

HP OpenView Smart Plug-in for Microsoft® Active Directory

Configuration Guide

Version: B.03.10

Windows® Operating System



April 2005

© Copyright 2005 Hewlett-Packard Development Company, L.P.

Legal Notices

Warranty

Hewlett-Packard makes no warranty of any kind with regard to this document, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Hewlett-Packard shall not be held liable for errors contained herein or direct, indirect, special, incidental or consequential damages in connection with the furnishing, performance, or use of this material.

A copy of the specific warranty terms applicable to your Hewlett-Packard product can be obtained from your local Sales and Service Office.

Restricted Rights Legend

Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause in DFARS 252.227-7013.

Hewlett-Packard Company
United States of America

Rights for non-DOD U.S. Government Departments and Agencies are as set forth in FAR 52.227-19(c)(1,2).

Copyright Notices

©Copyright 1983-2005 Hewlett-Packard Development Company, L.P., all rights reserved.

No part of this document may be copied, reproduced, or translated into another language without the prior written consent of Hewlett-Packard Company. The information contained in this material is subject to change without notice.

Trademark Notices

Microsoft®, Windows®, and Windows NT® are U.S. registered trademarks of Microsoft Corporation.

Pentium® is a U.S. registered trademark of Intel Corporation.

UNIX® is a registered trademark of The Open Group.

All other product names are the property of their respective trademark or service mark holders and are hereby acknowledged.

Support

Please visit the HP OpenView web site at:

<http://www.managementsoftware.hp.com/>

This web site provides contact information and details about the products, services, and support that HP OpenView offers.

You can also go directly to the support web site at:

<http://support.openview.hp.com/>

HP OpenView online software support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valuable support customer, you can benefit by using the support site to:

- Search for knowledge documents of interest
- Submit and track progress on support cases
- Manage a support contract
- Look up HP support contacts
- Review information about available services
- Enter discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HP Passport user and log in. Throughout the site, access levels are indicated by the following icons:

 HP Passport

 Active contract

 Premium contract

To find more information about access levels, go to the following URL:

http://support.openview.hp.com/access_level.jsp

To register for an HP Passport ID, go to:

<https://passport2.hp.com/hpp/newuser.do>

contents

Chapter 1	Introducing the Active Directory SPI	7
	What the Active Directory SPI Does	7
	Components of the Active Directory SPI	8
	Active Directory SPI Policy Group Descriptions	9
	What to Expect After Installing AD-SPI	12
	The Services and Components Discovered by the Active Directory Smart Plug-in (AD-SPI)	13
	The Topology Viewer Tool	18
Chapter 2	Upgrading/Installing the Active Directory SPI	19
	Before Starting	20
	Upgrading the Active Directory SPI	21
	Prepare to Upgrade the New AD-SPI	21
	Upgrade to the New AD-SPI	22
	Installing the Active Directory SPI	26
	Obtaining a License/Password	33
	Using Method #1, Install the License Key Using an Internet Connection	34
	Using Method #2, Retrieve the License Key from a File	35
	Uninstalling the Active Directory SPI	40
Chapter 3	Using the Active Directory SPI	43
	Auto-Deploy Policies	44
	Replication Monitoring	44
	FSMO Monitoring (Flexible Single Master Operations)	45
	Directory Information Tree Monitoring	48

Domain Name Server Monitoring	48
Global Catalog Monitoring	50
Sysvol Monitoring	50
Response Time Monitoring	51
Trust Monitoring	52
Manual-Deploy Policies	54
Basic Policy Modifications	54
The OpenView Topology Viewer	55
Getting Started with the OV Topology Viewer	59
Accessing Server and Map Properties	64
Chapter 4 Reporting and Graphing	67
AD-SPI Reports and Data Sources	68
Using AD-SPI with OpenView Reporter	76
AD-SPI Graphs and Data Sources	77
Chapter 5 Troubleshooting	81
Problem Solving with Self-Healing Services	81
Detecting Problems Through Tracing	82
Graphing Problems	84
Reporting Problems	85
Index	87

Introducing the Active Directory SPI

This chapter introduces you to the HP OpenView Smart Plug-in for Microsoft Active Directory, offering an overview of its functions and components. The chapter covers the following:

- “What the Active Directory SPI Does” on page 7
- “Components of the Active Directory SPI” on page 8
- “What to Expect After Installing AD-SPI” on page 12

What the Active Directory SPI Does

The Smart Plug-in (SPI) for Active Directory adds single master operations, replication, DNS, DIT, GC and trust monitoring/mapping capabilities to OpenView Operations for Windows. The Active Directory SPI keeps you informed of Active Directory-related conditions occurring across the network so that you can view your environment and be continually updated on the following:

- Data is consistent across all Domain Controllers.
- Replication is successfully completing in a timely manner.
- Systems are able to cope with outages.
- All role masters are running.
- Domain controllers are not contending with overly utilized CPUs.

- Active Directory is not experiencing capacity and fault-tolerance issues.
 - Active Directory global catalog is replicating in a timely manner.
 - Services, events, processes, and synchronizations are at acceptable performance levels.
 - Index and query activities for authentications, LDAP client sessions, etc., are occurring at acceptable levels.
 - Trust relationship status between sites and DCs is as expected.
 - Forests, sites, domain controllers appear as expected in both hierarchical and map renderings through the OpenView Topology Viewer tool (included with the Active Directory SPI).
- ▶ The OpenView Topology Viewer also allows you to view the Exchange environment if you are also running the Exchange SPI.

Components of the Active Directory SPI

The Active Directory SPI (AD-SPI) components include *policies* for service monitoring, *tools* for graphical displays of site/server connections, updating information on domain controllers, and troubleshooting AD-SPI, and finally *reports* and *graphs* for consolidating and charting the collected data.

Policies: AD-SPI *policies* allow you to control the monitoring schedule and receipt of collected information in the form of *service problem alerts* and *messages*. AD-SPI service map alerts are shown in the OVO service map, while AD-SPI *messages* are available in the OVO message browser.

Tools: The AD-SPI includes tools as follows:

- The **OpenView Topology Viewer:** This tool provides you with a simple means for viewing the content and topology of your Active Directory domains and sites, rearranging objects on the map, and saving the layout you have arranged on the map. When launched and connected to a domain controller, the OpenView Topology Viewer generates a tree showing your Active Directory components as well as a graphical map that shows the Active Directory site(s), forest(s), domains, and DC replication connections.

- The **AD DC Demotion Preparation** *tool* is used in preparation for a domain controller demotion. This tool should be used only after you have installed and configured the Active Directory SPI and begun to use it to monitor DCs in your Active Directory environment. In preparation of a domain controller demotion, you use this tool to disable the Active Directory SPI from continuing to monitor the demoted DC.
- The **AD Trust Relationships** *tool*, when launched on an Active Directory managed node, generates information about the domain controller and its trust relationship within its domain that includes trust type, trust status, and the tree (in the OV console) in which it resides.
- The **AD Self-Healing Info** *tool*, when launched on an Active Directory managed node, collects error-related logfile entries that you can send to HP support for assistance in solving operations issues with AD-SPI.

Reports and Graphs: AD-SPI integrates with OVO's *reporting/graphing* capabilities to produce Web-based, management-ready reports as well as graphs. While AD-SPI *message and service map alerts* provide you with information about present conditions on specific managed nodes, the OVO reporting and graphing provide you an overview, helpful in determining needs for the long-term.

Active Directory SPI Policy Group Descriptions

Two major subfolders for Active Directory SPI policies are located under *Policy Groups*→*SPI for Active Directory*; they are **Auto-Deploy** and **Manual-Deploy**. The Auto-Deploy folder contains policies that are automatically deployed to any system running Active Directory after services relevant to them are discovered. The Manual-Deploy folder contains policies that you must “push” out to the managed nodes as needed. Many of these policies may have already been deployed as a result of the Windows OS

discovery that runs automatically when system nodes are added to the Managed Nodes folder (please see the *OpenView Operations/Performance Installation Guide* following your OVO for Windows installation).



The Manual-Deploy policies are also available in the OVO for Windows Core SPI policies. The Windows OS SPI service discovery automatically discovers the Active Directory services associated with these policies, but deployment of the policies is not automatic. You can deploy these policies as necessary either individually or as a group.

- **Auto-Deploy** policy subgroups and their functions are as follows:
 - **Discovery:** AD-SPI includes *service discovery* policies that can detect *DIT, DNS, FSMO, replication, global catalog, and trust services/* components running on OVO-managed nodes. These discovered services augment the topology already created through the OVO Windows discovery (included with OVO).
 - **DIT Monitoring.** (Size and activity) Checks the size of the Active Directory database known as the directory information tree (DIT) and monitors the amount of free space. Also tracks the number of operations pending against the DIT.
 - **DNS Monitoring** (Configuration/Connectivity). DNS monitoring policies check the existence, visibility, and validity of various service resource records on a DNS server. The SRV records enable DNS clients to locate specific services available on other servers; when a DNS policy encounters missing or incorrect information, it sends an alert to the OVO message browser. Other policies check the responsiveness and availability of specific DNS servers and DNS services used by Active Directory.
 - **FSMO Monitoring** (Operations Masters general responsiveness and role movement). Through bind/ping, monitors general responsiveness of operations master services and master role movement among domain controllers that includes domain naming, schema master response, infrastructure master, schema master, PDC master, and RID master (RID pool requests).
 - **Replication Latency.** Replication policies can measure the time required to propagate a change to all domain controllers within the domain. In addition, a policy can also monitor the replication time of

inter-site and intra-site replication latency. Replication policies are run regularly in order to modify an Active Directory latency object to determine acceptable/unacceptable response times/conditions.

- **Response Time.** Response time policies measure the general responsiveness of Active Directory as well as the responsiveness of global catalog binds and queries.
- **Global Catalog Replication.** These policies measure the time required for the global catalog to replicate from two perspectives: (1) a domain controller providing the service (GC) and (2) a domain controller accessing the service (DC).
- **Sysvol Monitoring.** These policies monitor Sysvol file replication service [FRS], Sysvol size, connectivity, and synchronization with Group Policy Objects [GPOs], all of which are major indicators of Active Directory health.
- **Trust Monitoring (for Windows 2003 systems only):** These policies monitor trust health and gather data that allows the Trust Relationships tool to provide updates in changes within trust relationships.

Manual-Deploy policy subgroups/functions are as follows (please refer to the Smart Plug-in for Windows OS online Help for descriptions of the individual policies):

- **Connector policies (9):** These policies use Active Directory Connector performance monitor counters to check activities occurring around connection issues involving logon authentication, pages in memory (working set), page faults, warnings, errors, and processing time.
- **Domain and OU Structure policies (2):** These policies monitor domain and organization unit (OU) changes.
- **Directory Services Access policies (3):** These policies monitor Directory Services servers, gathering data from their performance monitor counters in regards to reads/writes/searches of the directory.
- **Health Monitors policies (20):** These policies check areas of Active Directory involving services, events, processes, and synchronizations essential to its acceptable performance. Key services and their associated processes include Kerberos Key Distribution Center (KDC),

NetLogon, NT LM Security Support Service, PolicyAgent, directory, and Security Account Manager. Log monitoring checks for the occurrence of specific events in the Windows Event Log and the System log.

- **Index and Query policies (5):** Monitors index and query activity for authentications, LDAP client sessions, etc.
- **Replication (Manual-Deploy) policies (5):** Monitors replication through measurement of inbound objects between and within sites, verification of synchronization of replication updates, pending updates, and queue size in replication inbound objects.
- **Replication Activity policy (1):** Monitors the Directory Service log for replication events.
- **Security policies (10):** Monitors (a) Security event logs for Active Directory related events, (b) Security group changes, (c) performance monitor counters associated with Security.
- **Site Structure policy (1):** Monitors the Active Directory Site to ensure that IP subnets are not being added, changed, or deleted unnecessarily.

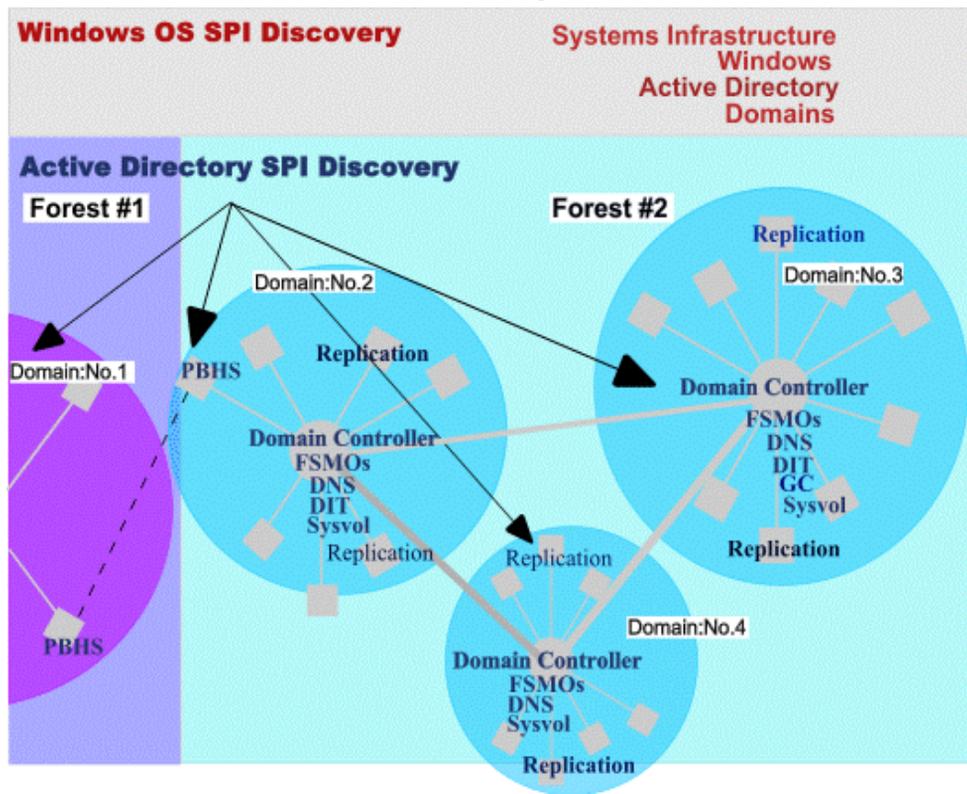
What to Expect After Installing AD-SPI

Like other Smart Plug-ins, the Active Directory SPI adds specific monitoring capabilities to OVO. After you have performed all steps required for installation and configuration of the AD-SPI, discovery occurs and the OVO console displays services in both the details (left) and content (right) panes. Within the details pane, the hierarchy expands to show the specific services present on each domain controller (DC). Likewise, the service map now includes another level of detail below each DC. In addition in the console tree, you will see all Active Directory folders under Policies, Tools, and Reports & Graphs.

The Services and Components Discovered by the Active Directory Smart Plug-in (AD-SPI)

The Active Directory Smart Plug-in includes service/component discovery policies that build on the initial discovery that takes place with the Windows OS Smart Plug-in. The Windows OS SPI Auto-Discovery policies discover the Windows infrastructure (including the defined Active Directory domains and sites). AD-SPI expands that discovery to add multiple levels of detail at both higher and lower levels. At a higher level, the Active Directory Smart Plug-in identifies forest(s), while at a lower level AD-SPI identifies each Domain Controller by its specified name and adds the services/components available on it. Finally the AD-SPI shows the partitions in the discovered sites.

Figure 1 Below is a diagram of the Active Directory Smart Plug-in discovery, which supplements the Windows OS SPI discovery to include forest(s), sites, domain controller services/components, and the preferred bridgehead servers (PBHS) connecting sites.



After AD-SPI discovery occurs, Active Directory services and components are displayed in the service map so that you are able to see the specific domain controllers and specific sites. More detail appears both above and below each domain controller, where you can now see Active Directory components and services, including forests, replication, and Sysvol, to name just a few.

Figure 2 Below is the OVO service map in which AD-SPI now identifies the Active Directory forest and DC services/components. With these additions, you can drill down from a service alert at the forest level to the domain controller service/component causing the problem.

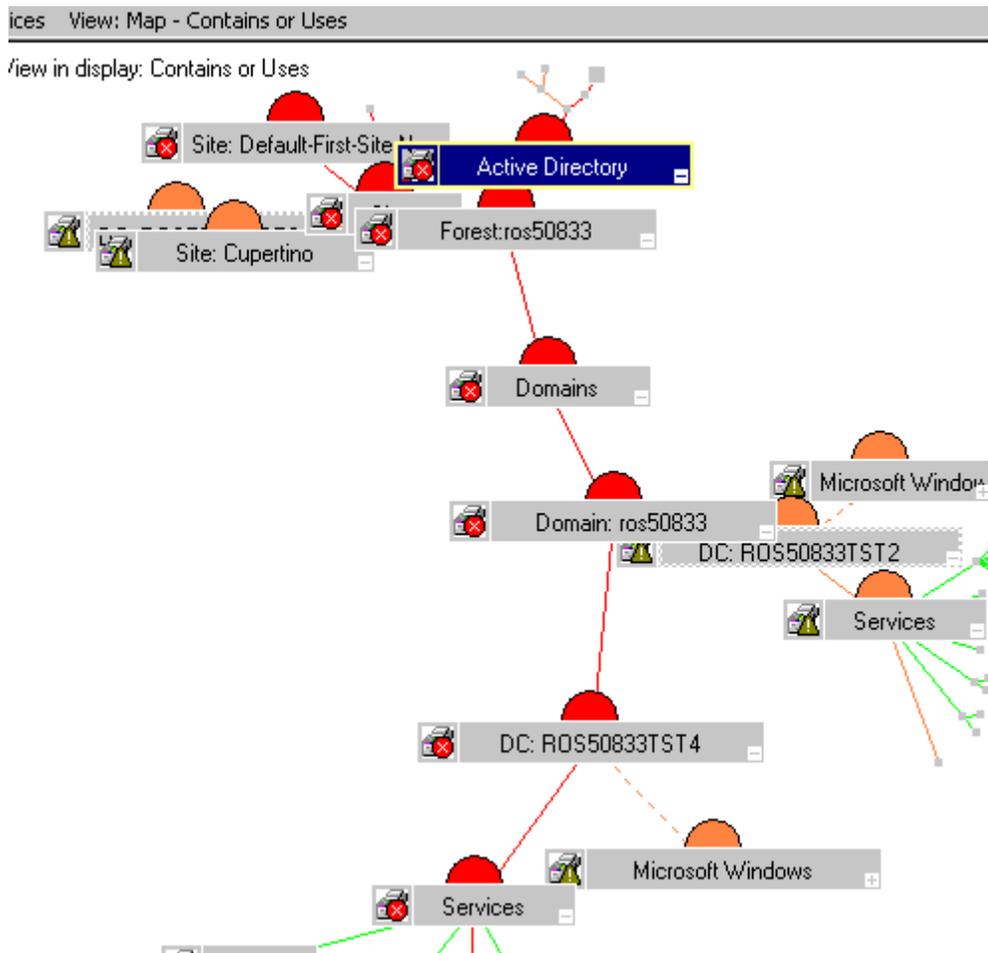
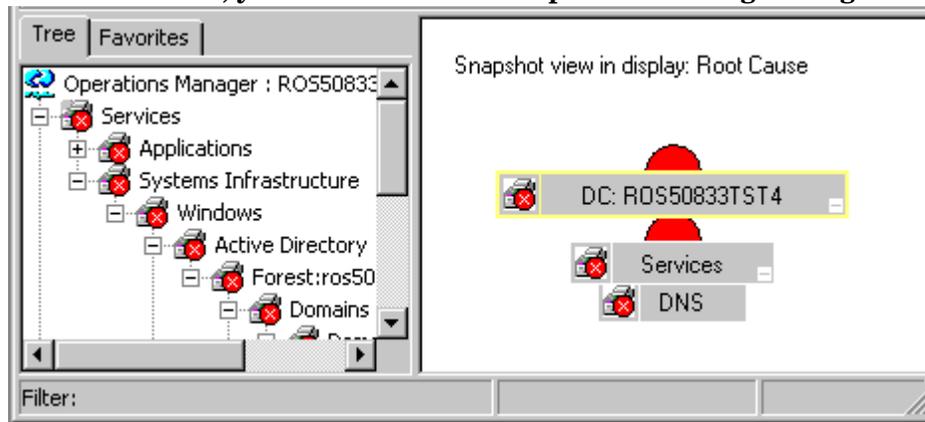


Figure 3 By right-clicking a service where an alert is occurring (indicated by its having turned red) and choosing Root Cause, you can see where the problem is originating.



How AD-SPI Policies Generate Information in the OVO Console

Active Directory data is targeted and gathered according to rules and schedule specifications contained within *policies*. Policies control Active Directory data collection and interpretation and enable its display in the following formats.

Service map alerts: After the AD-SPI discovery occurs, the OVO Services tree is updated with more information on Forests/Sites/Sites/Domain Controllers (DCs). The service map is updated to graphically add specific forests, services and components to the Domain Controller names (DC: <name>). Those Active Directory DC services/components include replication, DIT, DNS, GC (global catalog), operations master (FSMO), and Sysvol (see [Figure 2](#) on page 14). In addition, the Site map also shows the added Domain Controllers/Services, from a site-centric perspective.

Messages in the OVO message browser: Using the measurement threshold policy settings and the collected values/states for each targeted domain controller, the OVO agent software forwards appropriate messages to the console, where they are displayed with color-coded severity level.

OVO reporting/graphing: Reports are available under Reports & Graphs in the OVO console tree. These reports cover master operations connect times, DIT activity/size, DNS availability, GC replication delay times, and graphs on replication latency, DC availability, global catalog search response time levels, Sysvol size, and trust monitoring relationships. Each offers helpful information for analyzing trends and balancing server loads.

How the OV Topology Viewer Displays Information

The OV Topology Viewer is a tool that, once launched and then connected to a domain controller, opens a window of its own where it displays information about Active Directory forests, domain controllers, partitions, and connections. The tool also works in conjunction with the Exchange SPI, so if you are running the Exchange SPI, the generated view will likely contain Exchange servers. The OV Topology Viewer allows a view of Active Directory and Exchange information in two ways:

Expandable/collapsible tree: In the left pane of the OV Topology Viewer window you can see the various components that comprise an Active Directory forest and its domains, the domain which hosts the domain controller, as well as the sites available through the connection. For environments containing parent/child domain relationships, the Topology Viewer also reflects those distinctions: within the tree, as appropriate, child/grandchild domains are nested within in the parent domain in a hierarchical structure.

Topological view of site connections: The right-pane of the window offers a graphical representation of forests, sites and site links, DCs, GCs, and the connection objects linking them. Sites and DCs can be moved to accommodate more effective viewing in the map. Double-clicking a DC retrieves further information, such as the version of Windows that is running, status information, and more. The map also has zoom-in/zoom-out functions and allows exporting the view of the topology to a bitmap.

SPI Changes/Uses

You can use AD-SPI policies with no customization, or you can change them as you find necessary. Minor and major changes can occur as follows:

Modification of default policies: You can change a default policy by using the OVO console to select the policy and change conditions within it. The changes you might make include: (1) frequency of the monitoring interval, (2) message text, and (3) severity of the alert.

Creation of custom data collection groups: You can also create custom data collections where you can change the monitoring interval and/or threshold for a single Domain Controller. To create a separate group of policies, you can copy the desired policies into a folder with the new group name; after pasting the policies into the new group, you can then modify them and re-version them with your own version numbers (see, “[Modify a Monitoring Schedule or Measurement Threshold](#)” on page 55). The user-created versions make it possible to deploy specifically tailored policies to node groups to meet their monitoring needs. Using this method makes it possible to bring nodes and policies together in groups that are easily recognizable.

Following are summaries for how the Active Directory SPI policies are used.

Policy use: Active Directory SPI policies are available in the OVO console in two different ways: the first is according to group name under the *Policy groups* folder, and the second is according to type under the *Policies grouped by type* folder. You can view or edit an Active Directory SPI policy within either of these categories.

- *Policy groups:* organizes policies according to deployment method and area to be targeted for discovery or monitoring. The Auto Deploy group allows you to deploy all subgroups at once. The sub-groups allow you to choose a specific task (such as discovery) or area to monitor (such as DIT, DNS, FSMO, GC, Replication, Response Time, Sysvol, or Trust*). The Manual Deploy subgroup allows you to choose additional policies and deploy as you desire.
*Trust relationship monitoring is available for Windows 2003 systems only.
- *Policies grouped by type:* organizes policies according to their function; for example, you can find the scheduling for GC, replication, or FSMO monitoring in *Scheduled Tasks policies*; you can find the conditions (thresholds) for those replication/FSMO policies in the *Measurement Threshold policies*.

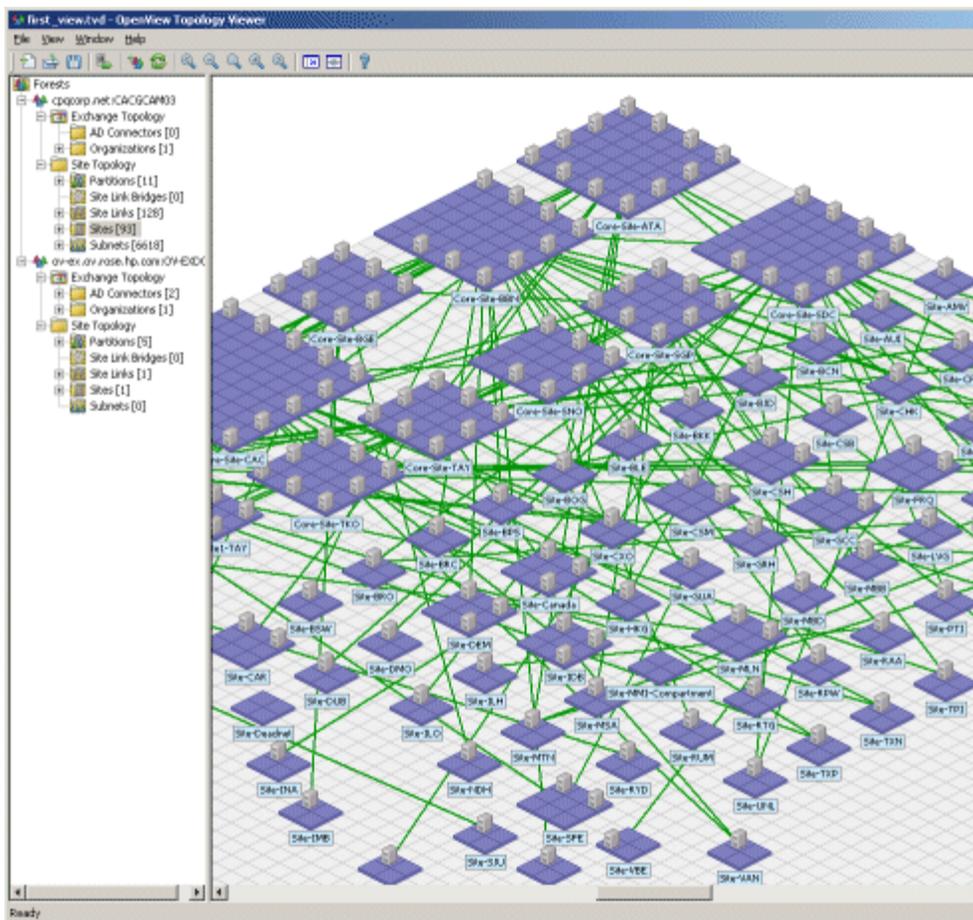


A printable management-ready graph of Active Directory replication latency data is available through the Reports & Graphs area of the OVO console. This graph provides baseline latency response time averages to help you determine how to adjust schedules/thresholds.

The Topology Viewer Tool

The *Topology Viewer* generates a map that shows the selected Active Directory environment, its forest(s), and the connections between sites and servers. Other details also available in the map are the names of the domain controllers, inter- and intra-site connections. To use the tool requires only that you connect to a domain controller. Once connected to a server, the tool does the rest.

Figure 4 The replication map captures information on site links at the time of the map's generation. Changes to your environment are not automatically reflected in the map. However, you can update the map by selecting **File→Refresh Data**.



Upgrading/Installing the Active Directory SPI

The sections that follow cover upgrades and new installations of the *HP OpenView Smart Plug-in for Microsoft Active Directory*. After you upgrade or install the SPI, you can discover Active Directory services running on OVO-managed nodes. Details are included on the discovery actions automatically occurring and those requiring manual steps, depending upon previous installations/configurations.

For instructions on upgrading, installing, or uninstalling the AD-SPI, refer to the specific sections:

- [“Before Starting”](#) on page 19
- [“Upgrading the Active Directory SPI”](#) on page 21
- [“Installing the Active Directory SPI”](#) on page 25.
- [“Uninstalling the Active Directory SPI”](#) on page 39

Before Starting

Policy changes listed in the table below include modifications of any kind to the SPI for Active Directory policy group. This list and the suggested preparation for upgrades can help you determine whether you need to modify newly installed policies.



Modifications should occur prior to your deployment of Discovery policies (after which new policies are automatically deployed as appropriate).

Table 1 **Version B.03.10 policy modifications**

Policy Name	Policy Change
ADSPI-FSMO_RoleMvmt	New scheduled task policy; determines when a FSMO role is seized or transferred from one domain controller to another.
ADSPI-FSMO_RoleMvmt_INFRA	New measurement threshold policy; monitors the domain controller’s ownership of the Infrastructure Master FSMO role.
ADSPI-FSMO_RoleMvmt_NAMING	New measurement threshold policy; monitors the domain controller’s ownership of the Domain Naming Master FSMO role.
ADSPI-FSMO_RoleMvmt_PDC	New measurement threshold policy; monitors the domain controller’s ownership of the PDC Emulator FSMO role.
ADSPI-FSMO_RoleMvmt_RID	New measurement threshold policy; monitors the domain controller’s ownership of the RID Master FSMO role.
ADSPI-FSMO_RoleMvmt_SCHEMA	New measurement threshold policy; monitors the domain controller’s ownership of the Schema Master FSMO role.
All DNS Monitoring policies	Modified continued actions: Alarms, once generated, do not continue to generate duplicate messages. All DNS monitoring policies now detect 'Hub and Spoke' settings in the user's Active Directory environment and taylor the alarms generated for missing records to reflect the 'Hub and Spoke' settings.
All Response Time Monitoring policies	Modified continued actions: Alarms, once generated, do not continue to generate duplicate messages

Upgrading the Active Directory SPI

Some manual actions are suggested before you begin (see below). During an upgrade, using Volume 1 of the Smart Plug-ins, New and Upgraded CD set, the previous version is detected and the smart plug-in installation proceeds as expected. To ensure easy access to *policy customizations* made in your previous version, be sure to complete the procedure below.

Prepare to Upgrade the New AD-SPI

Before upgrading the Active Directory SPI using the *Smart Plug-ins, New and Updated*, CD set, please see the Openview Operations for Windows Readme to ensure that you have met OpenView Operations for Windows management server prerequisites. Then complete the tasks below to (1) ready nodes to receive new policies and set up a reference folder for convenient access to previous customizations.

Task 1: Remove AD-SPI policies from managed nodes.

- 1 At the console, select **Operations Manager**→**Policy management**→**Policy groups**→**SPI for Active Directory**→**Auto-Deploy**.
- 2 Right-click **Auto-Deploy** and select **All Tasks**→**Uninstall from...**
- 3 Select all **Nodes** running Active Directory.
(It is all right to select every node since you are removing only AD-SPI policies and nothing else).
- 4 Click **OK**.

Task 2: Rename the SPI for Active Directory policy group.

- 1 At the console, select **Operations Manager**→**Policy management**→**Policy groups**.
- 2 Select the **SPI for Active Directory** group and rename it (for example, *SPI for Active Directory_old*).

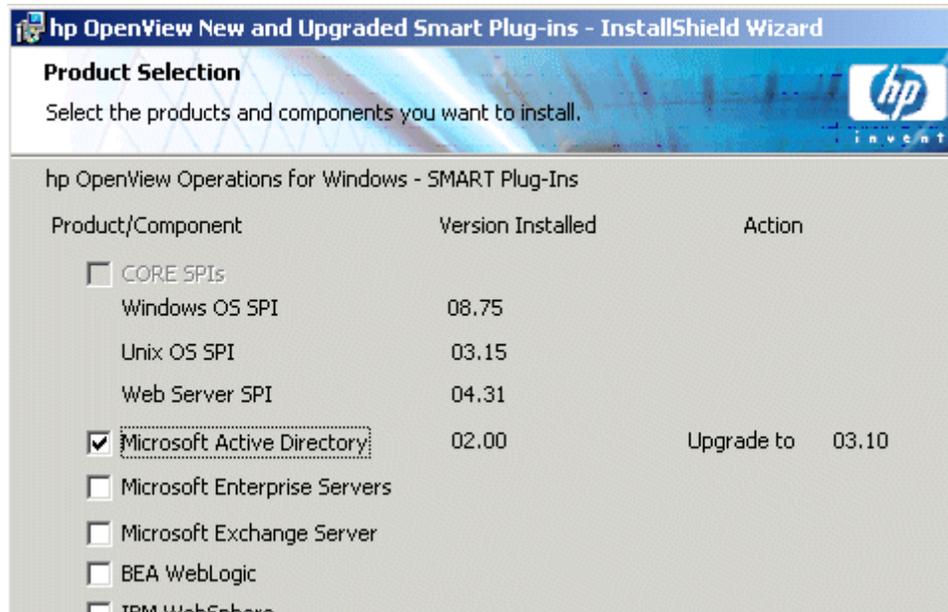
Upgrade to the New AD-SPI

Having completed the preceding tasks, you can now install the new AD-SPI and customize it as desired. The instructions below provide suggestions for retrieving previous customizations.

Task 1: Install the SPI for Active Directory

Insert the *Smart Plug-ins, New and Upgraded, Volume 1*, in the CD-ROM drive and follow the instructions as they appear on screen to select **Microsoft Active Directory** as the SPI to install.

Figure 5 During an upgrade installation, the previous SPI version is detected, and the new version displayed.



Task 2: Determine whether to change AD-SPI policies:

Now that new policies are available in the SPI for Active Directory policy group, you can compare your previously customized policies with this new group (as desired). Open each policy, as explained below, to compare old/new policies as necessary.

- 1 Choose **Policy management**→**Policy groups**→**SPI for Active Directory**.

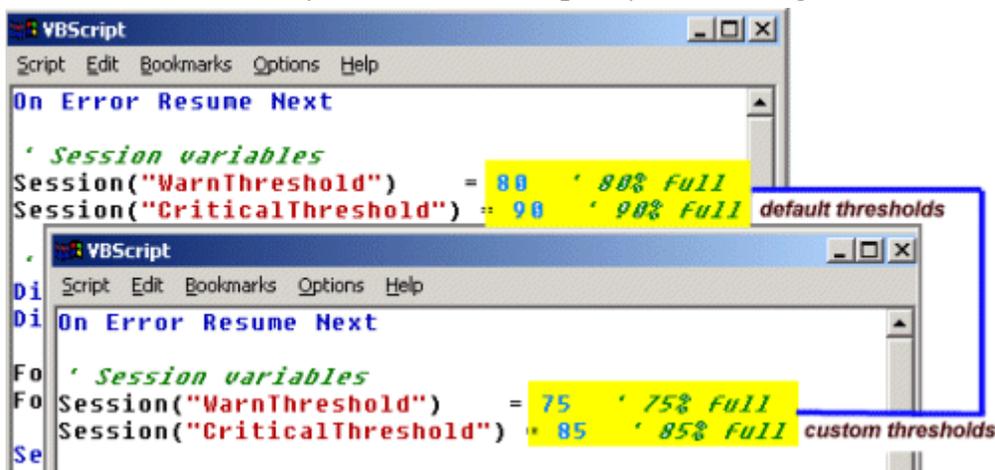
- 2 Select <renamed policy group> created in the task: “Rename the SPI for Active Directory policy group.” on page 21.



See the list of policy changes at the beginning of this chapter to determine whether or not to deploy the new policies; if so, continue to the next step.

- 3 Compare old and new policies by opening them side by side and change the new policy to match the previous customization (as desired):

Figure 6 Policies that have been customized show original version number with a decimal number; for example, 3.0. Open customized policies (from the renamed group) and compare them to the new policies (version 3.7). In the illustration below the thresholds for the ADSPI-Sysvol_PercentFull policy were changed.



- 4 When finished, delete the renamed group (if desired).

Task 3: Deploy updated instrumentation.

To enable the new/updated policies to work, you must deploy the updated AD-SPI instrumentation. You can deploy instrumentation in one step on a group of nodes (if defined), or you can deploy on individual nodes.

- 1 At the OVO console, open **Operations Manager**→**Nodes**.
- 2 Right-click any node running Active Directory (if you have an Active Directory group, you can right-click the group).

- 3 Select **All Tasks**→**Deploy instrumentation**.
- 4 From the Instrumentation Files area, select **ADSPI_Com** and **ADSPI_Disc**.
- 5 Click **OK**.
- 6 Repeat this process as necessary for remaining nodes running Active Directory.

Task 4: Deploy AD-SPI Discovery policies.

To enable deployment of the new policies, manually deploy the Discovery group. Manual deployment of this group causes new services to be discovered and added to the OVO services tree/service map. In turn, this discovery results in deployment of the relevant AD-SPI policies on nodes running those services.

- 1 At the OVO console, open **Policy Management**→**Policy Groups**→**SPI for Active Directory**→**Auto-Deploy**.
- 2 Right-click **Discovery** and select **All Tasks**→**Deploy on...**
- 3 In the Deploy policies on... dialog select all nodes where Active Directory might be running and click **OK**.

Shortly, you should see additional Active Directory components listed within the **Services**→**DC** tree as well as additional Active Directory services in the OVO services map. Also implemented through the Auto-Discovery process is the automatic deployment of relevant AD-SPI policies to monitor every discovered Active Directory service.

Task 5: (optional) Deploy AD-SPI Manual-Deploy policies.

You can choose policies from the Manual-Deploy policy group to deploy on nodes as desired. Some of these policies are likely already deployed as a result of the Windows OS SPI discovery.

Installing the Active Directory SPI

The HP OpenView Smart Plug-in for Active Directory is contained on the *HP OpenView New and Upgraded Smart Plug-ins, Volume 1*, of the CD set.

Important! In Task 1 you install Active Directory; then you will see that Tasks 2 and 3 both contain methods for discovering Active Directory services. Complete Task 2 and/or 3 as relevant to your current configuration:

- Complete Task 2: if systems (nodes) running Active Directory *are currently managed* by OpenView Operations.
- Complete Task 3 if systems (nodes) running Active Directory *are not currently managed* by OpenView Operations

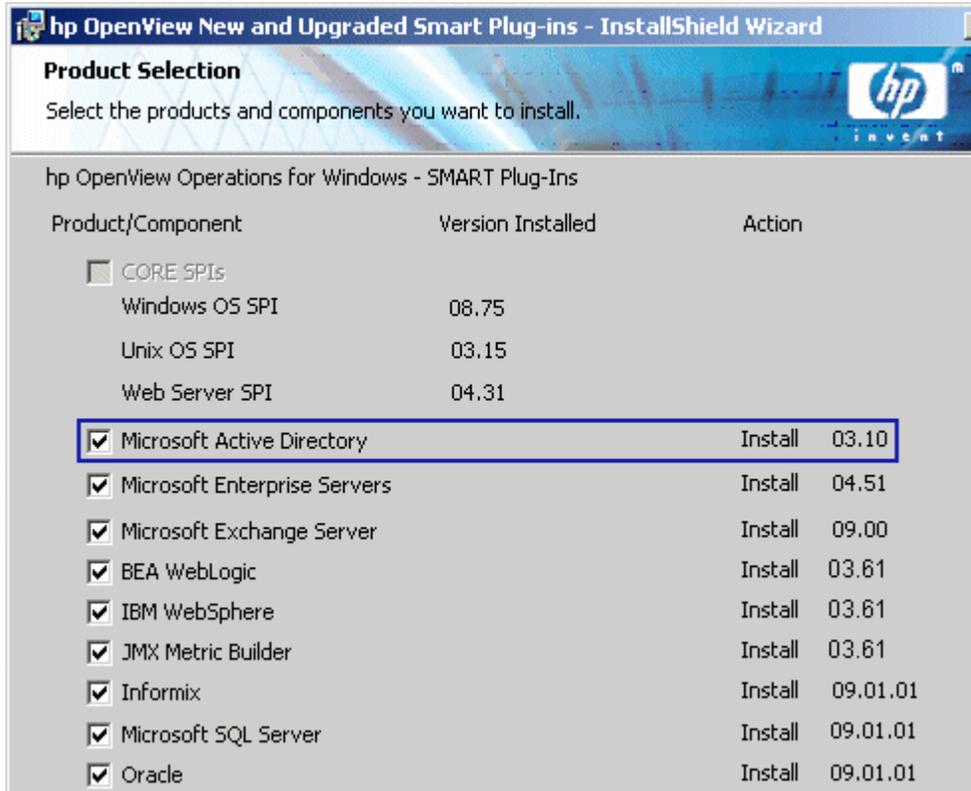
Task 1: Install the Active Directory SPI



Installation of the *OVO Console, Management Server, and Agents* is required for Active Directory SPI programs to work.

- 1 Insert the *HP OpenView New and Upgraded Smart Plug-ins, Volume 1*, into the CD-ROM drive.
- 2 Follow the instructions as they appear on screen and install the AD-SPI by clicking the check box next to **Microsoft Active Directory** (SPI).
- 3 Follow the instructions as they appear in each dialog (you are updated on the status of the installation as it progresses and finally completes).

Figure 7 After InstallShield wizard automatically starts, you eventually reach the dialog below, where you can select the Microsoft Active Directory SPI.



After you have installed the Active Directory SPI, you should see the *SPI for Active Directory* folder in the console tree under the OVO Policy Groups and under the Reports and Graphs folders as well.

Task 2: Discover services on nodes already managed by OVO.

To discover Active Directory services on nodes already managed by OVO, deploy the AD-SPI service Discovery policies. By deploying these policies, you launch an automated process that adds the discovered services to the OV services tree/service map and deploys the relevant AD-SPI policies on nodes running those services.

- 1 At the OVO console, open **Policy Management**→**Policy Groups**→**SPI for Active Directory**→**Auto Deploy**→**Discovery**.

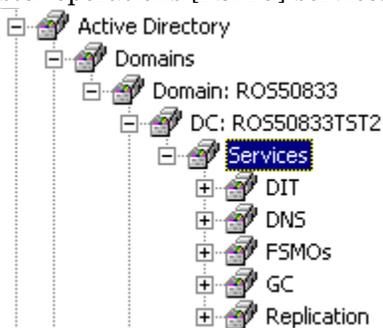
- 2 Right-click **Discovery** and select **All Tasks**→**Deploy on...**
- 3 In the Deploy policies on... dialog select all nodes where Active Directory is running and click **OK**.

To view the deployment, under the Policy Management folder, you can right-click **Deployment jobs**, select **New Window from Here** and choose **Window**→**Tile Horizontally**.

In the tiled window you should see the executed processes complete as follows:

- Discovery of Active Directory DIT, DNS, FSMO, GC, Replication, Sysvol, and Trust services and consequent deployment of relevant policies.
- Update of the OVO service map, showing DIT, DNS, FSMO, GC, Replication, and Sysvol services/components successfully discovered.

Starting at the *Services*→*Systems Infrastructure* folders of the OVO console tree (in the left pane), you can navigate downward to each domain controller (DC: <name>), under which you should now see a Services folder that could contain *DIT*, *DNS*, *FSMOs*, *GC*, *Sysvol*, and/or *Replication*. The Services folder should always include Replication and may include FSMO if the DC runs any flexible single master operations [FSMO] service.



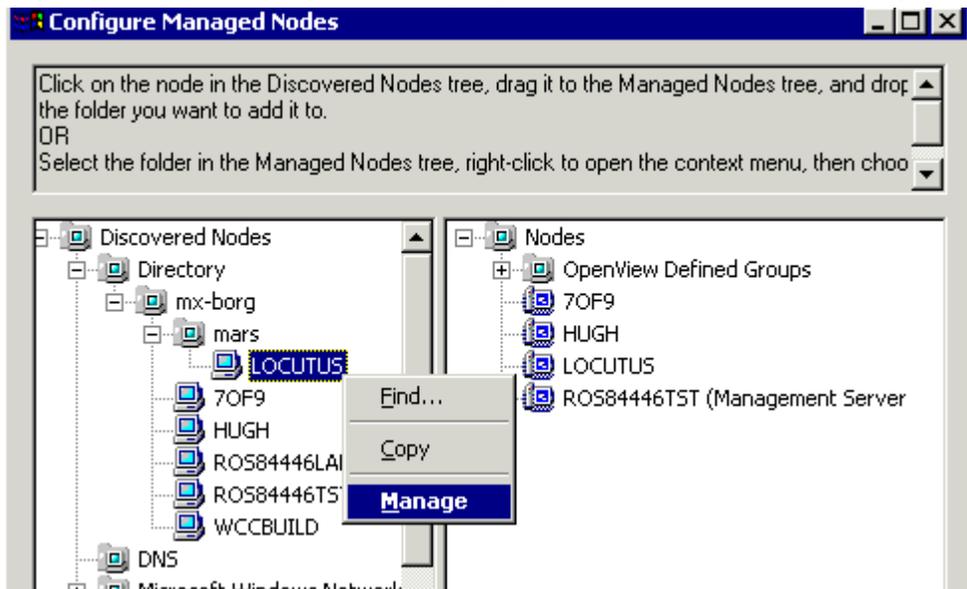
Task 3: Discover services on nodes not yet managed by OVO.

To discover services on unmanaged nodes, you add those nodes to the OVO console's Nodes folder. By adding nodes, you launch an automated service discovery process that duplicates the manually invoked process described above.

- 1 At the OVO console right-click the **Nodes** folder and select **Configure Nodes**.

- 2 In the Configure Managed Nodes dialog, you can add systems to the Nodes folder using any of three methods:
 - In the left pane double-click each system you want to add,
 - or
 - Drag and drop systems from left to right
 - or
 - In the left pane right-click each system and select **Manage**.

Figure 8 More than one way is available to configure a node for management by OVO. The illustration below shows how you can select a node, right-click it, and select “Manage.”



- 3 (as needed) If a system running OV agent software is not available in the Discovered Nodes folder in the left pane, in the details pane you can right-click the Nodes folder, select **New Node**, and enter the system name and other relevant information.
- 4 Click **OK**.

When you close the dialog, first the Windows OS SPI discovery is run; then the Active Directory SPI discovery occurs. The AD-SPI discovery involves deployment of the AD-SPI Discovery policies and then, as

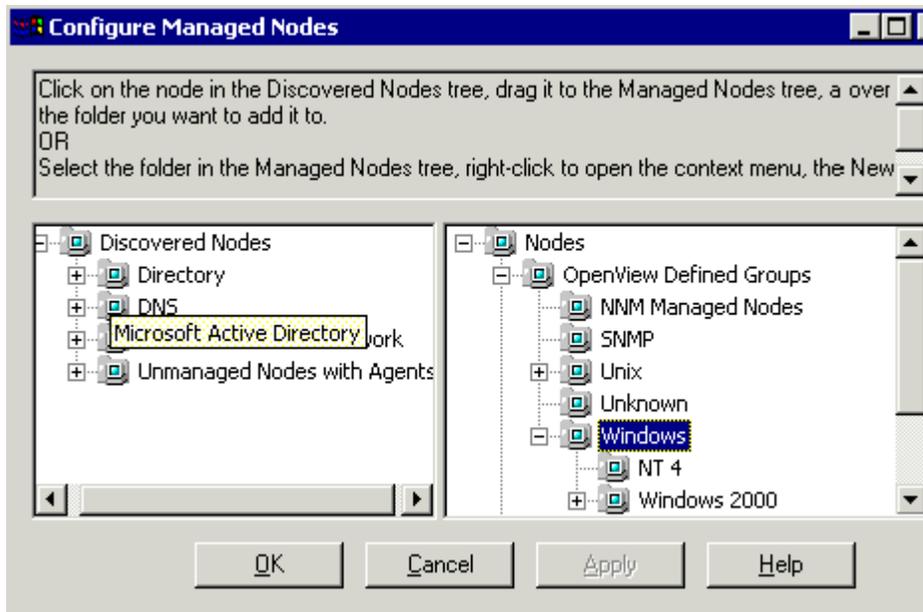
appropriate, the DIT, DNS, FSMO, GC, Replication, Response Time, Sysvol, and Trust monitoring policies according to the detected services on each new system.

*To view the deployment, under the Policy Management folder, you can right-click **Deployment jobs**, select **New Window from Here** and choose **Window**→**Tile Horizontally**.*

In the tiled window you can watch the executed processes complete as follows:

- Discovery of forests, domains/sites using methods specific to the Windows OS discovery; then discovery of Microsoft Active Directory DIT, DNS, FSMO, GC, Sysvol, and Replication services.
- Update of OVO service map, showing discovered DIT, DNS, FSMO, GC, PBHS, and replication services within domains/sites.
- Deployment of relevant Active Directory SPI policies for monitoring the discovered services.

Figure 9 OVO automatically places nodes within the correct Windows OS folder when you close the dialog, but you can define your own group(s) in which to place nodes if you choose.



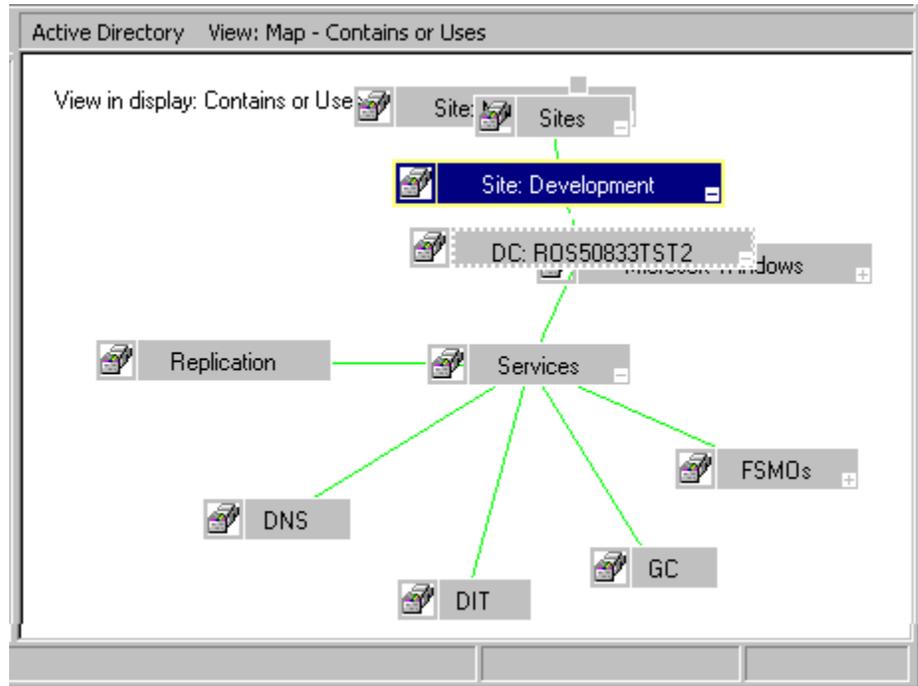
Task 4: View the service map with Active Directory services now added.

Now that auto-discovery has occurred, you should see the discovered services graphically represented under Domains and Sites within the OVO service map.

- 1 In the OVO console details pane select **Services**→**System Infrastructure**→**Windows**.
- 2 Select **Active Directory**.

In the console tree, when you select Services, you can view the service map in the right pane. There you see Domains/Sites/Domain Controller (DC:) names. For nodes managed by OVO, you should now see discovered services/components under the Services box. Among the possible discovered services/components are *Replication*, *DNS*, *DIT*, *GC*, *FSMO*, *PBHS*, and *Sysvol*. You can further expand FSMO (clicking the plus [+]) to show the specific master operations services on the selected DC.

Figure 10 The service map can show services/components from both domain- and a site-centric perspectives (the site-centric perspective is shown below).



Obtaining a License/Password

The Active Directory SPI can be used for 60 days without a license. Within this time frame, however, you should obtain a license/password to avoid continued, uninterrupted use of the AD-SPI.



The terms “license” and “password” are used interchangeably and mean essentially the same thing: a license key that allows permanent use of the AD-SPI.

To obtain a license/password for the AD-SPI, use the OpenView Operations *Obtain License* tool. When you launch the tool, you will see that you can choose from three methods for obtaining the required license/password information:

- **Method #1, Retrieve/Install License Key:** If you have an Internet connection from the OVO console, you can directly access license/password key information. In addition, information about the server you are using is automatically detected (unless you are connecting to the Internet through a proxy server, in which case, you will have to enter the proxy server IP address).
- **Method #2, Install/Restore License Key:** If you do not have an Internet connection from the OVO console, use this method, where you obtain the license/password information from an HP Web site (www.webware.hp.com). You store the information gained from the Web site in a file on the OVO console and import it during the procedure.
- **Method #3, Request License Key through Email/Fax:** Use this method if you would prefer to receive the license key through an email or fax.

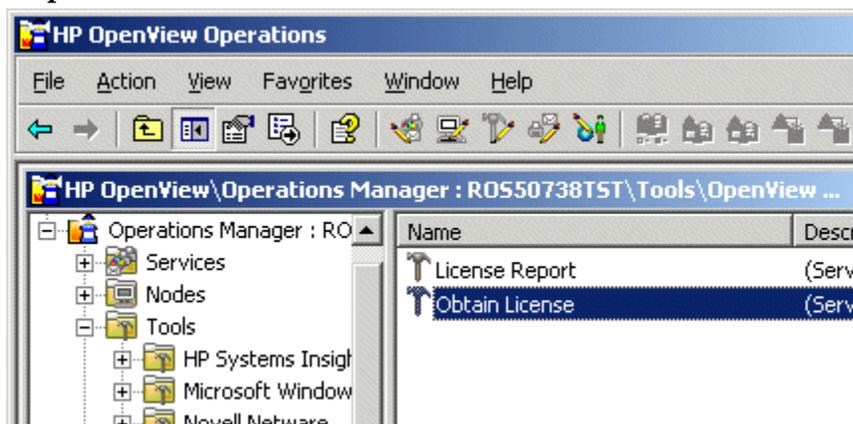
Please see the SPI CD Installation Guide for details on each method.

Using Method #1, Install the License Key Using an Internet Connection

Prerequisite: The License Entitlement Certificate, included with the purchased HP Smart Plug-in for Active Directory. From the Certificate you retrieve the unique *Product Order#*.

- 1 At the OVO console select **Tools**→**OpenView Tools**→**Licensing** and double-click **Obtain License**.

Figure 11 Starting the process to obtain an AD-SPI permanent password.



- 2 In the Obtain License dialog select **SPI for Active Directory** and click **OK**.

Figure 12 Selecting the SPI for Active Directory for licensing.



- 3 In the HPOV Auto Pass: Internet Connection dialog select the appropriate Internet connection method:
Direction connection. (if the console connects directly to the Internet)
or
Proxy server. (if the console connects to the Internet through a proxy server). Enter host name or IP address (required), and proxy port number (required); for example, 8088.
- 4 Click **Next**.
- 5 In the dialog that appears, enter the HP Order number (as it appears in the License Entitlement Certificate included with the product) and click **Next**.
- 6 In the **System identification and product details** dialog:
-In the Product profile **Select** column, click the product checkbox.
-In the **LTUs** column, enter the number of purchased licenses.
- 7 Select **Next**.
- 8 In the Member ID maintenance dialog enter your email address, then existing or first-time password/password verification, and click **Next**.
- 9 Enter customer information as required, then click **Next**.
- 10 In the dialog that appears verify that the IP address, host name, etc., information is correct and select the **Get password** button.
- 11 In the Confirmation window select **Finish**.

An email confirmation will be sent to you for your records containing the Permanent Password Certificate, which contains product information and password/license you have been issued.

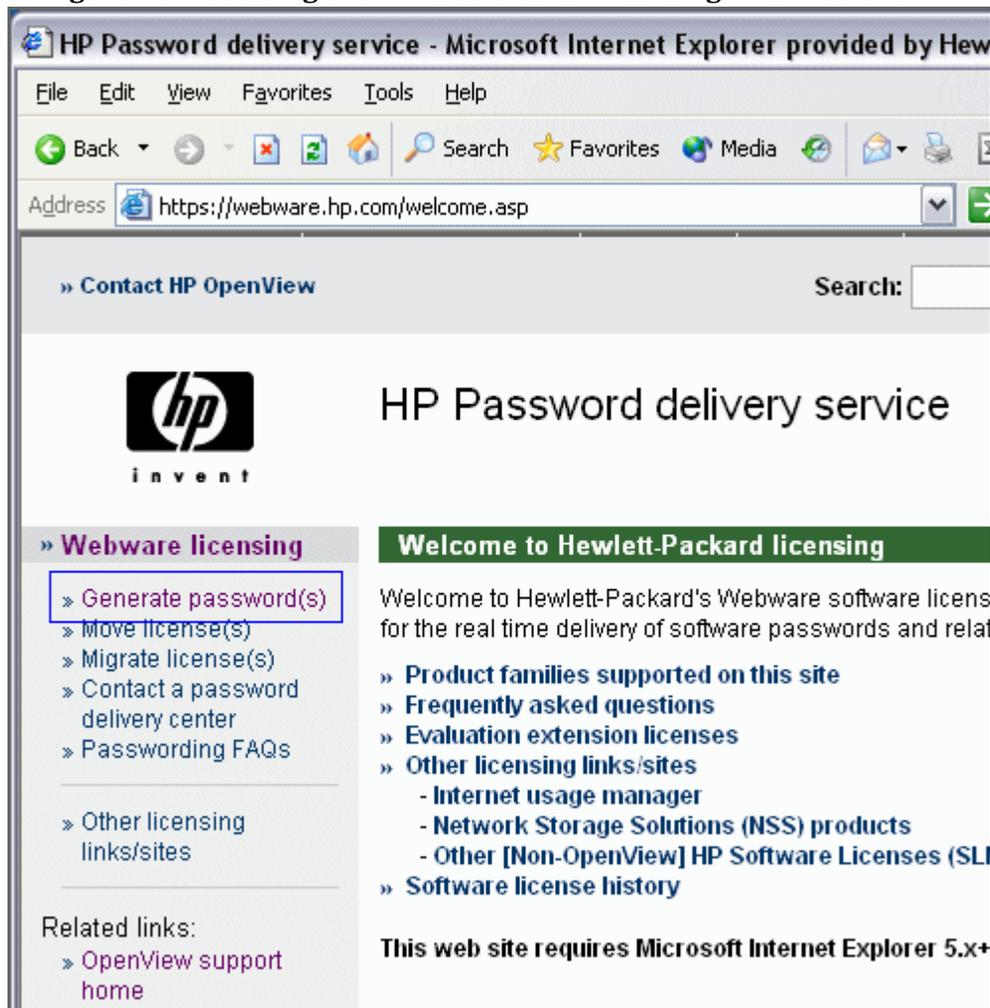
Using Method #2, Retrieve the License Key from a File

This method differs from the first in that it has a preliminary task where you open an HP Web site for information that you enter later in the second task.

Prerequisite: The License Entitlement Certificate, included with the purchased HP Smart Plug-in for Active Directory. From the Certificate you retrieve the unique *Product Order#*.

Task 1: Obtain license/password information from the Web:

- 1 At a system with Internet access, launch your Internet browser, and in the Address text box enter www.webware.hp.com.
- 2 Select **generate product password(s)**.

Figure 13 Accessing the HP Web site for licensing information.

- 3 In the page that appears, review the information, then scroll to the bottom of the page and click **Next**.

- 4 In the password delivery service page in the Order Number text box, enter the order number for your AD-SPI (as it appears in the License Entitlement Certificate included with the product).
- 5 Click **Next**.
- 6 In the page that appears, select the check box next to **HP OpenView Smart Plug-in for Microsoft Active Directory** and click **Next**.
- 7 In the page that appears showing your product number, name, version, enter information in columns as follows:
 - # **LTU**: number of AD-SPI licenses you have purchased
 - Management Server Host Name**: name of the management server on which OVO for Windows is installed.
 - IP Address**: as above, the IP address of the OVO for Windows server (must be correct or your license cannot be installed successfully)
 - Platform**: select the Windows version used on the OVO for Windows server.
- 8 Click **Next**.
- 9 In the member login page enter your email address, then your existing or first-time password/password verification, and click **login**.
- 10 In the address information page, enter information as required and click **Next**.

- In the permanent password certificates page above the certificate, click the text:
Save password file for <product_number>.



Password certificate

Permanent password certificates

Session ID: 749529 [More info](#)

Your password certificate(s) and password file attachment(s) have been addresses: cecelia.royal@hp.com

If you would like to select additional delivery options please click on the link
[Additional delivery options](#)

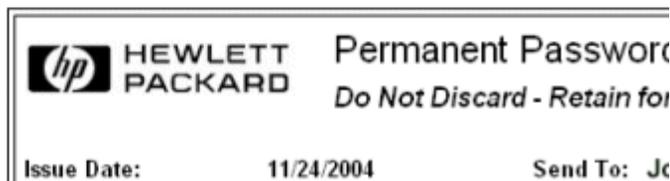
To eliminate chances of error, it is highly recommended that password(s) and password file, rather than attempting to manually transcribe and edit the certificate. Each password file can be copied to the appropriate target system and installed by the application. No editing of the password file

If you would like to save your password file immediately to your system (the file we have sent you), please use the links provided below:

Select to save

[Save password file for B9171AA](#)

A copy of your password certificate(s) are displayed below for your review

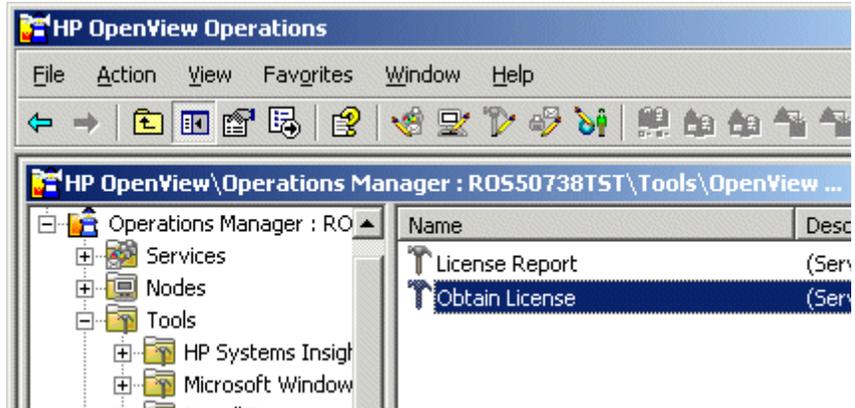


You will need to remember the location of the stored certificate for the next task. The file is titled <product_number>.dat. In addition, the Permanent Password Certificate is also mailed to the email address you entered.

Task 2: Import license/password information.

- At the OVO console in the contents pane, select **Tools**→**OpenView Tools**→**Licensing** and double-click **Obtain License**

Figure 14 Starting the process to import a permanent password.



- 2 In the Obtain License dialog select **SPI for Active Directory** and click **OK**.
- 3 In the HPOV Auto Pass: Internet Connection dialog select **No Internet connection** and click **Next**.
- 4 In the Order Validation dialog, select **Import passwords** and click **Next**.
- 5 In the Import passwords dialog click the **Browse...** button, navigate to the location of the file you stored in previous task, and select the file titled *<product_number>.dat*.
- 6 Select the **Choose** button.
- 7 (Required) Click the **View file contents** button.
- 8 Select **Permanent Password for Product Number <AD-SPI_product#>**. (For example, *Permanent Password for Product Number B917AA*.)
- 9 Click **Import**.

Successfully imported passwords are stored in
 \Program Files\Common Files\Hewlett-Packard\PPP\LicFile.txt.

Uninstalling the Active Directory SPI

To remove the Active Directory SPI, first uninstall all policies/policy groups from the managed nodes, then from the management server.

Task 1: Remove the Active Directory SPI policies from all managed nodes

- 1 At the console expand the folder **Policy Management**.
- 2 Right-click SPI for **Active Directory** and select **All tasks**→**Uninstall from...**
- 3 In the **Uninstall on...** window, select each check box next to the node(s) from which policies should be removed.
- 4 Click **OK**.

 To verify policies have been removed, at the OVO console expand the *Nodes* folder, right-click a node, and select *View*→*Policy Inventory*.

Task 2: Remove the Active Directory SPI policy group from the management server.

- 1 In the console expand the folder **Policy groups**.
- 2 Right-click **SPI for Active Directory** and select **Delete**.

Task 3: Remove the Active Directory SPI tool group from the management server.

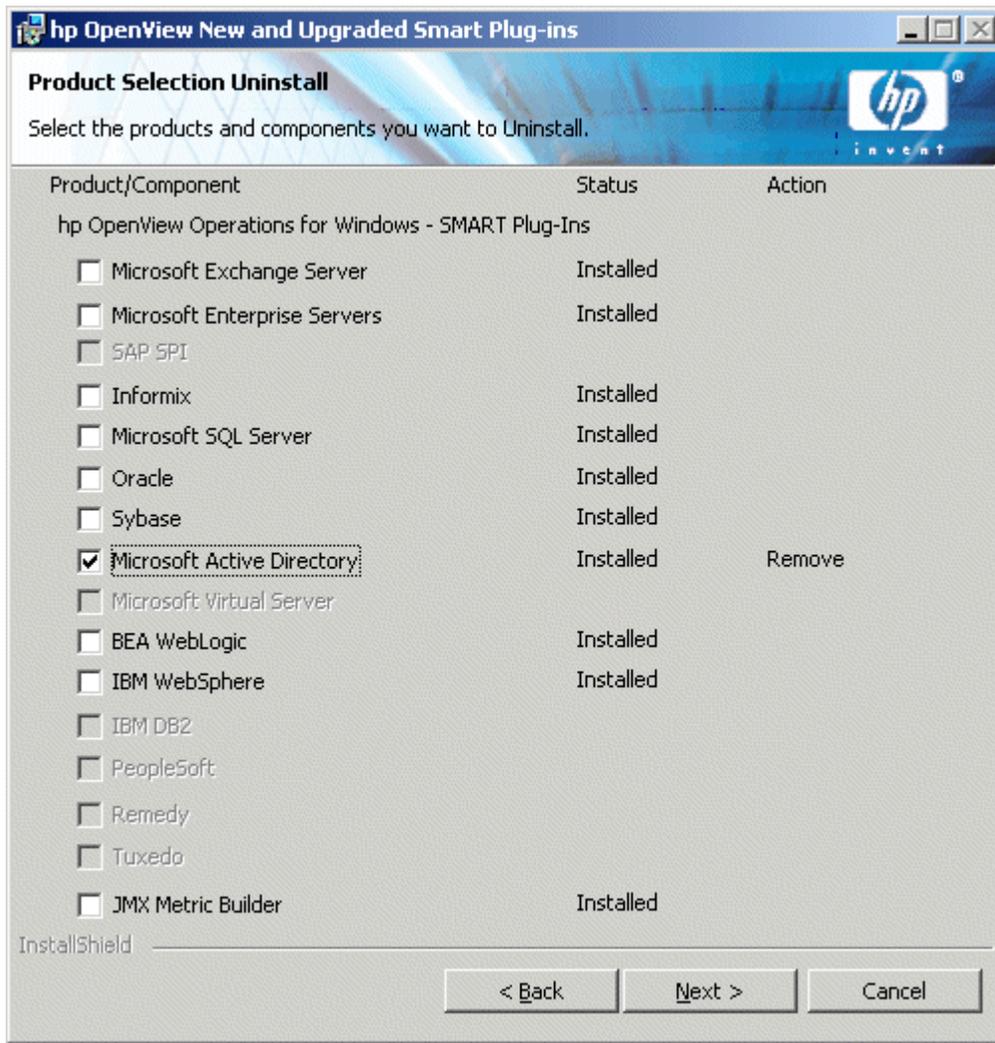
- 1 In the console expand the folder **Tools**.
- 2 Right-click **SPI for Active Directory** and select **Configure**→**Tools...**
- 3 In the Configure Tools dialog right-click **SPI for Active Directory** and select **Delete**.

Task 4: Uninstall Active Directory SPI programs from the OVO management server.

- 1 Insert the *HP OpenView Operations / Performance for Windows* CD (Disk 1) into the CD-ROM drive.
- 2 Follow the instructions as they appear on screen and start the uninstall procedure by selecting the **Remove products** radio button.
- 3 In the Product Selection Uninstall window select **Microsoft Active Directory (SPI)** and click **Next**.

- 4 In the next window select **Remove**.
(You are updated on the progress of the AD-SPI program removal)
- 5 Click **Finish** to complete.

Figure 15 Removing the Smart Plug-in for Microsoft Active Directory software from the management server.



Using the Active Directory SPI

After you complete your Active Directory SPI (AD-SPI) setup, the OVO console shows updates in areas as follows:

- Service map now shows newly added Active Directory services displayed in both the console Services tree and the service map.
- Message Browser now displays information in the form of messages (indicating problem severity level).
- Reports/Graphs are available, which consolidate Active Directory-related data as accumulated over time. The information contained in the reports and graphs can help you see trends so that you are better able to manage your Active Directory Server environment, implementing effective load balancing, capacity planning, and policy scheduling/thresholding adjustments.
- Topology Viewer is available for connecting to an Active Directory domain controller and viewing your Active Directory topology (see [“The OpenView Topology Viewer”](#) on page 55).

At the core of the Active Directory SPI are the policies that enable the above information to be displayed. As you review the numbers of service map alerts, browser messages, and reporting/graphing data, you may determine that you need to make some adjustments to policy settings. If a policy requires customizing, this chapter provides additional information for modifications.

More details concerning policies are also included in the online Help available in the OVO console. The topics below offer information on what the policies do, what you can do to customize them, and what to do for some specific problems. The topics for these issues are covered as follows:

- “Auto-Deploy Policies” on page 44
- “Basic Policy Modifications” on page 54

Auto-Deploy Policies

Active Directory SPI Auto-Deploy policies are divided into logical groups: one for service discovery and the others for monitoring Active Directory services/components DIT, DNS, GC, FSMO (flexible single master operations), replication, response time, and trust relationships. Please see the Active Directory SPI online Help for individual policy descriptions.

Replication Monitoring

- **ADSPI-Rep_ModifyObj:** This policy updates an object that is used by the ADSPI-Rep_Mon policy so that replication latency for both inter-site and intra-site purposes can be tracked.
- **ADSPI-Rep_Mon:** Windows 2000 Active Directory takes a multi master approach to common administrative tasks. Using this multi-master approach means that changes made to the directory on a domain controller are propagated to all other domain controllers. No single master is required. Every hour this policy modifies an Active Directory replication object. It works in conjunction with another policy that tracks the latency.
- **ADSPI-Rep_Modify_User_Object:** Every hour this policy modifies an Active Directory user object. It works in conjunction with the ADSPI-Rep_GC_Check_and_Threshold policy to provide the means for tracking the replication delay time between domain controllers and the global catalog server and vice versa.
- **ADSPI-Rep_Check_Obj:** This policy checks replication of the object modified by the ADSPI-Rep-Modify User_Object.
- **ADSPI-Rep_TimeSynch:** Windows 2000 (Win2K) uses a time service, known as Windows Time Synchronization Service (Win32Time), to ensure that all Win2K computers on a network use a common time. Win2K's

default authentication protocol requires the service. Time synchronization is crucial because Kerberos protocol uses workstation time as part of the authentication process.

The time synchronization policy measures the delta between the 'time master' and the local host. If the delta exceeds a given threshold, an alert/message is sent to the OVO console.

- **ADSPI-Rep_InboundObjs:** The number of connection objects inbound is an important metric to measure. A high number can indicate that a bridgehead may be getting overloaded and that a failure may have occurred. A failed bridgehead can cause a large number of DCs to retarget their requests; hence the high number of re-directed requests to another DC.

This policy measures the DRA inbound object/sec counter and monitors the number of inbound replication objects.

- **ADSPI-Rep_ISM_Chk:** This policy checks the status of the InterSite Messaging service to determine whether or not the service is running and the number of associated processes currently running. When Intersite Messaging does not run properly, inter-site replication problems can occur, resulting in the inability of the KCC to calculate the replication topology.

FSMO Monitoring (Flexible Single Master Operations)

Two AD-SPI scheduled task policies run checks on master operations (FSMO) configurations and performance. The two policies are:

ADSPI-FSMO_Consist (configuration replication across DCs) and **ADSPI-FSMO_Logging** (FSMO service response time across DCs).

ADSPI-FSMO_Consist: When a domain controller is demoted from a domain, its operation master roles are transferred to another domain controller. If the domain controller is not properly demoted or is taken off line without transferring role responsibilities, operation master identification can become inconsistent. The ADSPI-FSMO_Consist policy is a scheduled task policy that checks domain controller replication. Possible states are:

- state 0 = information is present and consistent
- state 1 = information is not present on the domain controller (critical)
- state 2 = information is not present on the replication partner (critical)

- state 3 = information is present on domain controller and replication partner, but is not consistent (warning)

The state is compared to the measurement threshold policy that matches the FSMO service, resulting in appropriate service map alerts and/or messages to the OV message browser.

- **ADSPI-FSMO_Logging:** This scheduled task policy adds to the configuration check by, once again, detecting FSMO services, then pinging and binding to those services. This policy logs the response times for each service. The data collected through this policy is used in the FSMO reports. It is also used to generate service map alerts and messages to the OV console when threshold policies have been deployed on the targeted managed node.

Measurement threshold policies allow the above master operations states and response times to be interpreted and acted upon in the form of messages/ service map alerts. The master operations (FSMO) measurement threshold policy sets are:

- **ADSPI-FSMO_Naming (Bind & Ping):** The domain-naming master is the domain controller responsible for making changes to the forest-wide domain name space. This domain controller is responsible for adding/removing a domain from the forest and adding/removing cross-references to domains in external directories. Each forest has only one domain naming master. The ADSPI-FSMO_Naming policies measure the general responsiveness of the domain naming master. To do this, the policies periodically bind to and ping the domain controller that is the domain naming master.
- **ADSPI-FSMO_INFRA (Bind & Ping):** The infrastructure master is the domain controller responsible for keeping track of objects referenced in multiple directories. The infrastructure master is responsible for maintaining security IDs and distinguished names for cross-domain references. Each domain in a forest has only one infrastructure master. The ADSPI-FSMO-INFRA_Bind policies measure the general responsiveness of the infrastructure master. They periodically bind to and ping the domain controller that is the infrastructure master.
- **ADSPI-FSMO_SCHEMA (Bind & Ping):** The schema master is the domain controller responsible for performing updates to the directory schema. The updated schema is replicated to the other domain controllers in the forest. There is one schema master per forest.

- **ADSPI-FSMO_PDC (Bind & Ping):** The PDC emulator is a Windows 2000 domain controller that acts as the primary domain controller to down-level workstations, member servers and domain controllers. In a Windows NT domain, there is one PDC master per domain in a forest, which performs the following functions:
 - Password changes, performed by other domain controllers in the domain are replicated preferentially to the PDC master.
 - Authentication failures occurring at a given domain controller in a domain because of an incorrect password, forwarded to the PDC master before a bad password failure message is reported to the user.
 - Account lockout, processed on the PDC master.
- **ADSPI-FSMO_RID (Bind & Ping):** The RID master is the domain controller responsible for processing RID pool requests from all domain controllers within a given domain. When a domain controller creates a security principal object such as a user, it attaches a unique Security ID (SID) to the object. The SID consists of a domain SID and a relative ID (RID).

Each Windows 2000 domain controller is allocated a pool of RIDs. When a domain controller's pool falls below a threshold, that domain controller issues a request to the domain's RID master for a new pool. There is one RID master per domain in a forest.

The ADSPI-FSMO_RID policies measure the general responsiveness of the RID master. They periodically bind to and ping the domain controller that is the PDC master.

- (a) **ADSPI-FSMO_Consist_INFRA**, (b) **ADSPI-FSMO_Consist_RID**, (c) **ADSPI-FSMO_Consist_PDC**, (d) **ADSPI-FSMO_Consist_SCHEMA**, and (e) **ADSPI-FSMO_Consist_NAMING**. These policies alarm when the ADSPI-FSMO_Consist policy determines that the domain controller running the policy and one or more of its replication partners do not agree on which domain controller holds the specified FSMO role.
- (a) **ADSPI-FSMO_RoleMvmt**, scheduled task policy, all other FSMO role movement policies are measurement threshold policies:
 - (b) **ADSPI-FSMO_RoleMvmt_INFRA**,
 - (c) **ADSPI-FSMO_RoleMvmt_NAMING**,
 - (d) **ADSPI-FSMO_RoleMvmt_PDC**,
 - (e) **ADSPI-FSMO_RoleMvmt_RID**, and
 - (f) **ADSPI-FSMO_RoleMvmt_SCHEMA**.

These policies generate messages to the console when a FSMO role is moved from one domain controller to another, a major change in the environment. An alarm is sent if a domain controller gains or loses a FSMO role.

Directory Information Tree Monitoring

Policies monitoring the Active Directory database, the directory information tree (DIT), ensure that DIT operations (as related to queue lengths), size, and occupied space on the disk of the hosting server fall within specific limits. Specifically, DIT policies monitor the following:

- **ADSPI-DIT_DITPercentFull:** Monitors the percentage of space used and the free space remaining on the logical drive hosting the DIT.
- **ADSPI-DIT_TotalDITSize:** Monitors the size of the Active Directory database and the remaining space on the logical hosting drive.
- **ADSPI-DIT_DIT QueueLength:** Monitors the queue length on the DIT logical drive, indicating the number of incomplete operations pending.
- **ADSPI-DIT_LogFilesQueueLength:** Monitors the log queue length, indicating the number of incomplete updates pending.
- **ADSPI-DIT_LogFilesPercentFull:** Calculates the percentage full of the logical drive hosting the DIT log files; the policy thresholds and logs the information.

Domain Name Server Monitoring

For DNS monitoring, the Active Directory SPI checks DNS responsiveness and consistency with the data contained in Active Directory. To this end, AD-SPI-DNS policies show you whether or not: (1) DNS is returning the correct IP address for each domain controller, (2) DNS contains all SRV records that ADS dictates it should, and (3) each SRV record is accurate. The DNS group contains the following policies:

- **ADSPI-DNS_DC_A_Chk:** Checks the two DNS host records (A records) associated with a Domain Controller. There are two host records associated with each Domain Controller—one for its fully qualified domain name and one for the domain that it serves. A critical message is generated if one or both records are missing.

- **ADSPI-DNS_DC_CNAME_Chk:** Generates a critical message when a Domain Controller cannot be found using the alias:
<domain_controller_GUID>._msdcs.<domain>
- **ADSPI-DNS_DC_Response:** Alerts the user when DNS queries made by the domain controller result in an unexpected or unacceptable response time; the policy thresholds on specified length of time and logs information for reporting.
- **ADSPI-DNS_LDAP_SRV_Chk:** Checks for extra DNS SRV resource records registered for the LDAP service. Generates a warning message if the domain controller is registered as an LDAP server on a site that it does not reside in. A warning message is generated because this can be a desirable situation under certain circumstances.
- **ADSPI-DNS_Extra_GC_SRV_Chk:** Checks for expected and unexpected DNS host records registered for the global catalog. A GC record is unexpected if the domain controller does not host the global catalog. Only a warning severity level is attached to the message because the situation may be intentional under certain circumstances.
- **ADSPI-DNS_Extra_Kerberos_SRV_Chk:** Generates a warning message if the domain controller is registered as a Kerberos KDC on a site in which it does not reside. Only a warning severity level is attached to the message because the situation may be intentional under certain circumstances.
- **ADSPI-DNS_Extra_LDAP_SRV_Chk:** Checks for extra DNS SRV resource records registered for the LDAP service. If an LDAP server is registered on a site in which it does not reside, a warning message is generated. The extra LDAP server incurs only a warning because the situation may be intentional under certain circumstances.
- **ADSPI-DNS_GC_A_Chk:** Checks for extra DNS host records registered for the registered for the global catalog. Checks for expected and unexpected DNS host records registered for the global catalog. A global catalog record is unexpected if the domain controller does not host the global catalog.
- **ADSPI-DNS_GC_SRV_Chk:** Checks for expected DNS SRV resource records registered for the global catalog.
- **ADSPI-DNS_GC_StrandedSite:** Checks for the existence of a global catalog on every site in the forest in which the domain controller resides.

- **ADSPI-DNS_Island_Server:** Generates a warning message if a domain controller is configured to use itself as a primary DNS server because replication problems can occur in such situations.
- **ADSPI-DNS_Kerberos_SRV_Chk:** Checks for missing resource records for Kerberos and generates a critical message when a domain controller is not properly registered in DNS as a Kerberos KDC server or Kerberos Password Change server. That is, it alerts the user when one or more SRV records that identify it as a Kerberos KDC server or Kerberos Password Change server are missing.
- **ADSPI-DNS_Obsolete_GUIDS:** Checks for hosts within the forest that the domain controller resides in that are registered under obsolete GUIDs.

Global Catalog Monitoring

The primary purpose of global catalog monitoring is to ensure that systems hosting global catalog (GC) servers are replicating in a timely manner. GC replication delay time is measured through two policies: the first is included in the Replication Monitoring group. This policy creates a user object and modifies it. The ADSPI-Rep_GC_Check_and_Threshold policy (contained in the GC Monitoring group) measures the delay time occurring in replicating this modified user object to other domain controllers and vice versa (from DC to GC, and from GC to other DCs). How this data is represented in the OVO message browser and reports should show you how timely/slowly replicating is occurring throughout your Active Directory environment. Policies are automatically deployed through Auto-Deployment (following discovery) as follows:

- The **ADSPI-Rep_GC_Check_and_Threshold** is used to measure the replication time from domain controllers throughout the Active Directory forest to a domain controller hosting global catalog services. This policy is deployed only on systems hosting global catalog services.

Sysvol Monitoring

Sysvol monitoring covers areas that are key to the health of Active Directory such as the Sysvol size, connectivity, and synchronization. Problems with Sysvol can initiate a cascading effect.

- **ADSPI-Sysvol_Connectivity:** The ability to connect to the Sysvol volume is a key indicator of the health of Active Directory. If Sysvol is unavailable, the Netlogon service cannot start. Group policies cannot replicate. It is not uncommon for a person to mistakenly un-share the Sysvol volume out of ignorance. When this happens, a cascading effect occurs.

The ADSPI-Sysvol_Connectivity identifies the DC's replication partner and checks to see that the Sysvol is available to ensure its group replication and other services.

- **ADSPI-Sysvol_PercentFull:** Calculates the percent full of the Sysvol and collects information about its size and logs the information for later reporting.
- **ADSPI-Sysvol_FRS:** Monitors the file replication service in the Sysvol from one domain controller to another.
- **ADSPI-Sysvol_AD_Sync:** Checks that the Group Policy objects in Sysvol and Active Directory synchronized with each other.

Response Time Monitoring

Response time monitoring policies ensure that Active Directory operations are completing in acceptable time frames. Response time monitoring checks the general health of Active Directory operations, the time required for binding to the global catalog, and the time required for global catalog searches and queries. The policies in this group are:

ADSPI-ResponseTime_Logging: This scheduled task policy logs Active Directory response times.

ADSPI-ResponseTime_Query: This policy measures the time required for the Active Directory queries. It periodically queries Active Directory and monitors latency.

ADSPI-ResponseTime_GC_Bind: This policy measures the time required to bind to the global catalog. The data gathered is used for a graph, which aids in base-lining what the value should be for your environment.

ADSPI-ResponseTime_Bind: This policy periodically binds to Active Directory to measure the domain controller's bind response time, which is graphed in order to aid in base-lining what the value should be for your environment.

ADSPI-ResponseTime_GCQuery: Monitors response times of Active Directory global catalog queries.

Trust Monitoring

These policies monitor the trust relationships between domain controllers of managed nodes that are Windows 2003 systems. The policies log modifications as they occur. You can also review this information on demand by using the AD Trust Relationships tool. The tool is located within the console in Tools→SPI for Active Directory→AD Trust Relationships. The policies are as follows:

ADSPI-Trust_CreateDataSources: Sets up the data sources necessary for the ADSPI-Trust_Mon policy to check trust relationships.

ADSPI-Trust_Mon: Monitors the trust changes in Active Directory (on Windows 2003 domain controllers only). The policy checks for creation, deletion and modification of Active Directory Trust information.

Accessing Trust Relationship Information

In addition to the policies that supply messages relating to additions, deletions, and changes in trust relationships, you can generate trust relationship information for each domain controller by using the AD Trust Relationships tool.

In a **Windows 2000 Server** environment for selected managed nodes, this tool displays a list showing the two-way trusts within a forest. In the **Windows 2003 Server** environment it not only reports two-way trusts within a forest but can also show trusts from one forest to another for the selected managed nodes. Please see the online Help for using the AD Trust Relationships tool.

Active Directory SPI and Demoting Domain Controllers

Use the AD DC Demotion Preparation tool before you demote any domain controller. This tool removes the OVRreplication objects inserted into the directory to monitor replication.

This tool should be used only after you have installed and configured the Active Directory SPI and begun to use it to monitor DCs in your Active Directory environment. Please see the Active Directory online Help for how to use this tool.



If you do not use the AD DC Demotion Preparation tool *before* demoting a domain controller, you can manually reconfigure Active Directory to no longer recognize the demoted domain controller by following the steps in the online Help topic “AD DC Demotion Preparation tool.”

Figure 16 The AD Trust Relationships tool lists information about the trust relationships for the selected managed node.

```

Tool Output:

Local Domain Information -----
DCname: .....ADSPI1
DNSname: .....adroot.system.usa.com
FlatName: .....ADROOT
SID: .....S-1-5-21-2532656728-29366491
TreeName: .....adroot.system.usa.com

Trust Relationships -----
FlatName: .....ADMNCR00T
SID: .....S-1-5-21-1667343185-28710011
TrustAttributes: .....0
TrustDirection: .....Bi-directional
TrustedDCName: .....\\adspi2.adncroot.
TrustedDomain: .....adncroot.system.us
TrustIsOk: .....True

```

Manual-Deploy Policies

Active Directory SPI Manual-Deploy policies are not automatically deployed, like the Auto-Deploy policies, after the Active Directory service occurs. Some, however, may already be running on nodes as a result of the service discovery occurring with the Windows OS SPI installation.

Manual-Deploy policies offer basic monitoring that cover areas of Active Directory involving connectivity, domain and organization unit structure, health, index and query, replication/replication activities, security, and site structure. For detailed descriptions, please see the online Help topic “Choosing an Active Directory SPI policy.”

Basic Policy Modifications

After using the Active Directory SPI for awhile, you may decide that specific policies need some modification. Measurement threshold policies contain the rules for interpreting Active Directory states/conditions according to the thresholds set for the incoming data. Scheduled task policies also contain the rules for how often the data is monitored. How to change either policy type is described below. Specific policy descriptions are provided in the OVO online Help.



When you modify a policy, OVO assigns a version number to the modified policy; this means that an extension such as “.1” is added to the policy version. You can then deploy the new policy to managed nodes.

Below find suggestions for basic customizations that you might implement for every managed node.

Modify a Monitoring Schedule or Measurement Threshold

You can modify the monitoring schedule or measurement threshold polices for any AD-SPI policy. After you update the policy for the nodes to which you want the latest change applied, you can right-click the policy group, select **All Tasks**→**Update to latest**, and then re-deploy the policy or policies to the node(s):

- 1 Expand the **Policies grouped by type** folder and select the **Scheduled Task** type (or Measurement Threshold).
- 2 In the details pane of the console double-click the specific (**ADSPI-<policy name>**) scheduled task policy.
- 3 Select the **Schedule** tab and modify the Schedule Task as desired (or in some measurement threshold type policies, the Global Polling Interval” or “Polling Interval” in the Source tabbed page).

The OpenView Topology Viewer

The OpenView Topology Viewer supplements the information you receive from other Active Directory SPI components and has no dependency on any Active Directory SPI policies. Using this tool (located in the OVO console under *Tools*→*SPI for Active Directory*), you are able to quickly see the forests and various site links and connection objects within your Active Directory environment.

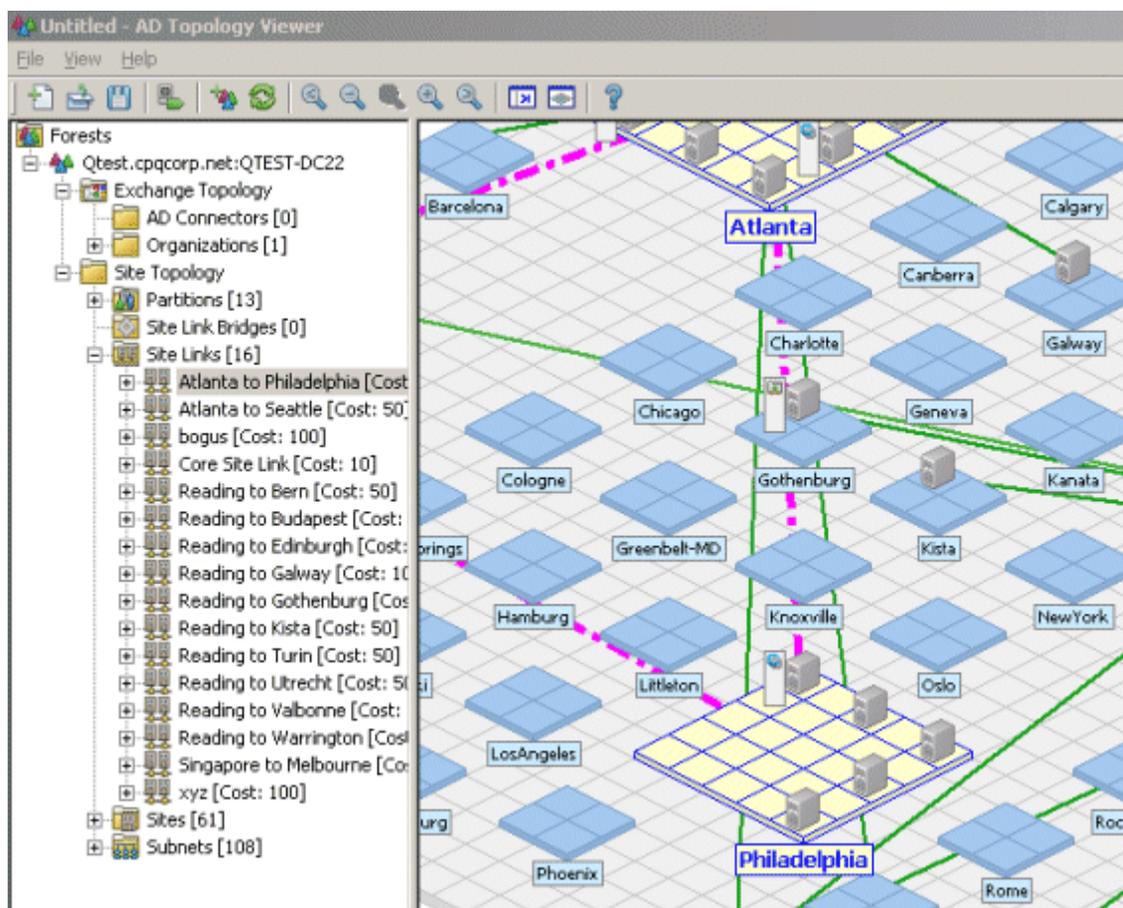
The display: The information gathered by the Topology Viewer is presented in both a tree in the Viewer’s left pane that a map in the right pane. The tree shows forest(s) and domains, including parent/child/grandchild domains, while the map shows the site/replication topology.

How the display gets generated: The Site Topology view requires only that you connect to any domain controller in an Active Directory forest and the tool is able to access the DC’s information, which includes information on other DCs and their links as replicated across the Active Directory environment. With this information, the tool displays current sites, partitions, and unique ID elements making up those Active Directory components in the left pane of

the Topology Viewer window. In the right pane the tool generates a topological map that shows specific forests, sites, and DC replication links among the Active Directory forest.

- ▶ The site/server information shown in the AD Topology Viewer is a snapshot of the data retrieved at the time of the connection to the specified server. It is not automatically updated, but can be refreshed (select *File*→*Refresh Data* or right-click a selected forest and select *Refresh Data*).

Figure 17 To highlight specific site links or connections, you can right-click one in the tree (left pane) and click Find in View, and the relevant object is highlighted as shown below.



The topology contains discovered components as follows:

- Forest(s)
- Partitions (ID component groupings)
- Sites (physical sites)
- Site Links (user-defined links between physical sites)

To launch the Topology Viewer tool:

- 1** At the OVO console select **Operations Manager**→**Tools**→**SPI for Active Directory**.
- 2** Double-click **OV Topology Viewer**.
- 3** In the window that appears, from the File menu select **Add Forest....**
(You can also right-click on the root node of the tree.)



By default, the Topology Viewer privileges are the same as the logged-on user at the OV console. If this user has permissions to access the forest that is being added, alternate credentials are unnecessary. If the logged-on user does not have permission to access the desired forest, the alternate credentials can be used to specify an account which does have access to the forest.

- 4 In the Add Forest dialog, enter the requested information and click **OK**.

 When you have both the Active Directory and Exchange SPIs, you can select this check box to allow additional Exchange data to appear in the Site Topology view of the map. However, gathering this data significantly impacts the efficiency of the map generation. You may need to wait several minutes, possibly up to an hour, depending on the size of your environment, for the map to be completely drawn.

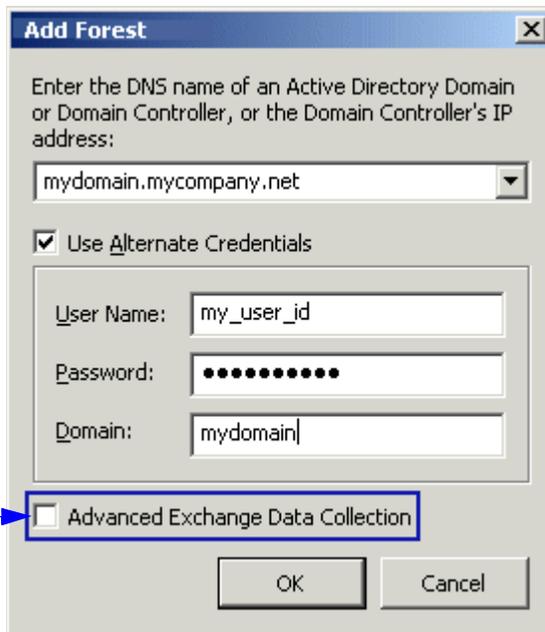
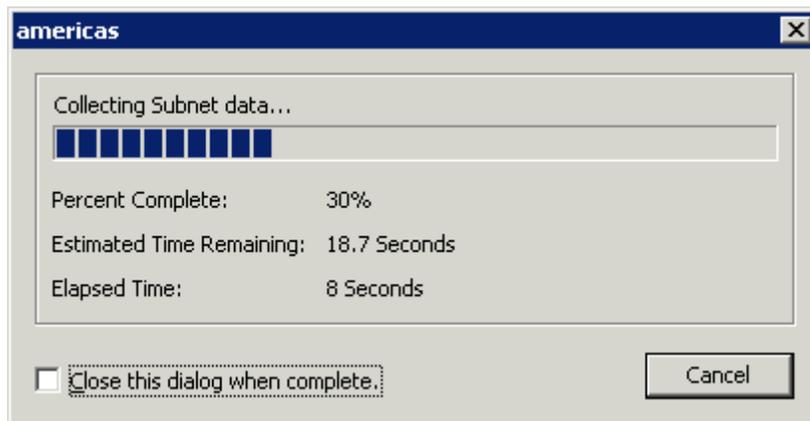


Figure 18 As the Topology Viewer makes the connection to the specified domain controller, you are updated on data retrieval progress.



Getting Started with the OV Topology Viewer

Each time you launch the Topology Viewer and make the connection to a domain, you are presented with two window panes that represent the information gathered from a server. Even though some of the information is the same, the dual-paned window shows you two different representations of it.

The tree and the map: On the left, you see folders containing forest, partition, site, and site link information. On the right, you see the topological map that places the forest, with its sites and site links in a context. While the left window lists components, the right pane shows the relationships among those components.



Site link cost: In the tree site links, in addition to showing the connections between sites, show the associated “cost” of each connection. Site links with a lower cost are able to replicate data between those sites more easily than those site links showing a higher cost.

The initial map view: The map shows only site links (represented by green lines), which are user-defined. These links are the foundation on which the Active Directory is able to build connections between servers.

The *Site Topology* view shows servers identified by their Active Directory functionality. If you are running the Exchange SPI, you will see Exchange functionality as well. The symbols shown next to each server are explained in a legend that you can display by selecting **View**→**Legend** (as shown in the illustration that follows).

The *Exchange Topology* view shows Exchange routing groups and is available only if you run the Exchange SPI. This view is entirely devoted to Exchange functionality, while the Site Topology view, though primarily focused on Active Directory functionality, does include some Exchange functionality. Please refer to the Exchange SPI Configuration Guide, online Help, and Release Notes for details about the Topology Viewer when used in conjunction with the Exchange SPI.



Right-click any server in the OV Topology Viewer map, and you are shown its DC: <name> or Exchange Server: <name>.

Figure 19 The Topology Viewer Legend explains the symbols used to represent server roles. Server roles are also shown in the server properties page (right-click server and select Properties....

Both Active Directory and Exchange server functions are explained in the OV Topology Viewer legend. Active Directory functions comprise only the first four. If you are using the Active Directory SPI only, only the first four functions appear.

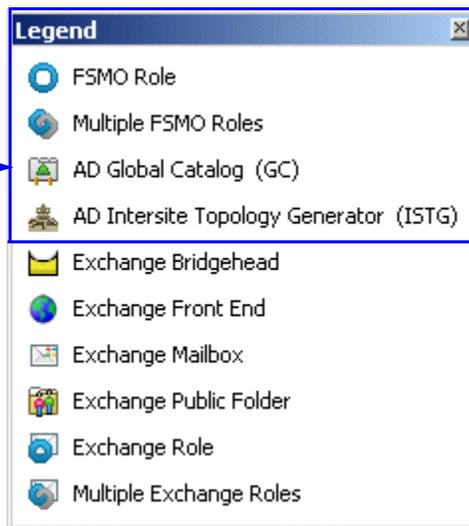


Figure 20 In the OV Topology Viewer map, a domain controller (top) and a server (bottom) have slightly different appearances; Active Directory functions appear on the left; Exchange, on the right. A domain controller with dual functionality (Exchange and Active Directory), displays functions on both left and right sides.

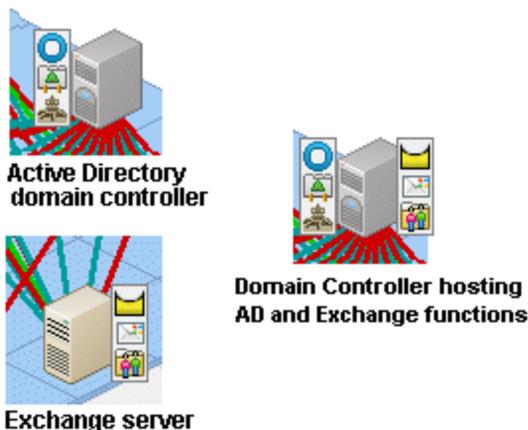


Figure 21 To change the map background or grid appearance, select **View→Properties**, and the **General** tabbed page.

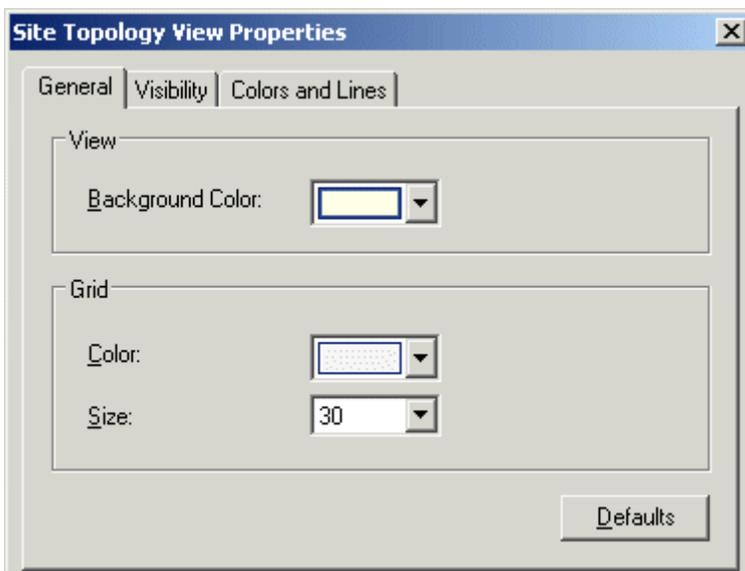


Figure 22 To show/hide the server connections/links or labels, select **View→Properties**, and the **Visibility** tabbed page.

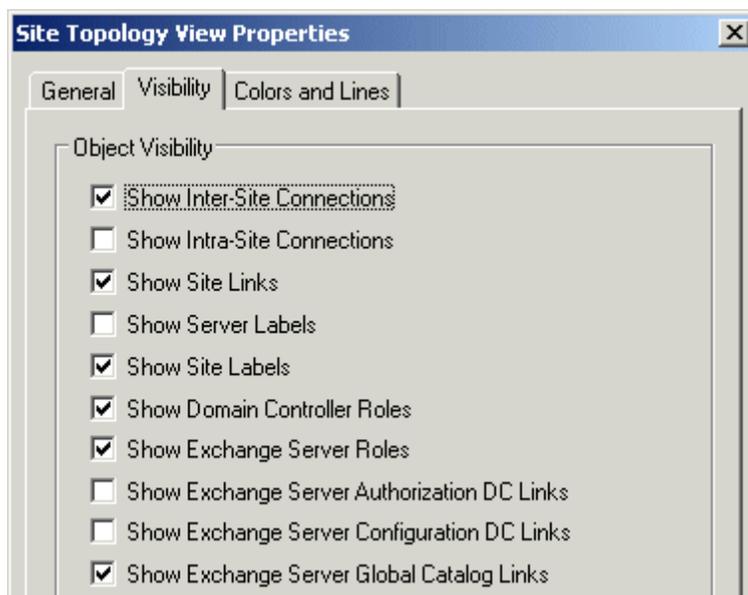
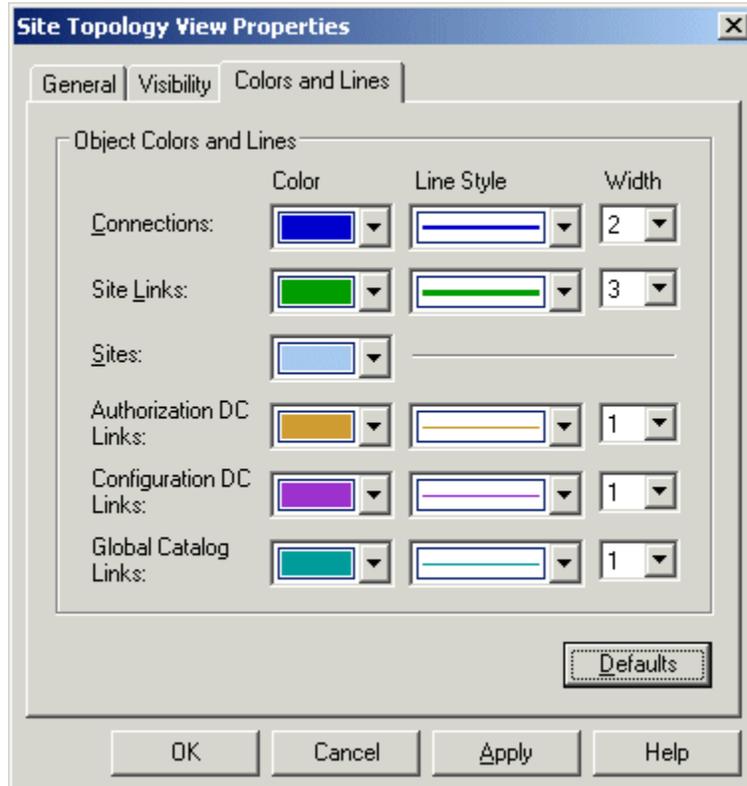


Figure 23 To change the server connections and links appearance, select View→Properties, and the Colors and Lines tabbed page.



Manipulating the Map View

You may find when you view the OV Topology Viewer replication map that sites or servers do not appear within the viewable area. You can access Topology Viewer features through its *menu commands*, its *toolbar buttons*, or by *mouse right-clicks* within areas of either side of the window pane. For

complete menu and toolbar descriptions, please refer to the SPI for Active Directory online Help. You may also want to resize the viewable area. These and other changes are possible as follows:

Table 2 Modifying the OV Topology Viewer

Tree/map modification	How to do it
To move sites to different locations on the map.	Drag and drop the site to desired the desired position on the grid.
To move servers.	Drag and drop to desired tiles within the site.
To display server or site labels.	From the View menu select Properties...
To increase/decrease the size of the row/columns in the map's grid.	Right-click the unused space on or off the map and select Properties.... and choose the General tabbed page.
To find a site, site link, server, or server connection in the tree.	On the map, right-click the site or server on the map and select Find in Tree .
To find a server in the map.	In the tree, right-click on the site or server and select Find in View . (Label appears in highlighted text.)

Using the keyboard to move around the map.

Table 3 Keyboard Functionality

Keystroke	Map function
← left arrow	Scrolls the map view to the left approximately one tile width.
→ right arrow	Scrolls the map view to the right approximately one tile width.
↑ up arrow	Scrolls the map view up approximately one tile height.
↓ down arrow	Scrolls the map view down approximately one tile height.
Page Up	Scrolls the map view up approximately 3 tiles.
Page Down	Scrolls the map view down approximately 3 tiles.
Home	Scrolls the map view to the left extent. (Vertical position remains the same).
End	Scrolls the map view to the right extent. (Vertical position remains the same).

Accessing Server and Map Properties

After you have successfully connected to a forest, resulting in a populated tree and topological map, you can access the following information:

Server Properties: By right-clicking a domain controller/server in either the tree or the map, you can open that server's properties sheet, where you can view:

- Domain Controller information: Shows the fully qualified domain name, distinguished name, GUID assigned to the server, and server Active Directory roles.
- System Information: Operating system and its version, date created, the operating system and OS version, and (if applicable) service pack and hot fix (as appropriate).
- Connections: Inbound connections and outbound notification

- Partitions: Shows all naming contexts associated with the server as displayed in the OV Topology Viewer tree, grouping them either within the master read-write components, or the replicating read-only context.
- Replication: Shows information about completed and pending replication operations.
- ▶ The availability of some information in the server (DC) property sheet is dependent on the WMI access rights of the user.
- DNS: Shows the fully qualified DNS host name and Name Servers, depending on the WMI access rights.

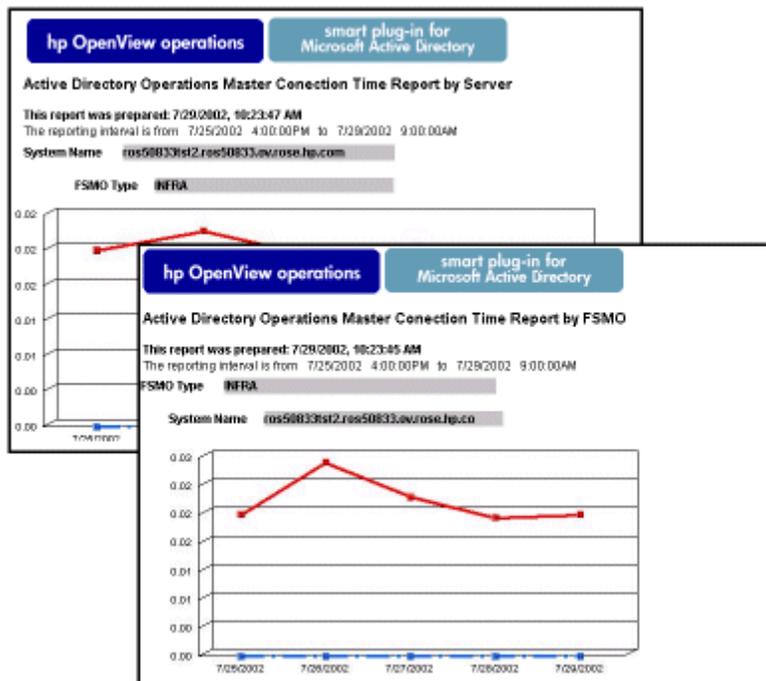
Site Topology Properties: Right-click outside the grid area, choose View Properties.... or from the View menu, select Properties. You can use the properties sheet to modify the display as desired (see [Figure 22](#), [Figure 23](#)):

- *General tab:* Color choices for the background (behind the grid) and the grid; grid tile size.
- *Visibility tab:* Toggles on/off the display of connections/links (between servers in a site), Intra-site connections (server connections between sites), Site links, server and site labels, and server roles.
- *Color and Lines tab:* Color choices for connection and site link lines, and site background.
 - Object visibility on/off settings: Allows you to turn on/off the display of links, labels, and domain controller/server roles.

Use the **Defaults** button to return to the default settings.

Reporting and Graphing

Active Directory SPI report- and graph-generating templates are installed when you install the AD-SPI. These reports cover availability/activity in *DIT*, *DNS*, *GC*, *replication*, *FSMO operations*, *Sysvol*, and *trust relationship changes* for each domain controller running those services.



Automatically generated every night, these Web-ready reports provide you with a routine means of checking the GC and DNS availability, disk space and queue length issues occurring with DIT, replication latency, and connection times specific to domain controllers running master operations services. Also available for 2003 systems are reports covering trust relationship changes between domain controllers.

- ▶ If you use OpenView Reporter and it is installed on a separate system, you need to complete that installation on the Reporter system.

By showing consolidated information, available otherwise only in pieces, OVO reporting provides you with a more complete view of how Active Directory services are performing over time.

AD-SPI Reports and Data Sources

After you install the Active Directory SPI, OVO can generate reports using the Active Directory SPI-collected data. These reports are generated after OVO runs through its first nightly schedule. From that point on, you can expect to see updated reports every day since OVO, by default, re-generates reports every night with the day's data.

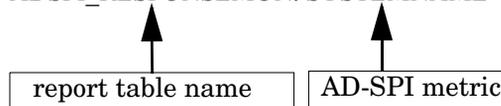
- ▶ Customizing reports requires that you purchase **HP OpenView Reporter**. The Reporter documentation set details how to modify reports and includes a *Concepts Guide*, an *Installation and Special Configurations Guide*, online Help, and Release Notes.

AD-SPI report data is collected according to metrics used for each report. This data is stored in the MS SQL "Reporter" database. The example metric formatting below (for the AD Domain Controller Availability report) shows how metric variables are identified for reporting purposes:

`<report_table_name>.<AD-SPI_metic_name>`

as in:

ADSPI_RESPONSEMON.SYSTEMNAME



AD-SPI reports are accessible from the *Reports & Graphs* area of the OVO console. Complete descriptions of all reports and graphs are available in the OVO online Help.

The following table shows reports, report template names, and the AD-SPI policies required to generate them.

Table 4 Active Directory Reports, report template names, and their required policies.

Report Name	Report Template File Name	Required Policy
AD Domain Controller Availability	g_ADDCAvailability.rpt	ADSPI-Response_Logging
AD GC Rep Delay Times by DC/GC Report - Monthly	g_ADDCGCmonthly.rpt	ADSPI-Rep_GC_Check_and_Threshold
AD GC Rep Delay Times by DC/GC Report - Weekly	g_ADDCGCweekly.rpt	ADSPI-Rep_GC_Check_and_Threshold
AD DIT Disk Size Summary - Monthly	g_ADDITDiskSpaceMonthly.rpt	ADSPI-DIT_DITPercentFull ADSPI-DIT_TotalDitSize
AD DIT Disk Size Summary -Weekly	g_ADDiskSpaceWeekly.rpt	ADSPI-DIT_DITPercentFull ADSPI-DIT_TotalDitSize
AD DIT Disk Queue Length - Weekly	g_ADDITQueueLengthWeekly.rpt	ADSPI-DIT_DITQueueLength
AD DC DNS Availability Report -Daily	g_ADDNSDCAvailDaily.rpt	ADSPI-DNS_DC_RESPONSE
AD DC DNS Availability Report- Weekly	g_ADDNSDCAvailWeekly.rpt	ADSPI-DNS_DC_RESPONSE
AD DNS Server Availability Report -Daily	g_ADDNSrvAvailDaily.rpt	ADSPI-DNS_DC_RESPONSE
AD DNS Server Availability Report -Weekly	g_ADDNSSrvAvailWeekly.rpt	WINOSSPI-DNS_ServerResponse

Table 4 Active Directory Reports, report template names, and their required policies.

Report Name	Report Template File Name	Required Policy
AD DNS Server Memory Capacity Planning Report - Monthly	g_ADDNSSrvMemCapPlanMonthly.rpt	WINOSSPI-DNS_ServerResponse
AD DNS Server Memory Capacity Planning Report - Weekly	g_ADDNSSrvMemCapPlanWeekly.rpt	WINOSSPI-DNS_LogDNSPagesSec
AD Domain and Forest Trust Changes - Monthly	g_ADDomainForestTrustMonthly.rpt	ADSPI-Trust_Mon
AD Domain and Forest Trust Changes - Weekly	g_ADDomainForestTrustWeekly.rpt	ADSPI-Trust_Mon
AD GC Rep Delay Times by GC/DC Report - Monthly	g_ADGCDCmonthly.rpt	ADSPI-Rep_GC_Check_and_Threshold
AD GC Rep Delay Times by GC/DC Report - Weekly	g_ADGCDCweekly.rpt	ADSPI-Rep_GC_Check_and_Threshold
AD GC Response Time - Monthly	g_ADGCResponseTimeMonthly.rpt	ADSPI-Reponse_Logging
AD GC Response Time - Weekly	g_ADGCResponseTimeWeekly.rpt	ADSPI-Reponse_Logging
AD Log Files Disk Size Summary - Monthly	g_ADLogFilesDiskSpaceMonthly.rpt	ADSPI-DIT_LogFilesPercentFull
AD Log Files Disk Size Summary - Weekly	g_ADLogFilesDiskSpaceWeekly.rpt	ADSPI-DIT_LogFilesPercentFull
AD Log Files Disk Queue Length - Weekly	g_ADLogQueueLengthWeekly.rpt	ADSPI-DIT_LogFilesQueueLength
AD Operations Masters Connection Time by FSMO	g_ADOPMstrConTimeByFsmo.rpt	ADSPI-FSMO_Logging
AD Operations Masters Connection Time by Server	g_ADOPMstrConTimeBySvr.rpt	ADSPI-FSMO_Logging

Table 4 Active Directory Reports, report template names, and their required policies.

Report Name	Report Template File Name	Required Policy
AD Size of Sysvol Report - Monthly	g_ADSizeOfSysvolMonthly.rpt	ADSPI-REP_SysVolPercentFull
AD Size of Sysvol Report - Weekly	g_ADSizeOfSysvolWeekly.rpt	ADSPI-REP_SysVolPercentFull

The following table shows the data sources for all AD-SPI reports.

Table 5 Active Directory Reports with Required Metrics

AD-SPI Reports and Source Policies	Data Source Tables & Metrics
<p>Report title: AD DIT Disk Queue Length Report (weekly)</p> <p>Policy: ADSPI-DIT_DITQueueLength</p>	<p>Tables:</p> <p>ADSPI_Domain ADSPI_Site ADSPI_LogQueueLength</p> <p>Metrics:</p> <p>SYSTEMNAME INSTANCEVALUE DATETIME</p>
<p>Report title: AD DIT Disk Size Summary Report (weekly & monthly)</p> <p>Policies:</p> <p>(1) ADSPI-DIT_DITPercentFull and (2) ADSPI-DIT_TotalDitSize</p>	<p>Tables:</p> <p>ADSPI_DITDatabaseSize ADSPI_DITPercentFull ADSPII_Domain ADSPI_Site.</p> <p>Metrics:</p> <p>DATETIME INSTANCEVALUE SYSTEMNAME</p>
<p>Report title: AD DC DNS Availability Report (daily and weekly)</p> <p>Policy: ADSPI-DNS_DC_RESPONSE</p>	<p>Table:</p> <p>ADSPI_DNS_DCRESP</p> <p>Metrics:</p> <p>DATETIME RESPONSETIME</p>

AD-SPI Reports and Source Policies	Data Source Tables & Metrics
<p>Report title: AD DNS Server Availability Report (daily and weekly) Policy: WINOSSPI-DNS_ServerResponse</p>	<p>Table: WINOSSPI_DNS_SVRRESP Metrics: DATETIME RESPONSETIME ISDOMAINCONTROLLER</p>
<p>Report title: AD DNS Server Memory Capacity Planning Report (weekly and monthly) Policy: WINOSSPI-DNS_LogDNSPagesSec</p>	<p>Table: WINOSSPI_DNS_SVRPLAN Metrics: DATETIME PAGESSEC(Avg) PAGESSEC (Max) PAGESSEC (Min)</p>
<p>Report title: AD Domain Controller Availability Policy: ADSPI-Response_Logging</p>	<p>Table: ADSPI_RESPONSEMON Metrics: SYSTEMNAME DATETIME</p>
<p>Report title: AD GC Rep Delay Times (DC to GC(s) and GC to DC(s) (weekly and monthly) Policies: (1) ADSPI-Rep_Modify_User_Object (must be deployed to all domain controllers); (2) ADSPI-Rep_GC_Check_and_Threshold (must be deployed to all global catalog servers).</p>	<p>Table: ADSPI_REP_GC Metrics: SYSTEMNAME DATETIME LATENCYDELTA</p>
<p>Report title: AD GC Response Time (weekly and monthly) Policy: ADSPI-Response_Logging</p>	<p>Tables: ADSPI_RESPONSEMON ADSPI_REP_GC Metrics: SYSTEMNAME DATETIME (Date) GCPRESENT GCBINDTIME QUERYTIME</p>

AD-SPI Reports and Source Policies	Data Source Tables & Metrics
<p>Report title: AD Log Files Disk Queue Length (weekly) Policy: DSPI-DIT_LogFilesQueueLength</p>	<p>Tables: ADSPI_Domain ADSPI_Site ADSPI_LogQueueLength Metrics: SYSTEMNAME INSTANCEVALUE DATETIME</p>
<p>Report title: AD Log Files Disk Size Summary (weekly and monthly) Policy: ADSPI-DIT_LogFilesPercentFull</p>	<p>Tables: ADSPI_LogDiskSize ADSPI_Domain ADSPI_Site ADSPI_LogPercentFull Metrics: DATETIME INSTANCEVALUE INSTANCENAME</p>
<p>Report title: AD Operations Master Connection Time (by FSMO and by Server) Policies: ADSPI-FSMO_NAMING_Bind (& Ping), ADSPI-FSMO_PDC_Bind (& Ping), ADSPI-FSMO_SCHEMA_Bind (& Ping), ADSPI-FSMO_INFRA_Bind (& Ping), ADSPI-FSMO_RID_Bind (& Ping). NOTE: <i>FSMO reports</i> graphically represent connections in both ping and bind measurements. The ping time measures the network connection time. Bind time measures the time between the ping connection and the connection to the targeted Active Directory service.</p>	<p>Table: ADSPI_FSMO_MET Metrics: FSMO GMT PINGTIME BINDTIME</p>

AD-SPI Reports and Source Policies	Data Source Tables & Metrics
<p>Report title: AD Size of Sysvol Report (weekly and monthly)</p> <p>Policy: ADSPI-Sysvol_PercentFull</p>	<p>Table: ADSPI_SYSVOL_PCT_FULL</p> <p>Metrics: SYSTEMNAME DATETIME INSTANCENAME (SysVolFilePath) INSTANCEVALUE (SysvolDriveFreeSpace)</p>
<p>Report title: AD Domain and Forest Changes (weekly and monthly)</p> <p>Policy: ADSPI-Trust_Mon</p>	<p>Table: ADSPI_TRUST</p> <p>Metrics: DATETIME CHANGETYPE TRUSTEDDOMAIN TRUSTATTRIBUTES TRUSTDIRECTION TRUSTSTATUSSTRING TRUSTTYPE TRUSTINGDOMAIN</p>
<p>Report title: AD FSMO Role Holder Movement (weekly and monthly)</p> <p>Policy: ADSPI-FSMO_Role_Mvmt</p>	<p>Table: ADSPI_FSMO_ROLEMVMT</p> <p>Metrics: SYSTEMNAME DATETIME FSMO ISROLEHOLDER</p>

Figure 24 The FSMO Role Holder Report lists DCs and their loss or gain of FSMO roles. The report is available for weekly and monthly updates.

AD FSMO Role Holder Movement - Weekly

hp OpenView operations smart plug-in for Microsoft Active Directory

FSMO Role Holder Report - Weekly

This report was prepared on 2005-02-23, 02:15:38

This report shows the movement of FSMO roles between Domain Controllers on a weekly basis. Data is collected for the period of 2005-02-18 06:00:00 to 2005-02-19 01:00:00

FSMO Role Holder Movement: By Week

The table below shows the following information for each Windows Server 2003 Domain Controller:
 SYSTEM NAME: Name of the Domain Controller
 FSMO: Flexible Single-Master Operations Role (Schema master, Domain naming master, RID master, PDC master and Infrastructure master).

Date: 2/18/2005

Time	FSMO Role	System Name	Role Movement
6:00:00	NAMING	ros50833tst2.ros50833.ov.rose.hp.com	Role left this DC
	NAMING	ros50833tst4.ros50833.ov.rose.hp.com	Role moved to this DC
23:00:00	NAMING	ROS50833TST4.ros50833.ov.rose.hp.com	Role left this DC
	NAMING	ROS50833TST2.ros50833.ov.rose.hp.com	Role moved to this DC

Date: 2/19/2005

Time	FSMO Role	System Name	Role Movement
1:00:00	NAMING	ros50833tst2.ros50833.ov.rose.hp.com	Role left this DC

Using AD-SPI with OpenView Reporter

If you use OpenView Reporter, you can install the Active Directory SPI reports on the Reporter system so that you can customize them and apply them, as desired, to groups of systems and single systems.

Install Report Package

If Reporter and OVO for Windows are installed on the same system, no separate installation for the AD-SPI is necessary (as described in the tasks below).

However, stand-alone Reporter installations require that you run the ADSPI-Reporter.msi set up. This setup installs the AD-SPI report package within Reporter.

To install the Active Directory SPI Report Package on a Reporter standalone system:

- 1 From the Smart Plug-ins, New and Upgraded, for OVO Windows CD set, locate Volume 1 and insert it in the CD-ROM drive of the Reporter system.
- 2 On CD Volume 1 open \SPIs\AD SPI\ and double-click the file: **ADSPI-Reporter.msi**.
- 3 In the dialog that appears, for the setup type select **Complete** and click **Next**.
- 4 Open the Reporter main window and check the status pane to note changes to the Reporter configuration, which include uploading AD-SPI reports.

AD-SPI Reports are automatically assigned to the ALL group in the Reporter main window. (See the preceding section “AD-SPI Reports and Data Sources” on page 68 for OVO Report list.)

- 5 Add group and single system reports by assigning reports as desired.

Reports are available for viewing the following day.



Group and single system AD-SPI reports require that you identify systems by their full name; for example, **abc.xyz.com** is acceptable while **abc** is not.

Instructions are available in the Reporter Help for assigning AD-SPI reports to the targeted nodes. To access Help, select **Reports** or **Discovered Systems** in the left panel of the Reporter main window and right-click it.

Select **Report Help** or **Discovered Systems Help** from the submenu that appears. See the topic “To assign a report definition to a Discovered Systems Group.” Reporter also includes two online documents: the *Concepts Guide* and the *Installation/Special Configurations Guide* for further information.

AD-SPI Graphs and Data Sources

The Active Directory SPI also includes graphs available in the OVO console in Reports & Graphs→Graphs→SPI for Active Directory. OVO graphs differ from reports in that you manually generate them and then view data that is more immediate and granular in nature.

AD-SPI graphs, which consolidate collected data, are listed in the following table.

-  Graphs showing response times are meant to aid you in establishing baseline values for setting thresholds in other policies.

Table 6 Active Directory Graphs and Source Policies

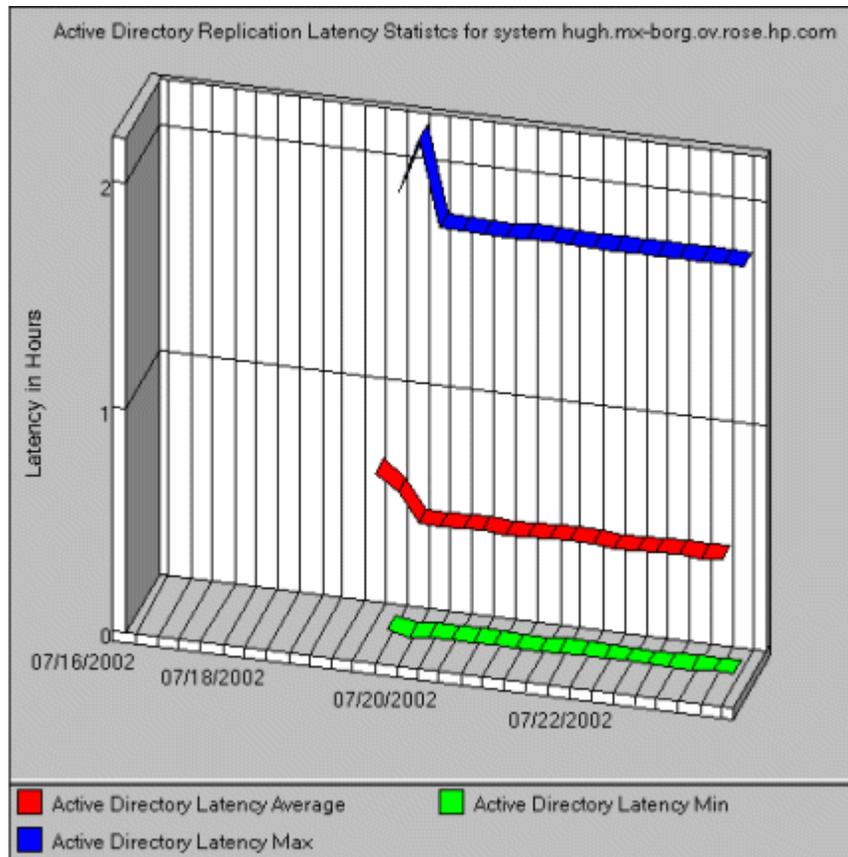
AD-SPI Graphs and Policies	Source Metrics
<p>Graph Title: Active Directory Replication Latency Graph</p> <p>Source Policies: ADSPI-Rep_ModifyObj and ADSPI-Rep_Mon</p>	<p>Metrics: LatencyMin LatencyMax LatencyAvg</p> <p>NOTE: The Replication Latency Graph can be generated only when one or more domain controllers exist in a forest; a forest with a single domain controller has no replication occurring, and so no data for graphing is available.</p>
<p>Graph Title: Active Directory Bind Response Time</p> <p>Source Policy: ADSPI-Response_Logging</p>	<p>Metrics: GCBindTime BindTime</p>

AD-SPI Graphs and Policies	Source Metrics
Graph Title: Active Directory GC Availability Source Policy: ADSPI-Response_Logging	Metrics: GCAVAILABILITY GCQueryTime
Graph Title: Active Directory Query Response Time Graph Source Policy: ADSPI-Response_Logging	Metric: GCQueryTime
Graph Title: Active Directory Replication Time by Global Catalog Source Policy: ADSPI-Response_Logging	Metric: GCBindTime

To access the Active Directory SPI graphs:

- 1 Select **Reports & Graphs**→**Graphs**→**SPI for Active Directory**.
- 2 Right-click the graph name, such as **Active Directory Replication Latency Graph**, and select **Show Graph....**
- 3 Select the Node and Date Range and click **Finish**.

Figure 25 In the right pane, you see the graph generated by the OVO grapher.



Troubleshooting

The situations described below offer methods of solving or detecting problems that may or may not require support assistance. Please see each for the relevancy to the problem you are experiencing.

Problem Solving with Self-Healing Services

Preferred method (using the HP Online Software Support web site):

Troubleshooting information is greatly enhanced with cross-referencing capabilities available through the HP support site:

http://support.openview.hp.com/self_healing.jsp. To access this information and the search capabilities available on the site, you must first download and configure the Self-Healing Services client software, an added benefit of your HP support contract. A link is then automatically set up to the Self-Healing Services web site, where your SPI problem can be matched to similar SPI problems/solutions for increased troubleshooting effectiveness. Please see the *SPI CD Installation Guide* section on Self-Healing Services for information on how to download, configure, and use the software and its automatic link to the HP web site support service.

Alternative method (using the AD-SPI tool): If Self-Healing Services is not installed/configured on the node, you can use the Active Directory Self-Healing Info tool. This tool also gathers SPI troubleshooting data and stores it in a file that you submit to HP support for assistance.

Using the Self-Healing Info tool

To use the Self-Healing Info tool, complete these steps:

- 1 At the console expand Tools→SPI for Active Directory.
- 2 Right-click the **Self-Healing Info** tool and select **All Tasks**→**Launch Tool...**
- 3 Locate the node on which you want to run the Self-Healing Info tool and click the check box next to it.
- 4 Select the **Launch...** button..



Depending on a Windows setting, the file may be a hidden file on some managed nodes. If you do not see the file, open **Windows Explorer** and from the **Tools** menu select **Folder Options...**→**View** tabbed page. Under *Hidden files and folders*, select **Show hidden files and folders**.

- 5 You can select where to store the file after the tool has run.

In your call to HP support, you can then send the file, as your support representative directs you, as part of your support case.

Detecting Problems Through Tracing

On occasion you may have a problem for which you cannot easily find a solution. To capture all Active Directory information, including FSMO and replication conditions, status, and errors included in the Active Directory SPI logs, you can turn on tracing to access this information.

To turn on tracing for FSMO service consistency monitoring:

- 1 At the OVO console tree, expand the Policies grouped by type folder and select Scheduled Task.
- 2 In the right pane double-click the policy; for example **ADSPI-FSMO_Consist.**

- 3 In the Command* text box, place the cursor at the end of the command and type:
-l 1
(a minus sign [-], the letter “l” for “log”, a blank space, and the number “1”).
- 4 Click **Save and Close**.
- 5 Re-deploy the policy to the node for which you want to conduct the trace.

To turn on tracing for FSMO service response time monitoring:

Repeat the above procedure, substituting the policy **ADSPI-FSMO_Logging**.

To turn on tracing for Replication service latency and response times.

- 1 At the OVO console tree, expand the **Policies grouped by type** folder and select **Measurement Threshold**.
- 2 In the right pane double-click the policy:
ADSPI-Rep_Mon
or
ADSPI-Rep_Sysvol
or
ADSPI-Rep_TimeSync
- 3 In the Program* text box, place the cursor at the end of the command and type:
-l 1
(a minus sign [-], the letter “l” for “log”, a blank space, and the number “1”).
- 4 Click **Save and Close**.
- 5 Re-deploy the policy to the node for which you want to conduct the trace.

To view trace logs.

- 1 At the managed node start your preferred text editor.
- 2 Open the directory: `<installed_drive>:\Program Files\HP OpenView\installedpackages\<GUID>\log\`



The above location shows the path to the file for default installations. For installations where file locations were modified, the location is determined by: `%ovagentdir%\log`.

In the `log` directory, open the file with a `.log` extension and a name matching the command or program executable name used in the `Command*` or `Program` text box above.

For example:

```
ADSPI_consist.log
```

Graphing Problems

Errors that occur when trying to generate a graph could result from the following:

Problem (graphing): Error 33, no data available for the replication latency graph.

— **Cause(s):**

(1) Replication has not had sufficient time to occur.

(2) The **user account** settings for both the agent and the policy do not match. The default setting for the agent is to run as the Local SYSTEM account. However, the default setup may have been disabled though using the `Tools` → `OpenView Tools` → `Agent Account` tool group.

Solution(s):

(1) Check the Scheduled Task policy to see how often replication latency is scheduled to occur. Wait until sufficient time elapses and then try once again to view or generate the report/graph.

(2) Check the agent account by going to `Tools` → `OpenView Tools` → `Show agent account`. Check the four AD-SPI Scheduled Task policies to ensure their user account settings match the agent account setup on the management server. Those policies are: `ADSPI-FSMO_Consist`, `ADSPI-FSMO_Logging`, `ADSPI-REP_ModifyObj`, `ADSPI_Response_Logging`. Double-click each policy and on the `Task` tabbed page of the `Properties`, see the `Task type Command` segment and note the `Execute` setting. The `$AGENT_USER` selection means that the agent runs as the Local SYSTEM account. Change the agent or policies as necessary to make all user account settings match.

— **Cause:** The Active Directory forest contains only a single domain controller; as a result, no replication occurs.

Solution: No replication latency graph can be generated when this configuration exists.

Problem (graphing): Error 33, data not available for the graph.

- **Cause:** The system selected for graphing purposes is not a domain controller and therefore has no AD-SPI policies deployed on it. As a result, no data is available for the graph.

Solution: N/A; no real problem exists.

Reporting Problems

Errors that occur when trying to view a report could result from the following:

Problem (reporting): No data available for reports:

- **Cause:** The policies needed for the report's data have not been deployed.
- **Solution:** Examine the policy inventory on the node in question to determine whether or not the policy is there. If not, deploy the policy.

Problem: The agent appears to be failing; that is, not collecting the data necessary for reporting.

- **Cause:** The **user account** settings for both the agent and the policy do not match. The default setting for the agent is to run as the Local SYSTEM account. However, the default setup may have been disabled through using the **Tools→OpenView Tools→Agent Account** tool group.
- **Solution:** Check the agent account by going to **Tools→OpenView Tools→Show agent account**. Check the four AD-SPI Scheduled Task policies to ensure their user account settings match the agent account setup on the management server. Those policies are: ADSPI-FSMO_Consist, ADSPI-FSMO_Logging, ADSPI-REP_ModifyObj, ADSPI_Response_Logging. Double-click each policy and on the Task tabbed page of the Properties, see the Task type *Command* segment and note the *Execute* setting. The \$AGENT_USER selection means that the agent runs as the Local SYSTEM account. Change the agent or policies as necessary to make all user account settings match.

Problem: The report “AD Domain Controller Availability Report” shows a non-global catalog server with a GC as unavailable 100% of the time.

- **Cause:** This error occurs whenever a server that hosts no global catalog services has a response-time monitoring policy deployed on it. Because no global catalog services are running, no data is available.
- **Solution:** The report is in error and no action is necessary.

A

- Active Directory SPI
 - components, summary of, **8**
 - discovery, diagram of, **13**
 - discovery summary, **10**
 - overview of functions, **43**
- AD DC Demotion Preparation, **9**
 - description of tool, **52**
- AutoPass, how to use, **33**

C

- components, summary of, **8**
- Connector policy group, description of, **11**

D

- data missing for graphs, possible cause of, **85**
- data missing for reports, possible cause of, **85**
- Directory Services Access policies
 - description of, **11**

- discovery
 - automatic and manual, requirements for each, **26**
 - diagram showing, **13**
 - method for currently managed nodes, **25, 27**
 - method for unmanaged nodes, **29**
 - replication links, **56**
 - summary of, **10**
- DIT monitoring, **48**
- DIT monitoring policies, **48**
 - ADSPI-DIT_DITPercentFull policy, **48**
 - ADSPI-DIT_DITQueueLength, **48**
 - ADSPI-DIT_TotalDITSize, **48**
- DNS monitoring, description of, **48**
- DNS monitoring policies
 - ADSPI-DNS_DC_A_Chk, **48**
 - ADSPI-DNS_DC_Response, **49**
 - ADSPI-DNS_Extra_GC_SRV_Chk, **49**
 - ADSPI-DNS_GC_A_Chk, **49**
 - ADSPI-DNS_GC_SRV_Chk, **49**
 - ADSPI-DNS_Island_Server, **50**
 - ADSPI-DNS_Kerberos_SRV_Chk, **50**

- ADSPI-DNS_Obsolete_GUIDS, **50**
 - Domain and OU Structure policies
 - description of, **11**
 - domain controllers
 - demoted, how to configure for AD-SPI, **9**
 - showing replication links between, **55**
 - F**
 - FSMO monitoring policies, **45**
 - ADSPI-FSMO_Consist, **45, 47**
 - ADSPI-FSMO_INFRA (Bind & Ping), **46**
 - ADSPI-FSMO_Logging, **46**
 - ADSPI-FSMO_NAMING, **46**
 - ADSPI-FSMO_PDC, **47**
 - ADSPI-FSMO_RID, **47**
 - ADSPI-FSMO_RoleMvmt, **47**
 - ADSPI-FSMO_SCHEMA, **46**
 - FSMO policies
 - general descriptions of, **10**
 - G**
 - global catalog
 - policies that monitor response times of, description, **11**
 - global catalog monitoring, description of, **50**
 - Global Catalog monitoring policies
 - ADSPI-DNS_Obsolete_GUIDS, **50**
 - graphing problems, **84**
 - graphs
 - Active Directory Bind Response Time, **77**
 - Active Directory GC Availability, **78**
 - Active Directory Query Response Time Graph, **78**
 - Active Directory Replication Latency Graph, **77**
 - Active Directory Replication Time by Global Catalog, **78**
 - AD Domain and Forest Changes, **77**
 - how to access, **78**
 - how to display, **77, 78**
 - illustration of, **79**
 - list of, with data sources, **77 — 78**
 - H**
 - Health Monitors policies
 - description of, **11**
 - I**
 - Index and Query policies
 - description of, **12**
 - installation
 - AD-SPI reports on Reporter system, **76**
 - procedure for, **26**
 - L**
 - legend for OV Topology Viewer
 - license, how to obtain, **33**
 - M**
 - Manual-Deploy
 - Domain and OU Structure group, **11**
 - Manual-Deploy policies, **54**
 - Connector group, **11**
 - Directory Services Access group, **11**
 - Domain and OU Structure group, **11**
 - Health Monitors group, **11**
 - Index and Query group, **12**
 - Replication Activity group, **12**
 - Replication group, **12**
 - Security group, **12**
 - Site Structure group, **12**
 - map
 - changing colors and lines, **62**
 - moving components within, **62**
 - measurement threshold policies
-

- modifying, **54**
- metrics
 - OVO-reports related, **71, 77**
- N**
- nodes, unmanaged, how to add to OVO
 - managed Nodes folder, **29**
- O**
- OpenView Reporter, using AD-SPI with, **76**
- OV Topology Viewer
 - customizing display, **65**
 - description of, **55**
 - legend for, **59**
 - map, accessing server properties
 - through, **64**
 - map, modifying display of, **63**
 - map, moving items within it around, **64**
 - using, **57**
- P**
- password for AD-SPI, how to obtain, **33**
- PCs, adding to OVO managed nodes folder, **29**
- policies
 - ADSPI_Rep_InboundObjs, **45**
 - ADSPI-DIT_DITPercentFull, **48**
 - ADSPI-DIT_DITPercentFull policy, **48**
 - ADSPI-DIT_DITQueueLength, **48**
 - ADSPI-DIT_LogFilesPercentFull, **48**
 - ADSPI-DIT_LogFilesQueueLength, **48**
 - ADSPI-DIT_TotalDITSize, **48**
 - ADSPI-DNS_DC_A_Chk, **48**
 - ADSPI-DNS_DC_CNAME_Chk, **49**
 - ADSPI-DNS_DC_Response, **49**
 - ADSPI-DNS_Extra_GC_SRV_Chk, **49**
 - ADSPI-DNS_Extra_Kerberos_SRV_Chk, **49**
 - ADSPI-DNS_Extra_LDAP_SRV_Chk, **49**
 - ADSPI-DNS_GC_A_Chk, **49**
 - ADSPI-DNS_GC_SRV_Chk, **49**
 - ADSPI-DNS_Island_Server, **50**
 - ADSPI-DNS_Kerberos_SRV_Chk, **50**
 - ADSPI-DNS_LDAP_SRV_Chk, **49**
 - ADSPI-DNS_Obsolete_GUIDS, **50**
 - ADSPI-FSMO_Consist, **45**
 - ADSPI-FSMO_INFRA (Bind & Ping), **46**
 - ADSPI-FSMO_Logging, **46**
 - ADSPI-FSMO_NAMING, **46**
 - ADSPI-FSMO_PDC, **47**
 - ADSPI-FSMO_PDC, description, **10**
 - ADSPI-FSMO_RID, **47**
 - ADSPI-FSMO_RID, description of policy
 - for, **10**
 - ADSPI-FSMO_SCHEMA, **46**
 - ADSPI-FSMO-InfraStruct, description, **10**
 - ADSPI-FSMO monitoring, description of
 - group, **10**
 - ADSPI-FSMO-Schema, description, **10**
 - ADSPI-Rep_GC_Check_and_Threshold, **50**
 - ADSPI-Rep_ModifyObj, **44**
 - ADSPI-Rep_ModifyUserObject, **44**
 - ADSPI-Rep_Mon, **44**
 - ADSPI-Rep_Sysvol, **51**
 - ADSPI-Rep_TimeSync, **44**
 - ADSPI-Replication Latency, description
 - of policies for, **10**
 - ADSPI-ResponseTime_Bind, **51**
 - ADSPI-ResponseTime_GC Bind, **51**
 - ADSPI-ResponseTime_GCQuery, **52**
 - ADSPI-ResponseTime_Logging, **51**
 - ADSPI-ResponseTime_Query, **51**
 - ADSPI-Sysvol_AD_Sync, **51**
 - ADSPI-Sysvol_FRS, **51**
 - ADSPI-Sysvol_PercentFull, **51**
 - ADSPI-Trust_CreateDataSources, **52**

- ADSPI-Trust_Mon, **52**
- changing monitoring schedule for, **55**
- customizing, general description of, **16**
- FSMO, **45**
- FSMO Infrastructure, description of policy for, **10**
- FSMO Schema, description of policies for, **10**
- general descriptions of, **10**
- global catalog replication monitoring, description of, **11**
- Manual-Deploy group list, **11**
- modifying, **54**
- organization within the OVO console, **17**
- replication monitoring, **44**
- specific to reports, **69**
- Sysvol monitoring, **50**
- policy deployment
 - viewing status of, **28**
- policy deployment, viewing as it occurs, **30**
- policy groups
 - descriptions of, **9**

R

- removing the Active Directory SPI, procedure for, **40**
- Replication Activity policy
 - description of, **12**
- replication monitoring, **44**
- replication monitoring, policy descriptions, **44**
- replication monitoring policies
 - ADSPI-Rep_InboundObjs, **45**
 - ADSPI-Rep_Mon, **44**
 - ADSPI-Rep_TimeSynch, **44**
- Replication policies
 - description of, **12**
- replication policies

- description of, **10**

- Reporter, using AD-SPI with, **76**

- reports

- AD DIT Disk Queue Length Report, **71**

- AD DNS Server Memory Capacity

- Planning Report, **72**

- AD Domain and Forest Change, **74**

- AD Domain Controller Availability, **72**

- AD GC Rep Delay Times, **72**

- AD Log Files Disk Queue Length, **73**

- AD Log Files Disk Size Summary, **73**

- AD Operations Master Connection Time, **73**

- AD Size of Sysvol Report, **74**

- data sources for/policies relating to,

- 71 — 74**

- installing on the Reporter system, **76**

- metrics used in OVO reports, **71, 77**

- policies required for generating, **69**

- resolving problems with, **85**

- schedule for generating, **68**

- system name requirement, **76**

- Response Time monitoring, description of, **51**

- response time monitoring, description of, **51**

- response time monitoring policies

- ADSPI-ResponseTime_Bind, **51**

- ADSPI-ResponseTime_GC Bind, **51**

- ADSPI-ResponseTime_GCQuery, **52**

- ADSPI-ResponseTime_Logging, **51**

- ADSPI-Response Time_Query, **51**

S

- Security policies

- description of, **12**

- servers

- accessing properties, **64**

- service discovery

- method for nodes managed prior to

- AD-SPI installation, **25, 27**

- method for unmanaged nodes, **29**
 - service map
 - how to display, **31**
 - Services
 - as displayed in the console tree, **28**
 - site links
 - cost, **59**
 - Site Structure policy
 - description of, **12**
 - systems
 - adding to the OVO managed Nodes folder, **29**
 - missing, how to add to managed Nodes folder, **30**
 - Sysvol monitoring
 - checking connectivity, **51**
 - description of monitoring capabilities, **50**
 - description of policies for, **11**
- T**
- time synchronization policy, **44**
 - tools
 - AD DC Demotion Preparation, **52**
 - AD DC Demotion Preparation, description of, **9**
 - AD Trust Relationships
 - description of, **52**
 - OV Topology Viewer, **64**
 - description of, **8**
 - getting started with, **59**
 - map, moving around, **64**
 - Site Topology properties, accessing, **65**
 - Topology Viewer *See OV Topology Viewer*
 - topology viewing
 - description of, **18**
 - replication map generated, **18**
 - tracing
 - turning on, **82**
 - using to detect FSMO service consistency problems, **82**
 - using to detect FSO service response time problems, **83**
 - using to detect replication latency problems, **83**
 - viewing trace logs, **83**
 - troubleshooting, **82**
 - FSMO, tracing problems with, **82**
 - graphing, problems resolutions, **84**
 - reporting problem resolutions, **85**
 - Self-Healing Info tool, description, **81**
 - Self-Healing Services, description, **81**
 - tracing replication latency problems, **83**
 - viewing trace logs, **83**
 - trust monitoring
 - ADSPI-Trust_CreateDataSources, description of, **52**
 - AD Trust Relationships tool, **52**
 - description of, **11, 52**
 - trust relationship monitoring, **52**
- U**
- uninstallation, procedure for, **40**
 - unmanaged missing systems, how to add to the managed Nodes folder, **30**
 - upgrading the Active Directory SPI, **21**
- V**
- verifying policy deployment
 - viewing as it occurs, **28**
- W**
- Windows discovery, summary of, **10**

