install the agent software.</p> <p>If necessary, specify the location where you will consolidate multiple agent startup files on a GroupWise volume.</p> <p>For more information, see “Deciding Where to Install the Agent Software” on page 29.</p>
<p>2) Domain Name:</p> <p>Domain Location:</p>	<p>Transfer this information from the System Clustering Worksheet (item 10).</p>
<p>3) Domain Failover Path:</p>	<p>List other nodes in the cluster where the GroupWise domain and its MTA could fail over.</p> <p>For more information, see “Determining Appropriate Failover Paths for the Agents” on page 29.</p>
<p>4) MTA Network Information:</p> <ul style="list-style-type: none"> ◆ MTA IP address ◆ MTA message transfer port ◆ MTA HTTP port 	<p>Gather the MTA network address information from the “IP Address Worksheet” on page 35.</p> <p>For more information, see “Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster” on page 27.</p>
<p>5) Post Office Name:</p> <p>Post Office Location:</p>	<p>Transfer this information from the System Clustering Worksheet (item 11).</p>
<p>6) Post Office Failover Path:</p>	<p>List other nodes in the cluster where the GroupWise post office and its POA could fail over.</p> <p>For more information, see “Determining Appropriate Failover Paths for the Agents” on page 29.</p>

Item	Explanation
7) POA Network Information:	Gather the POA network address information from the "IP Address Worksheet" on page 35.
<ul style="list-style-type: none"> ◆ POA IP address ◆ POA client/server port ◆ POA message transfer port ◆ POA HTTP port 	For more information, see "Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster" on page 27.
8) Load Agents in Protected Memory?	Mark whether you need to run the agents in protected memory. If so, specify a unique address space for each agent. For the POA, specify a user name and password if required by your version of NetWare.
<ul style="list-style-type: none"> ◆ No ◆ Yes 	For more information, see "Deciding Whether to Run the Agents in Protected Memory" on page 31.
<p>MTA protected address space</p> <p>POA protected address space</p> <p>POA /user startup switch setting</p> <p>POA /password startup switch setting</p>	

3 Setting Up a Domain and Post Office in a NetWare Cluster

You should have already reviewed “[Planning GroupWise in a NetWare Cluster](#)” on page 19 and filled out the “[System Clustering Worksheet](#)” on page 33, the “[IP Address Worksheet](#)” on page 35, and the “[Agent Clustering Worksheet](#)” on page 36. You are now ready to complete the following tasks to set up GroupWise in a clustering environment:

- ♦ [Section 3.1, “Preparing the Cluster for GroupWise,”](#) on page 39
- ♦ [Section 3.2, “Setting Up a New GroupWise System in a Cluster,”](#) on page 42
- ♦ [Section 3.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 43
- ♦ [Section 3.4, “Creating a New Post Office in a Cluster,”](#) on page 44
- ♦ [Section 3.5, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 46
- ♦ [Section 3.6, “Testing Your Clustered GroupWise System,”](#) on page 54
- ♦ [Section 3.7, “Managing Your Clustered GroupWise System,”](#) on page 55
- ♦ [Section 3.8, “What’s Next,”](#) on page 59
- ♦ [Section 3.9, “Clustering Quick Checklists,”](#) on page 59

3.1 Preparing the Cluster for GroupWise

After you have installed Novell Cluster Services, as described in *Novell Cluster Services Overview and Installation*, complete the following tasks to prepare the cluster for your GroupWise system:

- ♦ [Section 3.1.1, “Ensuring Required Software Versions,”](#) on page 39
- ♦ [Section 3.1.2, “Cluster-Enabling Shared Volumes for Use with GroupWise,”](#) on page 39
- ♦ [Section 3.1.3, “Configuring Short Name Resolution,”](#) on page 40

3.1.1 Ensuring Required Software Versions

Double-check each node in the cluster to make sure it meets the requirements described in [Section 2.1, “Meeting Software Version Requirements,”](#) on page 20.

3.1.2 Cluster-Enabling Shared Volumes for Use with GroupWise

To cluster-enable a shared volume for use with GroupWise:

- 1 Select a System Clustering Worksheet item ([6](#), [7](#), or [8](#)) where you marked Yes under Cluster Enabled?.

- 2 Complete the steps in the cluster-enabling section of the cluster documentation for your version of NetWare, as listed in [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,”](#) on page 17.

The System Clustering Worksheet provides the volume to cluster-enable for use the GroupWise, the cluster-enabled volume IP address, and the failover path for the GroupWise volume.

For a review of the new Novell eDirectory objects that are created when you cluster-enable a shared volume, see [Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,”](#) on page 23.

If you have installed the latest version of ConsoleOne and the Novell Cluster Services snap-in, you can rename the cluster-related objects in case your DNS name server cannot resolve object names that include the underscore (_) character.

- 3 Repeat [Step 1](#) and [Step 2](#) above for the other shared volumes on your System Clustering Worksheet that need to be cluster-enabled.
- 4 Continue with [Configuring Short Name Resolution](#).

3.1.3 Configuring Short Name Resolution

To ensure that GroupWise volumes are always locatable, configure the short name resolution methods that you want to rely on for GroupWise ([System Clustering Worksheet item 9](#)):

- ♦ [“eDirectory”](#) on page 40
- ♦ [“Hosts Files”](#) on page 41
- ♦ [“DNS”](#) on page 41
- ♦ [“SLP”](#) on page 42

After configuring your selected short name resolution methods, continue with the task you need to perform:

- ♦ [“eDirectory”](#) on page 40
- ♦ [“Hosts Files”](#) on page 41
- ♦ [“DNS”](#) on page 41
- ♦ [“SLP”](#) on page 42

eDirectory

Most commonly, you will use eDirectory to resolve the UNC path of a volume into its network address. For example, on the workstation where you run ConsoleOne, you need to map a drive to the location of a domain directory so that ConsoleOne can access the domain database. You could use a map command as shown in the example below:

Syntax:

```
map drive: = .cluster_volume.context
```

Example:

```
map m: = .GWCLUSTER_GWVOL1.GWServers
```

When specifying the map commands, use [System Clustering Worksheet item 3](#) for *cluster*. Use [System Clustering Worksheet item 7 or 8](#) for each *volume* where a domain or post office resides. Use [System Clustering Worksheet item 4](#) for *context*.

Hosts Files

Because each GroupWise volume where you plan to create a domain or post office has been associated with a virtual server, you should add lines for the new virtual servers to one or more of the following files as needed:

- ♦ **NetWare:**
sys:\etc\hosts
(on all nodes in the cluster; recommended)
- ♦ **Windows XP/Vista:**
\winnt\system32\drivers\etc\hosts
(on the administrator's workstation only; optional)

The lines you add to a hosts file could look similar to the following example:

Syntax:

```
IP_address cluster_volume_SERVER.context cluster_volume_SERVER
```

Remember that *cluster_volume_SERVER* represents the name of the virtual server created when you cluster-enabled the volume.

Example:

```
172.16.5.81 gwcluster_gwvol1_SERVER.gwcluster.com  
gwcluster_gwvol1_SERVER
```

When specifying the lines in the hosts files, use [System Clustering Worksheet item 7 or 8](#) for each *IP_address* and *volume* where a domain or post office resides. Use [System Clustering Worksheet item 3](#) for *cluster*. Use [System Clustering Worksheet item 4](#) for *context*.

DNS

Because each GroupWise volume where you plan to create a domain or post office has been associated with a virtual server, you should add all your new virtual servers to DNS. Then you could use a map command as shown in the example below (all on one line, of course):

Syntax:

```
map drive: = \\volume_SERVER.cluster.com\volume
```

Remember that *volume_SERVER* represents the name of the Volume Resource object created when you cluster-enabled the volume. A cluster-enabled volume can function like a server, as these commands illustrate.

Example:

```
map m: = \\gwvol1_SERVER.gwcluster.com\gwvol1
```

Or, if the ConsoleOne workstation is in the same DNS domain as the GroupWise volume:

Syntax:

```
map drive: = \\volume_SERVER\volume
```

Example

```
map m: = \\gwvol1_SERVER\gwvol1
```

When specifying the map commands you will need, use [System Clustering Worksheet item 7](#) or [8](#) for each *volume* where a domain or post office resides. Use [System Clustering Worksheet item 3](#) for *cluster*.

SLP

On NetWare 6.5, Novell Cluster Services automatically propagates virtual server information into SLP and provides the most reliable name resolution.

3.2 Setting Up a New GroupWise System in a Cluster

The GroupWise Installation Advisor walks you through setting up the primary domain and an initial post office in the primary domain. You might be creating your primary domain and initial post office on the same GroupWise volume or on two different volumes. After you have created the primary domain and initial post office and installed the GroupWise agents, you can create additional secondary domains and post offices as needed.

To set up the primary domain and initial post office for a new GroupWise system in a clustering environment:

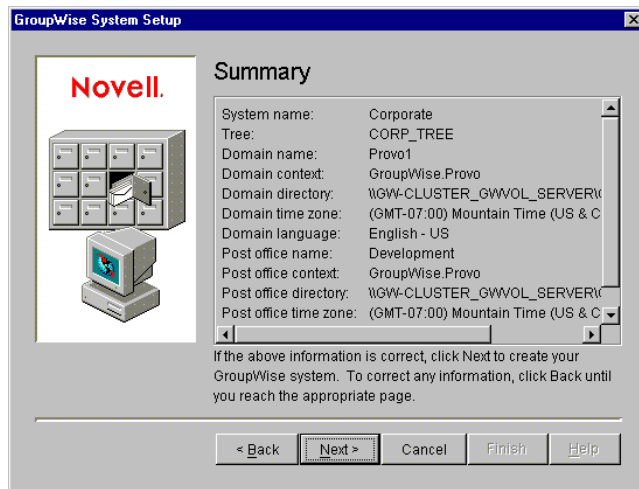
- 1 If necessary, map a drive to each GroupWise administration volume ([System Clustering Worksheet item 6](#)).
- 2 Map a drive to the GroupWise volume for the domain ([System Clustering Worksheet item 7](#)) and, if needed, to the GroupWise volume for the post office ([System Clustering Worksheet item 8](#)), where the primary domain and the initial post office for your new GroupWise system will be created.

The GroupWise volume name will be *cluster_volume*. For assistance with mapping a drive to a cluster-enabled volume, see [“Configuring Short Name Resolution”](#) on page 40.

- 3 Manually create the domain directory ([System Clustering Worksheet item 10](#)) and the post office directory ([System Clustering Worksheet item 12](#)).

This step is not required, but in a clustered environment, the following step is easier if the domain directory already exists.

- 4 Run the GroupWise Installation Advisor to set up your initial GroupWise system, following the steps provided in [“NetWare and Windows: Setting Up a Basic GroupWise System”](#) in [“Installing a Basic GroupWise System”](#) in the *GroupWise 8 Installation Guide*. Keep in mind the following cluster-specific details:
 - ◆ When you specify the ConsoleOne directory and the software distribution directory, be sure to browse to each location through the GroupWise volume accessed in [Step 1](#) above.
 - ◆ When you specify the domain directory and post office directory, be sure to browse through the GroupWise volume accessed in [Step 2](#) to select the directory created in [Step 3](#) above.
 - ◆ For the post office link type, select *TCP/IP Link*.
 - ◆ When providing the MTA and POA network address information, use the Agent Clustering Worksheet that you filled out in [Section 2.8, “Deciding How to Install and Configure the Agents in a Cluster,”](#) on page 26. The information you provide is used to configure the MTA and POA objects in the domain and post office even though you have not yet installed the agent software.
 - ◆ Do not create users in the post office at this time.
 - ◆ In the Summary dialog box, the domain directory and post office directory that you browsed to should display as UNC paths using the virtual server name with the GroupWise volume.



- 5 When you have finished creating the primary domain and the initial post office, continue with installing the GroupWise Agents, starting with [Step 4 on page 46 in Section 3.5, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 46.

3.3 Creating a New Secondary Domain in a Cluster

After you have set up the primary domain and initial post office, as described in [Section 3.2, “Setting Up a New GroupWise System in a Cluster,”](#) on page 42, you can create additional secondary domains as needed.

To create a new secondary domain in a clustering environment:

- 1 Map a drive to the GroupWise volume for the domain ([System Clustering Worksheet item 7](#)) where the new secondary domain will be created.
The GroupWise volume name will be *cluster_volume*. For assistance with mapping a drive to a cluster-enabled volume, see [“Configuring Short Name Resolution”](#) on page 40.
- 2 Manually create the domain directory ([System Clustering Worksheet item 10](#)).
This step is not required, but in a clustered environment, [Step 5](#) is easier if the domain directory already exists.
- 3 If you selected `vol:\system` on GroupWise volume as the agent installation location (under [Agent Clustering Worksheet item 1](#)), create the `vol:\system` directory on the GroupWise volume accessed in [Step 1](#).
or
If you selected `sys:\system` on each node, decide which node you will install the agents to first.
- 4 In ConsoleOne, connect to the primary domain in your GroupWise system, as described in [“Connecting to a Domain”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.
- 5 Create the new domain, following the steps provided in [“Creating the New Domain”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*. Keep in mind the following cluster-specific details:
 - ♦ Use the Domain Worksheet you filled out in [Section 2.3, “Planning a New Clustered Domain,”](#) on page 21 to fill in the fields in the Create GroupWise Domain dialog box.
 - ♦ In the *Domain Database Location* field, be sure to browse through the drive you mapped in [Step 1](#) to the domain directory you created in [Step 2](#) above.

- ♦ In the *Link to Domain* field, link the new domain to the primary domain of your GroupWise system.
 - ♦ The *Configure Link* option is selected by default. Select *TCP/IP Link to the Other Domain*. Refer to the Agent Clustering Worksheet that you filled out in “[Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster](#)” on page 27 for the secondary IP address and cluster-unique port numbers that you need to specify in order to configure the link.
- 6 Use the Link Configuration tool to change the links from the new domain to all other domains in the cluster to direct TCP/IP links, following the steps provided in “[Changing the Link Protocol between Domains to TCP/IP](#)” in “[Message Transfer Agent](#)” in the *GroupWise 8 Administration Guide*.

Although a complete mesh link configuration is the most efficient, it might not be feasible in all situations. Set up as many direct TCP/IP links as possible for best MTA performance in the cluster.
 - 7 Make sure you are still connected to the primary domain.
 - 8 Rebuild the domain database for the new domain, following the steps provided in “[Rebuilding Domain or Post Office Databases](#)” in “[Databases](#)” in the *GroupWise 8 Administration Guide*. Be sure to browse to the database location (under [System Clustering Worksheet item 10](#)) through the virtual server that was created when you cluster-enabled the GroupWise volume.

The database rebuild is necessary in order to transfer the MTA configuration information and the domain link information into the secondary domain database, because the MTA for the new domain is not yet running.
 - 9 Continue with [Creating a New Post Office in a Cluster](#).

3.4 Creating a New Post Office in a Cluster

You can create a new post office on the same GroupWise volume where its domain resides or on a separate GroupWise volume. If the post office and its domain are on the same GroupWise volume, they fail over together. If they are on separate GroupWise volumes, they fail over separately.

To create a new post office in a clustering environment:

- 1 If you marked Yes for Post Office on Same Volume as Domain? (under [System Clustering Worksheet item 7](#)), map a drive to the GroupWise volume for the domain ([System Clustering Worksheet item 7](#)).

or

Map a drive to the GroupWise volume for the post office ([System Clustering Worksheet item 8](#)). The GroupWise volume name will be *cluster_volume*. For assistance with mapping a drive to a cluster-enabled volume, see “[Configuring Short Name Resolution](#)” on page 40.
- 2 Manually create the post office directory ([System Clustering Worksheet item 12](#)).

This step is not required, but in a clustered environment, [Step 4](#) is easier if the post office directory already exists.
- 3 In ConsoleOne, connect to the GroupWise domain where you want to create the new post office, as described in “[Connecting to a Domain](#)” in “[Domains](#)” in the *GroupWise 8 Administration Guide*.

- 4 Create the new post office, following the steps provided in [“Creating the New Post Office”](#) in [“Post Offices”](#) in the *GroupWise 8 Administration Guide*. Keep in mind the following cluster-specific details:
 - ♦ Use the Post Office Worksheet you filled out in [Section 2.4, “Planning a New Clustered Post Office,”](#) on page 22 to fill in the fields in the Create GroupWise Post Office dialog box.
 - ♦ In the *Post Office Database Location* field, be sure to browse through the drive you mapped in [Step 1](#) to the post office directory you created in [Step 2](#) above.
 - ♦ If you want to create a library at the post office ([System Clustering Worksheet item 14](#)), select *Create Library*.
This option creates the document storage area for the library under the post office directory and is not recommended for large libraries.
 - ♦ The *Configure Link* option is selected by default. Select *TCP/IP Link from Domain to New Post Office*. Refer to the Agent Clustering Worksheet that you filled in during [“Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster”](#) on page 27 for the secondary IP address and cluster-unique port numbers that you need to specify in order to configure the link.
- 5 Right-click the new Post Office object, then click *Properties*.
- 6 Click *GroupWise > Post Office Settings*; in the *Access Mode* field, select *Client/Server Only*.
- 7 Right-click the new POA object, then click *Properties*.

On the POA Agent Settings and Scheduled Events pages, you might want to specify unique times for the following POA activities to prevent multiple POAs from performing the same activities on the same node at the same time during a failover situation:

- ♦ Start User Upkeep
- ♦ Generate Address Book for Remote
- ♦ Enable QuickFinder Indexing
- ♦ Mailbox/Library Maintenance Event

For more information about these repetitive POA activities, see [“Performing Nightly User Upkeep”](#), [“Regulating Indexing”](#), and [“Scheduling Database Maintenance”](#) in [“Post Office Agent”](#) in the *GroupWise 8 Administration Guide*.

- 8 Make sure you are still connected to the domain that owns the new post office.
- 9 Rebuild the post office database for the new post office, following the steps provided in [“Rebuilding Domain or Post Office Databases”](#) in [“Databases”](#) in the *GroupWise 8 Administration Guide*. Be sure to browse to the database location ([under System Clustering Worksheet item 11](#)) through the virtual server that was created when you cluster-enabled the GroupWise volume.
The database rebuild is necessary in order to transfer the POA configuration information and the post office link information into the post office database, because the POA for the new post office is not yet running.
- 10 If you want to create a library with its document storage area outside the post office directory, ([System Clustering Worksheet item 14](#)), follow the steps in [“Setting Up a Basic Library”](#) or [“Setting Up a Full-Service Library”](#) in [“Libraries and Documents”](#) in the *GroupWise 8 Administration Guide*, after you have completely finished setting up the clustered post office.
- 11 Continue with [Installing and Configuring the MTA and the POA in a Cluster](#).

3.5 Installing and Configuring the MTA and the POA in a Cluster

After you have created a new domain and/or post office, you are ready to install and configure the GroupWise agents. Complete all the tasks below if you are setting up a new GroupWise system or if you have created a new GroupWise volume where you want to install the agent software:

- ♦ [Section 3.5.1, “Installing the Agent Software in a Cluster,” on page 46](#)
- ♦ [Section 3.5.2, “Editing Clustered Agent Startup Files,” on page 47](#)
- ♦ [Section 3.5.3, “Configuring the GroupWise Volume Resource to Load and Unload the Agents,” on page 48](#)
- ♦ [Section 3.5.4, “Setting Up New Instances of the Agents without Installing the Agent Software,” on page 52](#)

Under some circumstances, the agent software has already been installed and you simply need to create a new startup file specific to the new domain or post office. For example:

- ♦ You have created a new domain and/or post office on a GroupWise volume where the agent software is already installed in the `vol:\system` directory of the GroupWise volume.
- ♦ In your GroupWise system, the agent software is already installed to multiple `sys:\system` directories.

In these circumstances, follow the instructions in [“Setting Up New Instances of the Agents without Installing the Agent Software” on page 52](#) instead of completing the tasks above.

3.5.1 Installing the Agent Software in a Cluster

To install the MTA and the POA:

- 1 Map a drive to the GroupWise volume for the domain ([Agent Clustering Worksheet item 2](#)) or the post office ([Agent Clustering Worksheet item 5](#)).

The GroupWise volume name will be `cluster_volume`. For assistance with mapping a drive to a cluster-enabled volume, see [“Configuring Short Name Resolution” on page 40](#).

- 2 If you selected `vol:\system` on GroupWise volume as the agent installation location (under [Agent Clustering Worksheet item 1](#)), create the `vol:\system` directory on the GroupWise volume accessed in [Step 1](#).

or

If you selected `sys:\system` on each node, decide which node you will install the agents to first.

- 3 Start the Agent Installation program, following the steps provided in [“Installing the NetWare Agent Software”](#) in [“Installing GroupWise Agents”](#) in the *GroupWise 8 Installation Guide*.
- 4 Install the NetWare agents, keeping in mind the following cluster-specific details:
 - ♦ Use the NetWare Agent Clustering Worksheet that you filled out in [“Planning the NetWare Agent Installation” on page 32](#) to fill in the fields during the agent installation process.
 - ♦ In the Installation Path dialog box, be sure to browse through the drive you mapped in [Step 1](#) to the location you chose in [Step 2](#) above. Also select *Configure GroupWise Agents for Clustering*.

- ♦ In the Domains / Post Offices dialog box, click *Add* for each domain and post office that the agents will service. In the *Path to Database* field, be sure to browse through the drive you mapped in [Step 1](#) above to the domain directory or the post office directory. In the *HTTP Port* field, specify the cluster-unique HTTP port planned for each agent (under [Agent Clustering Worksheet items 4 and 7](#)).
 - ♦ In the Installation Complete dialog box, do not select *Launch GroupWise Agents Now*. You will configure the agents to launch in protected mode later.
- 5 If you need to install the agents to `sys:\system` on multiple nodes in the cluster:
 - 5a Repeat [Step 4](#), mapping new drives as needed.
 - 5b If you marked Yes for Consolidate Multiple Startup Files on GroupWise Volume? (under [Agent Clustering Worksheet item 1](#)), copy one complete set of agent startup files and the `grpwise.ncf` file to the planned location, then delete all agent startup files, as well as the `grpwise.ncf` file, from the `sys:\system` directories to avoid future confusion.

The `grpwise.ncf` file includes a `load` command for each instance of each agent. You will use this information later when you create the load and unload scripts for the volume resources.
 - 6 Continue with [Editing Clustered Agent Startup Files](#).

3.5.2 Editing Clustered Agent Startup Files

By default, the Agent Installation program creates agent startup files in the agent installation directory. Each MTA startup file is named after the domain it services, with a `.mta` extension. Each POA startup file is named after the post office it services, with a `.poa` extension.

Because you selected Configure GroupWise Agents for Clustering during installation, the Agent Installation program set the MTA `/home` startup switch and the POA `/home` startup switch using the format:

```
volume:\directory
```

so that the startup files are valid no matter which node the agents are currently running on.

The Agent Installation program also adds a `/cluster` startup switch to POA startup files to ensure that GroupWise clients detect the clustering environment and try more persistently to reconnect in a failover, failback, or migration situation.

One additional manual modification of POA startup files is required for robust functionality in a clustering environment. Uncomment the `/ip` startup switch and provide the secondary IP address of the GroupWise volume where the post office is located ([Agent Clustering Worksheet item 7](#)). This information is available to the POA in its eDirectory object properties. However, in some failover situations, reconnection to the MTA is improved when the information is immediately available to the POA in its startup file.

If you are running the POA in protected memory and your version of NetWare requires it, add the `/user` and `/password` startup switches (under [Agent Clustering Worksheet item 8](#)) in order to provide a user name and password that the POA can use to access its post office volume.

If the POA needs to access a remote document storage area, add the `/user` and `/password` startup switches (under [System Clustering Worksheet item 12](#)) in order to provide a user name and password that the POA can use to access the volume where the document storage area resides. As an alternative to startup switches, you can assign the POA object all rights except Supervisor and Access control, as long as the remote document storage area is located in the same tree with the post office.

If you have connection problems between the MTA and the POA, you can use the `/user` and `/password` startup switches in the MTA startup file as well.

3.5.3 Configuring the GroupWise Volume Resource to Load and Unload the Agents

The properties of the Volume Resource object define how the GroupWise volume functions within the cluster, how NLM programs are loaded and unloaded, and how failover and fallback situations are handled. At this point, you might have one volume resource with a domain and post office on it, or you might have two volume resources, one for the domain and one for the post office. Complete the following tasks for each volume resource:

- ♦ “[Modifying the Volume Resource Load Script for the Agents](#)” on page 48
- ♦ “[Modifying the Volume Resource Unload Script for the Agents](#)” on page 49
- ♦ “[Setting the Failover Path and Policies for the Agents](#)” on page 50

Modifying the Volume Resource Load Script for the Agents

The volume resource load script executes whenever the GroupWise volume comes online.

To set up the load script:

- 1 In ConsoleOne, browse to and select the Cluster object.

If necessary, click *View > Console View* to display its contents.

- 2 Right-click the Volume Resource object (*volume_SERVER*), then click *Properties > Load* to display the default volume resource load script for the GroupWise volume.

- 3 Make the following changes to the default load script:

- ♦ Remove the `trustmig` command. It is not necessary to migrate trustees for a GroupWise volume. Removing this line helps the load script to execute faster.
- ♦ If you selected `vol:\system` on GroupWise volume as the agent installation location ([Agent Clustering Worksheet item 1](#)), add a `search add` command to add the new `vol:\system` directory to the server search path.

```
search add volume:\system
```

- ♦ If you selected `sys:\system` on each node as the installation location ([Agent Clustering Worksheet item 1](#)) but you are storing the agent startup files on the GroupWise volume, add that location to the server search path.
- ♦ If you marked No under Load Agents in Protected Memory? ([Agent Clustering Worksheet item 8](#)), add the following abend recovery options:

```
set auto restart after abend = 2
set auto restart after abend delay time = 0
set auto restart down timeout = 60
set developer option = off
```

These settings provide the best possible handling of GroupWise databases in the event that an abend should occur within the cluster when the agents are not running in protected memory.

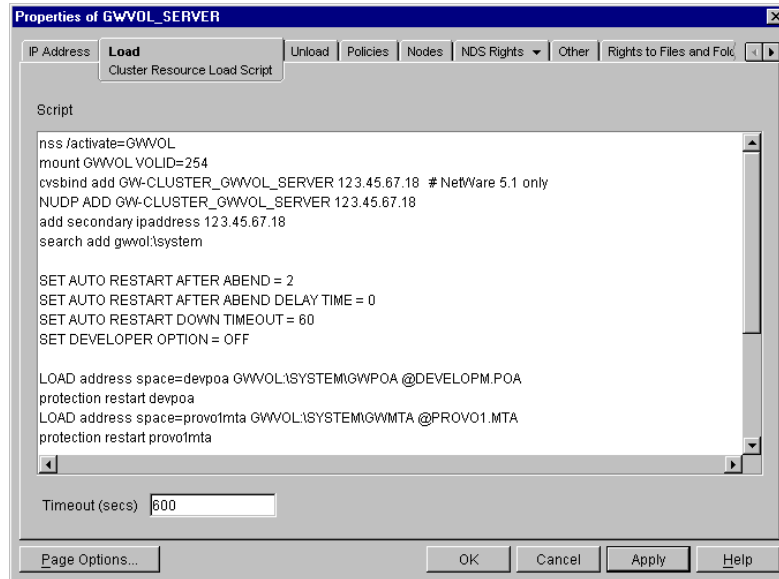
- ♦ Transfer the agent load commands from the `grpwise.ncf` file into the load script. Use Ctrl+C to copy and Ctrl+V to paste text into the load script page. Then delete or rename the `grpwise.ncf` file to avoid future confusion.

```
load volume:\system\agent.nlm @startup_file
```


- ♦ If you marked Yes under Load Agents in Protected Memory? ([Agent Clustering Worksheet item 8](#)), add the address space parameter to the agent load commands to specify the protected address space for each agent. Add a `protection restart` command for each address space name.

```
load address space=addr_space_name
                             volume:\system\agent.nlm @startup_file
protection restart name
```

The result would look similar to the following example:



NOTE: The set commands are needed in the load script only when the agents are *not* running in protected memory. The address space parameters are needed in the load commands only when the agents *are* running in protected memory.

For another example of a load script, see TID 7006193: Running the GroupWise Agents in a Non-Protected Address Space on a NetWare Cluster in the [Novell Knowledgebase](http://www.novell.com/support) (<http://www.novell.com/support>).

- 4 Click *Apply* to save the load script.
- 5 If necessary, click *OK* to confirm that you must offline and then online the volume resource in order for the changes to take effect.
- 6 Continue with [Modifying the Volume Resource Unload Script for the Agents](#).

Modifying the Volume Resource Unload Script for the Agents

The volume resource unload script executes whenever the GroupWise volume goes offline. Programs should be unloaded in the reverse order of how they were loaded. This ensures that supporting programs are not unloaded before programs that rely on them in order to function properly.

To set up the unload script:

- 1 In ConsoleOne, in the properties pages for the Volume Resource object (*volume_SERVER*), click *Unload* to display the default volume resource unload script.

2 Make the following changes to the default unload script:

- ◆ If you marked Yes under Load Agents in Protected Memory? ([Agent Clustering Worksheet item 8](#)), add an `unload address space` command for each address space. Add an `unload kill address space` command to ensure that the address space is completely cleaned up.

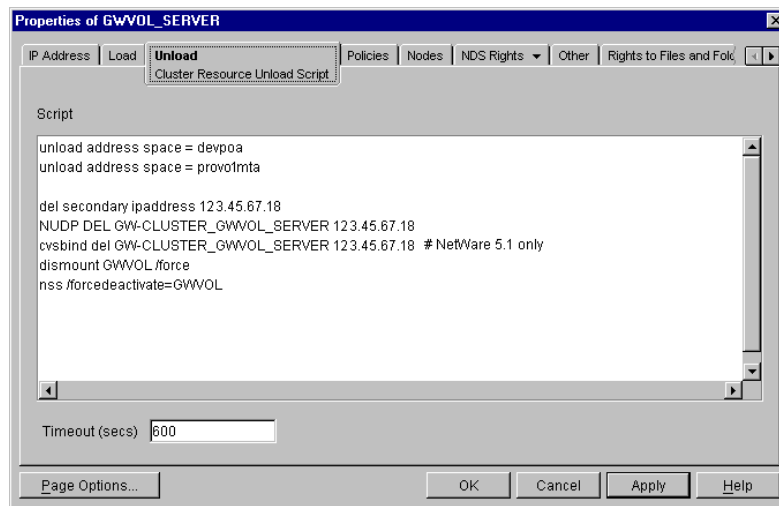
```
unload address space=addr_space_name
unload kill address space=addr_space_name
```

- ◆ If you marked No under Load Agents in Protected Memory? ([Agent Clustering Worksheet item 8](#)), create an `unload` command parallel to each `load` command that you placed in the load script.

```
unload agent.nlm
```

- ◆ Remove the `trustmig` command just like you did in the load script.

The result would look similar to the following example:

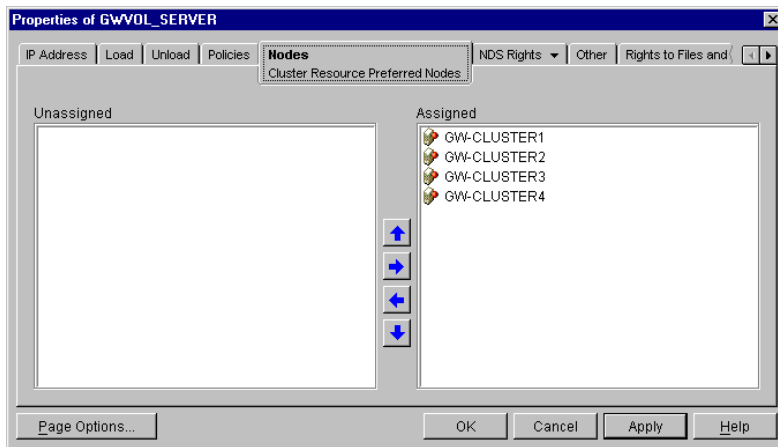


- 3 Click *Apply* to save the unload script.
- 4 If necessary, click *OK* to confirm that you must offline and then online the volume resource in order for the changes to take effect.
- 5 Continue with [Setting the Failover Path and Policies for the Agents](#).

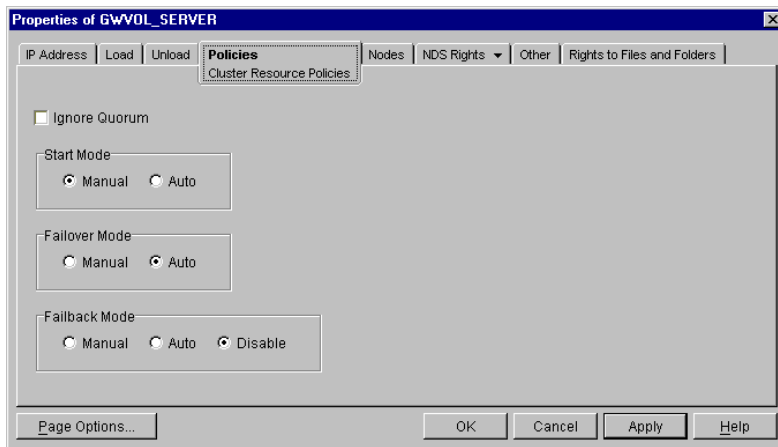
Setting the Failover Path and Policies for the Agents

To modify the failover path and policies for a GroupWise volume resource:

- 1 In ConsoleOne, in the properties pages for the Volume Resource object (*volume_SERVER*), click *Nodes* to display the default failover path for the GroupWise volume resource.



- 2 Arrange the nodes in the cluster into the desired failover path for the domain or post office volume (under [Agent Clustering Worksheet items 3 or 6](#)).
- 3 Click *Apply* to save the failover path.
- 4 Click *Policies* to display the default start, failover, and fallback policies.



The default policy settings are often appropriate. By default, a volume resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover path
- ◆ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the section about failover and fallback modes in the cluster documentation for your version of NetWare, as listed in [Chapter 1, "Introduction to GroupWise 8 and Novell Cluster Services on NetWare,"](#) on page 17.

- 5 Click *OK* when you are finished editing the GroupWise volume resource properties.
- 6 Skip to [Section 3.6, "Testing Your Clustered GroupWise System,"](#) on page 54.

3.5.4 Setting Up New Instances of the Agents without Installing the Agent Software

There are two steps to setting up new instances of the agents without installing the agent software:

- ♦ [“Creating New Startup Files” on page 52](#)
- ♦ [“Modifying Existing Load and Unload Scripts” on page 52](#)

Creating New Startup Files

Each MTA startup file is named after the domain it services, with a `.mta` extension. Each POA startup file is named after the post office it services, with a `.poa` extension. If the existing agent software is located in the `vol:\system` directory of a GroupWise volume, the startup files are there as well. If the existing agent software is located in multiple `sys:\system` directories, the startup files might be located there as well, or they might be in a directory on a GroupWise volume.

To create a new startup file without installing the agent software:

- 1 Make a copy of an existing startup file and name it after the domain or post office that will be serviced by the agent.
- 2 Edit the setting of the `/home` startup switch to point to the location of the new domain directory or post office directory. Be careful to maintain the syntax of the original line.
- 3 Scroll down through the startup file looking for other active (not commented out) startup switches, then modify them as needed for the new agent.

For example, you might find that the `/httpport` switch is active and needs to be changed to a cluster-unique port number for the new agent.

- 4 Save the new startup file.
- 5 Continue with [Modifying Existing Load and Unload Scripts](#).

Modifying Existing Load and Unload Scripts

The agent startup file names are part of the `load` commands found in GroupWise volume resource load scripts.

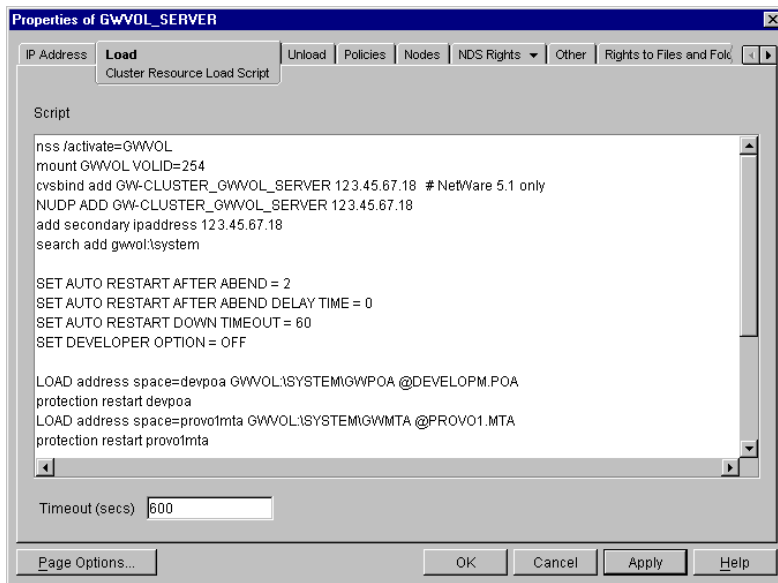
If you created the new domain and/or post office on a new GroupWise volume, skip back to [“Configuring the GroupWise Volume Resource to Load and Unload the Agents” on page 48](#) for instructions to create new load and unload scripts.

If you created the new domain and/or post office on an existing GroupWise volume, most of the configuration of the volume resource has already been done. You just need to add new `load` and `unload` commands to the existing scripts. Continue with the steps below:

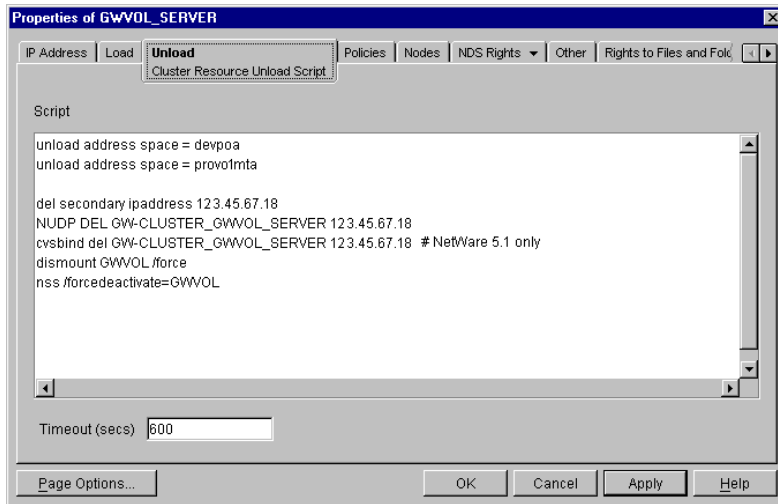
To modify existing load and unload scripts:

- 1 In ConsoleOne, browse to and select the Cluster object.
If necessary, click *View > Console View* to display its contents.
- 2 Right-click the Volume Resource object (`volume_SERVER`), then click *Properties > Load* to display the volume resource load script for the GroupWise volume.
- 3 Following the pattern of the existing `load` commands, add `load` commands for the new instances of the agents you are setting up. Use `Ctrl+C` to copy and `Ctrl+V` to paste lines in the load script page.

The results would be similar to the following example:



- 4 Click *Apply* to save the modified load script.
- 5 Click *Unload*
- 6 Add corresponding unload commands for the new instances of the agents.

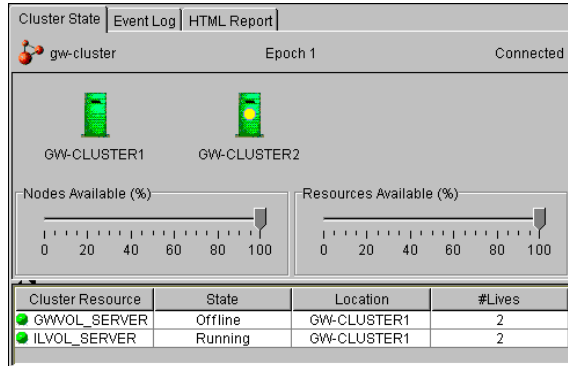


- 7 Click *Apply* to save the modified unload script.
- You might want to review other properties of the Volume Resource object, such as the failover path on the Nodes page and the failover/failback/migration procedures on the Policies page, in light of the fact that an additional domain and/or post office now resides on the GroupWise volume.
- 8 Change other *Volume Resource* properties as needed.
 - 9 Click *OK* to save the modified properties.
 - 10 In the Cluster State View, take the GroupWise volume offline and then bring it online again to test the new startup files and the modified load and unload scripts. If you need assistance with these tasks, see [Section 3.6, "Testing Your Clustered GroupWise System,"](#) on page 54.

3.6 Testing Your Clustered GroupWise System

After you have configured the GroupWise volume resources, you can test the load and unload scripts by bringing the GroupWise volume online and taking it offline again.

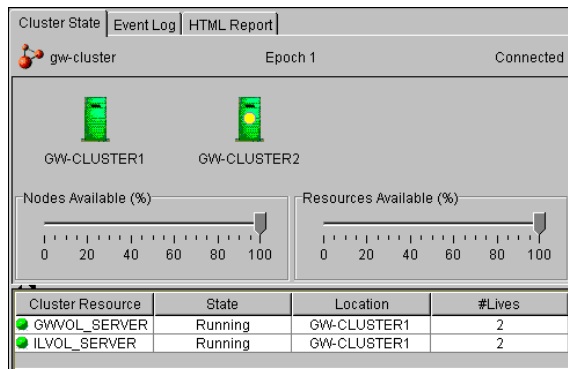
- 1 In ConsoleOne, select the Cluster object, then click *View > Cluster State*.



The new GroupWise volume resource shows *Offline* in the *State* column.

- 2 Click the new GroupWise volume resource, then click *Online*.

The *State* column for the volume resource now displays *Running*.



- 3 Observe the server console where the MTA and/or POA are loading to see that they start and run correctly.

If you are using protected memory, you can use the `protection` command at the server console prompt to list all the address spaces on the node and what NLM programs are running in each one.

- 4 Click the new GroupWise volume resource, then click *Offline*.

The *State* column for the volume resource returns to *Offline*.

- 5 Observe the server console where the MTA and/or POA are unloading to see that they shut down correctly.

If you are using protected memory, you can use the `protection` command again to make sure that the address spaces used by the GroupWise agents are no longer present.

- 6 Repeat [Step 2](#) whenever you are ready to bring the new GroupWise volume resource online permanently.

On NetWare 6.5, these actions can also be performed from your Web browser. See [“Using Novell Remote Manager on NetWare 6.5”](#) on page 56.

7 Continue with [Managing Your Clustered GroupWise System](#).

3.7 Managing Your Clustered GroupWise System

After you have set up a basic clustered GroupWise system, you should consider some long-term management issues.

- ♦ [Section 3.7.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 55
- ♦ [Section 3.7.2, “Using Novell Remote Manager on NetWare 6.5,”](#) on page 56
- ♦ [Section 3.7.3, “Knowing What to Expect in MTA and POA Failover Situations,”](#) on page 59

3.7.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After setting up your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record that cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to keep the information recorded in the GroupWise objects up to date if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information for a Domain and Its MTA”](#) on page 55
- ♦ [“Recording Cluster-Specific Information for a Post Office and Its POA”](#) on page 55
- ♦ [“Recording Cluster-Specific Information for a Software Distribution Directory”](#) on page 56

Recording Cluster-Specific Information for a Domain and Its MTA

To permanently record important cluster-specific information for the domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the domain Identification page, provide a cluster-specific description of the domain, including the secondary IP address of its cluster-enabled volume and the cluster-unique port numbers used by its MTA.
- 3 Click *OK* to save the domain description.
- 4 Select the Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the secondary IP address of the cluster-enabled domain volume and the cluster-unique port numbers used by the MTA.
This information appears on the MTA console, no matter which node in the cluster it is currently running on.
- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information for a Post Office and Its POA](#).

Recording Cluster-Specific Information for a Post Office and Its POA

To permanently record important cluster-specific information for a post office:

- 1 In ConsoleOne, browse to and right-click the Post Office object, then click *Properties*.

- 2 In the *Description* field of the post office Identification page, provide a cluster-specific description of the post office, including the secondary IP address of its cluster-enabled volume and the cluster-unique port numbers used by its POA.
 - 3 Click *OK* to save the post office description.
 - 4 Select the Post Office object to display its contents.
 - 5 Right-click the POA object, then click *Properties*.
 - 6 In the *Description* field of the POA Identification page, record the secondary IP address of the cluster-enabled post office volume and the cluster-unique port numbers used by the POA.
This information appears on the POA console, no matter which node in the cluster it is currently running on.
 - 7 Click *OK* to save the POA description.
 - 8 If necessary, continue with [“Recording Cluster-Specific Information for a Software Distribution Directory” on page 56](#).
- or
- Skip to [“Knowing What to Expect in MTA and POA Failover Situations” on page 59](#).

Recording Cluster-Specific Information for a Software Distribution Directory

To permanently record important cluster-specific information about a software distribution directory located on a cluster-enabled volume:

- 1 In ConsoleOne, click *Tools > System Operations > Software Directory Management*.
- 2 Select the software distribution directory, then click *Edit*.
- 3 In the description field, record the secondary IP address of the cluster-enabled volume where the software distribution directory resides.
- 4 Click *OK*, then click *Close* to save the software distribution directory description.
- 5 Skip to [“Knowing What to Expect in MTA and POA Failover Situations” on page 59](#).

3.7.2 Using Novell Remote Manager on NetWare 6.5

On NetWare 6.5, you can use Novell Remote Manager to manage many aspects of your GroupWise cluster from your Web browser. For instructions on setting up and accessing this useful network administration utility, see the NetWare 6.5 *Novell Remote Manager Administration Guide* at the [Novell Documentation Web site \(http://www.novell.com/documentation\)](http://www.novell.com/documentation). Cluster management features are automatically added to Novell Remote Manager when you install Novell Cluster Services.

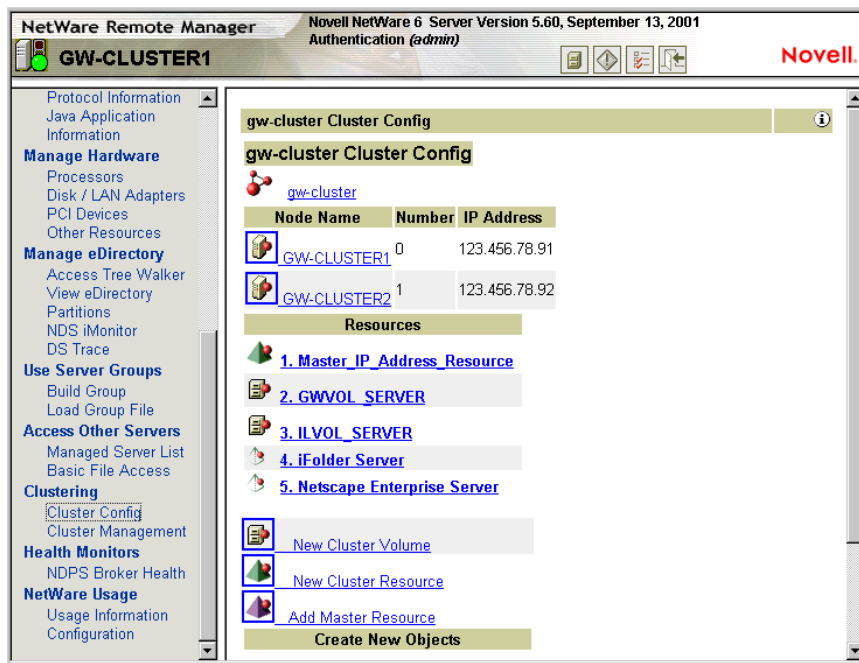
After you have accessed Novell Remote Manager, you might find that many GroupWise cluster management tasks are easier to perform with Novell Remote Manager than with ConsoleOne. The following sections help you configure and manage the cluster using Novell Remote Manager:

- ♦ [“Configuring Your GroupWise Cluster” on page 56](#)
- ♦ [“Managing Your GroupWise Cluster” on page 58](#)

Configuring Your GroupWise Cluster

On the main Novell Remote Manager page:

- 1 In the left frame, scroll down to the *Clustering* section, then click *Cluster Config*.



The Cluster Configuration page displays the cluster name, the nodes in the cluster, and the resources in the cluster. It also enables you to create new GroupWise Volume Resource objects (termed Cluster Volumes in the Novell Remote Manager interface).

- 2 Click the cluster name to display the Cluster object properties:

Cluster Configuration Fields: gw-cluster

Revision	261
IP Address	123.456.78.99
Port Number	7023
Quorum	
Membership	2
Timeout	60
Protocol	
Tolerance	8
Heartbeat	1
Master Watchdog	1
Slave Watchdog	8
Max Retransmit	30
GIPC Stream	
Resource Priorities	
Email Reporting	

Click a linked item to edit the Cluster object properties. Click your browser's *Back* button to return to the Cluster Configuration page.

- 3 On the Cluster Configuration page, click a server to display the Server object properties:

gw-cluster Cluster Config- Node: GW-CLUSTER1

IP Address	123.456.78.99
Node Number	0
Back	Delete

Click a linked item to edit the Server object properties. Click *Back* or *Delete* to perform the specified action.

- 4 On the Cluster Configuration page, click a GroupWise volume to display the Volume Resource object properties:

gw-cluster Cluster Config- Resource: GWWOL_SERVER

GWWOL_SERVER Resource Information .

[IP Address](#) 123.456.78.90

[Loading](#) [Unloading](#)

Script	Timeout	Script	Timeout
	600		600

[Policies](#) Ignore Quorum **No** Start **Auto** FailOver **Manual** FailBack **Disabled** Master

[Nodes](#) GW-CLUSTER1 , GW-CLUSTER2 , GW-CLUSTER3 , GW-CLUSTER4

[Back](#) [Delete](#)

Click a linked item to edit Volume Resource object properties. Click *Back* or *Delete* to perform the specified action.

- 5 On the Cluster Configuration page, click *New Cluster Volume* to create a new GroupWise Volume Resource object, then follow the instructions to provide the information needed to create the new Cluster Volume object.

Managing Your GroupWise Cluster

On the main Novell Remote Manager page:

- 1 In the left frame, scroll down to the Clustering section, then click *Cluster Management*.

NetWare Remote Manager Novell NetWare 6 Server Version 5.60, September 13, 2001 Authentication (admin) Novell.

GW-CLUSTER1

gw-cluster Cluster Status

Begin Refresh Page Refresh Rate 10 seconds

Epoch 1

Nodes

GW-CLUSTER1 GW-CLUSTER2 GW-CLUSTER3

Cluster Resource	State	Location	#Lives	Up Since
Master_IP_Address_Resource	Running	GW-CLUSTER1	1	10-30-2001 5:32:03 pm
GWWOL_SERVER	Running	GW-CLUSTER1	4	11-27-2001 1:53:39 pm
ILVOL_SERVER	Running	GW-CLUSTER1	1	10-30-2001 5:32:03 pm

[Event Log](#)

The Cluster Status page displays the nodes and volume resources in the cluster. The master node in the cluster is marked with a yellow ball. Status information is listed for each volume resource. You can set the refresh rate for the status information at the top of the Cluster Status page.

- 2 Select a page refresh rate, then click *Begin Refresh* so that the page automatically refreshes at the selected rate.
- 3 Click a cluster resource to bring it online, take it offline, or migrate it to another node.

Resource Action for GWWOL_SERVER

State **Running** GW-CLUSTER1

Offline

GW-CLUSTER2
GW-CLUSTER3
GW-CLUSTER4

To take the currently running volume resource offline, click *Offline*. To migrate the volume resource, select a node from the drop-down list, then click *Migrate*.

- 4 On the Cluster Resource page, click *Event Log* to view a list of cluster events.

The event log can help you resolve problems with cluster functioning.

3.7.3 Knowing What to Expect in MTA and POA Failover Situations

In a failover situation, the agents might need to perform some database repair as they start on the new node. The time required depends on the size of the databases involved.

Typically, the POA returns to full functionality faster than the MTA. This benefits GroupWise client users, who can reconnect to their mailboxes very quickly and probably do not notice if messages to users in other post offices are not delivered immediately. The only time a user would need to restart the GroupWise client would be if he or she was actually in the process of sending a message when the POA went down. Notify can continue running even if the connection to the POA becomes unavailable and then it reconnects automatically when the POA is again available.

The MTA typically takes some time reestablishing the links to its post offices, other domains, and gateways, but this situation usually resolves itself in a few minutes without administrator intervention. If it does not, you can manually restart the MTA to speed up the process.

In comparison to failover, migration typically takes longer because the agents methodically terminate their threads and close their databases as part of their normal shutdown procedure. However, as a result, no database repair is required when the agents start up again in their new location.

Continue with [What's Next](#).

3.8 What's Next

Now that you have at least one GroupWise domain and post office up and running in a clustering environment, you are ready to proceed with the rest of your GroupWise system setup by:

- ♦ Adding users to post offices. See “[Users](#)” in the *GroupWise 8 Administration Guide*.
- ♦ Setting up the GroupWise client software and helping users to get started using it. See “[Client](#)” in the *GroupWise 8 Administration Guide*. Also see the *GroupWise 8 Windows Client User Guide*.
- ♦ Connecting your clustered GroupWise system to the Internet. See [Chapter 4, “Implementing the Internet Agent in a NetWare Cluster,”](#) on page 63.
- ♦ Providing access to users’ GroupWise mailboxes from their Web browsers. See [Chapter 5, “Implementing WebAccess in a NetWare Cluster,”](#) on page 81.
- ♦ Connecting your clustered GroupWise system to other e-mail systems through GroupWise gateways. See [Chapter 6, “Implementing GroupWise Gateways in a NetWare Cluster,”](#) on page 97.
- ♦ Monitoring the status of your clustered GroupWise system from your Web browser. See [Chapter 7, “Monitoring a GroupWise System in a NetWare Cluster,”](#) on page 99.
- ♦ Backing up your clustered GroupWise system. See [Chapter 8, “Backing Up a GroupWise System in a NetWare Cluster,”](#) on page 101.

3.9 Clustering Quick Checklists

- ♦ [Section 3.9.1, “GroupWise System Quick Checklist,”](#) on page 60
- ♦ [Section 3.9.2, “Domain Quick Checklist,”](#) on page 60
- ♦ [Section 3.9.3, “Post Office Quick Checklist,”](#) on page 61

3.9.1 GroupWise System Quick Checklist

- Plan your new clustered GroupWise system.
See [Chapter 2, “Planning GroupWise in a NetWare Cluster,”](#) on page 19.
- Cluster-enable the volumes where GroupWise domains and post offices will reside.
See [Section 3.1.2, “Cluster-Enabling Shared Volumes for Use with GroupWise,”](#) on page 39.
- Make sure that short name resolution works throughout your network.
See [Section 3.1.3, “Configuring Short Name Resolution,”](#) on page 40.
- Create the primary domain and initial post office in your new clustered GroupWise system.
See [Section 3.2, “Setting Up a New GroupWise System in a Cluster,”](#) on page 42.
- Set up the agents for the primary domain and the initial post office.
See [Section 3.5, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 46.
- Modify the volume resource load script(s):
 - ◆ Remove the `trustmig` command
 - ◆ Add the `search add` command (optional)
 - ◆ If you will *not* run the agents in protected memory, add the `set auto restart` commands and the `set developer option = off` command
 - ◆ Add the `agent load` command(s)
 - ◆ If you *will* run the agents in protected memory, add the `address space` parameter to the `load` command(s) and add a corresponding `protection restart` command for each address spaceSee [“Modifying the Volume Resource Load Script for the Agents”](#) on page 48.
- Modify the volume resource unload script(s):
 - ◆ Add the agent or address space unload command(s)
 - ◆ Remove the `trustmig` commandSee [“Modifying the Volume Resource Unload Script for the Agents”](#) on page 49.
- Set up the volume failover path(s) and policies.
See [“Setting the Failover Path and Policies for the Agents”](#) on page 50.
- Test your new clustered GroupWise system.
See [Section 3.6, “Testing Your Clustered GroupWise System,”](#) on page 54.
- Record cluster-specific information in the properties pages of the GroupWise objects that the information pertains to.
See [Section 3.7, “Managing Your Clustered GroupWise System,”](#) on page 55.

3.9.2 Domain Quick Checklist

- Plan your new clustered domain.
See [Section 2.3, “Planning a New Clustered Domain,”](#) on page 21.
- Cluster-enable the volume where the domain will reside.
See [Section 3.1.2, “Cluster-Enabling Shared Volumes for Use with GroupWise,”](#) on page 39.

- Make sure that short name resolution for the new domain volume works throughout your network.
See [Section 3.1.3, “Configuring Short Name Resolution,”](#) on page 40.
- Create the new domain.
See [Section 3.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 43.
- Set up the MTA for the new domain.
See [Section 3.5, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 46.
- Modify the domain volume resource load script:
 - ◆ Remove the `trustmig` command
 - ◆ Add the `search add` command (optional)
 - ◆ If you will *not* run the MTA in protected memory, add the `set auto restart` commands and the `set developer option = off` command
 - ◆ Add the MTA `load` command
 - ◆ If you *will* run the MTA in protected memory, add the `address space` parameter to the MTA `load` command and add a corresponding `protection restart` command for the address space
 See [“Modifying the Volume Resource Load Script for the Agents”](#) on page 48.
- Modify the domain volume resource unload script:
 - ◆ Add the MTA or address space `unload` command
 - ◆ Remove the `trustmig` command
 See [“Modifying the Volume Resource Unload Script for the Agents”](#) on page 49.
- Set up the domain volume failover path and policies.
See [“Setting the Failover Path and Policies for the Agents”](#) on page 50.
- Test your new clustered domain.
See [Section 3.6, “Testing Your Clustered GroupWise System,”](#) on page 54.
- Record cluster-specific information in the properties pages of the GroupWise objects that the information pertains to.
See [Section 3.7, “Managing Your Clustered GroupWise System,”](#) on page 55.

3.9.3 Post Office Quick Checklist

- Plan your new clustered post office.
See [Section 2.4, “Planning a New Clustered Post Office,”](#) on page 22.
- Cluster-enable the volume where the post office will reside.
See [Section 3.1.2, “Cluster-Enabling Shared Volumes for Use with GroupWise,”](#) on page 39.
- Make sure that short name resolution for the new post office volume works throughout your network.
See [Section 3.1.3, “Configuring Short Name Resolution,”](#) on page 40.
- Create the new post office.
See [Section 3.4, “Creating a New Post Office in a Cluster,”](#) on page 44.
- Set up the POA for the new post office.

See [Section 3.5, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 46.

- ❑ Add the `/ip` startup switch to the POA startup file in order to provide the secondary IP address of the post office volume. If you are running the POA in protected memory, add the `/user` and `/password` startup switches so the POA can access the volume.

See [“Editing Clustered Agent Startup Files”](#) on page 47.

- ❑ Modify the post office volume resource load script:
 - ◆ Remove the `trustmig` command
 - ◆ Add the `search add` command (optional)
 - ◆ If you will *not* run the POA in protected memory, add the `set auto restart` commands and the `set developer option = off` command
 - ◆ Add the POA `load` command
 - ◆ If you *will* run the POA in protected memory, add the `address space` parameter to the POA `load` command and add a corresponding `protection restart` command for the address space

See [“Modifying the Volume Resource Load Script for the Agents”](#) on page 48.

- ❑ Modify the post office volume resource unload script:
 - ◆ Add the POA or address space `unload` command
 - ◆ Remove the `trustmig` command

See [“Modifying the Volume Resource Unload Script for the Agents”](#) on page 49.

- ❑ Set up the post office volume failover path and policies.

See [“Setting the Failover Path and Policies for the Agents”](#) on page 50.

- ❑ Test your new clustered post office.

See [Section 3.6, “Testing Your Clustered GroupWise System,”](#) on page 54.

- ❑ Record cluster-specific information in the properties pages of the GroupWise objects that the information pertains to.

See [Section 3.7, “Managing Your Clustered GroupWise System,”](#) on page 55.

4 Implementing the Internet Agent in a NetWare Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 2, “Planning GroupWise in a NetWare Cluster,”](#) on page 19 and [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39. As part of this process, the [“System Clustering Worksheet”](#) on page 33 and the [“IP Address Worksheet”](#) on page 35 were filled out. If you do not have access to the filled-out worksheets, print the worksheets now and fill in the clustering and network address information as it currently exists on your system. You need this information as you implement the Internet Agent in a cluster.

- ♦ [Section 4.1, “Planning the Internet Agent in a Cluster,”](#) on page 63
- ♦ [Section 4.2, “Setting Up the Internet Agent in a Cluster,”](#) on page 67
- ♦ [Section 4.3, “Managing the Internet Agent in a Cluster,”](#) on page 76
- ♦ [Section 4.4, “Internet Agent Clustering Worksheet,”](#) on page 77
- ♦ [Section 4.5, “Internet Agent Quick Checklist,”](#) on page 79

4.1 Planning the Internet Agent in a Cluster

A main system configuration difference between a GroupWise system in a clustering environment and a GroupWise system in a regular environment is that you need to create a separate domain to house each GroupWise gateway, including the Internet Agent.

The [Section 4.4, “Internet Agent Clustering Worksheet,”](#) on page 77 lists all the information you need as you set up the Internet Agent in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 4.1.1, “Planning a Domain for the Internet Agent,”](#) on page 64
- ♦ [Section 4.1.2, “Deciding Whether to Cluster-Enable the Internet Agent Volume,”](#) on page 64
- ♦ [Section 4.1.3, “Determining an Appropriate Failover Path for the Internet Agent Volume,”](#) on page 64
- ♦ [Section 4.1.4, “Planning a Secondary IP Address and Cluster-Unique Port Numbers for the Internet Agent and Its MTA,”](#) on page 65
- ♦ [Section 4.1.5, “Preparing Your Firewall for the Internet Agent,”](#) on page 65
- ♦ [Section 4.1.6, “Deciding Where to Install the Internet Agent and Its MTA,”](#) on page 66
- ♦ [Section 4.1.7, “Deciding Whether to Run the Internet Agent and Its MTA in Protected Memory,”](#) on page 66
- ♦ [Section 4.1.8, “Planning the MTA Installation,”](#) on page 66
- ♦ [Section 4.1.9, “Planning the Internet Agent Installation,”](#) on page 67

4.1.1 Planning a Domain for the Internet Agent

The considerations involved in planning a domain for the Internet Agent are much the same as planning any other domain. In preparation, review [“Planning a New Domain”](#), then print and fill out the [“Domain Worksheet”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.

Keep in mind the following cluster-specific details:

- ♦ When you specify the location for the domain directory on the Domain Worksheet, include the shared volume where you want the domain directory to reside.
- ♦ Do not concern yourself with the GroupWise agent information on the Domain Worksheet. You can stop with [item 10](#). You will plan the MTA installation later.

When you have completed the Domain Worksheet, transfer the key information from the Domain Worksheet to the Internet Agent Clustering Worksheet.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 1: Shared Volume for Internet Agent](#), transfer the domain location to the Internet Agent Clustering Worksheet.

Under [Item 2: Internet Agent Domain Name](#), transfer the domain name and database directory to the Internet Agent Clustering Worksheet.

4.1.2 Deciding Whether to Cluster-Enable the Internet Agent Volume

You should plan to cluster-enable the shared volume where the Internet Agent domain will reside. For a review of the benefits of cluster-enabling volumes, see [Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,”](#) on page 23, which describes the issues in the context of planning MTA and POA installations.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 1: Shared Volume for Internet Agent](#), mark Yes under Cluster Enabled?.

Cluster-enabling relies on successful short name resolution throughout your system. Review [Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,”](#) on page 25, which describes the issues in the context of planning MTA and POA installations.

4.1.3 Determining an Appropriate Failover Path for the Internet Agent Volume

As with the MTA and the POA, you need to decide which nodes in the cluster would be appropriate locations for the Internet Agent volume to fail over to. For a review of failover paths, see [“Determining Appropriate Failover Paths for the Agents”](#) on page 29, which describes the issues in the context of planning MTA and POA installations.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 3: Internet Agent Failover Path](#), list the nodes that you want to have in the Internet Agent volume failover path.

4.1.4 Planning a Secondary IP Address and Cluster-Unique Port Numbers for the Internet Agent and Its MTA

As with the MTA and the POA, the Internet Agent needs a secondary IP address and cluster-unique port numbers. As part of planning to install the MTA and POA, you should already have determined the secondary IP address and cluster-unique port numbers for the Internet Agent and its MTA as you filled out the “[IP Address Worksheet](#)” on page 35. If you do not have a filled-out copy of this worksheet for your system, print it now and fill in current system information.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 5: MTA Network Information](#), transfer the MTA secondary IP address and cluster-unique port numbers from the Internet Agent section of the IP Address Worksheet to the Internet Agent Clustering Worksheet.

Under [Item 1: Shared Volume for Internet Agent](#), copy the MTA secondary IP address under Cluster Volume IP Address as well, because they are the same.

Under [Item 7: Internet Agent Network Information](#), transfer the Internet Agent secondary IP address (the same as for its MTA) and the cluster-unique Internet Agent port number from the Internet Agent section of the IP Address Worksheet to the Internet Agent Clustering Worksheet.

4.1.5 Preparing Your Firewall for the Internet Agent

The Internet Agent receives incoming messages on the secondary IP address of the Internet Agent domain volume. Your firewall configuration must be modified to allow inbound TCP/IP traffic from the Internet to the Internet Agent secondary IP address on the following standard ports:

Table 4-1 Standard Ports

Protocol	Standard Port
IMAP4	143
LDAP	389
POP3	110
SMTP	25

By default, the Internet Agent sends outgoing messages on the *primary IP address of the server where it is running*. If you decide to use this default configuration, your firewall must be configured to allow outbound TCP/IP traffic from all nodes in the Internet Agent volume failover path.

If the Internet Agent has a large number of nodes on its failover path, you could configure the Internet Agent to send outgoing messages to a relay host, which would then send them out through the firewall using its own IP address rather than the address of the particular node where the Internet Agent was running. This reduces the amount of modification to your firewall required to set up the Internet Agent. However, if the relay host goes down, outgoing messages are delayed.

As another alternative, you can configure the Internet Agent to use its secondary IP address for sending as well as receiving messages. Setup instructions for this configuration are provided in “[Forcing Use of the Internet Agent Secondary IP Address](#)” on page 75, which you can complete after installing the Internet Agent.

In preparation for installing the Internet Agent, configure your firewall as needed to handle the Internet Agent's use of primary and secondary IP addresses when sending and receiving messages.

4.1.6 Deciding Where to Install the Internet Agent and Its MTA

As with the MTA and the POA, you can choose to install the Internet Agent and its MTA to the `sys:\system` directory of each node or to a `vol:\system` directory on the Internet Agent volume. For a discussion of these alternatives, see [“Deciding Where to Install the Agent Software” on page 29](#), which describes the issues in the context of planning MTA and POA installations. If you only have one Internet Agent for your GroupWise system with several servers in its failover path, it is an easy choice: Install it once to a `vol:\system` directory on the Internet Agent volume.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 4: MTA Installation Location](#) and [Item 6: Internet Agent Installation Location](#), mark whether you will install the Internet Agent and its MTA to a `vol:\system` directory on the Internet Agent volume or to `sys:\system` on each node in the cluster. If necessary, specify where the MTA startup file and the Internet Agent configuration file will be stored.

4.1.7 Deciding Whether to Run the Internet Agent and Its MTA in Protected Memory

As with the MTA and the POA, you can choose whether to run the Internet Agent in protected memory. For a review of the benefits of protected memory, see [“Deciding Whether to Run the Agents in Protected Memory” on page 31](#), which describes the issues in the context of planning MTA and POA installations.

You might think that protected memory is not necessary if you have only one Internet Agent for your GroupWise system because it could never fail over to a node where another Internet Agent was running. However, because the Internet Agent in a cluster is installed into its own domain with its own MTA, this MTA could fail over to a node where another MTA was already running. Therefore, it is safest to load the MTA into protected memory. Loading the Internet Agent into protected memory is also recommended. Load each agent into its own memory space and mark each memory space as restartable.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 8: Load Internet Agent and Its MTA in Protected Memory?](#), mark whether you need to run the Internet Agent and its MTA in protected memory. If you do, provide a protected memory address space name for each agent.

4.1.8 Planning the MTA Installation

Follow the instructions in [“Planning the NetWare Agent Installation” on page 32](#), then return to this point. After you follow the instructions, you have a filled-out NetWare Agent Worksheet to use when you install the MTA.

IMPORTANT: Do not install the NetWare MTA until you are instructed to do so in [Section 4.2, “Setting Up the Internet Agent in a Cluster,” on page 67](#).

4.1.9 Planning the Internet Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Internet Agent are the same in a clustering environment as for any other environment. Review the installation instructions in [“NetWare and Windows: Installing the Internet Agent Software”](#) in [“Installing the GroupWise Internet Agent”](#) in the *GroupWise 8 Installation Guide*. You might want to print this section and write down the types of planning information you have provided on worksheets in other sections. You will need this information as you install the Internet Agent in your cluster.

IMPORTANT: Do not install the Internet Agent software until you are instructed to do so in [Section 4.2, “Setting Up the Internet Agent in a Cluster,”](#) on page 67.

4.2 Setting Up the Internet Agent in a Cluster

You should already have reviewed [Section 4.1, “Planning the Internet Agent in a Cluster,”](#) on page 63 and filled out the [Section 4.4, “Internet Agent Clustering Worksheet,”](#) on page 77. You are now ready to complete the following tasks to set up the Internet Agent in a clustering environment:

- ♦ [Section 4.2.1, “Cluster-Enabling a Shared Volume for Use with the Internet Agent,”](#) on page 67
- ♦ [Section 4.2.2, “Creating a Domain for the Internet Agent,”](#) on page 68
- ♦ [Section 4.2.3, “Installing the MTA for the Internet Agent Domain,”](#) on page 68
- ♦ [Section 4.2.4, “Installing and Configuring the Internet Agent in a Cluster,”](#) on page 68
- ♦ [Section 4.2.5, “Testing the Clustered Internet Agent,”](#) on page 75

4.2.1 Cluster-Enabling a Shared Volume for Use with the Internet Agent

To cluster-enable the Internet Agent shared volume:

- 1 Complete the cluster-enabling steps in the applicable section of the cluster documentation for your version of NetWare, as listed in [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,”](#) on page 17.

The Internet Agent Clustering Worksheet provides the volume to cluster-enable, the cluster-enabled volume IP address, and the failover path for the Internet Agent volume.

For a review of the new Novell eDirectory objects that are created when you cluster-enable a shared volume, see [Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,”](#) on page 23.

If you have installed the latest version of ConsoleOne and the Novell Cluster Services snap-in, you can rename the cluster-related objects in case your DNS name server cannot resolve object names that include the underscore (_) character.

- 2 To ensure successful short name resolution, add entries for the Internet Agent virtual server to support your preferred methods of short name resolution, as described in [“Configuring Short Name Resolution”](#) on page 40.
- 3 To ensure that the Internet Agent has incoming and outgoing access to the Internet, make sure your firewall is properly configured, as described in [“Preparing Your Firewall for the Internet Agent”](#) on page 65.
- 4 Continue with [Creating a Domain for the Internet Agent](#).

4.2.2 Creating a Domain for the Internet Agent

The Internet Agent domain will be a secondary domain. To create it, follow the instructions in [Section 3.3, “Creating a New Secondary Domain in a Cluster,” on page 43](#), taking your information from the Internet Agent Clustering Worksheet, rather than the System Clustering Worksheet, then return to this point.

Do not create any post offices in the Internet Agent domain.

Continue with [Installing the MTA for the Internet Agent Domain](#).

4.2.3 Installing the MTA for the Internet Agent Domain

The MTA for the Internet Agent domain can be installed just like any other MTA in your clustered GroupWise system. Follow the instructions in [“Installing the Agent Software in a Cluster” on page 46](#), then return to this point.

You do not need to edit the MTA startup file. You do not need to modify the Volume Resource properties until after you have installed the Internet Agent.

Continue with [Installing and Configuring the Internet Agent in a Cluster](#).

4.2.4 Installing and Configuring the Internet Agent in a Cluster

After you have created a domain for the Internet Agent and installed the MTA for that domain, you are ready to install and configure the Internet Agent.

- ♦ [“Installing the Internet Agent Software in a Cluster” on page 68](#)
- ♦ [“Configuring the Internet Agent Volume Resource to Load and Unload the Internet Agent and Its MTA” on page 69](#)
- ♦ [“Enabling Internet Addressing for Your Clustered GroupWise System” on page 73](#)
- ♦ [“Verifying Internet Agent Object Properties” on page 74](#)

Installing the Internet Agent Software in a Cluster

- 1 Map a drive to the Internet Agent volume ([Internet Agent Clustering Worksheet item 1](#)).

The Internet Agent volume name will be *cluster_volume*. For assistance with mapping a drive to a cluster-enabled volume, see [“Configuring Short Name Resolution” on page 40](#).

- 2 If you selected `vol:\system` on Internet Agent Volume as the Internet Agent installation location ([Internet Agent Clustering Worksheet item 6](#)), create the `vol:\system` directory on the Internet Agent volume accessed in [Step 1](#).

or

If you selected `sys:\system` on Each Node, decide which node you will install the Internet Agent to first, then map a drive to `sys:\system` on that node.

- 3 Start the Internet Agent Installation program and install the NetWare Internet Agent, following the steps provided in [“NetWare and Windows: Installing the Internet Agent Software”](#) in [“Installing the GroupWise Internet Agent”](#) in the *GroupWise 8 Installation Guide*. Keep in mind the following cluster-specific details:
 - ♦ Use the notes you made during [“Planning the Internet Agent Installation” on page 67](#) to fill in the fields during the Internet Agent installation process.

- ♦ In the Installation Path dialog box, be sure to browse through the drive you mapped to the location you chose in [Step 2](#) above. Deselect *Update AUTOEXEC File* and select *Configure GroupWise Agents for Clustering*.
 - ♦ In the GroupWise Domain dialog box, be sure to browse through the drive you mapped in [Step 1](#) to the domain directory ([Internet Agent Clustering Worksheet item 2](#)).
 - ♦ The Internet Agent Installation program creates the `gwia.ncf` file, which includes the `load` command for the Internet Agent. You need this information later when you create the load script for the Volume Resource object.
- 4 If you need to install the Internet Agent to `sys:\system` to each node in the cluster:
 - 4a Repeat [Step 3](#), mapping new drives as needed.
 - 4b If you marked Yes for Consolidate Multiple Configuration Files on Internet Agent Volume? (under [Internet Agent Clustering Worksheet item 6](#)), copy the `gwia.cfg` file to the planned location, then delete it from the `sys:\system` directories to avoid future confusion.
 - 5 Make sure you have completed all the tasks described in “[Installing the GroupWise Internet Agent](#)” in the *GroupWise 8 Installation Guide*.
The Internet Agent starts automatically immediately after Installation.
 - 6 Stop each Internet Agent you have installed before configuring it for clustering.
 - 7 Continue with [Configuring the Internet Agent Volume Resource to Load and Unload the Internet Agent and Its MTA](#).

Configuring the Internet Agent Volume Resource to Load and Unload the Internet Agent and Its MTA

The properties of the Volume Resource object define how the Internet Agent volume functions within the cluster, how NLM programs are loaded and unloaded, and how failover and fallback situations are handled. Complete the following tasks for the Internet Agent volume:

- ♦ “[Modifying the Volume Resource Load Script for the Internet Agent](#)” on page 69
- ♦ “[Modifying the Volume Resource Unload Script for the Internet Agent](#)” on page 71
- ♦ “[Setting the Failover Path and Policies for the Internet Agent](#)” on page 72

Modifying the Volume Resource Load Script for the Internet Agent

The volume resource load script executes whenever the Internet Agent volume comes online.

To set up the load script:

- 1 In ConsoleOne, browse to and select the Cluster object.
If necessary, click *View > Console View* to display its contents.
- 2 Right-click the Volume Resource object (`volume_SERVER`), then click *Properties > Load* to display the default volume resource load script for the Internet Agent volume.

The next step assumes that this is the first time you have edited this load script. If other GroupWise agents are already running from this volume, some of the modifications have already been made.
- 3 Make the following changes to the default load script:
 - ♦ Remove the `trustmig` command. It is not necessary to migrate trustees for the Internet Agent volume. Removing this line helps the load script to execute faster.

- ◆ If you selected `vol:\system` on Internet Agent volume as the installation location ([Internet Agent Clustering Worksheet items 4 and 6](#)), add a `search add` command to add the new `vol:\system` directory to the server search path.

```
search add volume:\system
```

- ◆ If you selected `sys:\system` on each node as the installation location ([Internet Agent Clustering Worksheet items 4 and 6](#)) but you are storing the MTA startup file and the Internet Agent configuration file on the Internet Agent volume, add that location to the server search path.
- ◆ If you marked No under Load Internet Agent and Its MTA in Protected Memory? ([Internet Agent Clustering Worksheet item 8](#)), add the following `abend` recovery options:

```
set auto restart after abend = 2
set auto restart after abend delay time = 0
set auto restart down timeout = 60
set developer option = off
```

These settings provide the best possible handling of GroupWise databases in the event that an `abend` should occur within the cluster.

- ◆ Transfer the MTA load command from the `grpwise.ncf` file located in the `vol:\system` directory into the load script. Use `Ctrl+C` and `Ctrl+V` to copy and paste text into the load script page. Then delete or rename the `grpwise.ncf` file to avoid future confusion.

```
load volume:\system\gwmta.nlm @domain.mta
```

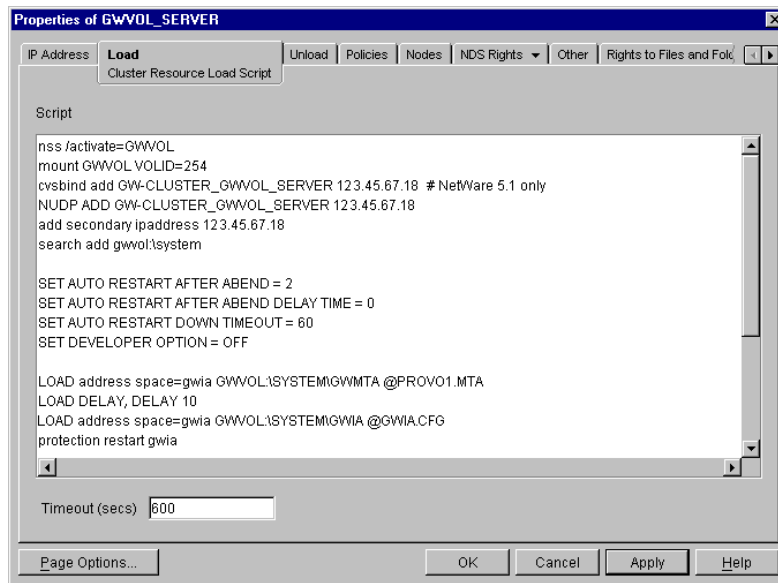
- ◆ Transfer the Internet Agent load command from the `gwia.ncf` file located in the `vol:\system` directory into the load script. Use `Ctrl+C` and `Ctrl+V` to copy and paste text into the load script page. Then delete or rename the `gwia.ncf` file to avoid future confusion.

```
load volume:\system\gwia.nlm @gwia.cfg
```

- ◆ If you marked Yes under Load Internet Agent and Its MTA in Protected Memory? ([Internet Agent Clustering Worksheet item 8](#)), add the `address space` parameter to the `load` commands to specify the protected address space where the Internet Agent and its MTA will run. Add a `protection restart` command for the address space name.

```
load address space=addr_space_name
                        volume:\system\gwmta.nlm @domain.mta
load address space=addr_space_name
                        volume:\system\gwia.nlm @gwia.cfg
protection restart addr_space_name
```

The result would look similar to the following example:



NOTE: The set commands are needed in the load script only when the MTA and the Internet Agent are *not* running in protected memory. The address space parameters are needed in the load commands only when the MTA and the Internet Agent *are* running in protected memory.

For another example of a load script, see TID 7006193: Running the GroupWise Agents in a Non-Protected Address Space on a NetWare Cluster in the [Novell Knowledgebase \(http://www.novell.com/support\)](http://www.novell.com/support).

- 4 Click *Apply* to save the load script.
- 5 If necessary, click *OK* to confirm that you must offline and then online the volume resource in order for the changes to take effect.
- 6 Continue with [Modifying the Volume Resource Unload Script for the Internet Agent](#).

Modifying the Volume Resource Unload Script for the Internet Agent

The volume resource unload script executes whenever the Internet Agent volume goes offline. Programs should be unloaded in the reverse order of how they were loaded. This ensures that supporting programs are not unloaded before programs that rely on them in order to function properly.

To set up the unload script:

- 1 In ConsoleOne, in the properties pages for the Volume Resource object (*volume_SERVER*), click *Unload* to display the default volume resource unload script.

The next step assumes that this is the first time you have edited this unload script. If other GroupWise agents are already running from this volume, some of the modifications have already been made.

- 2 Make the following changes to the default unload script:
 - ♦ If you marked Yes under Load Internet Agent and Its MTA in Protected Memory? ([Internet Agent Clustering Worksheet item 8](#)), add an unload address space command and an unload kill address space command to ensure that the address space is completely cleaned up.

```
unload address space=addr_space_name
unload kill address space=addr_space_name
```

If your system seems to be trying to kill the address space before the Internet Agent and its MTA have been completely unloaded, resulting in the agents hanging in the unloading state, set a delay of several seconds before issuing the `unload kill address space` command to allow the Internet Agent and its MTA adequate time to unload completely. The length of the delay varies from system to system; ten seconds is a good starting place.

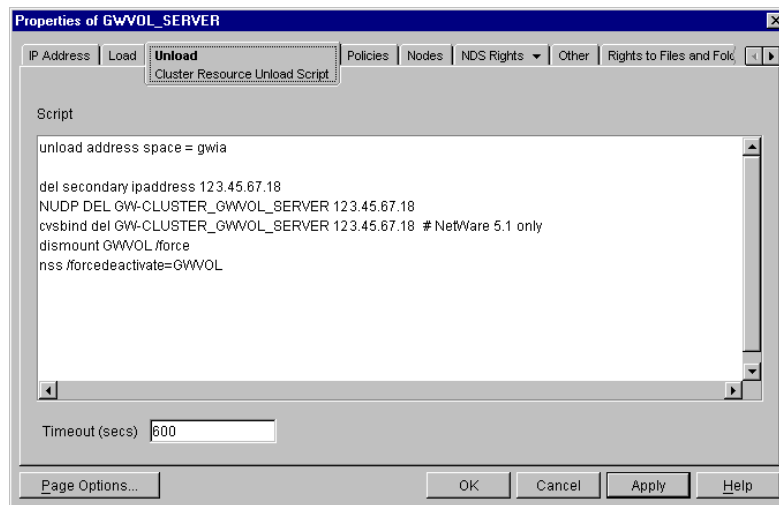
```
unload address space=addr_space_name
delay 10
unload kill address space=addr_space_name
```

- ◆ If you marked No under Load Internet Agent and Its MTA in Protected Memory? ([Internet Agent Clustering Worksheet items 8](#)), create an `unload` command parallel to each `load` command that you placed in the load script.

```
unload gwia.nlm
unload gwmta.nlm
```

- ◆ Remove the `trustmig` command just like you did in the load script.

The result would look similar to the following example:

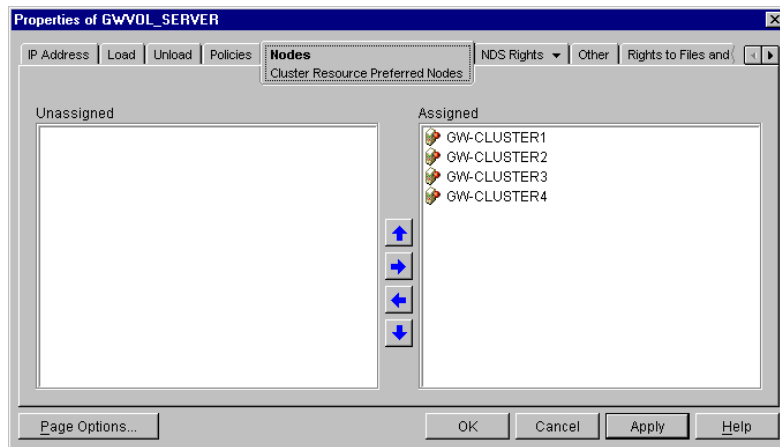


- 3 Click *Apply* to save the unload script.
- 4 If necessary, click *OK* to confirm that you must offline and then online the volume resource in order for the changes to take effect.
- 5 Continue with [Setting the Failover Path and Policies for the Internet Agent](#).

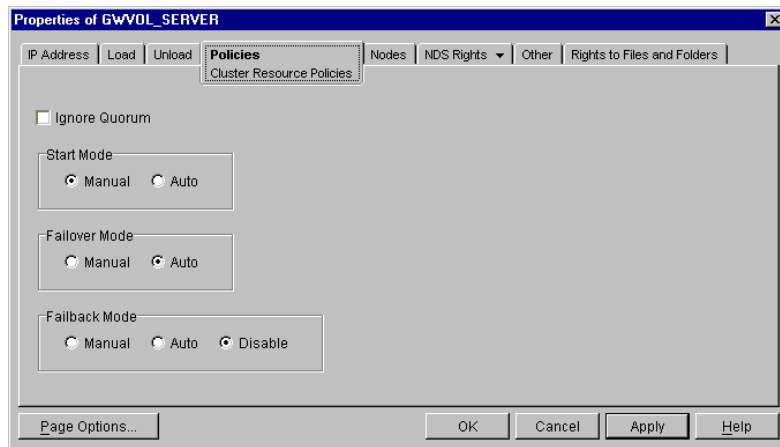
Setting the Failover Path and Policies for the Internet Agent

To modify the failover path and policies for the Internet Agent volume resource:

- 1 In ConsoleOne, in the properties pages for the Volume Resource object (*volume_SERVER*), click *Nodes* to display the default failover path for the Internet Agent volume resource.



- 2 Arrange the nodes in the cluster into the desired failover path for the Internet Agent volume ([Internet Agent Clustering Worksheet item 3](#)).
- 3 Click *Apply* to save the failover path.
- 4 Click *Policies* to display the default start, failover, and fallback policies.



The default policy settings are often appropriate. By default, a volume resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover path
- ◆ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the applicable section about failover and fallback modes in the cluster documentation for your version of NetWare, as listed in [Chapter 1, "Introduction to GroupWise 8 and Novell Cluster Services on NetWare,"](#) on page 17.

- 5 Click *OK* when you are finished editing the Internet Agent volume resource properties.
- 6 Continue with [Enabling Internet Addressing for Your Clustered GroupWise System](#).

Enabling Internet Addressing for Your Clustered GroupWise System

Setting up Internet addressing for a clustered Internet Agent is no different from setting it up for an Internet Agent in a any other environment. Follow the instructions in "[Enabling Internet Addressing](#)" in "[System](#)" in the *GroupWise 8 Administration Guide*, then return to this point.

Verifying Internet Agent Object Properties

During installation of the Internet Agent, the Internet Agent object should have been configured correctly. However, it can be helpful to verify certain cluster-specific information in order to familiarize yourself with the configuration of a clustered Internet Agent.

- ♦ [“Accessing Internet Agent Object Properties” on page 74](#)
- ♦ [“Verifying the Reference to the Volume Resource” on page 74](#)
- ♦ [“Verifying the Reference to the Virtual Server” on page 74](#)
- ♦ [“Verifying Post Office Links” on page 74](#)
- ♦ [“Forcing Use of the Internet Agent Secondary IP Address” on page 75](#)

Accessing Internet Agent Object Properties

- 1 In ConsoleOne, browse to and select the Internet Agent domain in order to display its contents.
- 2 Right-click the Internet Agent object, then click *Properties*.
- 3 Continue with [Verifying the Reference to the Volume Resource](#).

Verifying the Reference to the Volume Resource

In the Internet Agent object properties pages:

- 1 Click *SMTP/MIME > Settings*.
- 2 Verify the contents of the *Hostname/DNS "A Record" Name* field.
It displays the hostname as currently configured in DNS. It should match the Volume Resource object name (*volume_SERVER*) of the Internet Agent volume, not the name of a physical server in the cluster.
- 3 Make changes if necessary.
- 4 Continue with [Verifying the Reference to the Virtual Server](#).

Verifying the Reference to the Virtual Server

In the Internet Agent object properties pages:

- 1 Click *Server Directories*.
- 2 Verify that the displayed directories match the virtual server name (*cluster_volume_SERVER*) associated with the Volume Resource object, not the name of a physical server in the cluster.
- 3 Make changes if necessary.
- 4 Continue with [Verifying Post Office Links](#).

Verifying Post Office Links

In the Internet Agent object properties pages:

- 1 Click *Post Office Links*.
- 2 Verify that the Access Mode column displays C/S (for client/server mode) for all post offices serviced by the Internet Agent.
- 3 Verify that the Links column displays the secondary IP addresses of the GroupWise volumes where post offices reside, not the IP addresses of any physical servers in the cluster.

- 4 Make changes if necessary.
- 5 Continue with [Forcing Use of the Internet Agent Secondary IP Address](#).

Forcing Use of the Internet Agent Secondary IP Address

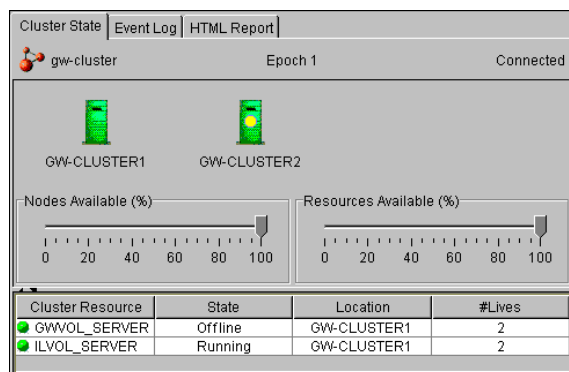
If you want the Internet Agent to send outgoing messages on its secondary IP address, rather than using the default of its primary IP address:

- 1 Click *GroupWise > Network Address*.
- 2 In the *TCP/IP Address* field, provide the secondary IP address (under [Internet Agent Clustering Worksheet item 1](#)) for the Internet Agent to use for sending outgoing messages.
- 3 Click *SMTP/MIME*, then click *Settings*.
- 4 Select *Bind to TCP/IP Address at Connection Time*.
- 5 Click *OK*.
- 6 Continue with [Testing the Clustered Internet Agent](#).

4.2.5 Testing the Clustered Internet Agent

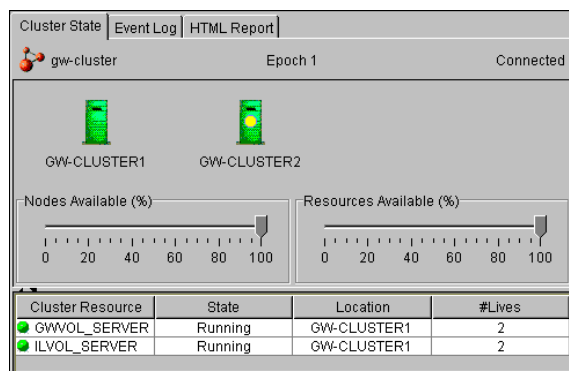
After you have configured the Internet Agent volume resource, you can test the load and unload scripts by bringing the Internet Agent volume online and taking it offline again.

- 1 In ConsoleOne, select the Cluster object, then click *View > Cluster State*.



The new Internet Agent volume resource shows *Offline* in the *State* column.

- 2 Click the new Internet Agent volume resource, then click *Online*.



The *State* column for the volume resource now displays *Running*.

- 3 Observe the server console where the Internet Agent and its MTA are loading to see that they start and run correctly.
If you are using protected memory, you can use the `protection` command at the server console prompt to list all the address spaces on the node and what NLM programs are running in each one.
- 4 Click the new Internet Agent volume resource, then click *Offline*.
The *State* column for the volume resource returns to *Offline*.
- 5 Observe the server console where the Internet Agent and its MTA are unloading to see that they shut down correctly.
If you are using protected memory, you can use the `protection` command again to make sure that the address space used by the Internet Agent and its MTA is no longer present.
- 6 Repeat [Step 2](#) whenever you are ready to bring the new Internet Agent volume resource online permanently.
On NetWare 6.5, these actions can also be performed from your Web browser. See [“Using Novell Remote Manager on NetWare 6.5” on page 56](#).
- 7 Continue with [Managing the Internet Agent in a Cluster](#).

4.3 Managing the Internet Agent in a Cluster

After you have installed the Internet Agent in a cluster, you should consider some long-term management issues.

- ♦ [Section 4.3.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,” on page 76](#)
- ♦ [Section 4.3.2, “Knowing What to Expect in an Internet Agent Failover Situation,” on page 77](#)

4.3.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After installing the Internet Agent in your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record that cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information recorded in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information about the Internet Agent Domain and Its MTA” on page 76](#)
- ♦ [“Recording Cluster-Specific Information about the Internet Agent” on page 77](#)

Recording Cluster-Specific Information about the Internet Agent Domain and Its MTA

To permanently record important cluster-specific information for the Internet Agent domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the Internet Agent domain Identification page, provide a cluster-specific description of the Internet Agent domain, including the secondary IP address of its cluster-enabled volume and the cluster-unique port numbers used by its MTA.
- 3 Click *OK* to save the Internet Agent domain description.
- 4 Select the Internet Agent Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.

- 6 In the *Description* field of the MTA Identification page, record the secondary IP address of the cluster-enabled Internet Agent domain volume and the cluster-unique port numbers used by the MTA.

This information appears on the MTA console, no matter which node in the cluster it is currently running on.

- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information about the Internet Agent](#).

Recording Cluster-Specific Information about the Internet Agent

With the contents of the Internet Agent domain still displayed:

- 1 Right-click the Internet Agent object, then click *Properties*.
- 2 Click *GroupWise*, then click *Identification*.
- 3 In the *Description* field, record the secondary IP address of the cluster-enabled Internet Agent domain volume and the cluster-unique port numbers used by the Internet Agent.
This information appears on the Internet Agent console, no matter which node in the cluster it is currently running on.
- 4 Click *OK* to save the Internet Agent information.
- 5 Continue with [Knowing What to Expect in an Internet Agent Failover Situation](#).

4.3.2 Knowing What to Expect in an Internet Agent Failover Situation

The failover behavior of the MTA for the Internet Agent domain is the same as for an MTA in a regular domain. See [“Knowing What to Expect in MTA and POA Failover Situations”](#) on page 59.

Failover of the Internet Agent itself is more complex. The various clients (POP3, IMAP4, and LDAP) receive an error message that the node is not available. Most of the clients do not attempt to reconnect automatically, so the user must exit the client and restart it to reestablish the connection after the failover process is complete. Fortunately, the Internet Agent restarts quickly in its failover location so users can reconnect quickly.

As with the MTA and the POA, migration of the Internet Agent takes longer than failover. In fact, the Internet Agent can seem especially slow to shut down properly as it finishes its normal processing and stops its threads. For a busy Internet Agent, you might need to wait several minutes for it to shut down properly.

4.4 Internet Agent Clustering Worksheet

Item	Explanation
1) Shared Volume for Internet Agent:	Specify the name (<i>cluster_volume</i>) of the shared volume where the Internet Agent domain will be created.
Cluster Enabled?	For cluster-enabling, specify the IP addresses of the virtual server (<i>volume_SERVER.cluster</i>) to which the cluster-enabled volume is tied.
<ul style="list-style-type: none"> ◆ Yes (highly recommended) 	
Cluster volume IP address	For more information, see “Deciding Whether to Cluster-Enable the Internet Agent Volume” on page 64.
<ul style="list-style-type: none"> ◆ No 	

Item	Explanation
2) Internet Agent Domain Name: Domain Database Location:	Specify a unique name for the Internet Agent domain. Specify the directory on the Internet Agent volume where you want to create the new domain. For more information, see “Planning a Domain for the Internet Agent” on page 64.
3) Internet Agent Failover Path:	List other nodes in the cluster where the Internet Agent and its MTA could fail over. For more information, see “Determining an Appropriate Failover Path for the Internet Agent Volume” on page 64.
4) MTA Installation Location: <ul style="list-style-type: none"> ◆ <code>vol:\system</code> on Internet Agent volume ◆ <code>sys:\system</code> on each node Consolidate multiple MTA startup files on Internet Agent volume?	Mark the location where you will install the MTA software. If necessary, specify the location where you will consolidate multiple MTA startup files on an Internet Agent volume. For more information, see “Deciding Where to Install the Internet Agent and Its MTA” on page 66.
5) MTA Network Information: <ul style="list-style-type: none"> ◆ MTA IP address ◆ MTA message transfer port ◆ MTA live remote port ◆ MTA HTTP port 	Gather the MTA network address information from the Internet Agent section of the “IP Address Worksheet” on page 35. For more information, see “Planning a Secondary IP Address and Cluster-Unique Port Numbers for the Internet Agent and Its MTA” on page 65.
6) Internet Agent Installation Location: <ul style="list-style-type: none"> ◆ <code>vol:\system</code> on the Internet Agent volume ◆ <code>sys:\system</code> on each node Consolidate multiple Internet Agent configuration files on Internet Agent volume?	Mark the location where you will install the Internet Agent software. If necessary, specify the location where you will consolidate multiple Internet Agent configuration files (<code>gwia.cfg</code>) on an Internet Agent volume. For more information, see “Deciding Where to Install the Internet Agent and Its MTA” on page 66.
7) Internet Agent Network Information: <ul style="list-style-type: none"> ◆ Internet Agent IP address ◆ Internet Agent HTTP port 	Gather the Internet Agent network address information from the Internet Agent section of the “IP Address Worksheet” on page 35. For more information, see “Planning a Secondary IP Address and Cluster-Unique Port Numbers for the Internet Agent and Its MTA” on page 65.

Item	Explanation
8) Load Internet Agent and Its MTA in Protected Memory?	Mark whether you need to run the Internet Agent and its MTA in protected memory. If so, specify a unique address space for each agent.
<ul style="list-style-type: none"> ◆ No ◆ Yes 	For more information, see “Deciding Whether to Run the Internet Agent and Its MTA in Protected Memory” on page 66.
Protected address space names:	
<ul style="list-style-type: none"> ◆ MTA: ◆ Internet Agent: 	

4.5 Internet Agent Quick Checklist

- Plan the new clustered Internet Agent, including the new domain required to house the Internet Agent in a clustering environment.
See [Section 4.1, “Planning the Internet Agent in a Cluster,”](#) on page 63.
- Make sure your firewall is configured to accommodate the Internet Agent.
See [Section 4.1.5, “Preparing Your Firewall for the Internet Agent,”](#) on page 65.
- Cluster-enable the volume where the Internet Agent domain will reside.
See [Section 5.3.1, “Cluster-Enabling a Shared Volume for Use with the WebAccess Agent,”](#) on page 85.
- Create the new Internet Agent domain.
See [Section 4.2.2, “Creating a Domain for the Internet Agent,”](#) on page 68.
- Set up the MTA for the new Internet Agent domain.
See [Section 4.2.3, “Installing the MTA for the Internet Agent Domain,”](#) on page 68.
- Install the Internet Agent.
See [“Installing the Internet Agent Software in a Cluster”](#) on page 68.
- Modify the Internet Agent volume resource load script:
 - ◆ Remove the `trustmig` command
 - ◆ Add the `search add` command (optional)
 - ◆ If you will *not* run the MTA and the Internet Agent in protected memory, add the `set auto restart` commands and the `set developer option = off` command
 - ◆ Add the `load` commands for the MTA and the Internet Agent, separating them with a `delay` command
 - ◆ If you *will* run the MTA and the Internet Agent in protected memory, add the address space parameter to the `load` commands and add a `protection restart` command for the address space
 See [“Modifying the Volume Resource Load Script for the Internet Agent”](#) on page 69.
- Modify the Internet Agent volume resource unload script:
 - ◆ Add the MTA and Internet Agent or address space unload command(s)
 - ◆ Remove the `trustmig` command

- See [“Modifying the Volume Resource Unload Script for the Internet Agent”](#) on page 71.
- ❑ Set up the Internet Agent volume failover path and policies.
See [“Setting the Failover Path and Policies for the Internet Agent”](#) on page 72.
 - ❑ Enable Internet Addressing for the clustered Internet Agent.
See [“Enabling Internet Addressing for Your Clustered GroupWise System”](#) on page 73.
 - ❑ Double-check the cluster-specific Internet Agent object properties.
See [“Verifying Internet Agent Object Properties”](#) on page 74.
 - ❑ Test the clustered Internet Agent.
See [Section 4.2.5, “Testing the Clustered Internet Agent,”](#) on page 75.
 - ❑ Record cluster-specific information in the properties pages of the GroupWise objects associated with the Internet Agent.
See [Section 4.3.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 76.

5 Implementing WebAccess in a NetWare Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 2, “Planning GroupWise in a NetWare Cluster,”](#) on page 19 and [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39. As part of this process, the [“System Clustering Worksheet”](#) on page 33 and the [“IP Address Worksheet”](#) on page 35 were filled out. If you do not have access to the filled-out worksheets, print the worksheets now and fill in the clustering and network address information as it currently exists on your system. You need this information as you implement WebAccess in a cluster.

- ♦ [Section 5.1, “Understanding the WebAccess Components,”](#) on page 81
- ♦ [Section 5.2, “Planning WebAccess in a Cluster,”](#) on page 82
- ♦ [Section 5.3, “Setting Up WebAccess in a Cluster,”](#) on page 85
- ♦ [Section 5.4, “Managing WebAccess in a Cluster,”](#) on page 92
- ♦ [Section 5.5, “WebAccess Clustering Worksheet,”](#) on page 94
- ♦ [Section 5.6, “WebAccess Quick Checklist,”](#) on page 95

5.1 Understanding the WebAccess Components

If you are not familiar with GroupWise WebAccess, review [“GroupWise WebAccess Overview”](#) in [“Installing GroupWise WebAccess”](#) in the *GroupWise 8 Installation Guide*.

As you plan WebAccess in a clustering environment, you must keep in mind that WebAccess consists of two components:

- ♦ WebAccess Agent (`gwinter.nlm`) that will be associated with a GroupWise WebAccess domain in the cluster
- ♦ WebAccess Application (a Java servlet) that will be added to your Web server. You can install the WebAccess Application on a clustered Web server or a non-clustered Web server. How to set up and manage a clustered Web server is beyond the scope of the GroupWise documentation. If you have not clustered your Web server, you can install the WebAccess Application on a server that is outside of the cluster where the WebAccess Agent is installed.

5.2 Planning WebAccess in a Cluster

A main system configuration difference between a GroupWise system in a clustering environment and a GroupWise system in a regular environment is that you need to create a separate domain to house each GroupWise gateway, including the WebAccess Agent.

Section 5.5, “WebAccess Clustering Worksheet,” on page 94 lists all the information you need as you set up the WebAccess Agent in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- Section 5.2.1, “Planning a New Domain for the WebAccess Agent,” on page 82
- Section 5.2.2, “Deciding Whether to Cluster-Enable the WebAccess Agent Volume,” on page 82
- Section 5.2.3, “Determining an Appropriate Failover Path for the WebAccess Agent Volume,” on page 83
- Section 5.2.4, “Planning a Secondary IP Address and Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA,” on page 83
- Section 5.2.5, “Deciding Where to Install the WebAccess Agent and Its MTA,” on page 83
- Section 5.2.6, “Deciding Whether to Run the WebAccess Agent and Its MTA in Protected Memory,” on page 84
- Section 5.2.7, “Planning the MTA Installation,” on page 84
- Section 5.2.8, “Planning the WebAccess Installation,” on page 84

5.2.1 Planning a New Domain for the WebAccess Agent

The considerations involved in planning a domain for the WebAccess Agent are much the same as planning any other domain. In preparation, review “Planning a New Domain”, then print and fill out the “Domain Worksheet” in “Domains” in the *GroupWise 8 Administration Guide*.

Keep in mind the following cluster-specific details:

- When you specify the location for the domain directory on the Domain Worksheet, include the shared volume where you want the domain directory to reside.
- Do not concern yourself with the GroupWise agent information on the Domain Worksheet. You can stop with [item 10](#). You will plan the MTA installation later.

When you have completed the Domain Worksheet, transfer the key information from the Domain Worksheet to the WebAccess Clustering Worksheet.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 1: Shared Volume for WebAccess Agent](#), transfer the domain location from the Domain Worksheet to the WebAccess Clustering Worksheet.

Under [Item 2: WebAccess Agent Domain Name](#), transfer the domain name and database directory from the Domain Worksheet to the WebAccess Clustering Worksheet.

5.2.2 Deciding Whether to Cluster-Enable the WebAccess Agent Volume

You should plan to cluster-enable the shared volume where the WebAccess Agent domain will reside. For a review of the benefits of cluster-enabling volumes, see [Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,”](#) on page 23, which describes the issues in the context of planning MTA and POA installations.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 1: Shared Volume for WebAccess Agent](#), mark Yes under Cluster Enabled?.

Cluster-enabling relies on successful short name resolution throughout your system. Review [Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,” on page 25](#), which describes the issues in the context of planning MTA and POA installations.

5.2.3 Determining an Appropriate Failover Path for the WebAccess Agent Volume

As with the MTA and the POA, you need to decide which nodes in the cluster are appropriate locations where the WebAccess Agent volume could fail over. For a review of failover paths, see [“Determining Appropriate Failover Paths for the Agents” on page 29](#), which describes the issues in the context of planning MTA and POA installations.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 4: WebAccess Agent Failover Path](#), list the nodes that you want to have in the WebAccess Agent volume failover path.

5.2.4 Planning a Secondary IP Address and Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA

As with the MTA and the POA, the WebAccess Agent needs a secondary IP address and cluster-unique port numbers. As part of planning to install the MTA and POA, you should already have determined the secondary IP address and cluster-unique port numbers for the WebAccess Agent and its MTA as you filled out the [“IP Address Worksheet” on page 35](#). If you do not have a filled-out copy of this worksheet for your system, print it now and fill in current system information.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 6: MTA Network Information](#), transfer the MTA secondary IP address and cluster-unique port numbers from the WebAccess section the IP Address Worksheet to the WebAccess Clustering Worksheet.

Under [Item 1: Shared Volume for WebAccess Agent](#), copy the MTA secondary IP address under Cluster Volume IP Address as well, because they are the same.

Under [Item 8: WebAccess Agent Network Information](#), transfer the WebAccess Agent secondary IP address (the same as for its MTA) and the cluster-unique WebAccess Agent port number from the WebAccess section of the IP Address Worksheet to the WebAccess Clustering Worksheet.

5.2.5 Deciding Where to Install the WebAccess Agent and Its MTA

As with the MTA and the POA, you can choose to install the WebAccess Agent and its MTA to the `sys:\system` directory of each node or to a `vol:\system` directory on the WebAccess Agent volume. For a discussion of these alternatives, see [“Deciding Where to Install the Agent Software” on page 29](#), which describes the issues in the context of planning MTA and POA installations. If you only have one WebAccess Agent for your GroupWise system with several nodes in its failover path, it is an easy choice.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 5: MTA Installation Location](#) and [Item 7: WebAccess Agent Installation Location](#), mark whether you will install the WebAccess Agent and its MTA to `sys:\system` on each node in the cluster or to a `vol:\system` directory on the WebAccess Agent volume. Also specify where the MTA startup file will be stored.

5.2.6 Deciding Whether to Run the WebAccess Agent and Its MTA in Protected Memory

As with the MTA and the POA, you can choose whether to run the WebAccess Agent in protected memory. For a review of the benefits of protected memory, see [“Deciding Whether to Run the Agents in Protected Memory” on page 31](#), which describes the issues in the context of planning MTA and POA installations.

You might think that protected memory is not necessary if you have only one WebAccess Agent for your GroupWise system because it could never fail over to a node where another WebAccess Agent was running. However, because the WebAccess Agent in a cluster is installed into its own domain with its own MTA, this MTA could fail over to a node where another MTA was already running. Therefore, it is safest to load the WebAccess Agent and its MTA into protected memory. Load each agent into its own memory space and mark each memory space as restartable.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 8: Load WebAccess Agent and Its MTA in Protected Memory?](#), mark whether you need to run the WebAccess Agent and its MTA in protected memory. If you do, provide a protected memory address space name for each agent.

5.2.7 Planning the MTA Installation

Follow the instructions in [“Planning the NetWare Agent Installation” on page 32](#), then return to this point. After you follow the instructions, you will have a filled-out NetWare Agent Worksheet to use when you install the MTA.

IMPORTANT: Do not install the NetWare MTA until you are instructed to do so in [Section 5.3, “Setting Up WebAccess in a Cluster,” on page 85](#).

5.2.8 Planning the WebAccess Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install WebAccess are the same in a clustering environment as for any other environment. Review [“Planning GroupWise WebAccess”](#), then print and fill out the [“GroupWise WebAccess Installation Summary Sheets”](#) in [“Installing GroupWise WebAccess”](#) in the [GroupWise 8 Installation Guide](#). When you set up WebAccess in a cluster, you install the WebAccess Agent and the WebAccess Application in two separate steps:

- ♦ [“Planning the WebAccess Agent Installation” on page 85](#)
- ♦ [“Planning the WebAccess Application Installation” on page 85](#)

IMPORTANT: Do not install the WebAccess software until you are instructed to do so in [Section 5.3, “Setting Up WebAccess in a Cluster,”](#) on page 85.

Planning the WebAccess Agent Installation

For the WebAccess Agent, fill out items 2 through 12 on the GroupWise WebAccess Installation Worksheet, taking into account the following cluster-specific issues:

WEBACCESS INSTALLATION WORKSHEET

Under [Server Information: Installation Path](#), take into account your decision recorded on the WebAccess Clustering Worksheet ([Item 7: WebAccess Agent Installation Location](#)).

Under [Server Address](#), transfer the IP address and port number from the WebAccess Clustering Worksheet ([Item 8: WebAccess Agent Network Information](#)) filled out in [“Planning a Secondary IP Address and Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA”](#) on page 83.

Under [Server Address: Configure the WebAccess Agent for Clustering](#), mark Yes. This causes the WebAccess Installation program to customize the WebAccess files for clustering.

Under [Gateway Directory: Domain Directory Path](#), transfer the domain directory from the Domain Worksheet you filled out in [“Planning a New Domain for the WebAccess Agent”](#) on page 82.

Planning the WebAccess Application Installation

The WebAccess Application can be installed on a clustered or non-clustered Web server. How to set up and manage a clustered Web server is beyond the scope of the GroupWise documentation. For WebAccess Application planning information, see [“Determining the WebAccess and WebPublisher Applications’ Configuration”](#) in [“Installing GroupWise WebAccess”](#) in the *GroupWise 8 Installation Guide*.

5.3 Setting Up WebAccess in a Cluster

You should already have reviewed [Section 5.2, “Planning WebAccess in a Cluster,”](#) on page 82 and filled out the [Section 5.5, “WebAccess Clustering Worksheet,”](#) on page 94. You are now ready to complete the following tasks to set up the WebAccess Agent in a clustering environment:

- ♦ [Section 5.3.1, “Cluster-Enabling a Shared Volume for Use with the WebAccess Agent,”](#) on page 85
- ♦ [Section 5.3.2, “Creating a Domain for the WebAccess Agent,”](#) on page 86
- ♦ [Section 5.3.3, “Installing the MTA for the WebAccess Agent Domain,”](#) on page 86
- ♦ [Section 5.3.4, “Installing and Configuring the WebAccess Agent in a Cluster,”](#) on page 86
- ♦ [Section 5.3.5, “Testing Your Clustered WebAccess Installation,”](#) on page 92

5.3.1 Cluster-Enabling a Shared Volume for Use with the WebAccess Agent

- 1 Complete the cluster-enabling steps in the applicable section of cluster documentation for your version of NetWare, as listed in [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,”](#) on page 17.

The WebAccess Clustering Worksheet provides the volume to cluster-enable, the cluster-enabled volume IP address, and the failover path for the WebAccess volume.

For a review of the new Novell eDirectory objects that are created when you cluster-enable a shared volume, see [Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,”](#) on page 23.

If you have installed the latest version of ConsoleOne and the Novell Cluster Services snap-in, you can rename the cluster-related objects in case your DNS name server cannot resolve object names that include the underscore (_) character.

- 2 To ensure successful short name resolution, add entries for the WebAccess Agent virtual server to support your preferred methods of short name resolution, as described in [“Configuring Short Name Resolution”](#) on page 40.
- 3 Continue with [Creating a Domain for the WebAccess Agent](#).

5.3.2 Creating a Domain for the WebAccess Agent

The WebAccess Agent domain will be a secondary domain. To create it, follow the instructions in [Section 3.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 43, taking your information from the WebAccess Clustering Worksheet, rather than the System Clustering Worksheet, then return to this point.

Do not create any post offices in the WebAccess Agent domain.

Continue with [Installing the MTA for the WebAccess Agent Domain](#).

5.3.3 Installing the MTA for the WebAccess Agent Domain

The MTA for the WebAccess Agent domain can be installed just like any other MTA in your clustered GroupWise system. Follow the instructions in [“Installing the Agent Software in a Cluster”](#) on page 46, then return to this point.

You do not need to edit the MTA startup file. You do not need to modify the Volume Resource properties until after you have installed the WebAccess Agent.

Continue with [Installing and Configuring the WebAccess Agent in a Cluster](#).

5.3.4 Installing and Configuring the WebAccess Agent in a Cluster

After you have created a domain for the WebAccess Agent and installed the MTA for that domain, you are ready to install and configure the WebAccess Agent.

- ♦ [“Installing the WebAccess Agent Software in a Cluster”](#) on page 86
- ♦ [“Configuring the WebAccess Agent Volume Resource to Load and Unload the WebAccess Agent and Its MTA”](#) on page 87

Installing the WebAccess Agent Software in a Cluster

The WebAccess Agent is the component of your WebAccess installation that accesses post offices and libraries to retrieve information for WebAccess client users.

- 1 Map a drive to the WebAccess Agent volume ([WebAccess Clustering Worksheet item 1](#)) where the WebAccess domain is located.

The WebAccess Agent volume name will be *cluster_volume*. For assistance with mapping a drive to a cluster-enabled volume, see [“Configuring Short Name Resolution”](#) on page 40.

- 2 If you selected `vol:\system` on WebAccess Agent volume as the WebAccess Agent installation location ([WebAccess Clustering Worksheet item 7](#)), create the `vol:\system` directory on the WebAccess Agent volume accessed in [Step 1](#).
or
if you selected `sys:\system` on each node, decide which node you will install the WebAccess agent to first, then map a drive to its `sys:\system` directory.
- 3 Start the WebAccess Installation program and install the NetWare WebAccess Agent, following Step 1 through Step 5 provided in [“Installing the WebAccess Agent”](#) in [“Installing GroupWise WebAccess”](#) in the [GroupWise 8 Installation Guide](#). Keep in mind the following cluster-specific details:
 - ◆ In the Components dialog box, select only *GroupWise WebAccess Agent*.
Do not install the WebAccess Application at this time.
 - ◆ Use items 2 through 12 on the GroupWise WebAccess Installation Worksheet that you filled out in [“Planning the WebAccess Installation”](#) on [page 84](#) to fill in the fields during the WebAccess Agent installation process.
 - ◆ In the Network Address dialog box, select *Configure GroupWise Agents for Clustering*.
 - ◆ In the Installation Path dialog box, be sure to browse through the drive you mapped to the location you chose in [Step 2](#) above.
 - ◆ In the Gateway Directory dialog box, be sure to browse to the domain directory through the drive you mapped in [Step 1](#) above.
 - ◆ In the Start Applications dialog box, deselect *Start the GroupWise WebAccess Agent*.
 - ◆ The WebAccess Installation program creates the `strtweb.ncf` and `stopweb.ncf` files, which include the `load` and `unload` commands for the WebAccess Agent. You use this information later when you create the load and unload scripts for the WebAccess Volume Resource object.
- 4 If you need to install the WebAccess Agent to `sys:\system` on multiple nodes in the cluster, repeat [Step 4](#), mapping new drives as needed.
- 5 Make sure you have completed all the WebAccess Agent tasks described in [“NetWare and Windows: Setting Up GroupWise WebAccess”](#) in [“Installing GroupWise WebAccess”](#) in the [GroupWise 8 Installation Guide](#), but do not start the WebAccess Agent at this time.
- 6 Continue with [Configuring the WebAccess Agent Volume Resource to Load and Unload the WebAccess Agent and Its MTA](#).

Configuring the WebAccess Agent Volume Resource to Load and Unload the WebAccess Agent and Its MTA

The properties of the Volume Resource object define how the WebAccess Agent volume functions within the cluster, how NLM programs are loaded and unloaded, and how failover and failback situations are handled. Complete the following tasks for the WebAccess Agent volume:

- ◆ [“Modifying the Volume Resource Load Script for the WebAccess Agent”](#) on [page 87](#)
- ◆ [“Modifying the Volume Resource Unload Script for the WebAccess Agent”](#) on [page 89](#)
- ◆ [“Setting the Failover Path and Policies for the WebAccess Agent”](#) on [page 91](#)
- ◆ [“Installing and Configuring the WebAccess Application in a Cluster”](#) on [page 92](#)

Modifying the Volume Resource Load Script for the WebAccess Agent

The volume resource load script executes whenever the WebAccess Agent volume comes online.

To set up the load script:

- 1 In ConsoleOne, browse to and select the Cluster object.

If necessary, click *View > Console View* to display its contents.

- 2 Right-click the Volume Resource object (*volume_SERVER*), then click *Properties > Load* to display the default volume resource load script for the WebAccess Agent volume.

The next step assumes that this is the first time you have edited the load script. If other GroupWise agents are already running from this volume, some of the modifications have already been made.

- 3 Make the following changes to the default load script:

- ◆ Remove the `trustmig` command. It is not necessary to migrate trustees for the WebAccess Agent volume. Removing this line helps the load script to execute faster.
- ◆ If you selected `vol:\system` on WebAccess Agent volume as the installation location ([WebAccess Clustering Worksheet items 5 and 7](#)), add a `search add` command to add the new `vol:\system` directory to the server search path.

```
search add volume:\system
```

- ◆ If you selected `sys:\system` on each node as the installation location ([WebAccess Clustering Worksheet items 5 and 7](#)) but you are storing the MTA startup file on the WebAccess Agent volume, add that location to the server search path.
- ◆ If you marked No under Load WebAccess Agent and Its MTA in Protected Memory? ([WebAccess Clustering Worksheet item 9](#)), add the following abend recovery options:

```
set auto restart after abend = 2
set auto restart after abend delay time = 0
set auto restart down timeout = 60
set developer option = off
```

These settings provide the best possible handling of GroupWise databases in the event that an abend should occur within the cluster.

- ◆ Transfer the MTA load command from the `grpwise.ncf` file located in the `vol:\system` directory into the load script. Use Ctrl+C and Ctrl+V to copy and paste text into the load script page. Then delete or rename the `grpwise.ncf` file to avoid future confusion.

```
load volume:\system\gwmta.nlm @domain.mta
```

- ◆ Add a delay so that the MTA is fully loaded before the WebAccess Agent starts to load:

```
load delay
delay 10
```

The length of the delay varies from system to system; ten seconds is a good starting place.

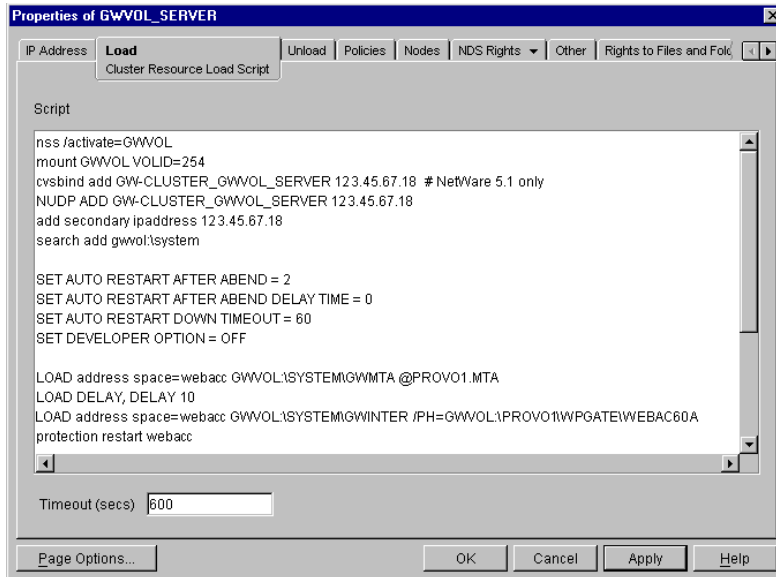
- ◆ Transfer the WebAccess Agent load command from the `strtweb.ncf` file located in the `vol:\system` directory into the load script. Use Ctrl+C and Ctrl+V to copy and paste text into the load script page.

```
load volume:\system\gwinter.nlm
  /ph=volume:\domain\wpgate\webac80a
  /user=username /PASSWORD=password
```


- ♦ If you marked Yes under Load WebAccess Agent and Its MTA in Protected Memory? ([WebAccess Clustering Worksheet item 9](#)), add the address space parameter to the load commands to specify the protected address space where the WebAccess Agent and its MTA will run. Add a protection restart command for the address space name.

```
load address space=addr_space_name
    volume:\system\gwmta.nlm @domain.mta
load address space=addr_space_name
    volume:\system\gwinter.nlm
    /ph=volume:\domain\wpgate\webac80a
    /user=username /password=password
protection restart addr_space_name
```

The result would look similar to the following example:



NOTE: The set commands are needed only when the MTA and the WebAccess Agent are not running in protected memory. The address space parameters are needed in the load commands only when the MTA and the WebAccess Agent are running in protected memory.

For another example of a load script, see TID 7006193: Running the GroupWise Agents in a Non-Protected Address Space on a NetWare Cluster in the [Novell Knowledgebase \(http://www.novell.com/support\)](http://www.novell.com/support).

- 4 Click *Apply* to save the load script.
- 5 If necessary, click *OK* to confirm that you must offline and then online the volume resource in order for the changes to take effect.
- 6 Continue with [Modifying the Volume Resource Unload Script for the WebAccess Agent](#).

Modifying the Volume Resource Unload Script for the WebAccess Agent

The volume resource unload script executes whenever the WebAccess Agent volume goes offline. Programs should be unloaded in the reverse order of how they were loaded. This ensures that supporting programs are not unloaded before programs that rely on them in order to function properly.

To set up the unload script:

- 1 In ConsoleOne, in the properties pages for the Volume Resource object (*volume_SERVER*), click *Unload* to display the default volume resource unload script.

The next step assumes that this is the first time you have edited the unload script. If other GroupWise agents are already running from this volume, some of the modifications have already been made.

- 2 Make the following changes to the default unload script:

- ♦ If you marked Yes under Load WebAccess Agent and Its MTA in Protected Memory? ([WebAccess Clustering Worksheet item 9](#)), add an `unload address space` command and an `unload kill address space` command to ensure that the address space is completely cleaned up.

```
unload address space=addr_space_name
unload kill address space=addr_space_name
```

If your system seems to be trying to kill the address space before the WebAccess Agent and its MTA have been completely unloaded, resulting in the agents hanging in the unloading state, set a delay of several seconds before issuing the `unload kill address space` command to allow the WebAccess Agent and its MTA adequate time to unload completely. The length of the delay varies from system to system; ten seconds is a good starting place.

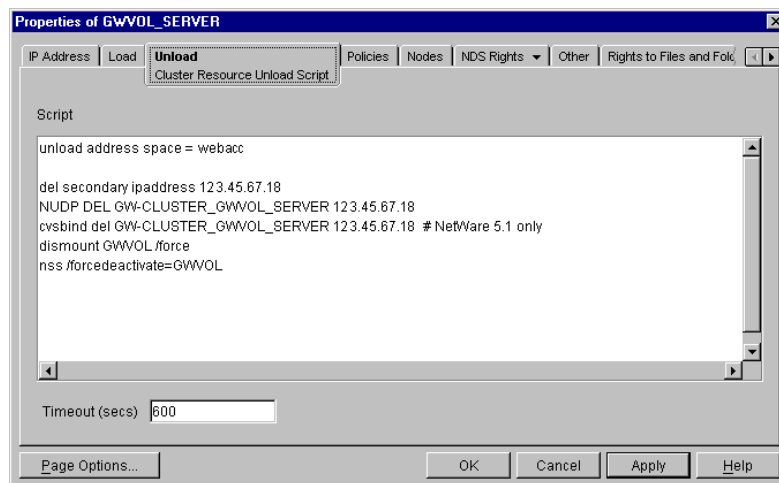
```
unload address space=addr_space_name
delay 10
unload kill address space=addr_space_name
```

- ♦ If you marked No under Load WebAccess Agent and Its MTA in Protected Memory? ([WebAccess Clustering Worksheet items 9](#)), create an `unload` command parallel to each `load` command that you placed in the load script.

```
unload gwinter.nlm
unload gwmta.nlm
```

- ♦ Remove the `trustmig` command just like you did in the load script.

The result would look similar to the following example:

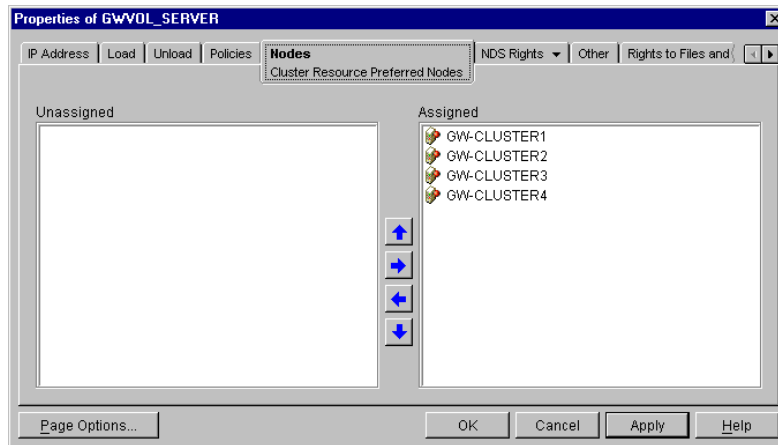


- 3 Click *Apply* to save the unload script.
- 4 If necessary, click *OK* to confirm that you must offline and then online the volume resource in order for the changes to take effect.
- 5 Continue with [Setting the Failover Path and Policies for the WebAccess Agent](#).

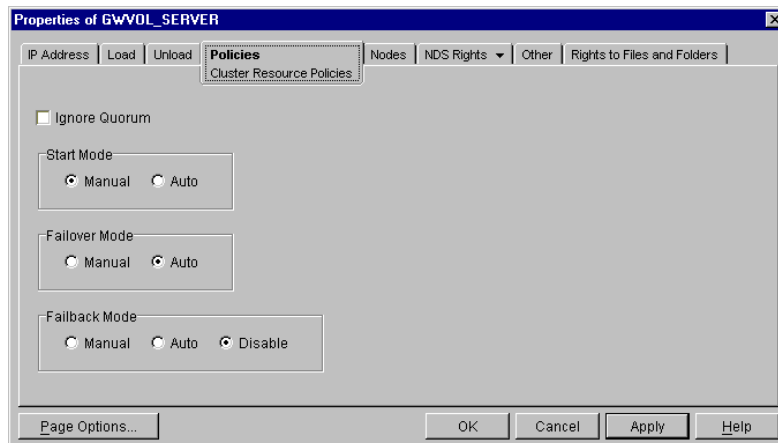
Setting the Failover Path and Policies for the WebAccess Agent

To modify the failover path and policies for the WebAccess Agent volume resource:

- 1 In ConsoleOne, in the properties pages for the Volume Resource object (*volume_SERVER*), click *Nodes* to display the default failover path for the WebAccess Agent volume resource.



- 2 Arrange the nodes in the cluster into the desired failover path for the WebAccess Agent volume ([WebAccess Clustering Worksheet item 4](#)).
- 3 Click *Apply* to save the failover path.
- 4 Click *Policies* to display the default start, failover, and failback policies.



The default policy settings are often appropriate. By default, a volume resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover path
- ◆ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the section about failover and failback mode modes in the clustering documentation for your version of NetWare, as listed in [Chapter 1, "Introduction to GroupWise 8 and Novell Cluster Services on NetWare,"](#) on page 17.

- 5 Click *OK* when you are finished editing the WebAccess Agent volume resource properties.
- 6 Continue with ["Installing and Configuring the WebAccess Agent in a Cluster"](#) on page 86.

Installing and Configuring the WebAccess Application in a Cluster

If you have clustered your Web server, you must install the WebAccess Application on each node where the Web server is installed, as described in “[Installing the WebAccess Application and WebPublisher Application](#)” in “[Installing GroupWise WebAccess](#)” in the *GroupWise 8 Installation Guide*.

5.3.5 Testing Your Clustered WebAccess Installation

Remember that the WebAccess Agent volume resource and the WebAccess Application on your Web server are separate and could fail over to different nodes at different times.

To thoroughly test your WebAccess installation:

- 1 Make sure the initial combination of WebAccess Agent volume resource and the WebAccess Application installed on your Web server is functioning properly.
- 2 Migrate the WebAccess Agent volume resource to each node on its failover path, making sure it functions with your Web server.
- 3 If your Web server is clustered, migrate the Web server cluster resource to a different node, migrate the WebAccess Agent volume resource to each node in the Web server cluster resource failover path, then make sure each combination works.
- 4 Repeat [Step 3](#) for each Web server cluster resource.

5.4 Managing WebAccess in a Cluster

After you have installed WebAccess in a cluster, you should consider some long-term management issues.

- ♦ [Section 5.4.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 92
- ♦ [Section 5.4.2, “Knowing What to Expect in WebAccess Failover Situations,”](#) on page 93
- ♦ [Section 5.4.3, “Updating the WebAccess Agent Configuration File \(commgr.cfg\),”](#) on page 94

5.4.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After installing WebAccess in your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record that cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information recorded in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information about the WebAccess Agent Domain and Its MTA”](#) on page 92
- ♦ [“Recording Cluster-Specific Information about the WebAccess Agent”](#) on page 93

Recording Cluster-Specific Information about the WebAccess Agent Domain and Its MTA

To permanently record important cluster-specific information for the WebAccess Agent domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.

- 2 In the *Description* field of the WebAccess Agent domain Identification page, provide a cluster-specific description of the WebAccess Agent domain, including the secondary IP address of its cluster-enabled volume and the cluster-unique port numbers used by its MTA.

You might also want to include cluster-specific information about the WebAccess Application, such as the secondary IP address of the Web server cluster resource where the WebAccess Application is installed.

- 3 Click *OK* to save the WebAccess Agent domain description.
- 4 Select the WebAccess Agent Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the secondary IP address of the cluster-enabled WebAccess Agent domain volume and the cluster-unique port numbers used by the MTA.

This information appears on the MTA console, no matter which node in the cluster it is currently running on.

- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information about the Internet Agent](#).

Recording Cluster-Specific Information about the WebAccess Agent

With the contents of the WebAccess Agent domain still displayed:

- 1 Right-click the WEBAC80A object, then click *Properties*.
- 2 Click *GroupWise*, then click *Identification*.
- 3 In the *Description* field, record the secondary IP address of the cluster-enabled WebAccess Agent domain volume and the cluster-unique port numbers used by the WebAccess Agent.

This information appears on the WebAccess Agent console, no matter which node in the cluster it is currently running on.

- 4 Click *OK* to save the WebAccess Agent information.
- 5 Continue with [Knowing What to Expect in MTA and POA Failover Situations](#).

5.4.2 Knowing What to Expect in WebAccess Failover Situations

The failover behavior of the MTA for the WebAccess Agent domain is the same as for an MTA in a regular domain. See [“Knowing What to Expect in MTA and POA Failover Situations”](#) on page 59.

The WebAccess Application caches users' credentials on the node where it is running. Therefore, if that node fails, or if the WebAccess Application migrates to a different node, the cached credentials are lost. Consequently, the user needs to restart the WebAccess client in order to re-authenticate and re-establish the credentials.

If the WebAccess Agent fails over or migrates, the user receives an error message that the WebAccess Agent is no longer available. However, after the WebAccess Agent starts in its new location, the WebAccess Application passes the cached user credentials to the WebAccess Agent and the user reconnects automatically without having to re-authenticate.

As with the MTA and the POA, migration of the WebAccess Agent takes longer than failover. However, the WebAccess Agent restarts quickly so that users are able to reconnect quickly.

5.4.3 Updating the WebAccess Agent Configuration File (commgr.cfg)

As part of installing WebAccess, the WebAccess Agent configuration file (`commgr.cfg`) is created in the following subdirectory:

```
domain\wpgate\webac80a
```

It is also automatically copied to the following Web server subdirectory:

```
sys:\novell\webaccess
```

If you change WebAccess agent configuration information (for example, if you change its ip address), the information is changed in the following file:

```
domain\wpgate\webac80a\commgr.cfg
```

because the domain is on a cluster-enabled volume, and it is changed in the following file:

```
sys:\novell\webaccess\commgr.cfg
```

on the node where the WebAccess Application is currently running. However, the other nodes on the WebAccess Application failover path are not currently available for update. therefore, you must manually copy the updated `commgr.cfg` file to the `sys:\novell\webaccess` subdirectory on each node in the WebAccess Application failover path.

5.5 WebAccess Clustering Worksheet

Item	Explanation
1) Shared Volume for WebAccess Agent:	Specify the name (<i>cluster_volume</i>) of the shared volume where the WebAccess Agent domain will be created.
Cluster Enabled?	For cluster-enabling, specify the IP addresses of the virtual server (<i>volume_cluster</i>) to which the cluster-enabled volume is tied.
♦ Yes (highly recommended)	For more information, see "Deciding Whether to Cluster-Enable the WebAccess Agent Volume" on page 82.
Cluster volume IP address	
♦ No	
2) WebAccess Agent Domain Name:	Specify a unique name for the WebAccess Agent domain. Specify the directory on the WebAccess Agent volume where you want to create the new domain.
Domain Database Location:	For more information, see "Planning a New Domain for the WebAccess Agent" on page 82.
3) WebAccess Agent Failover Path:	List other nodes in the cluster where the WebAccess Agent and its MTA could fail over.
	For more information, see "Determining an Appropriate Failover Path for the WebAccess Agent Volume" on page 83.

Item	Explanation
4) MTA Installation Location:	Mark the location where you will install the MTA software.
<ul style="list-style-type: none"> ◆ <code>vol:\system</code> on WebAccess Agent volume ◆ <code>sys:\system</code> on each node Consolidate multiple MTA startup files on WebAccess Agent volume?	<p>If necessary, specify the location where you will consolidate multiple MTA startup files on a WebAccess Agent volume.</p> <p>For more information, see “Deciding Where to Install the WebAccess Agent and Its MTA” on page 83.</p>
5) MTA Network Information:	Gather the MTA network address information from the WebAccess section of the “IP Address Worksheet” on page 35.
<ul style="list-style-type: none"> ◆ MTA IP address ◆ MTA message transfer port ◆ MTA live remote port ◆ MTA HTTP port 	For more information, see “Planning a Secondary IP Address and Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA” on page 83.
6) WebAccess Agent Installation Location:	Mark the location where you will install the WebAccess Agent software.
<ul style="list-style-type: none"> ◆ <code>vol:\system</code> on the WebAccess Agent volume ◆ <code>sys:\system</code> on each node 	For more information, see “Deciding Where to Install the WebAccess Agent and Its MTA” on page 83.
7) WebAccess Agent Network Information:	Gather the WebAccess Agent network address information from the WebAccess section of the “IP Address Worksheet” on page 35.
<ul style="list-style-type: none"> ◆ WebAccess Agent IP address ◆ WebAccess Agent HTTP port 	For more information, see “Planning a Secondary IP Address and Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA” on page 83.
8) Load WebAccess Agent and Its MTA in Protected Memory?	Mark whether you need to run the WebAccess Agent and its MTA in protected memory. If so, specify a unique address space for each agent.
<ul style="list-style-type: none"> ◆ No ◆ Yes 	For more information, see “Deciding Whether to Run the WebAccess Agent and Its MTA in Protected Memory” on page 84.
Protected address space names:	
<ul style="list-style-type: none"> ◆ MTA: ◆ WebAccess: 	

5.6 WebAccess Quick Checklist

- Plan the new clustered WebAccess installation, including the new domain required to house the WebAccess Agent in a clustering environment.
See [Section 5.2, “Planning WebAccess in a Cluster,” on page 82.](#)
- Cluster-enable the volume where the WebAccess Agent domain will reside.

See [Section 5.3.1, “Cluster-Enabling a Shared Volume for Use with the WebAccess Agent,”](#) on page 85.

- Create the new WebAccess Agent domain.

See [Section 5.3.2, “Creating a Domain for the WebAccess Agent,”](#) on page 86.

- Set up the MTA for the new WebAccess Agent domain.

See [Section 5.3.3, “Installing the MTA for the WebAccess Agent Domain,”](#) on page 86.

- Install the WebAccess Agent.

See [Section 5.3.4, “Installing and Configuring the WebAccess Agent in a Cluster,”](#) on page 86.

- Modify the WebAccess Agent volume resource load script:

- ◆ Remove the `trustmig` command
- ◆ Add the `search add` command (optional)
- ◆ If you will *not* run the MTA and the WebAccess Agent in protected memory, add the `set auto restart` commands and the `set developer option = off` command
- ◆ Add the `load` commands for the MTA and the WebAccess Agent, separating them with a `delay` command
- ◆ If you *will* run the MTA and the WebAccess Agent in protected memory, add the `address space` parameter to the `load` commands and add a `protection restart` command for the address space

See [“Modifying the Volume Resource Load Script for the WebAccess Agent”](#) on page 87.

- Modify the WebAccess Agent volume resource unload script:

- ◆ Add the MTA and WebAccess Agent or address space `unload` command(s)
- ◆ Remove the `trustmig` command

See [“Modifying the Volume Resource Unload Script for the WebAccess Agent”](#) on page 89.

- Set up the WebAccess Agent volume failover path and policies.

See [“Setting the Failover Path and Policies for the WebAccess Agent”](#) on page 91.

- Test the clustered WebAccess Agent.

See [Section 5.3.5, “Testing Your Clustered WebAccess Installation,”](#) on page 92.

- Record cluster-specific information in the properties pages of the GroupWise objects associated with the WebAccess Agent.

See [Section 5.4.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 92.

6 Implementing GroupWise Gateways in a NetWare Cluster

A significant system configuration difference between a GroupWise system in a clustering environment and a GroupWise system in a regular environment is that you need to create a separate domain to house each GroupWise gateway. The gateway domain should be created on a cluster-enabled volume. This enables the gateway to fail over independently from other GroupWise components.

If you have set up the Internet Agent or WebAccess in your clustered GroupWise system, you should already have the skills necessary to set up a GroupWise gateway as well.

GroupWise gateways that have not received recent development have not been thoroughly tested in a clustering environment. If you are currently using such GroupWise gateways, you might want to leave them outside of your cluster.

7 Monitoring a GroupWise System in a NetWare Cluster

Because the GroupWise 8 Monitor currently runs on Windows and Linux, rather than NetWare, you cannot run GroupWise Monitor in a NetWare cluster. However, GroupWise Monitor can easily monitor a clustered GroupWise system from a vantage point outside the NetWare cluster.

When you first install Monitor, it gathers information about agents to monitor from a domain database ([wpdomain.db](#)). This provides the secondary IP address of each agent (the IP address associated with the cluster-enabled volume where the agent's domain or post office resides). When an agent fails over or migrates to a different node, its status in Monitor displays as Not Listening until it is up and running again, at which time its status returns to Normal.

Because Monitor must use secondary IP addresses to monitor the agents in a clustered GroupWise system, the Discover Machine and Discover Network options do not work in a cluster. Secondary IP addresses cannot be obtained by examining the network itself. If you need to add agents to monitor, use the Add Agent option and provide the agent's secondary IP address.

For instructions on setting up GroupWise Monitor, see "[Installing GroupWise Monitor](#)" in the *GroupWise 8 Installation Guide*.

8 Backing Up a GroupWise System in a NetWare Cluster

The GroupWise Target Service Agent for File Systems (TSAFSGW) is a GroupWise-specific API that works with compatible backup software to provide reliable backups of a running GroupWise system on NetWare 6.5. TSAFSGW can be used in a clustered GroupWise system with appropriate preparation and understanding of how the TSAs work. For background information about the GroupWise TSAs, see “GroupWise Target Service Agent” in “Databases” in the *GroupWise 8 Administration Guide*.

In a clustering environment, TSAFSGW must be installed and loaded on each node from which your backup software backs up any portion of your GroupWise system. To accommodate the variable locations of data to back up from a clustered GroupWise system, the .ncf file for TSAFSGW on each node should be edited to include a /home startup switch for every domain and post office on every shared volume that might ever be mounted on that node.

If you are using TSAFSGW, the /vserver switch enables you to specify the name of a virtual server in your NetWare cluster. Then you can use the /home switch to specify shared volumes and paths rather than physical volumes and paths. For example:

```
/vserver-clustername_volumename_SERVER  
/home-volumename:\domain_directory  
/home-volumename:\post_office_directory
```

For example, if you have a domain named NewYork and a post office named Engineering, with libraries named Design and Training, the switches for TSAFSGW would be:

```
/vserver-CORPORATE_GROUPWISE_SERVER  
/home-gw:\gwsystem\newyork  
/home-gw:\gwsystem\engineering
```

You can use this same configuration file on every node in the cluster. TSAFSGW can identify the libraries based on information provided by the post office. Your backup software would then list the following locations to back up, based on the previous example:

```
GroupWise Cluster System  
[DOM] newyork  
[PO] engineering  
[DMS] lib0001  
[BLB] design_store  
[DMS] lib0002  
[BLB] training_store
```

From the list provided in your backup software, you can select *GroupWise Cluster System* to back up all the objects listed, or you can select individual objects for backup.

When TSAFSGW runs, it backs up the shared volumes that are currently accessible and skips shared volumes that are not currently accessible. If a shared volume migrates, you must restart TSAFSGW so that it can re-determine what shared volumes are currently available for backup.

TSAFSGW connects to the virtual server from all nodes in the cluster. If the node where TSAFSGW is performing a backup goes down, that node is dismounted and the next node is mounted to the virtual server. TSAFSGW on the next node is aware of this and notifies your backup software. Your backup software acknowledges the disruption and attempts to reconnect to the next node. When the next node is fully up and responding, the backup recommences, starting with the resource that was being backed up when the disruption occurred.

To restore data in a clustering environment, you must run your backup/restore software on the node where the location to restore is currently mounted.

9 Updating a GroupWise System in a NetWare Cluster

In a NetWare cluster, you have the option of installing the GroupWise software on each node in the cluster or on a GroupWise volume along with a domain or post office, as described in [Section 2.8.3, “Deciding Where to Install the Agent Software,”](#) on page 29. Before you run the GroupWise Installation program to install updated software, make sure you understand where in your cluster the GroupWise software is already installed.

If your existing GroupWise software is installed on each cluster node, it is very important to update all nodes on the failover path of each domain and post office at once, because each domain and post office should be serviced by only one version of the agent software. If you do not update all nodes on the failover path at once, there is the potential for a domain or post office to be serviced by a different version of the agent software during a failover situation. This can cause database problems.

If your existing GroupWise software is installed on a GroupWise volume along with a domain or post office, updating the agent software on the GroupWise volume needs to be done only once, because the agents fail over along with the domain or post office they service.

Keep in mind these cluster-specific details as you follow the instructions in “[Update](#)” in the [GroupWise 8 Installation Guide](#) to update your GroupWise system in a NetWare cluster.

10 Moving an Existing GroupWise 8 System into a NetWare Cluster

If you are adding the high availability benefits of Novell Cluster Services to a GroupWise 8 system that is already up and running, the first step is to install Novell Cluster Services following the instructions in the clustering documentation for your version of NetWare, as listed in [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,” on page 17](#). You should also review [Chapter 1, “Introduction to GroupWise 8 and Novell Cluster Services on NetWare,” on page 17](#) to help you apply clustering principles and practices to your GroupWise system.

You do not need to transfer your entire GroupWise system into the cluster all at once. You could transfer individual post offices where the needs for high availability are greatest. You could transfer a domain and all of its post offices at the same time. You might decide that you don't need to have all of your GroupWise system running in the cluster.

This section provides a checklist to help you get started with moving your GroupWise system into a clustering environment:

- Decide which shared volumes in your shared disk system you will use for GroupWise administration (ConsoleOne and the software distribution directory).
- Decide which shared volumes in your shared disk system you will use for GroupWise domains and post offices.
- Decide which nodes in your storage area network you will have on failover paths for the GroupWise agents.
- Review [Chapter 2, “Planning GroupWise in a NetWare Cluster,” on page 19](#). Fill out the “[System Clustering Worksheet](#)” on page 33 to help you decide which domains and post offices you will move to which shared volumes.
- Review “[Planning Secondary IP Addresses and Cluster-Unique Port Numbers for Agents in the Cluster](#)” on page 27 and fill out the “[IP Address Worksheet](#)” on page 35 to select secondary IP addresses for cluster-enabled volumes and to specify cluster-specific port numbers for all of your GroupWise agents.
- Select the first shared volume that will be part of your clustered GroupWise system and cluster-enable it, following the instructions in “[Cluster-Enabling Shared Volumes for Use with GroupWise](#)” on page 39 and “[Configuring Short Name Resolution](#)” on page 40.
- Move a domain and/or post office onto the cluster-enabled volume, following the instructions in “[Moving a Domain](#)” in “[Domains](#)” or “[Moving a Post Office](#)” in “[Post Offices](#)” in the *GroupWise 8 Administration Guide*.
- Review [Section 2.8, “Deciding How to Install and Configure the Agents in a Cluster,” on page 26](#), fill out the “[Agent Clustering Worksheet](#)” on page 36, and install the agents as needed for the first clustered domain and/or post office, following the instructions in [Section 3.5, “Installing and Configuring the MTA and the POA in a Cluster,” on page 46](#). This includes setting up the load and unload scripts for the cluster-enabled volume.

- ❑ Test the first component of your clustered GroupWise system following the instructions in [Section 3.6, “Testing Your Clustered GroupWise System,”](#) on page 54.
- ❑ Take care of the cluster management details described in [Section 3.7, “Managing Your Clustered GroupWise System,”](#) on page 55.
- ❑ Move more domains and post offices into the cluster as needed. If you have GroupWise libraries, see [Section 2.5, “Planning a New Library for a Clustered Post Office,”](#) on page 23.
- ❑ Move GroupWise administration into the cluster as needed.
- ❑ Add other components to your clustered GroupWise system as needed, following the instructions in:
 - ◆ [Chapter 4, “Implementing the Internet Agent in a NetWare Cluster,”](#) on page 63
 - ◆ [Chapter 5, “Implementing WebAccess in a NetWare Cluster,”](#) on page 81.
 - ◆ [Chapter 6, “Implementing GroupWise Gateways in a NetWare Cluster,”](#) on page 97
 - ◆ [Chapter 7, “Monitoring a GroupWise System in a NetWare Cluster,”](#) on page 99
 - ◆ [Chapter 8, “Backing Up a GroupWise System in a NetWare Cluster,”](#) on page 101

11 Implementing Messenger in a NetWare Cluster

Novell Messenger does not require the existence of a GroupWise system in the cluster, but presumably one has already been set up as described in [Chapter 2, “Planning GroupWise in a NetWare Cluster,”](#) on page 19 and [Chapter 3, “Setting Up a Domain and Post Office in a NetWare Cluster,”](#) on page 39. As part of the process of setting up GroupWise in the cluster, you filled out the “[System Clustering Worksheet](#)” on page 33. Some of the information from that worksheet is helpful as you implement Messenger in your cluster.

- ♦ [Section 11.1, “Planning Your Messenger System in a Cluster,”](#) on page 107
- ♦ [Section 11.2, “Setting Up Your Messenger System in a Cluster,”](#) on page 110
- ♦ [Section 11.3, “Messenger Clustering Worksheet,”](#) on page 115

11.1 Planning Your Messenger System in a Cluster

Because the Messenger agents are not associated with GroupWise domains or post offices, the Messenger agents are easier to implement in a cluster than are the GroupWise agents. [Section 11.3, “Messenger Clustering Worksheet,”](#) on page 115 lists all the information you need as you set up the Messenger agents in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [“Understanding Your Cluster”](#) on page 107
- ♦ [“Planning Messenger Administration”](#) on page 107
- ♦ [“Deciding Where to Install the Messenger Agent Software”](#) on page 108
- ♦ [“Planning the Messenger Agent Installation”](#) on page 109

11.1.1 Understanding Your Cluster

Fill out items 1 through 5 on the [Section 11.3, “Messenger Clustering Worksheet,”](#) on page 115 with information about your cluster. This information corresponds to items 1-5 on the “[System Clustering Worksheet](#)” on page 33. For background information, see [Section 2.1, “Meeting Software Version Requirements,”](#) on page 20 and [Section 2.2, “Installing Novell Cluster Services,”](#) on page 20.

11.1.2 Planning Messenger Administration

If you have set up a cluster-enabled shared volume for GroupWise administration, as described in [Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,”](#) on page 23, you can use the same cluster-enabled shared volume for the Messenger administration files. For example, you might have a shared pub: volume with a `\public` directory where you install the Messenger snap-in to ConsoleOne. Or you can install the Messenger snap-in on one or more administrator workstations.

MESSENGER CLUSTERING WORKSHEET

Under [Item 6: Installation Location for Messenger Administration](#), mark where you want to install the Messenger snap-in to ConsoleOne.

If you plan to install the Messenger snap-in to ConsoleOne on a cluster-enabled shared volume, under [Item 7: Shared Volume for Messenger Administration](#), list the IP address of the shared volume and the directory where you want to install the Messenger snap-in.

IMPORTANT: Cluster-enabling relies on successful short name resolution throughout your system. Review [Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,” on page 25](#), which describes the issues in the context of planning MTA and POA installations for GroupWise.

11.1.3 Deciding Where to Install the Messenger Agent Software

When you install the NetWare Messenger agents in a clustering environment, you can choose between two different installation locations:

Table 11-1 *Messenger Agent Software Installation Locations*

Location	Description
Each node in the cluster	The <code>sys:\system</code> directory is the default location provided by the Messenger Installation program.
Shared volume	If you create a <code>vol:\system</code> directory on a cluster-enabled shared volume, the agent software and startup files fail over and back along with supporting files such as the Messenger archive. IMPORTANT: Cluster-enabling relies on successful short name resolution throughout your system. Review Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,” on page 25 , which describes the issues in the context of planning MTA and POA installations for GroupWise.

You must install to a cluster-enabled shared volume if you do not want a separate Messenger archive to be created on each node where the Archive Agent runs. If you do not want to use a shared volume, you should plan to install the Archive Agent separately outside the cluster.

MESSENGER CLUSTERING WORKSHEET

Under [Item 8: Installation Location for Messenger Agents](#), mark where you want to install the Messenger agent software.

Continue with the planning instructions for the installation location you want to use:

- ◆ [“Each Node in the Cluster” on page 108](#)
- ◆ [“Shared Volume” on page 109](#)

Each Node in the Cluster

Make sure you have filled out [item 5](#) on the Messenger Clustering Worksheet with a complete list of nodes in the cluster. Skip to [“Planning the Messenger Agent Installation” on page 109](#).

Shared Volume

For convenience throughout the rest of this section, the term “Messenger volume” means “a cluster-enabled shared volume where the Messenger agents are installed.” Complete the following planning tasks for the Messenger volume:

- ♦ [“Selecting the Messenger Volume” on page 109](#)
- ♦ [“Determining an Appropriate Failover Path for the Messenger Volume” on page 109](#)
- ♦ [“Selecting IP Address Resolution Methods for the Messenger Volume” on page 109](#)

Selecting the Messenger Volume

If you are not planning to enable archiving, or if you are not anticipating a large Messenger archive, you can use one Messenger volume. If you anticipate archiving a large number of messages so that the Messenger archive grows very large, you might want to have a separate Messenger volume for the Archive Agent and the archive database. The steps in this section cover setting up the Messenger agents on a single Messenger volume.

MESSENGER CLUSTERING WORKSHEET

Under [Item 9: Shared Volume for Messenger Agents](#), record the name and IP address of the Messenger volume.

Determining an Appropriate Failover Path for the Messenger Volume

By default, a Messenger volume is configured to have all nodes in the cluster in its failover path, organized in ascending alphanumeric order. Only one node at a time can have the Messenger volume mounted and active. If a Messenger volume’s preferred node fails, the volume fails over to the next node in the failover path.

MESSENGER CLUSTERING WORKSHEET

Under [Item 10: Failover Path for Messenger Volume](#), list the nodes that you want to have in the Messenger volume failover path. The Messenger agents might need to run on any node that the Messenger volume fails over to.

Selecting IP Address Resolution Methods for the Messenger Volume

Because you are using a cluster-enabled volume for the Messenger agents, you must ensure that short name resolution is always successful. For background information, see [Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,” on page 25](#).

MESSENGER CLUSTERING WORKSHEET

Under [Item 11: IP Address Resolution Methods](#), mark the short name address resolution methods you want to implement to ensure that the UNC paths stored in ConsoleOne can be successfully resolved into the physical network address of the Messenger volume.

11.1.4 Planning the Messenger Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Messenger agents are the same in a clustering environment as for any other environment. Review [“Planning Your Novell Messenger System”](#), then print and fill out

the “Novell Messenger Worksheet” in “Installing a Novell Messenger System” in the *Novell Messenger 2.1 Installation Guide*. Transfer the following information from the Messenger Clustering Worksheet to the Messenger System Worksheet:

- ◆ For [Item 3: Installation Path](#) on the Messenger System Worksheet:
 - ◆ If you are installing the Messenger agents to each node in the cluster, use `sys:\system`.
 - ◆ If you are installing the Messenger agents to a Messenger volume, use `volume:\system`, where *volume* is the name of the Messenger volume from [Item 9: Shared Volume for Messenger Administration](#) on the Messenger Clustering Worksheet.
- ◆ Under [Item 12: Server Address](#) on the Messenger System Worksheet:
 - ◆ If you are installing the Messenger agents to each node in the cluster, use the cluster IP address from [Item 3: Cluster Identification](#) on the Messenger Clustering Worksheet.
 - ◆ If you are installing the Messenger agents to a Messenger volume, specify the Messenger volume IP address from [Item 9: Shared Volume for Messenger Agents](#) on the Messenger Clustering Worksheet.
- ◆ Under [Item 13: Configure Agents for Clustering?](#) on the Messenger System Worksheet, mark *Yes*. This adds the /cluster switch to the agent startup files. The /cluster switch tells the Messenger agents to use the virtual server name of the cluster or the Messenger volume rather than the specific server name in pathnames obtained from agent object properties in Novell eDirectory or from startup switches. This enables the Messenger agents to access the location no matter which node it is currently running on. This applies to the agents’ working directory, queue directory, log file directory, and so on.
- ◆ Under [Item 14: Admin Configuration](#) on the Messenger System Worksheet:
 - ◆ If you are installing the Messenger snap-in to ConsoleOne to an administrator workstation, use the location where ConsoleOne is already installed (typically `c:\novell\consoleone\version_number`).
 - ◆ If you are installing the Messenger snap-in to ConsoleOne to a shared volume, use `volume:\directory`, where *volume* is the name of the Messenger administration volume from [Item 7: Shared Volume for Messenger Administration](#) on the Messenger Clustering Worksheet and *directory* is typically `\public`.

Continue with [Setting Up Your Messenger System in a Cluster](#).

11.2 Setting Up Your Messenger System in a Cluster

You should have already reviewed [Section 11.1, “Planning Your Messenger System in a Cluster,”](#) on page 107 and filled out the [Section 11.3, “Messenger Clustering Worksheet,”](#) on page 115 and the “Novell Messenger Worksheet” in the *Novell Messenger 2.1 Installation Guide*. Follow the instructions for the installation location you have chosen:

- ◆ [Section 11.2.1, “Installing to Each Node in the Cluster,”](#) on page 111
- ◆ [Section 11.2.2, “Installing to a Messenger Volume,”](#) on page 111

11.2.1 Installing to Each Node in the Cluster

There are two methods of installing the Messenger agents to each node in the cluster:

- ♦ Run the Messenger Installation program multiple times in order to install the agent software and to create the agent startup files on each node in the cluster.
- ♦ Run the Messenger Installation program, then copy the Messenger agent software and startup files to each node in the cluster.

Use whichever method you prefer, following the steps provided in [“Starting the Messenger Installation Program”](#) and [“Creating Your Messenger System”](#) in [“Installing a Novell Messenger System”](#) in the *Novell Messenger 2.1 Installation Guide*. Make each node in the cluster active to make sure that the Messenger agents start successfully.

11.2.2 Installing to a Messenger Volume

Complete the following tasks to set up your Messenger system on a Messenger volume:

- ♦ [“Preparing the Cluster for Messenger”](#) on page 111
- ♦ [“Running the Messenger Installation Program”](#) on page 111
- ♦ [“Configuring the Messenger Volume Resource to Load and Unload the Messenger Agents”](#) on page 112
- ♦ [“Copying LDAP and QuickFinder Files to the Messenger Volume”](#) on page 113
- ♦ [“Testing Your Clustered Messenger System”](#) on page 113

Preparing the Cluster for Messenger

Cluster preparation for Messenger is the same as cluster preparation for GroupWise. Review [Section 3.1, “Preparing the Cluster for GroupWise,”](#) on page 39 before running the Messenger installation program.

Running the Messenger Installation Program

The Messenger Installation program walks you through setting up your Messenger system and installing the Messenger agents.

- 1 If necessary, map a drive to the Messenger administration volume ([Messenger Clustering Worksheet item 7](#)).
- 2 Map a drive to the Messenger volume ([Messenger Clustering Worksheet item 9](#)).

The Messenger volume name will be *cluster_volume*. For assistance with mapping a drive to a cluster-enabled volume, see [“Configuring Short Name Resolution”](#) on page 40.

- 3 Run the Messenger Installation program at an administrator workstation to set up your Messenger system, following the steps provided in “[Starting the Messenger Installation Program](#)” and “[Creating Your Messenger System](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*. Keep in mind the following cluster-specific details:
 - ♦ When you specify the Messenger installation directory, be sure to browse to the location through the Messenger volume accessed in [Step 2](#) above.
 - ♦ When you specify the ConsoleOne directory, be sure to browse to the location through the Messenger administration volume accessed in [Step 1](#) above.
 - ♦ On the Start Copying Files page, the server object name should be the virtual server name, not a physical server name.
- 4 When you have finished creating your Messenger system, continue with [Configuring the Messenger Volume Resource to Load and Unload the Messenger Agents](#).

Configuring the Messenger Volume Resource to Load and Unload the Messenger Agents

The properties of the Volume Resource object define how the Messenger volume functions within the cluster, how the Messenger agents are loaded and unloaded, and how failover and failback situations are handled.

- 1 In ConsoleOne, browse to and select the Cluster object.
If necessary, click *View > Console View* to display its contents.
- 2 Right-click the Volume Resource object (*volume_SERVER*), then click *Properties > Load* to display the default volume resource load script for the Messenger volume.

The volume resource load script executes whenever the Messenger volume comes online.

- 3 Add the following lines to the load script:

```
load volume:\novell\nm\ma\nmma.nlm @volume:novell\nm\ma\strtup.ma
load volume:\novell\nm\aa\nmaa.nlm @volume:novell\nm\aa\strtup.aa
```

where *volume* is the name of the Messenger volume ([Messenger Clustering Worksheet item 9](#)).

For example:

```
load msgr:\novell\nm\ma\nmma.nlm @msgr:novell\nm\ma\strtup.ma
load msgr:\novell\nm\aa\nmaa.nlm @msgr:novell\nm\aa\strtup.aa
```

As an alternative, you can start both Messenger agents with a single command:

```
volume:\novell\nm\nmstart.ncf
```

- 4 Click *Apply* to save the load script.
- 5 Click *Unload*.
- 6 Add the following lines to the unload script:


```
unload nmma.nlm
unload nmaa.nlm
```
- 7 Click *Apply* to save the unload script.
- 8 Click *Nodes* to display the default failover path for the Messenger volume.
- 9 Arrange the nodes in the cluster into the desired failover path for the Messenger volume ([Messenger Clustering Worksheet item 10](#)).
- 10 Click *Apply* to save the failover path.
- 11 Click *Policies* to display the default start, failover, and failback policies.

By default, a volume resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the net node in its failover path
- ◆ Continues running at its failover location even after its most preferred node is again available

12 Change the policies if necessary, then click *OK*.

13 Continue with [Copying LDAP and QuickFinder Files to the Messenger Volume](#).

Copying LDAP and QuickFinder Files to the Messenger Volume

During installation of the Messenger agents, some files were copied to `sys:\system` of the node where the Messenger volume was mounted. These files must be copied one time to the cluster volume that is hosting the Messenger agents.

From the node where the Messenger volume was mounted during installation, copy the following files to the cluster volume:

Table 11-2 LDAP and QuickFinder Files to Copy

Copy From:	Copy To:
<code>sys:\system\ldapsdk.nlm</code>	<code>clustervol:\system\ma</code>
<code>sys:\system\ldapssl.nlm</code>	<code>clustervol:\system\ma</code>
<code>sys:\system\ldapx.nlm</code>	<code>clustervol:\system\ma</code>
<code>sys:\system\qfind217.nlm</code>	<code>clustervol:\system\aa</code>

If you are running in a language other than English, copy the following files from the appropriate numbered language subdirectory on the NetWare server to the cluster volume:

Table 11-3 Language-Specific Files to Copy

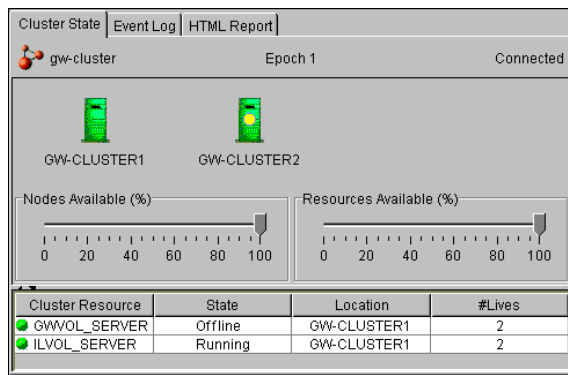
Copy From:	Copy To:
<code>sys:\system\nls\language_code\nmma.msg</code>	<code>clustervol:\system\ma</code>
<code>sys:\system\nls\language_code\nmaa.msg</code>	<code>clustervol:\system\aa</code>

Continue with [Testing Your Clustered Messenger System](#).

Testing Your Clustered Messenger System

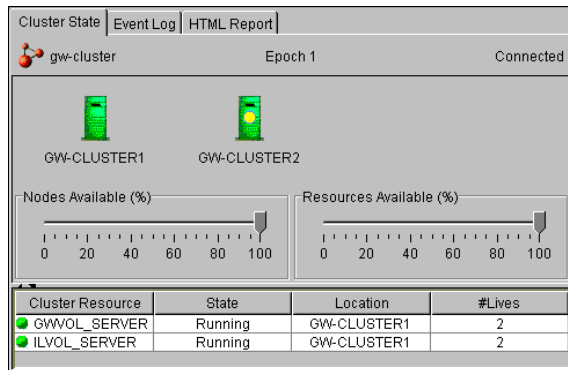
After you have configured the Messenger volume resource, you can test the load and unload scripts by bringing the Messenger volume online and taking it offline again.

- 1 In ConsoleOne, select the Cluster object, then click *View > Cluster State*.



The new Messenger volume resource shows *Offline* in the *State* column.

- Click the new Messenger volume resource, then click *Online*.



The *State* column for the volume resource now displays *Running*.

- Observe the server console where the Messenger agents are loading to see that they start and run correctly.
- Click the new Messenger volume resource, then click *Offline*.
The *State* column for the volume resource returns to *Offline*.
- Observe the server console where the Messenger agents are unloading to see that they shut down correctly.
- Repeat [Step 2](#) whenever you are ready to bring the new Messenger volume resource online permanently.

On NetWare 6.5, these actions can also be performed from your Web browser. See [“Using Novell Remote Manager on NetWare 6.5”](#) on page 56.

11.3 Messenger Clustering Worksheet

Item	Explanation
1) Software Version Updates for Cluster: <ul style="list-style-type: none">◆ Latest ConsoleOne Snap-In for Novell Cluster Services	<p>Mark any updates that the nodes in your cluster need in order to meet the system requirements for Messenger system in a cluster.</p> <p>To review the background information provided for GroupWise clustering, see Section 2.1, "Meeting Software Version Requirements," on page 20.</p>
2) eDirectory Tree for Cluster:	<p>Record the eDirectory tree where you created the Novell Cluster object when you installed Novell Cluster Services.</p> <p>To review the background information provided for GroupWise clustering, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
3) Cluster Identification: Cluster Name: Cluster IP Address:	<p>Record the name of the name of the NetWare Cluster object where your Messenger system will be located. Also record the virtual IP address of the cluster that will remain constant regardless of which node is currently active.</p> <p>To review the background information provided for GroupWise clustering, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
4) Cluster Context:	<p>Record the full context where you created the NetWare Cluster object.</p> <p>To review the background information provided for GroupWise clustering, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
5) Nodes in Cluster	<p>List the nodes that are part of the cluster.</p> <p>To review the background information provided for GroupWise clustering, see Section 2.2, "Installing Novell Cluster Services," on page 20.</p>
6) Installation Location for Messenger Administration: <ul style="list-style-type: none">◆ Administrator workstation(s)◆ Shared volume	<p>Mark the location where you will install the Messenger snap-in to ConsoleOne. For more information, see "Planning Messenger Administration" on page 107.</p>
7) Shared Volume for Messenger Administration: Cluster Volume IP Address: Installation Location for Messenger Snap-In to ConsoleOne: <ul style="list-style-type: none">◆ /public directory◆ Other directory	<p>If you plan to install the Messenger snap-in to ConsoleOne on a shared volume, specify the name (<i>cluster_volume</i>) of the shared volume where you will install it.</p> <p>Specify the IP addresses of the virtual server (<i>volume_SERVER.cluster</i>) to which the shared volume is tied.</p> <p>Specify the directory where you will install the Messenger snap-in to ConsoleOne on the shared volume.</p> <p>To review the background information about cluster-enabled volumes provided for GroupWise, see Section 2.6, "Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise," on page 23.</p>

Item	Explanation
8) Installation Location for Messenger Agents: <ul style="list-style-type: none"> ◆ Each node in the cluster ◆ Shared volume 	Mark the location where you will install the Messaging Agent software. For more information, see “Deciding Where to Install the Messenger Agent Software” on page 108.
9) Shared Volume for Messenger Agents: Cluster volume IP address:	If you plan to install the Messenger agents on a shared volume, specify the name (<i>cluster_volume</i>) of the shared volume. Specify the IP address of the virtual server (<i>volume_SERVER.cluster</i>) to which the cluster-enabled volume is tied. To review the background information about cluster-enabled volumes provided for GroupWise, see Section 2.6, “Deciding Whether to Cluster-Enable the Shared Volumes Used by GroupWise,” on page 23. For more information, see “Selecting the Messenger Volume” on page 109.
10) Failover Path for Messenger Shared Volume:	If you plan to install the Messenger agents on a shared volume, list other nodes in the cluster where the Messenger agents could fail over. For more information, see “Determining an Appropriate Failover Path for the Messenger Volume” on page 109.
11) IP Address Resolution Methods: <ul style="list-style-type: none"> ◆ eDirectory ◆ hosts file ◆ DNS ◆ SLP (highly recommended) 	Mark the short name address resolution methods you want to implement to ensure that the UNC paths stored in ConsoleOne can be successfully resolved into physical network addresses. To review the background information provided for GroupWise, see Section 2.7, “Ensuring Successful Name Resolution for GroupWise Volumes,” on page 25.

Novell Cluster Services on Linux

- ♦ Chapter 12, “Introduction to GroupWise 8 and Novell Cluster Services on Linux,” on page 119
- ♦ Chapter 13, “Planning GroupWise in a Linux Cluster,” on page 121
- ♦ Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,” on page 131
- ♦ Chapter 15, “Implementing the Internet Agent in a Linux Cluster,” on page 153
- ♦ Chapter 16, “Implementing WebAccess in a Linux Cluster,” on page 175
- ♦ Chapter 17, “Implementing GroupWise Monitor in a Linux Cluster,” on page 195
- ♦ Chapter 18, “Backing Up a GroupWise System in a Linux Cluster,” on page 209
- ♦ Chapter 19, “Updating a GroupWise System in a Linux Cluster,” on page 211
- ♦ Chapter 20, “Moving an Existing Linux GroupWise 8 System into a Linux Cluster,” on page 213
- ♦ Chapter 21, “Moving a Clustered GroupWise 8 System from NetWare to Linux,” on page 215
- ♦ Chapter 22, “Implementing Messenger in a Linux Cluster,” on page 217

12 Introduction to GroupWise 8 and Novell Cluster Services on Linux

Before implementing GroupWise 8 with Novell Cluster Services on Linux, make sure you have a solid understanding of Novell Cluster Services by reviewing the [OES Linux Clustering documentation](http://www.novell.com/documentation/oes2/cluster-services.html#cluster) (<http://www.novell.com/documentation/oes2/cluster-services.html#cluster>). When you review this information, you discover that clustering employs very specialized terminology. The following brief glossary provides basic definitions of clustering terms and relates them to your GroupWise system:

cluster: A grouping of from two to 32 servers configured using Novell Cluster Services so that data storage locations and applications can transfer from one server to another without interrupting their availability to users.

NOTE: Although a cluster can include both Linux and NetWare servers, GroupWise components on Linux servers can fail over only to other Linux servers.

node: A clustered server; in other words, a single server that is part of a cluster.

shared disk system: The hardware housing the physical disks that are shared among the cluster nodes.

shared partition: A disk partition in a shared disk system that can be accessed from any cluster node that needs the data stored on it. On Linux, Novell Cluster Services supports shared partitions (Linux traditional file system disk partitions), shared NSS volumes (Novell Storage Services volumes), and shared pools (virtual servers).

NOTE: For simplicity, this section uses the term “shared partition” to represent any of these three storage configuration alternatives. For more information, the [OES 11 Novell Cluster Services 2 for Linux Administration Guide](http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html) (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

cluster-enabled shared partition: A shared partition for which a Cluster Resource object has been created in Novell eDirectory. The properties of the Cluster Resource object provide load and unload scripts for applications and services installed on the partition, failover/failback/migration policies for the applications and services, and the failover list for the partition.

IMPORTANT: Cluster-enabling is required for GroupWise. For more information, see the [OES 11 Novell Cluster Services 2 for Linux Administration Guide](http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html) (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

GroupWise partition: As used in this section, a cluster-enabled shared partition that is used for GroupWise, such as for housing a domain, a post office, or a software distribution directory.

Messenger partition: As used in this section, a cluster-enabled shared partition that is used for Messenger, such as for storing conversation files, log files, temporary files, queue directories, etc.

cluster resource: A shared partition, secondary IP address, application, service, Web server, etc., that can function successfully anywhere in the cluster. Cluster resources include the GroupWise agents and the Messenger agents.

failover: The process of moving cluster resources from a failed node to a functional node so that availability to users is uninterrupted. For example, if the node where the POA is running goes down, the POA and its post office fail over to a secondary node so that users can continue to use GroupWise. When setting up cluster resources, you must consider what components need to fail over together in order to continue functioning.

fan-out-failover: The configuration where cluster resources from a single failed node fail over to several different nodes in order to distribute the load from the failed node across multiple nodes. For example, if a node runs a cluster resource consisting of a domain and its MTA, another cluster resource consisting of a post office and its POA, and a third cluster resource for the Internet Agent, each cluster resource could be configured to fail over separately to different secondary nodes.

failback: The process of returning cluster resources to their preferred node after the situation causing the failover has been resolved. For example, if a POA and its post office fail over to a secondary node, that cluster resource can be configured to fail back to its preferred node when the problem is resolved.

migration: The process of manually moving a cluster resource from its preferred node to a secondary node for the purpose of performing maintenance on the preferred node, temporarily lightening the load on the preferred node, etc.

13 Planning GroupWise in a Linux Cluster

The majority of this part of the *GroupWise 8 Interoperability Guide* (Chapter 13, “Planning GroupWise in a Linux Cluster,” on page 121 through Chapter 18, “Backing Up a GroupWise System in a Linux Cluster,” on page 209) is designed for those who are creating a new GroupWise system, or at least new domains and post offices, in the context of Novell Cluster Services on Linux.

If you already have an existing GroupWise 8 system on OES Linux and need to configure it to work in a newly installed cluster, see Chapter 20, “Moving an Existing Linux GroupWise 8 System into a Linux Cluster,” on page 213. If you already have an existing clustered GroupWise 8 system on OES NetWare, see Chapter 21, “Moving a Clustered GroupWise 8 System from NetWare to Linux,” on page 215.

When you implement a new GroupWise system or a new domain or post office in a clustering environment, overall GroupWise system design does not need to change substantially. For a review, see “Installing a Basic GroupWise System” in the *GroupWise 8 Installation Guide*. However, the configuration of individual components of your GroupWise system will be significantly different. This section helps you plan the following GroupWise components in a cluster:

- ♦ A new GroupWise system consisting of the primary domain and the initial post office
- ♦ A new secondary domain
- ♦ A new post office
- ♦ The GroupWise agents: Message Transfer Agent (MTA) and Post Office Agent (POA)

During the planning process, component configuration alternatives are explained. For example, you might want the domain and post office together on the same [shared partition](#) or on different shared partitions.

Section 13.7.1, “System Clustering Worksheet,” on page 128 lists the information you need as you set up GroupWise in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ Section 13.1, “Installing Novell Cluster Services on Linux,” on page 122
- ♦ Section 13.2, “Planning a Clustered Software Distribution Directory,” on page 123
- ♦ Section 13.3, “Planning a New Clustered Domain,” on page 124
- ♦ Section 13.4, “Planning a New Clustered Post Office,” on page 125
- ♦ Section 13.5, “Planning a New Library for a Clustered Post Office,” on page 125
- ♦ Section 13.6, “Deciding How to Install and Configure the Linux Agents in a Cluster,” on page 126
- ♦ Section 13.7, “GroupWise Clustering Worksheets,” on page 127

After you have completed the tasks and filled out Section 13.7.1, “System Clustering Worksheet,” on page 128 and Section 13.7.2, “Agent Clustering Worksheet,” on page 129, you are ready to continue with Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,” on page 131.

13.1 Installing Novell Cluster Services on Linux

Install Novell Cluster Services on OES Linux by following the instructions provided in the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

The cluster installation process includes:

- ♦ Meeting hardware and software requirements
- ♦ Setting up a shared disk system
- ♦ Creating a new Cluster object to represent the cluster in Novell eDirectory
- ♦ Adding **nodes** to the cluster
- ♦ Installing the Novell Cluster Services software on all nodes in the cluster
- ♦ Creating shared partitions, shared NSS volumes, or shared pools as needed for your cluster, as described in the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

NOTE: For simplicity in this section, the term “shared partition” is intended to include any of these shared storage alternatives.

- ♦ Cluster-enabling any of these shared storage alternatives, as described in the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

IMPORTANT: Cluster-enabling is required for GroupWise.

- ♦ Mounting the shared partitions where you want to set up GroupWise domains and post offices.

As you install Novell Cluster Services on Linux, record key information about the cluster on the System Clustering Worksheet:

SYSTEM CLUSTERING WORKSHEET

Under **Item 1: eDirectory Tree for Cluster**, record the name of the eDirectory tree where the new Cluster object has been created.

Under **Item 2: Cluster Name**, record the name of the Cluster object that you created for your GroupWise system.

Under **Item 3: Cluster Context**, record the full context of the Cluster object.

Under **Item 4: Nodes in Cluster**, list the nodes that you have added to the cluster. Include the file system information about each partition, including file system type (*reiserfs*, *ext3*, etc.), device name (*sda2*, *hda1*, etc.), and mount point directory (*/mnt*, */mail*, etc.). You need this information when you set up the load and unload scripts for the GroupWise cluster resources.

Under **Item 5: Shared Partitions**, list the shared partitions that are available for use in your GroupWise system.

The number of nodes and shared partitions that are available in the cluster strongly influences where you can place GroupWise domains and post offices. You have several alternatives:

- ♦ Your whole GroupWise system can run in a single cluster.

- ◆ Parts of your GroupWise system can run in one cluster while other parts of it run in one or more other clusters.
- ◆ Parts of your GroupWise system can run in a cluster while other parts run outside of the cluster, on non-clustered servers.

If you do not have the system resources to run all of your GroupWise system in a clustering environment, you must decide which parts have the most urgent need for the high availability provided by clustering. Here are some suggestions:

- ◆ Post offices and their POAs must be available in order for users to access their GroupWise mailboxes. Therefore, post offices and their POAs are excellent candidates for the high availability provided by clustering.
- ◆ Domains and their MTAs are less noticeable to users when they are unavailable (unless users in different post offices happen to be actively engaged in an e-mail discussion when the MTA goes down). On the other hand, domains and their MTAs are critical to GroupWise administrators, although administrators might be more tolerant of a down server than end users are. Critical domains in your system would be the primary domain and, if you have one, a hub or routing domain. These domains should be in the cluster, even if other domains are not.
- ◆ The Internet Agent might or might not require high availability in your GroupWise system, depending on the importance of immediate messaging across the Internet and the use of POP3 or IMAP4 clients by GroupWise users.
- ◆ The Monitor Agent is a vital partner with the GroupWise High Availability service, described in “[Enabling the Groupwise High Availability Service for the Linux GroupWise Agents](#)” in “[Installing GroupWise Agents](#)” in the *GroupWise 8 Installation Guide*. The High Availability service automatically restarts agents that go down under circumstances that do not cause the entire server to go down. If you want this protection for your GroupWise agents, you can run the Monitor Agent in your cluster.

There is no right or wrong way to implement GroupWise in a clustering environment. It all depends on the specific needs of your particular GroupWise system and its users.

13.2 Planning a Clustered Software Distribution Directory

During creation of a GroupWise system, you are prompted to create a software distribution directory. You can create the software distribution directory on each node where you install the GroupWise software or you can create it on a [GroupWise partition](#) so that you install it only once but it is still always available.

IMPORTANT: You must the software distribution directory in a location that is available to all nodes in the cluster if you want to take advantage of the *Configure GroupWise for Clustering* option of the Installation program. This option simplifies the process of installing the agent software to multiple nodes in the cluster. It eliminates the need to provide the same agent configuration information multiple times. The installation instructions in this section are based on using the *Configure GroupWise for Clustering* option of the Installation program.

For background information about software distribution directories, see “[Software Directory Management](#)” in “[System](#)” in the *GroupWise 8 Administration Guide*.

SYSTEM CLUSTERING WORKSHEET

If you want to have your GroupWise software distribution directory as part of your cluster, under [Item 6: GroupWise Partition for Software Distribution Directory](#), list the GroupWise partition and associated secondary IP address for the software distribution directory. List the full path for the software distribution directory, regardless of whether it is located on a GroupWise partition or on each node in the cluster.

13.3 Planning a New Clustered Domain

The considerations involved in planning a new domain in a clustering environment are essentially the same as for any other environment.

- ♦ **Primary Domain:** If you are setting up a new GroupWise system in a clustering environment, you are creating the primary domain as you complete the tasks in this section. To prepare, review “[Planning a Basic GroupWise System](#)”, then print and fill out the “[Basic GroupWise System Summary Sheet](#)” in “[Installing a Basic GroupWise System](#)” in the *GroupWise 8 Installation Guide*. This covers planning the primary domain and an initial post office in the primary domain.
- ♦ **Secondary Domain:** If your GroupWise system already exists, you are creating a new secondary domain. To prepare, review “[Planning a New Domain](#)”, then print and fill out the “[Domain Worksheet](#)” in “[Domains](#)” in the *GroupWise 8 Administration Guide*.

Regardless of the type of domain you are creating, keep in mind the following cluster-specific details as you fill out the worksheet you need:

- ♦ When you specify the location for the domain directory (and for a new GroupWise system, the post office directory) on the worksheet, remember that it will be on a [GroupWise partition](#), not on the node where you will be running the GroupWise Installation program.
- ♦ Do not concern yourself with the GroupWise agent information on the worksheet. You will plan the agent installation later. If you are filling out the Basic GroupWise System Worksheet, stop with [Post Office Settings](#). If you are filling out the Domain Worksheet, stop with [Domain Administrator](#).

When you have completed the worksheet, transfer the key information from the Basic GroupWise System Worksheet or the Domain Worksheet to the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 9: Domain Name](#), transfer the domain name and database directory to the System Clustering Worksheet.

Under [Item 7: GroupWise Partition for Domain](#), transfer the domain location to the System Clustering Worksheet. Also specify the secondary IP address of the shared partition where you plan to create the domain.

IMPORTANT: Do not create the new domain until you are instructed to do so in [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131.

13.4 Planning a New Clustered Post Office

The considerations involved in planning a new post office in a clustering environment are essentially the same as for any other environment. The initial post office in a new GroupWise system is planned on the Basic GroupWise System Worksheet. To plan additional new post offices, review “[Planning a New Post Office](#)”, then print and fill out the “[Post Office Worksheet](#)” in “[Post Offices](#)” in the *GroupWise 8 Administration Guide*. When you specify the location for the post office directory, remember that it will be on a [GroupWise partition](#), not on the node where you will be running the GroupWise Installation program.

When you have completed the worksheet, transfer key information from the Basic GroupWise System Worksheet or the Post Office Worksheet to the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 10: Post Office Name](#), transfer the post office name and database location to the System Clustering Worksheet. Also specify the secondary IP address of the shared partition where you plan to create the domain.

If you will create the post office on a different GroupWise partition from where the domain is located, under [Item 8: Shared Partition for Post Office](#), transfer the post office location to the System Clustering Worksheet. Also specify the secondary IP address of the shared partition where you plan to create the post office.

IMPORTANT: Do not create the new post office until you are instructed to do so in [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131.

13.5 Planning a New Library for a Clustered Post Office

The considerations involved in planning a new library in a clustering environment are essentially the same as for any other environment. However, in a Linux cluster, you should not plan to locate a document storage area on a remote storage area. If you choose to place it outside the post office directory structure, it should still be located on the same server with the post office.

You can plan a library for a clustered post office by following the standard instructions provided in “[Creating and Managing Libraries](#)” in the *GroupWise 8 Administration Guide* and filling out the “[Basic Library Worksheet](#)” or the “[Full-Service Library Worksheet](#)”. Then provide the library information on the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 11: Document Storage Area Location](#), mark where you want to create the library's document storage area.

IMPORTANT: Do not create the new library until you are instructed to do so in [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131.

13.6 Deciding How to Install and Configure the Linux Agents in a Cluster

There are several cluster-specific issues to consider as you plan to install the Linux MTA and POA in your clustered GroupWise system:

- ♦ [Section 13.6.1, “Recording Secondary IP Addresses for the Agents,” on page 126](#)
- ♦ [Section 13.6.2, “Determining Appropriate Failover Lists for the Agents,” on page 126](#)
- ♦ [Section 13.6.3, “Determining Cluster Resource Information for the Linux Agents,” on page 127](#)
- ♦ [Section 13.6.4, “Planning the Linux Agent Installation,” on page 127](#)

13.6.1 Recording Secondary IP Addresses for the Agents

By default, the GroupWise agents listen on all IP addresses, both primary and secondary, that are bound to the server. This means that any time there is a possibility of two of the same type of agent loading on the same node, it is important that each agent use the appropriate secondary IP address of the [GroupWise partition](#). The secondary IP address moves with each agent when it fails over, so that, in the case of the POA, GroupWise clients do not lose their connections to the POA. When you use the *Configure GroupWise for Clustering* option, the GroupWise Installation program sets the `--ip` switch in each agent startup file to its unique secondary IP address.

If you are going to set up a GroupWise name server to help GroupWise clients locate their post offices, make sure that the default POA port number of 1677 is used somewhere in the cluster. For more information, see [“Simplifying Client/Server Access with a GroupWise Name Server”](#) in [“Post Office Agent”](#) in the *GroupWise 8 Administration Guide*.

AGENT CLUSTERING WORKSHEET

Under [Item 3: MTA Network Information](#), transfer the domain secondary IP address from the System Clustering Worksheet to the Agent Clustering Worksheet.

Under [Item 6: POA Network Information](#), transfer the post office secondary IP address from the System Clustering Worksheet to the Agent Clustering Worksheet.

13.6.2 Determining Appropriate Failover Lists for the Agents

By default, a [GroupWise partition](#) is configured to have all nodes in the cluster in its failover list, organized in ascending alphanumeric order. Only one node at a time can have a particular GroupWise partition mounted and active. If a GroupWise partition’s preferred node fails, the partition fails over to the next node in the failover list. You should customize the failover list for each GroupWise partition based on the [fan-out-failover](#) principle.

When a node fails, its partitions should not all fail over together to the same secondary node. Instead, the partitions should be distributed across multiple nodes in the cluster. This prevents any one node from shouldering the entire processing load typically carried by another node. In addition, some partitions should never have the potential of being mounted on the same node during a failover situation. For example, a post office and POA that service a large number of very active GroupWise client users should never fail over to a node where another very large post office and heavily loaded POA reside. If they did, users on both post offices would notice a decrease in responsiveness of the GroupWise client.

AGENT CLUSTERING WORKSHEET

Under [Item 2: Domain Failover List](#), list the nodes that you want to have in the domain partition failover list. The MTA might need to run on any node that the domain partition fails over to. Therefore, you will install the agent software on all of the nodes in the domain failover list.

If you are planning the post office on a different GroupWise partition from where the domain is located, under [Item 5: Post Office Failover List](#), list the nodes that you want to have in the post office partition failover list. The POA might need to run on any node that the post office partition fails over to. Therefore, you will install the agent software on all of the nodes in the post office failover list.

13.6.3 Determining Cluster Resource Information for the Linux Agents

A cluster resource is a [shared partition](#), secondary IP address, application, service, Web server, etc., that can function successfully anywhere in the cluster. Cluster resources include the GroupWise agents and the Messenger agents. When using the *Configure GroupWise for Clustering* option, the GroupWise Installation program needs to know the mount point for the [GroupWise partition](#) where it will create the domain and post office. For example, you might create a `/mnt/gwssystem` mount point, or you might create `/mnt/dom1` and `/mnt/po1` mount points. The Installation program also needs to know the secondary IP address of the GroupWise partition.

AGENT CLUSTERING WORKSHEET

Under [Item 7: Cluster Resource Information](#), list the mount point and secondary IP address for the GroupWise partition where the domain and post office will be located.

13.6.4 Planning the Linux Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the GroupWise Linux agents are the same in a clustering environment as for any other environment. Review [“Planning the GroupWise Agents”](#), then print and fill out the [“GroupWise Agent Installation Summary Sheet”](#) in [“Installing GroupWise Agents”](#) in the *GroupWise 8 Installation Guide* for each location where you will install the Linux MTA and/or POA.

IMPORTANT: Do not install the Linux agent software until you are instructed to do so in [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131.

Skip to [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131.

13.7 GroupWise Clustering Worksheets

- ♦ [Section 13.7.1, “System Clustering Worksheet,”](#) on page 128
- ♦ [Section 13.7.2, “Agent Clustering Worksheet,”](#) on page 129

13.7.1 System Clustering Worksheet

Item	Explanation
1) eDirectory Tree for Cluster:	Record the eDirectory tree where you created the new Novell Cluster object when you installed Novell Cluster Services. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122
2) Cluster Name: Master IP Address:	Record the name of the new Cluster object that you created for your GroupWise system. Also record the virtual IP address of the cluster that will remain constant regardless of which node is currently active. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.
3) Cluster Context:	Record the full context where you created the new Cluster object. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.
4) Nodes in Cluster: <ul style="list-style-type: none">◆ File system type◆ Device name◆ Mount point directory	List the nodes that are part of the cluster that you set up for your GroupWise system. Also list the file system type (<i>reiserfs</i> , <i>ext3</i> , etc.), device name (<i>sda2</i> , <i>hda1</i> , etc.), and mount point directory (<i>/mnt</i> , <i>/mail</i> , etc.) for each. You need this information as you create load and unload scripts for GroupWise agents. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.
5) Shared Partitions in Cluster:	List the shared partitions that are available for use in your GroupWise system. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.
6) GroupWise Partition for Software Distribution Directory: Secondary IP Address: Directory:	If desired, specify the name of the shared partition where the GroupWise software distribution directory will reside and the full path to its location. For more information, see Section 13.2, "Planning a Clustered Software Distribution Directory," on page 123.
7) GroupWise Partition for Domain: Secondary IP Address: Post Office on Same Partition as Domain? <ul style="list-style-type: none">◆ Yes◆ No	Specify the name of the shared partition where the GroupWise domain will reside and its secondary IP address. For more information, see Section 13.3, "Planning a New Clustered Domain," on page 124.
8) GroupWise Partition for Post Office: Secondary IP Address:	Specify the name of the shared partition where the GroupWise post office will reside and its secondary IP address. For more information, see Section 13.4, "Planning a New Clustered Post Office," on page 125.

Item	Explanation
9) Domain Name: Domain Directory:	Specify a unique name for the domain. Specify the directory on the GroupWise partition where you want to create the new domain. For more information, see Section 13.3, "Planning a New Clustered Domain," on page 124.
10) Post Office Name: Post Office Directory:	Specify a unique name for the post office. Specify the directory on the GroupWise partition where you want to create the post office. For more information, see Section 13.4, "Planning a New Clustered Post Office," on page 125.
11) Document Storage Area Location: <ul style="list-style-type: none"> ◆ At the post office ◆ Outside the post office ◆ Separate post office 	If you need a library for a clustered post office, mark where you want to create its document storage area and provide a directory if necessary. For more information, see Section 13.5, "Planning a New Library for a Clustered Post Office," on page 125.

13.7.2 Agent Clustering Worksheet

Item	Explanation
1) Domain Name: Domain Location:	Transfer this information from the System Clustering Worksheet (item 9).
2) Domain Failover List:	List other nodes in the cluster where the GroupWise domain and its MTA could fail over. For more information, see Section 13.6.2, "Determining Appropriate Failover Lists for the Agents," on page 126.
3) MTA Network Information: <ul style="list-style-type: none"> ◆ MTA IP address ◆ MTA message transfer port ◆ MTA HTTP port 	Record the MTA network address information for the server where the MTA will run. The MTA IP address is the same as the domain secondary IP address in the cluster. See Section 13.6.1, "Recording Secondary IP Addresses for the Agents," on page 126.
4) Post Office Name: Post Office Location:	Transfer this information from the System Clustering Worksheet (item 10).
5) Post Office Failover List:	List other nodes in the cluster where the GroupWise post office and its POA could fail over. For more information, see Section 13.6.2, "Determining Appropriate Failover Lists for the Agents," on page 126.

Item	Explanation
6) POA Network Information:	Record the POA network address information for the server where the POA will run. The POA IP address is the same as the post office secondary IP address in the cluster.
♦ POA IP address	
♦ POA client/server port	See Section 13.6.1, "Recording Secondary IP Addresses for the Agents," on page 126.
♦ POA message transfer port	
♦ POA HTTP port	
7) Cluster Resource Information	List the cluster resource information for the GroupWise partition where the domain and post office serviced by the agents are located.
♦ Path to the cluster resource mount point	
♦ IP address of the cluster resource	For more information, see Section 13.6.3, "Determining Cluster Resource Information for the Linux Agents," on page 127.

14 Setting Up a Domain and a Post Office in a Linux Cluster

You should have already reviewed [Chapter 13, “Planning GroupWise in a Linux Cluster,”](#) on page 121 and filled out the [Section 13.7.1, “System Clustering Worksheet,”](#) on page 128 and the [Section 13.7.2, “Agent Clustering Worksheet,”](#) on page 129. You are now ready to complete the following tasks to set up GroupWise in a clustering environment on Linux:

- ♦ [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131
- ♦ [Section 14.2, “Creating a New Secondary Domain in a Linux Cluster,”](#) on page 132
- ♦ [Section 14.3, “Creating a New Post Office in a Linux Cluster,”](#) on page 133
- ♦ [Section 14.4, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 134
- ♦ [Section 14.5, “Testing Your Clustered GroupWise System,”](#) on page 147
- ♦ [Section 14.6, “Managing Your Clustered GroupWise System,”](#) on page 148
- ♦ [Section 14.7, “What’s Next,”](#) on page 150
- ♦ [Section 14.8, “Clustering Quick Checklists,”](#) on page 151

14.1 Setting Up a New GroupWise System in a Linux Cluster

The GroupWise Installation program walks you through setting up the primary domain and an initial post office in the primary domain. You might be creating your primary domain and initial post office on the same [GroupWise partition](#) or on two different partitions. After you have created the primary domain and initial post office and then installed the GroupWise agents on multiple nodes in the cluster, you can create additional secondary domains and post offices as needed.

To set up the primary domain and initial post office for a new GroupWise system in a clustering environment:

- 1 Start with the first node on the domain failover list ([Agent Clustering Worksheet item 2](#)).
- 2 Make sure that ConsoleOne is installed on the node.
If necessary, you can download ConsoleOne for Linux from the [Novell Product Downloads site](http://download.novell.com) (<http://download.novell.com>). ConsoleOne is always installed in `/usr/ConsoleOne`.
- 3 If necessary, mount the [GroupWise partition](#) where you want to create the GroupWise software distribution directory ([System Clustering Worksheet item 6](#)).
- 4 Mount the [GroupWise partition](#) for the domain ([System Clustering Worksheet item 7](#)) and, if needed, the [GroupWise partition](#) for the post office ([System Clustering Worksheet item 8](#)), where the primary domain and the initial post office for your new GroupWise system will be created.
- 5 Run the GroupWise Installation program, as described in “Starting the Linux GroupWise Installation Program” in “Installing a Basic GroupWise System” in the *GroupWise 8 Installation Guide*.

IMPORTANT: Do not select the *Configure GroupWise for Clustering* option at this time.

- 6 When you set up the software distribution directory, install all the agent software.
Although this is not required when creating your initial domain and post office, it makes installation of the other GroupWise agents easier after you have created the initial domain and post office.
- 7 From the Installation program, run ConsoleOne to set up your initial GroupWise system, as described in [“Using ConsoleOne to Create Your Basic GroupWise System”](#) in [“Installing a Basic GroupWise System”](#) in the *GroupWise 8 Installation Guide*.
- 8 When providing the MTA and POA network address information, use the Agent Clustering Worksheet that you filled out in [Section 13.6, “Deciding How to Install and Configure the Linux Agents in a Cluster,”](#) on page 126. The information you provide is used to configure the MTA and POA objects in the domain and post office even though you have not yet installed the agent software on any nodes in the cluster.
Do not create users in the post office at this time.
- 9 When you have finished creating the primary domain and the initial post office, click *Finish* to exit the GroupWise Installation program without installing the agent software.
- 10 Skip to [“Running the GroupWise Installation Program on the Preferred Node”](#) on page 134.

14.2 Creating a New Secondary Domain in a Linux Cluster

After you have set up the primary domain and initial post office, as described in [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131, you can create additional secondary domains in your GroupWise system as needed.

To create a new secondary domain in a clustering environment:

- 1 Mount the [GroupWise partition](#) where the new secondary domain will be created.
- 2 In ConsoleOne, connect to the primary domain in your GroupWise system, as described in [“Connecting to a Domain”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.
- 3 Create the new domain, following the steps provided in [“Creating the New Domain”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.
Use the Domain Worksheet you filled out in [Section 13.3, “Planning a New Clustered Domain,”](#) on page 124 to fill in the fields in the Create GroupWise Domain dialog box.
- 4 In the Link to Domain field, link the new domain to the primary domain of your GroupWise system.
- 5 Use the Link Configuration tool to change the links from the new domain to all other domains in the cluster to direct TCP/IP links, following the steps provided in [“Changing the Link Protocol between Domains to TCP/IP”](#) in [“Message Transfer Agent”](#) in the *GroupWise 8 Administration Guide*.
Although a complete mesh link configuration is the most efficient, it might not be feasible in all situations. Set up as many direct TCP/IP links as possible for best MTA performance in the cluster.
- 6 Make sure you are still connected to the primary domain.
- 7 Rebuild the domain database for the new domain, following the steps provided in [“Rebuilding Domain or Post Office Databases”](#) in [“Databases”](#) in the *GroupWise 8 Administration Guide*.

The database rebuild is necessary in order to transfer the MTA configuration information and the domain link information into the secondary domain database, because the MTA for the new domain is not yet running.

- 8 Skip to [Installing and Configuring the MTA and the POA in a Cluster](#) to install the MTA software for the new domain.

14.3 Creating a New Post Office in a Linux Cluster

You can create a new post office on the same [GroupWise partition](#) where its domain resides or on a separate GroupWise partition. If the post office and its domain are on the same GroupWise partition, they fail over together. If they are on separate GroupWise partitions, they fail over separately.

To create a new post office in a clustering environment on Linux:

- 1 Mount the GroupWise partition where the domain that will own the new post office located.
- 2 If necessary, mount the GroupWise partition for the new post office
- 3 In ConsoleOne, connect to the GroupWise domain where you want to create the new post office, as described in “[Connecting to a Domain](#)” in “[Domains](#)” in the *GroupWise 8 Administration Guide*.
- 4 Create the new post office, following the steps provided in “[Creating the New Post Office](#)” in “[Post Offices](#)” in the *GroupWise 8 Administration Guide*.

Use the Post Office Worksheet you filled out in [Section 13.4, “Planning a New Clustered Post Office,”](#) on page 125 to fill in the fields in the Create GroupWise Post Office dialog box.

- 5 Refer to the Agent Clustering Worksheet that you filled in during [Section 13.6, “Deciding How to Install and Configure the Linux Agents in a Cluster,”](#) on page 126 for the secondary IP address and port numbers that you need to specify in order to configure the link.
- 6 If you want to create a library at the post office, select *Create Library*.

This option creates the document storage area for the library under the post office directory and is not recommended for large libraries.

- 7 Right-click the new POA object, then click *Properties*.

On the POA Agent Settings and Scheduled Events pages, you might want to specify unique times for the following POA activities to prevent multiple POAs from performing the same activities on the same node at the same time during a failover situation:

- ♦ Start User Upkeep
- ♦ Generate Address Book for Remote
- ♦ Enable QuickFinder Indexing
- ♦ Mailbox/Library Maintenance Event

For more information about these repetitive POA activities, see “[Performing Nightly User Upkeep](#)”, “[Regulating Indexing](#)”, and “[Scheduling Database Maintenance](#)” in “[Post Office Agent](#)” in the *GroupWise 8 Administration Guide*.

- 8 Make sure you are still connected to the domain that owns the new post office.
- 9 Rebuild the post office database for the new post office, following the steps provided in “[Rebuilding Domain or Post Office Databases](#)” in “[Databases](#)” in the *GroupWise 8 Administration Guide*. Be sure to browse to the database location ([under System Clustering Worksheet item 11](#)) through the GroupWise partition.

The database rebuild is necessary in order to transfer the POA configuration information and the post office link information into the post office database, because the POA for the new post office is not yet running.

- 10 If you want to create a library with its document storage area outside the post office directory, follow the steps in “[Setting Up a Basic Library](#)” or “[Setting Up a Full-Service Library](#)” in “[Libraries and Documents](#)” in the *GroupWise 8 Administration Guide*, after you have completely finished setting up the clustered post office.
- 11 Continue with [Installing and Configuring the MTA and the POA in a Cluster](#) to install the POA software for the new post office.

14.4 Installing and Configuring the MTA and the POA in a Cluster

By following the instructions in [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,” on page 131](#), you installed the MTA and the POA on the first node in your cluster, as well as created the initial domain and post office in your GroupWise system. You are now ready to install and configure the agents on additional nodes and set up the agent software for use in your cluster.

- ♦ [Section 14.4.1, “Installing and Setting Up the Agents in Your Cluster,” on page 134](#)
- ♦ [Section 14.4.2, “Changing Agent Paths to Locations on GroupWise Partitions,” on page 138](#)
- ♦ [Section 14.4.3, “Configuring GroupWise Cluster Resources to Load and Unload the Agents,” on page 139](#)
- ♦ [Section 14.4.4, “Setting Up New Instances of the Agents without Installing the Agent Software,” on page 146](#)

If you have added a new secondary domain or a new post office to an existing GroupWise system, the agent software has already been installed and you simply need to create a new startup file specific to the new domain or post office. In these circumstances, follow the instructions in [Section 14.4.4, “Setting Up New Instances of the Agents without Installing the Agent Software,” on page 146](#) instead of completing the tasks above.

14.4.1 Installing and Setting Up the Agents in Your Cluster

The agents must be installed on each node in domain failover list ([Agent Clustering Worksheet item 2](#)) and the post office failover list ([Agent Clustering Worksheet item 5](#)).

- ♦ [“Running the GroupWise Installation Program on the Preferred Node” on page 134](#)
- ♦ [“Running the GroupWise Installation Program on Subsequent Nodes” on page 136](#)
- ♦ [“Testing Your Agent Installation on Each Node” on page 137](#)

After you have installed and tested the agents on each node in the cluster, continue with [Section 14.4.2, “Changing Agent Paths to Locations on GroupWise Partitions,” on page 138](#).

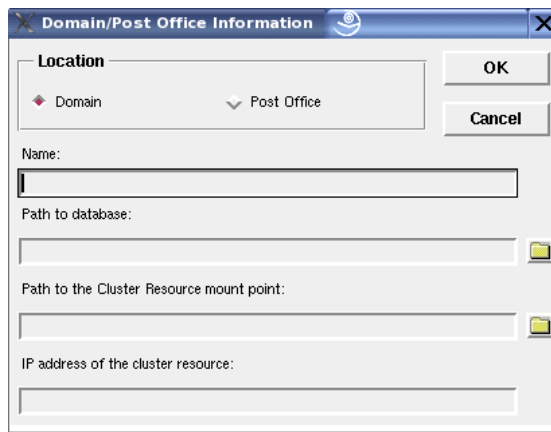
Running the GroupWise Installation Program on the Preferred Node

- 1 Mount the [GroupWise partition](#) for the domain ([System Clustering Worksheet item 7](#)) or the post office ([System Clustering Worksheet item 8](#)).
- 2 From the software distribution directory you created in [Step 6 in Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,” on page 131](#), start the GroupWise Installation program.

IMPORTANT: This time, you should select the *Configure GroupWise for Clustering* option.



- 3 Install the agent software, following the steps provided in “Installing the GroupWise Agents on Linux” in “Installing GroupWise Agents” in the *GroupWise 8 Installation Guide*.
- 4 Configure the Linux agents according to the [Section 13.7.2, “Agent Clustering Worksheet,”](#) on page 129 that you filled out in [Section 13.6, “Deciding How to Install and Configure the Linux Agents in a Cluster,”](#) on page 126, paying special attention to the cluster resource information on the Domains / Post Offices page.



As a result of selecting *Configure GroupWise for Clustering* on the preferred node, the following cluster-specific configuration actions are performed:

- ◆ The agent startup files are created in `mount_point/groupwise/agents/share` on the shared resource so that the agents use the same startup files regardless of which cluster node the agents are running on. The `--home` switch includes the mount point and the path to the database so that the startup file is valid when mounted to each cluster node.
- ◆ The `--cluster` switch is added to the agent startup files to inform the agents that they are running in a cluster.
- ◆ The `--ip` startup switch is set to the secondary IP address of the shared resource where the domain and post office are located. This ensures that the MTA and the POA run with the same IP address regardless of which cluster node the agents are running on.
- ◆ The `--log` startup switch is set to a location on the shared resource (`mount_point/groupwise/agents/log`) so that agent logging information is written to the same log file regardless of which cluster node the agents are running on.
- ◆ The GroupWise High Availability service is automatically configured on the current cluster node and its configuration file (`gwha.conf`) is created in the `/etc/opt/novell/groupwise` directory.

- ◆ A `clusterimport.conf` file is created in the `gwinst` subdirectory of the software distribution directory from which you ran the GroupWise Installation program, so that the cluster-specific information collected when you configured the agents on the preferred node is available when you install the agents on subsequent nodes.
 - ◆ The agents are not configured to start automatically on system startup. In a cluster, you do not want the agents to start automatically whenever a node restarts.
- 5 Configure the agents to run as a non-root user, as described in the applicable section of the *GroupWise 8 Installation Guide*:
 - ◆ “Running the Linux GroupWise Agents As a Non-root User”
 - ◆ “Setting Up Non-root Access on an NSS Volume on Novell Open Enterprise Server Linux”
 - 6 Continue with [Running the GroupWise Installation Program on Subsequent Nodes](#).

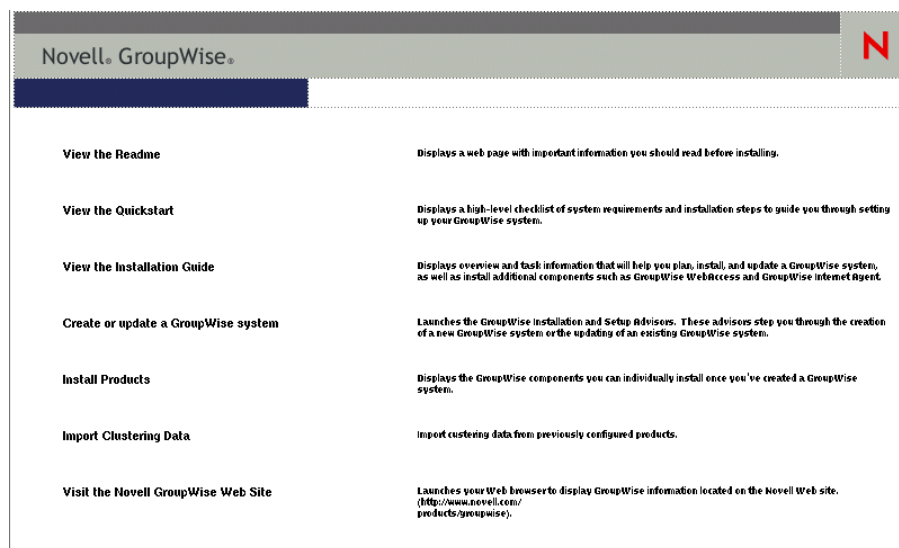
Running the GroupWise Installation Program on Subsequent Nodes

- 1 On the next node in the GroupWise agent failover list, mount the [GroupWise partition](#) for the domain ([System Clustering Worksheet item 7](#)) or the post office ([System Clustering Worksheet item 8](#)).
- 2 From the software distribution directory you created in [Step 6](#) in [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131, start the GroupWise Installation program.

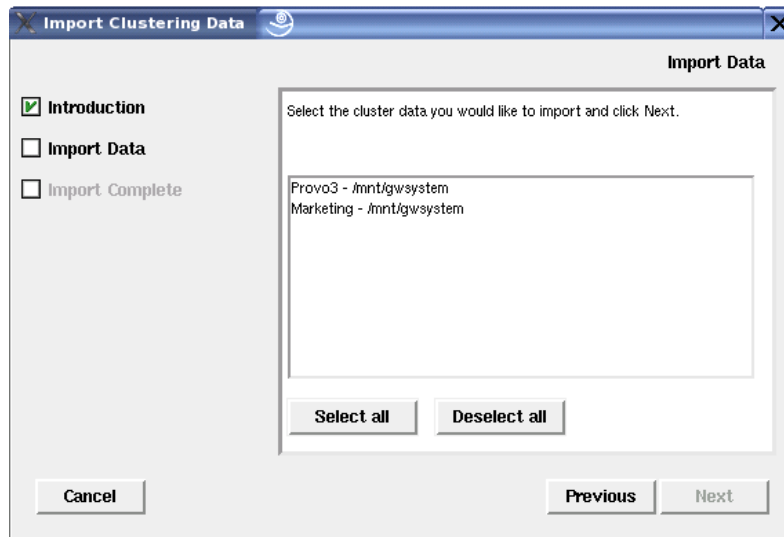
IMPORTANT: You should select the *Configure GroupWise for Clustering* option again.



Because of the existence of the `clusterimport.conf` file in the `gwinst` subdirectory of the software distribution directory, a new installation option, *Import Clustering Data*, is now available on the main GroupWise Installation program page.



- 3 Install the agent software on the cluster node as usual, but do not use the *Configure* option.
- 4 On the main page of the Installation program, click *Import Clustering Data*, then click *Next*.



All GroupWise agents that you have installed from the software distribution directory are listed, based on the information stored in the `clusterimport.conf` file.

- 5 Select the GroupWise agents that you want to configure on the current cluster node, then click *OK*.

The *Import Clustering Data* option performs the following configuration actions for each subsequent node where you run it:

- ♦ The `grpwise` script is created in the `/etc/init.d` directory on the current cluster node. It is configured specifically for the agents you just selected.
- ♦ The GroupWise High Availability service is automatically configured on the current cluster node and its configuration file (`gwha.conf`) is created in the `/etc/opt/novell/groupwise` directory. It is configured specifically for the agents you just selected.

Because the agent startup files and log files are stored on the shared resource, they do not need to be customized for each cluster node.

- 6 Configure the agents to run as a non-root user, as described in the applicable section of the [GroupWise 8 Installation Guide](#):
 - ♦ [“Running the Linux GroupWise Agents As a Non-root User”](#)
 - ♦ [“Setting Up Non-root Access on an NSS Volume on Novell Open Enterprise Server Linux”](#)
- 7 Repeat [Step 1](#) through [Step 6](#) for each cluster node in the GroupWise agent failover list.

After you install and configure the agents on each node in each agent’s failover list, the cluster node is ready for the GroupWise agent to fail over to it.
- 8 Continue with [Testing Your Agent Installation on Each Node](#).

Testing Your Agent Installation on Each Node

- 1 Test the agents by starting them with a user interface, as described in [“Starting the Linux Agents with a User Interface”](#) in [“Installing GroupWise Agents”](#) in the [GroupWise 8 Administration Guide](#).

```
/opt/novell/groupwise/agents/bin/gwmta --show @domain.mta &
/opt/novell/groupwise/agents/bin/gwpoa --show @post_office.poa &
```

- 2 Stop the agents by clicking *File > Exit*
- 3 After you can see that the agents start successfully, test them by starting them as daemons, as described in [“Starting the Linux GroupWise Agents as Daemons”](#) in [“Installing GroupWise Agents”](#) in the *GroupWise 8 Administration Guide*.

```
/etc/init.d/grpwise start  
/etc/init.d/grpwise status
```

- 4 Stop the agents.

```
/etc/init.d/grpwise stop  
/etc/init.d/grpwise status
```

- 5 Return to [“Running the GroupWise Installation Program on the Preferred Node”](#) on page 134 for each node in the domain or post office failover list.

When you have installed the agents on all of the nodes in the domain and post office failover lists, continue with [Changing Agent Paths to Locations on GroupWise Partitions](#).

14.4.2 Changing Agent Paths to Locations on GroupWise Partitions

The default locations for some agent files are on the cluster nodes along with the agent software, rather than being located with the domain and post office on one or more GroupWise partitions. To avoid having multiple copies of these files in multiple locations, you should set the locations in ConsoleOne.

- ♦ [“Setting the MTA Message Log File Path”](#) on page 138
- ♦ [“Setting the MTA Certificate and Key File Path”](#) on page 138
- ♦ [“Setting the POA Certificate and Key File Path”](#) on page 139

Setting the MTA Message Log File Path

If you plan to enable message logging, as described in [“Enabling MTA Message Logging”](#) in [“Message Transfer Agent”](#) in the *GroupWise 8 Administration Guide*:

- 1 On the GroupWise partition where the domain is located, create the directory where you want to store MTA message log files.
- 2 In ConsoleOne, browse to and select the Domain object.
- 3 Right-click the MTA object, then click *Properties*.
- 4 Click *GroupWise > Message Log Settings*.
- 5 In the *Message Log File Path* field, browse to and select the directory you created in [Step 1](#), then click *OK*.

Setting the MTA Certificate and Key File Path

If you plan to enable SSL, as described in [“Securing the Domain with SSL Connections to the MTA”](#) in [“Message Transfer Agent”](#) in the *GroupWise 8 Administration Guide*:

- 1 On the GroupWise partition where the domain is located, create the directory where you want to store the certificate and key file required for SSL.
- 2 Copy the certificate file and key file into the new directory.

If you need assistance obtaining these files, see [“Server Certificates and SSL Encryption”](#) in [“Security Administration”](#) in the *GroupWise 8 Administration Guide*.

- 3 In ConsoleOne, browse to and select the Domain object.
- 4 Right-click the MTA object, then click *Properties*.
- 5 Click *GroupWise > SSL Settings*.
- 6 In the *Certificate File* field, browse to and select the certificate file.
- 7 In the *SSL Key File* field, browse to and select the key file.
- 8 Click *OK*.

Setting the POA Certificate and Key File Path

If you plan to enable SSL, as described in “[Securing the Post Office with SSL Connections to the POA](#)” in “[Post Office Agent](#)” in the *GroupWise 8 Administration Guide*:

- 1 On the GroupWise partition where the post office is located, create the directory where you want to store the certificate and key file required for SSL.
- 2 Copy the certificate file and key file into the new directory.
If you need assistance obtaining these files, see “[Server Certificates and SSL Encryption](#)” in “[Security Administration](#)” in the *GroupWise 8 Administration Guide*.
- 3 In ConsoleOne, browse to and select the Post Office object.
- 4 Right-click the POA object, then click *Properties*.
- 5 Click *GroupWise > SSL Settings*.
- 6 In the *Certificate File* field, browse to and select the certificate file.
- 7 In the *SSL Key File* field, browse to and select the key file.
- 8 Click *OK*.

14.4.3 Configuring GroupWise Cluster Resources to Load and Unload the Agents

The properties of the Cluster Resource object associated with the [GroupWise partition](#) define how partitions function within the cluster, how agents are loaded and unloaded, and how failover and failback situations are handled. At this point, you might have one cluster resource for a GroupWise partition with a domain and post office on it, or you might have two cluster resources for two GroupWise partitions, one for the domain and one for the post office. Complete the following tasks for each cluster resource:

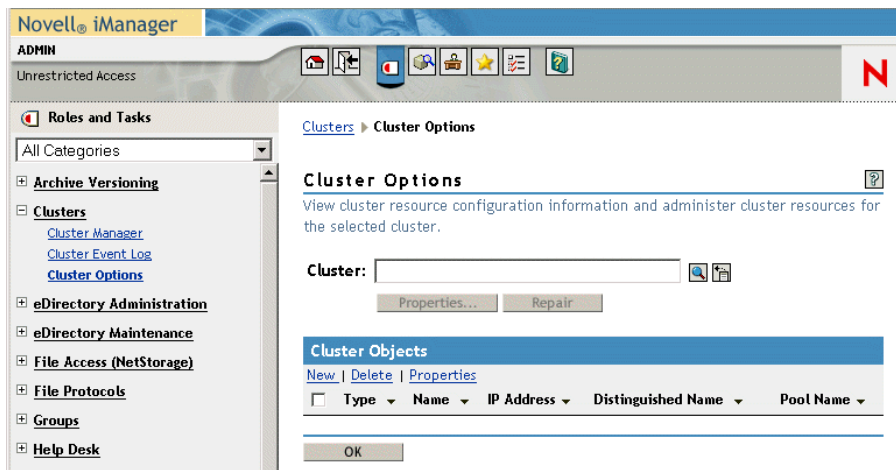
- ♦ “[Modifying the Cluster Resource Load Script for the Agents](#)” on page 139
- ♦ “[Modifying the Cluster Resource Unload Script for the Agents](#)” on page 143
- ♦ “[Setting the Failover List and Policies for the Agents](#)” on page 145

Modifying the Cluster Resource Load Script for the Agents

The cluster resource load script executes whenever the [GroupWise partition](#) comes online. On OES Linux, all cluster management activities are performed in Novell iManager.

To set up the load script in iManager:

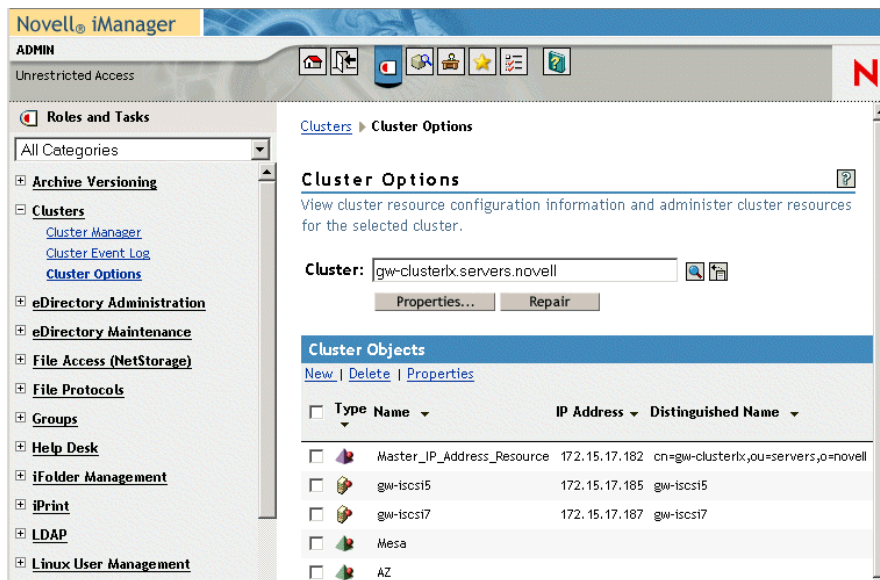
- 1 Expand *Clusters*, then click *Cluster Options*.



2 In the *Cluster* field, browse to the Cluster object where the GroupWise cluster resource is located.



3 Click the Cluster object to display the cluster resources that belong to the cluster.



4 Select the GroupWise Cluster Resource object that you created when you set up the GroupWise partition, then click *Details*.

5 Click *Scripts > Load Script*.

- 6** If this is an NSS volume or a shared pool, use a load script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

# mount filesystem
exit_on_error ncpcon mount /opt="noatime,nodiratime" volume_name=volume_ID

# add IP address
exit_on_error add_secondary_ipaddress gw_partition_ip_address

# start service
exit_on_error /etc/init.d/grpwise start domain
exit_on_error /etc/init.d/grpwise start post_office.domain
exit_on_error /etc/init.d/grpwise start gwdva
```

- 6a** In the `mount filesystem` section, specify the volume name and volume ID of the GroupWise partition that you are clustering ([System Clustering Worksheet item 5](#)).
- 6b** In the `add IP address` section, specify the secondary IP address of the GroupWise partition ([System Clustering Worksheet item 7](#) or [System Clustering Worksheet item 8](#)).
- 6c** In the `start service` section, use the commands to start the specific GroupWise agents that you want to run on this GroupWise partition.

If you created a domain on the partition, you need to start the MTA. If you created a post office on the partition, you need to start the POA. If you created both a domain and a post office, you need to start both the MTA and the POA. If you installed the DVA, you need to start it as well.

- 7** If this is a traditional Linux volume, use a load script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfunc

# define IP address
RESOURCE_IP=gw_partition_ip_address

# define filesystem type
MOUNT_FS=filesystem

# define device (if using EVMS)
exit_on_error evms -f /var/opt/novell/ncs/ContainerActivate -rl
Share `uname -n`
MOUNT_DEV=/dev/evms/Share/dat

# define mount point
```

```

MOUNT_POINT=/mnt/mount_point_directory

# mount filesystem
exit_on_error mount -t $MOUNT_FS $MOUNT_DEV $MOUNT_POINT -o noatime,nodiratime

# add IP address
exit_on_error add_secondary_ipaddress $RESOURCE_IP

# start service
exit_on_error /etc/init.d/grpwise start domain
exit_on_error /etc/init.d/grpwise start post_office.domain
exit_on_error /etc/init.d/grpwise start gwdva

exit 0

```

- 7a** In the `define IP address` section, specify the secondary IP address of the GroupWise partition ([System Clustering Worksheet item 7](#) or [System Clustering Worksheet item 8](#))
- 7b** In the `define filesystem type` section, specify the filesystem type that is in use on the nodes in the cluster ([System Clustering Worksheet item 5](#)).
- 7c** In the `define mount point` section, specify the mount point directory in use for the nodes in the cluster ([System Clustering Worksheet item 5](#)).
- 7d** In the `start service` section, use the commands to start the specific GroupWise agents that you want to run on this GroupWise partition.

If you created a domain on the partition, you need to start the MTA. If you created a post office on the partition, you need to start the POA. If you created both a domain and a post office, you need to start both the MTA and the POA. If you installed the DVA, you need to start it as well.

- 8** Click *OK* to save the load script.

Modifying the Cluster Resource Unload Script for the Agents

The cluster resource unload script executes whenever the GroupWise partition goes offline. Programs should be unloaded in the reverse order of how they were loaded. This ensures that supporting programs are not unloaded before programs that rely on them in order to function properly.

- 1 On the Cluster Resource Properties page of the GroupWise cluster resource, click *Scripts > Unload Script*.
- 2 If this is an NSS volume or a shared pool, use an unload script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfncs

# request service stop
ignore_error /etc/init.d/grpwise stop domain
ignore_error /etc/init.d/grpwise stop post_office.domain
ignore_error /etc/init.d/grpwise stop gwdva

# stop service otherwise
sleep 8
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwmta
    @/media/nss/volume_name/groupwise/agents/share/domain_name.mta"
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwpoa
    @/media/nss/volume_name/groupwise/agents/share/
    post_office_name.poa"
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwdva
    @/media/nss/volume_name/groupwise/agents/share/gwdva.dva"

# delete IP address
ignore_error del_secondary_ipaddress gw_partition_ip_address

# unmount filesystem
exit_on_error umount /mnt/mount_point_directory

# return status
exit 0
```

- 2a In the `request service stop` section, use the commands to stop the specific GroupWise agents that are running on this GroupWise partition.
- 2b In the `stop service otherwise` section, adjust the `sleep` command as needed so that the agents can shut down normally on your system without being inadvertently killed by the `pkill` command that follows.
- 2c In the `delete IP address` section, specify the secondary IP address of the GroupWise partition.
- 2d In the `unmount filesystem` section, specify the mount point directory in use for the nodes in the cluster.
- 2e (Conditional) If you are running the GroupWise High Availability service (gwha), stop it before the script stops the agents, then start it again at the end of the unload script.

This prevents the GroupWise High Availability service from trying to restart the agents while the script is trying to stop them.

Add the following section before the `request service stop` section:

```
# Temporarily disable the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha off
ignore_error kill -HUP `pidof xinetd`
```

Add the following section before the `return status` section:

```
# Restart the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha on
ignore_error kill -HUP `pidof xinetd`
```

- 3** (Conditional) If this is a traditional Linux volume, use an unload script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfncs

# request service stop
ignore_error /etc/init.d/grpwise stop domain
ignore_error /etc/init.d/grpwise stop post_office.domain
ignore_error /etc/init.d/grpwise stop gwdva

# stop service otherwise
sleep 8
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwmta
@/media/nss/volume_name/groupwise/agents/share/domain_name.mta"
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwpoa
@/media/nss/volume_name/groupwise/agents/share/
post_office_name.poa"

# define IP address
RESOURCE_IP=gw_partition_ip_address

# define mount point
MOUNT_POINT=/mnt/mount_point_directory

# delete IP address
ignore_error del_secondary_ipaddress $RESOURCE_IP

# unmount filesystem
exit_on_error umount $MOUNT_POINT

# return status
exit 0
```

- 3a** In the `request service stop` section, use the commands to stop the specific GroupWise agents that are running on this GroupWise partition.
- 3b** In the `stop service otherwise` section, adjust the `sleep` command as needed so that the agents can shut down normally on your system without being inadvertently killed by the `pkill` command that follows.
- 3c** In the `define IP address` section, specify the secondary IP address of the GroupWise partition.
- 3d** In the `define mount point` section, specify the mount point directory in use for the nodes in the cluster.
- 3e** (Conditional) If you are running the GroupWise High Availability service (`gwha`), stop it before the script stops the agents, then start it again at the end of the unload script.

This prevents the GroupWise High Availability service from trying to restart the agents while the script is trying to stop them.

Add the following section before the `request service stop` section:

```
# Temporarily disable the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha off
ignore_error kill -HUP `pidof xinetd`
```

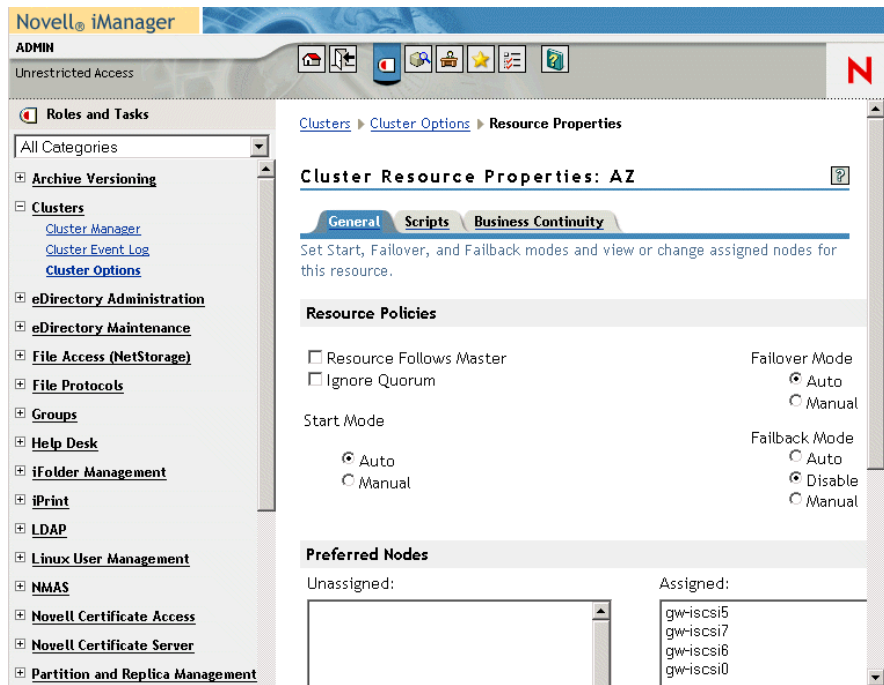

Add the following section before the return status section:

```
# Restart the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha on
ignore_error kill -HUP `pidof xinetd`
```

- 4 Click *OK* to save the unload script.

Setting the Failover List and Policies for the Agents

- 1 On the Cluster Resource Properties page of the GroupWise cluster resource, click *General*.



The default policy settings are often appropriate. By default, a cluster resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover list
- ◆ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

- 2 Under *Preferred Nodes*, arrange the nodes in the cluster into the desired failover list for the domain or post office (under [Agent Clustering Worksheet items 3 or 6](#)).
- 3 Click *OK*.

14.4.4 Setting Up New Instances of the Agents without Installing the Agent Software

There are two steps to setting up new instances of the agents without installing the agent software:

- ♦ [“Creating New Startup Files” on page 146](#)
- ♦ [“Modifying Existing Load and Unload Scripts” on page 146](#)

Creating New Startup Files

Each MTA startup file is named after the domain it services, with a `.mta` extension. Each POA startup file is named after the post office it services, with a `.poa` extension. When you select the *Configure GroupWise for Clustering* option, the GroupWise Installation program creates agent startup files in `mount_point/groupwise/agents/share` on the shared resource.

To create a new startup file without installing the agent software:

- 1 Make a copy of an existing startup file and name it after the domain or post office that will be serviced by the agent.
- 2 Edit the setting of the `--home` startup switch to point to the location of the new domain directory or post office directory. Be careful to maintain the syntax of the original line.
- 3 Scroll down through the new startup file looking for other active (not commented out) startup switches, then modify them as needed for the new agent.
- 4 Save the new startup file.
- 5 Edit the GroupWise High Availability service configuration file (`/etc/opt/novell/groupwise/gwha.conf`).
- 6 Make a copy of the section for an existing domain and its MTA or post office and its POA, then modify the information for the new domain or post office and its accompanying agent.
- 7 Save the `gwha.conf` file.

For more information about the High Availability service, see [“Enabling the Groupwise High Availability Service for the Linux GroupWise Agents”](#).

- 8 Continue with [Modifying Existing Load and Unload Scripts](#).

Modifying Existing Load and Unload Scripts

The agent startup file names are part of the `load` commands found in GroupWise cluster resource load scripts.

If you created the new domain and/or post office on a new GroupWise partition, skip back to [Section 14.4.3, “Configuring GroupWise Cluster Resources to Load and Unload the Agents,” on page 139](#) for instructions to create new load and unload scripts.

If you created the new domain and/or post office on an existing GroupWise partition, most of the configuration of the cluster resource has already been done. You just need to add new service start and stop commands to the existing scripts. Continue with the steps below:

To modify existing load and unload scripts:

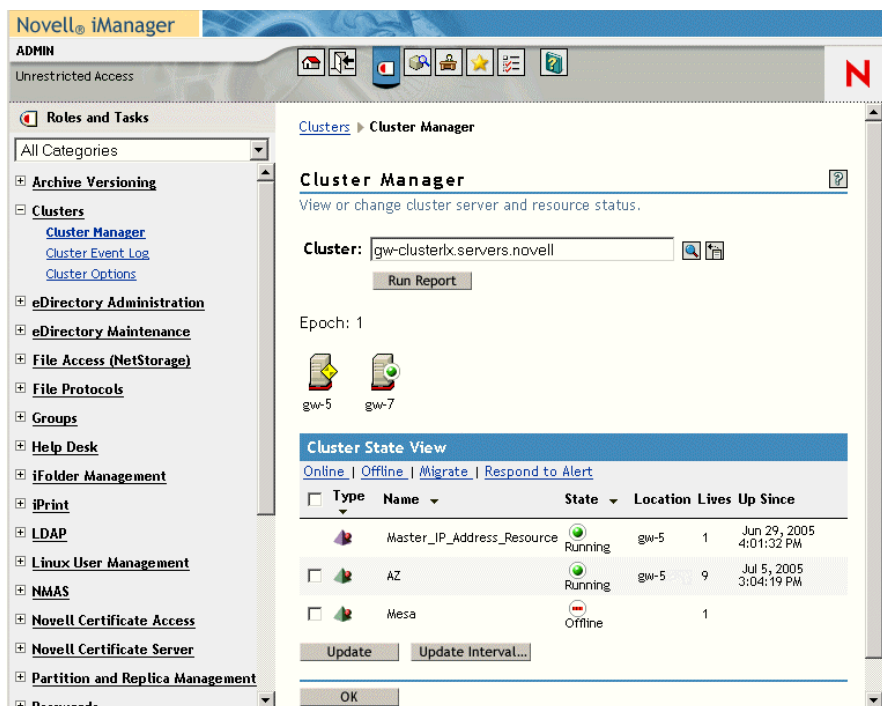
- 1 In iManager, expand Cluster, then click *Cluster Options*.
- 2 In the *Cluster* field, browse to and click the Cluster object where the GroupWise cluster resource is located.

- 3 Select a cluster resource that contains a GroupWise partition, then click *Properties > Scripts*.
 - 4 Following the pattern of the existing service start commands, add start commands for the new instances of the agents you are setting up. Use Ctrl+C to copy and Ctrl+V to paste lines in the load script page.
 - 5 Click *Apply* to save the modified load script.
 - 6 Click *Unload Script*.
 - 7 Add corresponding service stop commands for the new instances of the agents.
 - 8 Click *Apply* to save the modified unload script.
- You might want to review other properties of the Cluster Resource object, such as the failover list and the failover/failback/migration procedures on the General page, in light of the fact that an additional domain and/or post office now resides on the GroupWise partition.
- 9 Change other Cluster Resource properties as needed.
 - 10 Click *OK* to save the modified properties.
 - 11 In the Cluster Manager, take the GroupWise partition offline and then bring it online again to test the new startup files and the modified load and unload scripts. If you need assistance with these tasks, see [Testing Your Clustered GroupWise System](#).

14.5 Testing Your Clustered GroupWise System

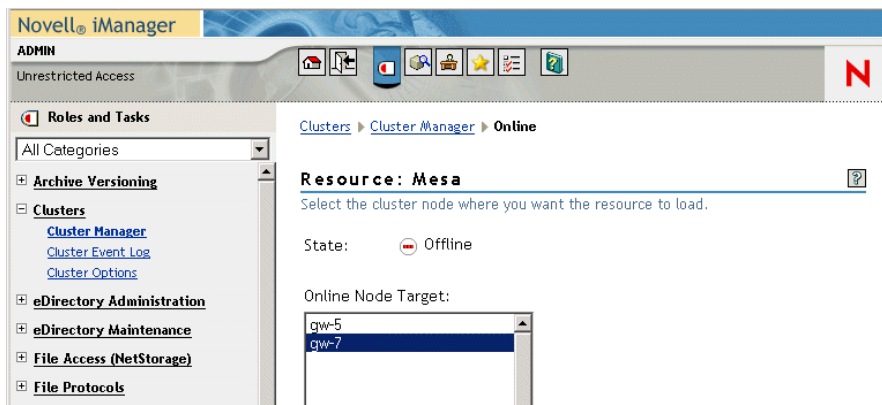
After you have configured the GroupWise cluster resources, you can test the load and unload scripts by bringing the GroupWise cluster resource online and taking it offline again.

- 1 In iManager, expand Clusters, then click *Cluster Manager*.



The new GroupWise cluster resource shows *Offline* in the *State* column.

- 2 Click the new GroupWise cluster resource, then click *Online*.



- 3 Select the cluster node where you want to online the GroupWise cluster resource, then click *OK*.
After a moment, the GroupWise cluster resource displays *Running* in the *State* column.
- 4 At the server where the MTA and/or POA are starting, use the following command to see if they are running:


```
/etc/init.d/grpwise status domain
/etc/init.d/grpwise status post_office.domain
```
- 5 Select the new GroupWise cluster resource, then click *Offline*.
The *State* column for the GroupWise cluster resource returns to *Offline*.
- 6 Use the same command you used in [Step 4](#) to verify if they have stopped.
- 7 Repeat [Step 2](#) whenever you are ready to bring the new GroupWise cluster resource online permanently.
- 8 Continue with [Managing Your Clustered GroupWise System](#).

14.6 Managing Your Clustered GroupWise System

After you have set up a basic clustered GroupWise system, you should consider some long-term management issues.

- ♦ [Section 14.6.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 148
- ♦ [Section 14.6.2, “Knowing What to Expect in MTA and POA Failover Situations,”](#) on page 150

14.6.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After setting up your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record the cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information for a Domain and Its MTA”](#) on page 149
- ♦ [“Recording Cluster-Specific Information for a Post Office and Its POA”](#) on page 149
- ♦ [“Recording Cluster-Specific Information for a Software Distribution Directory”](#) on page 150

Recording Cluster-Specific Information for a Domain and Its MTA

To permanently record important cluster-specific information for the domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the domain Identification page, provide a cluster-specific description of the domain, including the secondary IP address of its GroupWise partition.
- 3 Click *OK* to save the domain description.
- 4 Select the Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the secondary IP address of the domain's GroupWise partition.
This information appears on the MTA server console, no matter which node in the cluster it is currently running on.
- 7 Click *Apply* to save the description.
- 8 Click *Network Address*.
- 9 In the *TCP/IP Address* field, provide the secondary IP address that you provided in the GroupWise Installation program for use with the `--ip` switch in the MTA startup file.
- 10 Select *Bind Exclusively to TCP/IP Address*.
This records this vital information in eDirectory as well as in the MTA startup file.
- 11 Click *OK* to save the MTA description and secondary IP address.
- 12 Continue with [Recording Cluster-Specific Information for a Post Office and Its POA](#).

Recording Cluster-Specific Information for a Post Office and Its POA

To permanently record important cluster-specific information for a post office:

- 1 In ConsoleOne, browse to and right-click the Post Office object, then click *Properties*.
- 2 In the *Description* field of the post office Identification page, provide a cluster-specific description of the post office, including the secondary IP address of its GroupWise partition.
- 3 Click *OK* to save the post office description.
- 4 Select the Post Office object to display its contents.
- 5 Right-click the POA object, then click *Properties*.
- 6 In the *Description* field of the POA Identification page, record the secondary IP address of the post office's GroupWise partition.
This information appears on the POA server console, no matter which node in the cluster it is currently running on.
- 7 Click *Apply* to save the description.
- 8 Click *Network Address*.
- 9 In the *TCP/IP Address* field, provide the secondary IP address that you provided in the GroupWise Installation program for use with the `--ip` switch in the POA startup file.
- 10 Select *Bind Exclusively to TCP/IP Address*.
This records this vital information in eDirectory as well as in the POA startup file.
- 11 Click *OK* to save the POA description and secondary IP address.

12 If applicable, continue with [Recording Cluster-Specific Information for a Software Distribution Directory](#).

or

Skip to [Section 14.6.2, “Knowing What to Expect in MTA and POA Failover Situations,”](#) on page 150.

Recording Cluster-Specific Information for a Software Distribution Directory

To permanently record important cluster-specific information about a software distribution directory located on a GroupWise partition:

- 1 In ConsoleOne, click *Tools > System Operations > Software Directory Management*.
- 2 Select the software distribution directory, then click *Edit*.
- 3 In the description field, record the secondary IP address of the GroupWise partition where the software distribution directory resides.
- 4 Click *OK*, then click *Close* to save the software distribution directory description.
- 5 Continue with [Knowing What to Expect in MTA and POA Failover Situations](#).

14.6.2 Knowing What to Expect in MTA and POA Failover Situations

In a failover situation, the agents might need to perform some database repair as they start on the new node. The time required depends on the size of the databases involved.

Typically, the POA returns to full functionality faster than the MTA. This benefits GroupWise client users, who can reconnect to their mailboxes very quickly and probably do not notice if messages to users in other post offices are not delivered immediately. The only time a user needs to restart the GroupWise client is if he or she was actually in the process of sending a message when the POA went down. Notify can continue running even if the connection to the POA becomes unavailable and then it reconnects automatically when the POA is again available.

The MTA typically takes some time reestablishing the links to its post offices, other domains, and gateways, but this situation usually resolves itself in a few minutes without administrator intervention. If it does not, you can manually restart the MTA to speed up the process.

In comparison to failover, migration typically takes longer because the agents methodically terminate their threads and close their databases as part of their normal shutdown procedure. However, as a result, no database repair is required when the agents start up again in their new location.

Continue with [What's Next](#).

14.7 What's Next

Now that you have at least one GroupWise domain and post office up and running in a clustering environment, you are ready to proceed with the rest of your GroupWise system setup by:

- ♦ Adding users to post offices. See “[Users](#)” in the *GroupWise 8 Administration Guide*.
- ♦ Setting up the GroupWise client software and helping users to get started using it. See “[Client](#)” in the *GroupWise 8 Administration Guide*. Also see the *GroupWise 8 Windows Client User Guide*.
- ♦ Connecting your clustered GroupWise system to the Internet. See [Chapter 15, “Implementing the Internet Agent in a Linux Cluster,”](#) on page 153.

- ♦ Providing access to users' GroupWise mailboxes from their Web browsers. See [Chapter 16, "Implementing WebAccess in a Linux Cluster,"](#) on page 175.
- ♦ Monitoring the status of your clustered GroupWise system from your Web browser. See [Chapter 17, "Implementing GroupWise Monitor in a Linux Cluster,"](#) on page 195.
- ♦ Backing up your clustered GroupWise system. See [Chapter 18, "Backing Up a GroupWise System in a Linux Cluster,"](#) on page 209.

14.8 Clustering Quick Checklists

- ♦ [Section 14.8.1, "GroupWise System Quick Checklist,"](#) on page 151
- ♦ [Section 14.8.2, "Domain Quick Checklist,"](#) on page 151
- ♦ [Section 14.8.3, "Post Office Quick Checklist,"](#) on page 152

14.8.1 GroupWise System Quick Checklist

- Plan your new clustered GroupWise system.
See [Chapter 13, "Planning GroupWise in a Linux Cluster,"](#) on page 121.
- Create the primary domain and initial post office in your new clustered GroupWise system.
See [Section 14.1, "Setting Up a New GroupWise System in a Linux Cluster,"](#) on page 131.
- Set up the agents for the primary domain and the initial post office.
See [Section 14.4, "Installing and Configuring the MTA and the POA in a Cluster,"](#) on page 134.
- Modify the cluster resource load scripts:
See ["Modifying the Cluster Resource Load Script for the Agents"](#) on page 139.
- Modify the cluster resource unload scripts:
See ["Modifying the Cluster Resource Unload Script for the Agents"](#) on page 143.
- Set up the cluster failover lists and policies.
See ["Setting the Failover List and Policies for the Agents"](#) on page 145.
- Test your new clustered GroupWise system.
See [Section 14.5, "Testing Your Clustered GroupWise System,"](#) on page 147.
- Record cluster-specific information in the properties pages of the GroupWise objects that the information pertains to.
See [Section 14.6, "Managing Your Clustered GroupWise System,"](#) on page 148.

14.8.2 Domain Quick Checklist

- Plan your new clustered domain.
See [Section 13.3, "Planning a New Clustered Domain,"](#) on page 124.
- Create the new domain.
See [Section 14.2, "Creating a New Secondary Domain in a Linux Cluster,"](#) on page 132.
- Set up the MTA for the new domain.
See [Section 14.4, "Installing and Configuring the MTA and the POA in a Cluster,"](#) on page 134.

- Modify the domain cluster resource load script.
See [“Modifying the Cluster Resource Load Script for the Agents”](#) on page 139.
- Modify the domain cluster resource unload script.
See [“Modifying the Cluster Resource Unload Script for the Agents”](#) on page 143.
- Set up the domain failover list and policies.
See [“Setting the Failover List and Policies for the Agents”](#) on page 145.
- Test your new clustered domain.
See [Section 14.5, “Testing Your Clustered GroupWise System,”](#) on page 147.
- Record cluster-specific information in the properties pages of the GroupWise objects that the information pertains to.
See [Section 14.6, “Managing Your Clustered GroupWise System,”](#) on page 148.

14.8.3 Post Office Quick Checklist

- Plan your new clustered post office.
See [Section 13.4, “Planning a New Clustered Post Office,”](#) on page 125 and [Section 13.5, “Planning a New Library for a Clustered Post Office,”](#) on page 125.
- Create the new post office.
See [Section 14.3, “Creating a New Post Office in a Linux Cluster,”](#) on page 133.
- Set up the POA for the new post office.
See [Section 14.4, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 134.
- Modify the post office cluster resource load script:
See [“Modifying the Cluster Resource Load Script for the Agents”](#) on page 139.
- Modify the post office cluster resource unload script:
See [“Modifying the Cluster Resource Unload Script for the Agents”](#) on page 143.
- Set up the post office failover list and policies.
See [“Setting the Failover List and Policies for the Agents”](#) on page 145.
- Test your new clustered post office.
See [Section 14.5, “Testing Your Clustered GroupWise System,”](#) on page 147.
- Record cluster-specific information in the properties pages of the GroupWise objects that the information pertains to.
See [Section 14.6, “Managing Your Clustered GroupWise System,”](#) on page 148.

15 Implementing the Internet Agent in a Linux Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 13, “Planning GroupWise in a Linux Cluster,”](#) on page 121 and [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131. As part of this process, you filled you the “[System Clustering Worksheet](#)” on page 128. If you do not have access to the filled-out worksheet, print the worksheet now and fill in the clustering information as it currently exists on your system. You need this information as you implement the Internet Agent in a cluster.

- ♦ [Section 15.1, “Planning the Internet Agent in a Linux Cluster,”](#) on page 153
- ♦ [Section 15.2, “Setting Up the Internet Agent in a Linux Cluster,”](#) on page 157
- ♦ [Section 15.3, “Testing the Internet Agent in a Linux Cluster,”](#) on page 168
- ♦ [Section 15.4, “Managing the Internet Agent in a Linux Cluster,”](#) on page 170
- ♦ [Section 15.5, “Internet Agent Clustering Worksheet,”](#) on page 171
- ♦ [Section 15.6, “Internet Agent Quick Checklist,”](#) on page 172

15.1 Planning the Internet Agent in a Linux Cluster

A major system configuration difference between the Internet Agent in a clustering environment and the Internet Agent in a regular environment is that you need to create a separate domain to house each GroupWise gateway, including the Internet Agent.

The [Section 15.5, “Internet Agent Clustering Worksheet,”](#) on page 171 lists the information you need as you set up the Internet Agent in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 15.1.1, “Planning a Domain for the Internet Agent,”](#) on page 154
- ♦ [Section 15.1.2, “Selecting the Internet Agent Partition and Secondary IP Address,”](#) on page 154
- ♦ [Section 15.1.3, “Determining an Appropriate Failover List for the Internet Agent,”](#) on page 155
- ♦ [Section 15.1.4, “Determining Cluster Resource Information for the Internet Agent,”](#) on page 155
- ♦ [Section 15.1.5, “Preparing DNS for the Clustered Internet Agent,”](#) on page 155
- ♦ [Section 15.1.6, “Preparing Your Firewall for the Clustered Internet Agent,”](#) on page 155
- ♦ [Section 15.1.7, “Planning the MTA Installation,”](#) on page 156
- ♦ [Section 15.1.8, “Planning the Internet Agent Installation,”](#) on page 156

15.1.1 Planning a Domain for the Internet Agent

The considerations involved in planning a domain for the Internet Agent are much the same as planning any other domain. In preparation, review “[Planning a New Domain](#)”, then print and fill out the “[Domain Worksheet](#)” in “[Domains](#)” in the *GroupWise 8 Administration Guide*.

Keep in mind the following cluster-specific details:

- ♦ When you specify the location for the domain directory on the Domain Worksheet, remember that it is on a [GroupWise partition](#), not on the node where you running the GroupWise Installation program. This location is referred to as the Internet Agent partition because it is where the Internet Agent message queues are located.
- ♦ Do not concern yourself with the GroupWise agent information on the Domain Worksheet. You can stop with [item 10](#). You will plan the MTA installation later.

When you have completed the Domain Worksheet, transfer the key information from the Domain Worksheet to the Internet Agent Clustering Worksheet.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 1: GroupWise Partition for the Internet Agent](#), transfer the domain location to the Internet Agent Clustering Worksheet.

Under [Item 2: Internet Agent Domain Name](#), transfer the domain name and database directory to the Internet Agent Clustering Worksheet.

IMPORTANT: Do not create the new domain until you are instructed to do so in [Section 15.2.1, “Creating a Domain for the Internet Agent,”](#) on page 157.

15.1.2 Selecting the Internet Agent Partition and Secondary IP Address

As with the MTA and the POA, the Internet Agent needs a secondary IP address that remains the same no matter which node in the cluster it is running on. You can place the Internet Agent and its domain on a [GroupWise partition](#) where a domain or post office already reside, which means that the Internet Agent shares the same secondary IP address as that domain or post office and fails over along with that domain or post office. Or you can place the Internet Agent and its domain on its own GroupWise partition, which means that it has its own secondary IP address and fails over independently.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 1: GroupWise Partition for Internet Agent](#), specify the secondary IP address for the Internet Agent partition.

Under [Item 5: MTA Network Information](#), copy the same secondary IP address.

Under [Item 6: Internet Agent Network Information](#), copy the same secondary IP address.

IMPORTANT: You must configure the GWIA to bind exclusively to the secondary IP address. Novell Cluster Services uses Postfix to send cluster email alerts using the primary IP address. Postfix and the GWIA both default to port 25. A conflict results unless you configure the GWIA so that it does not use the primary IP address. Instructions are provided in “[Forcing Use of the Internet Agent Secondary IP Address](#)” on page 167.

15.1.3 Determining an Appropriate Failover List for the Internet Agent

By default, a [GroupWise partition](#) is configured to have all nodes in the cluster in its failover list, organized in ascending alphanumeric order. Only one node at a time can have a particular GroupWise partition mounted and active. If a GroupWise partition's preferred node fails, the partition fails over to the next node in the failover list. You should customize the failover list for each GroupWise partition based on the [fan-out-failover](#) principle.

As with the MTA and the POA, you need to decide which nodes in the cluster are appropriate locations for the [Internet Agent partition](#) to fail over to. You must install the Internet Agent software on all of the nodes where you want the Internet Agent to be able to fail over. For a review of failover lists, see [Section 13.6.2, "Determining Appropriate Failover Lists for the Agents,"](#) on page 126, which describes the issues in the context of planning MTA and POA installations.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 3: Internet Agent Failover List](#), list the nodes that you want in the Internet Agent partition failover list.

15.1.4 Determining Cluster Resource Information for the Internet Agent

A cluster resource is a [shared partition](#), secondary IP address, application, service, Web server, etc., that can function successfully anywhere in the cluster. Cluster resources include the GroupWise agents and the Messenger agents. When using the *Configure GroupWise for Clustering* option, the GroupWise Installation program needs to know the mount point for the [GroupWise partition](#) where the Internet Agent domain is located.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 4: Cluster Resource Mount Point](#), list the mount point for the GroupWise partition where the Internet Agent domain is located.

15.1.5 Preparing DNS for the Clustered Internet Agent

In order for the Internet Agent partition to be recognized on your network, DNS must have an MX record that includes the hostname corresponding to the secondary IP address of the Internet Agent partition. A DNS A record associates the secondary IP address with the hostname.

15.1.6 Preparing Your Firewall for the Clustered Internet Agent

The Internet Agent receives incoming messages on the secondary IP address of the Internet Agent partition. Your firewall configuration must be modified to allow inbound TCP/IP traffic from the Internet to the Internet Agent secondary IP address on the following standard ports:

Table 15-1 *Standard Ports*

Protocol	Standard Port
IMAP4	143
LDAP	389

Protocol	Standard Port
POP3	110
SMTP	25

By default, the Internet Agent sends outgoing messages on the *primary IP address of the server where it is running*. If you decide to use this default configuration, your firewall must be configured to allow outbound TCP/IP traffic from all nodes in the Internet Agent partition failover list.

If the Internet Agent has a large number of nodes on its failover list, you could configure the Internet Agent to send outgoing messages to a relay host, which then sends them out through the firewall using its own IP address rather than the address of the particular node where the Internet Agent was running. This reduces the amount of modification to your firewall required to set up the Internet Agent. However, if the relay host goes down, outgoing messages are delayed.

As another alternative, you can configure the Internet Agent to use its secondary IP address for sending as well as receiving messages. Setup instructions for this configuration are provided in [“Forcing Use of the Internet Agent Secondary IP Address” on page 167](#), which you can complete after installing the Internet Agent.

In preparation for installing the Internet Agent, configure your firewall as needed to handle the Internet Agent’s use of primary and secondary IP addresses when sending and receiving messages.

15.1.7 Planning the MTA Installation

Follow the instructions in [Section 13.6.4, “Planning the Linux Agent Installation,” on page 127](#), then return to this point. After you follow the instructions, you will have a filled-out [Agent Clustering Worksheet](#) to use when you install the MTA.

IMPORTANT: Do not install the Linux MTA until you are instructed to do so in [Section 15.2, “Setting Up the Internet Agent in a Linux Cluster,” on page 157](#).

15.1.8 Planning the Internet Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Internet Agent are the same in a clustering environment as for any other environment. Review the installation instructions in [“Linux: Installing the Internet Agent Software”](#) in [“Installing the GroupWise Internet Agent”](#) in the *GroupWise 8 Installation Guide*. Use the [“GroupWise Internet Agent Installation Summary Sheet”](#) to record the planning information you will need as you install the Internet Agent in your cluster.

IMPORTANT: Do not install the Internet Agent software until you are instructed to do so in [Setting Up the Internet Agent in a Linux Cluster](#).

15.2 Setting Up the Internet Agent in a Linux Cluster

You should already have reviewed [Section 15.1, “Planning the Internet Agent in a Linux Cluster,”](#) on page 153 and filled out [Section 15.5, “Internet Agent Clustering Worksheet,”](#) on page 171. You are now ready to complete the following tasks to set up the Internet Agent in a clustering environment:

- ♦ [Section 15.2.1, “Creating a Domain for the Internet Agent,”](#) on page 157
- ♦ [Section 15.2.2, “Installing the MTA for the Internet Agent Domain,”](#) on page 157
- ♦ [Section 15.2.3, “Installing and Configuring the Internet Agent in a Cluster,”](#) on page 157

15.2.1 Creating a Domain for the Internet Agent

The Internet Agent domain will be a secondary domain. To create it, follow the instructions in [Section 14.2, “Creating a New Secondary Domain in a Linux Cluster,”](#) on page 132, taking your information from the Internet Agent Clustering Worksheet, rather than the System Clustering Worksheet, then return to this point.

Do not create any post offices in the Internet Agent domain.

After you have created the domain, continue with [Installing the MTA for the Internet Agent Domain.](#)

15.2.2 Installing the MTA for the Internet Agent Domain

The MTA for the Internet Agent domain can be installed just like any other MTA in your clustered GroupWise system. Follow the instructions in [Section 14.4.1, “Installing and Setting Up the Agents in Your Cluster,”](#) on page 134, then return to this point.

You do not need to edit the MTA startup file. You do not need to modify the Cluster Resource object properties until after you have installed the Internet Agent.

After you have installed the MTA, continue with [Installing and Configuring the Internet Agent in a Cluster.](#)

15.2.3 Installing and Configuring the Internet Agent in a Cluster

After you have created a domain for the Internet Agent and installed the MTA for that domain, you are ready to install and configure the Internet Agent.

- ♦ [“Installing and Setting Up the Internet Agent Software in Your Cluster”](#) on page 158
- ♦ [“Configuring the Clustered Internet Agent for SSL”](#) on page 161
- ♦ [“Configuring the Internet Agent Cluster Resource to Load and Unload the Internet Agent and Its MTA”](#) on page 162
- ♦ [“Enabling Internet Addressing for Your Clustered GroupWise System”](#) on page 167
- ♦ [“Forcing Use of the Internet Agent Secondary IP Address”](#) on page 167
- ♦ [“Verifying Internet Agent Object Properties”](#) on page 167

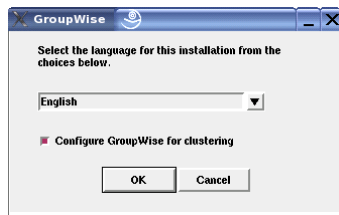
Installing and Setting Up the Internet Agent Software in Your Cluster

The Internet Agent must be installed on each node in its failover list ([Internet Agent Clustering Worksheet item 3](#)).

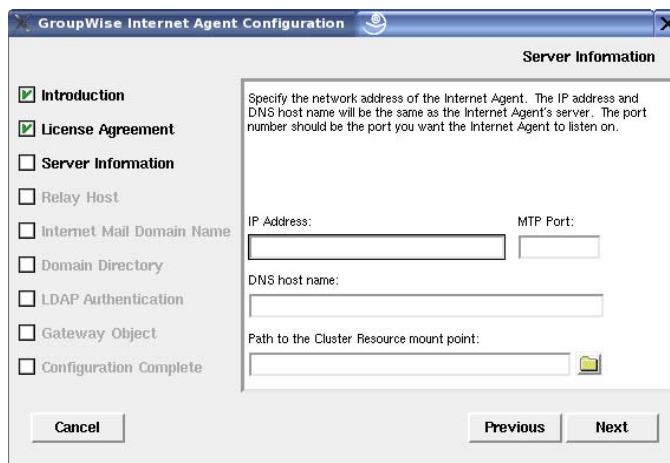
- ♦ “Running the Internet Agent Installation Program on the Preferred Node” on page 158
- ♦ “Running the Internet Agent Installation Program on Subsequent Nodes” on page 159
- ♦ “Testing Your Internet Agent Installation on Each Node” on page 161

Running the Internet Agent Installation Program on the Preferred Node

- 1 Make sure that the Internet Agent software is available in the software distribution directory you created in [Step 6](#) in [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131.
- 2 Mount the Internet Agent partition ([Internet Agent Clustering Worksheet item 1](#)) where the Internet Agent message queues are located.
- 3 From the software distribution directory, start the GroupWise Installation program and select *Configure GroupWise for Clustering*.



- 4 Install the Internet Agent software, following the steps provided in “[Linux: Installing the Internet Agent Software](#)” in “[Installing the GroupWise Internet Agent](#)” in the *GroupWise 8 Installation Guide*.
- 5 Configure the Internet Agent according to the “[GroupWise Internet Agent Installation Summary Sheet](#)” that you filled out in [Section 15.1, “Planning the Internet Agent in a Linux Cluster,”](#) on [page 153](#), paying special attention to the cluster resource information on the Server Information page.



As a result of selecting *Configure GroupWise for Clustering* on the preferred node, the following cluster-specific configuration actions are performed:

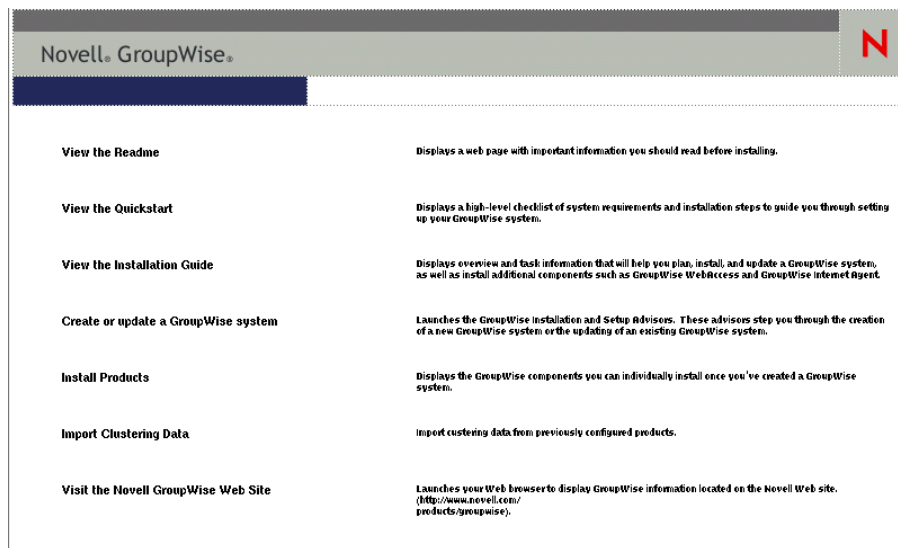
- ◆ The Internet Agent startup file (`gwia.cfg`) is created in `mount_point/groupwise/agents/share` on the shared resource so that the Internet Agent uses the same startup file regardless of which cluster node it is running on. The `--home` switch includes the mount point and the path to the database so that the startup file is valid when mounted to each cluster node.
 - ◆ The `--cluster` switch is added to the Internet Agent startup file to inform the Internet Agent that it is running in a cluster.
 - ◆ The `--ip` startup switch is set to the secondary IP address of the shared resource where the domain is located. This ensures that the Internet Agent runs with the same IP address regardless of which cluster node it is running on.
 - ◆ The `--log` startup switch is set to a location on the shared resource (`mount_point/groupwise/agents/log`) so that Internet Agent logging information is written to the same log file regardless of which cluster node it is running on.
 - ◆ If this is the first GroupWise agent installed on this cluster node, the GroupWise High Availability service is automatically configured and its configuration file (`gwha.conf`) is created in the `/etc/opt/novell/groupwise` directory. If another GroupWise agent has already been installed on this cluster node, the `gwha.conf` file is updated to include the Internet Agent.
 - ◆ The `clusterimport.conf` file in the `gwinst` subdirectory of the software distribution directory from which you ran the GroupWise Installation program is updated, so that the cluster-specific information collected when you configured the Internet Agent on the preferred node is available when you install the Internet Agent on subsequent nodes.
 - ◆ The Internet Agent is not configured to start automatically on system startup. In a cluster, you do not want the Internet Agent to start automatically whenever a node restarts.
- 6 Configure the Internet Agent to run as a non-root user, as described in the applicable section of the [GroupWise 8 Installation Guide](#):
- ◆ [“Running the Linux GroupWise Agents As a Non-root User”](#)
 - ◆ [“Setting Up Non-root Access on an NSS Volume on Novell Open Enterprise Server Linux”](#)
- 7 Continue with [Running the Internet Agent Installation Program on Subsequent Nodes](#).

Running the Internet Agent Installation Program on Subsequent Nodes

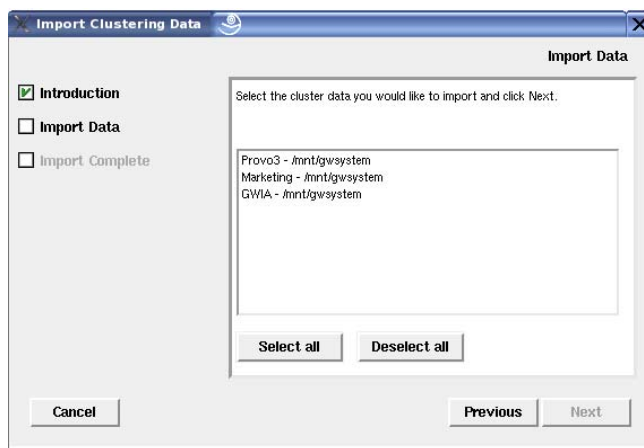
- 1 On the next node in the Internet Agent failover list, mount the Internet Agent partition ([Internet Agent Clustering Worksheet item 1](#)) where the Internet Agent message queues are located.
- 2 From the software distribution directory you created in [Step 6 in Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,” on page 131](#), start the GroupWise Installation program and select *Configure GroupWise for Clustering*.



Because of the existence of the `clusterimport.conf` file in the `gwinst` subdirectory of the software distribution directory, a new installation option, *Import Clustering Data*, is now available on the main GroupWise Installation program page.



- 3 Install the Internet Agent software on the cluster node as usual, but do not use the *Configure* option.
- 4 On the main page of the Installation program, click *Import Clustering Data*, then click *Next*.



All GroupWise agents that you have installed from the software distribution directory are listed, based on the information stored in the `clusterimport.conf` file.

- 5 Select the GroupWise agents that you want to configure on the current cluster node, then click *OK*.

The *Import Clustering Data* option performs the following configuration actions for each subsequent node where you run it:

- ◆ The `grpwise` script is created in the `/etc/init.d` directory on the current cluster node. It is configured specifically for the agents you just selected.
- ◆ The GroupWise High Availability service is automatically configured on the current cluster node and its configuration file (`gwha.conf`) is created in the `/etc/opt/novell/groupwise` directory. It is configured specifically for the agents you just selected.

Because the agent startup files and log files are stored on the shared resource, they do not need to be customized for each cluster node.

- 6 Configure the Internet Agent to run as a non-root user, as described in the applicable section of the [GroupWise 8 Installation Guide](#):
 - ♦ [“Running the Linux GroupWise Agents As a Non-root User”](#)
 - ♦ [“Setting Up Non-root Access on an NSS Volume on Novell Open Enterprise Server Linux”](#)
- 7 Repeat [Step 1](#) through [Step 6](#) for each cluster node in the Internet Agent failover list.

After you install and configure the Internet Agent on each node in its failover list, the cluster node is ready for the Internet Agent to fail over to it.
- 8 Continue with [Testing Your Internet Agent Installation on Each Node](#).

Testing Your Internet Agent Installation on Each Node

- 1 Test the Internet Agent by starting it with a user interface, as described in [“Linux: Starting the Internet Agent”](#) in [“Installing the GroupWise Internet Agent”](#) in the [GroupWise 8 Installation Guide](#).

```
/opt/novell/groupwise/agents/bin/gwia --show @gwia.cfg &
```

- 2 Stop the Internet Agent by clicking *File > Exit*.
- 3 After you can see that the Internet Agent stopped successfully, test it by starting it as a daemon, as described in [“Starting the Linux GroupWise Agents as Daemons”](#) in [“Installing GroupWise Agents”](#) in the [GroupWise 8 Installation Guide](#).

```
/etc/inet.d/grpwise start domain.gwia
/etc/inet.d/grpwise status domain.gwia
```

- 4 Stop the Internet Agent.

```
/etc/inet.d/grpwise stop domain.gwia
/etc/inet.d/grpwise status domain.gwia
```

- 5 Make sure you have completed all the tasks described in [“Installing the GroupWise Internet Agent”](#) in the [GroupWise 8 Installation Guide](#).

A few tasks, such as assigning a postmaster, are not dealt with in this cluster-oriented section.
- 6 Repeat the steps in [“Running the Internet Agent Installation Program on the Preferred Node”](#) on [page 158](#) for each node in the Internet Agent failover list.

When you have installed the Internet Agent on all of the nodes in the Internet Agent failover list, continue with [Configuring the Clustered Internet Agent for SSL](#).

Configuring the Clustered Internet Agent for SSL

If you plan to enable SSL, as described in [“Securing Internet Agent Connections with SSL”](#) in [“Internet Agent”](#) in the [GroupWise 8 Administration Guide](#), you must make the SSL certificate file and key file available to the Internet Agent in the cluster. The default locations for the SSL certificate file and key file are on the cluster nodes along with the GroupWise software, rather than being located with the domain and post office on one or more GroupWise partitions. To avoid having multiple copies of these files in multiple locations, you should set the locations in ConsoleOne.

- 1 On the Internet Agent partition, create the directory where you want to store the certificate and key file required for SSL.
- 2 Copy the certificate file and key file into the new directory.

If you need assistance obtaining these files, see [“Server Certificates and SSL Encryption”](#) in [“Security Administration”](#) in the [GroupWise 8 Administration Guide](#).
- 3 In ConsoleOne, browse to and select the Domain object.

- 4 Right-click the Internet Agent object, then click *Properties*.
- 5 Click *GroupWise > SSL Settings*.
- 6 In the *Certificate File* field, browse to and select the certificate file.
- 7 In the *SSL Key File* field, browse to and select the key file.
- 8 Click *OK*.
- 9 Continue with [Configuring the Internet Agent Cluster Resource to Load and Unload the Internet Agent and Its MTA](#).

Configuring the Internet Agent Cluster Resource to Load and Unload the Internet Agent and Its MTA

The properties of the Cluster Resource object define how the [Internet Agent partition](#) functions within the cluster, how the Internet Agent is loaded and unloaded, and how failover and failback situations are handled. Complete the following tasks for the Internet Agent cluster resource:

- ♦ [“Modifying the Cluster Resource Load Script for the Internet Agent and Its MTA” on page 162](#)
- ♦ [“Modifying the Cluster Resource Unload Script for the Internet Agent and Its MTA” on page 165](#)
- ♦ [“Setting the Failover List and Policies for the Internet Agent and Its MTA” on page 167](#)

Modifying the Cluster Resource Load Script for the Internet Agent and Its MTA

The cluster resource load script executes whenever the Internet Agent cluster resource comes online.

To set up the load script in iManager:

- 1 Expand *Clusters*, then click *Cluster Options*.
- 2 In the *Cluster* field, browse to the Cluster object where the Internet Agent cluster resource is located.
- 3 Click the Cluster object to display the cluster resources that belong to the cluster.
- 4 Select the Internet Agent cluster resource that you created when you set up the Internet Agent partition, then click *Details*.
- 5 Click *Scripts > Load Script*.

- 6** (Conditional) If this is an NSS volume or a shared pool, use a load script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

# mount filesystem
exit_on_error ncpcon mount /opt="noatime,nodiratime" volume_name=volume_ID

# add IP address
exit_on_error add_secondary_ipaddress gwia_partition_ip_address

# start service
exit_on_error /etc/init.d/grpwise start domain
exit_on_error /etc/init.d/grpwise start domain.gwia
```

- 6a** In the `mount filesystem` section, specify the volume name and volume ID of the GWIA partition that you are clustering ([System Clustering Worksheet item 5](#)):
- 6b** In the `add IP address` section, specify the secondary IP address of the GWIA partition ([System Clustering Worksheet item 7](#)):
- 6c** In the `start service` section, provide the commands to start the MTA first, following by the GWIA.
- 7** (Conditional) If this is a traditional Linux volume, use a load script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfunc

# define IP address
RESOURCE_IP=gwia_partition_ip_address

# define filesystem type
MOUNT_FS=filesystem

# define device (if using EVMS)
exit_on_error evms -f /var/opt/novell/ncs/ContainerActivate -rl
                                                    Share `uname -n`
MOUNT_DEV=/dev/evms/Share/dat

# define mount point
MOUNT_POINT=/mnt/mount_point_directory

# mount filesystem
exit_on_error mount -t $MOUNT_FS $MOUNT_DEV $MOUNT_POINT -o noatime,nodiratime

# add IP address
exit_on_error add_secondary_ipaddress $RESOURCE_IP

# start service
exit_on_error /etc/init.d/grpwise start domain
exit_on_error /etc/init.d/grpwise start domain.gwia

exit 0
```

- 7a** In the `define IP address` section, specify the secondary IP address of the GWIA partition ([Internet Agent Clustering Worksheet item 1](#)).
- 7b** In the `define filesystem type` section, specify the filesystem type that is in use in use on the nodes in the cluster ([System Clustering Worksheet item 5](#)).
- 7c** In the `define mount point` section, specify the mount point directory in use for the nodes in the cluster ([System Clustering Worksheet item 5](#)).
- 7d** In the `start service` section, provide the commands to start the MTA first, following by the GWIA.

- 8** If this is an NSS volume or a shared pool, make the following changes to set up the Internet Agent load script:
- 8a** As needed, in the mount command, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
 - 8b** In the mount command, change `vol` to the actual device name in use on nodes in the cluster.
 - 8c** In the mount command, change `/mnt/generic` to the mount point directory in use on nodes in the cluster.
 - 8d** In the `add_secondary_ipaddress` command, change `a.b.c.d` to the secondary IP address of the Internet Agent partition ([Internet Agent Clustering Worksheet item 1](#))
 - 8e** In the start service command, change `myservice start` to the command to start the Internet Agent and its MTA.

```
/etc/init.d/grpwise start domain
/etc/init.d/grpwise start domain.gwia
```

- 9** If this is a traditional Linux volume, use the following load script:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfunc

# define the IP address
RESOURCE_IP=123.123.1.

# define the file system type
MOUNT_FS=reiserf

# define the device
exit_on_error evms -f /var/opt/novell/ncs/ContainerActivate -rl
Share `uname -n`
MOUNT_DEV=/dev/evms/Share/dat

# define the mount point
MOUNT_POINT=/mnt/mount_point

# mount the file system
exit_on_error mount -t $MOUNT_FS $MOUNT_DEV $MOUNT_POINT

# add the IP address
exit_on_error add_secondary_ipaddress $RESOURCE_IP

/etc/init.d/grpwise start domain
/etc/init.d/grpwise start domain.gwia

exit 0
```

Make the following changes to set up the load script for the Internet Agent:

- 9a** On the `RESOURCE_IP` line, change `123.123.1.1` to the secondary IP address of the GroupWise partition ([Internet Agent Clustering Worksheet item 1](#)).
- 9b** As needed on the `MOUNT_FS` line, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
- 9c** On the `MOUNT_DEV` line, change `/dev/evms/Share/dat` to the actual device name in use on nodes in the cluster.
- 9d** On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory in use on nodes in the cluster.
- 9e** If you created a domain on the partition, use the following command to start the MTA:

```
/etc/init.d/grpwise start domain
```

9f Use the following commands to start the Internet Agent and its MTA:

```
/etc/init.d/grpwise start domain
/etc/init.d/grpwise start domain.gwia
```

10 Click OK to save the load script.

Modifying the Cluster Resource Unload Script for the Internet Agent and Its MTA

The cluster resource unload script executes whenever the Internet Agent cluster resource goes offline. Programs should be unloaded in the reverse order of how they were loaded. This ensures that supporting programs are not unloaded before programs that rely on them in order to function properly.

- 1** On the Cluster Resource Properties page of the Internet Agent cluster resource, click *Scripts > Unload Script*.
- 2** If this is an NSS volume or a shared pool, use an unload script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuns

# request service stop
ignore_error /etc/init.d/grpwise stop domain.gwia
ignore_error /etc/init.d/grpwise stop domain

# stop service otherwise
sleep 8
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwia
    @/media/nss/volume_name/groupwise/agents/share/gwia.cfg"
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwmta
    @/media/nss/volume_name/groupwise/agents/share/domain_name.mta"

# delete IP address
ignore_error del_secondary_ipaddress gwia_partition_ip_address

# unmount filesystem
exit_on_error umount /mnt/mount_point_directory

# return status
exit 0
```

- 2a** In the `request service stop` section, provide the commands to stop the GWIA first, followed by the MTA.
- 2b** In the `stop service otherwise` section, adjust the `sleep` command as needed so that the agents can shut down normally on your system without being inadvertently killed by the `pkill` command the follows.
- 2c** In the `delete IP address` section, specify the secondary IP address of the GWIA partition.
- 2d** In the `unmount filesystem` section, specify the mount point directory in use for the nodes in the cluster.
- 2e** (Conditional) If you are running the GroupWise High Availability service (gwha), stop it before the script stops the agents, then start it again at the end of the unload script.

This prevents the GroupWise High Availability service from trying to restart the agents while the script is trying to stop them.

Add the following section before the commands to stop the agents:

```
# Temporarily disable the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha off
ignore_error kill -HUP `pidof xinetd`
```

Add the following section before the `return status` section:

```
# Restart the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha on
ignore_error kill -HUP `pidof xinetd`
```

- 3** If this is a traditional Linux volume, use an unload script similar to the following example, depending on the configuration of your cluster and nodes:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfncs

# request service stop
ignore_error /etc/init.d/grpwise stop domain.gwia
ignore_error /etc/init.d/grpwise stop domain

# stop service otherwise
sleep 8
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwia
    @/media/nss/volume_name/groupwise/agents/share/gwia.cfg"
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwmta
    @/media/nss/volume_name/groupwise/agents/share/domain_name.mta"

# define IP address
RESOURCE_IP=gwia_partition_ip_address

# define mount point
MOUNT_POINT=/mnt/mount_point_directory

# delete IP address
ignore_error del_secondary_ipaddress $RESOURCE_IP

# unmount filesystem
exit_on_error umount $MOUNT_POINT

# return status
exit 0
```

- 3a** In the `request service stop` section, provide the commands to stop the GWIA first, followed by the MTA.
- 3b** In the `stop service otherwise` section, adjust the `sleep` command as needed so that the agents can shut down normally on your system without being inadvertently killed by the `pkill` command the follows.
- 3c** In the `define IP address` section, specify the secondary IP address of the GWIA partition.
- 3d** In the `define mount point` section, specify the mount point directory in use for the nodes in the cluster.

- 3e** (Conditional) If you are running the GroupWise High Availability (gwha) service, stop it before the script stops the agents, then start it again at the end of the unload script.

This prevents the GroupWise High Availability service from trying to restart the agents while the script is trying to stop them.

Add the following section before the `request service stop` section:

```
# Temporarily disable the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha off
ignore_error kill -HUP `pidof xinetd`
```

Add the following section before the `return status` section:

```
# Restart the gwha service under xinetd
ignore_error /sbin/chkconfig -s gwha on
ignore_error kill -HUP `pidof xinetd`
```

- 4** Click **OK** to save the unload script.

Setting the Failover List and Policies for the Internet Agent and Its MTA

- 1 On the Cluster Resource Properties page of the Internet Agent cluster resource, click *General*.

The default policy settings are often appropriate. By default, a cluster resource:

- ♦ Fails over automatically if the node it is running on fails
- ♦ Starts automatically on the next node in its failover list
- ♦ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

- 2 Under *Preferred Nodes*, arrange the nodes in the cluster into the desired failover list for the Internet Agent ([Internet Agent Clustering Worksheet item 3](#)).
- 3 Click *OK*.

Enabling Internet Addressing for Your Clustered GroupWise System

Setting up Internet addressing for a clustered Internet Agent is no different from setting it up for an Internet Agent in any other environment. Follow the instructions in “[Configuring Internet Addressing](#)” in “[Internet Agent](#)” in the *GroupWise 8 Administration Guide*, then return to this point.

Forcing Use of the Internet Agent Secondary IP Address

If you want the Internet Agent to send outgoing messages on its secondary IP address, rather than using the default of its primary IP address:

- 1 Click *GroupWise > Network Address*.
- 2 In the *TCP/IP Address* field, provide the secondary IP address ([Internet Agent Clustering Worksheet item 1](#)) for the Internet Agent to use for sending outgoing messages.
- 3 Select *Bind Exclusively to TCP/IP Address*.
- 4 Click *OK*.
- 5 Continue with [Verifying Internet Agent Object Properties](#).

Verifying Internet Agent Object Properties

During installation of the Internet Agent, the Internet Agent object should have been configured correctly. However, it can be helpful to verify certain cluster-specific information in order to familiarize yourself with the configuration of a clustered Internet Agent.

- ♦ “[Accessing Internet Agent Object Properties](#)” on page 168
- ♦ “[Verifying the Reference to the Internet Agent Cluster Resource](#)” on page 168
- ♦ “[Verifying the Reference to the Mount Point Directory](#)” on page 168
- ♦ “[Verifying Post Office Links](#)” on page 168

Accessing Internet Agent Object Properties

- 1 In ConsoleOne, browse to and select the Internet Agent domain in order to display its contents.
- 2 Right-click the Internet Agent object, then click *Properties*.
- 3 Continue with [Verifying the Reference to the Internet Agent Cluster Resource](#).

Verifying the Reference to the Internet Agent Cluster Resource

In the Internet Agent object properties pages:

- 1 Click *SMTP/MIME > Settings*.
- 2 Verify the contents of the *Hostname/DNS "A Record" Name* field.
It displays the hostname as currently configured in DNS. It should display the hostname that corresponds to the secondary IP address of the Internet Agent cluster resource. For more information, see [Section 15.1.5, "Preparing DNS for the Clustered Internet Agent,"](#) on page 155.
- 3 Make changes if necessary.
- 4 Continue with [Verifying the Reference to the Mount Point Directory](#).

Verifying the Reference to the Mount Point Directory

In the Internet Agent object properties pages:

- 1 Click *Server Directories*.
- 2 Verify that the displayed directories match the mount point directory and the domain directory.
- 3 Make changes if necessary.
- 4 Continue with [Verifying Post Office Links](#).

Verifying Post Office Links

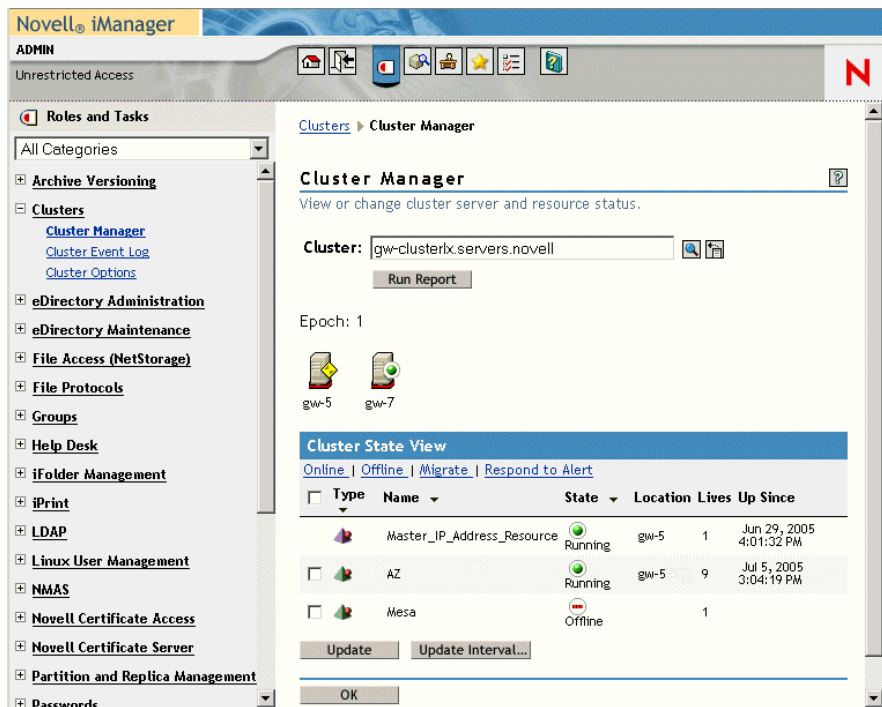
In the Internet Agent object properties pages:

- 1 Click *Post Office Links*.
- 2 Verify that the *Access Mode* column displays *C/S* (for client/server mode) for all post offices serviced by the Internet Agent.
- 3 Verify that the *Links* column displays the secondary IP addresses of the [GroupWise partitions](#) where post offices reside, not the IP addresses of any nodes in the cluster.
- 4 Make changes if necessary.
- 5 Continue with [Forcing Use of the Internet Agent Secondary IP Address](#).

15.3 Testing the Internet Agent in a Linux Cluster

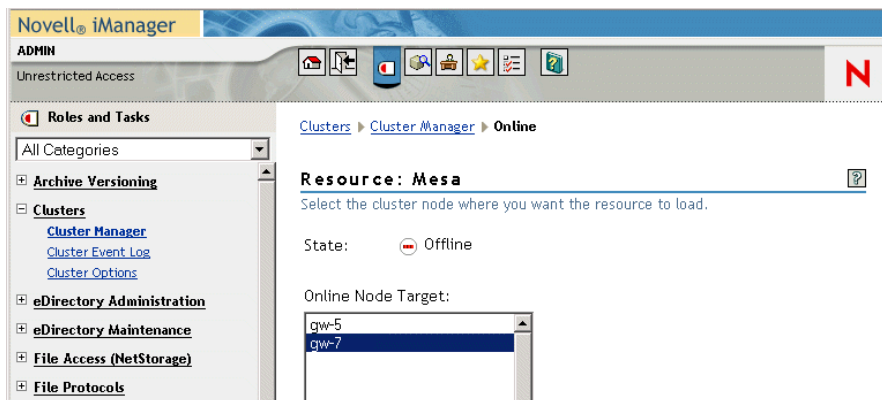
After you have configured the Internet Agent cluster resource, you can test the load and unload scripts by bringing the cluster resource online and taking it offline again.

- 1 In iManager, expand *Clusters*, then click *Cluster Manager*.



The new Internet Agent cluster resource shows *Offline* in the *State* column.

- 2 Click the new Internet Agent cluster resource, then click *Online*.



- 3 Select the cluster node where you want to online the Internet Agent cluster resource, then click *OK*.

After a moment, the Internet Agent cluster resource displays *Running* in the *State* column.

- 4 At the server where the Internet Agent is starting, use the following command to see that the Internet Agent has started:

```
/etc/init.d/grpwise status domain.gwia
```

- 5 Select the new Internet Agent cluster resource, then click *Offline*.

The *State* column for the Internet Agent cluster resource returns to *Offline*.

- 6 Use the same command that you used in [Step 4](#) to verify that the Internet Agent has stopped.

- 7 Repeat [Step 2](#) whenever you are ready to bring the new Internet Agent cluster resource online permanently.
- 8 Continue with [Managing Your Clustered GroupWise System](#).

15.4 Managing the Internet Agent in a Linux Cluster

After you have installed the Internet Agent in a cluster, you should consider some long-term management issues.

- ♦ [Section 15.4.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 170
- ♦ [Section 15.4.2, “Knowing What to Expect in an Internet Agent Failover Situation,”](#) on page 171

15.4.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After installing the Internet Agent in your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record the cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information about the Internet Agent Domain and Its MTA”](#) on page 170
- ♦ [“Recording Cluster-Specific Information about the Internet Agent”](#) on page 170

Recording Cluster-Specific Information about the Internet Agent Domain and Its MTA

To permanently record important cluster-specific information for the Internet Agent domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the Internet Agent domain Identification page, provide a cluster-specific description of the Internet Agent domain, including the secondary IP address of its [GroupWise partition](#).
- 3 Click *OK* to save the Internet Agent domain description.
- 4 Select the Internet Agent Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the secondary IP address of the GroupWise partition.
This information appears on the MTA console, no matter which node in the cluster it is currently running on.
- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information about the Internet Agent](#).

Recording Cluster-Specific Information about the Internet Agent

With the contents of the Internet Agent domain still displayed:

- 1 Right-click the Internet Agent object, then click *Properties*.
- 2 Click *GroupWise*, then click *Identification*.

- 3 In the *Description* field, record the secondary IP address of the [GroupWise partition](#) where the Internet Agent domain is located.

This information appears on the Internet Agent console, no matter which node in the cluster it is currently running on.

- 4 Click *OK* to save the Internet Agent information.
- 5 Continue with [Knowing What to Expect in an Internet Agent Failover Situation](#).

15.4.2 Knowing What to Expect in an Internet Agent Failover Situation

The failover behavior of the MTA for the Internet Agent domain is the same as for an MTA in a regular domain. See [Section 14.6.2, “Knowing What to Expect in MTA and POA Failover Situations,” on page 150](#).

Failover of the Internet Agent itself is more complex. The various clients (POP3, IMAP4, and LDAP) receive an error message that the node is not available. Most of the clients do not attempt to reconnect automatically, so the user must exit the client and restart it to reestablish the connection after the failover process is complete. Fortunately, the Internet Agent restarts quickly in its failover location so users can reconnect quickly.

As with the MTA and the POA, migration of the Internet Agent takes longer than failover. In fact, the Internet Agent can seem especially slow to shut down properly as it finishes its normal processing and stops its threads. For a busy Internet Agent, you might need to wait several minutes for it to shut down properly.

15.5 Internet Agent Clustering Worksheet

Item	Explanation
1) GroupWise Partition for the Internet Agent:	Specify the GroupWise partition where the Internet Agent domain will be created, along with its secondary IP address.
Secondary IP Address:	For more information, see Section 15.1.2, “Selecting the Internet Agent Partition and Secondary IP Address,” on page 154 .
2) Internet Agent Domain Name:	Specify a unique name for the Internet Agent domain. Specify the directory on the GroupWise partition where you want to create the new domain.
Domain Database Location:	For more information, see Section 15.1.1, “Planning a Domain for the Internet Agent,” on page 154 .
3) Internet Agent Failover List:	List other nodes in the cluster where the Internet Agent and its MTA could fail over. For more information, see Section 15.1.3, “Determining an Appropriate Failover List for the Internet Agent,” on page 155 .
4) Cluster Resource Mount Point:	Specify the mount point directory where the Internet Agent domain will be mounted. For more information, see Section 15.1.4, “Determining Cluster Resource Information for the Internet Agent,” on page 155 .

Item	Explanation
5) MTA Network Information:	Record the MTA network address information that you will need as you install the MTA.
<ul style="list-style-type: none"> ◆ MTA IP address ◆ MTA message transfer port ◆ MTA live remote port ◆ MTA HTTP port 	For more information, see Section 15.1.7, “Planning the MTA Installation,” on page 156.
6) Internet Agent Network Information:	Record the Internet Agent network address information that you will need to install the Internet Agent.
<ul style="list-style-type: none"> ◆ Internet Agent IP address ◆ Internet Agent HTTP port 	For more information, see Section 15.1.8, “Planning the Internet Agent Installation,” on page 156.

15.6 Internet Agent Quick Checklist

- Plan the new clustered Internet Agent, including the new domain required to house the Internet Agent in a clustering environment.
See [Section 15.1, “Planning the Internet Agent in a Linux Cluster,”](#) on page 153.
- Make sure DNS includes the secondary IP address of the Internet Agent partition
See [Section 15.1.5, “Preparing DNS for the Clustered Internet Agent,”](#) on page 155
- Make sure your firewall is configured to accommodate the Internet Agent.
See [Section 15.1.6, “Preparing Your Firewall for the Clustered Internet Agent,”](#) on page 155.
- Create the new Internet Agent domain.
See [Section 15.2.1, “Creating a Domain for the Internet Agent,”](#) on page 157.
- Set up the MTA for the new Internet Agent domain.
See [Section 15.2.2, “Installing the MTA for the Internet Agent Domain,”](#) on page 157.
- Install the Internet Agent.
See [“Installing and Setting Up the Internet Agent Software in Your Cluster”](#) on page 158.
- Modify the Internet Agent cluster resource load script.
See [“Modifying the Cluster Resource Load Script for the Internet Agent and Its MTA”](#) on page 162.
- Modify the Internet Agent cluster resource unload script.
See [“Modifying the Cluster Resource Unload Script for the Internet Agent and Its MTA”](#) on page 165.
- Set up the Internet Agent failover list and policies.
See [“Setting the Failover List and Policies for the Internet Agent and Its MTA”](#) on page 167.
- Enable Internet Addressing for the clustered Internet Agent.
See [“Enabling Internet Addressing for Your Clustered GroupWise System”](#) on page 167.
- Double-check the cluster-specific Internet Agent object properties.
See [“Verifying Internet Agent Object Properties”](#) on page 167.

- ❑ Test the clustered Internet Agent.
See [Section 15.3, “Testing the Internet Agent in a Linux Cluster,”](#) on page 168.
- ❑ Record cluster-specific information in the properties pages of the GroupWise objects associated with the Internet Agent.
See [Section 15.4.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 170.

16 Implementing WebAccess in a Linux Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 13, “Planning GroupWise in a Linux Cluster,”](#) on page 121 and [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131. As part of this process, you filled out the “[System Clustering Worksheet](#)” on page 128. If you do not have access to the filled-out worksheet, print the worksheet now and fill in the clustering information as it currently exists on your system. You need this information as you implement the WebAccess Agent in a cluster.

- ♦ [Section 16.1, “Understanding the WebAccess Components,”](#) on page 175
- ♦ [Section 16.2, “Planning the WebAccess Agent in a Linux Cluster,”](#) on page 176
- ♦ [Section 16.3, “Setting Up the WebAccess Agent in a Linux Cluster,”](#) on page 178
- ♦ [Section 16.4, “Testing the WebAccess Agent in a Linux Cluster,”](#) on page 189
- ♦ [Section 16.5, “Managing the WebAccess Agent in a Linux Cluster,”](#) on page 190
- ♦ [Section 16.6, “WebAccess Agent Clustering Worksheet,”](#) on page 191
- ♦ [Section 16.7, “WebAccess Agent Quick Checklist,”](#) on page 192

16.1 Understanding the WebAccess Components

If you are not familiar with GroupWise WebAccess, review “[GroupWise WebAccess Overview](#)” in “[Installing GroupWise WebAccess](#)” in the *GroupWise 8 Installation Guide*.

As you plan WebAccess in a clustering environment, you must keep in mind that you will plan and set up two WebAccess components:

- ♦ WebAccess Agent ([gwinter](#)) that will be associated with a domain in your GroupWise system
- ♦ WebAccess Application (a Java servlet) that will be added to your Web server (Apache). The WebAccess Application is currently not supported on a cluster resource.

You install the WebAccess Agent on each node in the cluster. You install the WebAccess Application to your Web server, which must not be clustered. This means that the WebAccess client login to the Web server at the following URL:

```
http://secondary_IP_address/gw/webacc
```

is available only when the Web server is running.

16.2 Planning the WebAccess Agent in a Linux Cluster

In a cluster, you need to create a separate domain to house each GroupWise gateway, including the WebAccess Agent.

Section 16.6, “WebAccess Agent Clustering Worksheet,” on page 191 lists the information you need as you set up the WebAccess Agent in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ Section 16.2.1, “Planning a Domain for the WebAccess Agent,” on page 176
- ♦ Section 16.2.2, “Selecting the WebAccess Agent Partition and Secondary IP Address,” on page 177
- ♦ Section 16.2.3, “Determining an Appropriate Failover List for the WebAccess Agent,” on page 177
- ♦ Section 16.2.4, “Determining Cluster Resource Information for the WebAccess Agent,” on page 177
- ♦ Section 16.2.5, “Planning the MTA Installation,” on page 178
- ♦ Section 16.2.6, “Planning the WebAccess Agent Installation,” on page 178
- ♦ Section 16.2.7, “Planning the WebAccess Application Installation,” on page 178

16.2.1 Planning a Domain for the WebAccess Agent

The considerations involved in planning a domain for the WebAccess Agent are much the same as planning any other domain. In preparation, review “Planning a New Domain”, then print and fill out the “Domain Worksheet” in “Domains” in the *GroupWise 8 Administration Guide*.

Keep in mind the following cluster-specific details:

- ♦ When you specify the location for the domain directory on the Domain Worksheet, remember that it is on a [GroupWise partition](#), not on the node where you running the GroupWise Installation program. This location is referred to as the WebAccess Agent partition because it is where the WebAccess Agent message queues are located.
- ♦ Do not concern yourself with the GroupWise agent information on the Domain Worksheet. You can stop with [item 10](#). You will plan the MTA installation later.

When you have completed the Domain Worksheet, transfer the key information from the Domain Worksheet to the WebAccess Agent Clustering Worksheet.

WEBACCESS AGENT CLUSTERING WORKSHEET

Under [Item 1: GroupWise Partition for the WebAccess Agent](#), transfer the domain location to the WebAccess Agent Clustering Worksheet.

Under [Item 2: WebAccess Agent Domain Name](#), transfer the domain name and database directory to the WebAccess Agent Clustering Worksheet.

IMPORTANT: Do not create the new domain until you are instructed to do so in [Section 16.3.1, “Creating a Domain for the WebAccess Agent,” on page 178](#).

16.2.2 Selecting the WebAccess Agent Partition and Secondary IP Address

As with the MTA and the POA, the WebAccess Agent needs a secondary IP address that remains the same no matter which node in the cluster it is running on. You can place the WebAccess Agent and its domain on a [GroupWise partition](#) where a domain or post office already reside, which means that the WebAccess Agent shares the same secondary IP address as that domain or post office and fails over along with that domain or post office. Or you can place the WebAccess Agent and its domain on its own GroupWise partition, which means that it has its own secondary IP address and fails over independently.

WEBACCESS AGENT CLUSTERING WORKSHEET

Under [Item 1: GroupWise Partition for WebAccess Agent](#), specify the secondary IP address for the WebAccess Agent partition.

Under [Item 5: MTA Network Information](#), copy the same secondary IP address.

Under [Item 6: WebAccess Agent Network Information](#), copy the same secondary IP address.

16.2.3 Determining an Appropriate Failover List for the WebAccess Agent

By default, a [GroupWise partition](#) is configured to have all nodes in the cluster in its failover list, organized in ascending alphanumeric order. Only one node at a time can have a particular GroupWise partition mounted and active. If a GroupWise partition's preferred node fails, the partition fails over to the next node in the failover list. You should customize the failover list for each GroupWise partition based on the [fan-out-failover](#) principle.

As with the MTA and the POA, you need to decide which nodes in the cluster are appropriate locations for the [WebAccess Agent partition](#) to fail over to. You must install the WebAccess Agent software on all of the nodes where you want the WebAccess Agent to be able to fail over. For a review of failover lists, see [Section 13.6.2, "Determining Appropriate Failover Lists for the Agents," on page 126](#), which describes the issues in the context of planning MTA and POA installations.

WEBACCESS AGENT CLUSTERING WORKSHEET

Under [Item 3: WebAccess Agent Failover List](#), list the nodes that you want in the WebAccess Agent partition failover list.

16.2.4 Determining Cluster Resource Information for the WebAccess Agent

A cluster resource is a [shared partition](#), secondary IP address, application, service, Web server, etc., that can function successfully anywhere in the cluster. Cluster resources include the GroupWise agents and the Messenger agents. When using the *Configure GroupWise for Clustering* option, the GroupWise Installation program needs to know the mount point for the [GroupWise partition](#) where the WebAccess Agent domain is located.

WEBACCESS AGENT CLUSTERING WORKSHEET

Under [Item 4: Cluster Resource Mount Point](#), list the mount point for the GroupWise partition where the WebAccess Agent domain is located.

16.2.5 Planning the MTA Installation

Follow the instructions in [Section 13.6.4, “Planning the Linux Agent Installation,”](#) on page 127, then return to this point. After you follow the instructions, you have a filled-out [Agent Clustering Worksheet](#) to use when you install the MTA.

IMPORTANT: Do not install the Linux MTA until you are instructed to do so in [Section 16.3, “Setting Up the WebAccess Agent in a Linux Cluster,”](#) on page 178.

16.2.6 Planning the WebAccess Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the WebAccess Agent are the same in a clustering environment as for any other environment. Review the installation instructions in [“Installing the Linux WebAccess Agent”](#) in [“Installing GroupWise WebAccess”](#) in the *GroupWise 8 Installation Guide*. Use the [“GroupWise WebAccess Installation Summary Sheets”](#) to record the planning information you will need as you install the WebAccess Agent in your cluster.

IMPORTANT: Do not install the WebAccess Agent software until you are instructed to do so in [Setting Up the WebAccess Agent in a Linux Cluster](#).

16.2.7 Planning the WebAccess Application Installation

The WebAccess Application must be installed on a non-clustered Web server. For WebAccess Application planning information, see [“Determining the WebAccess and WebPublisher Applications’ Configuration”](#) in [“Installing GroupWise WebAccess”](#) in the *GroupWise 8 Installation Guide*.

16.3 Setting Up the WebAccess Agent in a Linux Cluster

You should already have reviewed [Section 16.2, “Planning the WebAccess Agent in a Linux Cluster,”](#) on page 176 and filled out [Section 16.6, “WebAccess Agent Clustering Worksheet,”](#) on page 191. You are now ready to complete the following tasks to set up the WebAccess Agent in a clustering environment:

- ♦ [Section 16.3.1, “Creating a Domain for the WebAccess Agent,”](#) on page 178
- ♦ [Section 16.3.2, “Installing the MTA for the WebAccess Agent Domain,”](#) on page 179
- ♦ [Section 16.3.3, “Installing and Configuring the WebAccess Agent in a Cluster,”](#) on page 179
- ♦ [Section 16.3.4, “Installing and Configuring the WebAccess Application in a Cluster,”](#) on page 189

16.3.1 Creating a Domain for the WebAccess Agent

The WebAccess Agent domain will be a secondary domain. To create it, follow the instructions in [Section 14.2, “Creating a New Secondary Domain in a Linux Cluster,”](#) on page 132, taking your information from the WebAccess Agent Clustering Worksheet, rather than the System Clustering Worksheet, then return to this point.

Do not create any post offices in the WebAccess Agent domain.

After you have created the domain, continue with [Installing the MTA for the WebAccess Agent Domain](#).

16.3.2 Installing the MTA for the WebAccess Agent Domain

The MTA for the WebAccess Agent domain can be installed just like any other MTA in your clustered GroupWise system. Follow the instructions in [Section 14.4.1, “Installing and Setting Up the Agents in Your Cluster,”](#) on page 134, then return to this point.

You do not need to edit the MTA startup file. You do not need to modify the Cluster Resource object properties until after you have installed the WebAccess Agent.

After you have installed the MTA, continue with [Installing and Configuring the WebAccess Agent in a Cluster](#).

16.3.3 Installing and Configuring the WebAccess Agent in a Cluster

After you have created a domain for the WebAccess Agent and installed the MTA for that domain, you are ready to install and configure the WebAccess Agent.

- ♦ [“Installing and Setting Up the WebAccess Agent Software in Your Cluster”](#) on page 179
- ♦ [“Configuring Clustered Logging”](#) on page 182
- ♦ [“Configuring the Clustered WebAccess Agent for SSL”](#) on page 183
- ♦ [“Configuring the WebAccess Agent Cluster Resource to Load and Unload the WebAccess Agent and Its MTA”](#) on page 183
- ♦ [“Verifying WebAccess Agent Object Properties”](#) on page 188

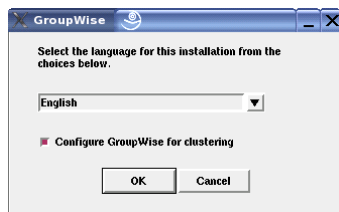
Installing and Setting Up the WebAccess Agent Software in Your Cluster

The WebAccess Agent must be installed on each node in its failover list ([WebAccess Agent Clustering Worksheet item 3](#)).

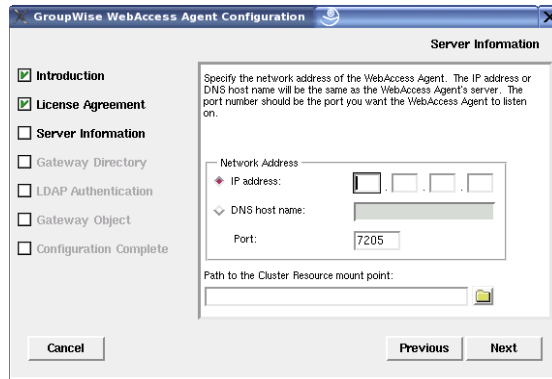
- ♦ [“Running the WebAccess Agent Installation Program on the Preferred Node”](#) on page 179
- ♦ [“Running the WebAccess Agent Installation Program on Subsequent Nodes”](#) on page 180
- ♦ [“Testing Your WebAccess Agent Installation on Each Node”](#) on page 182

Running the WebAccess Agent Installation Program on the Preferred Node

- 1 Make sure that the WebAccess Agent software is available in the software distribution directory you created in [Step 6](#) in [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131.
- 2 Mount the WebAccess Agent partition ([WebAccess Agent Clustering Worksheet item 1](#)) where the WebAccess Agent message queues are located.
- 3 From the software distribution directory, start the GroupWise Installation program and select *Configure GroupWise for Clustering*.



- 4 Install the WebAccess Agent software, following the steps provided in “Installing the Linux WebAccess Agent” in “Installing GroupWise WebAccess” in the *GroupWise 8 Installation Guide*.
- 5 Configure the WebAccess Agent according to the “GroupWise WebAccess Installation Summary Sheets” that you filled out in Section 16.2, “Planning the WebAccess Agent in a Linux Cluster,” on page 176, paying special attention to the cluster resource information on the Server Information page.



As a result of selecting *Configure GroupWise for Clustering* on the preferred node, the following cluster-specific configuration actions are performed:

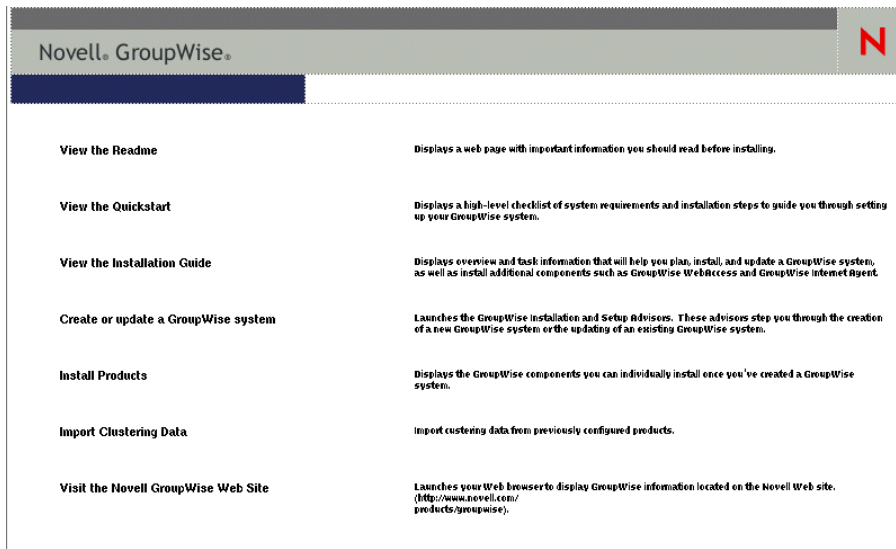
- ◆ The WebAccess Agent startup file (*webac80a.waa*) is created in *mount_point/groupwise/agents/share* on the shared resource so that the WebAccess Agent uses the same startup file regardless of which cluster node it is running on. The *--home* switch includes the mount point and the path to the database so that the startup file is valid when mounted to each cluster node.
 - ◆ If this is the first GroupWise agent installed on this cluster node, the GroupWise High Availability service is automatically configured and its configuration file (*gwha.conf*) is created in the */etc/opt/novell/groupwise* directory. If another GroupWise agent has already been installed on this cluster node, the *gwha.conf* file is updated to include the WebAccess Agent.
 - ◆ The *clusterimport.conf* file in the *gwinst* subdirectory of the software distribution directory from which you ran the GroupWise Installation program is updated, so that the cluster-specific information collected when you configured the WebAccess Agent on the preferred node is available when you install the WebAccess Agent on subsequent nodes.
 - ◆ The WebAccess Agent is not configured to start automatically on system startup. In a cluster, you do not want the WebAccess Agent to start automatically whenever a node restarts.
- 6 Continue with [Running the WebAccess Agent Installation Program on Subsequent Nodes](#).

Running the WebAccess Agent Installation Program on Subsequent Nodes

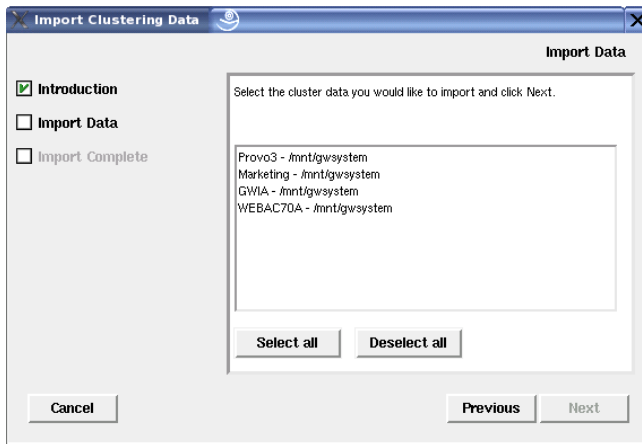
- 1 On the next node in the WebAccess Agent failover list, mount the WebAccess Agent partition ([WebAccess Agent Clustering Worksheet item 1](#)) where the WebAccess Agent message queues are located.
- 2 From the software distribution directory you created in Step 6 in Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,” on page 131, start the GroupWise Installation program and select *Configure GroupWise for Clustering*.



Because of the existence of the `clusterimport.conf` file in the `gwinst` subdirectory of the software distribution directory, a new installation option, *Import Clustering Data*, is now available on the main GroupWise Installation program page.



- 3 Install the WebAccess Agent software on the cluster node as usual, but do not use the *Configure* option.
- 4 On the main page of the Installation program, click *Import Clustering Data*, then click *Next*.



All GroupWise agents that you have installed from the software distribution directory are listed, based on the information stored in the `clusterimport.conf` file.

- 5 Select the GroupWise agents that you want to configure on the current cluster node, then click *OK*.

The *Import Clustering Data* option performs the following configuration actions for each subsequent node where you run it:

- ♦ The `grpwise` script is created in the `/etc/init.d` directory on the current cluster node. It is configured specifically for the agents you just selected.
- ♦ The GroupWise High Availability service is automatically configured on the current cluster node and its configuration file (`gwha.conf`) is created in the `/etc/opt/novell/groupwise` directory. It is configured specifically for the agents you just selected.

Because the agent startup files and log files are stored on the shared resource, they do not need to be customized for each cluster node.

- 6 Repeat [Step 1](#) through [Step 5](#) for each cluster node in the WebAccess Agent failover list.

After you install and configure the WebAccess Agent on each node in its failover list, the cluster node is ready for the WebAccess Agent to fail over to it.

- 7 Continue with [Testing Your WebAccess Agent Installation on Each Node](#).

Testing Your WebAccess Agent Installation on Each Node

- 1 Test the WebAccess Agent by starting it with a user interface, as described in “[Starting the Linux WebAccess Agent](#)” in “[Installing GroupWise WebAccess](#)” in the *GroupWise 8 Installation Guide*.

```
/opt/novell/groupwise/agents/bin/gwinter --show @webac80a.waa &
```

- 2 Stop the WebAccess Agent by closing the window that it is running in.

- 3 After you can see that the WebAccess Agent stopped successfully, test it by starting it as a daemon, as described in “[Starting the Linux GroupWise Agents as Daemons](#)” in “[Installing GroupWise Agents](#)” in the *GroupWise 8 Installation Guide*.

```
/etc/inet.d/grpwise start webac80a  
/etc/inet.d/grpwise status webac80a
```

- 4 Stop the WebAccess Agent.

```
/etc/inet.d/grpwise stop webac80a  
/etc/inet.d/grpwise status webac80a
```

- 5 Repeat [Step 1](#) through [Step 4](#) for each node in the WebAccess Agent failover list.

- 6 Continue with “[Configuring Clustered Logging](#)” on page 182

Configuring Clustered Logging

The default location for the WebAccess Agent log files is on the cluster nodes along with the WebAccess Agent software, rather than being located with the domain on the WebAccess Agent partition. To avoid having multiple copies of log files in multiple locations, you should set the location in ConsoleOne.

- 1 On the WebAccess Agent partition where the domain is located, create the directory where you want to store WebAccess Agent log files.
- 2 In ConsoleOne, browse to and select the Domain object.
- 3 Right-click the WebAccess Agent object, then click *Properties*.
- 4 Click *GroupWise > Log Settings*.
- 5 In the *Log File Path* field, browse to and select the directory you created in [Step 1](#), then click *OK*.
- 6 If you want the WebAccess Agent to use SSL connections, continue with [Configuring the Clustered WebAccess Agent for SSL](#)

or

Skip to [“Configuring the WebAccess Agent Cluster Resource to Load and Unload the WebAccess Agent and Its MTA”](#) on page 183.

Configuring the Clustered WebAccess Agent for SSL

If you plan to enable SSL, as described in [“Securing WebAccess Agent Connections with SSL”](#) in [“WebAccess”](#) in the *GroupWise 8 Administration Guide*, you need to make the SSL certification file and key file available to the WebAccess Agent in the cluster. The default locations for the SSL certificate file and key file are on the cluster nodes along with the WebAccess Agent software, rather than being located with the domain on a GroupWise partition. To avoid having multiple copies of these files in multiple locations, you should set the locations in ConsoleOne.

- 1 On the WebAccess Agent partition, create the directory where you want to store the certificate and key file required for SSL.
- 2 Copy the certificate file and key file into the new directory.
If you need assistance obtaining these files, see [“Server Certificates and SSL Encryption”](#) in [“Security Administration”](#) in the *GroupWise 8 Administration Guide*.
- 3 In ConsoleOne, browse to and select the Domain object.
- 4 Right-click the WebAccess Agent object, then click *Properties*.
- 5 Click *GroupWise > SSL Settings*.
- 6 In the *Certificate File* field, browse to and select the certificate file.
- 7 In the *SSL Key File* field, browse to and select the key file.
- 8 Click *OK*.
- 9 After you have set these locations to the WebAccess Agent partition, continue with [Configuring the WebAccess Agent Cluster Resource to Load and Unload the WebAccess Agent and Its MTA](#).

Configuring the WebAccess Agent Cluster Resource to Load and Unload the WebAccess Agent and Its MTA

The properties of the Cluster Resource object define how the WebAccess Agent partition functions within the cluster, how the WebAccess Agent is loaded and unloaded, and how failover and failback situations are handled. Complete the following tasks for the WebAccess Agent cluster resource:

- ♦ [“Modifying the Cluster Resource Load Script for the WebAccess Agent and Its MTA”](#) on page 183
- ♦ [“Modifying the Cluster Resource Unload Script for the WebAccess Agent and Its MTA”](#) on page 185
- ♦ [“Setting the Failover List and Policies for the WebAccess Agent and Its MTA”](#) on page 187

Modifying the Cluster Resource Load Script for the WebAccess Agent and Its MTA

The cluster resource load script executes whenever the WebAccess Agent cluster resource comes online.

To set up the load script in iManager:

- 1 Expand *Clusters*, then click *Cluster Options*.
- 2 In the *Cluster* field, browse to the Cluster object where the WebAccess Agent cluster resource is located.

- 3 Click the Cluster object to display the cluster resources that belong to the cluster.
- 4 Select the WebAccess Agent cluster resource that you created when you set up the WebAccess Agent partition, then click *Properties*.

The default load script from a generic IP service template appears as follows:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

# mount the file system
exit_on_error mount -t reiserfs /dev/evms/vol /mnt/generic

# add the IP address
exit_on_error add_secondary_ipaddress a.b.c.d

# start the service
exit_on_error /etc/init.d/myservice start

# return status
exit 0
```

- 5 If this is an NSS volume or a shared pool, make the following changes to set up the WebAccess Agent load script:
 - 5a As needed, in the `mount` command, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
 - 5b In the `mount` command, change `vol` to the actual device name in use on nodes in the cluster.
 - 5c In the `mount` command, change `/mnt/generic` to the mount point directory in use on nodes in the cluster.
 - 5d In the `add_secondary_ipaddress` command, change `a.b.c.d` to the secondary IP address of the WebAccess Agent partition ([WebAccess Agent Clustering Worksheet item 1](#))
 - 5e In the start service command, change `myservice start` to the command to start the WebAccess Agent and its MTA.

```
/etc/init.d/grpwise start domain
/etc/init.d/grpwise start webac80a
```

- 6 If this is a traditional Linux volume, use the following load script:


```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfunc

# define the IP address
RESOURCE_IP=123.123.1.

# define the file system type
MOUNT_FS=reiserf

# define the device
exit_on_error evms -f /var/opt/novell/ncs/ContainerActivate -rl
Share `uname -n`
MOUNT_DEV=/dev/evms/Share/dat

# define the mount point
MOUNT_POINT=/mnt/mount_point

# mount the file system
exit_on_error mount -t $MOUNT_FS $MOUNT_DEV $MOUNT_POINT

# add the IP address
exit_on_error add_secondary_ipaddress $RESOURCE_IP

/etc/init.d/grpwise start domain
/etc/init.d/grpwise start domain.webac80a

exit 0

```

Make the following changes to set up the load script for the agents:

- 6a** On the `RESOURCE_IP` line, change `123.123.1.1` to the secondary IP address of the GroupWise partition ([WebAccess Agent Clustering Worksheet item 1](#))
- 6b** As needed on the `MOUNT_FS` line, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
- 6c** On the `MOUNT_DEV` line, change `/dev/evms/Share/dat` to the actual device name in use on nodes in the cluster.
- 6d** On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory in use on nodes in the cluster.
- 6e** Use the following command to start the MTA:

```
/etc/init.d/grpwise start domain
```

- 6f** Use the following command to start the WebAccess Agent:

```
/etc/init.d/grpwise start domain.webac80a.
```

- 7** Click *OK* to save the load script.

Modifying the Cluster Resource Unload Script for the WebAccess Agent and Its MTA

The cluster resource unload script executes whenever the WebAccess Agent cluster resource goes offline. Programs should be unloaded in the reverse order of how they were loaded. This ensures that supporting programs are not unloaded before programs that rely on them in order to function properly.

- 1** On the Cluster Resource Properties page of the WebAccess Agent cluster resource, click *Scripts > Unload Script*.

The default unload script appears as follows:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

# request service stop
ignore_error /etc/init.d/mybservice stop

# stop service otherwise
sleep 8
ignore_error fuser -k /mnt/generic

# del the IP address
ignore_error del_secondary_ipaddress a.b.c.d

# umount the file system
exit_on_error umount /mnt/generic

# return status
exit 0

```

2 If this is an NSS volume or a shared pool, make the following changes:

- 2a** In the `request service stop` section, change `mybservice stop` to the command to stop the WebAccess Agent and its MTA.

```

/etc/init.d/grpwise stop webac80a
/etc/init.d/grpwise stop domain

```

- 2b** In the `stop service otherwise` section (used if the agents do not stop normally), remove these commands:

```

sleep 8
ignore_error fuser -k /mnt/generic

```

- 2c** Use these commands instead to stop the WebAccess Agent and its MTA:

```

ignore_error /etc/init.d/grpwise stop webac80a
ignore_error /etc/init.d/grpwise stop domain

sleep 8

ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwinter
@/webac80a.waa"
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwmta
@/path_to_startup_file/domain.mta"

```

- 2d** In the `del IP address` section, change `a.b.c.d` to the secondary IP address used in the load script.

- 2e** In the `umount file system` section, change `/mnt/generic` to the mount point directory used in the load script.

3 If this is a traditional Linux volume, use the following unload script:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

/etc/init.d/grpwise stop domain.webac80a
/etc/init.d/grpwise stop domain

# define the IP address
RESOURCE_IP=172.16.5.18

# define the mount point
MOUNT_POINT=/mnt/mount_point

sleep 8

ignore_error fuser -k $MOUNT_POINT

# del IP the address
ignore_error del_secondary_ipaddress $RESOURCE_IP

# umount the file system
exit_on_error umount $MOUNT_POINT

# return status
exit 0

```

Make the following changes to set up the unload script for the agents.

3a Use the following command to stop the WebAccess Agent:

```
/etc/init.d/grpwise stop domain.webac80a
```

3b Use the following command to stop the MTA:

```
/etc/init.d/grpwise stop domain
```

3c On the `RESOURCE_IP` line, change `172.16.5.18` to the secondary IP address used in the load script.

3d On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory used in the load script.

3e Adjust the `sleep` command as needed so that the agents can shut down normally on your system without being inadvertently killed. by the `fuser -k` command that follows.

3f In the `fuser -k` command (used if the agents do not stop normally), change `-k` to `-mk`.

The `-m` parameter obtains the PID numbers of the processes to kill.

4 Click *OK* to save the unload script.

Setting the Failover List and Policies for the WebAccess Agent and Its MTA

1 On the Cluster Resource Properties page of the WebAccess Agent cluster resource, click *General*.

The default policy settings are often appropriate. By default, a cluster resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover list
- ◆ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

- 2 Under *Preferred Nodes*, arrange the nodes in the cluster into the desired failover list for the WebAccess Agent ([WebAccess Agent Clustering Worksheet item 3](#)).
- 3 Click *OK*.

Verifying WebAccess Agent Object Properties

During installation of the WebAccess Agent, the WebAccess Agent object should have been configured correctly. However, it can be helpful to verify certain cluster-specific information in order to familiarize yourself with the configuration of a clustered WebAccess Agent.

- ♦ [“Accessing WebAccess Agent Object Properties” on page 188](#)
- ♦ [“Verifying Post Office Links” on page 188](#)
- ♦ [“Forcing Use of the Web Access Agent Secondary IP Address” on page 188](#)

Accessing WebAccess Agent Object Properties

- 1 In ConsoleOne, browse to and select the WebAccess Agent domain in order to display its contents.
- 2 Right-click the WebAccess Agent object, then click *Properties*.
- 3 Continue with [Verifying Post Office Links](#).

Verifying Post Office Links

In the WebAccess object properties pages:

- 1 Click *Post Office Links*.
- 2 Verify that the *Access Mode* column displays *C/S* (for client/server mode) for all post offices serviced by the WebAccess Agent.
- 3 Verify that the *Links* column displays the secondary IP addresses of the [GroupWise partitions](#) where post offices reside, not the IP addresses of any nodes in the cluster.
- 4 Make changes if necessary.
- 5 Continue with [Forcing Use of the Web Access Agent Secondary IP Address](#).

Forcing Use of the Web Access Agent Secondary IP Address

If you want the WebAccess Agent to always use its secondary IP address, rather than using the primary IP address:

- 1 Click *GroupWise > Network Address*.
- 2 In the *TCP/IP Address* field, provide the secondary IP address ([WebAccess Agent Clustering Worksheet item 1](#)) for the Internet Agent.
- 3 Select *Bind Exclusively to TCP/IP Address*.
- 4 Click *OK*.
- 5 Continue with [Testing the WebAccess Agent in a Linux Cluster](#).

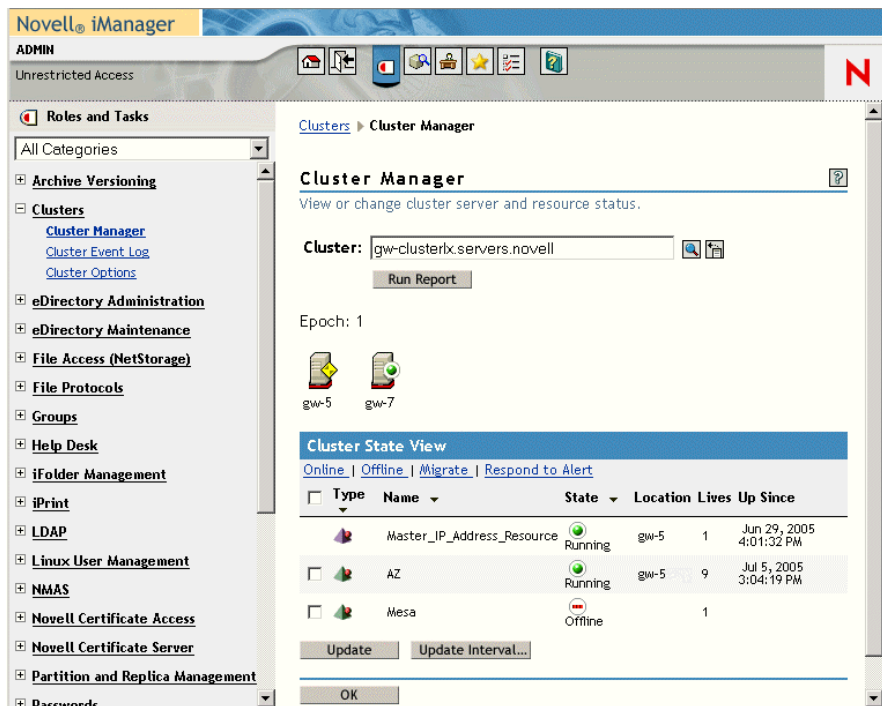
16.3.4 Installing and Configuring the WebAccess Application in a Cluster

If you have clustered your Web server, you must install the WebAccess Application on each node where the Web server is installed, as described in “Installing the WebAccess Application and WebPublisher Application” in “Installing GroupWise WebAccess” in the *GroupWise 8 Installation Guide*.

16.4 Testing the WebAccess Agent in a Linux Cluster

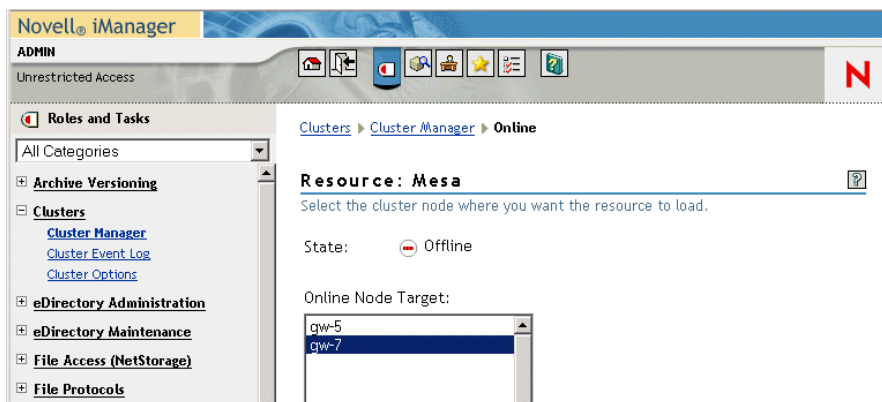
After you have configured the WebAccess Agent cluster resource, you can test the load and unload scripts by bringing the cluster resource online and taking it offline again.

- 1 In iManager, expand Clusters, then click *Cluster Manager*.



The new WebAccess Agent cluster resource shows *Offline* in the *State* column.

- 2 Click the new WebAccess Agent cluster resource, then click *Online*.



- 3 Select the cluster node where you want to online the WebAccess Agent cluster resource, then click *OK*.
After a moment, the WebAccess Agent cluster resource displays *Running* in the *State* column.
- 4 At the server where the WebAccess Agent is starting, use the following command to see that the Internet Agent has started:

```
/etc/init.d/grpwise status webac80a
```
- 5 Select the new WebAccess Agent cluster resource, then click *Offline*.
The *State* column for the WebAccess Agent cluster resource returns to *Offline*.
- 6 Use the same command that you used in [Step 4](#) to verify that the WebAccess Agent has stopped.
- 7 Repeat [Step 2](#) whenever you are ready to bring the new Internet Agent cluster resource online permanently.
- 8 Continue with [Managing the WebAccess Agent in a Linux Cluster](#).

16.5 Managing the WebAccess Agent in a Linux Cluster

After you have installed the WebAccess Agent in a cluster, you should consider some long-term management issues.

- ♦ [Section 16.5.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 190
- ♦ [Section 16.5.2, “Knowing What to Expect in a WebAccess Agent Failover Situation,”](#) on page 191

16.5.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After installing the WebAccess Agent in your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record the cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information about the WebAccess Agent Domain and Its MTA”](#) on page 190
- ♦ [“Recording Cluster-Specific Information about the WebAccess Agent”](#) on page 191

Recording Cluster-Specific Information about the WebAccess Agent Domain and Its MTA

To permanently record important cluster-specific information for the WebAccess Agent domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the WebAccess Agent domain Identification page, provide a cluster-specific description of the WebAccess Agent domain, including the secondary IP address of its [GroupWise partition](#).
- 3 Click *OK* to save the WebAccess Agent domain description.
- 4 Select the Internet Agent Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the secondary IP address of the GroupWise partition.

This information appears on the MTA console, no matter which node in the cluster it is currently running on.

- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information about the WebAccess Agent](#).

Recording Cluster-Specific Information about the WebAccess Agent

With the contents of the WebAccess Agent domain still displayed:

- 1 Right-click the WebAccess Agent object, then click *Properties*.
- 2 Click *GroupWise*, then click *Identification*.
- 3 In the *Description* field, record the secondary IP address of the [GroupWise partition](#) where the WebAccess Agent domain is located.

This information appears on the WebAccess Agent console, no matter which node in the cluster it is currently running on.

- 4 Click *OK* to save the WebAccess Agent information.
- 5 Continue with [Knowing What to Expect in an Internet Agent Failover Situation](#).

16.5.2 Knowing What to Expect in a WebAccess Agent Failover Situation

The failover behavior of the MTA for the WebAccess Agent domain is the same as for an MTA in a regular domain. See [Section 14.6.2, “Knowing What to Expect in MTA and POA Failover Situations,” on page 150](#).

When the WebAccess Agent fails over, the WebAccess client user sees the following message:

```
Unable to communicate with the GroupWise WebAccess Agent
```

The user just needs to be patient. When the WebAccess Agent comes up on the next node, the user can continue working without logging in again.

If the POA for the user’s post office fails over, the WebAccess client becomes unresponsive, but there is no error message. Again, the user should be patient until the POA comes up on the next node. Then the user can continue working without logging in again.

As with the MTA and the POA, migration of the WebAccess Agent takes longer than failover. In fact, the WebAccess Agent can seem especially slow to shut down properly as it finishes its normal processing, stops its threads, and stops the Document Viewer Agent. For a busy WebAccess Agent, you might need to wait several minutes for it to shut down properly.

16.6 WebAccess Agent Clustering Worksheet

Item	Explanation
1) GroupWise Partition for the WebAccess Agent:	Specify the GroupWise partition where the WebAccess Agent domain will be created, along with its secondary IP address.
Secondary IP Address:	For more information, see Section 16.2.2, “Selecting the WebAccess Agent Partition and Secondary IP Address,” on page 177 .

Item	Explanation
2) WebAccess Agent Domain Name: Domain Database Location:	Specify a unique name for the Internet Agent domain. Specify the directory on the GroupWise partition where you want to create the new domain. For more information, see Section 16.2.1, “Planning a Domain for the WebAccess Agent,” on page 176.
3) WebAccess Agent Failover List:	List other nodes in the cluster where the WebAccess Agent and its MTA could fail over. For more information, see Section 16.2.3, “Determining an Appropriate Failover List for the WebAccess Agent,” on page 177.
4) Cluster Resource Mount Point:	Specify the mount point directory where the WebAccess Agent domain will be mounted. For more information, see Section 16.2.4, “Determining Cluster Resource Information for the WebAccess Agent,” on page 177.
5) MTA Network Information:	Record the MTA network address information that you will need as you install the MTA.
<ul style="list-style-type: none"> ◆ MTA IP address ◆ MTA message transfer port ◆ MTA live remote port ◆ MTA HTTP port 	For more information, see Section 16.2.5, “Planning the MTA Installation,” on page 178.
6) WebAccess Agent Network Information:	Record the WebAccess Agent network address information that you will need to install the WebAccess Agent.
<ul style="list-style-type: none"> ◆ WebAccess Agent IP address ◆ WebAccess Agent HTTP port 	For more information, see Section 16.2.6, “Planning the WebAccess Agent Installation,” on page 178.

16.7 WebAccess Agent Quick Checklist

- Plan the new clustered WebAccess Agent, including the new domain required to house the WebAccess Agent in a clustering environment.
See [Section 16.2, “Planning the WebAccess Agent in a Linux Cluster,” on page 176.](#)
- Create the new WebAccess Agent domain.
See [Section 16.3.1, “Creating a Domain for the WebAccess Agent,” on page 178.](#)
- Set up the MTA for the new WebAccess Agent domain.
See [Section 16.3.2, “Installing the MTA for the WebAccess Agent Domain,” on page 179.](#)
- Install the WebAccess Agent.
See [Section 16.3.3, “Installing and Configuring the WebAccess Agent in a Cluster,” on page 179.](#)
- Modify the WebAccess Agent cluster resource load script.
See [“Modifying the Cluster Resource Load Script for the WebAccess Agent and Its MTA” on page 183.](#)
- Modify the WebAccess Agent cluster resource unload script.

See [“Modifying the Cluster Resource Unload Script for the WebAccess Agent and Its MTA”](#) on page 185.

- ❑ Set up the WebAccess Agent failover list and policies.

See [“Setting the Failover List and Policies for the WebAccess Agent and Its MTA”](#) on page 187.

- ❑ Double-check the cluster-specific WebAccess Agent object properties.

See [“Verifying WebAccess Agent Object Properties”](#) on page 188.

- ❑ Test the clustered WebAccess Agent.

See [Section 16.4, “Testing the WebAccess Agent in a Linux Cluster,”](#) on page 189.

- ❑ Record cluster-specific information in the properties pages of the GroupWise objects associated with the WebAccess Agent.

See [Section 16.5.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 190.

17 Implementing GroupWise Monitor in a Linux Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 13, “Planning GroupWise in a Linux Cluster,”](#) on page 121 and [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131. As part of this process, [Section 13.7.1, “System Clustering Worksheet,”](#) on page 128 was filled out. If you do not have access to the filled-out worksheet, print the worksheet now and fill in the clustering and network address information as it currently exists on your system. You need this information as you implement Monitor in a cluster.

- ♦ [Section 17.1, “Understanding the Monitor Components,”](#) on page 195
- ♦ [Section 17.2, “Planning GroupWise Monitor in a Linux Cluster,”](#) on page 196
- ♦ [Section 17.3, “Setting Up GroupWise Monitor in a Linux Cluster,”](#) on page 198
- ♦ [Section 17.4, “Testing the Monitor Agent in a Linux Cluster,”](#) on page 205
- ♦ [Section 17.5, “Managing the Monitor Agent in a Linux Cluster,”](#) on page 206
- ♦ [Section 17.6, “Monitor Agent Clustering Worksheet,”](#) on page 206
- ♦ [Section 17.7, “Monitor Agent Quick Checklist,”](#) on page 207

17.1 Understanding the Monitor Components

If you are not familiar with GroupWise Monitor, review [“GroupWise Monitor Overview”](#) in [“Installing GroupWise Monitor”](#) in the *GroupWise 8 Installation Guide*.

As you plan Monitor in a clustering environment, you must keep in mind that you will plan and set up two Monitor components:

- ♦ Monitor Agent ([gwmon](#)) that will be associated with a domain in your GroupWise system
- ♦ Monitor Application (a Java servlet) that will be added to your Web server (Apache). You must install the Monitor Application on a non-clustered Web server.

You install the Monitor Agent on each node in the cluster. You install the Monitor Application to your Web server, which must not be clustered. This means that the [Monitor Agent Web console](#) at the following URL is always available, because it is part of the cluster:

```
http://secondary_IP_address:8200
```

However, the [Monitor Web console](#) at the following URLs are not available if the Web server is down:

Table 17-1 Monitor Web Console URLs

NetWare or Windows Web Server:	<code>http://Web_server_address/gw/gwmonitor</code>
Linux Web Server:	<code>http://Web_server_address/gwmon/gwmonitor</code>

17.2 Planning GroupWise Monitor in a Linux Cluster

A major system configuration difference between the Monitor Agent and other GroupWise agents is that the Monitor Agent needs access to a domain during installation but does not need permanent access to a domain thereafter.

[Section 17.6, “Monitor Agent Clustering Worksheet,” on page 206](#) lists information you need as you set up Monitor in a clustering environment. You should print the worksheet and fill it out as you complete the planning tasks listed below

- ♦ [Section 17.2.1, “Selecting a Domain for Access during Monitor Agent Installation,” on page 196](#)
- ♦ [Section 17.2.2, “Selecting an MTA for the Monitor Agent to Access after Installation,” on page 196](#)
- ♦ [Section 17.2.3, “Selecting the Monitor Agent Partition and Secondary IP Address,” on page 197](#)
- ♦ [Section 17.2.4, “Determining an Appropriate Failover List for the Monitor Agent,” on page 197](#)
- ♦ [Section 17.2.5, “Determining Cluster Resource Information for the Monitor Agent,” on page 197](#)
- ♦ [Section 17.2.6, “Planning the Monitor Agent Installation,” on page 197](#)

17.2.1 Selecting a Domain for Access during Monitor Agent Installation

During installation, the Monitor Agent Installation program needs access to a domain database (`wpdomain.db`) in order to obtain information about agents to monitor. You might want to use the domain you created for use with the Internet Agent, as described in [Section 15.2.1, “Creating a Domain for the Internet Agent,” on page 157](#), although you can use any domain in your GroupWise system.

MONITOR CLUSTERING WORKSHEET

Under [Item 2: Domain Name](#), specify the domain and domain directory that the Monitor Agent Installation program can use to obtain information about your GroupWise system.

17.2.2 Selecting an MTA for the Monitor Agent to Access after Installation

After installation, you can configure the Monitor Agent to be independent of a domain database. To do this, you configure the Monitor Agent to communicate with an MTA by way of TCP/IP.

MONITOR CLUSTERING WORKSHEET

Under [Item 3: MTA IP Address](#), specify the MTA IP address and message transfer port that the Monitor Agent can use after installation to communicate with an MTA to obtain agent information.

17.2.3 Selecting the Monitor Agent Partition and Secondary IP Address

As with the MTA and the POA, the Monitor Agent needs a secondary IP address that remains the same no matter which node in the cluster it is running on. You can associate the Monitor Agent with the domain that was accessed during installation or with any other domain, so that they fail over together, or you can associate the Monitor Agent with its own shared partition, so that it fails over independently of any domain.

MONITOR CLUSTERING WORKSHEET

Under [Item 1: GroupWise Partition for Monitor Agent](#), specify the secondary IP address for the Monitor Agent.

17.2.4 Determining an Appropriate Failover List for the Monitor Agent

By default, a [GroupWise partition](#) is configured to have all nodes in the cluster in its failover list, organized in ascending alphanumeric order. Only one node at a time can have a particular GroupWise partition mounted and active. If a GroupWise partition's preferred node fails, the partition fails over to the next node in the failover list. You should customize the failover list for each GroupWise partition based on the [fan-out-failover](#) principle.

As with the other agents, you need to decide which nodes in the cluster would be appropriate locations for the Monitor Agent to fail over to. You must install the Monitor Agent software on all of the nodes where you want the Monitor Agent to be able to fail over. For a review of failover lists, see [Section 13.6.2, "Determining Appropriate Failover Lists for the Agents," on page 126](#), which describes the issues in the context of planning MTA and POA installations.

MONITOR CLUSTERING WORKSHEET

Under [Item 4: Monitor Agent Failover List](#), list the nodes that you want in the Monitor Agent failover list.

17.2.5 Determining Cluster Resource Information for the Monitor Agent

A cluster resource is a [shared partition](#), secondary IP address, application, service, Web server, etc., that can function successfully anywhere in the cluster. Cluster resources include the GroupWise agents and the Messenger agents. When using the *Configure GroupWise for Clustering* option, the GroupWise Installation program needs to know the mount point for the [GroupWise partition](#) where it can access a domain database in order to gather information about agents to monitor. The Installation program also needs to know the secondary IP address of the GroupWise partition.

MONITOR AGENT CLUSTERING WORKSHEET

Under [Item 5: Cluster Resource Information](#), list the mount point and secondary IP address for the GroupWise partition where the domain and post office will be located.

17.2.6 Planning the Monitor Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Monitor Agent are the same in a clustering environment as for any other environment. Review the installation instructions in ["Installing the Linux Monitor Agent"](#) in

“Installing GroupWise Monitor” in the *GroupWise 8 Installation Guide*. Use the “GroupWise Monitor Installation Summary Sheets” to record the types of planning information you need as you install the Monitor Agent in your cluster.

IMPORTANT: Do not install the Monitor Agent software until you are instructed to do so in [Section 17.3, “Setting Up GroupWise Monitor in a Linux Cluster,”](#) on page 198.

17.3 Setting Up GroupWise Monitor in a Linux Cluster

GroupWise Monitor depends on a Web server, Apache in particular on Linux. However, Apache is not typically installed in a cluster and the Monitor Application is not supported in a cluster. Therefore, these instructions do not include that task.

- ♦ [Section 17.3.1, “Installing and Configuring the Monitor Agent on Each Node in Your Cluster,”](#) on page 198
- ♦ [Section 17.3.2, “Configuring the Monitor Agent Cluster Resource to Load and Unload the Monitor Agent,”](#) on page 200

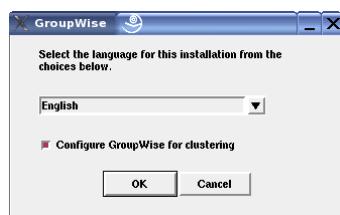
17.3.1 Installing and Configuring the Monitor Agent on Each Node in Your Cluster

The Monitor Agent must be installed on each node in the Monitor Agent failover list ([Monitor Agent Clustering Worksheet item 4](#)). The Monitor Application is installed to your Web server and is therefore not installed on nodes in the cluster.

- ♦ [“Running the Monitor Installation Program on the Preferred Node”](#) on page 198
- ♦ [“Running the Monitor Agent Installation Program on Subsequent Nodes”](#) on page 199
- ♦ [“Configuring the Monitor Agent Web Console for SSL”](#) on page 200
- ♦ [“Testing the Monitor Agent Installation on Each Node”](#) on page 200

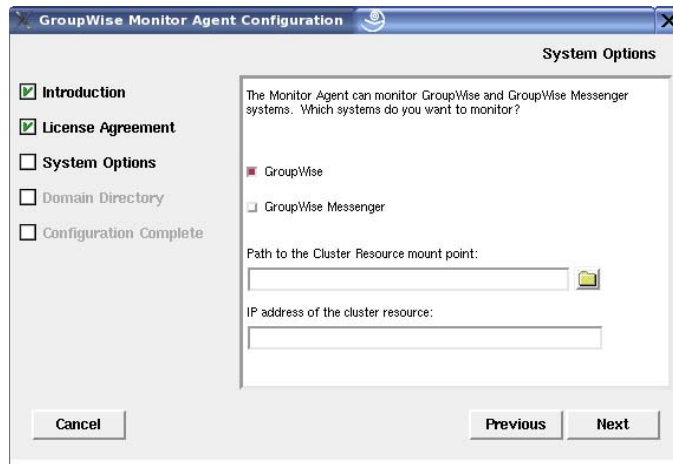
Running the Monitor Installation Program on the Preferred Node

- 1 Make sure that the Monitor Agent software is available in the software distribution directory you created in [Step 6 in Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131.
- 2 Mount the [GroupWise partition \(Monitor Agent Clustering Worksheet item 2\)](#) where the Monitor Agent Installation program can access a domain database.
- 3 From the software distribution directory, start the Installation program and select *Configure GroupWise for Clustering*.



- 4 Install the Monitor Agent software, following the steps provided in [“Installing the Linux Monitor Agent”](#) in [“Installing GroupWise Monitor”](#) in the *GroupWise 8 Installation Guide*.

- 5 Configure the Monitor Agent, following the steps provided in “[Configuring the Linux Monitor Agent](#)” in “[Installing GroupWise Monitor](#)” in the *GroupWise 8 Installation Guide*, paying special attention to the cluster resource information on the System Options page.

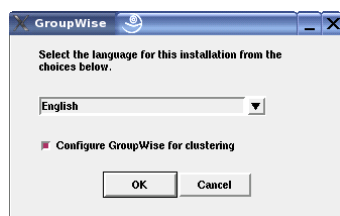


As a result of selecting *Configure GroupWise for Clustering* on the preferred node, the following cluster-specific configuration actions are performed:

- The Monitor Agent configuration file ([monitor.xml](#)) is created in `mount_point/groupwise/agents/share` on the shared resource so that the Monitor Agent uses the same configuration file regardless of which cluster node it is running on. The HOME_PATH option includes the mount point and the path to the database so that the configuration file is valid when mounted to each cluster node.
 - The `--log` startup switch in the `grpwise-ma` script is set to a location on the shared resource (`mount_point/groupwise/agents/log`) so that Monitor Agent logging information is written to the same log file regardless of which cluster node it is running on. Gateway accounting files that you can use to generate reports are stored in the `acct` subdirectory of this location.
 - The Monitor Agent is not configured to start automatically on system startup. In a cluster, you do not want the Monitor Agent to start automatically whenever a node restarts.
- 6 Continue with [Running the Monitor Agent Installation Program on Subsequent Nodes](#)

Running the Monitor Agent Installation Program on Subsequent Nodes

- 1 On the next node in the Monitor Agent failover list, mount the [GroupWise partition](#) ([Monitor Agent Clustering Worksheet item 2](#)) where the Monitor Agent Installation program can access a domain database.
- 2 From the software distribution directory you created in [Step 6](#) in [Section 14.1, “Setting Up a New GroupWise System in a Linux Cluster,”](#) on page 131, start the GroupWise Installation program and select *Configure GroupWise for Clustering*.



- 3 Install the Monitor Agent software on the cluster node as usual, but do not use the *Configure* option.
For the Monitor Agent, you do not need to import clustering data on subsequent nodes as you do for the other GroupWise agents.
- 4 Repeat [Step 1](#) through [Step 3](#) for each cluster node in the Monitor Agent failover list.
After you install the Monitor Agent on each node in its failover list, the cluster node is ready for the Monitor Agent to fail over to it.
- 5 Continue with [Configuring the Monitor Agent Web Console for SSL](#).

Configuring the Monitor Agent Web Console for SSL

If you plan to secure the Monitor Web console using SSL, you need to provide an SSL certificate file. You can place the file on the Monitor Agent partition, rather than each node.

- 1 Create a directory on the Monitor Agent partition where you want to store the certificate file.
- 2 In the `grpwise-ma` script, use the `--httpcertfile` switch to specify the full path to the directory you created in [Step 1](#).

Continue with [Testing the Monitor Agent Installation on Each Node](#).

Testing the Monitor Agent Installation on Each Node

- 1 Test the Monitor by starting it as a daemon, as described in “[Starting the Linux Monitor Agent as a Daemon](#)” in “[Installing GroupWise Monitor](#)” in the *GroupWise 8 Installation Guide*.

```
/etc/initd/grpwise-ma start
/etc/initd/grpwise-ma status
```

- 2 Then stop the Monitor Agent.

```
/etc/initd/grpwise-ma stop
/etc/initd/grpwise-ma status
```

- 3 Return to “[Running the Monitor Installation Program on the Preferred Node](#)” on page 198 for each node in the Monitor Agent failover list ([Monitor Agent Clustering Worksheet item 4](#))

When you have installed the Monitor Agent on all of the nodes in the Monitor Agent fail over list, continue with [Configuring the Monitor Agent Cluster Resource to Load and Unload the Monitor Agent](#).

17.3.2 Configuring the Monitor Agent Cluster Resource to Load and Unload the Monitor Agent

The properties of the Monitor Agent Cluster Resource object define how the Monitor Agent functions within the cluster, how the Monitor Agent is loaded and unloaded, and how failover and failback situations are handled. Complete the following tasks for the Monitor Agent cluster resource:

- ♦ “[Modifying the Cluster Resource Load Script for the Monitor Agent](#)” on page 201
- ♦ “[Modifying the Cluster Resource Unload Script for the Monitor Agent](#)” on page 202
- ♦ “[Setting the Failover List and Policies for the Monitor Agent](#)” on page 204

Modifying the Cluster Resource Load Script for the Monitor Agent

The cluster resource load script executes whenever the Monitor Agent cluster resource comes online.

To set up the load script in iManager:

- 1 Expand Clusters, then click *Cluster Options*.
- 2 In the *Cluster* field, browse to the Cluster object where the Monitor Agent cluster resource is located.
- 3 Click the Cluster object to display the cluster resources that belong to the cluster.
- 4 Select the Monitor Agent cluster resource that you created when you set up the [Monitor Agent partition](#), then click *Properties*.

The default load script from a generic IP service template appears as follows:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfncs

# mount the file system
exit_on_error mount -t reiserfs /dev/evms/vol /mnt/generic

# add the IP address
exit_on_error add_secondary_ipaddress a.b.c.d

# start the service
exit_on_error /etc/init.d/myservice start

# return status
exit 0
```

- 5 If this is an NSS volume or a shared pool, make the following changes to set up the Monitor Agent load script:
 - 5a As needed, in the mount command, change *reiserfs* to whatever file system type is in use on nodes in the cluster.
 - 5b In the mount command, change *vol* to the actual device name of the device in use on nodes in the cluster.
 - 5c In the mount command, change */mnt/generic* to the mount point directory in use on nodes in the cluster.
 - 5d In the *add_secondary_ipaddress* command, change *a.b.c.d* to the secondary IP address of the Monitor Agent cluster resource ([Monitor Agent Clustering Worksheet item 1](#))
 - 5e In the start service command, change *myservice start* to the command to start the Monitor Agent.

```
/etc/init.d/grpwise-ma start
```

- 6 If this is a traditional Linux volume, use the following load script:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfunc

# define the IP address
RESOURCE_IP=123.123.1.

# define the file system type
MOUNT_FS=reiserf

# define the device
exit_on_error evms -f /var/opt/novell/ncs/ContainerActivate -rl
Share `uname -n`
MOUNT_DEV=/dev/evms/Share/dat

# define the mount point
MOUNT_POINT=/mnt/mount_point

# mount the file system
exit_on_error mount -t $MOUNT_FS $MOUNT_DEV $MOUNT_POINT

# add the IP address
exit_on_error add_secondary_ipaddress $RESOURCE_IP

/etc/init.d/grpwise-ma start

exit 0

```

Make the following changes to set up the load script for the Monitor Agent:

- 6a** On the `RESOURCE_IP` line, change `123.123.1.1` to the secondary IP address of the GroupWise partition ([Monitor Agent Clustering Worksheet item 1](#)).
- 6b** As needed, on the `MOUNT_FS` line, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
- 6c** On the `MOUNT_DEV` line, change `/dev/evms/Share/dat` to the actual device name in use on nodes in the cluster.
- 6d** On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory in use on nodes in the cluster.
- 6e** Use the following command to start the Monitor Agent:

```
/etc/init.d/grpwise-ma start
```

- 7** Click *OK* to save the load script.

Modifying the Cluster Resource Unload Script for the Monitor Agent

The cluster resource unload script executes whenever the Monitor Agent cluster resource goes offline.

- 1** On the Cluster Resource Properties page of the Monitor Agent cluster resource, click *Scripts > Unload Script*.

The default unload script appears as follows:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

# request service stop
ignore_error /etc/init.d/mybservice stop

# stop service otherwise
sleep 8
ignore_error fuser -k /mnt/generic

# del the IP address
ignore_error del_secondary_ipaddress a.b.c.d

# umount the file system
exit_on_error umount /mnt/generic

# return status
exit 0

```

2 If this is an NSS volume or a shared pool, make the following changes:

- 2a** In the `request service stop` section, change `mybservice stop` to the command to stop the Monitor Agent.

```
/etc/init.d/grpwise-ma stop
```

- 2b** In the `stop service otherwise` section (used if the agents do not stop normally), remove these commands:

```
sleep 8
ignore_error fuser -k /mnt/generic
```

- 2c** Use these commands instead:

```
ignore_error /etc/init.d/grpwise-ma stop
sleep 8
ignore_error pkill -fx "/opt/novell/groupwise/agents/bin/gwmon
                    --home /domain_directory"
```

- 2d** In the `del IP address` section, change `a.b.c.d` to the secondary IP address used in the load script.

- 2e** In the `umount file system` section, change `/mnt/generic` to the mount point directory used in the load script.

3 If this is a traditional Linux volume, use the following unload script:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

/etc/init.d/grpwise-ma stop

# define the IP address
RESOURCE_IP=172.16.5.18

# define the mount point
MOUNT_POINT=/mnt/mount_point

sleep 8

ignore_error fuser -k $MOUNT_POINT

# del the IP address
ignore_error del_secondary_ipaddress $RESOURCE_IP

# umount the file system
exit_on_error umount $MOUNT_POINT

# return status
exit 0

```

Make the following changes to set up the unload script for the Monitor Agent.

3a Use the following command to stop the Monitor Agent:

```
/etc/init.d/grpwise-ma stop
```

3b On the `RESOURCE_IP` line, change `172.16.5.18` to the secondary IP address used in the load script.

3c On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory used in the load script.

3d Adjust the `sleep` command as needed so that the Monitor Agent can shut down normally on your system without being inadvertently killed. by the `fuser -k` command that follows.

3e In the `fuser -k` command (used if the Monitor Agent does not stop normally), change `-k` to `-mk`.

The `-m` parameter obtains the PID numbers of the processes to kill.

4 Click *OK* to save the unload script.

Setting the Failover List and Policies for the Monitor Agent

1 On the Cluster Resource Properties page of the Monitor Agent cluster resource, click *General*.

The default policy settings are often appropriate. By default, a cluster resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover list
- ◆ Continues running at its failover location, even after its most preferred node is again available

If you are considering changing these defaults, see the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

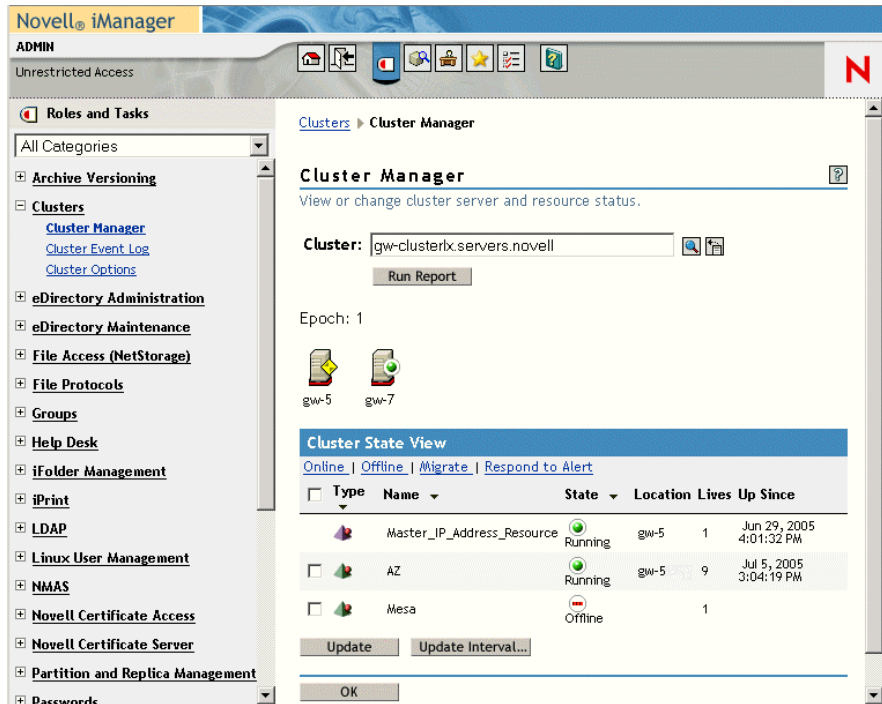
2 Under *Preferred Nodes*, arrange the nodes in the cluster into the desired failover list for the Monitor Agent ([Monitor Agent Clustering Worksheet item 4](#)).

3 Click *OK*.

17.4 Testing the Monitor Agent in a Linux Cluster

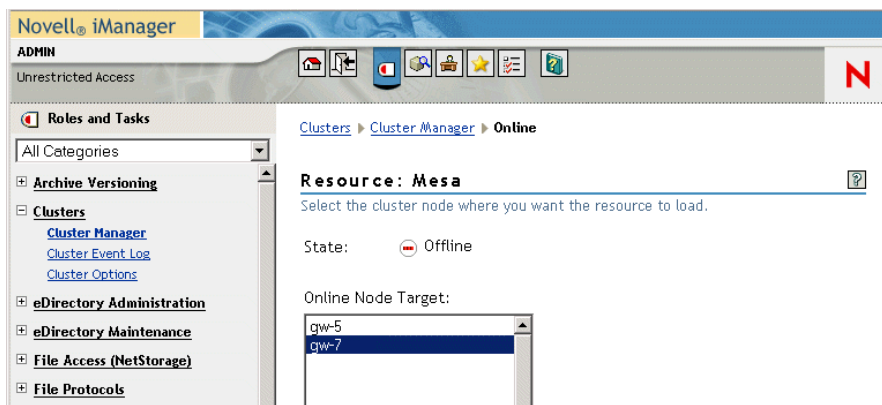
After you have configured the Monitor Agent cluster resource, you can test the load and unload scripts by bringing the Monitor Agent cluster resource online and taking it offline again.

- 1 In iManager, expand Clusters, then click *Cluster Manager*.



The new Monitor Agent cluster resource shows *Offline* in the *State* column.

- 2 Click the new Monitor Agent cluster resource, then click *Online*.



- 3 Select the cluster node where you want to online the Monitor Agent cluster resource, then click *OK*.

After a moment, the Monitor Agent cluster resource displays *Running* in the *State* column.

- 4 At the server where the Monitor Agent is starting, use the following command to see that the Monitor Agent has started:

```
/etc/init.d/grpwise-ma status
```

- 5 Select the new Monitor Agent cluster resource, then click *Offline*.
The *State* column for the Monitor Agent cluster resource returns to *Offline*.
- 6 Use the same command that you used in [Step 4](#) to verify that the Monitor Agent has stopped.
- 7 Repeat [Step 2](#) whenever you are ready to bring the new Monitor Agent cluster resource online permanently.
- 8 Continue with [Managing the Monitor Agent in a Linux Cluster](#).

17.5 Managing the Monitor Agent in a Linux Cluster

When the Monitor Agent fails over, it must repoll all the monitored agents to ascertain their current status. This may take a few moments, depending on the number of agents being monitored. However, no action is necessary on your part as the Monitor Agent starts on the next node in the cluster.

17.6 Monitor Agent Clustering Worksheet

Item	Explanation
1) GroupWise Partition for Monitor Agent:	Specify the name of the Cluster Resource object for the Monitor Agent, along with its secondary IP address.
Secondary IP Address:	For more information, see Section 17.2.3, "Selecting the Monitor Agent Partition and Secondary IP Address," on page 197.
2) GroupWise Partition for Domain	Specify a GroupWise partition where there is a domain database from which the Monitor Agent can gather information about agents to monitor. Also provide the domain name and directory.
Domain Name:	
Domain Directory:	For more information, see Section 17.2.1, "Selecting a Domain for Access during Monitor Agent Installation," on page 196.
3) MTA IP Address:	If you want the Monitor Agent to be able to fail over independently, specify the IP address and message transfer port number of an MTA with which the Monitor Agent can communicate, as an alternative to accessing a domain database.
MTA MTP Port Number:	For more information, see Section 17.2.2, "Selecting an MTA for the Monitor Agent to Access after Installation," on page 196
4) Monitor Agent Failover List:	List the nodes in the cluster where the Monitor Agent could fail over. For more information, see Section 17.2.4, "Determining an Appropriate Failover List for the Monitor Agent," on page 197.
5) Cluster Resource Information	List the cluster resource information for the GroupWise partition where the domain is located so that the Monitor Agent can access its domain database for information about agents to monitor.
♦ Path to the cluster resource mount point	
♦ IP address of the cluster resource	For more information see, Section 17.2.5, "Determining Cluster Resource Information for the Monitor Agent," on page 197.

17.7 Monitor Agent Quick Checklist

- Plan the new clustered Monitor Agent, including a domain to access during installation to gather information about agents to monitor
See [Section 17.2, “Planning GroupWise Monitor in a Linux Cluster,”](#) on page 196.
- Install the Monitor Agent on all nodes in the Monitor Agent’s failover list.
See [Section 17.3.1, “Installing and Configuring the Monitor Agent on Each Node in Your Cluster,”](#) on page 198.
- Modify the Monitor Agent cluster resource load script.
See [“Modifying the Cluster Resource Load Script for the Monitor Agent”](#) on page 201.
- Modify the Monitor Agent cluster resource unload script.
See [“Modifying the Cluster Resource Unload Script for the Monitor Agent”](#) on page 202.
- Set up the Monitor Agent failover list and policies.
See [“Setting the Failover List and Policies for the Monitor Agent”](#) on page 204.
- Test the clustered Monitored Agent.
See [Section 17.4, “Testing the Monitor Agent in a Linux Cluster,”](#) on page 205.

18 Backing Up a GroupWise System in a Linux Cluster

To back up GroupWise data in a Linux cluster, you can use the GroupWise Database Copy (DBCOPY) utility to copy the data from the live GroupWise system to a static location for backup. For more information, see [“Backing Up GroupWise Databases”](#) and [“GroupWise Database Copy Utility”](#) in [“Databases”](#) in the *GroupWise 8 Administration Guide*.

You can also use the GroupWise Target Service Agent for File Systems (TSAFSGW), as described in [“GroupWise Target Service Agent”](#) in [“Databases”](#) in the *GroupWise 8 Administration Guide*.

In a clustering environment, TSAFSGW must be installed and loaded on each node from which your backup software backs up any portion of your GroupWise system. To accommodate the variable locations of data to back up from a clustered GroupWise system, use the `/home` startup switch on the `smsconfig` command for every domain and post office on every shared volume that might ever be mounted on that node.

When TSAFSGW runs, it backs up the shared volumes that are currently accessible and skips shared volumes that are not currently accessible. If a shared volume migrates, you must restart TSAFSGW so that it can re-determine what shared volumes are currently available for backup.

To restore data in a clustering environment, you must run your backup/restore software on the node where the location to restore is currently mounted.

19 Updating a GroupWise System in a Linux Cluster

In a Linux cluster, you must install the GroupWise software on each node in the cluster. Before you run the GroupWise Installation program to install updated software, make sure you know all the cluster nodes where the GroupWise software is already installed.

It is very important to update all nodes on the failover list of each domain and post office at the same time because each domain and post office should be serviced by only one version of the agent software. If you do not update all nodes on the failover list at once, there is the potential for a domain or post office to be serviced by a different version of the agent software during a failover situation. This can cause database problems.

Keep in mind these cluster-specific details as you follow the instructions in “[Update](#)” in the *GroupWise 8 Installation Guide* to update your GroupWise system in a NetWare cluster.

20 Moving an Existing Linux GroupWise 8 System into a Linux Cluster

If you are adding the high availability benefits of Novell Cluster Services to a GroupWise 8 system that is already up and running, the first step is to install Novell Cluster Services following the instructions in the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html). You should also review Chapter 12, “Introduction to GroupWise 8 and Novell Cluster Services on Linux,” on page 119 to help you apply clustering principles and practices to your GroupWise system.

You do not need to transfer your entire GroupWise system into the cluster all at once. You could transfer individual post offices where the needs for high availability are greatest. You could transfer a domain and all of its post offices at the same time. You might decide that you don't need to have all of your GroupWise system running in the cluster.

This section provides a checklist to help you get started with moving your GroupWise system into a clustering environment:

- Decide which shared partitions in your cluster you want to use for GroupWise domains and post offices.
- Decide which nodes in your storage area network you want have on failover lists for the GroupWise agents.
- Review Chapter 13, “Planning GroupWise in a Linux Cluster,” on page 121. Fill out the Section 13.7.1, “System Clustering Worksheet,” on page 128 to help you decide which domains and post offices you want move to which shared partitions.
- Move a domain and/or post office onto the GroupWise partition, following the instructions in “Moving a Domain” in “Domains” or “Moving a Post Office” in “Post Offices” in the *GroupWise 8 Administration Guide*.
- Review Section 13.6, “Deciding How to Install and Configure the Linux Agents in a Cluster,” on page 126, fill out the Section 13.7.2, “Agent Clustering Worksheet,” on page 129, and install the agents as needed for the first clustered domain and/or post office, following the instructions in Section 14.4, “Installing and Configuring the MTA and the POA in a Cluster,” on page 134. This includes setting up the load and unload scripts for the GroupWise partition.
- Test the first component of your clustered GroupWise system, following the instructions in Section 14.5, “Testing Your Clustered GroupWise System,” on page 147.
- Take care of the cluster management details described in Section 14.6, “Managing Your Clustered GroupWise System,” on page 148.
- Move more domains and post offices into the cluster as needed. If you have GroupWise libraries, see Section 13.5, “Planning a New Library for a Clustered Post Office,” on page 125.
- Add other components to your clustered GroupWise system as needed, following the instructions in:
 - ♦ Chapter 15, “Implementing the Internet Agent in a Linux Cluster,” on page 153

- ♦ Chapter 16, “Implementing WebAccess in a Linux Cluster,” on page 175.
- ♦ Chapter 17, “Implementing GroupWise Monitor in a Linux Cluster,” on page 195
- ♦ Chapter 18, “Backing Up a GroupWise System in a Linux Cluster,” on page 209

21 Moving a Clustered GroupWise 8 System from NetWare to Linux

For general information about moving from a NetWare cluster to a Linux cluster, see the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html). It is possible to have a cluster that includes both NetWare and Linux servers. Therefore, you can move your GroupWise 8 system from NetWare servers to Linux servers one component at a time. However, all of the servers on the failover list of each GroupWise component must be of the same platform. For example, a domain and MTA on a NetWare server cannot fail over to a Linux server; they must fail over to another NetWare server.

Ideally, you should administer a GroupWise system on Linux using the Linux version of ConsoleOne, which is available from [Novell Product Downloads site](http://download.novell.com) (<http://download.novell.com>).

The *GroupWise Server Migration Guide* provides instructions to help you move components of your GroupWise system to Linux.

GroupWise 6.5 cannot run in a cluster on Linux. Therefore, if you have a clustered GroupWise 6.5 system, you must update it to GroupWise 8 before you can move it into a Linux cluster.

22 Implementing Messenger in a Linux Cluster

Novell Messenger does not require the existence of a GroupWise system in the cluster, but presumably one has already been set up as described in [Chapter 13, “Planning GroupWise in a Linux Cluster,”](#) on page 121 and [Chapter 14, “Setting Up a Domain and a Post Office in a Linux Cluster,”](#) on page 131. As part of the process of setting up GroupWise in the cluster, you filled out the “[System Clustering Worksheet](#)” on page 128. Some of the information from that worksheet is helpful as you implement Messenger in your cluster.

- ♦ [Section 22.1, “Planning Your Messenger System in a Linux Cluster,”](#) on page 217
- ♦ [Section 22.2, “Setting Up Your Messenger System in a Linux Cluster,”](#) on page 219
- ♦ [Section 22.3, “Testing Your Clustered Messenger System,”](#) on page 227
- ♦ [Section 22.4, “Managing Your Clustered Messenger System,”](#) on page 228
- ♦ [Section 22.5, “Messenger Clustering Worksheet,”](#) on page 228
- ♦ [Section 22.6, “Messenger Clustering Quick Checklist,”](#) on page 229

22.1 Planning Your Messenger System in a Linux Cluster

Because the Messenger agents are not associated with GroupWise domains or post offices, the Messenger agents are easier to implement in a cluster than are the GroupWise agents. [Section 22.5, “Messenger Clustering Worksheet,”](#) on page 228 lists the information you need as you set up the Messenger agents in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 22.1.1, “Understanding Your Cluster,”](#) on page 217
- ♦ [Section 22.1.2, “Selecting the Messenger Partition and Secondary IP Address,”](#) on page 218
- ♦ [Section 22.1.3, “Determining an Appropriate Failover List for the Messenger Agents,”](#) on page 218
- ♦ [Section 22.1.4, “Determining Cluster Resource Information for the Messenger Agents,”](#) on page 218
- ♦ [Section 22.1.5, “Planning the Messenger Agent Installation,”](#) on page 219

22.1.1 Understanding Your Cluster

As described in [Section 13.1, “Installing Novell Cluster Services on Linux,”](#) on page 122, you set up your cluster with a certain number of [shared partitions](#) and [cluster resources](#).

MESSENGER CLUSTERING WORKSHEET

Under [Items 1-5](#), record information about your cluster. This information corresponds to items 1-5 on the [Section 13.7.1, "System Clustering Worksheet,"](#) on page 128.

22.1.2 Selecting the Messenger Partition and Secondary IP Address

If you are not planning to enable archiving, or if you are not anticipating a large Messenger archive, you can use one [Messenger partition](#) for both the Messaging Agent and the Archive Agent. If you anticipate archiving a large number of messages so that the Messenger archive grows very large, you might want to have a separate Messenger partition for the Archive Agent and its archive database. The steps in this section focus on setting up the Messenger agents on a single Messenger partition.

MESSENGER CLUSTERING WORKSHEET

Under [Item 6: Shared Partition for Messenger](#), record the name and secondary IP address of the Messenger partition in your cluster.

If you want a separate Messenger partition for archiving, under [Item 7: Shared Partition for Archiving](#), record the name and secondary IP address of the archiving partition in your cluster.

22.1.3 Determining an Appropriate Failover List for the Messenger Agents

By default, a Messenger partition is configured to have all nodes in the cluster in its failover list, organized in ascending alphanumeric order. Only one node at a time can have the Messenger partition mounted and active and the Messenger agents running. If a Messenger partition's preferred node fails, the partition fails over to the next node in the failover list. The Messenger agents might need to run on any node that the Messenger partition fails over to.

MESSENGER CLUSTERING WORKSHEET

Under [Item 8: Failover List for Messenger Agents](#), list the nodes that you want to have in the Messenger agents' failover list.

22.1.4 Determining Cluster Resource Information for the Messenger Agents

A cluster resource is a [shared partition](#), secondary IP address, application, service, Web server, etc., that can function successfully anywhere in the cluster. Cluster resources include the GroupWise agents and the Messenger agents. When you are installing the Messenger agents in a cluster, the Messenger Installation program needs to know the mount point for the [Messenger partition](#) where it can store agent startup files, log files, SSL certificate files, and the `uid.conf` file that enables the Messenger agents to run as a non-root user. By storing these files on a shared partition, the Messenger agents can access the files regardless of which node in the cluster the agents are currently running on.

MESSENGER AGENT CLUSTERING WORKSHEET

Under [Item 9: Mount Point for Shared Storage](#), list the mount point directory for the Messenger partition where the Messenger startup and other files will be located.

22.1.5 Planning the Messenger Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Messenger agents are the same in a clustering environment as for any other environment. Review [“Planning Your Novell Messenger System”](#), then print and fill out the [“Novell Messenger Worksheet”](#) in [“Installing a Novell Messenger System”](#) in the *Novell Messenger 2.1 Installation Guide*. Messenger must be installed on each node in the failover list (Messenger Clustering Worksheet item 8)

Continue with [Setting Up Your Messenger System in a Linux Cluster](#).

22.2 Setting Up Your Messenger System in a Linux Cluster

You should have already reviewed [Section 22.1, “Planning Your Messenger System in a Linux Cluster,”](#) on page 217 and filled out the [Section 22.5, “Messenger Clustering Worksheet,”](#) on page 228 and the [“Novell Messenger Worksheet”](#) in the *Novell Messenger 2.1 Installation Guide*.

- ♦ [Section 22.2.1, “Creating Your Messenger System and Installing the Messenger Agents,”](#) on page 219
- ♦ [Section 22.2.2, “Changing Messenger Paths to Locations on the Messenger Partition,”](#) on page 221
- ♦ [Section 22.2.3, “Configuring the Messenger Cluster Resource to Load and Unload the Messenger Agents,”](#) on page 223

22.2.1 Creating Your Messenger System and Installing the Messenger Agents

The Messenger Installation program walks you through setting up your Messenger system and installing the Messenger agents. The first time you run the Messenger Installation program, you create your Messenger system, which includes creating various Messenger objects in eDirectory and installing the Messenger software on the node where you run the Messenger Installation program. After that, you run the Messenger Installation program on each node in the Messenger failover list to install the Messenger software on each node, but you do not create any more objects in eDirectory.

- ♦ [“Running the Messenger Installation Program on the Preferred Node”](#) on page 219
- ♦ [“Running the Messenger Installation Program on Subsequent Nodes”](#) on page 220
- ♦ [“Setting Up Non-root Access on NSS Volumes on Each Node”](#) on page 220
- ♦ [“Testing Your Messenger Agent Installation on Each Node”](#) on page 220

Running the Messenger Installation Program on the Preferred Node

- 1 Mount the Messenger partition ([Messenger Clustering Worksheet item 6](#)) on the mount point for shared storage ([Messenger Clustering Worksheet item 9](#)).
- 2 Run the Messenger Installation program, following the steps provided in [“Starting the Messenger Installation Program on Linux”](#) in [“Installing a Novell Messenger System”](#) in the *Novell Messenger 2.1 Installation Guide*.
- 3 When asked if you are installing to a cluster, enter *y* for *Yes*.
- 4 From the options list, enter 1 for *Create a new system*.
- 5 Specify the mount point for the shared storage.

- 6 Set up your Messenger system, following the steps provided in “[Configuring Your Messenger System on Linux](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*.
- 7 Continue with [Running the Messenger Installation Program on Subsequent Nodes](#).

Running the Messenger Installation Program on Subsequent Nodes

- 1 On the next node in the Messenger failover list ([Messenger Cluster Worksheet item 8](#)), mount the Messenger partition on the mount point for shared storage.
- 2 Run the Messenger Installation program.
- 3 When asked if you are installing to a cluster, enter *y* for *Yes*.
- 4 From the options list, enter *2* for *Install a new server to an existing system*.
- 5 Specify the mount point for the shared storage.

The Messenger Installation program then accesses the Messenger files that were created on the shared storage when the Messenger agents were installed on the preferred node. From these files, the Messenger Installation program lists the probable configuration for the Messenger agents you are installing on the current node.

- 6 Enter *1* for *Proceed with these settings*.
or
Enter *2* for *Change the settings*, then modify the configuration for the Messenger agents as needed.
- 7 When asked if you want to start the agents, enter *n* for *No*.
- 8 Repeat [Step 1](#) through [Step 7](#) for each node on the Messenger failover list.
- 9 Continue with [Setting Up Non-root Access on NSS Volumes on Each Node](#).

Setting Up Non-root Access on NSS Volumes on Each Node

If your cluster uses NSS volumes, as described in the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html), you must set up non-root access to those NSS volumes, as described in “[Setting Up Non-root Access on an NSS Volume on Novell Open Enterprise Server Linux](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*. Then continue with [Testing Your Messenger Agent Installation on Each Node](#).

Testing Your Messenger Agent Installation on Each Node

- 1 Test the Messenger agents by starting them as daemons, as described in “[Starting the Linux Messenger Agents](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*.

```
/etc/init.d/novell-nmma start
/etc/init.d/novell-nmaa start
/etc/init.d/novell-nmma status
/etc/init.d/novell-nmaa status
```

- 2 Stop the Messenger agents.

```
/etc/init.d/novell-nmma stop
/etc/init.d/novell-nmaa stop
/etc/init.d/novell-nmma status
/etc/init.d/novell-nmaa status
```

- 3 Return to [“Running the Messenger Installation Program on the Preferred Node”](#) on page 219 for each node in the Messenger failover list ([Messenger Clustering Worksheet item 8](#)).

When you have installed the Messenger agents on all of the nodes in the Messenger failover list, continue with [Changing Messenger Paths to Locations on the Messenger Partition](#).

22.2.2 Changing Messenger Paths to Locations on the Messenger Partition

During installation, various Messenger paths are set to locations on the node where the software is installed. After installation, you need to set these paths to locations on the Messenger partition, so that the files stored at these locations are available to the Messenger agents regardless of which node in the cluster the agents are running on:

- ♦ [“Setting the Store Path”](#) on page 221
- ♦ [“Setting the Messaging Agent Queue Path”](#) on page 221
- ♦ [“Setting the Archive Agent Queue Path”](#) on page 222
- ♦ [“Setting the Messaging Agent Log Path”](#) on page 222
- ♦ [“Setting the Archive Agent Log Path”](#) on page 222

After settings these directories, continue with [Section 22.2.3, “Configuring the Messenger Cluster Resource to Load and Unload the Messenger Agents,”](#) on page 223.

Setting the Store Path

The store path is the location where you want the archive created. During installation, the default store path is created in `/var/opt/novell/messenger/aa/store` on each node, but you need the archive to be stored on the Messenger partition.

- 1 Choose a directory where you want to store the archive and create that directory on the Messenger partition.
- 2 In ConsoleOne, browse to and select the Novell Messenger Service object (MessengerService), then click *Messenger Server > Archive Agent*.
- 3 Right-click the File Module object, then click *Properties*.
- 4 In the *Store Path* field, specify your archive store path, then click *OK*.

Setting the Messaging Agent Queue Path

When archiving is enabled, the Messaging Agent passes conversations to the Archive Agent when the conversations are completed. If the Messaging Agent cannot communicate with the Archive Agent when it has a conversation to archive, it saves the conversation in its holding directory (queue) until it can communicate with the Archive Agent again. During installation, the default Messaging Agent queue path is created in `/var/opt/novell/messenger/ma/queue`, but you need the queue directory to be located on the Messenger partition.

- 1 Choose a directory for the Messaging Agent queue and create that directory on the Messenger partition.
- 2 In ConsoleOne, browse to and select the Novell Messenger Service object (MessengerService), then click *Messenger Server*.

- 3 Right-click the Messaging Agent object, then click *Properties*.
- 4 Click *Agent > Messaging*.
- 5 In the *Messaging Queue Path* field, specify the Messaging Agent queue path, then click *OK*.

Setting the Archive Agent Queue Path

When the Archive Agent receives a conversation to archive, if it is already busy processing other conversations, it temporarily stores the conversation in its holding directory (queue). During installation, the default Archive Agent queue path is created in `/var/opt/novell/messenger/aa/queue`, but you need the queue directory to be located on the Messenger partition.

- 1 Choose a directory for the Archive Agent queue and create that directory on the Messenger partition.
- 2 In ConsoleOne, browse to and select the Novell Messenger Service object (MessengerService), then click *Messenger Server*.
- 3 Right-click the Archive Agent object, then click *Properties*.
- 4 Click *Agent > Messaging*.
- 5 In the *Messaging Queue Path* field, specify the Archive Agent queue path, then click *OK*.

Setting the Messaging Agent Log Path

During installation, the default Messaging Agent log path is created in `/var/opt/novell/log/messenger/ma`, but you need the log file directory to be located on the Messenger partition.

- 1 Choose a directory for the Messaging Agent log files and create that directory on the Messenger partition.
- 2 In ConsoleOne, browse to and select the Novell Messenger Service object (MessengerService), then click *Messenger Server*.
- 3 Right-click the Messaging Agent object, then click *Properties*.
- 4 Click *Agent > Log Settings*.
- 5 In the *Log Files Path* field, specify the Messaging Agent log path, then click *OK*.

Setting the Archive Agent Log Path

During installation, the default Archive Agent log path is created in `/var/opt/novell/log/messenger/aa`, but you need the log file directory to be located on the Messenger partition.

- 1 Choose a directory for the Archive Agent queue and create that directory on the Messenger partition.
- 2 In ConsoleOne, browse to and select the Novell Messenger Service object (MessengerService), then click *Messenger Server*.
- 3 Right-click the Archive Agent object, then click *Properties*.
- 4 Click *Agent > Log Settings*.
- 5 In the *Log Files Path* field, specify the Archive Agent log path, then click *OK*.

22.2.3 Configuring the Messenger Cluster Resource to Load and Unload the Messenger Agents

The properties of the Messenger Cluster Resource object define how the [Messenger partition](#) functions within the cluster, how the Messenger agents are loaded and unloaded, and how failover and fallback situations are handled.

- ♦ “[Modifying the Cluster Load Script for the Messenger Agents](#)” on page 223
- ♦ “[Modifying the Cluster Resource Unload Script for the Messenger Agents](#)” on page 224
- ♦ “[Setting the Failover List and Policies for the Messenger Agents](#)” on page 226

Modifying the Cluster Load Script for the Messenger Agents

To set up the load script in iManager:

- 1 Expand Clusters, then click *Cluster Options*.
- 2 In the *Cluster* field, browse to the Cluster object where the Messenger cluster resource is located.
- 3 Click the Cluster object to display the cluster resources that belong to the cluster.
- 4 Select the Messenger cluster resource that you created when you set up the Messenger partition, then click *Properties*.

The default load script from a generic IP service template appears as follows:

```
#!/bin/bash
. /opt/novell/ncs/lib/ncsfuns

# mount the file system
exit_on_error mount -t reiserfs /dev/evms/vol /mnt/generic

# add the IP address
exit_on_error add_secondary_ipaddress a.b.c.d

# start the service
exit_on_error /etc/init.d/myervice start

# return status
exit 0
```

- 5 If this is an NSS volume or a shared pool, make the following changes to set up the Messenger load script:
 - 5a As needed, in the `mount` command, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
 - 5b In the `mount` command, change `vol` to the actual device name in use on nodes in the cluster.
 - 5c In the `mount` command, change `/mnt/generic` to the mount point directory in use on nodes in the cluster.
 - 5d In the `add_secondary_ipaddress` command, change `a.b.c.d` to the secondary IP address of the Messenger partition.
 - 5e In the start service command, change `myervice start` to the command to start the Messenger agents.

```
/etc/init.d/novell-nmma start
/etc/init.d/novell-nmaa start
```

- 6 If this is a traditional Linux volume, use the following load script:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfunc

# define the IP address
RESOURCE_IP=123.123.1.

# define the file system type
MOUNT_FS=reiserf

# define the device
exit_on_error evms -f /var/opt/novell/ncs/ContainerActivate -rl
                                                    Share `uname -n`
MOUNT_DEV=/dev/evms/Share/dat

# define the mount point
MOUNT_POINT=/mnt/mount_point

# mount the file system
exit_on_error mount -t $MOUNT_FS $MOUNT_DEV $MOUNT_POINT

# add the IP address
exit_on_error add_secondary_ipaddress $RESOURCE_IP
/etc/init.d/novell-nmma start
/etc/init.d/novell-nmaa start

exit 0

```

Make the following changes to set up the load script for the Messenger agents:

- 6a** On the `RESOURCE_IP` line, change `123.123.1.1` to the secondary IP address of the GroupWise partition ([Messenger Clustering Worksheet item 6](#) and [Messenger Clustering Worksheet item 7](#))
- 6b** As needed on the `MOUNT_FS` line, change `reiserfs` to whatever file system type is in use on nodes in the cluster.
- 6c** On the `MOUNT_DEV` line, change `/dev/evms/Share/dat` to the actual device name in use on nodes in the cluster.
- 6d** On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory in use on nodes in the cluster.
- 6e** Use the following command to start the Messaging Agent:


```
/etc/init.d/novell-nmma start
```
- 6f** Use the following command to start the Archive Agent:


```
/etc/init.d/novell-nmaa start
```

7 Click *Apply* to save the load script.

Modifying the Cluster Resource Unload Script for the Messenger Agents

The cluster resource unload script executes whenever the Messenger cluster resource goes offline.

- 1** On the Cluster Resource Properties page of the Monitor Agent cluster resource, click *Scripts > Unload Script*.

The default unload script appears as follows:


```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

# request service stop
ignore_error /etc/init.d/myservice stop

# stop service otherwise
sleep 8
ignore_error fuser -k /mnt/generic

# del the IP address
ignore_error del_secondary_ipaddress a.b.c.d

# umount the file system
exit_on_error umount /mnt/generic

# return status
exit 0

```

2 If this is an NSS volume or a shared pool, make the following changes to the Messenger unload script:

2a In the stop service command, change `myservice stop` to the command to stop the Messenger agents.

```

/etc/init.d/novell-nmma stop
/etc/init.d/novell-nmaa stop

```

2b Adjust the `sleep` command as needed so that the Messenger agents can shut down normally on your system without being inadvertently killed by the `fuser -k` command that follows.

2c In the kill service command, used if the Messenger agents do not stop normally, change `-k` to `-mk`.

The `-m` parameter obtains the PID numbers of the processes to kill.

2d In the kill service command, change `/mnt/generic` to the mount point directory used in the load script.

2e In the `del_secondary_ipaddress` command, change `a.b.c.d` to the secondary IP address used in the load script.

2f In the `umount` command, change `/mnt/generic` to the mount point directory used in the load script.

3 If this is a traditional Linux volume, use the following unload script:

```

#!/bin/bash
. /opt/novell/ncs/lib/ncsfuncs

/etc/init.d/novell-nmma stop
/etc/init.d/novell-nmaa stop

# define the IP address
RESOURCE_IP=172.16.5.18

# define the mount point
MOUNT_POINT=/mnt/mount_point

sleep 8

ignore_error fuser -k $MOUNT_POINT

# del the IP address
ignore_error del_secondary_ipaddress $RESOURCE_IP

# umount the file system
exit_on_error umount $MOUNT_POINT

# return status
exit 0

```

Make the following changes to set up the unload script for the Messenger agents.

3a Use the following command to stop the Messaging Agent:

```
/etc/init.d/novell-nmma stop
```

3b Use the following command to stop the Archive Agent:

```
/etc/init.d/novell-nmaa stop
```

3c On the `RESOURCE_IP` line, change `172.16.5.18` to the secondary IP address used in the load script.

3d On the `MOUNT_POINT` line, change `/mnt/mount_point` to the mount point directory used in the load script.

3e Adjust the `sleep` command as needed so that the Messenger agents can shut down normally on your system without being inadvertently killed by the `fuser -k` command that follows.

3f In the `fuser -k` command (used if the agents do not stop normally), change `-k` to `-mk`. The `-m` parameter obtains the PID numbers of the processes to kill.

4 Click *Apply* to save the unload script.

Setting the Failover List and Policies for the Messenger Agents

1 On the Cluster Resource Properties page of the Messenger cluster resource, click *General*.

The default policy settings are often appropriate. By default, a cluster resource:

- ◆ Fails over automatically if the node it is running on fails
- ◆ Starts automatically on the next node in its failover list
- ◆ Continues running at its failover location, even after its most preferred node is again available

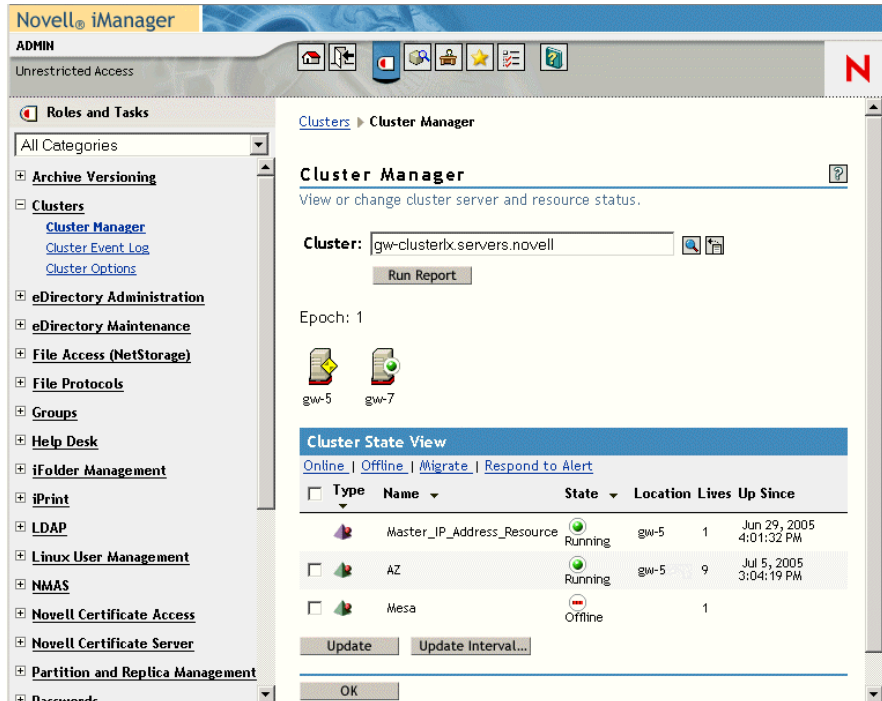
If you are considering changing these defaults, see the *OES 11 Novell Cluster Services 2 for Linux Administration Guide* (http://www.novell.com/documentation/oes11/clus_admin_lx/data/h4hgu4hs.html).

- 2 Under *Preferred Nodes*, arrange the nodes in the cluster into the desired failover list for the Messenger agents (under [Messenger Clustering Worksheet item 3](#)).
- 3 Click *OK*.

22.3 Testing Your Clustered Messenger System

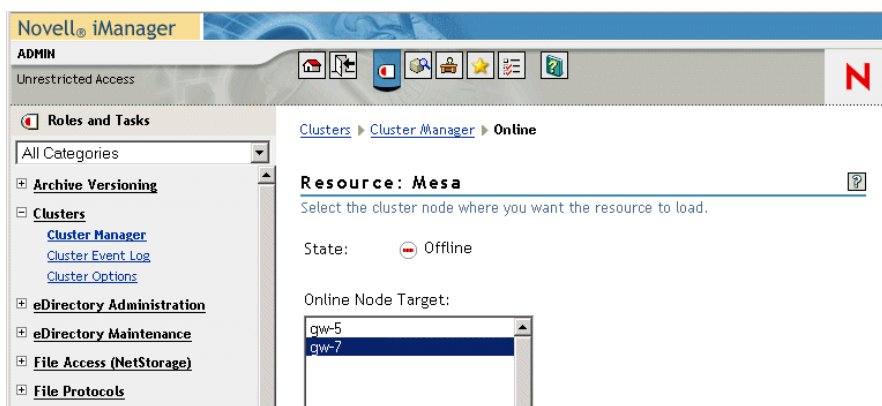
After you have configured the Messenger cluster resource, you can test the load and unload scripts by bringing the Messenger cluster resource online and taking it offline again.

- 1 In iManager, expand *Clusters*, then click *Cluster Manager*.



The new Messenger cluster resource shows *Offline* in the *State* column.

- 2 Click the new Messenger cluster resource, then click *Online*.



- 3 Select the cluster node where you want to online the Messenger cluster resource, then click *OK*. After a moment, the Messenger cluster resource displays *Running* in the *State* column.

- At the server where the Messenger agents are starting, use the following commands to see that the Messenger agents have started:

```
/etc/init.d/novell-nmma status
/etc/init.d/novell-nmaa status
```

- Select the new Messenger cluster resource, then click *Offline*.
The *State* column for the Messenger cluster resource returns to *Offline*.
- Use the same command that you used in [Step 4](#) to verify that the Messenger agents have stopped.
- Repeat [Step 2](#) whenever you are ready to bring the new Messenger cluster resource online permanently.
- Continue with [Managing Your Clustered Messenger System](#).

22.4 Managing Your Clustered Messenger System

If the node where your Messenger system is running goes down, it fails over to the next node in its fail over list. Messenger clients reconnect automatically as soon as the Messaging Agent restarts on the next node. Users who are actively carrying on conversations notice the interruption, but do not need to do anything to reestablish their conversation when the Messaging Agent is up and running again.

In comparison to failover, migration typically takes longer because the Messaging Agent methodically terminates its thread as part of its normal shutdown procedure.

22.5 Messenger Clustering Worksheet

Item	Explanation
1) eDirectory Tree for Cluster:	Record the eDirectory tree where you created the Novell Cluster object when you installed Novell Cluster Services. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.
2) Cluster Name: Master IP Address:	Record the name of the name of the Cluster object where your Messenger system will be located. Also record the master IP address of the cluster. For more information, see Section 2.2, "Installing Novell Cluster Services," on page 20.
3) Cluster Context:	Record the full context where you created the Cluster object. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.
4) Nodes in Cluster <ul style="list-style-type: none"> ◆ File system type ◆ Device name ◆ Mount point 	List the nodes that are part of the cluster that will include Messenger. Also list technical information, including file system type (<i>reiserfs</i> , <i>ext3</i> , etc.), device name (<i>sda2</i> , <i>hda1</i> , etc.), and mount point directory (<i>/mnt</i> , <i>/mail</i> , etc.) in use on the nodes the cluster. You need this information as you create load and unload scripts for the Messenger agents. For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.

Item	Explanation
5) Shared Partitions in Cluster:	<p>List the shared partitions that are available for use in your Messenger system.</p> <p>For more information, see Section 13.1, "Installing Novell Cluster Services on Linux," on page 122.</p>
6) Messenger Partition for Messaging Agent: Secondary IP address: Use Same Partition for Archive Agent?	<p>The Messaging Agent software is installed on each node in its failover list but it does use a shared partition to store its log files, temporary files, and queue directories. Specify the name of the shared partition in the your cluster that the Messaging Agent can use for these purposes. also specify the secondary IP address of that shared partition.</p> <p>For more information, see "Selecting the Messenger Volume" on page 109.</p> <ul style="list-style-type: none"> ◆ Yes ◆ No
7) Messenger Partition for Archive Agent? Secondary IP Address:	<p>In addition to the data storage needs of the Messaging Agent, the Archive Agent can be configured to store all instant message conversations. It is possible that this might consume a large quantity of disk space. If so, you could choose to use a separate shared partition for the Archive Agent.</p> <p>For more information, see "Selecting the Messenger Volume" on page 109.</p>
8) Failover List for Messenger Agents:	<p>List other nodes in the cluster where the Messenger agents can fail over. You might want to have the same nodes on the both agents' lists or have separate lists for each agent. It depends on the loads that each agent will be carrying.</p> <p>For more information, see "Determining an Appropriate Failover Path for the Messenger Volume" on page 109.</p>
9) Mount Point for Shared Storage:	<p>Specify the mount point directory where the shared resource is mounted to the cluster node where the Messenger Agents run.</p> <p>For more information, see Section 22.1.4, "Determining Cluster Resource Information for the Messenger Agents," on page 218.</p>

22.6 Messenger Clustering Quick Checklist

- Plan your clustered Messenger system.
See [Section 22.1, "Planning Your Messenger System in a Linux Cluster,"](#) on page 217.
- Create your Messenger system and install the Messenger agents.
See [Section 22.2.1, "Creating Your Messenger System and Installing the Messenger Agents,"](#) on page 219.
- If you use NSS volumes in your cluster, configure the Messenger agents so that they run as a non-root user.
See ["Setting Up Non-root Access on NSS Volumes on Each Node"](#) on page 220.
- In ConsoleOne, change the locations of various Messenger files from their default locations on local nodes to the Messenger partition that is always available not matter what node the Messenger agents are running on.

See [Section 22.2.2, “Changing Messenger Paths to Locations on the Messenger Partition,”](#) on page 221.

- Modify the Messenger agents cluster resource load script.

See [“Modifying the Cluster Load Script for the Messenger Agents”](#) on page 223.

- Modify the Messenger agents cluster resource unload script.

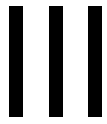
See [“Modifying the Cluster Resource Unload Script for the Messenger Agents”](#) on page 224.

- Set up the Messenger agents failover list and policies.

See [“Setting the Failover List and Policies for the Messenger Agents”](#) on page 226.

- Test your clustered Messenger system.

See [Section 22.3, “Testing Your Clustered Messenger System,”](#) on page 227.



Novell Vibe

Before installing Novell Vibe, you should thoroughly review the documentation provided at the [Novell Vibe 3.2 documentation Web site \(http://www.novell.com/documentation/vibe32\)](http://www.novell.com/documentation/vibe32). These guides provide detailed product installation and configuration instructions, but they do not include specific instructions for integrating Novell Vibe with eDirectory or GroupWise. This section of the *GroupWise 8 Interoperability Guide* supplies these product-specific instructions.

- ♦ [Chapter 23, “Configuring GroupWise for Use with Novell Vibe,” on page 233](#)
- ♦ [Chapter 24, “Accessing Your Vibe Site from the GroupWise Client,” on page 237](#)
- ♦ [Chapter 25, “Streamlining Authentication to Vibe,” on page 239](#)

NOTE: Novell Vibe 3.2 is the next major product release after Novell Teaming 2.1.

23 Configuring GroupWise for Use with Novell Vibe

When you install Novell Vibe with eDirectory and GroupWise, some configuration steps are required to integrate the applications.

- ♦ [Section 23.1, “Understanding How Novell Vibe Interacts with eDirectory and GroupWise,” on page 233](#)
- ♦ [Section 23.2, “Using eDirectory as the Vibe LDAP Directory,” on page 233](#)
- ♦ [Section 23.3, “Using GroupWise as the Vibe E-Mail System,” on page 234](#)
- ♦ [Section 23.4, “Enabling GroupWise/Vibe Integration for GroupWise Windows Client Users,” on page 234](#)

23.1 Understanding How Novell Vibe Interacts with eDirectory and GroupWise

When you install Novell Vibe in an environment where eDirectory and GroupWise are already set up, the products interact in the following ways:

- ♦ Vibe can use eDirectory for LDAP authentication of Vibe users. This means that you do not need to create Vibe users manually. Vibe can create its user accounts based on the users that already exist in eDirectory.
- ♦ Vibe can use GroupWise as its integrated e-mail system. This means that e-mail messages sent from the Vibe site are delivered to GroupWise mailboxes. It also means that GroupWise users can post items to Vibe folders by sending e-mail messages to Vibe folders.
- ♦ Vibe information can be displayed in the GroupWise Windows client. Starting in GroupWise 8.0.2, you can drag and drop GroupWise items into Vibe folders in the GroupWise Folder List to post items to the corresponding folders in your Vibe site. You can also use the GroupWise Find feature to search your Vibe site.

23.2 Using eDirectory as the Vibe LDAP Directory

For instructions, see the following sections of the *Novell Vibe OnPrem 3 Installation Guide*:

- ♦ [“Gathering Directory Services Information”](#) in [“Planning a Basic Vibe Installation”](#)
- ♦ [“Adding Users to Your Vibe Site”](#) in [“Basic Installation”](#)

23.3 Using GroupWise as the Vibe E-Mail System

For setup instructions, see the following sections of the *Novell Vibe OnPrem 3 Installation Guide*:

- ♦ [“Gathering Outbound E-Mail Information”](#) in [“Planning a Basic Vibe Installation”](#)
- ♦ [“Enabling Inbound E-Mail”](#) in [“Planning a Basic Vibe Installation”](#)

See also the following section of the *Novell Vibe OnPrem 3 Administration Guide*:

- ♦ [“Configuring E-Mail Integration”](#)

For basic e-mail usage instructions, see the following sections of the *Novell Vibe OnPrem 3 User Guide*:

- ♦ [“Sending E-Mail to Team Members and Announcing the Workspace after Its Creation”](#) in [“Managing and Using Workspaces”](#)
- ♦ [“Subscribing to E-Mail Notifications from a Folder”](#), [“Setting Up a Folder to Receive Entries Via E-Mail”](#) and [“Adding Entries to a Folder Via E-Mail”](#) in [“Managing and Using Folders”](#)
- ♦ [“Sending E-Mail from within Vibe”](#) in [“Connecting With Your Co-Workers”](#)

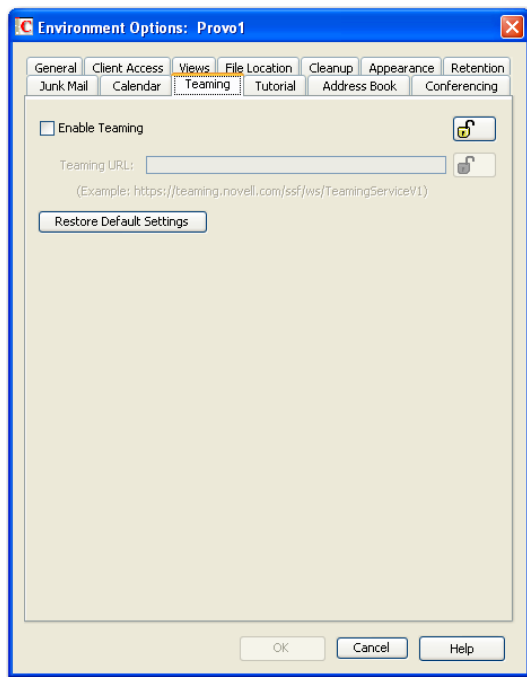
See also the following sections of the *Novell Vibe OnPrem 3 Advanced User Guide*:

- ♦ [“Enabling Folders to Receive Entries through E-Mail”](#) and [“Configuring Folders to Send E-Mail Notifications to Other Users”](#) in [“Managing Folders”](#)
- ♦ [“Sending E-Mail Notifications”](#) in [“Creating and Managing Workflows”](#)
- ♦ [“E-Mailing Files and Attachments to the Vibe Site When You Are Over Your Quota”](#) in [“Managing Your Data Quota”](#)
- ♦ [“Sending E-Mail”](#) in [“Using Vibe on Your Mobile Phone”](#)

23.4 Enabling GroupWise/Vibe Integration for GroupWise Windows Client Users

Before you can integrate GroupWise and Vibe, your Vibe site must be set up, as described in the *Novell Vibe OnPrem 3 Installation Guide*.

- 1 In ConsoleOne, browse to and select a Domain object, Post Office object, or User object where you want to make Vibe available to GroupWise Windows client users.
- 2 Click *Tools > GroupWise Utilities > Client Options*.
- 3 Click *Environment > Teaming*.



NOTE: Novell Vibe 3.2 is the next major product release after Novell Teaming 2.1.

4 Select *Enable Teaming*.

5 Provide the Vibe URL:

5a Specify the fully qualified hostname of the Vibe server:

`vibe_server.domain`

For example:

`vibe.yourcompanyname.com`

ConsoleOne provides the rest of the default Vibe URL, which uses a secure HTTPS connection, assumes the default port number, and includes the default location for the Vibe Web service that communicates with other applications:

`https://vibe_server.domain/ssf/ws/TeamingServiceV1`

5b (Conditional) If you want to use HTTP instead of HTTPS, include it in the *Teaming URL* field, for example:

`http://vibe.yourcompanyname.com`

5c (Conditional) If Vibe is not configured with the default HTTPS port, include the port number after the hostname, for example:

`vibe.yourcompanyname.com:444`

5d (Conditional) If Vibe is not installed in the default location, include the path to *TeamingServiceV1*, for example:

`vibe.yourcompanyname.com/Web/Teaming/TeamingServiceV1`

6 Click *OK*.

IMPORTANT: In order for GroupWise users to take advantage of GroupWise/Vibe integration, they must provide their GroupWise email address in their Vibe profile.

24 Accessing Your Vibe Site from the GroupWise Client

Before you can access the Vibe site from the GroupWise Windows client, you must add your GroupWise email address to your Vibe profile, as described in [“Modifying Your Profile”](#) in [“Getting Started”](#) in the *Novell Vibe 3.2 User Guide*.

By providing the Vibe site URL in ConsoleOne, you provide GroupWise Windows client users with the functionality described in [“Novell Vibe OnPrem”](#) in the *GroupWise 8 Windows Client User Guide*.

NOTE: Vibe is not integrated with the GroupWise Linux/Mac client.

25 Streamlining Authentication to Vibe

You can implement single sign-on for use with Novell Vibe.

- ♦ [Section 25.1, “Using iChain for Authenticating to Vibe,” on page 239](#)
- ♦ [Section 25.2, “Using Novell Access Manager for Authenticating to Vibe,” on page 241](#)

25.1 Using iChain for Authenticating to Vibe

You can use Novell iChain to eliminate a dual user login into your network and into Vibe. The instructions in this section assume that you have an understanding of iChain, as described on the [Novell iChain 2.3 Documentation Web site \(http://www.novell.com/documentation/ichain23\)](http://www.novell.com/documentation/ichain23) and that you have iChain set up and running on your system.

There are many ways to configure iChain. This section illustrates one possible way to configure iChain to support Vibe. Before following the steps in this section, you must have Vibe, as well as iChain, installed, configured, and running.

- ♦ [Section 25.1.1, “Meeting iChain Requirements,” on page 239](#)
- ♦ [Section 25.1.2, “Setting Up an iChain Web Server Accelerator for Vibe,” on page 239](#)
- ♦ [Section 25.1.3, “Adding the New Web Server Accelerator to the iChain Server Object in ConsoleOne,” on page 240](#)
- ♦ [Section 25.1.4, “Using iChain for Authentication,” on page 241](#)

25.1.1 Meeting iChain Requirements

In order to get the best performance and reliability from iChain with Vibe, you must install iChain 2.3 Support Pack 5 Release 4 version 2.3.410. This software is available on the iChain *Patches* tab on the [Novell Downloads Web site \(http://download.novell.com\)](http://download.novell.com). Follow the installation instructions that are provided with the patch.

25.1.2 Setting Up an iChain Web Server Accelerator for Vibe

- 1 Access the iChain Proxy Administration Tool at the following URL:
`http://proxy_server_address:port/appliance/config.html`
- 2 Click *Configure*, then click *Insert* to create a new Web server accelerator for Vibe.
The new accelerator is enabled by default.
- 3 In the *Name* field, provide a unique and descriptive name for the new accelerator.
For example, you might want to call it Vibe.
- 4 Select *Allow Pages to Be Cached at the Browser*.

- 5 Select *Enable Multi-Homing*.
 - 5a In the Multi-Homing Options dialog box, select *Domain-Based Multi-Homing* to configure the Vibe URL as a DNS name prepended to your Internet domain name, for example:
`http://vibe.yourcompanyname.com`
 The A record for the DNS name must already exist. The Proxy Administration Tool does not create it for you.
 - 5b In the *DNS Name* field, specify the DNS A record.
 - 5c Click *OK* to save your multi-homing settings.
- 6 If you have created a custom login page for your Vibe Web site, specify it in the *Custom Login Page Location* field.
 The default location for custom login pages is `sys:\etc\proxy\data`. The custom login page must be an HTML file with a `.htm` extension. If it is located in a directory other than the default, specify the full pathname for the file.
- 7 Select *Enable Secure Exchange*.
 - 7a In the *Port* field on the right, specify the port number that the iChain proxy server should use to communicate with the Web server where Vibe is installed.
 - 7b If desired, select *Enable Secure Access between the iChain Proxy and the Origin Web Server*.
 - 7c Click *OK* to save your secure exchange options.
- 8 Under the Web Server Addresses box, click *Insert*.
 - 8a Specify the IP address or DNS hostname of the Web server where you have installed Vibe.
 - 8b Click *OK* to add the Web server to the list in the Web Server Accelerator dialog box.
- 9 Click *OK* to save the new Web server accelerator.
- 10 Continue with [Adding the New Web Server Accelerator to the iChain Server Object in ConsoleOne](#).

25.1.3 Adding the New Web Server Accelerator to the iChain Server Object in ConsoleOne

- 1 Start ConsoleOne in a location where the iChain snap-ins are installed.
- 2 Browse to and right-click the iChain Server object, then click *Properties*.
- 3 Click *Protected Resource* to display a list of protected resources.
- 4 Click the *Plus* icon to add a new protected resource.
 - 4a In the *Resource Name* field, provide a unique and descriptive name for the new protected resource, which is the Web server accelerator.
 - 4b In the *URL Prefix* field, specify the part of the URL that precedes the application-specific part of the URL; for example:
`vibe.yourcompanyname.com/*`
 - 4c Select the type of access you want to provide for users to view the URL: *Secure*, *Restricted*, or *Public*.
 - 4d Click *OK* to save the new protected resource.
- 5 Select the new protected resource, then click the *Parameters* icon to display the OLAC Parameters dialog box.
 - 5a In the *Name* column, specify *Authorization*.
 - 5b In the *Data Source* column, specify *ldap*.

5c In the *Value* column, specify *cn*.

These settings add an extended HTTP request header called *X-Authorization* that stores each user's *cn* (common name). The *cn* is retrieved from the LDAP server by the iChain OLAC process so that users can log in automatically.

5d Click *OK* to save the OLAC parameters.

6 When prompted, click *Yes* to refresh the iChain proxy configuration with the new changes.

7 Provide the password to the proxy server, then click *OK* to perform the refresh operation immediately.

25.1.4 Using iChain for Authentication

Now that you have created an iChain Web server accelerator for Vibe and have configured the iChain Server object for the new Web server accelerator, users should be able to authenticate to Vibe in a single step, using their eDirectory or LDAP passwords.

25.2 Using Novell Access Manager for Authenticating to Vibe

See "[Configuring Single Sign-On with Novell Access Manager](#)" in "[Advanced Installation and Reconfiguration](#)" in the *Novell Vibe OnPrem 3 Installation Guide*.

IV Novell Conferencing

Before installing Novell Conferencing you should thoroughly review the documentation provided at the [Novell Conferencing documentation Web site \(http://www.novell.com/documentation/novell_conferencing\)](http://www.novell.com/documentation/novell_conferencing). These guides provide detailed product usage instructions, but they do not include specific instructions for integrating Novell Conferencing with GroupWise. This section of the *GroupWise 8 Interoperability Guide* supplies these product-specific instructions.

- ♦ [Chapter 26, “Using GroupWise with Conferencing,” on page 245](#)
- ♦ [Chapter 27, “Accessing Conferencing Features in the GroupWise Client,” on page 247](#)

26 Using GroupWise with Conferencing

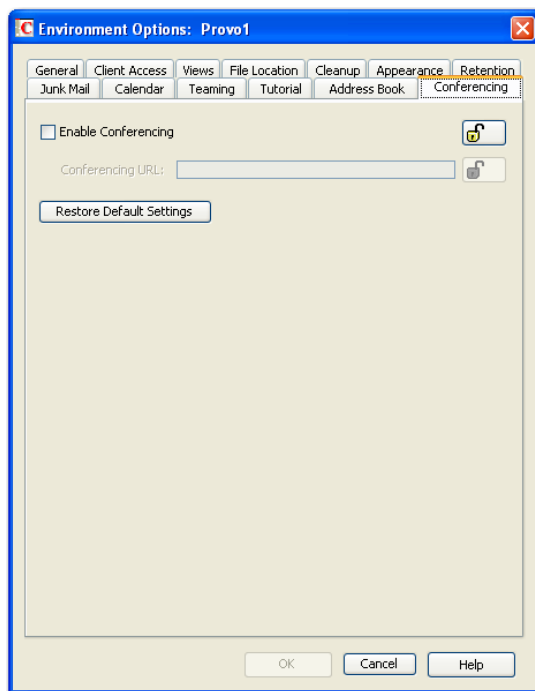
When you set up Novell Conferencing with GroupWise, some configuration steps are required to integrate the applications.

- ♦ Section 26.1, “Enabling GroupWise/Conferencing Integration for GroupWise Windows Client Users,” on page 245
- ♦ Section 26.2, “Using Conferencing Features in the GroupWise Windows Client,” on page 246

26.1 Enabling GroupWise/Conferencing Integration for GroupWise Windows Client Users

Before you can integrate GroupWise and Conferencing, Conferencing must be set up. For more information, see the [Novell Conferencing documentation Web site \(http://www.novell.com/documentation/novell_conferencing\)](http://www.novell.com/documentation/novell_conferencing).

- 1 In ConsoleOne, browse to and select a Domain object, Post Office object, or User object where you want to make Conferencing available to GroupWise Windows client users.
- 2 Click *Tools > GroupWise Utilities > Client Options*.
- 3 Click *Environment > Conferencing*.



- 4 Select *Enable Conferencing*.

5 Specify the URL of the Novell Conferencing server.

6 Click *OK*.

26.2 Using Conferencing Features in the GroupWise Windows Client

By providing the Conferencing site URL in ConsoleOne, you provide GroupWise Windows client users with the functionality described in “[Conferencing](#)” in the *[GroupWise 8 Windows Client User Guide](#)*.

27 Accessing Conferencing Features in the GroupWise Client

By providing the Conferencing URL in ConsoleOne, you provide GroupWise Windows client users with the functionality described in “[Conferencing](#)” in the *GroupWise 8 Windows Client User Guide*.

NOTE: Conferencing is not integrated with the GroupWise Linux/Mac client.

V Novell ZENworks

- ♦ [Chapter 28, “Using ZENworks 10 Configuration Management to Distribute the GroupWise Windows Client,” on page 251](#)
- ♦ [Chapter 29, “Using ZENworks 7 Desktop Management to Distribute the GroupWise Windows Client,” on page 257](#)
- ♦ [Chapter 30, “Using ZENworks Linux Management to Distribute the GroupWise Linux/Mac Client,” on page 265](#)
- ♦ [Chapter 31, “ZENworks Application Virtualization for GroupWise and Messenger,” on page 267](#)

28 Using ZENworks 10 Configuration Management to Distribute the GroupWise Windows Client

You can use the Configuration Management functionality in Novell ZENworks 10 to distribute the GroupWise Windows client to workstations.

- ♦ [Section 28.1, “Creating ZENworks Bundles,” on page 251](#)
- ♦ [Section 28.2, “Setting the Security Level for Each Bundle,” on page 254](#)
- ♦ [Section 28.3, “Configuring Each Bundle,” on page 255](#)

IMPORTANT: This information assumes that you are familiar with ZENworks 10.3 Configuration Management. For background information, or for help completing the ZENworks tasks outlined in the steps below, see the ZENworks Configuration Management documentation at the [Novell ZENworks Documentation Web site \(http://www.novell.com/documentation/zcm10\)](http://www.novell.com/documentation/zcm10).

28.1 Creating ZENworks Bundles

To install the GroupWise Windows client software, you must distribute the following .msi files.

- ♦ wse3.msi
- ♦ msxml.msi
- ♦ groupwise.msi

To create a ZENworks bundle for each .msi file:

- 1 In ZENworks Control Center, click *Bundles*, then click *New > Bundle*.

[Bundles](#) > [Create New Bundle](#)

Create New Bundle

Step 1: Select Bundle type

Select the type of Bundle you wish to create from the list of options.

New Bundle Type:

- Directive Bundle
- File Bundle
- Imaging Bundle
- Windows Bundle

Description:

Directive Bundle - Select this option to create a bundle which performs a set of tasks on a number of managed devices, regardless of platform.

2 Select *Windows Bundle*, then click *Next*.

[Bundles](#) > [Create New Windows Bundle](#)

Create New Windows Bundle

Step 2: Select Bundle category

Select the category of Bundle you wish to create from the list of options.

New Bundle Category:

- (Empty Bundle)
- MSI Application
- MSP Application
- Simple Application
- Thin Client Application
- Web Application

Description:

(Empty Bundle) - Select this option to create a bundle with no initial tasks.

3 Select *MSI Application*, then click *Next*.

Bundles > Create New Windows Bundle

Create New Windows Bundle

Step 3: Define Details

Enter the details for the bundle.

Bundle Name: *

Folder: *

Icon:

Description:

Fields marked with an asterisk are required.

<< Back Next >> Cancel

- 4 Specify a name for the bundle, such as WSE3, MSXML, or GroupWise Windows Client, then click *Next*.

Bundles > Create New Windows Bundle

Create New Windows Bundle WSE3

Step 4: Select .msi File

Select the .msi file and parameters for the application.

.msi File: *

Upload .msi file for normal install:

Enter UNC path of .msi file for network install:

Browse

- 5 Select the .msi file for the bundle that you are creating:

- 5a In the *Upload .msi file for normal install* field, browse to and select the .msi file in your GroupWise software distribution directory:

\grpwise\software\client\win32

Select .msi File

.msi File:

Browse

Include all files in and below the directory of this file

Status:

OK Cancel

- 5b (Conditional) If you are creating a bundle for the wse3.msi or msxml.msi file, do not select *Include all files in and below the directory of this file*.

or

(Conditional) If you are creating a bundle for the groupwise.msi file, select *Include all files in and below the directory of this file*.

This includes all the contents of the win32 subdirectory, which is the GroupWise client software.

5c Click *OK*.

6 Click *Next*.

7 Finish creating the bundle as usual.

Success: The Bundle has been created successfully.

Status	Name	Type	Category	Enabled	Version
<input type="checkbox"/>	WSE3	Windows Bundle	MSI Application	Yes	0

8 Repeat [Step 1](#) through [Step 7](#) until you have created the bundles that you need.

9 Continue with [Setting the Security Level for Each Bundle](#).

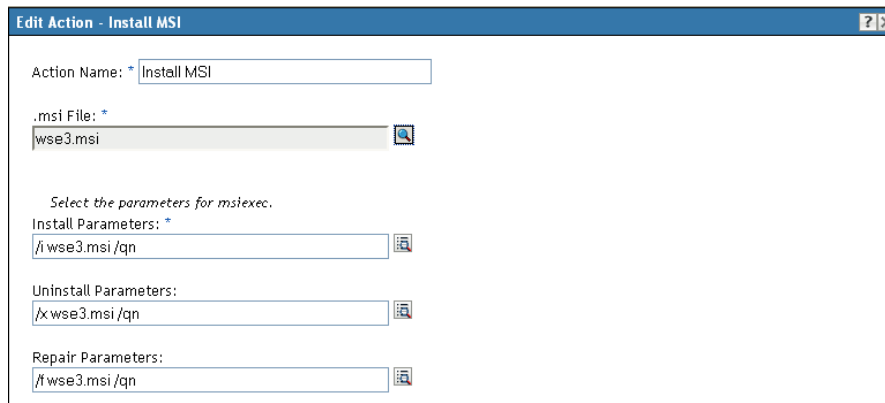
28.2 Setting the Security Level for Each Bundle

In ZENworks Control Center:

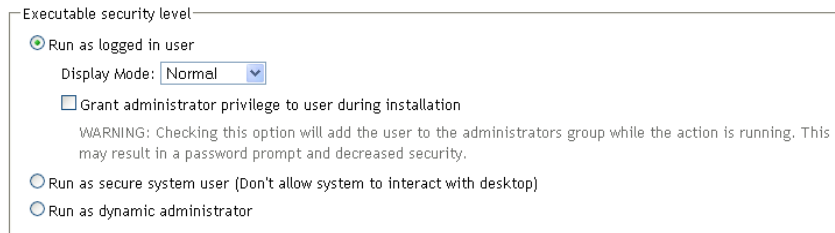
1 Click a bundle name, then click the *Actions* tab.

Name	Type	State	Continue on Failure
<input type="checkbox"/> Distribute Files	Distribute Files	Enabled	<input type="checkbox"/>

2 Click the *Install* tab, then click *Install MSI*.



3 Click *More Options* in the lower right corner of the dialog box.



4 Set *Executable security level* to *Run as dynamic administration*, then click *OK*.

5 Click *Apply* to save the setting.

6 Repeat [Step 1](#) through [Step 5](#) for each bundle that you created.

7 Continue with [Configuring Each Bundle](#).

28.3 Configuring Each Bundle

In ZENworks Control Center:

1 Assign each bundle to the appropriate GroupWise users.

2 Create a launch schedule for each bundle so that the bundles launch in the following order:

- ◆ wse3.msi
- ◆ msxml.msi
- ◆ groupwise.msi

29 Using ZENworks 7 Desktop Management to Distribute the GroupWise Windows Client

You can use the Application Management functionality in Novell ZENworks 7 Desktop Management to distribute the GroupWise Windows client to workstations.

- ♦ [Section 29.1, “Installing Supporting Applications,” on page 257](#)
- ♦ [Section 29.2, “Creating a GroupWise Client Application Object,” on page 258](#)
- ♦ [Section 29.3, “Using GroupWise 8 Tuner,” on page 261](#)
- ♦ [Section 29.4, “Configuring ZENworks to Use a Transform File,” on page 263](#)

IMPORTANT: This information assumes that you are familiar with ZENworks Desktop Management. For background information, or for help completing the ZENworks tasks outlined in the steps below, see the ZENworks Desktop Management documentation at the [Novell ZENworks Documentation Web site \(http://www.novell.com/documentation/zenworks7\)](http://www.novell.com/documentation/zenworks7).

29.1 Installing Supporting Applications

Before you distribute the GroupWise Windows client software, the following files must be distributed to GroupWise users' workstations:

- ♦ `dotnetfx.exe` (if .NET 2.0 or later is not already installed on workstations)
- ♦ `wse3.msi`
- ♦ `msxml.msi`

To prepare workstations for installation of the GroupWise Windows client:

- 1 Create a NAL Application object for each file that you need to distribute:
 - 1a In ConsoleOne, right-click the container where you want to create the NAL Application object, then click *New > Object > Application*.
 - 1b (Conditional) When you are creating the object for `dotnetfx.exe`, select *A simple application*, then click *Next*.
or
(Conditional) When you are creating the object for a `.msi` file, select *An application that has an .MSI file*.
 - 1c Click *Next*.
 - 1d Specify the path to the file, then click *Next*.
 - 1e Specify the name for the NAL Application object, such as `DOTNETFX`, `WSE3`, `MSXML`, or `GroupWise Windows Client`, then click *Next*.

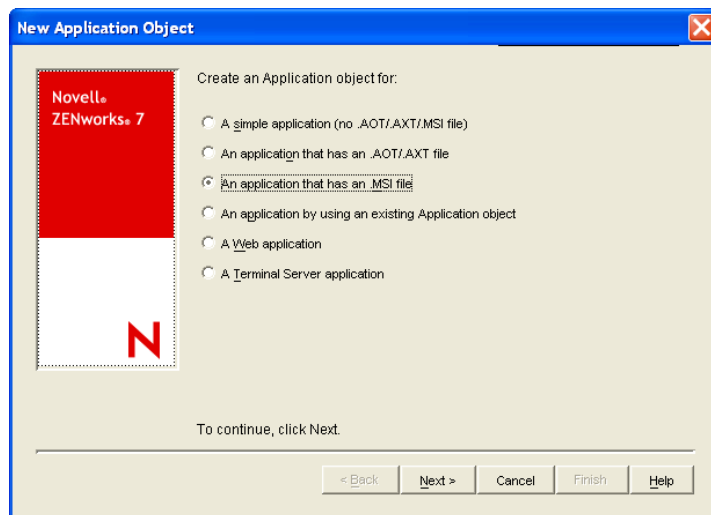
- 1f Finish creating each NAL Application object as usual.
- 1g Repeat [Step 1](#) for each file that you need to distribute.
- 2 (Conditional) When you are installing `dotnetfx.exe`:
 - 2a Right-click the DOTNETFX NAL Application object that you created in [Step 1b](#), then click *Properties*.
 - 2b Click the *Run Options* tab, then click *Application*.
 - 2c In the *Parameters* field, specify:


```
/q:a /c:"install /q"
```
 - 2d Click *OK*.
- 3 Select *Force Cache* for each NAL Application object.
- 4 Assign each NAL Application object to the appropriate GroupWise users.
- 5 Create a schedule for each NAL Application object so that the applications are installed in the following order:
 - ♦ `dotnetfx.exe`
 - ♦ `wse3.msi`
 - ♦ `msxml.msi`
 - ♦ `groupwise.msi`

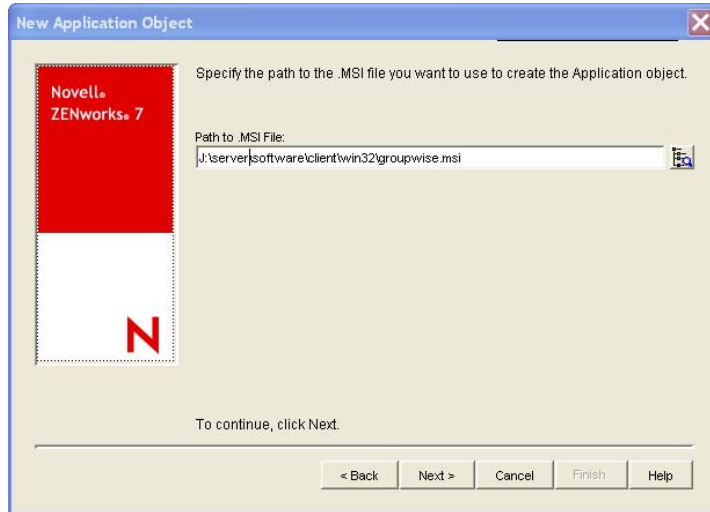
29.2 Creating a GroupWise Client Application Object

The following steps explain how to use ZENworks Desktop Management to create a GroupWise client Application object from the `.msi` file. Depending on your version of ZENworks Desktop Management, the steps might be slightly different. If you want to change the default MSI installation, then you must use the GroupWise 8 Tuner program to create a custom transform file. For more information on how to use GroupWise 8 Tuner, see [Section 29.3, "Using GroupWise 8 Tuner,"](#) on [page 261](#).

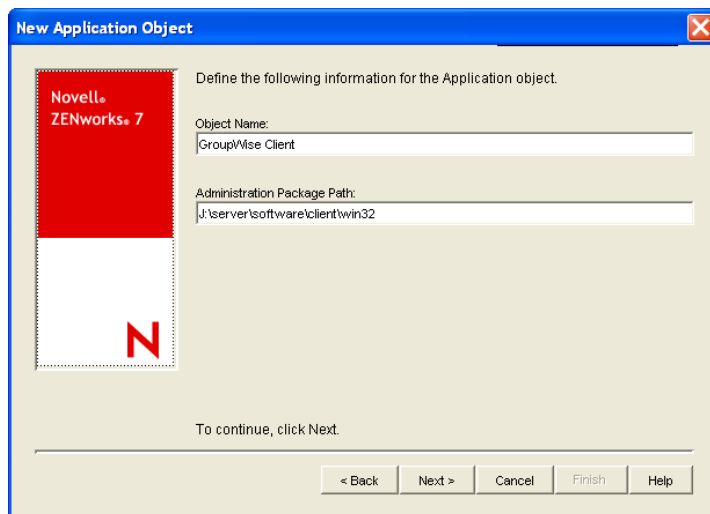
- 1 In ConsoleOne, right-click the container where you want to create the GroupWise client Application object, then click *New > Object* to display the New Object dialog box.
- 2 In the list of objects, click *Application*, then click *OK* to display the New Application dialog box.



- 3 Select *An Application that Has an .msi File*, then click *Next* to display the .msi file path page.



- 4 In the *Path to .msi File* field, browse for and select the *groupwise.msi* file.
- 5 Click *Next* to display the Application object information page, then customize the object name, source path, and target path information if necessary.

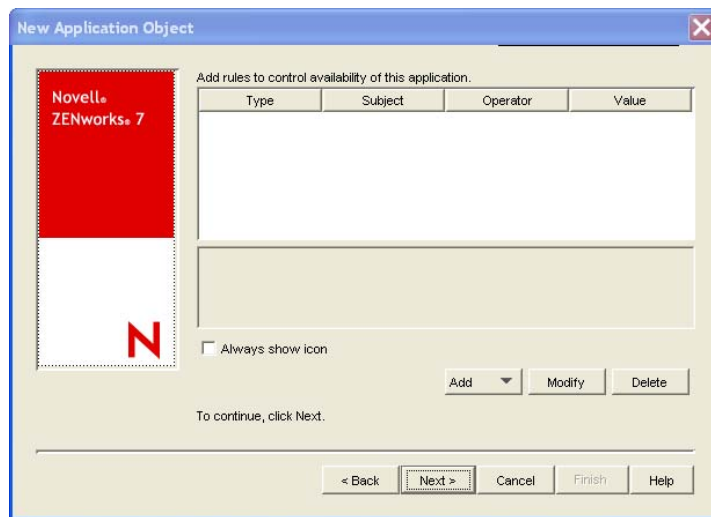


Object Name: The name to be used for the Application object in eDirectory. You might want to use a descriptive name.

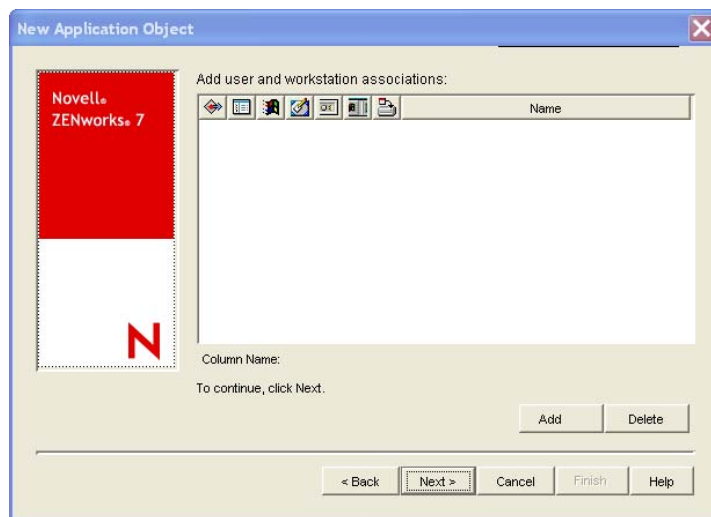
Administration Package Path: The directory from which the GroupWise client will be installed. Specify the full path to the client directory (for example, \\server1\vol1\grpwise\software\client\win32). Unless all users will have the same drive mapping to the volume, make sure you use a UNC path.

This path is saved as the Administration Package Path variable. If you need to change it later, you can do so on the Application object's Sources page (Application object > *Common* > *Sources*).

- 6 Click *Next* to display the rules to control availability of this application page, then modify the rules if necessary.



7 Click *Next* to display the user associations page.



You can associate the Application object with the users and workstations you want the object distributed to at this time, or you can create the associations later.

- 8 After you add the associations you want, click *Next*, review the information, then click *Finish* to create the Application object.
- 9 Right-click the newly-created GroupWise client Application object, then click *Properties*.
- 10 Configure any other Application object settings required to provide the performance or functionality you want.

For example, you can configure the Application object so that the GroupWise client is installed immediately upon distribution to the user's workstation, without any intervention by the user. Or, you can change the locations where the GroupWise client's icon is displayed. Or, you can specify the location of a transform file for custom MSI installs. For information about Application object settings, see the ZENworks Desktop Management documentation at the [Novell ZENworks Documentation Web site \(http://www.novell.com/documentation-index/index.jsp?category=ZENworks\)](http://www.novell.com/documentation-index/index.jsp?category=ZENworks).

After you associate the Application objects with the users you want, Novell Application Launcher displays the Application object's icon on the users' workstations, if the workstation meets the operating system requirements. If the Application object's icon does not appear immediately, have the user refresh Novell Application Launcher.

If a service is preventing the GroupWise Windows client from installing correctly you can add a property to the GroupWise application object that stops the service until the installation has finished.

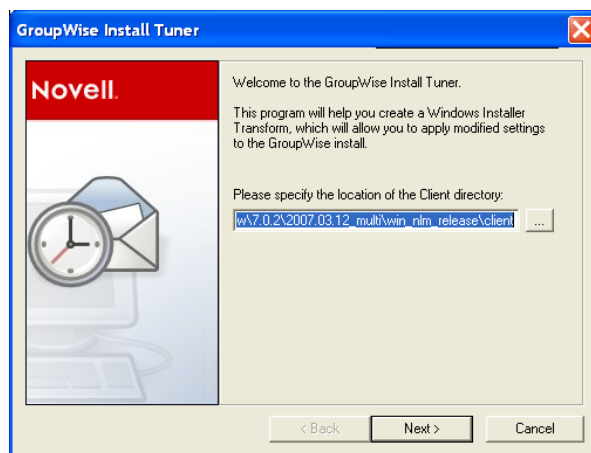
- 1 In ConsoleOne, right-click the container where you created the GroupWise client Application object, then double-click the GroupWise Application object.
- 2 Click *MSI > Properties*, then click *Add*.
- 3 In the *Value name* field, type *STOPSERVICE*.
- 4 In the *Value Data* field, type the name of the service to stop.
- 5 Click *OK* twice.

29.3 Using GroupWise 8 Tuner

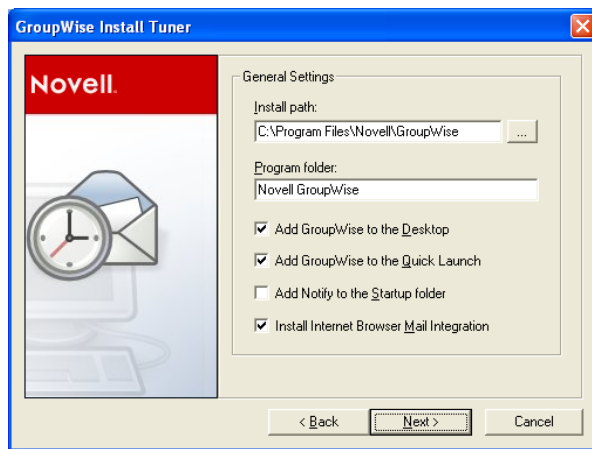
GroupWise 8 Tuner is an application that allows you to customize your MSI install. The Tuner application creates a transform file called *groupwise.mst*, which you can specify to use when performing an MSI install with ZENworks. You must have write access to the software distribution directory to use the GroupWise 8 Tuner application.

NOTE: If you install the GroupWise client using a Tuner file to a protected area, such as the *C:\Program Files* directory, the installation fails if you try to install using a non-Administrator user. You must install the GroupWise client to an unprotected area such as, *C:\Novell\GroupWise* if you are using a non-Administrator user.

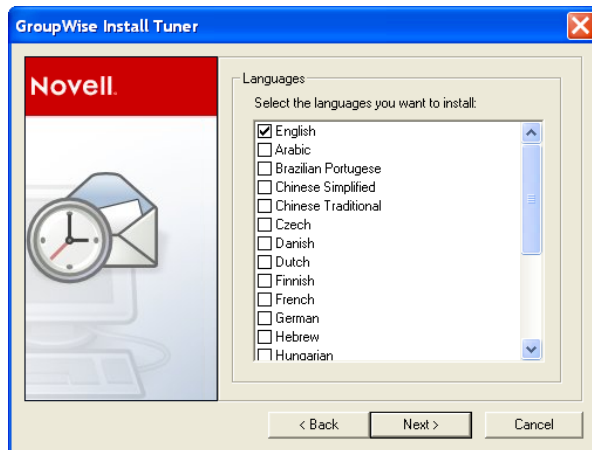
- 1 From the *\admin\UTILITY\GWTUNER* directory of the GroupWise 8 or greater download, select the *GWTuner.exe* file, then click *OK* to run the GroupWise 8 Tuner application.
- 2 Specify the location of the client distribution directory on your GroupWise system, then click *Next*.



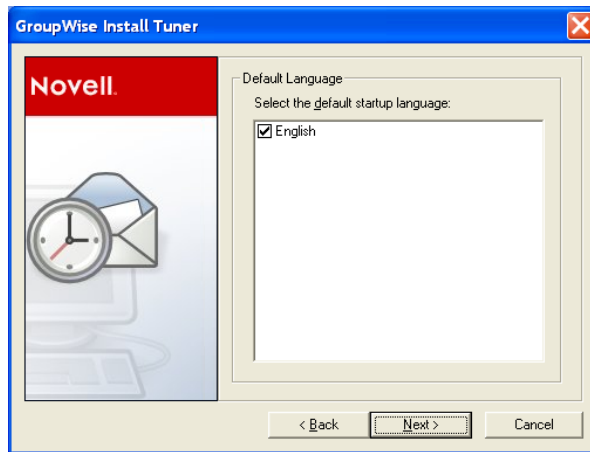
- 3 Specify where the GroupWise client should be installed on the client machines.



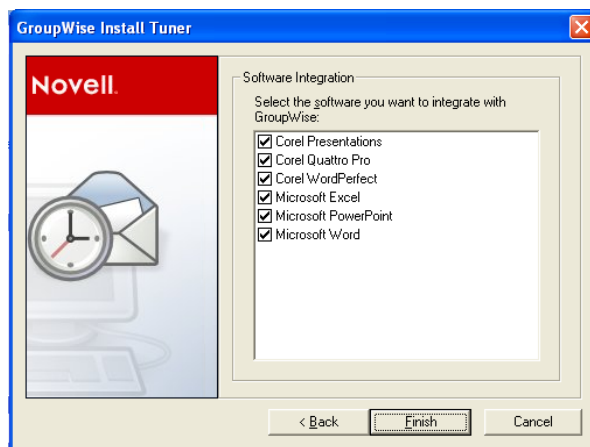
- 4 Specify which program folder the GroupWise client should be installed to.
- 5 Select if you want to add a GroupWise icon to the client desktop.
- 6 Select if you want to add a GroupWise icon to the client Quick Launch.
- 7 Select if you want to add GroupWise to the client Startup folder.
- 8 Select if you want to install GroupWise Internet Browser Mail Integration.
- 9 Click *Next* to continue.
- 10 Select the languages to install, then click *Next*.



- 11 Select the default startup language for the client, then click *Next*.



- 12 Select which software integration you want the client to use.



- 13 Click Finish to create the transform file (`groupwise.mst`) in the client software distribution directory.

29.4 Configuring ZENworks to Use a Transform File

After you have created the transform file (`groupwise.mst`), you must configure ZENworks to use the transform file when doing MSI installations.

- 1 From ConsoleOne, right-click the application file that was created in [Section 29, “Using ZENworks 7 Desktop Management to Distribute the GroupWise Windows Client,”](#) on page 257, then click *Properties*.
- 2 Click the *MSI > Transform* tab.
- 3 Click *Add*, then browse to the location of the transform file (`groupwise.mst`).
- 4 Click *OK* to add the transform file to the Transform List.
- 5 Click *OK* again.

30 Using ZENworks Linux Management to Distribute the GroupWise Linux/Mac Client

You can install the GroupWise Linux/Mac client and agents using Novell ZENworks Linux Management or later. Refer to the [Novell ZENworks Linux Management \(http://www.novell.com/products/zenworks/linuxmanagement/\)](http://www.novell.com/products/zenworks/linuxmanagement/) site for additional information.

31 ZENworks Application Virtualization for GroupWise and Messenger

Novell ZENworks Application Virtualization lets you convert applications that run on Microsoft Windows into self-contained virtual applications. After being virtualized, an application becomes a single, isolated file that runs instantly from anywhere, including a thumb drive or other removable media. Unlike traditional installation methods, the single virtual application file does not require a separate setup process, and does not rely on external components and runtimes, reboots, or administrative privileges. After virtualization, the application is isolated from other system applications, preventing DLL conflicts and other deployment nightmares, yet the experience for the application's user is unchanged.

For instructions on virtualizing the GroupWise Windows client, see "Preparing GroupWise and GroupWise Notify for Virtualization" in the *ZENworks Integration Guide* (http://www.novell.com/documentation/zav61/zav61_integration/data/index.html).

For instructions on virtualizing the Messenger Windows client, see "Preparing Novell Messenger for Virtualization" in the *ZENworks Integration Guide* (http://www.novell.com/documentation/zav61/zav61_integration/data/index.html).

VI Other Novell Products

- ♦ [Chapter 32, “GroupWise DirXML Driver for Novell Identity Manager,” on page 271](#)
- ♦ [Chapter 33, “GroupWise Customization Tools,” on page 275](#)
- ♦ [Chapter 34, “Novell exteNd,” on page 277](#)

32 GroupWise DirXML Driver for Novell Identity Manager

The GroupWise DirXML driver for use with Novell Identity Manager provides data integration between users in Novell eDirectory with GroupWise accounts in your GroupWise system. For example, the driver can create e-mail accounts automatically when employees are hired. The driver can also disable an e-mail account when a user is no longer active. This configurable solution gives you the ability to increase productivity and streamline business processes by integrating GroupWise and eDirectory.

This guide gives information about certain administrative actions in ConsoleOne that require you to stop the GroupWise DirXML driver or disable a user's association:

- ◆ [Section 32.1, "Identity Manager Warnings in ConsoleOne," on page 271](#)

For additional information, see:

- ◆ [Novell Identity Manager \(http://www.novell.com/documentation/idm36\)](http://www.novell.com/documentation/idm36)
- ◆ [Identity Manager Drivers \(http://www.novell.com/documentation/idm36drivers\)](http://www.novell.com/documentation/idm36drivers)

32.1 Identity Manager Warnings in ConsoleOne

Some GroupWise administrative actions in ConsoleOne require that you stop the GroupWise DirXML driver or disable a user's association with it before you perform the action and usually restart the GroupWise DirXML driver or re-enable the user's association when you have completed the action. By default, these activities generate a warning message in ConsoleOne:

- ◆ [Section 32.1.1, "Recovering a Deleted GroupWise Account," on page 272](#)
- ◆ [Section 32.1.2, "Grafting Users," on page 272](#)
- ◆ [Section 32.1.3, "Converting an External Entity to a User," on page 272](#)
- ◆ [Section 32.1.4, "Converting a User to an External Entity," on page 272](#)
- ◆ [Section 32.1.5, "Associating a GroupWise Object with an eDirectory Object," on page 272](#)
- ◆ [Section 32.1.6, "Disassociating a GroupWise Object's Attributes from an eDirectory Object," on page 273](#)
- ◆ [Section 32.1.7, "Resolving an Invalid Association," on page 273](#)
- ◆ [Section 32.1.8, "Disabling the DirXML Warnings," on page 273](#)
- ◆ [Section 32.1.9, "Enabling the DirXML Warnings," on page 273](#)

32.1.1 Recovering a Deleted GroupWise Account

- 1 Using the DirXML Management role in Novell iManager, stop the GroupWise DirXML driver.
- 2 Recover the deleted account, as described in “[Recovering Deleted GroupWise Accounts](#)” in “[Databases](#)” in the *GroupWise 8 Administration Guide*.
- 3 Using the DirXML Management role, restart the GroupWise DirXML driver.

32.1.2 Grafting Users

- 1 If you are grafting the users into a different eDirectory tree, on the *DirXML* tab of each User object in Novell iManager, disable the association with the GroupWise DirXML driver.
- 2 Using the DirXML Management role in Novell iManager, stop the GroupWise DirXML driver for the tree into which you are grafting the users.
- 3 Graft the users, as described in “[Graft GroupWise Objects](#)” in “[Databases](#)” in the *GroupWise 8 Administration Guide*.
- 4 If you grafted the users into a different eDirectory tree, on the *DirXML* tab of each User object, enable the association with the GroupWise DirXML driver in the new tree.
- 5 Using the DirXML Management role, restart the GroupWise DirXML driver for the tree into which you grafted the users.

32.1.3 Converting an External Entity to a User

- 1 Using the DirXML Management role in Novell iManager, stop the GroupWise DirXML driver.
- 2 Convert the external entity, as described in “[Convert External Entity to User](#)” in “[System](#)” in the *GroupWise 8 Administration Guide*.
- 3 Using the DirXML Management role, restart the GroupWise DirXML driver.

32.1.4 Converting a User to an External Entity

- 1 On the *DirXML* tab of the User object in Novell iManager, disable the association with the GroupWise DirXML driver.
- 2 Convert the user, as described in “[Convert User to External Entity](#)” in “[System](#)” in the *GroupWise 8 Administration Guide*.

32.1.5 Associating a GroupWise Object with an eDirectory Object

- 1 Using the DirXML Management role in Novell iManager, stop the GroupWise DirXML driver.
- 2 Establish the association, as described in “[Associate Objects](#)” in “[System](#)” in the *GroupWise 8 Administration Guide*.
- 3 Using the DirXML Management role, restart the GroupWise DirXML driver.

32.1.6 Disassociating a GroupWise Object's Attributes from an eDirectory Object

- 1 On the *DirXML* tab of the User object in Novell iManager, disable the association with the GroupWise DirXML driver.
- 2 Disassociate the objects, as described in “[Disassociate GroupWise Attributes](#)” in “[System](#)” in the *GroupWise 8 Administration Guide*.
- 3 On the *DirXML* tab of the User object, enable the association with the GroupWise DirXML driver.

32.1.7 Resolving an Invalid Association

- 1 On the *DirXML* tab of the User object in Novell iManager, disable the association with the GroupWise DirXML driver.
- 2 Resolve the invalid association, as described in “[Invalid Associations](#)” in “[System](#)” in the *GroupWise 8 Administration Guide*.

32.1.8 Disabling the DirXML Warnings

- 1 In ConsoleOne, deselect *Display DirXML Warnings* in any DirXML warning dialog box.

32.1.9 Enabling the DirXML Warnings

- 1 In ConsoleOne, click *Tools > GroupWise System Operations > System Preferences*.
- 2 On the *Admin Preferences* tab, select *Display DirXML Warnings*.
- 3 Click *OK*.

33 GroupWise Customization Tools

The GroupWise Software Developer Kit provides tools for customizing GroupWise to the specific needs of your organization. It includes the following components:

- ♦ **WebAccess Customization:** Lets you modify the WebAccess client HTML source files to include your own graphics or company information. You can also enhance the WebAccess client by creating additional calendar views. For more information, see [GroupWise WebAccess Customization \(http://developer.novell.com/wiki/index.php/GroupWise_WebAccess_Customization\)](http://developer.novell.com/wiki/index.php/GroupWise_WebAccess_Customization).
- ♦ **GroupWise Object API:** Lets you create your own client application. It provides access to the Address Book, along with documents, mail messages, appointments, tasks, notes, phone messages, and workflow items. The GroupWise Object API supports COM Automation, which is an industry standard for interfacing applications and is simple to use with languages such as Delphi, Visual Basic, and C++. For more information, see [GroupWise Object API \(http://developer.novell.com/wiki/index.php/GroupWise_Object_API\)](http://developer.novell.com/wiki/index.php/GroupWise_Object_API).
- ♦ **GroupWise Administrative Object API:** Lets you see, use, and manipulate GroupWise administration information from outside GroupWise. You can use the GroupWise Administrative Object API through COM languages, such as Visual Basic, Delphi, and object-oriented languages (such as C++). It also supports COM Automation, which is an industry standard for interfacing applications. For more information, see [GroupWise Administrative Object API \(http://developer.novell.com/wiki/index.php/GroupWise_Administrative_Object_API\)](http://developer.novell.com/wiki/index.php/GroupWise_Administrative_Object_API).
- ♦ **GroupWise C3PO (Custom 3rd-Party Object):** Works with C++, Delphi, or Visual Basic to let you add menu and toolbar items to trigger applications. For example, you can modify the GroupWise client toolbar or define new record types in the GroupWise information store. For more information, see [GroupWise C3PO \(http://developer.novell.com/wiki/index.php/GroupWise_C3PO\)](http://developer.novell.com/wiki/index.php/GroupWise_C3PO).
- ♦ **GroupWise Tokens:** Let you manipulate the GroupWise client interface by subscribing to internal token events or by publishing new tokens to the client. It names low-level events, such as “save a file” or “send mail,” which allows you to extend GroupWise functionality. A C3PO lets you extend GroupWise objects and the Object API lets you see and manipulate the GroupWise information store from outside GroupWise. In addition, tokens let your solution command the GroupWise client from DLLs and DDE scripts, using the Third-Party Handler. You can also use tokens to create Visual Basic executables that users can run from the client interface. For more information, see [GroupWise Tokens \(http://developer.novell.com/wiki/index.php/GroupWise_Tokens\)](http://developer.novell.com/wiki/index.php/GroupWise_Tokens).
- ♦ **GroupWise Trusted Applications:** Enables you to develop applications that can log in to any user’s mailbox without supplying the user’s password and perform various tasks such as virus scanning, content filtering, or e-mail auditing. For more information, see [GroupWise Trusted Application API \(http://developer.novell.com/wiki/index.php/GroupWise_Trusted_Application_API\)](http://developer.novell.com/wiki/index.php/GroupWise_Trusted_Application_API).
- ♦ **GroupWise SOAP:** Provides access to GroupWise data, through defined standards, directly from the GroupWise post office. The standards used include: HTTP, SOAP, XML, XML schemas, and WSDL. HTTP, SOAP, and XML are used to transport data from between computers. XML

schemas define the structure and the types of GroupWise data that is transported. The GroupWise WSDL (Service Descriptive Language) combines everything into a GroupWise Web service. For more information, see [GroupWise Web Service \(SOAP\) \(http://developer.novell.com/wiki/index.php/GroupWise_Web_Service_%28SOAP%29\)](http://developer.novell.com/wiki/index.php/GroupWise_Web_Service_%28SOAP%29).

- ♦ **GroupWise MAPI:** Uses a set of object-oriented functions that provide messaging capabilities. The Messaging Application Programming Interface (MAPI) is used by mail-enabled applications to create, transfer, and store messages, as well as to handle complex addressing information. MAPI objects are data structures that support a set of properties and that comply with the component object model (which requires that objects support one or more interfaces or sets of functions). For more information, see [GroupWise MAPI \(http://developer.novell.com/wiki/index.php/GroupWise_MAPI\)](http://developer.novell.com/wiki/index.php/GroupWise_MAPI).
- ♦ **GroupWise Events:** Provides event notification to registered third-party applications, and is responsive to queries, while not significantly degrading the overall performance of the GroupWise Post Office Agent (POA). This functionality is included in the [GroupWise Object API \(http://developer.novell.com/wiki/index.php/GroupWise_Object_API\)](http://developer.novell.com/wiki/index.php/GroupWise_Object_API).
- ♦ **GroupWise Controls for ActiveX:** Lets you embed an Address Book or Name Completion COM Control (OCX) in your Visual Basic, Delphi, and C++ solutions. OCX properties let you customize user access to Address Book contents and control return information for your solution to use. For more information, see [GroupWise Controls for ActiveX \(http://developer.novell.com/wiki/index.php/GroupWise_Controls_for_ActiveX\)](http://developer.novell.com/wiki/index.php/GroupWise_Controls_for_ActiveX).

34 Novell exteNd

In different versions of GroupWise, WebAccess has stored its default user interface files in different directories on the Web server:

GroupWise 6.5:

```
tomcat_root/webapps/gw/WEB-INF/classes/com/novell/webaccess/templates/frames
```

GroupWise 7:

```
tomcat_root/webapps/gw/WEB-INF/classes/com/novell/webaccess/templates/css
```

GroupWise 8:

```
tomcat_root/webapps/gw/WEB-INF/classes/templates/webacc/css
```

If you have exteNd portlets configured to use WebAccess, you must copy some of the exteNd template files from the previous directory into the GroupWise 8 `css` directory. Refer to the [Identity Manager Accessory Portlet Reference Guide](http://developer.novell.com/wiki/index.php/Identity_Manager_Accessory_Portlet_Reference_Guide) (http://developer.novell.com/wiki/index.php/GroupWise_Controls_for_ActiveX) to determine which exteNd template files you should copy to the `css` directory. Do not copy the entire contents of the previous directory into the GroupWise 8 `css` directory; this would damage the new GroupWise 8 WebAccess user interface.

If you are updating from GroupWise 6.5 to GroupWise 8, modify the WebAccess URL in the exteNd Portal Preferences from:

```
http://web_server_address/servlet/webacc
```

to:

```
http://web_server_address/gw/webacc
```

VII Microsoft Clustering Services on Windows

- ♦ Chapter 35, “Introduction to GroupWise 8 and Microsoft Clusters,” on page 281
- ♦ Chapter 36, “Planning GroupWise in a Microsoft Cluster,” on page 283
- ♦ Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,” on page 299
- ♦ Chapter 38, “Implementing the Internet Agent in a Microsoft Cluster,” on page 309
- ♦ Chapter 39, “Implementing WebAccess in a Microsoft Cluster,” on page 319
- ♦ Chapter 40, “Implementing GroupWise Gateways in a Microsoft Cluster,” on page 331
- ♦ Chapter 41, “Monitoring a GroupWise System in a Microsoft Cluster,” on page 333
- ♦ Chapter 42, “Backing Up a GroupWise System in a Microsoft Cluster,” on page 335
- ♦ Chapter 43, “Moving an Existing GroupWise 8 System into a Microsoft Cluster,” on page 337
- ♦ Chapter 44, “Implementing Messenger in a Microsoft Cluster,” on page 339

35 Introduction to GroupWise 8 and Microsoft Clusters

Before implementing GroupWise 8 in a Microsoft cluster, make sure you have a solid understanding of Microsoft clustering technologies by reviewing the following information resources:

- ♦ [Windows Server 2008 – High Availability \(http://www.microsoft.com/windowsserver2008/en/us/high-availability.aspx\)](http://www.microsoft.com/windowsserver2008/en/us/high-availability.aspx)
- ♦ [Windows Server 2003 – Server Cluster \(http://www.microsoft.com/windowsserver2003/technologies/clustering/default.mspx\)](http://www.microsoft.com/windowsserver2003/technologies/clustering/default.mspx)

When you review the information resources recommended above, you discover that clustering employs very specialized terminology. The following brief glossary provides basic definitions of clustering terms and relates them to your GroupWise system:

cluster: A grouping of from two to eight Windows servers configured so that data storage locations and applications can transfer from one server to another without interrupting their availability to users.

node: A clustered server; in other words, a single Windows server that is part of a cluster.

active node: A node in the cluster that is actively running programs. An active node makes its resources available in the cluster.

passive node: A node in the cluster that is not currently running programs, but is waiting for an active node to fail. A passive node does not make its resources available in the cluster until an active node fails over to it.

resource: A data storage location or application. For example, a domain directory and the MTA for the domain are resources. A post office directory and the POA for the post office are resources.

resource group: Two or more resources that must fail over together in order to remain functional. For example, for a domain to be functional, the domain directory and its MTA must fail over together. For a post office to be functional, the post office directory and its POA must fail over together.

physical disk: The physical location where resources are created or installed. For example, a domain or post office directory is created on a physical disk. The agent software is installed on a physical disk.

shared disk: A physical disk that can be made active on any node in the cluster.

failover: The process of moving resources and resource groups on a shared disk from a failed node to a functional node so that availability to users is uninterrupted. For example, if the node where the POA is running goes down, the post office resource group would fail over to another node so that users could continue to use GroupWise.

fan-out-failover: The configuration where resources and resource groups from a failed node fail over to different nodes in order to distribute the load from the failed node across multiple nodes in the cluster. For example, if a node runs a resource group consisting of a domain and its MTA, another resource group consisting of a post office and its POA, and a third resource group for WebAccess, each resource group could be configured to fail over separately to different nodes in the cluster.

failback: The process of returning resources and resource groups to their original node after the situation causing the failover has been resolved. For example, if a POA and its post office fail over to another node in the cluster, that resource group can be configured to fail back to its original node when the problem is resolved.

shared disk system: The hardware housing the physical disks that are shared among the nodes in the cluster. The C: drives in the clustered nodes are not part of the shared disk system. Each C: drive belongs to its own server.

storage area network (SAN): The clustered nodes together with their shared disk system and shared physical disks.

36 Planning GroupWise in a Microsoft Cluster

The majority of this part of the guide ([Chapter 36, “Planning GroupWise in a Microsoft Cluster,”](#) on page 283 through [Chapter 42, “Backing Up a GroupWise System in a Microsoft Cluster,”](#) on page 335) is designed for those who are creating a new GroupWise system, or at least new domains and post offices, in a Microsoft cluster. If you already have an existing GroupWise 6.x system and need to configure it to work in a newly installed cluster, see [Chapter 43, “Moving an Existing GroupWise 8 System into a Microsoft Cluster,”](#) on page 337.

When you implement a new GroupWise system or a new domain or post office in a Microsoft cluster, overall GroupWise system design does not need to change substantially. For a review, see “[Installing a Basic GroupWise System](#)” in the *GroupWise 8 Installation Guide*. However, the configuration of individual components of your GroupWise system will be significantly different. This section helps you plan the following GroupWise components in a Microsoft cluster:

- ♦ A new GroupWise system consisting of the primary domain and the initial post office
- ♦ A new secondary domain
- ♦ A new post office
- ♦ The GroupWise agents (MTA and POA)

During the planning process, component configuration alternatives are explained. For example, you might want the domain and post office together in the same resource group or in separate resource groups. You might want to install the agents to the standard `c:\grpwise` directory on each node or to manually create a `drive:\grpwise` directory for each shared disk for domains and post offices so that the agents fail over with the domains and post offices they service.

The “[System Clustering Worksheet](#)” on page 294 lists all the information you need as you set up GroupWise in a Microsoft cluster. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 36.1, “Setting Up Your Microsoft Cluster,”](#) on page 284
- ♦ [Section 36.2, “Planning a New Clustered Domain,”](#) on page 285
- ♦ [Section 36.3, “Planning a New Clustered Post Office,”](#) on page 285
- ♦ [Section 36.4, “Planning a New Library for a Clustered Post Office,”](#) on page 286
- ♦ [Section 36.5, “Planning GroupWise Resource Groups,”](#) on page 286
- ♦ [Section 36.6, “Planning Shared Administrative Resources,”](#) on page 287
- ♦ [Section 36.7, “Ensuring Successful Name Resolution for GroupWise Resource Groups,”](#) on page 287
- ♦ [Section 36.8, “Deciding How to Install and Configure the Agents in a Cluster,”](#) on page 289
- ♦ [Section 36.9, “GroupWise Clustering Worksheets,”](#) on page 294

After you have completed the tasks and filled out the “[System Clustering Worksheet](#)” on page 294, you are ready to continue with [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299.

36.1 Setting Up Your Microsoft Cluster

As you set up your Microsoft cluster, record key information about the cluster on the System Clustering Worksheet:

SYSTEM CLUSTERING WORKSHEET

Under [Item 1: Cluster Name](#), record the name of your Microsoft cluster.

Under [Item 2: Nodes in Cluster](#), list the servers that you have added to the cluster.

The number of nodes in the cluster strongly influences where you place GroupWise domains and post offices. You have several alternatives:

- ◆ Your whole GroupWise system can run in a single cluster.
- ◆ Parts of your GroupWise system can run in one cluster while other parts of it run in one or more other clusters.
- ◆ Parts of your GroupWise system can run in a cluster while other parts run outside of the cluster, on non-clustered servers.

If you do not have the system resources to run all of your GroupWise system in the cluster, you must decide which parts have the most urgent need for the high availability provided by clustering. Here are some suggestions:

- ◆ Post offices and their POAs must be available in order for users to access their GroupWise mailboxes. Therefore, post offices and their POAs are excellent candidates for the high availability provided in a cluster.
- ◆ In a like manner, WebAccess provides user access to GroupWise mailboxes across the Internet through users’ Web browsers. It is another good candidate for the cluster.
- ◆ Domains and their MTAs are less noticeable to GroupWise client users when they are unavailable (unless users in different post offices happen to be actively engaged in an e-mail discussion when the MTA goes down). On the other hand, domains and their MTAs are critical to GroupWise administrators, although administrators might be more tolerant of a down server than client users are. Critical domains in your GroupWise system are the primary domain and, if you have one, a hub or routing domain. These domains should be in the cluster, even if other domains are not.
- ◆ The Internet Agent might or might not require high availability in your GroupWise system, depending on the importance of immediate messaging across the Internet and the use of POP3 or IMAP4 clients by GroupWise users.

There is no right or wrong way to implement GroupWise in a cluster. It all depends on the specific needs of your particular GroupWise system and its users.

36.2 Planning a New Clustered Domain

The considerations involved in planning a new domain in a Microsoft cluster are essentially the same as for any other environment.

- ♦ **Primary Domain:** If you are setting up a new GroupWise system in a Microsoft cluster, you will be creating the primary domain as you complete the tasks in this section. In preparation, review “[Planning a Basic GroupWise System](#)”, then print and fill out the “[Basic GroupWise System Summary Sheet](#)” in “[Installing a Basic GroupWise System](#)” in the *GroupWise 8 Installation Guide*. This covers planning the primary domain and an initial post office in the primary domain.
- ♦ **Secondary Domain:** If your GroupWise system already exists, you will be creating a new secondary domain. In preparation, review “[Planning a New Domain](#)”, then print and fill out the “[Domain Worksheet](#)” in “[Domains](#)” in the *GroupWise 8 Administration Guide*.

Regardless of the type of domain you are creating, keep in mind the following cluster-specific details as you fill out the worksheet you need:

- ♦ When you specify the location for the domain directory (and for a new GroupWise system, the post office directory) on the worksheet, include the shared disk where you want the directory to reside.
- ♦ Do not concern yourself with the GroupWise agent information on the worksheet. You will plan the agent installation later. If you are filling out the Basic GroupWise System Worksheet, stop with [Post Office Settings](#). If you are filling out the Domain Worksheet, stop with [Domain Administrator](#).

When you have completed the worksheet, transfer the key information from the Basic GroupWise System Worksheet or the Domain Worksheet to the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 7: Domain Name](#), transfer the domain name and directory to the System Clustering Worksheet.

IMPORTANT: Do not create the new domain until you are instructed to do so in [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299.

36.3 Planning a New Clustered Post Office

The considerations involved in planning a new post office in a Microsoft cluster are essentially the same as for any other environment. The initial post office in a new GroupWise system is planned on the Basic GroupWise System Worksheet. To plan additional new post offices, review “[Planning a New Post Office](#)”, then print and fill out the “[Post Office Worksheet](#)” in “[Post Offices](#)” in the *GroupWise 8 Administration Guide*. When you specify the locations for the post office directories, include the shared disks where you want the post office directories to reside.

When you have completed the worksheet, transfer key information from the Basic GroupWise System Worksheet or the Post Office Worksheet to the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 8: Post Office Name](#), transfer the post office name and directory to the System Clustering Worksheet.

IMPORTANT: Do not create the new post office until you are instructed to do so in [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299.

36.4 Planning a New Library for a Clustered Post Office

The considerations involved in planning a library in a Microsoft cluster are essentially the same as for any other environment. You can plan a library for a new clustered post office by following the standard instructions provided in “[Creating and Managing Libraries](#)” in the *GroupWise 8 Administration Guide* and filling out the “[Basic Library Worksheet](#)” or the “[Full-Service Library Worksheet](#)”. Then provide the library information on the System Clustering Worksheet.

SYSTEM CLUSTERING WORKSHEET

Under [Item 9: Document Storage Area Location](#), mark where you want to create the library’s document storage area.

If the document storage area will be located outside the post office directory structure and outside the cluster, specify a user name and password that the POA can use to access the server where the document storage area will reside.

IMPORTANT: Do not create the new library until you are instructed to do so in [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299.

36.5 Planning GroupWise Resource Groups

Resource groups ensure that resources that depend on each other fail over together. If your GroupWise system is very small (for example, one domain and one post office), you could have a single GroupWise resource group so that your whole GroupWise system would fail over together. More typically, multiple domains and post offices are located throughout your organization, so you would set up a resource group for each domain and post office.

A resource group for a domain or post office must include the following types of resources:

- ♦ **Network Name:** The virtual name by which the domain or post office resource group will be known on the network, regardless of which node it is active on
- ♦ **IP Address:** The virtual IP address that will be associated with the network name, regardless of which node the domain or post office resource group is active on
- ♦ **Physical Disk:** The drive letter where the domain or post office directory will be located, used when mapping a drive to the physical disk
- ♦ **File Share:** The name of the physical disk, used when mapping a drive to the physical disk
- ♦ **Generic Service:** The GroupWise agent, running as a Windows service, that will service the domain or post office

For convenience, you might want to name each resource group after the domain or post office it represents. In this documentation, a resource group that could include a domain, a post office, or both, is termed a “GroupWise resource group.”

Each GroupWise resource group has associated with it a list of possible owners. The possible owners are the nodes to which the resource group could fail over. By default, a resource group is configured to have all nodes in the cluster in its possible owners list, organized in ascending alphanumeric order. Only one node at a time can have a particular GroupWise resource group active. If a resource group’s

current owner node fails, the resource group fails over to the next node in the possible owners list. You should customize the owners list for each GroupWise resource group based on the fan-out-failover principle.

When a node fails, its resource groups should not all fail over together to the same node in the cluster. Instead, the resource groups should be distributed across multiple nodes throughout the cluster. This prevents any one node from shouldering the entire processing load typically carried by another node. In addition, some GroupWise resource groups should never have the potential of failing over to the same node. For example, a post office and POA that service a large number of very active GroupWise client users should never fail over to a node where another very large post office and heavily loaded POA reside. If they did, users on both post offices would notice a decrease in responsiveness of the GroupWise client.

IMPORTANT: If you are planning more than one Internet Agent or WebAccess Agent in the cluster, you must ensure that they can never fail over to the same node at the same time. You cannot customize the Windows service names for the Internet Agent or the WebAccess Agent. Therefore, only one of each can run on a server. The Windows service names for POAs and MTAs include the name of the post office or domain that they service, so this limitation does not apply to POAs and MTAs.

SYSTEM CLUSTERING WORKSHEET

Under [Item 4: Resource Group for Domain](#), specify the network name and other required information for the domain resource group. Mark whether you will place the post office in the same resource group with the domain.

If you want the post office in a different resource group from where the domain is located, under [Item 5: Resource Group for Post Office](#), specify the network name and other required information for the post office resource group.

36.6 Planning Shared Administrative Resources

Depending on your administrative needs, you might or might not want to set up shared administrative resources. For example, you might want to have a shared disk where you install the GroupWise snap-ins to ConsoleOne instead of installing them on multiple administrator workstations. You might also have a shared disk where you create the GroupWise software distribution directory. These shared disks could be configured to fail over as part of your clustered environment.

SYSTEM CLUSTERING WORKSHEET

Under [Item 3: Resources for GroupWise Administration](#), list any shared disks you want to use for GroupWise administration purposes.

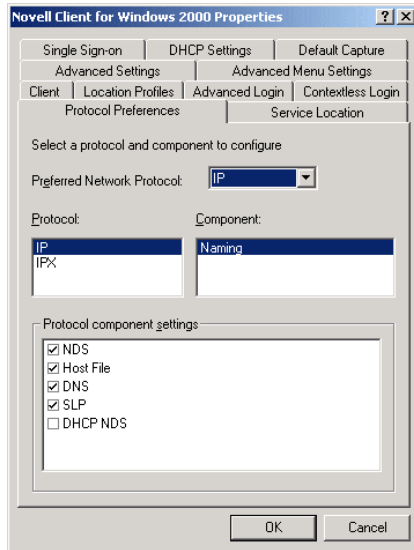
36.7 Ensuring Successful Name Resolution for GroupWise Resource Groups

When you establish GroupWise resource groups, you establish network names for the locations of domains and post offices. The network names remain constant no matter which node in the cluster the domain or post office is currently active on. Because you are using virtual network names, not physical locations, you must ensure that short name resolution is always successful. For example, in ConsoleOne, if you right-click a Domain object in the GroupWise View and then click *Connect*,

ConsoleOne must be able to resolve the domain database location, as provided in the *UNC Path* field, to the network name of that domain within your cluster. It is through short name resolution that all GroupWise resource groups are accessed and managed in ConsoleOne.

A client program (such as ConsoleOne) that runs on a Windows workstation, can be configured to use several different short name resolution methods. To see which methods are in use at a particular workstation, view the protocol preferences for the Novell Client that is installed on the Windows workstation:

Figure 36-1 *Novell Client Preferences Property Page*



Short name resolution methods that pertain to your clustered GroupWise system are discussed below:

Table 36-1 *Short Name Resolution Methods*

Short Name Resolution Method	Description
eDirectory	You can use Novell eDirectory to resolve short names into specific network addresses. However, when using eDirectory for short name resolution, you must remember to consider current context in the name resolution process. eDirectory short name resolution works only if your current context is the same as the context of the eDirectory object you need to access.
Hosts File	Windows XP/Vista uses the <code>\winnt\system32\drivers\etc\hosts</code> file when performing short name resolution at the workstation: Using this file at the Windows workstation is not a preferred method for short name resolution (except perhaps for the administrator's workstation).

Short Name Resolution Method	Description
DNS	Perhaps the most common short name resolution option is Domain Name Service (DNS). As with the hosts file, it is good practice to place all the network names of your GroupWise resource groups into DNS. For short name resolution to work using DNS, the client workstation must either belong to the same DNS zone (such as support.novell.com) as the resource group, or the cluster resource zone must be configured in the client's DNS suffix search path under TCP/IP settings for the workstation.

Specific setup instructions for each of these short name resolution methods are provided in [Chapter 37, "Setting Up a Domain and Post Office in a Microsoft Cluster,"](#) on page 299.

SYSTEM CLUSTERING WORKSHEET

Under [Item 6: IP Address Resolution Methods](#), mark which methods you want to implement in order to resolve the locations stored as UNC paths in ConsoleOne into the network names of the GroupWise resource groups.

36.8 Deciding How to Install and Configure the Agents in a Cluster

There are several cluster-specific issues to consider as you plan to install the Windows MTA and POA in your clustered GroupWise system:

- ♦ [Section 36.8.1, "Planning Cluster-Unique Port Numbers for Agents in the Cluster,"](#) on page 289
- ♦ [Section 36.8.2, "Deciding Where to Install the Agent Software,"](#) on page 291
- ♦ [Section 36.8.3, "Planning the Agent Services,"](#) on page 293
- ♦ [Section 36.8.4, "Planning the Windows Agent Installation,"](#) on page 293

36.8.1 Planning Cluster-Unique Port Numbers for Agents in the Cluster

By default, the GroupWise agents listen on all IP addresses, both primary and secondary, that are bound to the server on their specified port numbers. The primary IP address is the IP address of the physical node. Secondary IP addresses are the IP addresses associated with GroupWise resource groups.

Any time there is a possibility of two of the same type of agent running on the same node, it is important that each agent use a cluster-unique port number, even though each agent is using the unique IP address established for each GroupWise resource group. The best way for you to avoid port conflicts is to plan your cluster so that each agent in the cluster runs on a cluster-unique port. Print out a copy of the ["Network Address Worksheet" on page 296](#) to help you plan cluster-unique port numbers for all GroupWise agents in your GroupWise system.

The following filled-out version of the Network Address Worksheet illustrates one way this can be done:

Domain Information

Domain	MTA IP Address	MTA MTP Port	MTA HTTP Port
Provo1	172.16.5.81	7100	7180

Post Office Information

Post Office	POA IP Address	POA C/S Port	POA MTP Port	POA HTTP Port
Development	(same as MTA)	1677	7101	7181
Manufacturing	172.16.5.82	1678	7102	7182

Internet Agent Information

Internet Agent	GWIA IP Address	MTA MTP Port	MTA Live Remote Port	MTA HTTP Port	GWIA HTTP Port
GWIA Domain MTA	172.16.5.83	7110	7677	7183	N/A
Internet Agent (GWIA)	(same as MTA)	N/A	N/A	N/A	9850

WebAccess Information

WebAccess Agent	WebAccess IP Address	MTA MTP Port	MTA HTTP Port	WebAccess Agent Port	WebAccess HTTP Port
WebAccess Domain MTA	172.16.5.84	7120	7184	N/A	N/A
WebAccess Agent (GWINTER)	(same as MTA)	N/A	N/A	7205	7205 (same as agent)

This example places the Development post office in the same resource group with the Provo1 domain; therefore, the Provo1 MTA and the Development POA use the same IP address. The Manufacturing post office is placed in a different resource group, so the Manufacturing post office has a different IP address. The Internet Agent and the WebAccess Agent each have their own domains and separate resource groups.

The example also illustrates that the MTA, the POA, and the Internet Agent use different port numbers for agent ports and HTTP ports. In contrast, the WebAccess Agent uses the same port number for the agent port and the HTTP port.

The example uses default port numbers where possible. For example, the default MTA message transfer port is 7100 and the default POA client/server port is 1677. Incrementing port numbers are used in the example when multiple components have the same type of ports. For example, port numbers 1677 and 1678 are both POA client/server ports and port numbers 7180 through 7184 are all HTTP ports. Incrementing from the default port numbers generates unique, though related, port numbers.

If you are going to set up a GroupWise name server to help GroupWise clients locate their post offices, make sure that the default POA port number of 1677 is used somewhere in the cluster and specify the IP address of the post office resource group, not the IP address of a specific node. For more information, see [“Simplifying Client/Server Access with a GroupWise Name Server”](#) in [“Post Office Agent”](#) in the *GroupWise 8 Administration Guide*.

NETWORK ADDRESS WORKSHEET

Fill out the [“Network Address Worksheet”](#) on page 296 to help you determine resource group IP addresses and cluster-unique port numbers for all GroupWise agents in the cluster. (MTA, POA, Internet Agent, WebAccess Agent). Refer to the IP addresses you planned for the domain and post office resource groups under [items 4 and 5](#) on the System Clustering Worksheet.

After you have filled out the Network Address Worksheet, transfer the IP addresses and the cluster-unique port numbers from the Network Address Worksheet to the Agent Clustering Worksheet so that they will be available in the sequence in which you will need them as you set up the GroupWise agents in the cluster.

AGENT CLUSTERING WORKSHEET

Under [Item 4: MTA Network Information](#), transfer the resource group IP address and cluster-unique port numbers for the MTA from the Network Address Worksheet to the Agent Clustering Worksheet.

Under [Item 7: POA Network Information](#), transfer the resource group IP address and cluster-unique port numbers for the POA from the Network Address Worksheet to the Agent Clustering Worksheet.

36.8.2 Deciding Where to Install the Agent Software

In a Microsoft cluster, the agents must run as Windows services. When you install the Windows MTA and POA, you can choose between two different installation locations:

Table 36-2 Agent Software Installation Locations

Location	Description
Each node in the cluster	The <code>c:\grpwise</code> directory is the default location provided by the Agent Installation program.
Shared disk	If you create a <code>drive:\grpwise</code> directory on the same shared disk with the domain or post office directory, the agent software and startup files fail over and back with the domains and post offices that the agents service.

Because the agents must be installed as Windows services in a Microsoft cluster, you must initially run the Agent Installation program for each node in the cluster so that the Windows services for the agents get created, regardless of where you are planning to run the agents from. However, for updates, you need to run the Agent Installation program only once if you are running the agents from a shared disk.

The following sections can help you choose which installation location would be best for your clustered GroupWise system:

- ♦ [“Advantages of Installing to a Shared Disk” on page 292](#)
- ♦ [“Disadvantages of Installing to a Shared Disk” on page 292](#)
- ♦ [“Recommendation” on page 292](#)

Advantages of Installing to a Shared Disk

Using a *drive*:\grpwise directory for each GroupWise shared disk has several advantages:

- ♦ When you update the agent software, you only need to update it in one place for a particular domain or post office, not on every node in the resource group’s possible owners list. This prevents the potential problem of having a domain or post office fail over to a node where a different version of the agent software is installed.
- ♦ Having the agent startup files on the same node as the domain or post office makes them easy to find.
- ♦ If you change information in the agent startup files, you only need to change it in one place, not on every node in the resource group’s possible owners list.
- ♦ If you want to back up the GroupWise data, you can back up the domain and/or post office directories and the agent software from the same shared disk.

Disadvantages of Installing to a Shared Disk

Installing the agents on the same shared disk with a domain or post office does have some disadvantages:

- ♦ You must install the agent software each time you create a new domain or post office on a new shared disk.
- ♦ GroupWise administrators who are used to the GroupWise agents being installed in `c:\grpwise` might be confused by not finding them there in the clustered GroupWise system.
- ♦ You must remember where you installed the GroupWise agents when you update the agent software. Accidentally installing a GroupWise Support Pack to the default location of `c:\grpwise` on the active node would not have the desired results if the original agent software was installed to a shared disk.

Recommendation

Whichever method you choose, be consistent throughout the entire cluster. Either put all the GroupWise agents on the shared disks with the domains and post offices they service, or put them all in `c:\grpwise` directories on all nodes. If you put them on shared disks with domains and post offices, make sure there are no agent files in `c:\grpwise` directories on nodes to confuse the issue at a later time.

Even if you choose to install the agents to the `c:\grpwise` directory of multiple nodes, you can still store the agent startup files on shared disks with the domains and post offices. The significant advantage of this approach is that you only have one startup file to modify per agent.

AGENT CLUSTERING WORKSHEET

Under [Item 1: Agent Installation Location](#), mark whether you will install the agent software to the shared disk with a domain or post office, or to each node in the cluster. If necessary, specify where the agent startup files will be stored.

Under [Item 2: Domain Name](#), transfer the domain name, shared disk, and directory from the System Clustering Worksheet to the Agent Clustering Worksheet.

Under [Item 5: Post Office Name](#), transfer the post office name, shared disk, and directory from the System Clustering Worksheet to the Agent Clustering Worksheet.

36.8.3 Planning the Agent Services

In a Microsoft cluster, the MTA and POA must be set up as service resources. A service resource for a GroupWise agent must include the following information:

- ♦ **Name:** The name by which the agent service will be listed in the resource group (for example, MTA Service or POA Service)
- ♦ **Possible Owners:** The list of nodes in the cluster to which the GroupWise agent can fail over (the same as the possible owners of the resource group to which the agent service belongs)
- ♦ **Resource Dependencies:** Other resources in the resource group that must be online before the GroupWise agent can start on a new node (for example, the Group IP Address resource and the Physical Disk resource where the domain or post office directory is located)

AGENT CLUSTERING WORKSHEET

Under [Item 3: MTA Service Resource](#), specify the MTA service resource name and list any possible resource dependencies.

Under [Item 6: POA Service Resource](#), specify the POA service resource name and list any possible resource dependencies.

36.8.4 Planning the Windows Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the GroupWise Windows agents are the same in a Microsoft cluster as in any other environment. Review [“Planning the GroupWise Agents”](#), then print and fill out the [“GroupWise Agent Installation Summary Sheet”](#) in [“Installing GroupWise Agents”](#) in the [GroupWise 8 Installation Guide](#) for each location where you will install the Windows MTA and/or POA.

Fill out the Windows Agent Worksheet.

GROUPWISE AGENT INSTALLATION WORKSHEET

Under [Agents and Locations](#), mark *POA Local to Post Office* and *MTA Local to Domain*. In a Microsoft cluster, a domain or post office and its agent must be located on the same node in order to fail over together.

Under [Installation Path](#), take into account your decision based on [“Deciding Where to Install the Agent Software”](#) on page 291.

Under [Windows Installation Options](#), mark *Install as Windows Services*.

Under [Domain Information](#) and [Post Office Information](#), refer to the Domain and Post Office Worksheets you filled out in [Section 36.2, “Planning a New Clustered Domain,”](#) on page 285 and [Section 36.3, “Planning a New Clustered Post Office,”](#) on page 285, and to the Network Address Worksheet you completed during [“Planning Cluster-Unique Port Numbers for Agents in the Cluster”](#) on page 289.

IMPORTANT: Do not install the Windows agent software until you are instructed to do so in [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299.

Skip to [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299.

36.9 GroupWise Clustering Worksheets

- ◆ [Section 36.9.1, “System Clustering Worksheet,”](#) on page 294
- ◆ [Section 36.9.2, “Network Address Worksheet,”](#) on page 296
- ◆ [Section 36.9.3, “Agent Clustering Worksheet,”](#) on page 297

36.9.1 System Clustering Worksheet

Item	Explanation
1) Cluster Name:	Record the name of the name of your Microsoft cluster. For more information, see Section 36.1, “Setting Up Your Microsoft Cluster,” on page 284.
2) Nodes in Cluster:	List the servers that are part of the cluster that you set up for your GroupWise system. For more information, see Section 36.1, “Setting Up Your Microsoft Cluster,” on page 284.

Item	Explanation
3) Resources for GroupWise Administration:	List any shared locations that you want to set up for ConsoleOne or the software distribution directory.
ConsoleOne:	For more information, see Section 36.6, "Planning Shared Administrative Resources," on page 287.
Shared disk:	
Possible owners:	
Software Distribution Directory:	
Shared disk:	
Possible owners:	
4) Resource Group for Domain:	Specify the information for the domain resource group.
Network name:	For more information, see Section 36.2, "Planning a New Clustered Domain," on page 285.
IP address:	
Physical disk:	
File share:	
MTA service:	
Possible owners:	
Post Office in Same Resource Group as Domain?	
♦ Yes	
♦ No	
5) Resource Group for Post Office:	Specify the information for the post office resource group.
Network name:	For more information, see Section 36.3, "Planning a New Clustered Post Office," on page 285.
IP address:	
Physical disk:	
File share:	
POA service:	
Possible owners:	
6) IP Address Resolution Methods:	Mark the short name address resolution methods you want to implement to ensure that the UNC paths stored in ConsoleOne with network names can be successfully resolved into physical network addresses.
♦ eDirectory	
♦ hosts file	
♦ DNS	For more information, see Section 36.7, "Ensuring Successful Name Resolution for GroupWise Resource Groups," on page 287
7) Domain Name:	Specify a unique name for the domain. Specify the directory where you want to create the new domain.
Domain Directory:	For more information, see Section 36.2, "Planning a New Clustered Domain," on page 285.
8) Post Office Name:	Specify a unique name for the post office. Specify the directory where you want to create the post office.
Post Office Directory:	For more information, see Section 36.3, "Planning a New Clustered Post Office," on page 285.

Item	Explanation
9) Document Storage Area Location:	If you need a library for a clustered post office, mark where you want to create its document storage area and provide a directory if necessary.
<ul style="list-style-type: none"> ◆ At the post office ◆ Outside the post office ◆ Separate post office 	For more information, see Section 36.4, “Planning a New Library for a Clustered Post Office,” on page 286.
Document Storage Area Access	
<ul style="list-style-type: none"> ◆ POA /user startup switch setting ◆ POA /password startup switch setting 	

36.9.2 Network Address Worksheet

- ◆ “Domain Information” on page 296
- ◆ “Post Office Information” on page 296
- ◆ “Internet Agent Information” on page 296
- ◆ “WebAccess Information” on page 297

Domain Information

Domain	MTA IP Address	MTA MTP Port	MTA HTTP Port

Post Office Information

Post Office	POA IP Address	POA C/S Port	POA MTP Port	POA HTTP Port

Internet Agent Information

Internet Agent	GWIA IP Address	MTA MTP Port	MTA Live Remote Port	MTA HTTP Port	GWIA HTTP Port
GWIA Domain MTA					N/A
Internet Agent (GWIA)	(same)	N/A	N/A	N/A	

WebAccess Information

WebAccess Agent	WebAccess IP Address	MTA MTP Port	MTA HTTP Port	WebAccess Agent Port	WebAccess HTTP Port
WebAccess Domain MTA				N/A	N/A
WebAccess Agent (GWINTER)	(same)	N/A	N/A		

36.9.3 Agent Clustering Worksheet

Item	Explanation
1) Agent installation location:	Mark the location where you will install the agent software.
<ul style="list-style-type: none"> ◆ Shared disk with domain or post office ◆ Each node in the cluster 	<p>If necessary, specify the location where you will store agent startup files on the same shared disk with the domain or post office.</p> <p>For more information, see “Deciding Where to Install the Agent Software” on page 291.</p>
<p>Consolidate startup files?</p>	
2) Domain Name:	Transfer this information from the System Clustering Worksheet (item 6).
Domain Directory:	
3) MTA Service Resource:	List other nodes in the cluster where the domain resource group could fail over and any resources that must be online before the MTA can start.
Service name:	
Possible owners:	
Resource dependencies:	For more information, see “Planning the Agent Services” on page 293 .
4) MTA Network Information:	Gather the MTA network address information from the “Network Address Worksheet” on page 296 .
MTA IP address:	
MTA message transfer port:	For more information, see “Planning Cluster-Unique Port Numbers for Agents in the Cluster” on page 289 .
MTA HTTP port:	
5) Post Office Name:	Transfer this information from the System Clustering Worksheet (item 7).
Post Office Directory:	
6) POA Service Resource:	List other nodes in the cluster where post office resource group could fail over and any resources that must be online before the POA can start.
Service name:	
Possible owners:	
Resource dependencies:	For more information, see “Planning the Agent Services” on page 293 .
7) POA Network Information:	Gather the POA network address information from the “Network Address Worksheet” on page 296 .
POA IP address	
POA client/server port	For more information, see “Planning Cluster-Unique Port Numbers for Agents in the Cluster” on page 289 .
POA message transfer port	
POA HTTP port	

37 Setting Up a Domain and Post Office in a Microsoft Cluster

You should have already reviewed [“Planning GroupWise in a Microsoft Cluster”](#) on page 283 and filled out the [“System Clustering Worksheet”](#) on page 294, the [“Network Address Worksheet”](#) on page 296, and the [“Agent Clustering Worksheet”](#) on page 297. You are now ready to complete the following tasks to set up GroupWise in your Microsoft cluster:

- ♦ [Section 37.1, “Preparing the Cluster for GroupWise,”](#) on page 299
- ♦ [Section 37.2, “Setting Up a New GroupWise System in a Cluster,”](#) on page 301
- ♦ [Section 37.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 301
- ♦ [Section 37.4, “Creating a New Post Office in a Cluster,”](#) on page 303
- ♦ [Section 37.5, “Installing and Configuring the MTA and the POA in a Cluster,”](#) on page 304
- ♦ [Section 37.6, “Testing Your Clustered GroupWise System,”](#) on page 306
- ♦ [Section 37.7, “Managing Your Clustered GroupWise System,”](#) on page 306
- ♦ [Section 37.8, “What’s Next,”](#) on page 308

37.1 Preparing the Cluster for GroupWise

After you have set up your Microsoft cluster and become familiar with its functioning, as described in [Chapter 35, “Introduction to GroupWise 8 and Microsoft Clusters,”](#) on page 281, complete the following tasks to prepare the cluster for your GroupWise system:

- ♦ [Section 37.1.1, “Creating GroupWise Resource Groups,”](#) on page 299
- ♦ [Section 37.1.2, “Creating Agent Service Resources,”](#) on page 299
- ♦ [Section 37.1.3, “Configuring Short Name Resolution,”](#) on page 300

37.1.1 Creating GroupWise Resource Groups

Create the needed domain and post office resource groups in your Microsoft cluster ([System Clustering Worksheet](#) items 3 and 4), as planned in [Section 36.2, “Planning a New Clustered Domain,”](#) on page 285 and [Section 36.3, “Planning a New Clustered Post Office,”](#) on page 285.

37.1.2 Creating Agent Service Resources

Within each GroupWise resource group, create the MTA or POA service resource ([Agent Clustering Worksheet](#) items 3 and 6), as planned in [“Planning the Agent Services”](#) on page 293.

37.1.3 Configuring Short Name Resolution

To ensure that GroupWise resource groups are always locatable on the network, configure the short name resolution methods that you want to rely on for your clustered GroupWise system ([System Clustering Worksheet item 9](#)), as planned in [Section 36.7, “Ensuring Successful Name Resolution for GroupWise Resource Groups,”](#) on page 287.

- ♦ “eDirectory” on page 300
- ♦ “Hosts Files” on page 300
- ♦ “DNS” on page 300

After configuring your selected short name resolution methods, continue with the task you need to perform:

- ♦ [Section 37.2, “Setting Up a New GroupWise System in a Cluster,”](#) on page 301
- ♦ [Section 37.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 301
- ♦ [Section 37.4, “Creating a New Post Office in a Cluster,”](#) on page 303

eDirectory

ConsoleOne uses Novell eDirectory to resolve the UNC path of a domain or post office directory into its network name in the cluster. For example, on the workstation where you run ConsoleOne, you need to map a drive to the location of a domain directory using the network name of the domain resource group so that ConsoleOne can access the domain database no matter which node in the cluster it is active on.

Hosts Files

Because each GroupWise resource group has been associated with a network name, you should add lines for the new network names to the `\winnt\system32\drivers\etc\hosts` file as needed. This should only be done on the administrator’s workstation.

The lines you add to a hosts file could look similar to the following example (all on one line, of course):

Syntax:

```
IP_address network_name.context
```

Remember that *network_name* represents the name of the virtual server, which remains unchanged regardless of which node is currently active.

Example:

```
172.16.5.81 gwcluster.novell.com
```

When specifying the lines in the hosts files, use [System Clustering Worksheet item 7 or 8](#) for each *IP_address* and *network_name* where a domain or post office resides. Use [System Clustering Worksheet item 3](#) for *cluster*. Use [System Clustering Worksheet item 4](#) for *context*.

DNS

Because each GroupWise resource group has been associated with a virtual network name, you should add all your new network names to DNS.

37.2 Setting Up a New GroupWise System in a Cluster

The GroupWise Installation Advisor walks you through setting up the primary domain and an initial post office in the primary domain. You might be creating your primary domain and initial post office in the same resource group or in two different resource groups. After you have created the primary domain and initial post office and installed the GroupWise agents, you can create additional secondary domains and post offices in the cluster as needed.

To set up the primary domain and initial post office for a new GroupWise system in a Microsoft cluster:

- 1 If necessary, map a drive to each GroupWise administration shared disk ([System Clustering Worksheet item 3](#)).
- 2 Map a drive to the shared disk of the domain resource group ([System Clustering Worksheet item 6](#)) and, if needed, to the shared disk of the post office resource group ([System Clustering Worksheet item 7](#)), where the primary domain and the initial post office for your new GroupWise system will be created.
- 3 Manually create the domain directory ([System Clustering Worksheet item 6](#)) and the post office directory ([System Clustering Worksheet item 7](#)).

This step is not required, but in a Microsoft cluster, the following step is easier if the directory already exists.

- 4 Run the GroupWise Installation Advisor to set up your initial GroupWise system, following the steps provided in “[NetWare and Windows: Setting Up a Basic GroupWise System](#)” in “[Installing a Basic GroupWise System](#)” in the *GroupWise 8 Installation Guide*. Keep in mind the following cluster-specific details:
 - ♦ When you specify the ConsoleOne directory and the software distribution directory, be sure to browse to each location through the shared disk accessed in [Step 1](#) above.
 - ♦ When you specify the domain directory and post office directory, be sure to browse through the shared disk accessed in [Step 2](#) to select the directory created in [Step 3](#) above.
 - ♦ For the post office link type, select *TCP/IP Link*.
 - ♦ When providing the MTA and POA network address information, use the Agent Clustering Worksheet that you filled out in [Section 36.8, “Deciding How to Install and Configure the Agents in a Cluster,” on page 289](#). The information you provide will be used to configure the MTA and POA objects in the domain and post office even though you have not yet installed the agent software.
 - ♦ Do not create users in the post office at this time.
 - ♦ In the Summary dialog box, the domain directory and post office directory that you browsed to should display as UNC paths using the network name of the GroupWise resource group, not the name of a specific node in the cluster.
- 5 When you have finished creating the primary domain and the initial post office, continue with installing the GroupWise Agents, starting with [Step 5](#) in “[Installing the Agent Software in a Cluster](#)” on page 304.

The GroupWise Installation Advisor starts the Agent Installation program for you.

37.3 Creating a New Secondary Domain in a Cluster

After you have set up the primary domain and initial post office, as described in [Section 37.2, “Setting Up a New GroupWise System in a Cluster,” on page 301](#), you can create additional secondary domains as needed.

To create a new secondary domain in a Microsoft cluster:

- 1 Create a domain resource group for the new domain, as described in [“Creating GroupWise Resource Groups” on page 299](#).
- 2 Create an MTA service resource for the domain’s MTA, as described in [“Creating Agent Service Resources” on page 299](#).
- 3 Map a drive to the shared disk of the domain resource group ([System Clustering Worksheet item 7](#)) where the new secondary domain will be created.
- 4 Manually create the domain directory ([System Clustering Worksheet item 7](#)).
This step is not required, but in a clustered environment, [Step 7](#) is easier if the domain directory already exists.
- 5 If you selected the same shared disk with the domain as the agent installation location ([Agent Clustering Worksheet item 1](#)), create the `drive:\grpwise` directory on the drive accessed in [Step 3](#).
or
If you selected `c:\grpwise` on each node in the cluster, decide which node to install the agents to first.
- 6 In ConsoleOne, connect to the primary domain in your GroupWise system, as described in [“Connecting to a Domain” in “Domains” in the *GroupWise 8 Administration Guide*](#).
- 7 Create the new domain, following the steps provided in [“Creating the New Domain” in “Domains” in the *GroupWise 8 Administration Guide*](#). Keep in mind the following cluster-specific details:
 - ♦ Use the Domain Worksheet you filled out in [Section 36.2, “Planning a New Clustered Domain,” on page 285](#) to fill in the fields on the Create GroupWise Domain page.
 - ♦ In the *Domain Database Location* field, be sure to browse through the drive you accessed in [Step 3](#) to the domain directory you created in [Step 4](#) above.
 - ♦ In the *Link to Domain* field, link the new domain to the primary domain of your GroupWise system.
 - ♦ The *Configure Link* option is selected by default. Select *TCP/IP Link to the Other Domain*. Refer to the Agent Clustering Worksheet that you filled out in [“Planning Cluster-Unique Port Numbers for Agents in the Cluster” on page 289](#) for the resource group IP address and cluster-unique port numbers that you need to specify in order to configure the link.
- 8 Use the Link Configuration tool to change the links from the new domain to all other domains in the cluster to direct TCP/IP links, following the steps provided in [“Changing the Link Protocol between Domains to TCP/IP” in “Message Transfer Agent” in the *GroupWise 8 Administration Guide*](#).
Although a complete mesh link configuration is the most efficient, it might not be feasible in all situations. Set up as many direct TCP/IP links as possible for best MTA performance in the cluster.
- 9 Make sure you are still connected to the primary domain.
- 10 Rebuild the domain database for the new domain, following the steps provided in [“Rebuilding Domain or Post Office Databases” in “Databases” in the *GroupWise 8 Administration Guide*](#). Be sure to browse to the database location ([System Clustering Worksheet item 7](#)) through the shared disk you accessed in [Step 3](#) to the domain directory you created in [Step 4](#) above.
The database rebuild is necessary in order to transfer the MTA configuration information and the domain link information into the secondary domain database, because the MTA for the new secondary domain is not yet running.
- 11 Continue with [Creating a New Post Office in a Cluster](#).

37.4 Creating a New Post Office in a Cluster

You can create a new post office in the same resource group where its domain is located or in a separate resource group. If the post office and its domain are in the same resource group, they fail over together. If they are in separate resource groups, they fail over separately.

To create a new post office in a Microsoft cluster:

- 1 If you selected *Yes* for *Post Office in Same Resource Group as Domain?* (under [System Clustering Worksheet item 4](#)), map a drive to the shared disk of the domain resource group.
or
Map a drive to the shared disk of the post office resource group ([System Clustering Worksheet item 5](#)).
 - 2 Manually create the post office directory ([System Clustering Worksheet item 8](#)).
This step is not required, but in a Microsoft cluster, [Step 4](#) is easier if the post office directory already exists.
 - 3 In ConsoleOne, connect to the GroupWise domain where you want to create the new post office, as described in “[Connecting to a Domain](#)” in “[Domains](#)” in the [GroupWise 8 Administration Guide](#).
 - 4 Create the new post office, following the steps provided in “[Creating the New Post Office](#)” in “[Post Offices](#)” in the [GroupWise 8 Administration Guide](#). Keep in mind the following cluster-specific details:
 - ♦ Use the Post Office Worksheet you filled out in [Section 36.3, “Planning a New Clustered Post Office,” on page 285](#) to fill in the fields on the Create GroupWise Post Office page.
 - ♦ In the *Post Office Database Location* field, be sure to browse through the shared disk you accessed in [Step 1](#) to the post office directory you created in [Step 2](#) above.
 - ♦ If you want to create a library at the post office ([System Clustering Worksheet item 9](#)), select *Create Library*.
 - ♦ The *Configure Link* option is selected by default. Select *TCP/IP Link from Domain to New Post Office*. Refer to the Agent Clustering Worksheet that you filled in during “[Planning Cluster-Unique Port Numbers for Agents in the Cluster](#)” [on page 289](#) for the resource group IP address and cluster-unique port numbers that you need to specify in order to configure the link.
 - 5 In ConsoleOne, right-click the new Post Office object, then click *Properties*.
 - 6 Click *GroupWise > Post Office Settings*, then in the *Access Mode* field, select *Client/Server Only*.
 - 7 Right-click the new POA object, then click *Properties*.
On the POA Agent Settings and Scheduled Events pages, you might want to specify unique times for the following POA activities to prevent multiple POAs from performing the same activities on the same node at the same time during a failover situation:
 - ♦ Start User Upkeep
 - ♦ Generate Address Book for Remote
 - ♦ Enable QuickFinder Indexing
 - ♦ Mailbox/Library Maintenance Event
- For more information about these repetitive POA activities, see “[Performing Nightly User Upkeep](#)”, “[Regulating Indexing](#)”, and “[Scheduling Database Maintenance](#)” in “[Post Office Agent](#)” in the [GroupWise 8 Administration Guide](#).
- 8 Make sure you are still connected to the domain that owns the new post office.

- 9 Rebuild the post office database for the new post office, following the steps provided in [“Rebuilding Domain or Post Office Databases”](#) in [“Databases”](#) in the *GroupWise 8 Administration Guide*. Be sure to browse to the database location ([System Clustering Worksheet item 7](#)) through the shared disk you accessed in [Step 1](#) to the post office directory you created in [Step 2](#) above.
The database rebuild is necessary in order to transfer the POA configuration information and the post office link information into the post office database, because the POA for the new post office is not yet running.
- 10 If you want to create a library ([System Clustering Worksheet item 9](#)) for the new clustered post office, follow the steps in [“Setting Up a Basic Library”](#) or [“Setting Up a Full-Service Library”](#) in [“Libraries and Documents”](#) in the *GroupWise 8 Administration Guide*, after you have completely finished setting up the new clustered post office.
- 11 Continue with [Installing and Configuring the MTA and the POA in a Cluster](#).

37.5 Installing and Configuring the MTA and the POA in a Cluster

After you have created a new domain and/or post office, you are ready to install and configure the GroupWise agents. Complete all the tasks below if you are setting up a new GroupWise system or if you have created a new GroupWise resource group where you want to install the agent software:

- ♦ [Section 37.5.1, “Installing the Agent Software in a Cluster,”](#) on page 304
- ♦ [Section 37.5.2, “Editing Clustered Agent Startup Files,”](#) on page 305
- ♦ [Section 37.5.3, “Setting Up New Instances of the Agents without Installing the Agent Software,”](#) on page 306

Under some circumstances, the agent software has already been installed in the cluster and you simply need to create a new startup file specific to the new domain or post office. For example:

- ♦ You have created a new domain and/or post office in a GroupWise resource group where the agent software is already installed in the `drive:\grpwise` directory for the resource group.
- ♦ In your GroupWise system, the agent software is already installed to the `c:\grpwise` directory on each node in the cluster.

In these circumstances, follow the instructions in [“Setting Up New Instances of the Agents without Installing the Agent Software”](#) on page 306 instead of completing the tasks listed above.

37.5.1 Installing the Agent Software in a Cluster

To install the MTA and the POA:

- 1 Map a drive to the shared disk of the domain resource group ([Agent Clustering Worksheet item 2](#)) or the post office resource group ([Agent Clustering Worksheet item 5](#)).
- 2 Map a drive to `c:\` on the first node in the cluster where you will set up the agents as Windows services ([System Clustering Worksheet item 2](#)).
- 3 If you plan to install the agent software to the shared disk of the domain or post office resource group (under [Agent Clustering Worksheet item 1](#)), create the `drive:\grpwise` directory on the shared disk accessed in [Step 1](#).

or

If you plan to install the agent software to each node in the cluster, create the `c:\grpwise` directory on the drive accessed in [Step 2](#).

- 4 Start the Agent Installation program, following the steps provided in “Installing the Windows Agent Software” in “Installing GroupWise Agents” in the *GroupWise 8 Installation Guide*.
- 5 Install the Windows agents, keeping in mind the following cluster-specific details:
 - ♦ Use the Windows Agent Clustering Worksheet that you filled out in “Planning the Windows Agent Installation” on page 293 to fill in the fields during the agent installation process.
 - ♦ On the Installation Path page, be sure to browse through the mapped drive to the directory you created in Step 3 above. Be sure that *Install as Windows Services* is selected.
 - ♦ On the Domains / Post Offices page, click *Add* for each domain and post office that the agents will service. In the *Path to Database* field, be sure to browse through the drive you mapped in Step 1 above to the domain directory or the post office directory on the shared disk.
 - ♦ On the Installation Complete page, do not select *Launch GroupWise Agents Now*.
- 6 If you need to install the agent software to `c:\grpwise` on each node in the cluster, repeat Step 4 and Step 5, mapping a drive to each node in the cluster.
or
If you installed the agent software to a shared disk and need only to set up the agents as Windows services on each node, repeat Step 4 and Step 5, mapping drives to new nodes as needed. On the Installation Options page, select only the *Install as Windows Services* option to speed up the installation process for each node.
- 7 If you installed the agent software to each node and you selected *Yes* for *Consolidate Startup Files?* (under [Agent Clustering Worksheet item 1](#)), copy one complete set of agent startup files to the planned location on the shared disk, then delete all agent startup files from the `c:\grpwise` directories on the nodes to avoid future confusion.
- 8 Continue with [Editing Clustered Agent Startup Files](#).

37.5.2 Editing Clustered Agent Startup Files

By default, the Agent Installation program creates agent startup files in the agent installation directory. Each MTA startup file is named after the domain it services, with a `.mta` extension. Each POA startup file is named after the post office it services, with a `.poa` extension.

Because you mapped a drive to the shared disk of the GroupWise resource group using the physical disk and file share information from the resource group, the setting for the MTA `/home` startup switch and the POA `/home` startup switch are always correct, no matter which node in the cluster the domain and post office are currently active on.

One manual modification of POA startup files is required for robust functionality in a Microsoft cluster. Uncomment the `/ip` startup switch and provide the IP address of the post office resource group ([Agent Clustering Worksheet item 7](#)). This information is available to the POA in its eDirectory object properties. However, in some failover situations, the POA reconnects to the MTA more quickly when the information is immediately available to the POA in its startup file.

If the POA needs to access a remote document storage area that is outside the cluster, add the `/user` and `/password` startup switches (under [System Clustering Worksheet item 9](#)) in order to provide a user name and password that the POA can use to access the server where the document storage area resides. As an alternative to startup switches, you can assign the POA object all rights except Supervisor and Access control, as long as the remote document storage area is located in the same tree with the post office.

Skip to [Section 37.6, “Testing Your Clustered GroupWise System,”](#) on page 306.

37.5.3 Setting Up New Instances of the Agents without Installing the Agent Software

To set up new instances of the agents without installing the agent software, you simply create new startup files. Each MTA startup file is named after the domain it services, with a `.mta` extension. Each POA startup file is named after the post office it services, with a `.poa` extension.

If the existing agent software is located in the `drive:\grpwise` directory of a shared disk with a domain or post office, the startup files are located there as well. If the existing agent software is located in the `c:\grpwise` directory on each node in the cluster, the startup files might be located there, or they might be located on the shared disk with the domain or post office.

To create a new startup file without installing the agent software:

- 1 Make a copy of an existing startup file and name it after the domain or post office that will be serviced by the new instance of the agent.
- 2 Edit the setting of the `/home` startup switch to point to the location of the new domain directory or post office directory. Be careful to maintain the syntax of the original line, using the physical disk and file share provided in the GroupWise resource group.
- 3 Scroll down through the startup file looking for other active (not commented out) startup switches, then modify them as needed for the new instance of the agent.
- 4 Save the new startup file.
- 5 Continue with [Testing Your Clustered GroupWise System](#).

37.6 Testing Your Clustered GroupWise System

After you have configured the GroupWise resource group, you can test the failover and failback functionality by bringing the GroupWise resource group online and taking it offline again.

Continue with [Managing Your Clustered GroupWise System](#).

37.7 Managing Your Clustered GroupWise System

After you have set up a basic clustered GroupWise system, you should consider some long-term management issues.

- ♦ [Section 37.7.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 306
- ♦ [Section 37.7.2, “Knowing What to Expect in MTA and POA Failover Situations,”](#) on page 308

37.7.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After setting up your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record that cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to keep the information recorded in the GroupWise objects up to date if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information for a Domain and Its MTA”](#) on page 307
- ♦ [“Recording Cluster-Specific Information for a Post Office and Its POA”](#) on page 307
- ♦ [“Recording Cluster-Specific Information for a Software Distribution Directory”](#) on page 307

Recording Cluster-Specific Information for a Domain and Its MTA

To permanently record important cluster-specific information for the domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the domain Identification page, provide a cluster-specific description of the domain, including the resource group IP address and the cluster-unique port numbers used by its MTA.
- 3 Click *OK* to save the domain description.
- 4 Select the Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the domain resource group IP address and the cluster-unique port numbers used by the MTA.
This information appears on the MTA console, no matter which node in the cluster it is currently running on.
- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information for a Post Office and Its POA](#).

Recording Cluster-Specific Information for a Post Office and Its POA

To permanently record important cluster-specific information for a post office:

- 1 In ConsoleOne, browse to and right-click the Post Office object, then click *Properties*.
- 2 In the *Description* field of the post office Identification page, provide a cluster-specific description of the post office, including the resource group IP address and the cluster-unique port numbers used by its POA.
- 3 Click *OK* to save the post office description.
- 4 Select the Post Office object to display its contents.
- 5 Right-click the POA object, then click *Properties*.
- 6 In the *Description* field of the POA Identification page, record the post office resource group IP address and the cluster-unique port numbers used by the POA.
This information appears on the POA console, no matter which node in the cluster it is currently running on.
- 7 Click *OK* to save the POA description.
- 8 If necessary, continue with [“Recording Cluster-Specific Information for a Software Distribution Directory” on page 307](#).
or
Skip to [“Knowing What to Expect in MTA and POA Failover Situations” on page 308](#).

Recording Cluster-Specific Information for a Software Distribution Directory

To permanently record important cluster-specific information about a software distribution directory located on a shared disk:

- 1 In ConsoleOne, click *Tools > System Operations > Software Directory Management*.
- 2 Select the software distribution directory, then click *Edit*.

- 3 In the *Description* field, record the IP address of the cluster resource where the software distribution directory resides.
- 4 Click *OK*, then click *Close* to save the software distribution directory description.
- 5 Continue with [Knowing What to Expect in MTA and POA Failover Situations](#).

37.7.2 Knowing What to Expect in MTA and POA Failover Situations

In a failover situation, the agents might need to perform some database repair as they start on the new node. The time required depends on the size of the databases involved.

Typically, the POA returns to full functionality faster than the MTA. This benefits GroupWise client users, who can reconnect to their mailboxes very quickly and probably do not notice if messages to users in other post offices are not delivered immediately. The only time a user would need to restart the GroupWise client would be if he or she was actually in the process of sending a message when the POA went down. Notify can continue running even if the connection to the POA becomes unavailable and then it reconnects automatically when the POA is again available.

The MTA typically takes some time reestablishing the links to its post offices, other domains, and gateways, but this situation usually resolves itself in a few minutes without administrator intervention. If it does not, you can manually restart the MTA to speed up the process.

In comparison to failover, manual migration typically takes longer because the agents methodically terminate their threads and close their databases as part of their normal shutdown procedure. However, as a result, no database repair is required when the agents start up again in their new location.

Continue with [What's Next](#).

37.8 What's Next

Now that you have at least one GroupWise domain and post office up and running in your Microsoft cluster, you are ready to proceed with the rest of your GroupWise system setup by:

- ♦ Adding users to post offices. See “[Users](#)” in the [GroupWise 8 Administration Guide](#).
- ♦ Setting up the GroupWise client software and helping users to get started using it. See “[Client](#)” in the [GroupWise 8 Administration Guide](#). Also see the [GroupWise 8 Windows Client User Guide](#).
- ♦ Connecting your clustered GroupWise system to the Internet. See [Chapter 38, “Implementing the Internet Agent in a Microsoft Cluster,”](#) on page 309.
- ♦ Providing access to users’ GroupWise mailboxes from their Web browsers. See [Chapter 39, “Implementing WebAccess in a Microsoft Cluster,”](#) on page 319.
- ♦ Connecting your clustered GroupWise system to other e-mail systems through GroupWise gateways. See [Chapter 40, “Implementing GroupWise Gateways in a Microsoft Cluster,”](#) on page 331.
- ♦ Monitoring the status of your clustered GroupWise system from your Web browser. See [Chapter 41, “Monitoring a GroupWise System in a Microsoft Cluster,”](#) on page 333.
- ♦ Backing up your clustered GroupWise system. See [Chapter 42, “Backing Up a GroupWise System in a Microsoft Cluster,”](#) on page 335.

38 Implementing the Internet Agent in a Microsoft Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 36, “Planning GroupWise in a Microsoft Cluster,”](#) on page 283 and [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299. As part of this process, the [“System Clustering Worksheet”](#) on page 294 and the [“Network Address Worksheet”](#) on page 296 were filled out. If you do not have access to the filled-out worksheets, print the worksheets now and fill in the clustering and network address information as it currently exists on your system. You need this information as you implement the Internet Agent in a cluster.

- ♦ [Section 38.1, “Planning the Internet Agent in a Cluster,”](#) on page 309
- ♦ [Section 38.2, “Setting Up the Internet Agent in a Cluster,”](#) on page 312
- ♦ [Section 38.3, “Managing the Internet Agent in a Cluster,”](#) on page 316
- ♦ [Section 38.4, “Internet Agent Clustering Worksheet,”](#) on page 317

38.1 Planning the Internet Agent in a Cluster

A main system configuration difference between a GroupWise system in a clustering environment and a GroupWise system in a regular environment is that you need to create a separate domain to house each GroupWise gateway, including the Internet Agent. The Internet Agent is faster and more stable when it runs on the same server with its domain. In a cluster, creating a separate domain for the Internet Agent ensures that the Internet Agent and its domain always fail over together.

[Section 38.4, “Internet Agent Clustering Worksheet,”](#) on page 317 lists all the information you need as you set up the Internet Agent in a Microsoft cluster. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 38.1.1, “Planning a Domain for the Internet Agent,”](#) on page 310
- ♦ [Section 38.1.2, “Planning the Internet Agent Resource Group,”](#) on page 310
- ♦ [Section 38.1.3, “Planning Cluster-Unique Port Numbers for the Internet Agent and Its MTA,”](#) on page 310
- ♦ [Section 38.1.4, “Preparing Your Firewall for the Internet Agent,”](#) on page 311
- ♦ [Section 38.1.5, “Deciding Where to Install the Internet Agent and Its MTA,”](#) on page 311
- ♦ [Section 38.1.6, “Planning the MTA Installation,”](#) on page 312
- ♦ [Section 38.1.7, “Planning the Internet Agent Installation,”](#) on page 312

38.1.1 Planning a Domain for the Internet Agent

The considerations involved in planning a domain for the Internet Agent are much the same as planning any other domain. In preparation, review [“Planning a New Domain”](#), then print and fill out the [“Domain Worksheet”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.

Keep in mind the following cluster-specific details:

- ♦ When you specify the location for the domain directory on the Domain Worksheet, include the shared disk where you want the domain directory to be located.
- ♦ Do not concern yourself with the GroupWise agent information on the Domain Worksheet. You can stop with [item 10](#). You will plan the MTA installation later.

When you have completed the Domain Worksheet, transfer the key information from the Domain Worksheet to the Internet Agent Clustering Worksheet.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 1: Resource Group for Internet Agent](#), transfer the disk drive to the Internet Agent Clustering Worksheet.

Under [Item 2: Internet Agent Domain Name](#), transfer the domain name and directory to the Internet Agent Clustering Worksheet.

38.1.2 Planning the Internet Agent Resource Group

The Internet Agent resource group is similar to the GroupWise resource groups you have already set up, as described in [Section 36.5, “Planning GroupWise Resource Groups,” on page 286](#) and [“Creating GroupWise Resource Groups” on page 299](#). The Internet Agent resource group contains a domain whose only role is to connect the Internet Agent into your clustered GroupWise system. It also contains two agent service resources, one for the MTA that services the domain and one for the Internet Agent.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 1: Resource Group for Internet Agent](#), specify the network name and other required information for the Internet Agent resource group.

To ensure successful short name resolution, add entries for the Internet Agent network name to support your preferred methods of short name resolution, as described in [“Configuring Short Name Resolution” on page 300](#).

38.1.3 Planning Cluster-Unique Port Numbers for the Internet Agent and Its MTA

As with the MTA and the POA, the Internet Agent needs cluster-unique port numbers. As part of planning to install the MTA and POA, you should already have determined the resource group IP address and cluster-unique port numbers for the Internet Agent and its MTA as you filled out the [“Network Address Worksheet” on page 296](#). If you do not have a filled-out copy of this worksheet for your system, print it now and fill in current system information.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 5: MTA Network Information](#), transfer the resource group IP address and cluster-unique port numbers from the Internet Agent section of the Network Address Worksheet to the Internet Agent Clustering Worksheet.

Under [Item 7: Internet Agent Network Information](#), transfer the resource group IP address (the same as for its MTA) and the cluster-unique Internet Agent port number from the Internet Agent section of the Network Address Worksheet to the Internet Agent Clustering Worksheet.

38.1.4 Preparing Your Firewall for the Internet Agent

The Internet Agent receives incoming messages on the IP address of the Internet Agent resource group. Your firewall configuration must be modified to allow inbound TCP/IP traffic from the Internet to the Internet Agent IP address on the following standard ports:

Table 38-1 Standard Ports

Protocol	Standard Port
IMAP4	143
LDAP	389
POP3	110
SMTP	25

By default, the Internet Agent sends outgoing messages on the IP address of the node where it is running. If you decide to use this default configuration, your firewall must be configured to allow outbound TCP/IP traffic from all nodes on the Internet Agent resource group's possible owners list.

If the Internet Agent has a large number of nodes in its possible owners list, you could configure the Internet Agent to send outgoing messages to a relay host, which would then send them out through the firewall using its own IP address rather than the IP address of the particular node where the Internet Agent is running. This reduces the amount of modification to your firewall required to set up the Internet Agent. However, if the relay host goes down, all outgoing messages are delayed.

As another alternative, you can configure the Internet Agent to use its resource group IP address for sending as well as receiving messages. Setup instructions for this configuration are provided in ["Forcing Use of the Internet Agent Secondary IP Address" on page 75](#), which you can complete after installing the Internet Agent.

In preparation for installing the Internet Agent, configure your firewall as needed to handle the Internet Agent's use of node and resource group IP addresses when sending and receiving messages.

38.1.5 Deciding Where to Install the Internet Agent and Its MTA

The default Internet Agent installation directory is `c:\grpwise\gwia`. As with the MTA and the POA, you can choose to install the Internet Agent and its MTA to each node in the cluster or to the shared disk of the Internet Agent resource group. For a discussion of these alternatives, see ["Deciding Where to Install the Agent Software" on page 291](#), which describes the issues in the context of planning MTA and POA installations. As with the MTA and POA, the Internet Agent and its MTA must be installed as Windows services.

INTERNET AGENT CLUSTERING WORKSHEET

Under [Item 4: MTA Installation Location](#) and [Item 6: Internet Agent Installation Location](#), mark whether you will install the Internet Agent and its MTA to the shared disk of the Internet Agent resource group or to each node in the cluster. If necessary, specify where the MTA startup file and the Internet Agent configuration file (`gwia.cfg`) will be stored.

38.1.6 Planning the MTA Installation

Follow the instructions in “[Planning the Windows Agent Installation](#)” on page 293 to plan the MTA installation for the Internet Agent domain, then return to this point. After you follow the instructions, you will have a filled-out Windows Agent Worksheet to use when you install the MTA.

IMPORTANT: Do not install the Windows MTA until you are instructed to do so in [Section 38.2, “Setting Up the Internet Agent in a Cluster,”](#) on page 312.

38.1.7 Planning the Internet Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Internet Agent are the same in a Microsoft cluster as for any other environment. Review “[NetWare and Windows: Installing the Internet Agent Software](#)”, then print and fill out the “[GroupWise Internet Agent Installation Summary Sheet](#)” in “[Installing the GroupWise Internet Agent](#)” in the *GroupWise 8 Installation Guide*. You need this information as you install the Internet Agent in your cluster.

IMPORTANT: Do not install the Internet Agent software until you are instructed to do so in [Section 38.2, “Setting Up the Internet Agent in a Cluster,”](#) on page 312.

38.2 Setting Up the Internet Agent in a Cluster

You should already have reviewed [Section 38.1, “Planning the Internet Agent in a Cluster,”](#) on page 309 and filled out [Section 38.4, “Internet Agent Clustering Worksheet,”](#) on page 317. You are now ready to complete the following tasks to set up the Internet Agent in a Microsoft cluster:

- ♦ [Section 38.2.1, “Setting Up the Internet Agent Resource Group,”](#) on page 312
- ♦ [Section 38.2.2, “Creating a Domain for the Internet Agent,”](#) on page 313
- ♦ [Section 38.2.3, “Installing the MTA for the Internet Agent Domain,”](#) on page 313
- ♦ [Section 38.2.4, “Installing and Configuring the Internet Agent in a Cluster,”](#) on page 313
- ♦ [Section 38.2.5, “Testing the Clustered Internet Agent,”](#) on page 316

38.2.1 Setting Up the Internet Agent Resource Group

- 1 Create the Internet Agent resource group and agent services resources ([Internet Agent Clustering Worksheet item 1](#)), as planned in “[Planning the Internet Agent Resource Group](#)” on page 310.
- 2 To ensure successful short name resolution, add entries for the Internet Agent network name to support your preferred methods of short name resolution, as described in “[Configuring Short Name Resolution](#)” on page 300.

- 3 To ensure that the Internet Agent has incoming and outgoing access to the Internet, make sure your firewall is properly configured, as described in [“Preparing Your Firewall for the Internet Agent”](#) on page 311.
- 4 Continue with [Creating a Domain for the Internet Agent](#).

38.2.2 Creating a Domain for the Internet Agent

The Internet Agent domain will be a secondary domain. To create it, follow the instructions in [Section 37.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 301, taking your information from the Internet Agent Clustering Worksheet, rather than the System Clustering Worksheet, then return to this point.

Do not create any post offices in the Internet Agent domain.

Continue with [Installing the MTA for the Internet Agent Domain](#).

38.2.3 Installing the MTA for the Internet Agent Domain

The MTA for the Internet Agent domain can be installed just like any other MTA in your clustered GroupWise system. Follow the instructions in [“Installing the Agent Software in a Cluster”](#) on page 304, then return to this point.

You do not need to edit the MTA startup file.

Continue with [Installing and Configuring the Internet Agent in a Cluster](#).

38.2.4 Installing and Configuring the Internet Agent in a Cluster

After you have created a domain for the Internet Agent and installed the MTA for that domain, you are ready to install and configure the Internet Agent.

- ♦ [“Installing the Internet Agent Software in a Cluster”](#) on page 313
- ♦ [“Enabling Internet Addressing for Your Clustered GroupWise System”](#) on page 314
- ♦ [“Verifying Internet Agent Object Properties”](#) on page 314

Installing the Internet Agent Software in a Cluster

- 1 Map a drive to the shared disk of the Internet Agent resource group ([Internet Agent Clustering Worksheet item 1](#)).
- 2 Map a drive to `c:\` on the first node in the cluster where you will set up the Internet Agent as a Windows service ([System Clustering Worksheet item 2](#)).
- 3 If you plan to install the Internet Agent software to the shared disk of the Internet Agent resource group ([Internet Agent Clustering Worksheet item 6](#)), create the `drive:\grpwise\gwia` directory on the shared disk accessed in [Step 1](#).

or

If you plan to install the Internet Agent software to each node in the cluster, create the `c:\grpwise\gwia` directory on the drive accessed in [Step 2](#).

- 4 Start the Internet Agent Installation program, following the steps provided in [“NetWare and Windows: Installing the Internet Agent Software”](#) in [“Installing the GroupWise Internet Agent”](#) in the *GroupWise 8 Installation Guide*.

- 5 Install the Windows Internet Agent, keeping in mind the following cluster-specific details:
 - ♦ Use the Windows Internet Agent Clustering Worksheet that you filled out in [“Planning the Internet Agent Installation”](#) on page 67 to fill in the fields during the Internet Agent installation process.
 - ♦ On the Installation Path page, be sure to browse through the mapped drive to the directory you created in [Step 3](#) above. Be sure that *Run WebAccess Agent as a Windows Service* is selected.
 - ♦ On the GroupWise Domain page, be sure to browse through the drive you mapped in [Step 1](#) to the domain directory on the shared disk.
 - ♦ On the Post Installation Task List page, deselect *Launch Internet Agent Now* so that the Installation program does not start the Internet Agent after installation is complete.
- 6 Repeat [Step 4](#) and [Step 5](#), mapping a drive to each node in the cluster.

Even if you installed the Internet Agent software to a shared disk, you need to repeat the installation process for each node so that the Internet Agent gets set up as a Windows service on each node.
- 7 If you installed the software to each node in the cluster and you selected *Yes* for *Consolidate Configuration Files?* (under [Internet Agent Clustering Worksheet item 6](#)), copy the `gwia.cfg` file to the planned location on the shared disk, then delete it from the `c:\grpwise\gwia` directory on each node to avoid future confusion.
- 8 Make sure you have completed all the tasks described in [“Installing the GroupWise Internet Agent”](#) in the [GroupWise 8 Installation Guide](#).
- 9 Continue with [Enabling Internet Addressing for Your Clustered GroupWise System](#).

Enabling Internet Addressing for Your Clustered GroupWise System

Setting up Internet addressing for a clustered Internet Agent is no different from setting it up for an Internet Agent in a any other environment. Follow the instructions in [“Enabling Internet Addressing”](#) in [“System”](#) in the [GroupWise 8 Administration Guide](#), then continue with [Verifying Internet Agent Object Properties](#).

Verifying Internet Agent Object Properties

During installation of the Internet Agent, the Internet Agent object should have been configured correctly. However, it can be helpful to verify certain cluster-specific information in order to familiarize yourself with the configuration of a clustered Internet Agent.

- ♦ [“Accessing Internet Agent Object Properties”](#) on page 314
- ♦ [“Verifying the Reference to the Network Name for Use by DNS”](#) on page 315
- ♦ [“Verifying the Reference to the Network Name in Directory Paths”](#) on page 315
- ♦ [“Verifying Post Office Links”](#) on page 315
- ♦ [“Forcing Use of the Internet Agent Resource Group IP Address”](#) on page 315

Accessing Internet Agent Object Properties

- 1 In ConsoleOne, browse to and select the Internet Agent domain in order to display its contents.
- 2 Right-click the Internet Agent object, then click *Properties*.
- 3 Continue with [Verifying the Reference to the Volume Resource](#).

Verifying the Reference to the Network Name for Use by DNS

In the Internet Agent object properties page tabs:

- 1 Click *SMTP/MIME > Settings*.
- 2 Verify the contents of the *Hostname/DNS "A Record" Name* field.
It displays the hostname as currently configured in DNS. It should match the network name of the domain resource group, not the name of a node in the cluster.
- 3 Make changes if necessary.
- 4 Continue with [Verifying the Reference to the Network Name in Directory Paths](#).

Verifying the Reference to the Network Name in Directory Paths

In the Internet Agent object properties page tabs:

- 1 Click *Server Directories*.
- 2 Verify that the displayed directories match the network name of the domain resource group, not the name of a node in the cluster.
- 3 Make changes if necessary.
- 4 Continue with [Verifying Post Office Links](#).

Verifying Post Office Links

In the Internet Agent object properties page tabs:

- 1 Click *Post Office Links*.
- 2 Verify that the *Access Mode* column displays *C/S* (for client/server mode) for all post offices serviced by the clustered Internet Agent.
- 3 Verify that the *Links* column displays the IP addresses of the post office resource groups, not the IP addresses of any nodes in the cluster.
- 4 Make changes if necessary.
- 5 Continue with [Forcing Use of the Internet Agent Resource Group IP Address](#).

Forcing Use of the Internet Agent Resource Group IP Address

If you want the Internet Agent to send outgoing messages on its resource group IP address, rather than using the default the node IP address:

- 1 Click *GroupWise > Network Address*.
- 2 In the *TCP/IP Address* field, provide the resource group IP address ([Internet Agent Clustering Worksheet item 1](#)) for the Internet Agent to use for sending outgoing messages.
- 3 Click *SMTP/MIME*, then click *Settings*.
- 4 Select *Bind to TCP/IP Address at Connection Time*.
- 5 Click *OK*.
- 6 Continue with [Testing the Clustered Internet Agent](#).

38.2.5 Testing the Clustered Internet Agent

After you have set up the Internet Agent resource group, you can test it by manually bringing it online and taking it offline again.

Continue with [Managing the Internet Agent in a Cluster](#).

38.3 Managing the Internet Agent in a Cluster

After you have installed the Internet Agent in a cluster, you should consider some long-term management issues.

- ♦ [Section 38.3.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 316
- ♦ [Section 38.3.2, “Knowing What to Expect in an Internet Agent Failover Situation,”](#) on page 317

38.3.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After installing the Internet Agent in your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record that cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information recorded in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information about the Internet Agent Domain and Its MTA”](#) on page 316
- ♦ [“Recording Cluster-Specific Information about the Internet Agent”](#) on page 317

Recording Cluster-Specific Information about the Internet Agent Domain and Its MTA

To permanently record important cluster-specific information for the Internet Agent domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the Internet Agent domain Identification page, provide a cluster-specific description of the Internet Agent domain, including its resource group IP address and the cluster-unique port numbers used by its MTA.
- 3 Click *OK* to save the Internet Agent domain description.
- 4 Select the Internet Agent Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the domain resource group IP address and the cluster-unique port numbers used by the MTA.

This information appears on the MTA console, no matter which node in the cluster it is currently running on.

- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information about the Internet Agent](#).

Recording Cluster-Specific Information about the Internet Agent

With the contents of the Internet Agent domain still displayed:

- 1 Right-click the Internet Agent object, then click *Properties*.
- 2 Click *GroupWise*, then click *Identification*.
- 3 In the *Description* field, record the resource group IP address and the cluster-unique port numbers used by the Internet Agent.

This information appears on the Internet Agent console, no matter which node in the cluster it is currently running on.

- 4 Click *OK* to save the Internet Agent information.
- 5 Continue with [Knowing What to Expect in an Internet Agent Failover Situation](#).

38.3.2 Knowing What to Expect in an Internet Agent Failover Situation

The failover behavior of the MTA for the Internet Agent domain is the same as for an MTA in a regular domain. See [“Knowing What to Expect in MTA and POA Failover Situations”](#) on page 308.

Failover of the Internet Agent itself is more complex. The various e-mail clients (POP3, IMAP4, and LDAP) receive an error message when the server they were connected to becomes unavailable. Most of the clients do not attempt to reconnect automatically, so the user must exit the e-mail client and restart it to reestablish the connection after the failover process is complete. Fortunately, the Internet Agent restarts quickly in its failover location so users can reconnect quickly.

As with the MTA and the POA, manual migration of the Internet Agent takes longer than failover. In fact, the Internet Agent can seem especially slow to shut down properly, as it finishes its normal processing and stops its threads. For a busy Internet Agent, you might need to wait several minutes for it to shut down properly when you are manually migrating it.

38.4 Internet Agent Clustering Worksheet

Item	Explanation
1) Resource Group for Internet Agent:	Specify the information for the Internet Agent resource group.
Network name:	For more information, see “Planning the Internet Agent Resource Group” on page 310.
IP address:	
Physical disk:	
File share:	
MTA service resource:	
Internet Agent service resource:	
Possible owners:	
2) Internet Agent Domain Name:	Specify a unique name for the Internet Agent domain. Specify the directory on the physical disk that belongs to the Internet Agent resource group where you want to create the new domain.
Domain Directory:	For more information, see “Planning a Domain for the Internet Agent” on page 310.

Item	Explanation
<p>4) MTA Installation Location:</p> <ul style="list-style-type: none"> ◆ Shared disk of the Internet Agent resource group ◆ Each node in the cluster <p>Consolidate MTA startup files?</p>	<p>Mark the location where you will install the MTA software. If necessary, specify the location where you will consolidate the MTA startup files from the various nodes where the Internet Agent is installed.</p> <p>For more information, see “Deciding Where to Install the Internet Agent and Its MTA” on page 311.</p>
<p>5) MTA Network Information:</p> <p>MTA IP address:</p> <p>MTA message transfer port:</p> <p>MTA live remote port:</p> <p>MTA HTTP port</p>	<p>Gather the MTA network address information from the Internet Agent section of the “Network Address Worksheet” on page 296.</p> <p>For more information, see “Planning Cluster-Unique Port Numbers for the Internet Agent and Its MTA” on page 310.</p>
<p>6) Internet Agent Installation Location:</p> <ul style="list-style-type: none"> ◆ Shared disk in the Internet Agent resource group ◆ Each node in the cluster <p>Consolidate configuration files?</p>	<p>Mark the location where you will install the Internet Agent software.</p> <p>If necessary, specify the location on the shared disk of the Internet Agent resource group where you will consolidate the Internet Agent configuration files (<i>gwia.cfg</i>) from the various nodes where it is installed.</p> <p>For more information, see “Deciding Where to Install the Internet Agent and Its MTA” on page 311.</p>
<p>7) Internet Agent Network Information:</p> <p>Internet Agent IP address:</p> <p>Internet Agent HTTP port:</p>	<p>Gather the Internet Agent network address information from the Internet Agent section of the “Network Address Worksheet” on page 296.</p> <p>For more information, see “Planning Cluster-Unique Port Numbers for the Internet Agent and Its MTA” on page 310.</p>

39 Implementing WebAccess in a Microsoft Cluster

You should already have set up at least a basic GroupWise system, as described in [Chapter 36, “Planning GroupWise in a Microsoft Cluster,”](#) on page 283 and [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299. As part of this process, the [“System Clustering Worksheet”](#) on page 294 and the [“Network Address Worksheet”](#) on page 296 were filled out. If you do not have access to the filled-out worksheets, print the worksheets now and fill in the clustering and network address information as it currently exists on your system. You will need this information as you implement WebAccess in a cluster.

- ♦ [Section 39.1, “Understanding the WebAccess Components,”](#) on page 319
- ♦ [Section 39.2, “Planning WebAccess in a Cluster,”](#) on page 319
- ♦ [Section 39.3, “Setting Up WebAccess in a Cluster,”](#) on page 323
- ♦ [Section 39.4, “Managing WebAccess in a Cluster,”](#) on page 326
- ♦ [Section 39.5, “WebAccess Clustering Worksheet,”](#) on page 328

39.1 Understanding the WebAccess Components

If you are not familiar with GroupWise WebAccess, review [“GroupWise WebAccess Overview”](#) in [“Installing GroupWise WebAccess”](#) in the *GroupWise 8 Installation Guide*.

As you plan WebAccess in a clustering environment, you must keep in mind that you will plan and set up two separate WebAccess components:

- ♦ WebAccess Agent (`gwinter.exe`) that will be associated with a GroupWise WebAccess domain
- ♦ WebAccess Application (a Java servlet) that will be added to your Web server

39.2 Planning WebAccess in a Cluster

A main system configuration difference between a GroupWise system in a clustering environment and a GroupWise system in a regular environment is that you need to create a separate domain to house each GroupWise gateway, including the WebAccess Agent. The WebAccess Agent is faster and more stable when it runs on the same server with its domain. In a cluster, creating a separate domain for the WebAccess Agent ensures that the WebAccess Agent and its domain always fail over together.

[Section 39.5, “WebAccess Clustering Worksheet,”](#) on page 328 lists all the information you need as you set up the WebAccess Agent and the WebAccess Application in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 39.2.1, “Setting Up Your Web Server in the Microsoft Cluster,”](#) on page 320
- ♦ [Section 39.2.2, “Planning a New Domain for the WebAccess Agent,”](#) on page 320
- ♦ [Section 39.2.3, “Planning the WebAccess Resource Group,”](#) on page 321

- ♦ [Section 39.2.4, “Planning Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA,”](#) on page 321
- ♦ [Section 39.2.5, “Deciding Where to Install the WebAccess Agent and Its MTA,”](#) on page 321
- ♦ [Section 39.2.6, “Planning the MTA Installation,”](#) on page 322
- ♦ [Section 39.2.7, “Planning the WebAccess Installation,”](#) on page 322

39.2.1 Setting Up Your Web Server in the Microsoft Cluster

Before you install WebAccess, your Web server must already be set up and running in the cluster. Make sure that it can fail over and fail back successfully.

As you set up your Web server, record the following key configuration information on the WebAccess Clustering Worksheet:

WEBACCESS CLUSTERING WORKSHEET

Under [Item 7: Physical Web Servers](#), list the nodes in the cluster where you are installing the Web server software.

Under [Item 8: Web Server IP Address](#), record the secondary IP address of the Web server resource that you create.

Under [Item 9: Hardware Virtual Server Information](#), record the dedicated IP address for the Web site and the document root directory.

Because the WebAccess Application is installed to a subdirectory of the Web server installation directory (*directory\com\novell\webaccess*), the WebAccess Application cannot be installed on a shared disk. Instead, you will install it to each node in the cluster where the Web server has been installed.

39.2.2 Planning a New Domain for the WebAccess Agent

The considerations involved in planning a domain for the WebAccess Agent are much the same as planning any other domain. In preparation, review [“Planning a New Domain”](#), then print and fill out the [“Domain Worksheet”](#) in [“Domains”](#) in the *GroupWise 8 Administration Guide*.

Keep in mind the following cluster-specific details:

- ♦ When you specify the location for the domain directory on the Domain Worksheet, include the physical disk in your shared disk system where you want the domain directory to be located.
- ♦ Do not concern yourself with the GroupWise agent information on the Domain Worksheet. You can stop with [item 10](#). You will plan the MTA installation later.

When you have completed the Domain Worksheet, transfer the key information from the Domain Worksheet to the WebAccess Clustering Worksheet.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 1: Resource Group for WebAccess Agent](#), transfer the shared disk from the Domain Worksheet to the WebAccess Clustering Worksheet.

Under [Item 2: WebAccess Agent Domain Name](#), transfer the domain name and directory from the Domain Worksheet to the WebAccess Clustering Worksheet.

39.2.3 Planning the WebAccess Resource Group

The WebAccess resource group is similar to the domain and post office resource groups you have already set up, as described in [Section 36.5, “Planning GroupWise Resource Groups,” on page 286](#) and [“Creating GroupWise Resource Groups” on page 299](#). The WebAccess resource group contains a domain whose only role is to connect the WebAccess Agent into your clustered GroupWise system. It also contains two agent service resources, one for the MTA that services the domain and one for the WebAccess Agent.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 1: Resource Group for WebAccess](#), specify the network name and other required information for the WebAccess resource group.

To ensure successful short name resolution, add entries for the WebAccess network name to support your preferred methods of short name resolution, as described in [“Configuring Short Name Resolution” on page 300](#).

39.2.4 Planning Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA

As with the MTA and the POA, the WebAccess Agent needs cluster-unique port numbers. As part of planning to install the MTA and POA, you should already have determined the IP address and cluster-unique port numbers for the WebAccess Agent and its MTA as you filled out the [“Network Address Worksheet” on page 296](#). If you do not have a filled-out copy of this worksheet for your system, print it now and fill in current system information.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 1: Resource Group for WebAccess](#), transfer the WebAccess resource group IP address.

Under [Item 4: MTA Network Information](#), transfer the cluster-unique MTA port numbers from the WebAccess section of the Network Address Worksheet to the WebAccess Clustering Worksheet.

Under [Item 6: WebAccess Agent Network Information](#), transfer the cluster-unique WebAccess Agent port number from the WebAccess section of the Network Address Worksheet to the WebAccess Clustering Worksheet.

39.2.5 Deciding Where to Install the WebAccess Agent and Its MTA

As with the MTA and the POA, you can choose to install the WebAccess Agent and its MTA to each node in the cluster or to the shared disk of the WebAccess resource group. For a discussion of these alternatives, see [“Deciding Where to Install the Agent Software” on page 291](#), which describes the issues in the context of planning MTA and POA installations.

WEBACCESS CLUSTERING WORKSHEET

Under [Item 3: MTA Installation Location](#) and [Item 5: WebAccess Agent Installation Location](#), mark whether you will install the WebAccess Agent and its MTA to each node in the cluster or to the shared disk of the WebAccess resource group. Also specify where the MTA startup file will be stored.

39.2.6 Planning the MTA Installation

Follow the instructions in [“Planning the MTA Installation” on page 322](#), then return to this point. After you follow the instructions, you will have a filled-out Windows Agent Worksheet to use when you install the MTA.

IMPORTANT: Do not install the Windows MTA until you are instructed to do so in [Section 39.3, “Setting Up WebAccess in a Cluster,” on page 323](#).

39.2.7 Planning the WebAccess Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install WebAccess are the same in a clustering environment as for any other environment. Review [“Planning GroupWise WebAccess”](#), then print and fill out the [“GroupWise WebAccess Installation Summary Sheets”](#) in [“Installing GroupWise WebAccess”](#) in the [GroupWise 8 Installation Guide](#). When you set up WebAccess in a cluster, you will install the WebAccess Agent and the WebAccess Application in two separate steps:

- ◆ [“Planning the WebAccess Agent Installation” on page 322](#)
- ◆ [“Planning the WebAccess Application Installation” on page 322](#)

IMPORTANT: Do not install the WebAccess software until you are instructed to do so in [Section 39.3, “Setting Up WebAccess in a Cluster,” on page 323](#).

Planning the WebAccess Agent Installation

For the WebAccess Agent, fill out items 2 through 12 on the GroupWise WebAccess Installation Worksheet, taking into account the following cluster-specific issues:

WEBACCESS INSTALLATION WORKSHEET

Under [Server Information: Installation Directory](#), take into account your decision recorded on the WebAccess Clustering Worksheet ([Item 5: WebAccess Agent Installation Location](#)).

Under [Server Address](#), transfer the IP address and port number from the WebAccess Clustering Worksheet ([Item 6: WebAccess Agent Network Information](#)) filled out in [“Planning Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA” on page 321](#).

Under [Gateway Directory: Domain Directory Path](#), transfer the domain directory from the Domain Worksheet you filled out in [“Planning a New Domain for the WebAccess Agent” on page 320](#).

Planning the WebAccess Application Installation

For the WebAccess Application, fill out items 13 through 19 on the GroupWise WebAccess Installation Worksheet, taking into account the following cluster-specific issues:

WEBACCESS INSTALLATION WORKSHEET

Under [Web Server Information](#), mark the Web server you have installed in your cluster and specify the Web server root directory. Also, specify a directory on the Web server where you want to install the WebAccess Agent configuration file. the default is `c:\novell`.

39.3 Setting Up WebAccess in a Cluster

You should already have reviewed [“Planning GroupWise in a Microsoft Cluster”](#) on page 283 and filled out the [Section 39.5, “WebAccess Clustering Worksheet,”](#) on page 328. You are now ready to complete the following tasks to set up the WebAccess Agent in a clustering environment:

- ♦ [Section 39.3.1, “Setting Up the WebAccess Resource Group,”](#) on page 323
- ♦ [Section 39.3.2, “Creating a Domain for the WebAccess Agent,”](#) on page 323
- ♦ [Section 39.3.3, “Installing the MTA for the WebAccess Agent Domain,”](#) on page 323
- ♦ [Section 39.3.4, “Installing the WebAccess Agent in a Cluster,”](#) on page 324
- ♦ [Section 39.3.5, “Installing and Configuring the WebAccess Application in a Cluster,”](#) on page 324
- ♦ [Section 39.3.6, “Testing Your Clustered WebAccess Installation,”](#) on page 325

39.3.1 Setting Up the WebAccess Resource Group

- 1 Create the WebAccess resource group and agent services resources ([WebAccess Clustering Worksheet item 1](#)), as planned in [“Planning the WebAccess Resource Group”](#) on page 321.
- 2 To ensure successful short name resolution, add entries for the WebAccess Agent network name to support your preferred methods of short name resolution, as described in [“Configuring Short Name Resolution”](#) on page 300.
- 3 Continue with [Creating a Domain for the WebAccess Agent](#).

39.3.2 Creating a Domain for the WebAccess Agent

The WebAccess Agent domain will be a secondary domain. To create it, follow the instructions in [Section 37.3, “Creating a New Secondary Domain in a Cluster,”](#) on page 301, taking your information from the WebAccess Clustering Worksheet, rather than the System Clustering Worksheet, then return to this point.

Do not create any post offices in the WebAccess Agent domain.

Continue with [Installing the MTA for the WebAccess Agent Domain](#).

39.3.3 Installing the MTA for the WebAccess Agent Domain

The MTA for the WebAccess Agent domain can be installed just like any other MTA in your clustered GroupWise system. Follow the instructions in [“Installing the Agent Software in a Cluster”](#) on page 304, then return to this point.

You do not need to edit the MTA startup file.

Continue with [Installing the WebAccess Agent in a Cluster](#).

39.3.4 Installing the WebAccess Agent in a Cluster

After you have created a domain for the WebAccess Agent and installed the MTA for that domain, you are ready to install and configure the WebAccess Agent. The WebAccess Agent is the component of your WebAccess installation that accesses post offices and libraries to retrieve information for WebAccess client users.

- 1 Map a drive to the shared disk of the WebAccess resource group ([WebAccess Clustering Worksheet item 1](#)).
- 2 Map a drive to `c:\` on the first node in the cluster where you will set up the WebAccess Agent as a Windows service ([System Clustering Worksheet item 2](#)).
- 3 If you plan to install the WebAccess Agent software to the shared disk of the WebAccess resource group ([WebAccess Clustering Worksheet item 5](#)), create the `drive:\grpwise\webacc` directory on the WebAccess shared disk accessed in [Step 1](#).
or
If you plan to install the WebAccess Agent software to each node in the cluster, create the `c:\grpwise\webacc` directory on the drive accessed in [Step 2](#).
- 4 Start the WebAccess Installation program, following the steps provided in “[Installing the WebAccess Agent](#)” in “[Installing GroupWise WebAccess](#)” in the *GroupWise 8 Installation Guide*.
- 5 Install the Windows WebAccess Agent, keeping in mind the following cluster-specific details:
 - ♦ On the Components page select only *GroupWise WebAccess Agent*.
Do not install the WebAccess Application at this time.
 - ♦ Use items 2 through 12 on the GroupWise WebAccess Installation Worksheet that you filled out in “[Planning the WebAccess Installation](#)” on [page 322](#) to fill in the fields during the WebAccess Agent installation process.
 - ♦ On the Installation Path page, be sure to browse through the mapped drive to the installation directory you created in [Step 3](#) above.
 - ♦ On the Gateway Directory page, be sure to browse to the domain directory through the drive you mapped in [Step 1](#) above.
 - ♦ On the Execution Options page, be sure that *Run WebAccess Agent as a Windows Service* is selected.
 - ♦ On the Start Applications page, deselect *Start the GroupWise WebAccess Agent*.
- 6 Repeat [Step 4](#) and [Step 5](#), mapping a drive to each node in the cluster.
Even if you installed the WebAccess Agent software to a shared disk, you need to repeat the installation process for each node so that the Internet Agent gets set up as a Windows service on each node.
- 7 Make sure you have completed all the WebAccess Agent tasks described in “[NetWare and Windows: Setting Up GroupWise WebAccess](#)” in “[Installing GroupWise WebAccess](#)” in the *GroupWise 8 Installation Guide*, but do not start the WebAccess Agent at this time.
- 8 Continue with [Installing and Configuring the WebAccess Application in a Cluster](#).

39.3.5 Installing and Configuring the WebAccess Application in a Cluster

Recall that the WebAccess Agent is the component of your WebAccess installation that accesses post offices and libraries to retrieve information for WebAccess client users. The WebAccess Application provides the link between the WebAccess Agent and the WebAccess clients’ Web browsers.

To install the WebAccess Application:

- 1 Map a drive to the shared disk of the WebAccess resource group ([WebAccess Clustering Worksheet item 1](#)) where the WebAccess domain is located.
- 2 Map a drive to the first Web server node where you want to install the WebAccess Application ([WebAccess Clustering Worksheet item 7](#)).
- 3 If the Web server node where you are going to install the WebAccess Application is currently running any applications that rely on Java or on the Web server, migrate those applications to another node in the cluster. If any GroupWise agents are running on the node, migrate the agents.
- 4 Stop the Web server.
- 5 Start the WebAccess Installation program as you did when you installed the WebAccess Agent ([Step 5 on page 324](#)). Keep in mind the following cluster-specific details:
 - ♦ On the Components page, select only *GroupWise WebAccess Application*.
 - ♦ Use items 13 through 19 on the GroupWise WebAccess Installation Worksheet that you filled out in "[Planning the WebAccess Installation](#)" on page 322 to fill in the fields during the WebAccess Application installation process.
 - ♦ On the Gateway Directory page, be sure to browse to the WebAccess gateway directory (*domain\wpgate\webac80a*) through the drive you mapped in [Step 1](#) above.
 - ♦ On the Web Server Information page be sure to browse to the Web server root directory through the drive you mapped in [Step 2](#) above.
 - ♦ On the Start Applications page, deselect *Restart Web Server*.
- 6 Make sure you have completed all the WebAccess Application tasks described in "[NetWare and Windows: Setting Up GroupWise WebAccess](#)" in "[Installing GroupWise WebAccess](#)" in the [GroupWise 8 Installation Guide](#).
- 7 Copy the *directory\docs\com* directory from the server where you just installed the WebAccess Application to the document root directory of the Web server.
- 8 Restart the Web server.
- 9 Offline and then online the Web server to reestablish its resource group IP address.
- 10 Repeat [Step 2](#) through [Step 9](#) for each Web server node in the Web server resource group possible owners list ([WebAccess Clustering Worksheet item 1](#)).
- 11 Continue with [Testing Your Clustered WebAccess Installation](#).

39.3.6 Testing Your Clustered WebAccess Installation

Remember that the WebAccess resource group and the Web server resource group are separate resource groups that could fail over to different nodes at different times.

To thoroughly test your WebAccess installation:

- 1 Make sure the initial combination of WebAccess resource group and Web server resource group is functioning properly.
- 2 Migrate the WebAccess resource group to each node in its possible owners list, making sure it functions with the initial Web server node.
- 3 Migrate the Web server to a different node, migrate the WebAccess resource group to each node in its possible owners list, then make sure each combination works.
- 4 Repeat [Step 3](#) for each Web server resource group.
- 5 Continue with [Managing WebAccess in a Cluster](#).

39.4 Managing WebAccess in a Cluster

After you have installed WebAccess in a cluster, you should consider some long-term management issues.

- ♦ [Section 39.4.1, “Updating GroupWise Objects with Cluster-Specific Descriptions,”](#) on page 326
- ♦ [Section 39.4.2, “Knowing What to Expect in WebAccess Failover Situations,”](#) on page 327
- ♦ [Section 39.4.3, “Updating the WebAccess Agent Configuration File \(commgr.cfg\),”](#) on page 327

39.4.1 Updating GroupWise Objects with Cluster-Specific Descriptions

After installing WebAccess in your clustered GroupWise system, while the cluster-specific information is fresh in your mind, you should record that cluster-specific information as part of the GroupWise objects in ConsoleOne so that you can easily refer to it later. Be sure to update the information recorded in the GroupWise objects if the configuration of your system changes.

- ♦ [“Recording Cluster-Specific Information about the WebAccess Agent Domain and Its MTA”](#) on page 326
- ♦ [“Recording Cluster-Specific Information about the WebAccess Agent”](#) on page 326

Recording Cluster-Specific Information about the WebAccess Agent Domain and Its MTA

To permanently record important cluster-specific information for the WebAccess Agent domain:

- 1 In ConsoleOne, browse to and right-click the Domain object, then click *Properties*.
- 2 In the *Description* field of the WebAccess Agent domain Identification page, provide a cluster-specific description of the WebAccess Agent domain, including the resource group IP address and the cluster-unique port numbers used by its MTA.

You might also want to include cluster-specific information about the WebAccess Application, such as the resource group IP address of the Web server where the WebAccess Application is installed.
- 3 Click *OK* to save the WebAccess domain description.
- 4 Select the WebAccess Domain object to display its contents.
- 5 Right-click the MTA object, then click *Properties*.
- 6 In the *Description* field of the MTA Identification page, record the WebAccess resource group IP address and the cluster-unique port numbers used by the MTA.

This information appears on the MTA console, no matter which node in the cluster it is currently running on.
- 7 Click *OK* to save the MTA description.
- 8 Continue with [Recording Cluster-Specific Information about the WebAccess Agent](#).

Recording Cluster-Specific Information about the WebAccess Agent

With the contents of the WebAccess domain still displayed:

- 1 Right-click the WEBAC80A object, then click *Properties*.
- 2 Click *GroupWise > Identification*.

- 3 In the *Description* field, record the WebAccess resource group IP address and the cluster-unique port numbers used by the WebAccess Agent.
This information appears on the WebAccess Agent console, no matter which node in the cluster it is currently running on.
- 4 Click *OK* to save the WebAccess Agent information.
- 5 Continue with [Knowing What to Expect in WebAccess Failover Situations](#).

39.4.2 Knowing What to Expect in WebAccess Failover Situations

The failover behavior of the MTA for the WebAccess domain is the same as for an MTA in a regular domain. See [“Knowing What to Expect in MTA and POA Failover Situations”](#) on page 308.

The WebAccess Application caches users' credentials on the node where it is running. Therefore, if that node fails, or if the WebAccess Application migrates to a different node, the cached credentials are lost. Consequently, the user needs to restart the WebAccess client in order to re-authenticate and re-establish the credentials.

If the WebAccess Agent fails over or migrates, the user receives an error message that the WebAccess Agent is no longer available. However, after the WebAccess Agent starts in its new location, the WebAccess Application passes the cached user credentials to the WebAccess Agent and the user reconnects automatically without having to re-authenticate.

As with the MTA and the POA, migration of the WebAccess Agent takes longer than failover. However, the WebAccess Agent restarts quickly so that users are able to reconnect quickly.

39.4.3 Updating the WebAccess Agent Configuration File (commgr.cfg)

As part of installing WebAccess, the WebAccess Agent configuration file (`commgr.cfg`) is created in the following subdirectory:

```
domain\wpgate\webac80a
```

It is also automatically copied to the following Web server subdirectory:

```
drive:\novell\webaccess
```

If you change WebAccess agent configuration information (for example, if you change its IP address), the information is changed in the following file:

```
domain\wpgate\webac80a\commgr.cfg
```

because the domain is on the shared disk of a resource group, and it is changed in the following file:

```
drive:\novell\webaccess\commgr.cfg
```

on the node where the WebAccess Application is currently running. However, the other nodes in the Web server possible owners list are not currently available for update. Therefore, you must manually copy the updated `commgr.cfg` file to the `drive:\novell\webaccess` subdirectory on each node in the Web serve possible owners list.

39.5 WebAccess Clustering Worksheet

Item	Explanation
1) Resource Group for WebAccess Agent: Group name: Network name: IP address: Shared disk: Share name: MTA service resource: WebAccess Agent service resource: Possible owners	Specify the information for the WebAccess resource group. For more information, see “Planning the WebAccess Resource Group” on page 321 .
2) WebAccess Agent Domain Name: Domain Directory:	Specify a unique name for the WebAccess Agent domain. Specify the directory on the WebAccess Agent resource group disk where you want to create the new domain. For more information, see “Planning a New Domain for the WebAccess Agent” on page 320 .
3) MTA Installation Location: ♦ Shared disk of WebAccess resource group ♦ Each node in the cluster Consolidate MTA startup files?	Mark the location where you will install the MTA software. If necessary, specify the location where you will consolidate the MTA startup files on the shared disk of the WebAccess resource group. For more information, see “Deciding Where to Install the WebAccess Agent and Its MTA” on page 321 .
4) MTA Network Information: MTA IP address: MTA message transfer port: MTA live remote port: MTA HTTP port:	Gather the MTA network address information from the WebAccess section of the “Network Address Worksheet” on page 296 . For more information, see “Planning Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA” on page 321 .
5) WebAccess Agent Installation Location: ♦ Shared disk of WebAccess resource group ♦ Each node in the cluster	Mark the location where you will install the WebAccess Agent software. For more information, see “Deciding Where to Install the WebAccess Agent and Its MTA” on page 321 .
6) WebAccess Agent Network Information: WebAccess Agent IP address: WebAccess Agent HTTP port:	Gather the WebAccess Agent network address information from the WebAccess section of the “Network Address Worksheet” on page 296 . For more information, see “Planning Cluster-Unique Port Numbers for the WebAccess Agent and Its MTA” on page 321 .

Item	Explanation
7) Physical Web Servers:	List the servers in the cluster where you are installing the Web server for use with WebAccess. For more information, see “Setting Up Your Web Server in the Microsoft Cluster” on page 320.
8) Web Server IP Address:	Record the secondary IP address for the Web server in the cluster. For more information, see “Setting Up Your Web Server in the Microsoft Cluster” on page 320.
9) Hardware Virtual Server Information:	Record the hardware virtual server information for your shared disk system.
♦ Dedicated IP address:	For more information, see “Setting Up Your Web Server in the Microsoft Cluster” on page 320.
♦ Document root	

40 Implementing GroupWise Gateways in a Microsoft Cluster

A significant system configuration difference between a GroupWise system in a clustering environment and a GroupWise system in a regular environment is that you need to create a separate domain to house each GroupWise gateway. The gateway domain should be created in its own resource group. This enables the gateway to fail over independently from other GroupWise components.

If you have set up the Internet Agent or WebAccess in your clustered GroupWise system, you should already have the skills necessary to set up a GroupWise gateway as well.

GroupWise gateways that have not received recent development have not been thoroughly tested in a clustering environment. If you are currently using such GroupWise gateways, you might want to leave them outside of your cluster.

41 Monitoring a GroupWise System in a Microsoft Cluster

GroupWise Monitor is similar to WebAccess in that it relies on a Web server for communication with administrators' Web browsers. Consequently, the setup procedure for GroupWise Monitor in a Microsoft cluster is similar to the setup procedure for WebAccess. If you have set up WebAccess in your clustered GroupWise system, you should already have the skills necessary to set up GroupWise Monitor as well.

When you first install Monitor, it gathers information about agents to monitor from a domain database ([wpdomain.db](#)). This provides the resource group IP address of each agent. When an agent fails over or migrates to a different node, its status in Monitor displays as Not Listening until it is up and running again, at which time its status returns to Normal.

Because Monitor must use resource group IP addresses to monitor the agents in a clustered GroupWise system, the Discover Machine and Discover Network options do not work in a cluster. Resource group IP addresses cannot be obtained by examining the network itself. If you need to add agents to monitor, use the Add Agent option and provide the agent's resource group IP address.

For instructions on setting up GroupWise Monitor, see "[Installing GroupWise Monitor](#)" in the *GroupWise 8 Installation Guide*.

42 Backing Up a GroupWise System in a Microsoft Cluster

The issues involved in backing up a GroupWise system in a Microsoft cluster are the same as in backing up any GroupWise system that is running on Windows. If you want to back up your GroupWise system while it is running, you must use backup software that can back up open files. If your backup software cannot back up open files, then you must stop all GroupWise agents before running the backup and start them again when the backup is finished. This means that GroupWise users cannot be logged into their mailboxes while backups are running.

To find backup software that is compatible with GroupWise, see the *Novell Partner Product Guide* (<http://www.novell.com/partnerguid>).

43 Moving an Existing GroupWise 8 System into a Microsoft Cluster

If you are adding the high availability benefits of a Microsoft cluster to a GroupWise 8 system that is already up and running, the first step is to set up the cluster and review [Chapter 35, “Introduction to GroupWise 8 and Microsoft Clusters,” on page 281](#) to help you apply clustering principles and practices to your GroupWise system.

You do not need to transfer your entire GroupWise system into the cluster all at once. You could transfer individual post offices where the needs for high availability are greatest. You could transfer a domain and all of its post offices at the same time. You might decide that you don't need to have all of your GroupWise system running in the cluster.

This section provides a checklist to help you get started with moving your GroupWise system into a Microsoft cluster:

- Decide which shared disks you will use for GroupWise administration (ConsoleOne and the software distribution directory).
- Decide which shared disks you will use for GroupWise domains and post offices.
- Plan the resource groups for domains and post offices.
- Review [Chapter 36, “Planning GroupWise in a Microsoft Cluster,” on page 283](#). Fill out the “[System Clustering Worksheet](#)” on page 294 to help you decide which domains and post offices you will move to which shared disks.
- Review “[Planning Cluster-Unique Port Numbers for Agents in the Cluster](#)” on page 289 and fill out the “[Network Address Worksheet](#)” on page 296 to record resource group IP addresses and to specify cluster-specific port numbers for all of your GroupWise agents.
- Select the first shared disk that will be part of your clustered GroupWise system and set up the resource group for it, following the instructions in “[Creating GroupWise Resource Groups](#)” on page 299 and “[Configuring Short Name Resolution](#)” on page 300.
- Move a domain and/or post office onto the shared disk, following the instructions in “[Moving a Domain](#)” in “[Domains](#)” or “[Moving a Post Office](#)” in “[Post Offices](#)” in the *GroupWise 8 Administration Guide*.
- Review [Section 36.8, “Deciding How to Install and Configure the Agents in a Cluster,” on page 289](#), fill out the “[Agent Clustering Worksheet](#)” on page 297, and install the agents as needed for the first clustered domain and/or post office, following the instructions in [Section 37.5, “Installing and Configuring the MTA and the POA in a Cluster,” on page 304](#).
- Test the first component of your clustered GroupWise system following the instructions in [Section 37.6, “Testing Your Clustered GroupWise System,” on page 306](#).
- Take care of the cluster management details described in [Section 37.7, “Managing Your Clustered GroupWise System,” on page 306](#).

- ❑ Move more domains and post offices into the cluster as needed. If you have GroupWise libraries, see [Section 36.4, “Planning a New Library for a Clustered Post Office,”](#) on page 286.
- ❑ Move GroupWise administration into the cluster as needed.
- ❑ Add other components to your clustered GroupWise system as needed, following the instructions in:
 - ◆ [Chapter 38, “Implementing the Internet Agent in a Microsoft Cluster,”](#) on page 309
 - ◆ [Chapter 39, “Implementing WebAccess in a Microsoft Cluster,”](#) on page 319.
 - ◆ [Chapter 40, “Implementing GroupWise Gateways in a Microsoft Cluster,”](#) on page 331
 - ◆ [Chapter 41, “Monitoring a GroupWise System in a Microsoft Cluster,”](#) on page 333
 - ◆ [Chapter 42, “Backing Up a GroupWise System in a Microsoft Cluster,”](#) on page 335

44 Implementing Messenger in a Microsoft Cluster

Novell Messenger does not require the existence of a GroupWise system in your Microsoft cluster, but presumably one has already been set up as described in [Chapter 36, “Planning GroupWise in a Microsoft Cluster,”](#) on page 283 and [Chapter 37, “Setting Up a Domain and Post Office in a Microsoft Cluster,”](#) on page 299. As part of the process of setting up GroupWise in your cluster, you filled out the [“System Clustering Worksheet”](#) on page 294. Some of the information from this worksheet will be helpful as you implement Messenger in your cluster.

- ♦ [Section 44.1, “Planning Your Messenger System in a Cluster,”](#) on page 339
- ♦ [Section 44.2, “Setting Up Your Messenger System in a Cluster,”](#) on page 342
- ♦ [Section 44.3, “Messenger Clustering Worksheet,”](#) on page 343

44.1 Planning Your Messenger System in a Cluster

Because the Messenger agents are not associated with GroupWise domains or post offices, the Messenger agents are easier to implement in a cluster than are the GroupWise agents. [Section 44.3, “Messenger Clustering Worksheet,”](#) on page 343 lists all the information you need as you set up the Messenger agents in a clustering environment. You should print the worksheet and fill it out as you complete the tasks listed below:

- ♦ [Section 44.1.1, “Understanding Your Cluster,”](#) on page 339
- ♦ [Section 44.1.2, “Planning Messenger Administration,”](#) on page 339
- ♦ [Section 44.1.3, “Deciding Where to Install the Messenger Agent Software,”](#) on page 340
- ♦ [Section 44.1.4, “Planning the Messenger Agent Installation,”](#) on page 341

44.1.1 Understanding Your Cluster

Fill out items 1 and 2 in [Section 44.3, “Messenger Clustering Worksheet,”](#) on page 343 with information about your cluster. This information corresponds to items 1 and 2 on the [“System Clustering Worksheet”](#) on page 294 that you filled out for GroupWise. For background information, see [Section 36.1, “Setting Up Your Microsoft Cluster,”](#) on page 284.

44.1.2 Planning Messenger Administration

If you have set up a shared disk for GroupWise administration, as described in [Section 36.6, “Planning Shared Administrative Resources,”](#) on page 287, you can use the same shared disk for the Messenger administration files. For example, you might want to have a shared disk where you install the Messenger snap-in to ConsoleOne instead of installing it to multiple administrator workstations.

MESSENGER CLUSTERING WORKSHEET

Under [Item 5: Installation Location for Messenger Administration](#), mark whether you want to install the Messenger snap-in to ConsoleOne to administrator workstations or to a shared disk.

If you plan to install the Messenger snap-in to ConsoleOne to a shared disk, under [Item 6: Resource for Messenger Administration](#), list the network name and IP address of the shared disk, the physical disk name and file share for mapping to it, and the nodes in the cluster that it could fail over to.

44.1.3 Deciding Where to Install the Messenger Agent Software

In a Microsoft cluster, the Messenger agents must run as Windows services. When you install the Windows Messenger Agents, you can choose between two different installation locations:

Table 44-1 Messenger Agent Software Installation Locations

Location	Description
Each node in the cluster	The <code>c:\novell\nm</code> directory is the default installation location provided by the Messenger Installation program.
Shared disk	If you create a <code>drive:\novell\nm</code> directory on a shared disk, the Messenger agent software and startup files fail over and fail back along with supporting files such as the Messenger archive. IMPORTANT: You must install to a shared disk if you do not want a separate Messenger archive to be created on each node where the Archive Agent runs. If you do not want to use a shared disk, you should plan to install the Archive Agent separately outside the cluster.

Because the Messenger agents must be installed as Windows services in a Microsoft cluster, you must initially run the Messenger Installation program for each node in the cluster so that the Windows services for the agents get created, regardless of where you are planning to run the Messenger agents from. However, for updates, you need to run the Messenger Installation program only once if you are running the Messenger agents from a shared disk.

MESSENGER CLUSTERING WORKSHEET

Under [Item 3: Installation Location for Messenger Agents](#), mark whether you want to install the Messenger agent software to each node in the cluster or to a shared disk.

Continue with the planning instructions for the installation location you want to use:

- ♦ [“Planning the Messenger Agents on Each Node in the Cluster” on page 340](#)
- ♦ [“Planning the Messenger Agents on a Shared Disk” on page 341](#)

Planning the Messenger Agents on Each Node in the Cluster

Make sure you have filled out [item 2](#) on the Messenger Clustering Worksheet with a complete list of nodes in the cluster where you need to install the Messenger agents. Skip to [“Planning the Messenger Agent Installation” on page 341](#).

Planning the Messenger Agents on a Shared Disk

If you do not anticipate a large Messenger archive, you can use one Messenger shared disk. If you anticipate archiving a large number of messages so that the Messenger archive grows very large, you might want to have a separate Messenger shared disk for the Archive Agent and the archive database. The steps in this section cover setting up the Messenger agents on a single shared disk.

MESSENGER CLUSTERING WORKSHEET

Under [Item 4: Resource Group for Messenger Agents](#), plan the network name and IP address of the resource group, the physical disk and share name for mapping to it, the agent service names, and the nodes in the cluster where the Messenger resource group can fail over.

Continue with [Planning the Messenger Agent Installation](#).

44.1.4 Planning the Messenger Agent Installation

Aside from the cluster-specific issues discussed in the preceding sections, the considerations involved in planning to install the Messenger agents are the same in a clustering environment as for any other environment. Review “[Planning Your Novell Messenger System](#)”, then print and fill out the “[Novell Messenger Worksheet](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*. Transfer the following information from the Messenger Clustering Worksheet to the Messenger System Worksheet:

- ◆ For [Item 3: Installation Path](#) on the Messenger System Worksheet:
 - ◆ If you are installing the Messenger agents to each node in the cluster, use `c:\novell\nm`.
 - ◆ If you are installing the Messenger agents to a shared disk, use `drive:\novell\nm` where *drive* is the shared disk from [Item 4: Resource Group for Messenger Agents](#) on the Messenger Clustering Worksheet.
- ◆ Under [Item 12: Server Address](#) on the Messenger System Worksheet:
 - ◆ If you are installing the Messenger agents to each node in the cluster, use the cluster IP address from [Item 1: Cluster Identification](#) on the Messenger Clustering Worksheet.
 - ◆ If you are installing the Messenger agents to a shared disk, specify the Messenger resource group IP address from [Item 4: Resource Group for Messenger Agents](#) on the Messenger Clustering Worksheet.
- ◆ Under [Item 13: Configure Agents for Clustering?](#) on the Messenger System Worksheet, mark *No*. This applies to the Messenger Agents running with Novell Cluster Services, not in a Microsoft cluster.
- ◆ Under [Item 14: Admin Configuration](#) on the Messenger System Worksheet:
 - ◆ If you are installing the Messenger snap-in to ConsoleOne to an administrator workstation, use the location where ConsoleOne is already installed (typically `c:\novell\consoleone\version_number`).
 - ◆ If you are installing the Messenger snap-in to ConsoleOne to a shared disk, use `drive:\directory`, where *drive* is the shared disk from [Item 6: Resource for Messenger Administration](#) on the Messenger Clustering Worksheet and *directory* is typically `c:\novell\consoleone\version_number`.

Continue with [Setting Up Your Messenger System in a Cluster](#).

44.2 Setting Up Your Messenger System in a Cluster

You should have already reviewed [Section 44.1, “Planning Your Messenger System in a Cluster,”](#) on page 339 and filled out [Section 44.3, “Messenger Clustering Worksheet,”](#) on page 343 and the “Novell Messenger Worksheet” in the *Novell Messenger 2.1 Installation Guide*. Follow the instructions for the installation location you have chosen:

- ♦ [Section 44.2.1, “Installing the Messenger Agents to Each Node in the Cluster,”](#) on page 342
- ♦ [Section 44.2.2, “Installing the Messenger Agents to a Shared Disk,”](#) on page 342

44.2.1 Installing the Messenger Agents to Each Node in the Cluster

- 1 Follow the steps provided in “Starting the Messenger Installation Program” and “Creating Your Messenger System” in “Installing a Novell Messenger System” in the *Novell Messenger 2.1 Installation Guide* for each node in the cluster.
- 2 After you have installed the software to each node in the cluster, if you selected Yes for *Consolidate Startup Files?* (under [Messenger Clustering Worksheet item 3](#)), copy the Messenger agent startup files to the planned location on the shared disk, then delete them from the `c:\novell\nm\ma` and `c:\novell\nm\aa` directories on each node to avoid future confusion.
- 3 Make each node in the cluster active to make sure that the Messenger agents start successfully on each node.
- 4 Continue setting up your Messenger system following the instructions in “What’s Next” in “Installing a Novell Messenger System” in the *Novell Messenger 2.1 Installation Guide*.

44.2.2 Installing the Messenger Agents to a Shared Disk

Complete the following tasks to set up your Messenger system on a shared disk:

- ♦ [“Setting Up the Messenger Resource Group”](#) on page 342
- ♦ [“Running the Messenger Installation Program”](#) on page 342
- ♦ [“Testing the Clustered Messenger Agents”](#) on page 343

Setting Up the Messenger Resource Group

- 1 Create the Messenger resource group and agent services resources ([Messenger Clustering Worksheet item 4](#)), as planned in “Planning the Messenger Agents on Each Node in the Cluster” on page 340.
- 2 To ensure successful short name resolution, add entries for the Messenger network name to support your preferred methods of short name resolution, as described in “Configuring Short Name Resolution” on page 300.
- 3 Continue with [Running the Messenger Installation Program](#).

Running the Messenger Installation Program

- 1 If necessary, map a drive to the shared disk for Messenger administration ([Messenger Clustering worksheet item 6](#)) where you will install the Messenger snap-ins to ConsoleOne.
- 2 Map a drive to the shared disk of the Messenger resource group ([Messenger Clustering Worksheet item 4](#)) where you will install the Messenger agent software.

- 3 Map a drive to c:\ on the first node in the cluster ([Messenger Clustering Worksheet item 2](#)) where you will set up the Messenger agents as a Windows services.
- 4 Start the Messenger Installation program, following the steps provided in “[Starting the Messenger Installation Program](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*.
- 5 Install the Windows Messenger agents, keeping in mind the following cluster-specific details:
 - ♦ Use the Novell Messenger System Worksheet that you filled out in “[Planning the Messenger Agent Installation](#)” on page 109 to fill in the fields during the Messenger installation process.
 - ♦ When you specify the Messenger installation directory, be sure to browse to the location through the drive mapped in [Step 2](#) above.
 - ♦ When you specify the ConsoleOne directory, be sure to browse to the location through the drive mapped in [Step 1](#) above.
 - ♦ On the Setup Complete page, do not select *Launch Agents Now*.
- 6 Repeat [Step 4](#) and [Step 5](#), mapping a drive to each node in the cluster.
Initially, you need to repeat the installation process for each node so that the Messenger agents are set up as Windows services on each node. For updates, you need to install only once to the shared disk.
- 7 Continue with [Testing the Clustered Messenger Agents](#).

Testing the Clustered Messenger Agents

After you have set up the Messenger agents on a shared disk in your Microsoft cluster, you can test them by manually bringing the Messenger resource group online and taking it offline again.

Continue setting up your Messenger system following the instructions in “[What’s Next](#)” in “[Installing a Novell Messenger System](#)” in the *Novell Messenger 2.1 Installation Guide*.

44.3 Messenger Clustering Worksheet

Item	Explanation
1) Cluster Identification:	Record the name and IP address of your Microsoft cluster.
Cluster name:	For more information, see Section 36.1, “Setting Up Your Microsoft Cluster,” on page 284.
Cluster IP address	
2) Nodes in Cluster:	List the servers that are included in your Microsoft cluster.
	For more information, see Section 36.1, “Setting Up Your Microsoft Cluster,” on page 284.
3) Installation Location for Messenger Agents:	Mark the location where you will install the Messenger agent software.
♦ Each node in the cluster Consolidate startup files?	For more information, see “ Deciding Where to Install the Messenger Agent Software ” on page 340.
♦ Shared disk	

Item	Explanation
<p>4) Resource Group for Messenger Agents</p> <p>Network name: IP address: Physical disk: File share: Messaging Agent service: Archive Agent service: Possible owners</p>	<p>If you plan to install the Messenger agent software to a shared disk, provide the information about the shared disk you want to use.</p> <p>For more information, see “Planning the Messenger Agents on a Shared Disk” on page 341.</p>
<p>5) Installation Location for Messenger Administration:</p> <ul style="list-style-type: none"> ◆ Administrator workstation(s) ◆ Shared disk 	<p>Mark the location where you want to install the Messenger snap-in to ConsoleOne.</p> <p>For more information, see “Planning Messenger Administration” on page 339.</p>
<p>6) Resource for Messenger Administration:</p> <p>Network name: IP address: Physical disk: File share: Possible owners</p>	<p>If you want to install the Messenger snap-in to ConsoleOne to a shared disk, provide the required information about the shared disk you want to use.</p> <p>For more information, see Section 36.6, “Planning Shared Administrative Resources,” on page 287.</p>
<p>7) IP Address Resolution Methods:</p> <ul style="list-style-type: none"> ◆ eDirectory ◆ hosts file ◆ DNS 	<p>Mark the short name address resolution methods you want to implement to ensure that the UNC paths stored in ConsoleOne with network names can be successfully resolved into physical network addresses.</p> <p>For more information, see Section 36.7, “Ensuring Successful Name Resolution for GroupWise Resource Groups,” on page 287.</p>

VIII Non-GroupWise E-Mail Clients

If your users already have a common POP, IMAP, or SOAP e-mail client that comes with Linux or Windows, they can continue to use it to access their GroupWise mailboxes. Users of non-GroupWise e-mail clients retain the feature sets of their familiar e-mail clients, but many GroupWise features are not available to such users because they are not offered in POP, IMAP, and SOAP e-mail clients. For example, calendaring is available only if the POP, IMAP, or SOAP client supports iCal.

- ♦ [Chapter 45, “Outlook Express,” on page 347](#)
- ♦ [Chapter 46, “Microsoft Outlook,” on page 349](#)
- ♦ [Chapter 47, “Evolution,” on page 351](#)

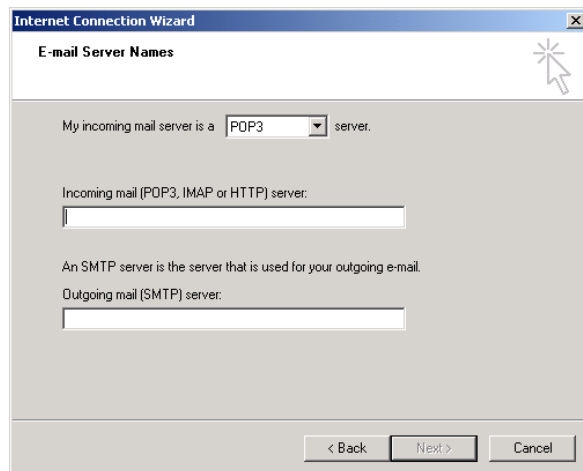
45 Outlook Express

The GroupWise Internet Agent is required in order for users to access their mailboxes using non-GroupWise clients. If you have not already installed the Internet Agent, follow the instructions in the [GroupWise 8 Installation Guide](#).

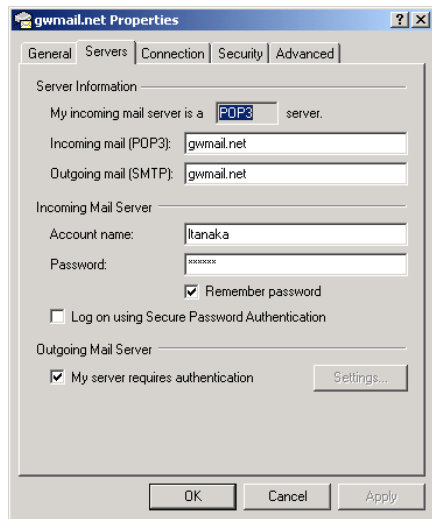
In order for users to access their GroupWise mailboxes from a third-party e-mail client, they must configure their e-mail clients to access their GroupWise accounts. For example, Outlook Express users would follow steps similar to the following:

NOTE: Steps might vary depending on the versions of Windows and Outlook Express installed on the workstation.

- 1 In Outlook Express, click *Tools > Accounts > Add > Mail*.
- 2 Follow the prompts and provide personal information until you are prompted for the e-mail server information.



- 3 Select *POP3* or *IMAP* as your incoming mail server type.
- 4 In the *Incoming* and *Outgoing Mail* fields, specify the IP address or hostname of your outgoing mail server, then click *Next*.
- 5 Continue following the prompts and providing personal information until the new account has been set up in Outlook Express.
- 6 Click *Tools > Accounts*.
- 7 Select the new account you just created, then click *Properties > Servers*.



- 8 Select *My Server Requires Authentication*, then click *OK*.

The default setting for server authentication is *Use Same Settings as My Incoming Mail Server*, so you do not need to change any settings.

- 9 To access your GroupWise mailbox in Outlook Express, click *Tools > Send and Receive*.
- 10 Click the IP address or hostname of your mail server.
- 11 Provide your username and password, then click *OK*.

46 Microsoft Outlook

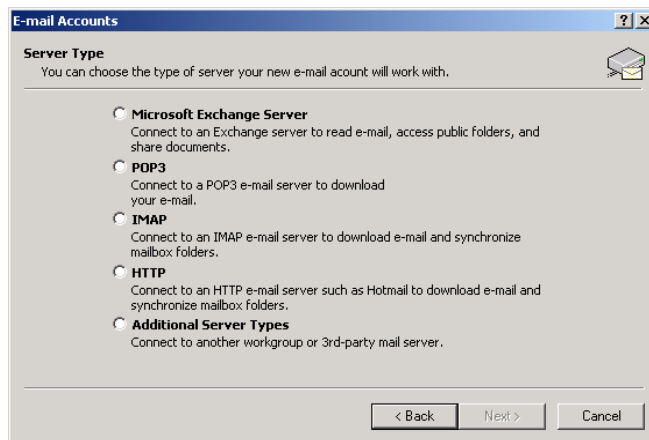
The GroupWise Internet Agent is required in order for users to access their mailboxes using non-GroupWise clients. If you have not already installed the Internet Agent, follow the instructions in the *GroupWise 8 Installation Guide*, available on the [GroupWise 8 Documentation Web site \(http://www.novell.com/documentation/gw8\)](http://www.novell.com/documentation/gw8).

If your users have been using the Microsoft Outlook e-mail client that comes with Microsoft Office, they can continue to use POP or IMAP in it to access their GroupWise mailboxes.

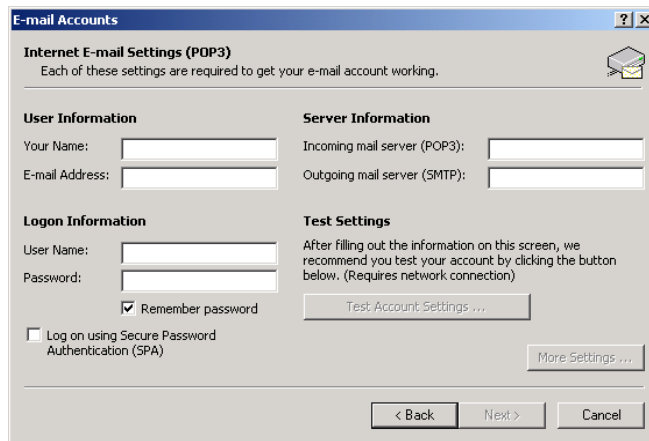
In order for users to access their GroupWise mailboxes from Outlook, they must configure Windows to access their GroupWise accounts. For example, Outlook users would follow steps similar to the following.

NOTE: Steps might vary depending on the versions of Windows and Outlook installed on the workstation.

- 1 In the Windows Control Panel, double-click *Mail*.
- 2 Click *Show Profiles > Add* to add a new profile for your GroupWise account.
- 3 Type a name for the new profile, then click *OK*.
- 4 Select *Add a New E-Mail Account*, then click *Next*.



- 5 Select *POP3* or *IMAP* as your incoming mail server type, then click *Next*.



- 6 Provide the e-mail account settings for the type of server you selected.
- 7 Click *Test Account Settings* to make sure that you have provided the information correctly.
- 8 Click *Next*, then click *Finish*.

You can now access your GroupWise mailbox using Microsoft Outlook by selecting the profile you just created.

47 Evolution

Evolution makes the tasks of storing, organizing, and retrieving your personal information easy, so you can work and communicate more effectively with others. It's a highly evolved groupware program, an integral part of the Internet-connected desktop.

Evolution can help you work in a group by handling e-mail, address, and other contact information, and one or more calendars. It can do that on one or more computers, connected directly or over a network, for one person or for large groups.

With Evolution, you can accomplish your most common daily tasks quickly. For example, it takes only one or two clicks to enter appointment or contact information sent to you by e-mail, or to send e-mail to a contact or appointment. People who get lots of e-mail will appreciate advanced features like vFolders, which let you save searches as though they were ordinary e-mail folders.

If you have Evolution 2.4 or later installed, you can access accounts on Novell GroupWise 8.

- ♦ [Section 47.1, "GroupWise Features Available in Evolution," on page 351](#)
- ♦ [Section 47.2, "Configuring Evolution," on page 352](#)

47.1 GroupWise Features Available in Evolution


Evolution connecting to GroupWise supports the following basic GroupWise features:

- ♦ Mail
 - ♦ View mail and folders stored on the GroupWise system.
 - ♦ Send mail from you GroupWise account.
 - ♦ Convert mail to a task or meeting.
- ♦ Calendar
 - ♦ Send and receive appointment and meeting requests. Allows Evolution users to schedule meetings and view attendee availability for other users on GroupWise.
 - ♦ Receive an iCalendar meeting request and add it to your calendar. It is saved to your GroupWise calendar.
- ♦ Contacts
 - ♦ Address Completion is supported for your GroupWise address books, including the corporate address book, the Frequent Contacts address book, and your personal address book.
 - ♦ Adding vCards to the Address Book. If you receive a vCard attachment and click *Save in Address Book*, it is saved to your Personal address book. New Address Book entries can be added to your Personal address book from received e-mail messages with a single click.
- ♦ Proxy
 - ♦ Assign Proxy access to other users.
 - ♦ View other users' accounts through Proxy access.

47.2 Configuring Evolution

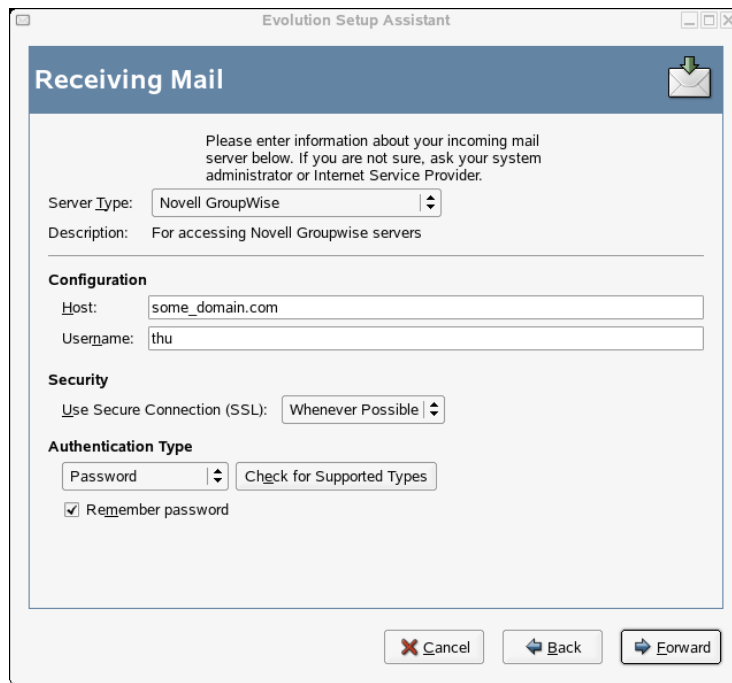
In order for users to access their GroupWise mailboxes from Evolution, they must configure Evolution to access their GroupWise accounts.

- 1 Click *Edit > Preferences*, then click *Mail Accounts*.
- 2 Click *Add*.
- 3 On the Identity page, type your e-mail address, then click *Forward*.



The screenshot shows the 'Identity' page of the Evolution Setup Assistant. The window title is 'Evolution Setup Assistant'. The page has a blue header with the word 'Identity' and a small icon. Below the header, there is a text box that says: 'Please enter your name and email address below. The "optional" fields below do not need to be filled in, unless you wish to include this information in email you send.' Underneath, there are two sections: 'Required Information' and 'Optional Information'. In the 'Required Information' section, there are two text boxes: 'Full Name:' with the value 'Tabitha Hu' and 'Email Address:' with the value 'thu@Corporate.com'. In the 'Optional Information' section, there is a checked checkbox labeled 'Make this my default account', and two more text boxes: 'Reply-To:' and 'Organization:'. At the bottom of the window, there are three buttons: 'Cancel' (with a red X icon), 'Back' (with a left arrow icon), and 'Forward' (with a right arrow icon).

- 4 On the Receiving Mail page, select *Novell GroupWise* as your server type.
- 5 Type the name of your mail server, your user name, and select whether to use SSL.



- 6 Click *Forward*.
- 7 On the Receive Options page, select if you want Evolution to automatically check for new mail. If you select this option, you need to specify how often Evolution should check for new messages.
- 8 Select if you want to check for new messages in all folders.
- 9 Select if you want to apply filters to new messages in the Inbox on the server.
- 10 Select if you want to check new messages for junk content.
- 11 Select if you want to only check for junk messages in the Inbox folder.
- 12 Select if you want to automatically synchronize remote mail locally.
- 13 Type your Post Office Agent SOAP port number in the *Post Office Agent SOAP Port* field, then click *Forward*.
If you are unsure of what your Post Office Agent SOAP port number is, contact your system administrator.
- 14 On the Account Management page, type the name for the account, then click *Forward*.
- 15 Click *Apply*.

IX Mobile Devices

If you own a mobile device, you can synchronize it with GroupWise. GroupWise has provided GroupWise Mobile Server for synchronizing several of the most common device. In addition, GroupWise has teamed up with BlackBerry for synchronizing of BlackBerry devices.

- ♦ [Chapter 48, “Novell Data Synchronizer Mobility Pack,” on page 357](#)
- ♦ [Chapter 49, “BlackBerry Enterprise Server,” on page 359](#)

48 Novell Data Synchronizer Mobility Pack

Using Novell Data Synchronizer, you can synchronize e-mail and other Personal Information Manager (PIM) data from Novell GroupWise to mobile devices. The Mobility Pack includes Data Synchronizer, the GroupWise Connector, and the Mobility Connector. Additional connectors can be added to a Synchronizer system to synchronize GroupWise data to other supported applications.

For more information, see:

- ♦ [Novell Data Synchronizer documentation Web page \(http://www.novell.com/documentation/datasynchronizer1\)](http://www.novell.com/documentation/datasynchronizer1)
- ♦ [Novell Data Synchronizer Connectors documentation Web page \(http://www.novell.com/documentation/datasync_connectors1\)](http://www.novell.com/documentation/datasync_connectors1)

49 BlackBerry Enterprise Server

Novell and Research In Motion collaborate to deliver stellar support to the thousands of customers accessing GroupWise on BlackBerry devices. This partnership has resulted in strong solutions for end users and administrators alike.

The BlackBerry Enterprise Solution provides a complete wireless platform that allows organizations to extend their Novell GroupWise messaging application and other enterprise tools to mobile professionals. The BlackBerry Enterprise Solution provides users with mobile access to e-mail, instant messaging (IM), calendar, personal information management (PIM) and applications - all from a single wireless device. In addition, with BlackBerry push technology, these users are automatically sent up-to-date information while they're on the go.

BlackBerry Enterprise Server software is an important element of the BlackBerry Enterprise Solution. It is designed to provide IT departments with simplified management and centralized control of wireless devices in a secure, scalable and flexible architecture. BlackBerry Enterprise Server v.4.1 for Novell GroupWise includes several new features to enhance end user productivity and back-end administration. These features include Novell Messenger support, enhanced support for PowerPoint and Web Doc attachments, group- and role-based administration, localized data pass-through and SMS/PIN/call log auditing.

For more information about BlackBerry Enterprise Server for Novell GroupWise, see the [BlackBerry Enterprise Server for Novell GroupWise product Web site](http://na.blackberry.com/eng/services/business/server/full/) (<http://na.blackberry.com/eng/services/business/server/full/>).

For documentation, see the [BlackBerry Enterprise Server for Novell GroupWise product documentation Web site](http://docs.blackberry.com/en/admin/subcategories/?userType=2&category=BlackBerry+Enterprise+Server+for+Novell+GroupWise) (<http://docs.blackberry.com/en/admin/subcategories/?userType=2&category=BlackBerry+Enterprise+Server+for+Novell+GroupWise>).

For GroupWise-specific BlackBerry articles, look up "GroupWise" in the [BlackBerry Technical Solution Center](http://na.blackberry.com/eng/support). (<http://na.blackberry.com/eng/support>)

For support information, look up "GroupWise" in the [BlackBerry Technical Knowledge Center](http://www.blackberry.com/knowledgecenterpublic/livelink.exe) (<http://www.blackberry.com/knowledgecenterpublic/livelink.exe>).

X Documentation Updates

This section lists updates to the *GroupWise 8 Interoperability Guide* that have been made since the initial release of GroupWise 8. The information helps you to keep current on documentation updates and, in some cases, software updates (such as a Support Pack release).

The information is grouped according to the date when the *GroupWise 8 Interoperability Guide* was republished. Within each dated section, the updates are listed by the names of the main table of contents sections.

The *GroupWise 8 Interoperability Guide* has been updated on the following dates:

- ♦ [Appendix A, “June 26, 2012 \(GroupWise 8 SP3\),” on page 363](#)
- ♦ [Appendix B, “December 9, 2010 \(Compatibility with Vibe OnPrem 3\),” on page 365](#)
- ♦ [Appendix C, “July 14, 2010 \(GroupWise 8 SP2\),” on page 367](#)
- ♦ [Appendix D, “August 31, 2009 \(GroupWise 8 SP1\),” on page 369](#)

A June 26, 2012 (GroupWise 8 SP3)

Location	Change
Novell Cluster Services on Linux	
Part II, "Novell Cluster Services on Linux," on page 117	Updated the examples of load and unload scripts for the MTA, POA, and GWIA.
Section 15.1.2, "Selecting the Internet Agent Partition and Secondary IP Address," on page 154 and "Forcing Use of the Internet Agent Secondary IP Address" on page 167	Emphasized the importance of exclusively binding the Internet Agent to the secondary IP address on its server.
Novell Vibe	
Part III, "Novell Vibe," on page 231	Updated for the product name change from Novell Vibe OnPrem to Novell Vibe.
Chapter 24, "Accessing Your Vibe Site from the GroupWise Client," on page 237	Emphasized that users must provide their GroupWise email address in their Vibe profile in order to take advantage of GroupWise/Vibe integration.

B December 9, 2010 (Compatibility with Vibe OnPrem 3)

Location	Change
Novell Vibe OnPrem	
Part III, "Novell Vibe," on page 231	Updated for the product name change from Novell Teaming to Novell Vibe OnPrem.

C July 14, 2010 (GroupWise 8 SP2)

Location	Change
Novell Cluster Services on NetWare	
“Modifying the Volume Resource Load Script for the Agents” on page 48	Added a link to a helpful TID.
“Modifying the Volume Resource Load Script for the Internet Agent” on page 69	Added a link to a helpful TID.
“Modifying the Volume Resource Load Script for the WebAccess Agent” on page 87	Added a link to a helpful TID.
Novell Cluster Services on Linux	
“Modifying the Cluster Resource Unload Script for the Agents” on page 143	Changed the recommended commands for unloading the MTA and POA on an NSS volume or in a shared pool.
“Modifying the Cluster Resource Unload Script for the Internet Agent and Its MTA” on page 165	Changed the recommended commands for unloading the Internet Agent and its MTA on an NSS volume or in a shared pool.
“Modifying the Cluster Resource Unload Script for the WebAccess Agent and Its MTA” on page 185	Changed the recommended commands for unloading the WebAccess Agent and its MTA on an NSS volume or in a shared pool.
“Modifying the Cluster Resource Unload Script for the Monitor Agent” on page 202	Changed the recommended commands for unloading the Monitor Agent on an NSS volume or in a shared pool.
Novell Conferencing	
Part IV, “Novell Conferencing,” on page 243	Updated the documentation links to the new version of Novell Conferencing.
Novell ZENworks	
Chapter 28, “Using ZENworks 10 Configuration Management to Distribute the GroupWise Windows Client,” on page 251	Added instructions for installing the GroupWise Windows client using ZENworks 10 Configuration Management.
Section 29.1, “Installing Supporting Applications,” on page 257	Added instructions for meeting prerequisites when installing the GroupWise Windows client using ZENworks 7 Desktop Management.

Location	Change
Mobile Devices	
Chapter 48, "Novell Data Synchronizer Mobility Pack," on page 357	Replaced the documentation links to GroupWise Mobile Server documentation with links to the Novell Data Synchronizer Mobility Pack documentation. Synchronizer is the next generation of mobile device support for GroupWise users.

D August 31, 2009 (GroupWise 8 SP1)

Location	Change
Novell Cluster Services on NetWare	
Section 16.1, "Understanding the WebAccess Components," on page 175	Emphasized that if you have not clustered your Web server, you can install the WebAccess Application on a Web server that is outside the cluster where the WebAccess Agent is installed.
Novell Cluster Services on Linux	
Chapter 18, "Backing Up a GroupWise System in a Linux Cluster," on page 209	Added information about using the GroupWise Target Service Agent for File Systems (TSAFSGW) on Linux.
Microsoft Clustering Services on Windows	
Section 36.5, "Planning GroupWise Resource Groups," on page 286	Explained that multiple Internet Agents or multiple WebAccess Agents cannot run on the same node at the same time.
Mobile Devices	
Chapter 49, "BlackBerry Enterprise Server," on page 359	Added links to BlackBerry documentation and support sites.
