Monitoring Windows Systems with PowerShell

SL1 version 8.14.1

Table of Contents

Chapter

1

Introduction

Overview

This manual describes how to monitor Windows systems in SL1 using SNMP and PowerShell credentials and Dynamic Applications.

The following sections provide an overview of SNMP and PowerShell, as well as the PowerPacks you can use to monitor Windows systems in SL1:

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Monitoring Windows Devices in the ScienceLogic Platform

SL1 can monitor a Windows device using the following methods:

- Requesting information from the Windows SNMP agent
- Requesting information by executing a remote PowerShell command
- Requesting information from the Windows Management Instrumentation (WMI) agent
- Requesting information using the SL1 agent

NOTE: This manual describes how to monitor Windows with SNMP and PowerShell. For more information about using WMI to monitor Windows devices, see the ***Monitoring Windows with WMI*** manual.

What is SNMP?

SNMP (*Simple Network Management Protocol*) is a set of standard protocols for managing diverse computer hardware and software within a TCP/IP network. SNMP is the most common network protocol used by network monitoring and management applications to exchange management information between devices. SL1 uses this protocol and other protocols to collect availability and performance information.

SNMP uses a server-client structure. Clients are called ***agents***. Devices and software that run SNMP are agents. The server is called the ***management system***. SL1 is the management system.

Most network hardware is configured for SNMP and can be SNMP-enabled. Many enterprise software applications are also SNMP-compliant. When SNMP is running on a device, it uses a standard format to collect and store data about the device and/or software. For example, SNMP might collect information on each network interface and the traffic for each interface. SL1 can then query the device to retrieve the stored data.

What is PowerShell?

Windows PowerShell is a command-line shell and scripting language for administration of Windows systems. SL1 can execute PowerShell requests on target Windows devices via WinRM (Windows Remote Management). For an overview of Windows PowerShell, see https://docs.microsoft.com/en-us/powershell/scripting/powershell-scripting?view=powershell-6.

SL1 supports the following PowerShell versions for monitoring Windows devices:

- PowerShell 3.0
- PowerShell 4.0
- PowerShell 5.1

PowerPacks

This manual describes content from the following PowerPack versions:

- Microsoft: Active Directory Server, version 100
- Microsoft: DHCP Server, version 1.0
- Microsoft: DNS Server, version 100
- Microsoft: Exchange Server, version 100
- Microsoft: Exchange Server 2010, version 1.2
- Microsoft: Hyper-V Server, version 100
- Microsoft: IIS Server, version 101
- Microsoft: Lync Server 2010, version 1.0
- Microsoft: SharePoint Server, version 1.0
- Microsoft: Skype for Business, version 100
- Microsoft: SQL Server, version 100
- Microsoft: Windows Event Logs, version 100
- Microsoft: Windows Server, version 108
- Microsoft: Windows Server Cluster, version 101
- Microsoft: Windows Server Services, version 101

Chapter 2

Configuring Windows Systems for Monitoring with SNMP

Overview

The following sections describe how to configure Windows Server 2016, Windows Server 2012, and Windows Server 2008 for monitoring by SL1 using SNMP:

Configuring SNMP for Windows Server 2016 and Windows Server 2012

To configure SNMP on a Windows 2016 Server or a Windows 2012 Server, you must:

1. *Configure "ping" responses*.
2. *Install the SNMP service*.
3. *Configure the SNMP service*.
4. *Configure the firewall to allow SNMP requests*.
5. *Configure Device Classes*. (*Windows Server 2016 only*)

Configuring Ping Responses

For SL1 to discover a device, including SNMP-enabled devices, the device must meet one of the following requirements:

- The device must respond to an ICMP "Ping" request.
- One of the ports selected in the ***Detection Method & Port*** field for the discovery session must be open on the device. If the *Default Method* option for the ***Detection Method & Port*** field is selected, SL1 scans TCP ports 21, 22, 23, 25, and 80.

The default configuration for a Windows Server does not allow ICMP "Ping" requests and does not allow connections to TCP ports 21, 22, 23, 25, or 80. Therefore, to discover a Windows Server in SL1, you must perform one of the following tasks:

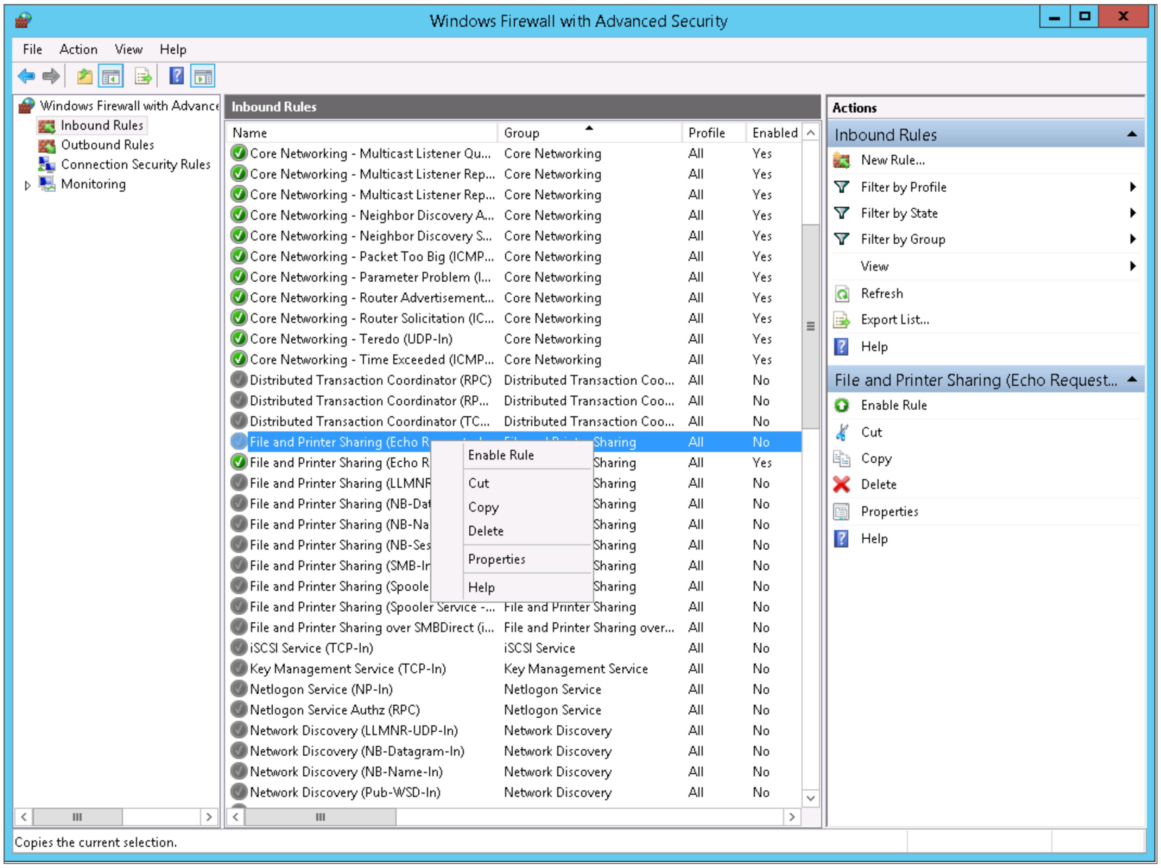
- Reconfigure the firewall on the Windows Server to allow ICMP "Ping" requests. This section describes how to perform this task.
- Reconfigure the firewall on the Windows Server to allow connections to port 21, 22, 23, 25, or 80. If you have already configured your Windows Server to accept SSH, FTP, Telnet, SMTP, or HTTP connections, this task might have been completed already. You should perform this task only if you were already planning to allow SSH, FTP, Telnet, SMTP, or HTTP connections to your Windows Server.
- When you create the discovery session that will discover the Windows Server, select at least one port in the ***Detection Method & Port*** field that is open on the Windows Server. For example, if your Windows Server is configured as an MSSQL Server, you could select port 1433 (the default port for MSSQL Server) in the ***Detection Method & Port*** field.

To reconfigure the firewall on a Windows Server to allow ICMP "Ping" requests, perform the following steps:

1. In the Start menu search bar, enter "firewall" to open a **Windows Firewall with Advanced Security** window.
2. In the left pane, select *Inbound Rules*.
3. If you want SL1 to discover your Windows Server using an IPv4 address, locate the *File and Printer Sharing (Echo Request - ICMPv4-In)* rule.

4. If you want SL1 to discover your Windows Server using an IPv6 address, locate the *File and Printer Sharing (Echo Request - ICMPv6-In)* rule.

5. Right click on the rule that you located, then select *Enable Rule*:



Name	Group	Profile	Enabled
Core Networking - Multicast Listener Qu...	Core Networking	All	Yes
Core Networking - Multicast Listener Rep...	Core Networking	All	Yes
Core Networking - Multicast Listener Rep...	Core Networking	All	Yes
Core Networking - Neighbor Discovery A...	Core Networking	All	Yes
Core Networking - Neighbor Discovery S...	Core Networking	All	Yes
Core Networking - Packet Too Big (ICMP...	Core Networking	All	Yes
Core Networking - Parameter Problem (I...	Core Networking	All	Yes
Core Networking - Router Advertisement...	Core Networking	All	Yes
Core Networking - Router Solicitation (IC...	Core Networking	All	Yes
Core Networking - Teredo (UDP-In)	Core Networking	All	Yes
Core Networking - Time Exceeded (ICMP...	Core Networking	All	Yes
Distributed Transaction Coordinator (RPC)	Distributed Transaction Coo...	All	No
Distributed Transaction Coordinator (RP...	Distributed Transaction Coo...	All	No
Distributed Transaction Coordinator (TC...	Distributed Transaction Coo...	All	No
File and Printer Sharing (Echo R	Sharing	All	No
File and Printer Sharing (Echo R	Sharing	All	Yes
File and Printer Sharing (LLMNR	Sharing	All	No
File and Printer Sharing (NB-Dat	Sharing	All	No
File and Printer Sharing (NB-Na	Sharing	All	No
File and Printer Sharing (NB-Ses	Sharing	All	No
File and Printer Sharing (SMB-In	Sharing	All	No
File and Printer Sharing (Spoole	Sharing	All	No
File and Printer Sharing (Spooler Service -...	File and Printer Sharing	All	No
File and Printer Sharing over SMBDirect (i...	File and Printer Sharing over...	All	No
iSCSI Service (TCP-In)	iSCSI Service	All	No
Key Management Service (TCP-In)	Key Management Service	All	No
Netlogon Service (NP-In)	Netlogon Service	All	No
Netlogon Service Authz (RPC)	Netlogon Service	All	No
Network Discovery (LLMNR-UDP-In)	Network Discovery	All	No
Network Discovery (NB-Datagram-In)	Network Discovery	All	No
Network Discovery (NB-Name-In)	Network Discovery	All	No
Network Discovery (Pub-WSD-In)	Network Discovery	All	No

Copies the current selection.

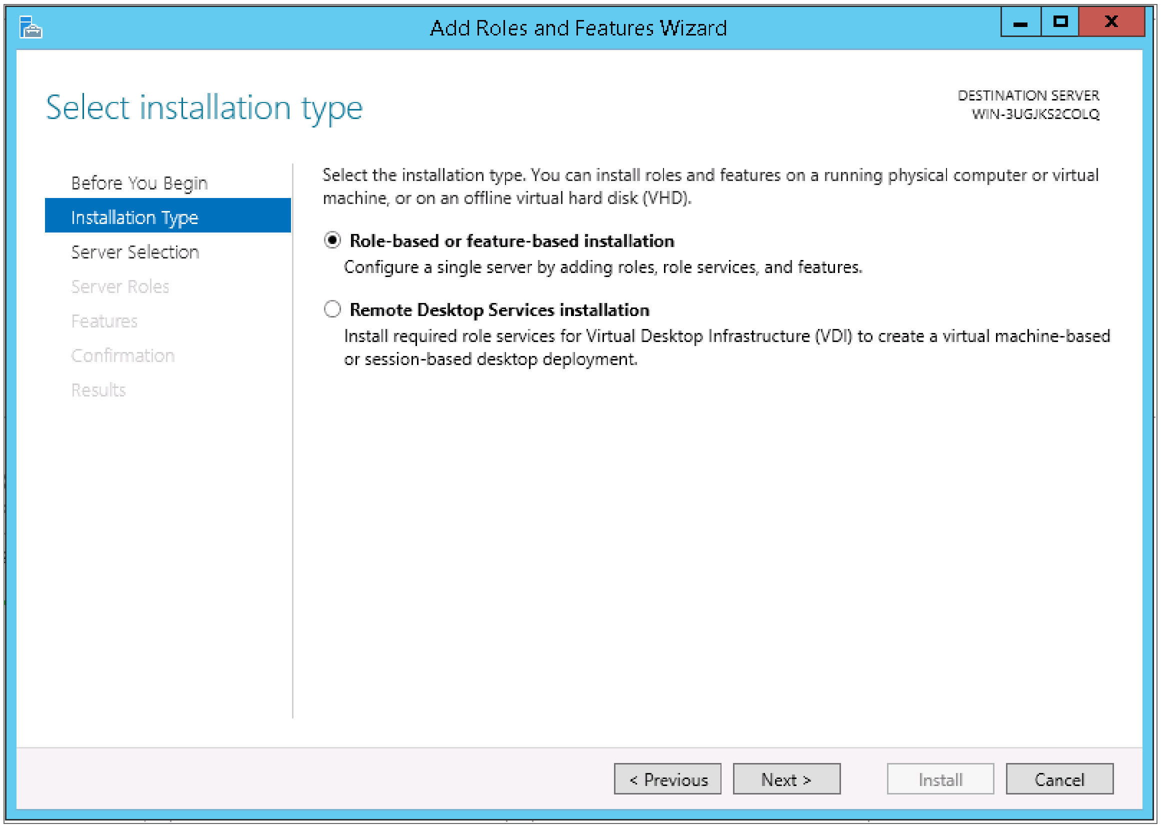
Installing the SNMP Service

To install the SNMP service on a Windows 2012 Server or Windows 2016 Server, perform the following steps:

1. Open the **Server Manager** utility.

2. In the upper-right of the window, select **[Manage]** > *Add Roles and Features*. The **Add Roles and Features** window is displayed.

3. If the server does not skip the **Before you begin** page, click the **[Next >]** button to manually skip it. The **Select installation type** page is displayed:



Select installation type

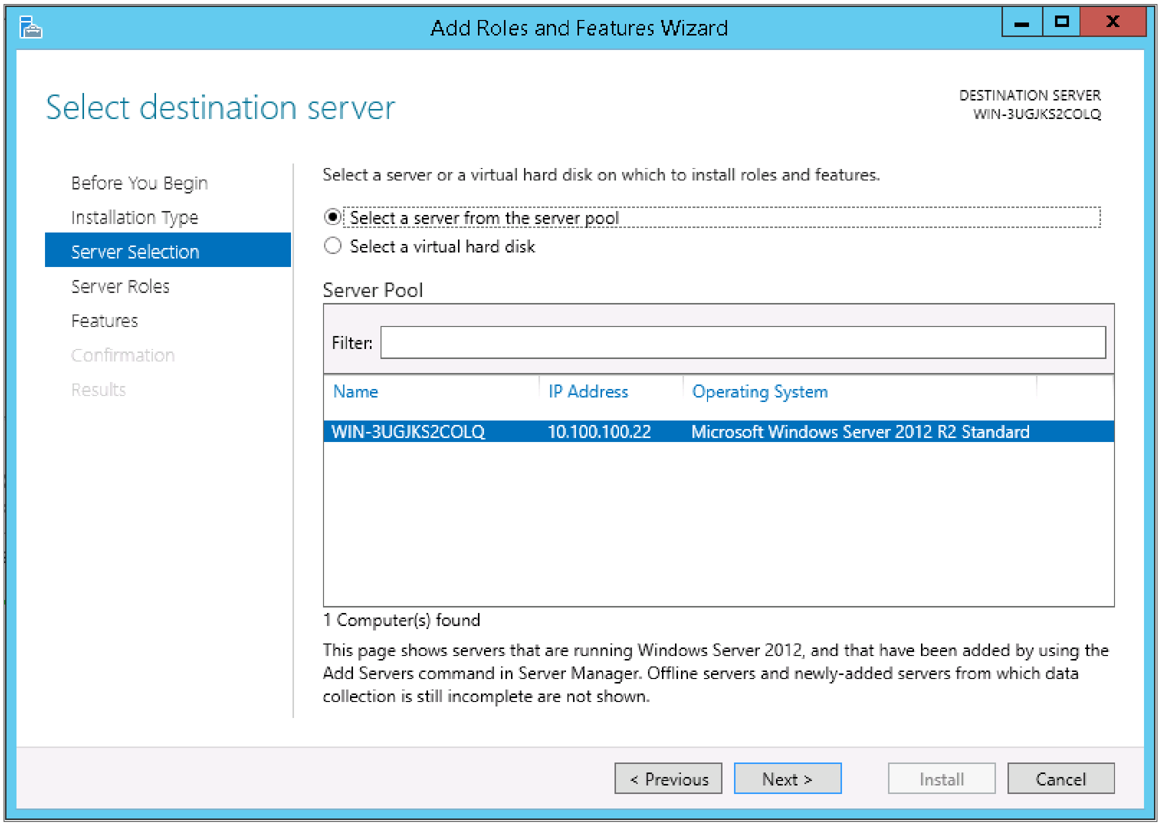
DESTINATION SERVER
WIN-3UGJKS2COLQ

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

● **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

○ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

4. Click the **[Next >]** button to continue with *Role-based or feature-based installation*. The **Select destination server** page is displayed:



Select destination server

DESTINATION SERVER
WIN-3UGJKS2COLQ

Select a server or a virtual hard disk on which to install roles and features.

● Select a server from the server pool

○ Select a virtual hard disk

Server Pool

Filter:

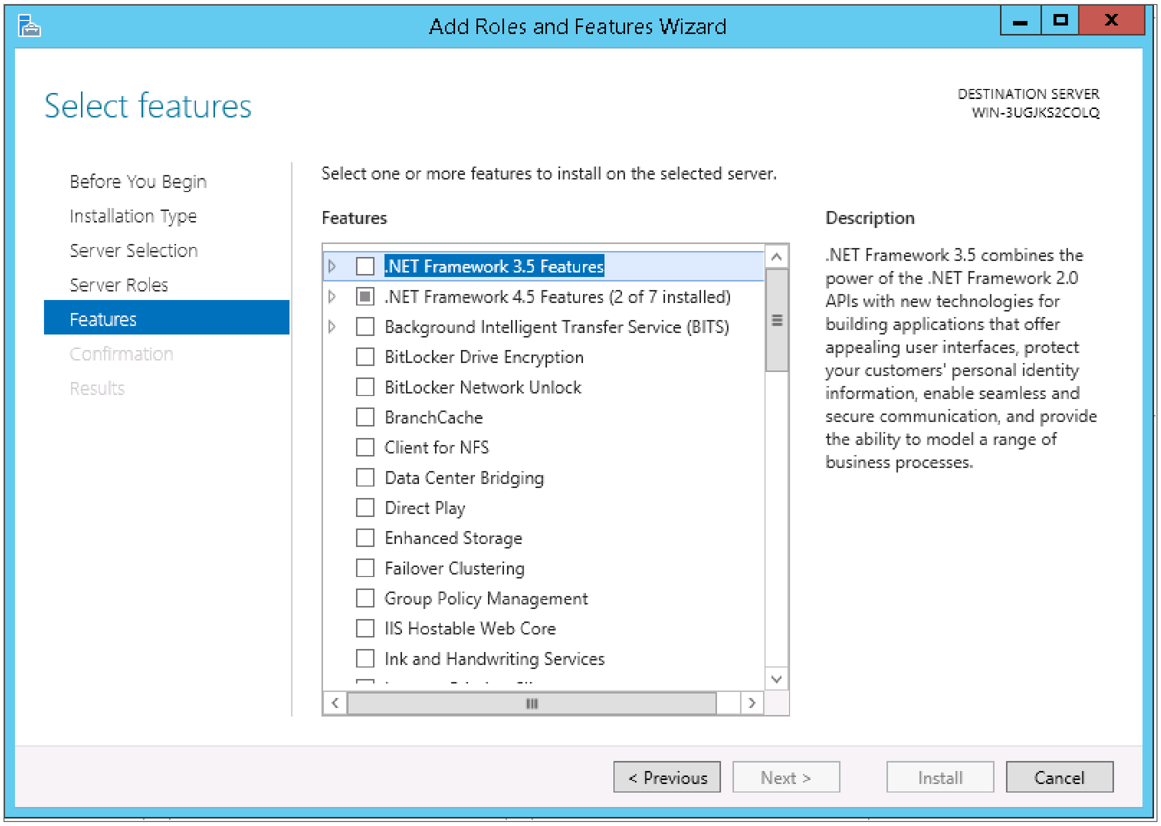
Name	IP Address	Operating System
WIN-3UGJKS2COLQ	10.100.100.22	Microsoft Windows Server 2012 R2 Standard

1 Computer(s) found

This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

5. Ensure the Windows 2012 server or Windows 2016 Server is selected and then click the **[Next >]** button. The **Select server roles page** is displayed.

6. Click the **[Next >]** button without selecting any additional roles. The **Select features** page is displayed:



Select features

DESTINATION SERVER
WIN-3UGJKS2COLQ

Select one or more features to install on the selected server.

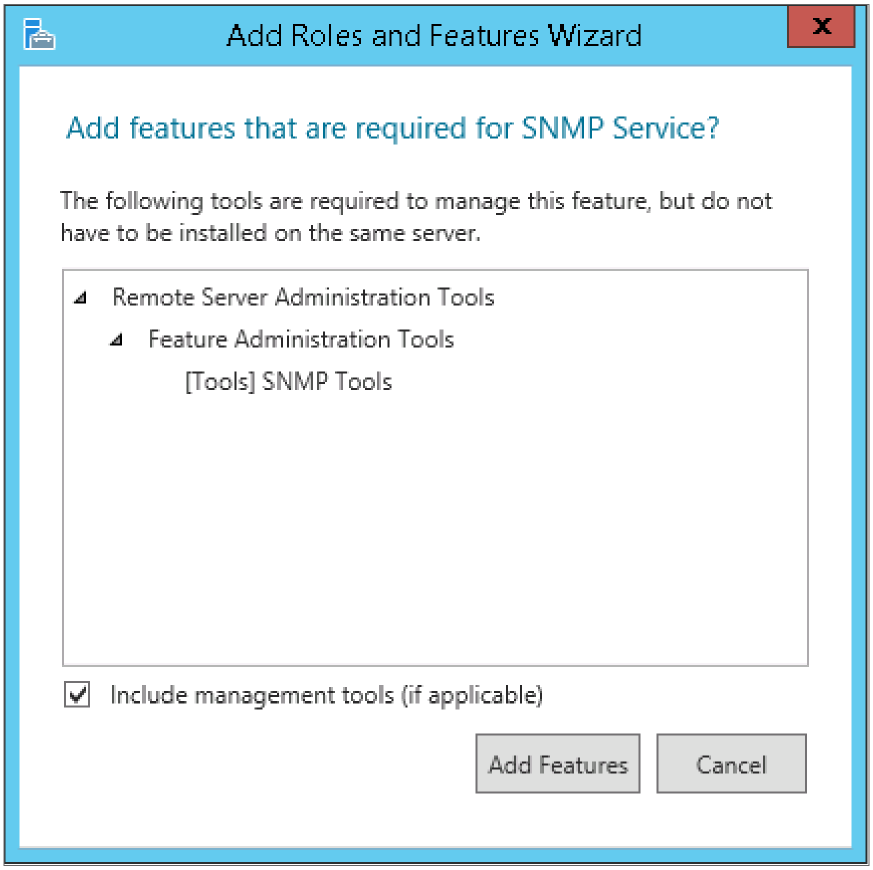
Features

- □ .NET Framework 3.5 Features
- ▣ .NET Framework 4.5 Features (2 of 7 installed)
- □ Background Intelligent Transfer Service (BITS)
- □ BitLocker Drive Encryption
- □ BitLocker Network Unlock
- □ BranchCache
- □ Client for NFS
- □ Data Center Bridging
- □ Direct Play
- □ Enhanced Storage
- □ Failover Clustering
- □ Group Policy Management
- □ IIS Hostable Web Core
- □ Ink and Handwriting Services

Description

.NET Framework 3.5 combines the power of the .NET Framework 2.0 APIs with new technologies for building applications that offer appealing user interfaces, protect your customers' personal identity information, enable seamless and secure communication, and provide the ability to model a range of business processes.

7. Select the *SNMP Service* checkbox. The following confirmation window is displayed:



Add features that are required for SNMP Service?

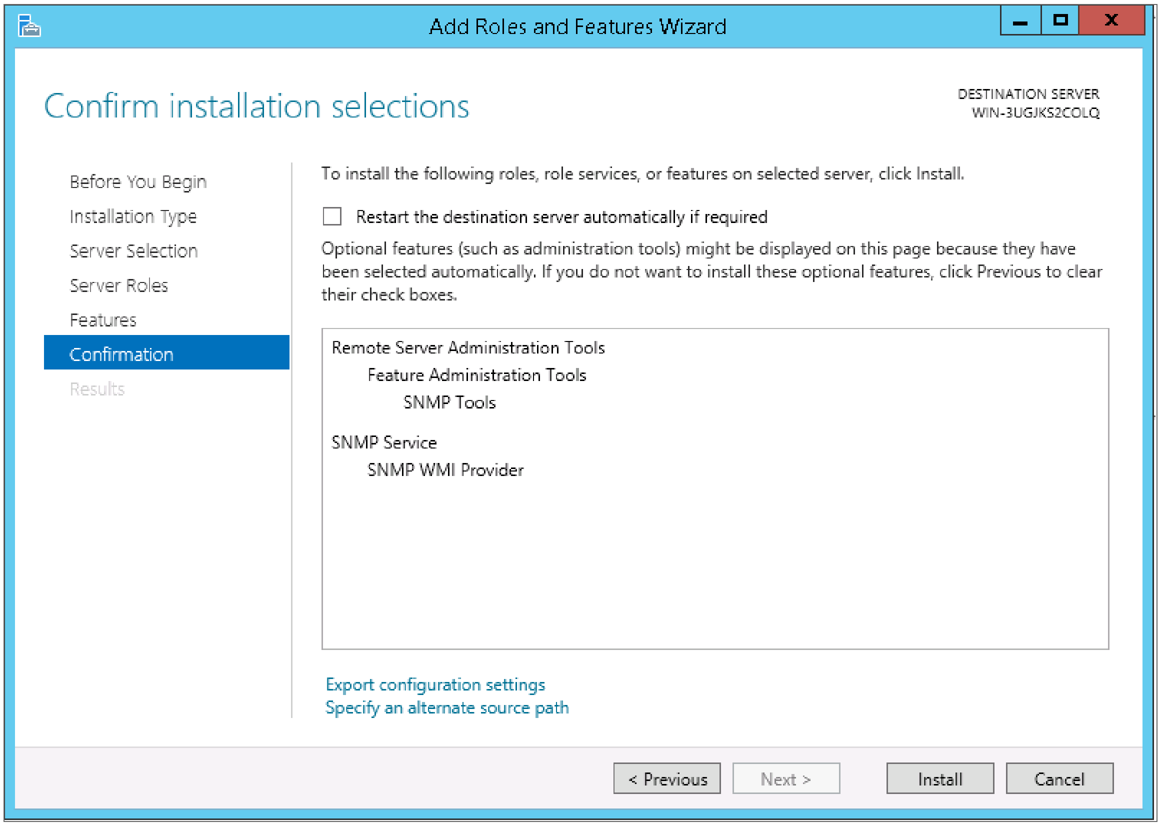
The following tools are required to manage this feature, but do not have to be installed on the same server.

- Remote Server Administration Tools
  - Feature Administration Tools
    - [Tools] SNMP Tools

☑ Include management tools (if applicable)

8. Click the **[Add Features]** button.
9. In the Select features page, expand SNMP Service and select the SNMP WMI Provider checkbox.

10. Click the **[Next >]** button. The **Confirm installation selections page** is displayed:



Confirm installation selections

DESTINATION SERVER
WIN-3UGJKS2COLQ

To install the following roles, role services, or features on selected server, click Install.

□ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

Remote Server Administration Tools
Feature Administration Tools
SNMP Tools

SNMP Service
SNMP WMI Provider

Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel

11. Click the **[Install]** button.

12. After the installation is complete, click the **[Close]** button.

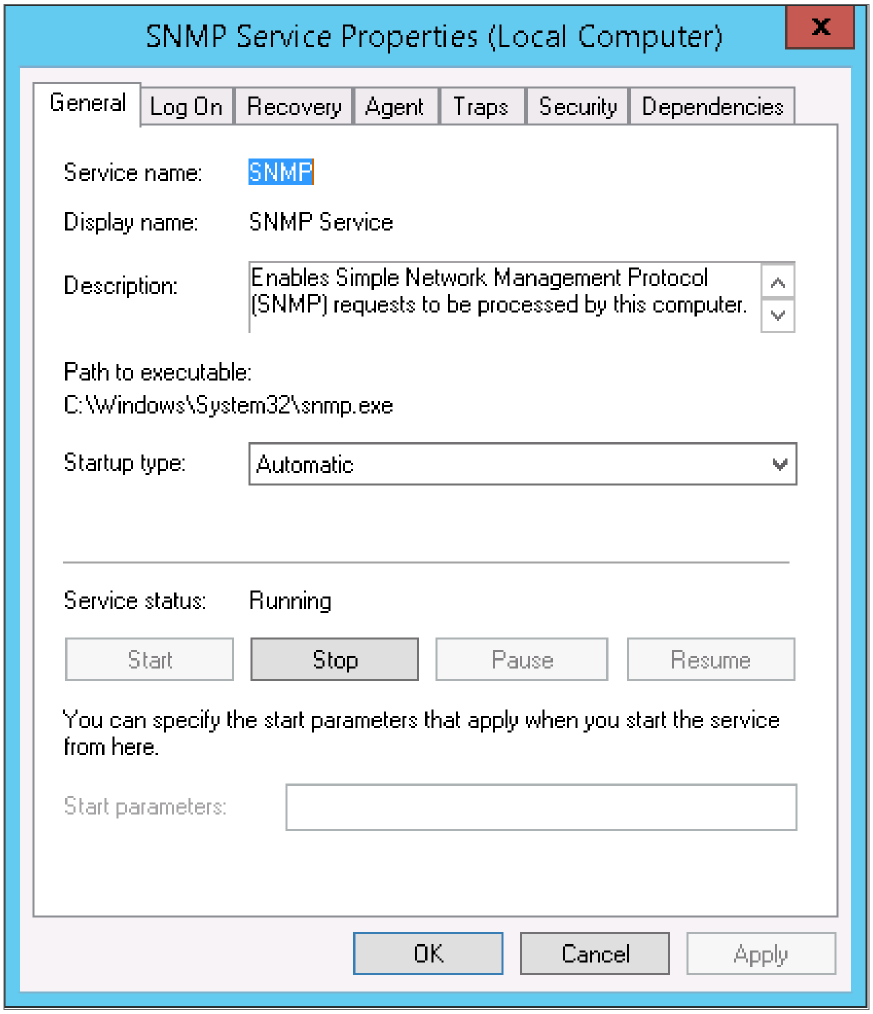
Configuring the SNMP Service

To configure the SNMP service on a Windows 2012 Server or Windows 2016 Server, perform the following steps:

> **NOTE:** If you recently installed the SNMP service, you must wait for the **Server Manager** window to refresh to allow the SNMP service snap-in to be added. You can manually refresh the **Server Manager** window by closing the **Server Manager** and then re-opening the **Server Manager**.

1. In the upper-right of the **Server Manager** window, select **[Tools]** > *Services*. The **Services** window is displayed.

2. In the **Services** window, right-click on *SNMP Service*, and then select *Properties*. The **SNMP Service Properties** window appears:



Service name: SNMP

Display name: SNMP Service

Description: Enables Simple Network Management Protocol (SNMP) requests to be processed by this computer.

Path to executable:
C:\Windows\System32\snmp.exe

Startup type: Automatic

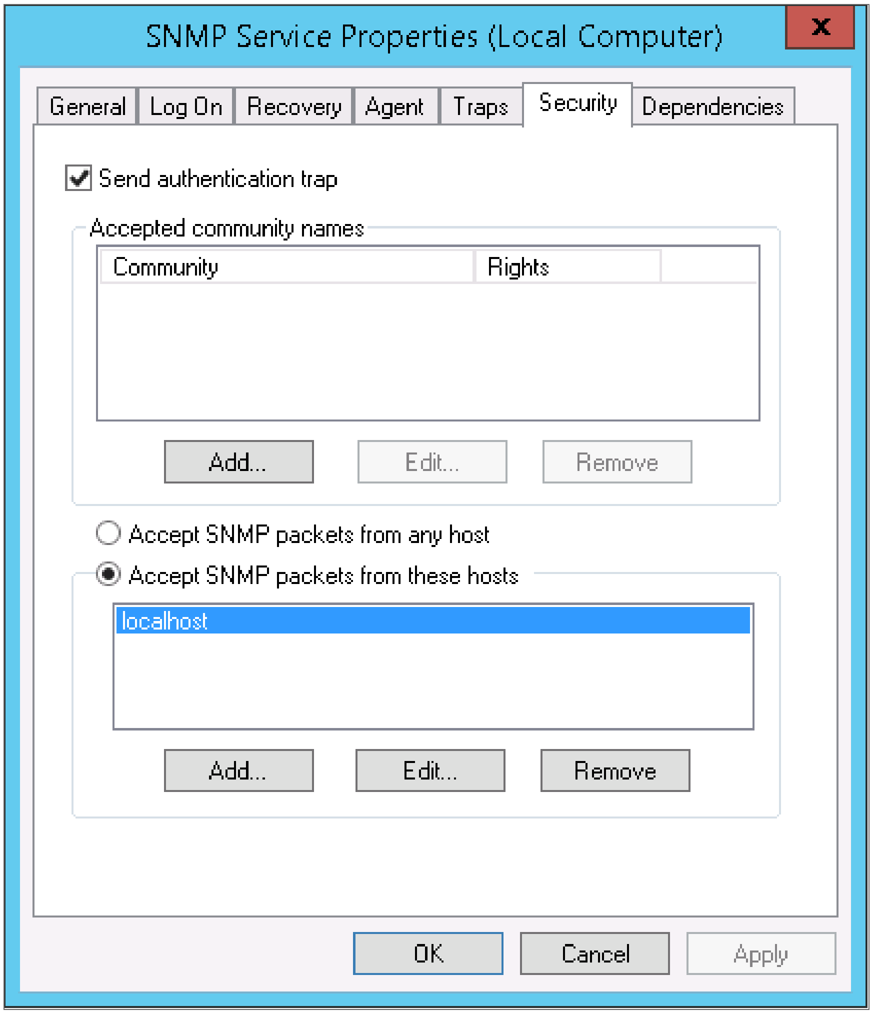
Service status: Running

You can specify the start parameters that apply when you start the service from here.

Start parameters:

3. In the ***Startup type:*** field, select *Automatic*.

4. Select the **[Security]** tab. The security settings are displayed:



☑ Send authentication trap

Accepted community names

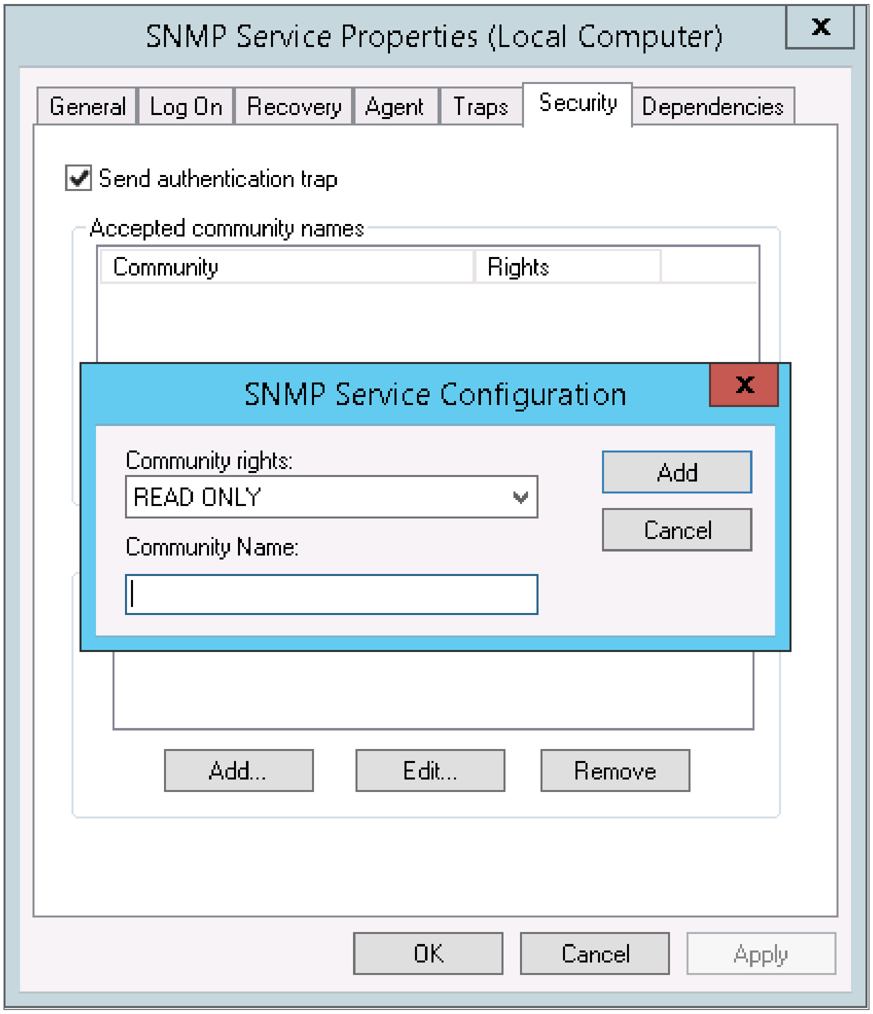
Community	Rights

○ Accept SNMP packets from any host

● Accept SNMP packets from these hosts

localhost

5. In the **Accepted community names** panel, click the **[Add...]** button. The **SNMP Service Configuration** pop-up window is displayed:



☑ Send authentication trap

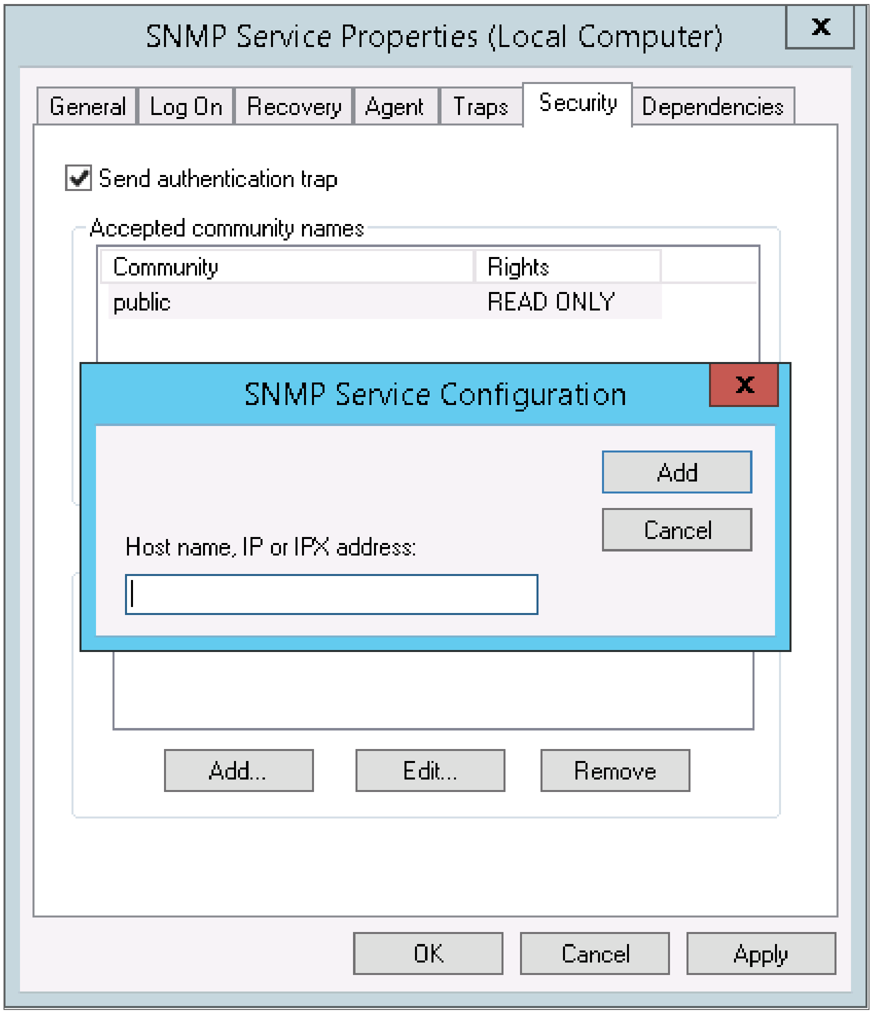
Community rights: READ ONLY

6. Enter a value in the following fields:

- ***Community rights***. Select one of the following options from the drop-down list:
  - *READ ONLY*. Select this option to allow SL1 to request information from this Windows 2012 Server or Windows 2016 Server using this SNMP community string. This option does not allow SL1 to perform write operations on this Windows 2012 Server or Windows 2016 Server using this SNMP community string.
  - *READ WRITE*. Select this option to allow SL1 to request information from this Windows 2008 server and to perform write operations on this Windows 2012 Server or a Windows 2016 Serve using this SNMP community string.

- ***Community name***. Enter the SNMP community string that SL1 will use when making SNMP requests to this Windows 2012 Server or Windows 2016 Server. When you create a credential for this Windows 2012 Server or Windows 2016 Server in SL1, you will enter this community string in one the following fields in the **Credential Editor** modal page:
  - *SNMP Community (Read-Only)*. Enter the SNMP community string in this field if you selected *READ ONLY* in the ***Community rights*** drop-down list.
  - *SNMP Community (Read/Write)*. Enter the SNMP community string in this field if you selected *READ WRITE* in the ***Community rights*** drop-down list.

7. Click the **[Add]** button to add the community string to the list of community strings this Windows 2012 Server or Windows 2016 Server accepts.
8. In the **Accept SNMP packets from these hosts** panel, click the **Add...** button. The **SNMP Service Configuration** pop-up window is displayed:



☑ Send authentication trap

Community	Rights
public	READ ONLY

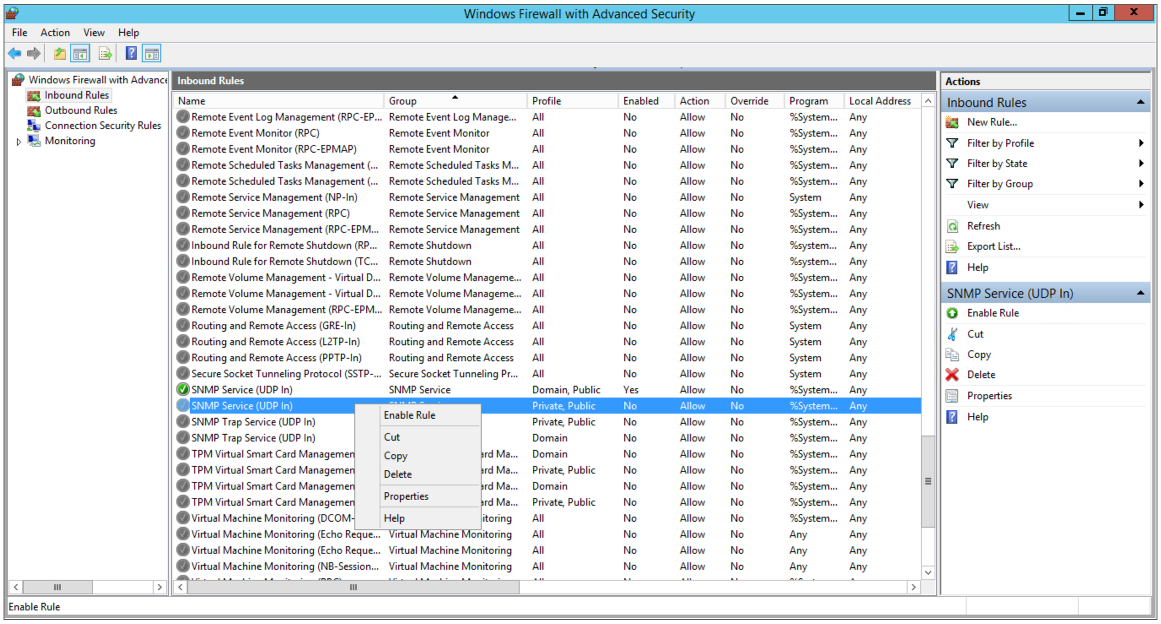
9. In the ***Host name, IP or IPX address*** field, enter the IP address of the All-In-One Appliance or Data Collector that will monitor this server.

10. Click the **[Add]** button to add the appliance to the list of authorized devices.
11. If you are using SL1 with a distributed architecture, repeat steps 8–10 for each Data Collector in the collector group that will monitor this server.
12. Click the **[Apply]** button to apply all changes.

Configuring the Firewall to Allow SNMP Requests

To configure the Windows Firewall to allow SNMP requests on a Windows 2012 server or Windows 2016 Server, perform the following steps:

1. In the Start menu search bar, enter "firewall" to open a **Windows Firewall with Advanced Security** window.
2. In the left pane, click *Inbound Rules*.
3. Locate the two *SNMP Service (UDP In)* rules.
4. If one or both of the rules is not enabled, right-click on the rule and then select *Enable Rule*:



Name	Group	Profile	Enabled	Action	Override	Program	Local Address
Remote Event Log Management (RPC-EP...	Remote Event Log Manage...	All	No	Allow	No	%System...	Any
Remote Event Monitor (RPC)	Remote Event Monitor	All	No	Allow	No	%System...	Any
Remote Event Monitor (RPC-EPMAP)	Remote Event Monitor	All	No	Allow	No	%System...	Any
Remote Scheduled Tasks Management (...	Remote Scheduled Tasks M...	All	No	Allow	No	%System...	Any
Remote Scheduled Tasks Management (...	Remote Scheduled Tasks M...	All	No	Allow	No	%System...	Any
Remote Service Management (NP-In)	Remote Service Management	All	No	Allow	No	System	Any
Remote Service Management (RPC)	Remote Service Management	All	No	Allow	No	%System...	Any
Remote Service Management (RPC-EPM...	Remote Service Management	All	No	Allow	No	%System...	Any
Inbound Rule for Remote Shutdown (RP...	Remote Shutdown	All	No	Allow	No	%system...	Any
Inbound Rule for Remote Shutdown (TC...	Remote Shutdown	All	No	Allow	No	%system...	Any
Remote Volume Management - Virtual D...	Remote Volume Manageme...	All	No	Allow	No	%System...	Any
Remote Volume Management - Virtual D...	Remote Volume Manageme...	All	No	Allow	No	%System...	Any
Remote Volume Management (RPC-EPM...	Remote Volume Manageme...	All	No	Allow	No	%System...	Any
Routing and Remote Access (GRE-In)	Routing and Remote Access	All	No	Allow	No	System	Any
Routing and Remote Access (L2TP-In)	Routing and Remote Access	All	No	Allow	No	System	Any
Routing and Remote Access (PPTP-In)	Routing and Remote Access	All	No	Allow	No	System	Any
Secure Socket Tunneling Protocol (SSTP-...	Secure Socket Tunneling Pr...	All	No	Allow	No	System	Any
SNMP Service (UDP In)	SNMP Service	Domain, Public	Yes	Allow	No	%System...	Any
SNMP Service (UDP In)		Private, Public	No	Allow	No	%System...	Any
SNMP Trap Service (UDP In)		Private, Public	No	Allow	No	%System...	Any
SNMP Trap Service (UDP In)		Domain	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	ard Ma...	Domain	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	ard Ma...	Private, Public	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	ard Ma...	Domain	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	ard Ma...	Private, Public	No	Allow	No	%System...	Any
Virtual Machine Monitoring (DCOM-	itoring	All	No	Allow	No	%System...	Any
Virtual Machine Monitoring (Echo Reque...	Virtual Machine Monitoring	All	No	Allow	No	Any	Any
Virtual Machine Monitoring (Echo Reque...	Virtual Machine Monitoring	All	No	Allow	No	Any	Any
Virtual Machine Monitoring (NB-Session...	Virtual Machine Monitoring	All	No	Allow	No	Any	Any

Configuring Device Classes for Windows Server 2016 and Windows 10

There is a known problem with the Microsoft OID that contains the version number for the operation system. This problem prevents SL1 from using SNMP to automatically align device classes to Windows 10 devices and Microsoft Server 2016 devices.

Because Microsoft has deprecated support of SNMP on Microsoft Server 2016 and Windows 10, users who want to use SNMP to monitor Windows 10 and Microsoft Server 2016 should use one of these workarounds:

- After discovering a Microsoft Server 2016 or Windows 10 device, manually align the device class and disable nightly auto-discovery
- Edit the registry key

Both workarounds are described in the following sections.

Manually Align the Device Class

After discovering Microsoft Server 2016 devices and Windows 10 devices, you can manually align a device class with the discovered devices. To preserve your manual changes, you must disable nightly auto-discovery for those devices. You can manually align the discovered devices with one of these device classes:

- Windows Server 2016
- Windows Server 2016 Domain Controller
- Windows 10 Workstation

For details on manually assigning a device class to a device, follow the steps in the section on *Manually Changing the Device Class for a Device* in the ***Device Management*** manual chapter on *Managing Device Classes and Device Categories*. For details on disabling nightly auto-discovery for a device, see the section on *Maintaining the New Device Class During Auto-Discovery* in the ***Device Management*** manual chapter on *Managing Device Classes and Device Categories*.

Edit the Registry Key

You can log in to the device that you want to monitor and manually edit the Windows Registry Key "HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\CurrentVersion". You can define the value CurrentVersion as either "2016" or "10.0". To do this:

1. Click the Start menu and choose Run.
2. In the Run dialog box, type regedit and then click OK.
3. Navigate to HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\CurrentVersion
4. In the right pane, double click on the Default key.
5. Enter the appropriate value:
    - For Microsoft Server 2016, change the ***Value*** to *2016*
    - For Windows 10, change the ***Value*** to *10.0*

Configuring SNMP for Windows Server 2008

To configure SNMP on a Windows 2008 Server, you must:

1. *Configure "ping" responses*.
2. *Install the SNMP service*.
3. *Configure the SNMP service*.
4. *Configure the firewall to allow SNMP requests*.

Configuring Ping Responses

For SL1 to discover a device, including SNMP-enabled devices, the device must meet one of the following requirements:

- The device must respond to an ICMP "Ping" request.
- One of the ports selected in the ***Detection Method & Port*** field for the discovery session must be open on the device. If the *Default Method* option for the ***Detection Method & Port*** field is selected, SL1 scans TCP ports 21, 22, 23, 25, and 80.

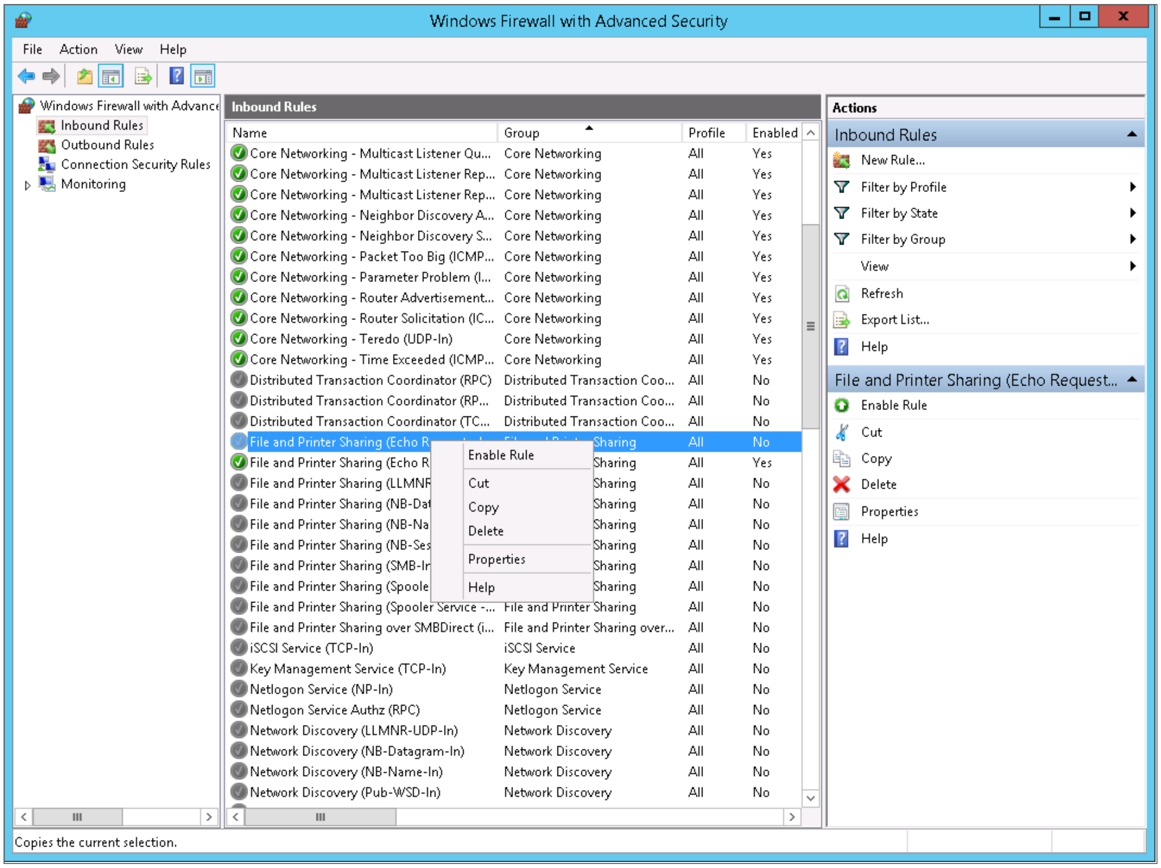
The default configuration for a Windows Server does not allow ICMP "Ping" requests and does not allow connections to TCP ports 21, 22, 23, 25, or 80. Therefore, to discover a Windows Server in SL1, you must perform one of the following tasks:

- Reconfigure the firewall on the Windows Server to allow ICMP "Ping" requests. This section describes how to perform this task.
- Reconfigure the firewall on the Windows Server to allow connections to port 21, 22, 23, 25, or 80. If you have already configured your Windows Server to accept SSH, FTP, Telnet, SMTP, or HTTP connections, this task might have been completed already. You should perform this task only if you were already planning to allow SSH, FTP, Telnet, SMTP, or HTTP connections to your Windows Server.
- When you create the discovery session that will discover the Windows Server, select at least one port in the ***Detection Method & Port*** field that is open on the Windows Server. For example, if your Windows Server is configured as an MSSQL Server, you could select port 1433 (the default port for MSSQL Server) in the ***Detection Method & Port*** field.

To reconfigure the firewall on a Windows Server to allow ICMP "Ping" requests, perform the following steps:

1. In the Start menu search bar, enter "firewall" to open a **Windows Firewall with Advanced Security** window.
2. In the left pane, select *Inbound Rules*.
3. If you want SL1 to discover your Windows Server using an IPv4 address, locate the *File and Printer Sharing (Echo Request - ICMPv4-In)* rule.
4. If you want SL1 to discover your Windows Server using an IPv6 address, locate the *File and Printer Sharing (Echo Request - ICMPv6-In)* rule.

5. Right click on the rule that you located, then select *Enable Rule*:



Name	Group	Profile	Enabled
Core Networking - Multicast Listener Qu...	Core Networking	All	Yes
Core Networking - Multicast Listener Rep...	Core Networking	All	Yes
Core Networking - Multicast Listener Rep...	Core Networking	All	Yes
Core Networking - Neighbor Discovery A...	Core Networking	All	Yes
Core Networking - Neighbor Discovery S...	Core Networking	All	Yes
Core Networking - Packet Too Big (ICMP...	Core Networking	All	Yes
Core Networking - Parameter Problem (I...	Core Networking	All	Yes
Core Networking - Router Advertisement...	Core Networking	All	Yes
Core Networking - Router Solicitation (IC...	Core Networking	All	Yes
Core Networking - Teredo (UDP-In)	Core Networking	All	Yes
Core Networking - Time Exceeded (ICMP...	Core Networking	All	Yes
Distributed Transaction Coordinator (RPC)	Distributed Transaction Coo...	All	No
Distributed Transaction Coordinator (RP...	Distributed Transaction Coo...	All	No
Distributed Transaction Coordinator (TC...	Distributed Transaction Coo...	All	No
File and Printer Sharing (Echo R	Sharing	All	No
File and Printer Sharing (Echo R	Sharing	All	Yes
File and Printer Sharing (LLMNR	Sharing	All	No
File and Printer Sharing (NB-Dat	Sharing	All	No
File and Printer Sharing (NB-Na	Sharing	All	No
File and Printer Sharing (NB-Ses	Sharing	All	No
File and Printer Sharing (SMB-In	Sharing	All	No
File and Printer Sharing (Spoole	Sharing	All	No
File and Printer Sharing (Spooler Service -...	File and Printer Sharing	All	No
File and Printer Sharing over SMBDirect (i...	File and Printer Sharing over...	All	No
iSCSI Service (TCP-In)	iSCSI Service	All	No
Key Management Service (TCP-In)	Key Management Service	All	No
Netlogon Service (NP-In)	Netlogon Service	All	No
Netlogon Service Authz (RPC)	Netlogon Service	All	No
Network Discovery (LLMNR-UDP-In)	Network Discovery	All	No
Network Discovery (NB-Datagram-In)	Network Discovery	All	No
Network Discovery (NB-Name-In)	Network Discovery	All	No
Network Discovery (Pub-WSD-In)	Network Discovery	All	No

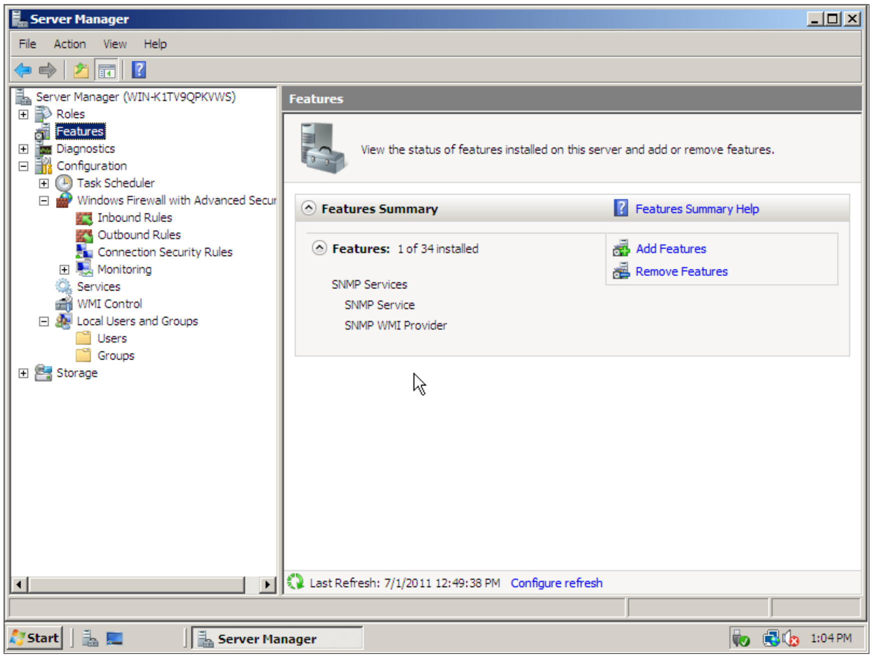
Copies the current selection.

Installing the SNMP Service

To install the SNMP service on a Windows 2008 Server, perform the following steps:

1. Open the **Server Manager** utility.

2. In the left pane of the **Server Manager** window, select *Features*. The **Features Summary** is displayed:



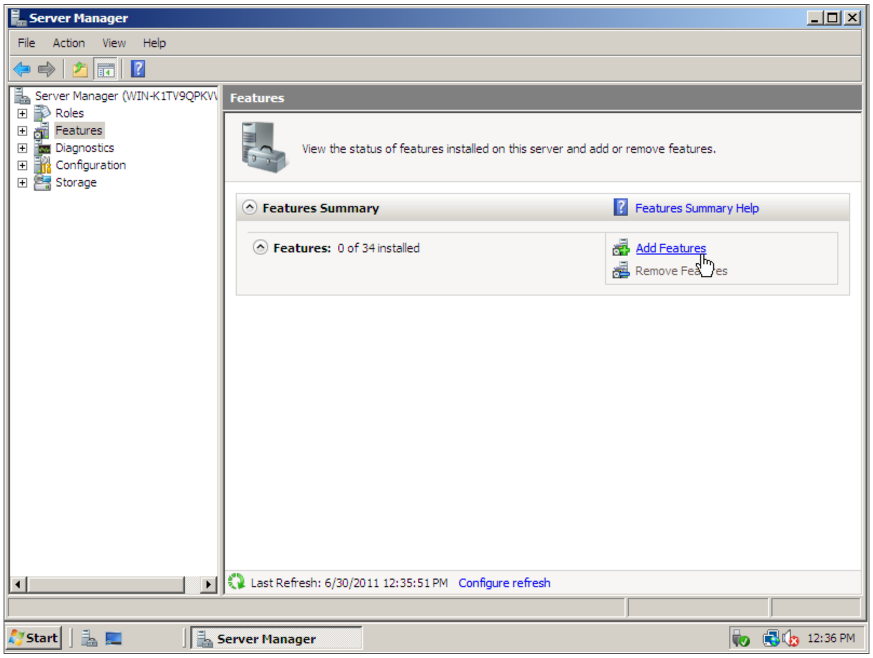
View the status of features installed on this server and add or remove features.

Features: 1 of 34 installed

SNMP Services
SNMP Service
SNMP WMI Provider

Last Refresh: 7/1/2011 12:49:38 PM

3. If the **Features Summary** displays "SNMP Service" and "SNMP WMI Provider" in the list of installed services (as shown above), you can skip to the section on configuring the SNMP service. If "SNMP Service" and "SNMP WMI Provider" are not included in the list of installed services, select ***Add Features***:

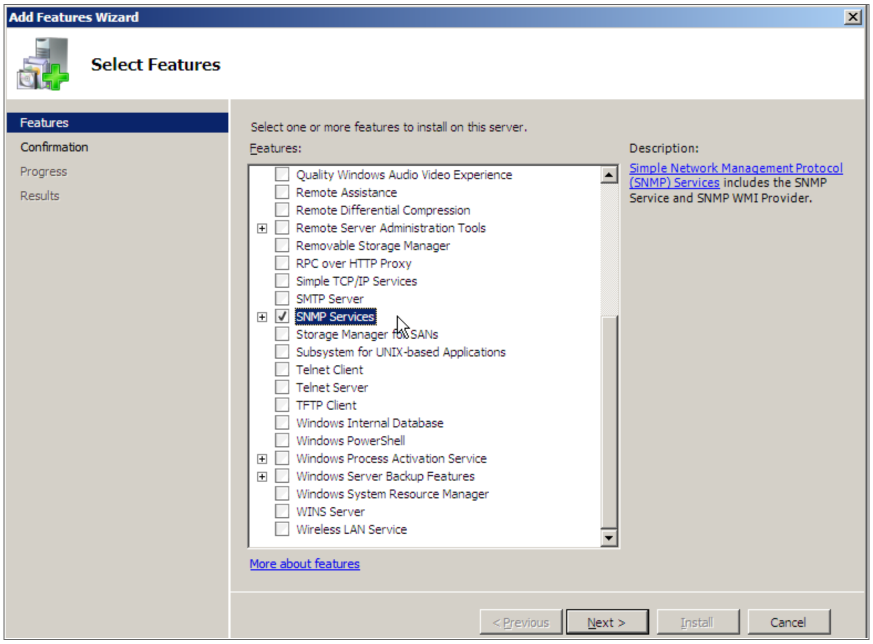


View the status of features installed on this server and add or remove features.

Features: 0 of 34 installed

Last Refresh: 6/30/2011 12:35:51 PM

4. In the **Select Features** window, select *SNMP Services*:



Select one or more features to install on this server.

Features:

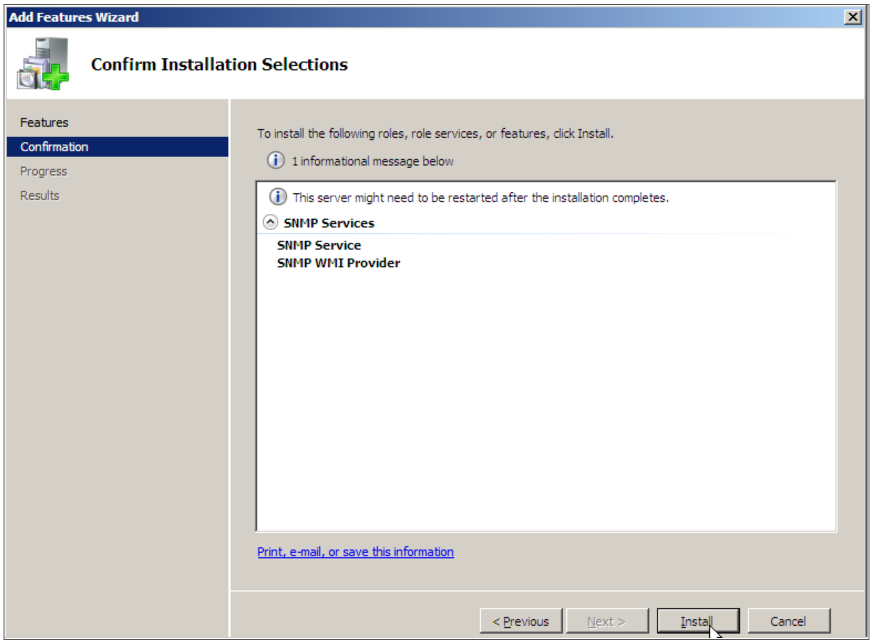
- □ Quality Windows Audio Video Experience
- □ Remote Assistance
- □ Remote Differential Compression
- ⊞ □ Remote Server Administration Tools
- □ Removable Storage Manager
- □ RPC over HTTP Proxy
- □ Simple TCP/IP Services
- □ SMTP Server
- ⊞ ☑ SNMP Services
- □ Storage Manager for SANs
- □ Subsystem for UNIX-based Applications
- □ Telnet Client
- □ Telnet Server
- □ TFTP Client
- □ Windows Internal Database
- □ Windows PowerShell
- ⊞ □ Windows Process Activation Service
- ⊞ □ Windows Server Backup Features
- □ Windows System Resource Manager
- □ WINS Server
- □ Wireless LAN Service

Description:

Simple Network Management Protocol (SNMP) Services includes the SNMP Service and SNMP WMI Provider.

More about features

5. Click the **[Next >]** button. The **Confirm Installed Selections** window is displayed with "SNMP Service" and "SNMP WMI Provider" in the list of features that will be installed:



To install the following roles, role services, or features, click Install.

1 informational message below

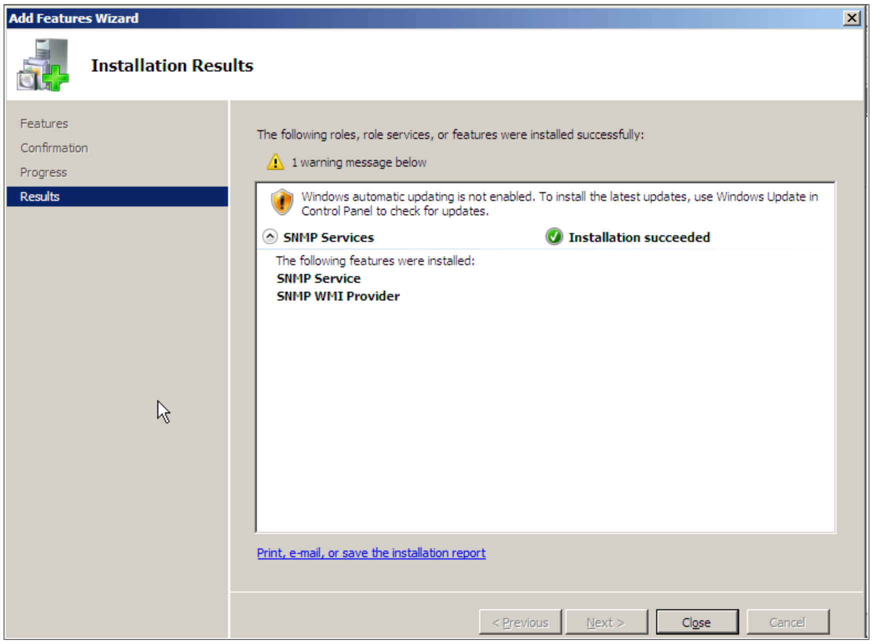
This server might need to be restarted after the installation completes.

SNMP Services

SNMP Service
SNMP WMI Provider

Print, e-mail, or save this information

6. Click the **[Install]** button. After the installation is completed, the **Installation Results** window will be displayed:



The following roles, role services, or features were installed successfully:

1 warning message below

Windows automatic updating is not enabled. To install the latest updates, use Windows Update in Control Panel to check for updates.

SNMP Services — Installation succeeded

The following features were installed:
SNMP Service
SNMP WMI Provider

7. Click the **[Close]** button.

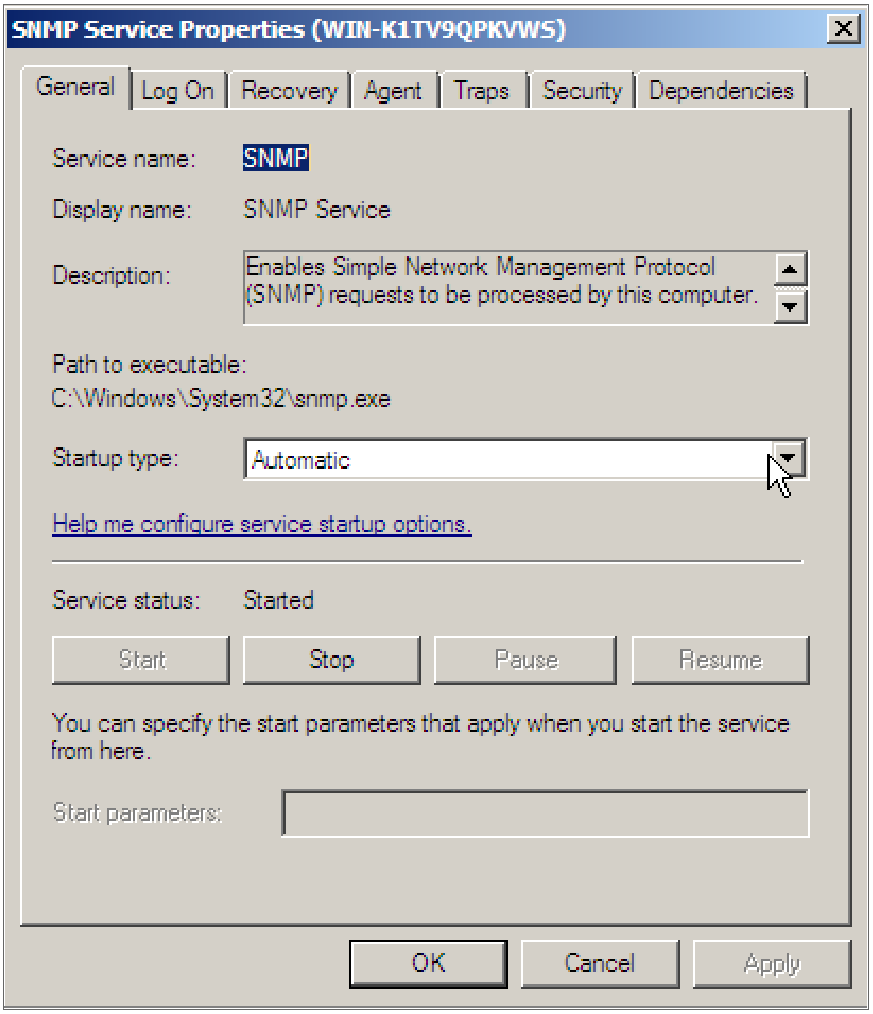
Configuring the SNMP Service

To configure the SNMP service on a Windows 2008 Server, perform the following steps:

NOTE: If you recently installed the SNMP service, you must wait for the **Server Manager** window to refresh before it will display the SNMP service snap-in. You can manually refresh the **Server Manager** window by closing the **Server Manager** and then re-opening the **Server Manager**.

1. In the left pane of the **Server Manager** window, expand the *Configuration* section, and then select *Services*.

2. In the list of services, right-click on *SNMP Service*, and then select *Properties*. The **SNMP Service Properties** window appears:



SNMP Service Properties (WIN-K1TV9QPKVWS)

Service name: SNMP

Display name: SNMP Service

Description: Enables Simple Network Management Protocol (SNMP) requests to be processed by this computer.

Path to executable:
C:\Windows\System32\snmp.exe

Startup type: Automatic

Help me configure service startup options.

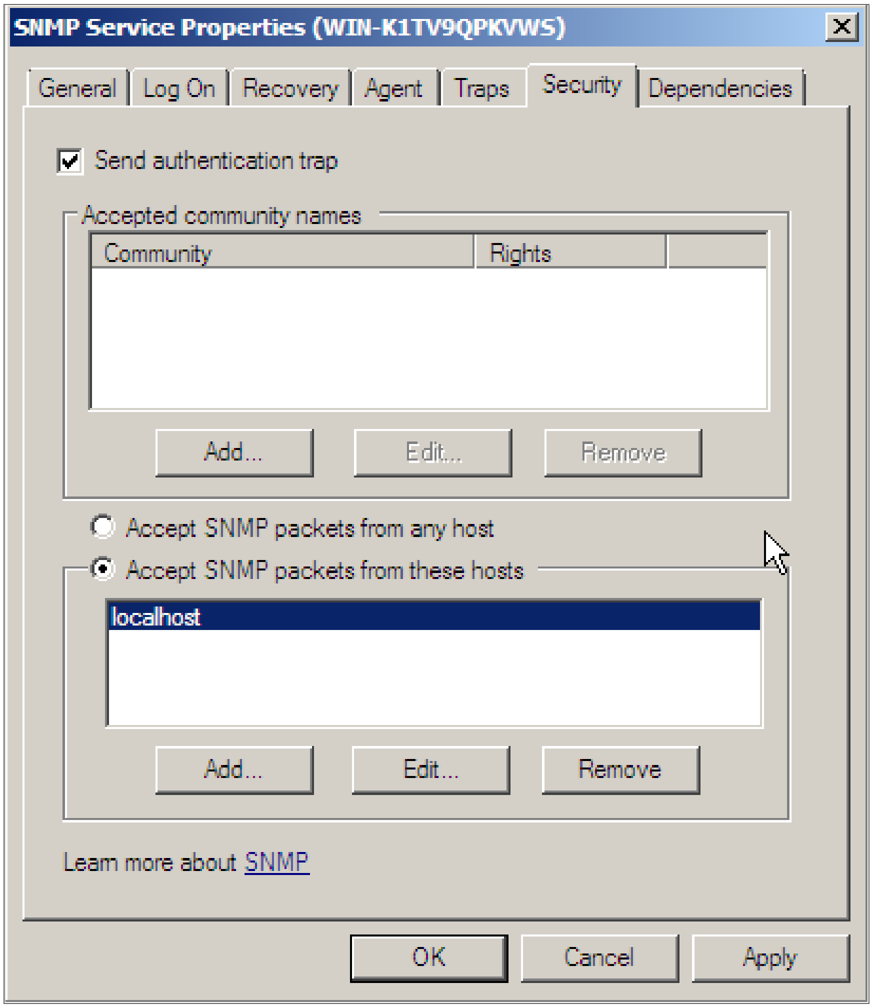
Service status: Started

You can specify the start parameters that apply when you start the service from here.

Start parameters:

3. In the ***Startup type:*** field, select *Automatic*.

4. Select the **[Security]** tab. The security settings are displayed:



SNMP Service Properties (WIN-K1TV9QPKVWS)

☑ Send authentication trap

Accepted community names

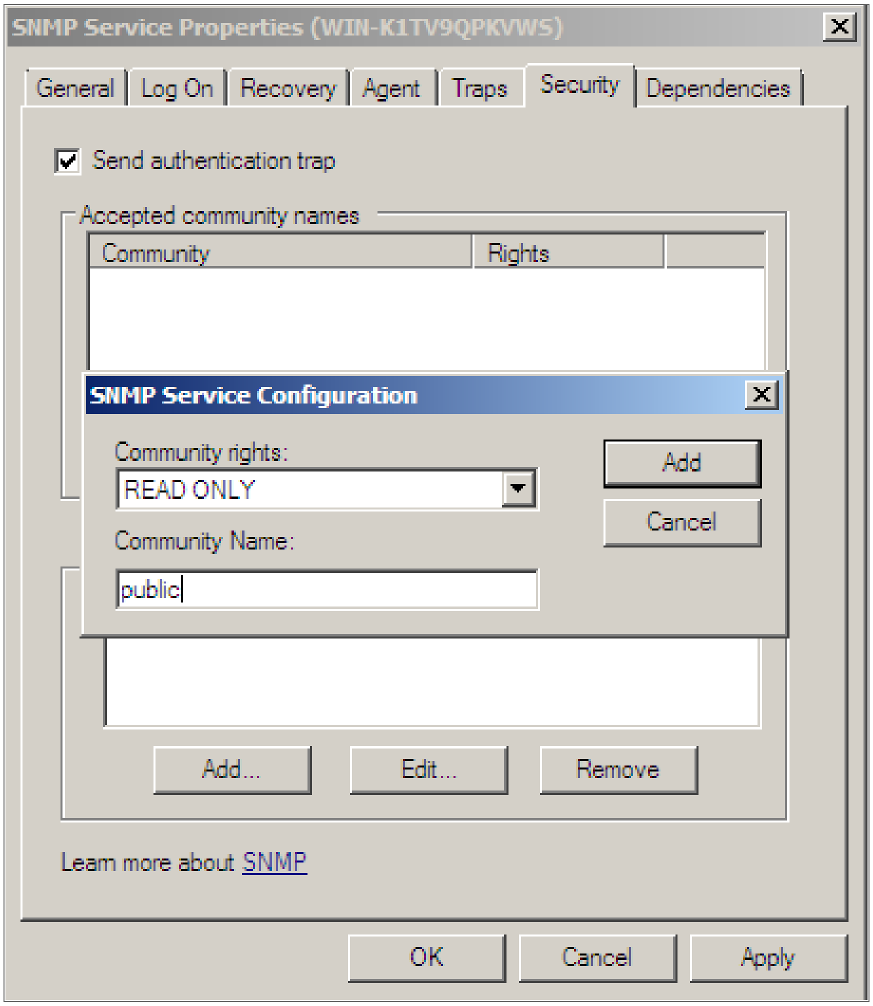
Community	Rights

○ Accept SNMP packets from any host

● Accept SNMP packets from these hosts

localhost

5. In the **Accepted community names** panel, click the **[Add...]** button. The **SNMP Service Configuration** pop-up window is displayed:



☑ Send authentication trap

Community rights: READ ONLY

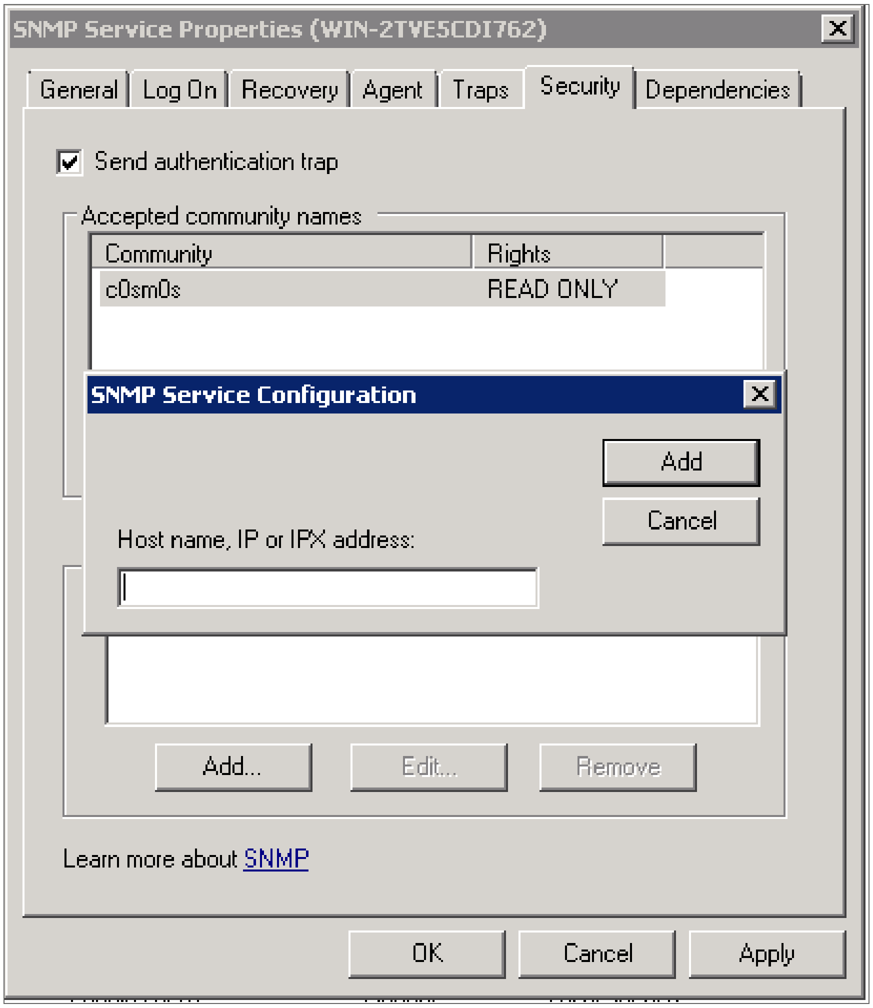
Community Name: public

6. Enter a value in the following fields:

- ***Community rights***. Select one of the following options from the drop-down list:
    - *READ ONLY*. Select this option to allow SL1 to request information from this Windows 2008 Server using this SNMP community string. This option does not allow SL1 to perform write operations on this Windows 2008 Server using this SNMP community string.
    - *READ WRITE*. Select this option to allow SL1 to request information from this Windows 2008 server and to perform write operations on this Windows 2008 Server using this SNMP community string.

- ***Community name***. Enter the SNMP community string that SL1 will use to make SNMP requests to this Windows 2008 Server. When you create a credential for this Windows 2008 Server in SL1, you will enter this community string in one the following fields in the **Credential Editor** modal page:
    - SNMP Community (Read-Only). Enter the SNMP community string in this field if you selected *READ ONLY* in the ***Community rights*** drop-down list.
    - SNMP Community (Read/Write). Enter the SNMP community string in this field if you selected *READ WRITE* in the ***Community rights*** drop-down list.

7. Click the **[Add]** button to add the community string to list of community strings this Windows 2008 Server accepts.
8. In the **Accept SNMP packets from these hosts** panel, click the **Add...** button. The **SNMP Service Configuration** pop-up window is displayed:



☑ Send authentication trap

Accepted community names

Community	Rights
c0sm0s	READ ONLY

9. In the ***Host name, IP or IPX address*** field, enter the IP address of the All-In-One Appliance or Data Collector that will monitor this server.
10. Click the **[Add]** button to add the appliance to the list of authorized devices.

11. If you are using SL1 with a distributed architecture, repeat steps 8–10 for each Data Collector in the collector group that will monitor this server.

12. Click the **[Apply]** button to apply all changes.

Configuring the Firewall to Allow SNMP Requests

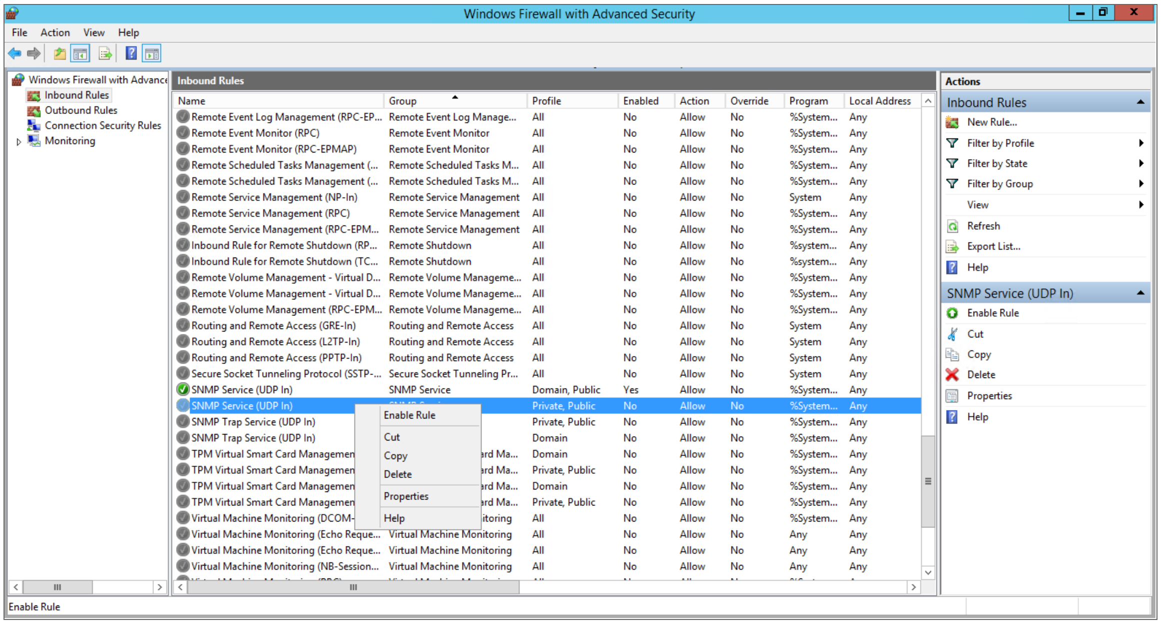
To configure the Windows Firewall to allow SNMP requests on a Windows 2008 server, perform the following steps:

1. In the Start menu search bar, enter "firewall" to open a **Windows Firewall with Advanced Security** window.

2. In the left pane, click *Inbound Rules*.

3. Locate the two *SNMP Service (UDP In)* rules.

4. If one or both of the rules is not enabled, right-click on the rule and then select *Enable Rule*:



Name	Group	Profile	Enabled	Action	Override	Program	Local Address
Remote Event Log Management (RPC-EP...	Remote Event Log Manage...	All	No	Allow	No	%System...	Any
Remote Event Monitor (RPC)	Remote Event Monitor	All	No	Allow	No	%System...	Any
Remote Event Monitor (RPC-EPMAP)	Remote Event Monitor	All	No	Allow	No	%System...	Any
Remote Scheduled Tasks Management (...	Remote Scheduled Tasks M...	All	No	Allow	No	%System...	Any
Remote Scheduled Tasks Management (...	Remote Scheduled Tasks M...	All	No	Allow	No	%System...	Any
Remote Service Management (NP-In)	Remote Service Management	All	No	Allow	No	System	Any
Remote Service Management (RPC)	Remote Service Management	All	No	Allow	No	%System...	Any
Remote Service Management (RPC-EPM...	Remote Service Management	All	No	Allow	No	%System...	Any
Inbound Rule for Remote Shutdown (RP...	Remote Shutdown	All	No	Allow	No	%system...	Any
Inbound Rule for Remote Shutdown (TC...	Remote Shutdown	All	No	Allow	No	%system...	Any
Remote Volume Management - Virtual D...	Remote Volume Manageme...	All	No	Allow	No	%System...	Any
Remote Volume Management - Virtual D...	Remote Volume Manageme...	All	No	Allow	No	%System...	Any
Remote Volume Management (RPC-EPM...	Remote Volume Manageme...	All	No	Allow	No	%System...	Any
Routing and Remote Access (GRE-In)	Routing and Remote Access	All	No	Allow	No	System	Any
Routing and Remote Access (L2TP-In)	Routing and Remote Access	All	No	Allow	No	System	Any
Routing and Remote Access (PPTP-In)	Routing and Remote Access	All	No	Allow	No	System	Any
Secure Socket Tunneling Protocol (SSTP-...	Secure Socket Tunneling Pr...	All	No	Allow	No	System	Any
SNMP Service (UDP In)	SNMP Service	Domain, Public	Yes	Allow	No	%System...	Any
SNMP Service (UDP In)		Private, Public	No	Allow	No	%System...	Any
SNMP Trap Service (UDP In)		Private, Public	No	Allow	No	%System...	Any
SNMP Trap Service (UDP In)		Domain	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	rd Ma...	Domain	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	rd Ma...	Private, Public	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	rd Ma...	Domain	No	Allow	No	%System...	Any
TPM Virtual Smart Card Managemen	rd Ma...	Private, Public	No	Allow	No	%System...	Any
Virtual Machine Monitoring (DCOM-	itoring	All	No	Allow	No	%System...	Any
Virtual Machine Monitoring (Echo Reque...	Virtual Machine Monitoring	All	No	Allow	No	Any	Any
Virtual Machine Monitoring (Echo Reque...	Virtual Machine Monitoring	All	No	Allow	No	Any	Any
Virtual Machine Monitoring (NB-Session...	Virtual Machine Monitoring	All	No	Allow	No	Any	Any

Chapter 3

Configuring Windows Servers for Monitoring with PowerShell

Overview

The following sections describe how to configure Windows Server 2016, 2012, 2012 R2, or 2008 R2 for monitoring by SL1 using PowerShell:

Prerequisites

Before configuring PowerShell, ensure the following:

- Forward and Reverse DNS should be available for the target Windows server from the SL1 Data Collector. Port 53 to the domain's DNS server should thus be available.
- When using an Active Directory user account as the SL1 credential, port 88 on the Windows Domain Controller, for the Active Directory domain, should be open for Kerberos authentication.
- If encrypted communication between the SL1 Data Collector and monitored Windows servers is desired, port 5986 on the Windows server should be open for HTTPS traffic. If unencrypted communications is being used, then port 5985 on the Windows server should be opened for HTTP traffic
- If multiple domains are in use, ensure that they are mapped in the [domain_realm] section of the Kerberos krb5.conf file.

Configuring PowerShell

To monitor a Windows Server using PowerShell Dynamic Applications, you must configure the Windows Server to allow remote access from SL1. To do so, you must perform the following general steps:

1. ***Configure a user account*** that SL1 will use to connect to the Windows Server. The user account can either be a local account or an Active Directory account.

TIP: For ease of configuration, ScienceLogic recommends using an Active Directory account that is a member of the local Administrators group on the Windows Server.

2. ***Configure a Server Authentication Certificate*** to encrypt communication between SL1 and the Windows Server.
3. ***Configure Windows Remote Management***.
4. Optionally, ***configure a Windows server as a Windows Management Proxy***.

NOTE: If you are configuring multiple Windows servers for monitoring by SL1, you can apply these settings using a Group Policy.

5. Optionally, you can ***increase the number of PowerShell Dynamic Applications that can run simultaneously*** against a single Windows server.

Step 1: Configuring the User Account for the ScienceLogic Platform

To enable SL1 to monitor Windows servers, you must first configure a user account on a Windows Server that SL1 can use to make PowerShell requests. You will include this user account information when creating the PowerShell credential that SL1 uses to collect data from the Windows Server.

To configure the Windows Server user account that SL1 can use to make PowerShell requests, complete one of the following options:

- **Option 1:** ***Create an Active Directory Account with Administrator access***
- **Option 2:** ***Create a local user account with Administrator access***
- **Option 3:** ***Create a non-administrator user account***

TIP: For ease-of-configuration, ScienceLogic recommends creating an Active Directory user account.

After creating your Windows Server user account, depending on your setup and the servers you want to monitor, you might also need to configure the user account for remote PowerShell access to the following server types:

- ***Microsoft Exchange Server***
- ***Hyper-V Servers***

Option 1: Creating an Active Directory Account with Administrator Access

For each Windows server that you want to monitor with PowerShell or WinRM, you can create an Active Directory account that is a member of the local Administrators group on each server. For instructions, consult Microsoft's documentation. On Windows Domain Controller servers, you can use a domain account that is not in the Domain Administrators group by following the configuration instructions for ***Option 3: Creating a Non-Administrator User Account***.

After creating your Active Directory account:

- If you use SL1 to monitor Microsoft Exchange Servers, you must ***configure the user account for remote PowerShell access to Microsoft Exchange Server***.
- If you use SL1 to monitor Hyper-V Servers, you must ***configure the user account for remote PowerShell access to the Hyper-V Servers***.
- Otherwise, ***you can skip the remainder of this section and*** proceed to Step 3.

Option 2: Creating a Local User Account with Administrator Access

If you have local Administrator access to the servers you want to monitor and are monitoring Windows Server 2016 or Windows Server 2012, you can alternatively create a local user account with membership in the Administrators group instead of an Active Directory account. For instructions, consult Microsoft's documentation.

WARNING: This method does not work for Windows Server 2008.

After creating your local user account with Local Administrator access:

- If you use SL1 to monitor Microsoft Exchange Servers, you must ***configure the user account for remote PowerShell access to Microsoft Exchange Server***.
- If you use SL1 to monitor Hyper-V Servers, you must ***configure the user account for remote PowerShell access to the Hyper-V Servers***.
- Otherwise, ***you can skip the remainder of this section and proceed to Step 2***.

Option 3: Creating a Non-Administrator User Account

If you do not have Local Administrator access to the servers that you want to monitor with PowerShell or WinRM, or if the monitored Windows server is a Domain Controller that will not be in the local Administrators group, then you must first create a domain user account or create a local user account on the Windows Server. For instructions, consult Microsoft's documentation.

After creating your domain user account or local user account:

- You must configure the Windows servers to allow that non-administrator user access. To do so, ***follow the steps in this section***.
- If you use SL1 to monitor Microsoft Exchange Servers, you must also ***configure the user account for remote PowerShell access to Microsoft Exchange Server***.
- If you use SL1 to monitor Hyper-V Servers, you must also ***configure the user account for remote PowerShell access to the Hyper-V Servers***.

To configure Windows Servers to allow access by your non-administrator user account:

1. Start a Windows PowerShell shell with ***Run As Administrator*** and execute the following command:

   ```
   winrm configsddl default
   ```

2. On the **Permissions for Default** window, click the **[Add]** button, and then add the non-administrator user account.
3. Select the *Allow* checkbox for the ***Read (Get, Enumerate, Subscribe)*** and ***Execute (Invoke)*** permissions for the user, and then click **[OK]**.

4. Access the Management console. To do this:
   - In Windows Server 2008, click **[Start]**, right-click **[Computer]**, click **[Manager]**, and then expand **[Configuration]**.
   - In Windows Server 2016 and 2012, right-click the Windows icon, click **[Computer Management]**, and then expand **[Services and Applications]**.
5. Right-click on **[WMI Control]** and then select *Properties*.
6. On the **WMI Control Properties** window, click the **[Security]** tab, and then click the **[Security]** button.
7. Click the **[Add]** button, and then add the non-administrator user or group in the **Select Users, Service Accounts, or Groups** dialog, then click **[OK]**.
8. On the **Security for Root** window, select the user o group just added, then in the **Permissions** section at the bottom of the window, select the ***Allow*** checkbox for the *Execute Methods*, *Enable Account*, and *Remote Enable* permissions.
9. Under the **Permissions** section of the **Security for Root** window, click the **[Advanced]** button.
10. In the **Advanced Security Settings** window, double-click on the user account or group you are modifying.
11. On the **Permission Entry** window, in the ***Type*** field, select *Allow*.
12. In the ***Applies to*** field, select *This namespace and subnamespaces*.
13. Select the ***Execute Methods***, ***Enable Account***, and ***Remote Enable*** permission checkboxes, and then click **[OK]** several times to exit the windows opened for setting WMI permissions.
14. Restart the WMI Service from services.msc.

NOTE: To open services.msc, press the Windows + R keys, type "services.msc", and then press Enter.

15. In the Management console, go to System Tools > Local Users and Groups > Groups.
16. Right-click ***Performance Monitor Users***, and then select *Properties*.
17. On the **Performance Monitor Users Properties** window, click the **[Add]** button.
18. In the ***Enter the object names to select*** field, type the non-administrator domain user or group name, and then click **[Check Names]**.
19. Select the user or group name from the list and then click **[OK]**.
20. In the **Performance Monitor Users Properties** window, click **[OK]**.
21. Perform steps 16-20 for the **Event Log Readers** user group and again for the **Distributed COM Users** user group, the R**emote Management Users** user group, and if it exists on the server, the **WinRMRemoteWMIUsers__** user group.
22. If you intend to use encrypted communications between the SL1 collector host and your monitored Windows servers, each Windows server must have a digital certificate installed that has "Server Authentication" as an Extended Key Usage property. You can create a self-signed certificate for WinRM by executing the following command:

```
$Cert = New-SelfSignedCertificate -CertstoreLocation Cert:\LocalMachine\My -DnsName
"myHost"
```

23. Add an HTTPS listener by executing the following command:

```
New-Item -Path WSMan:\LocalHost\Listener -Transport HTTPS -Address * -
CertificateThumbPrint $Cert.Thumbprint –Force
```

NOTE: This command should be entered on a single line.

24. Ensure that your local firewall allows inbound TCP connections on port 5986 if you are going to use encrypted communications between the SL1 collector(s) and the Windows server, or port 5985 if you will be using unencrypted communications between the two. You may have to create a new rule on Windows Firewall if one does not already exist.

Optional: Configuring the User Account for Remote PowerShell Access to Microsoft Exchange Server

If you use SL1 to monitor Microsoft Exchange Servers:

1. Follow the steps in the section ***Configuring the User Account for SL1***.
2. Add the new user account to the “Server Management” Exchange security group in Active Directory.
3. The user account will then be able to connect to the relevant WinRM endpoint to use cmdlets installed with the Exchange Management Shell. For example, this will give the user account access to the cmdlet “Get-ExchangeServer”.

Optional: Configuring the User Account for Remote PowerShell Access to Hyper-V Servers

To use PowerShell Dynamic Applications to monitor a Hyper-V server, you must:

- Create a user group in Active Directory
- Add the user account you will use to monitor the Hyper-V server to the group
- Set the session configuration parameters on the Hyper-V Server
- Set the group permissions on the Hyper-V Server
- Create a PowerShell credential using the new user account

Creating a User Group and Adding a User in Active Directory

To create a group in Active Directory and add a user:

1. In Active Directory, in the same DC as the Hyper-V host you want to monitor, in the OU called ***Users***, create a group. For example, we called our group ***PSSession Creators***.
2. Add a user that meets the requirements for monitoring a Windows server via PowerShell to the group. This is the user that you will specify in the PowerShell credential.

NOTE: For details on using Active Directory to perform these tasks, consult Microsoft's documentation.

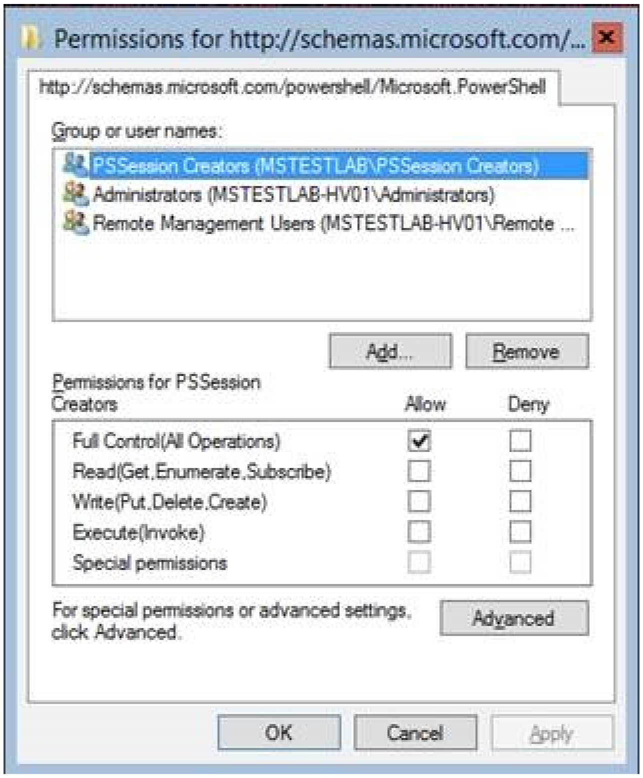
Setting the Session Configuration Parameters and Group Permissions

To set the Session Configuration and the Group Permissions on the Hyper-V Server:

1. Login to the Hyper-V server.
2. Open a PowerShell session. Enter the following command:

```
Set-PSSessionConfiguration -ShowSecurityDescriptorUI -Name Microsoft.PowerShell
```

3. When prompted, select **A**.
4. The **Permissions** dialog appears.



Permissions for http://schemas.microsoft.com/...

http://schemas.microsoft.com/powershell/Microsoft.PowerShell

Group or user names:

- PSSession Creators (MSTESTLAB\PSSession Creators)
- Administrators (MSTESTLAB-HV01\Administrators)
- Remote Management Users (MSTESTLAB-HV01\Remote ...

Permissions for PSSession Creators	Allow	Deny
Full Control(All Operations)	☑	□
Read(Get,Enumerate,Subscribe)	□	□
Write(Put,Delete,Create)	□	□
Execute(Invoke)	□	□
Special permissions	□	□

For special permissions or advanced settings, click Advanced.

5. In the **Permissions** dialog, supply values in the following fields:

   - ***Group or user names***. Select the name of the group you created in Active Directory.
   - ***Permissions for group***. For ***Full Control (All Operations)***, select the *Allow* checkbox.

6. Click the **[OK]** button.

Creating a PowerShell Credential

To create a PowerShell credential using the new user account, follow the instructions in the ***Creating a PowerShell Credential*** section.

Optional: Configuring the User Account for Access to Windows Failover Cluster

To configure Windows Servers to allow access to your Windows Failover Cluster:

1. Start a Windows PowerShell shell with ***Run As Administrator*** and execute the following command:

```
'Grant-ClusterAccess -User <domain>\<user> -ReadOnly'
```

Step 2: Configuring a Server Authentication Certificate

ScienceLogic highly recommends that you encrypt communications between SL1 and the Windows Servers you want it to monitor.

If you have created a ***local account on the Windows Server that uses Basic Auth*** and that account will allow communication between SL1 and the Windows server, the best practice for security is to enable HTTPS to support encrypted data transfer and authentication. To do this, you must configure WinRM to listen for HTTPS requests. This is called configuring an HTTPS listener.

NOTE: For details on configuring WinRM on your Windows servers to use HTTPS, see https://support.microsoft.com/en-us/help/2019527/how-to-configure-winrm-for-https.

The sections below describe how to configure a Server Authentication Certificate on the Windows Server. This is only one task included in configuring an HTTPS listener. However, not all users need to configure a Server Authentication Certificate. You can find out if your Windows computer has a digital certificate installed for Server Authentication by running `'Get-ChildItem -Path Cert:\LocalMachine\My -EKU "*Server Authentication*"'` from a PowerShell command shell.

To support encrypted data transfer and authentication between SL1 and the servers, one of the following must be true:

- You have created an ***Active Directory*** user account on the Windows Server to allow communication between SL1 and the server. In this scenario, Active Directory will use Kerberos and AES-256 encryption to ensure secure data transfer and authentication, which means you do not need to configure a self-signed Server Authentication Certificate. ***You can skip this section and proceed to Step 3***.

- You have created a ***local account*** on the Windows Server that uses Basic Auth to allow communication between SL1 and the server, and your network ***includes a Microsoft Certificate server***. In this scenario, you should work with your Microsoft administrator to get a certificate for your Windows Server instead of configuring a self-signed Server Authentication Certificate. ***You can skip this section and proceed to Step 3***.
- You have created a ***local account*** on the Windows Server that uses Basic Auth to allow communication between SL1 and the server, and your network ***does not include a Microsoft Certificate server***. In this scenario, you must configure a self-signed Server Authentication Certificate on the Windows Server that you want to monitor with SL1 using one of the following methods:
  - **Option 1:** *Use the Microsoft Management Console*.
  - **Option 2:** If your Windows Server includes Windows Software Development Kit (SDK), you can ***use the makecert tool***.
  - **Option 3:** If you are running PowerShell 4.0 or later, you can ***use the New-SelfSignedCertificate and Export-PfxCertificate commands***.

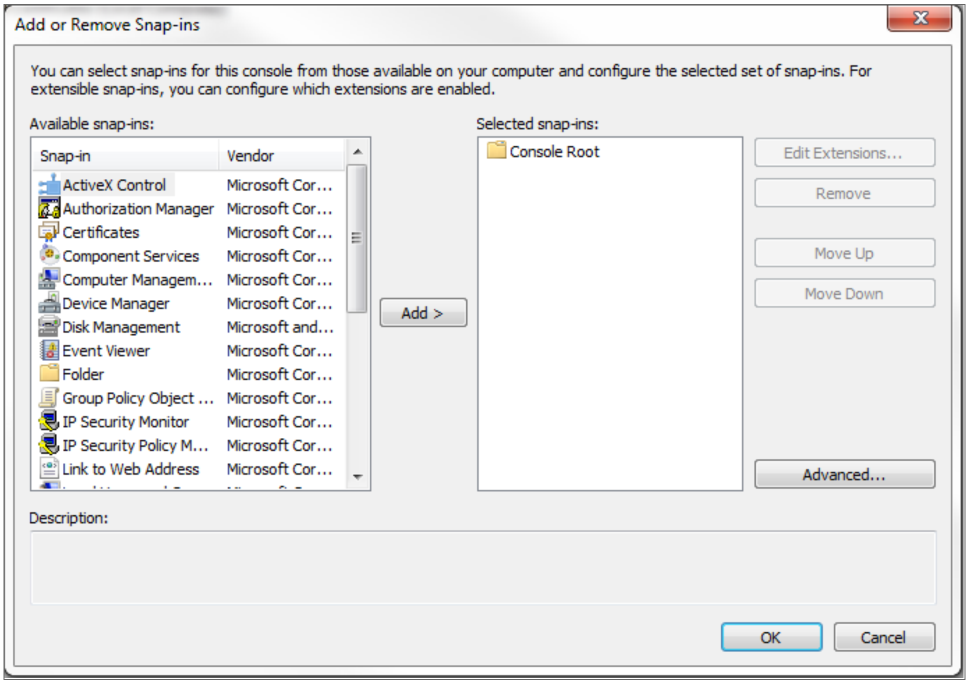
NOTE: Self-signed certificates are appropriate for use on a trusted network, such as a LAN that includes both a ScienceLogic Data Collector and the Windows Server to be monitored.

Option 1: Using the Microsoft Management Console to Create a Self-Signed Authentication Certificate

To use the **Microsoft Management Console** to create a self-signed certificate:

1. Log in to the Windows Server that you want to monitor with SL1.
2. In the Start menu search bar, enter "mmc" to open a **Microsoft Management Console** window.

3. Select **[File]**, then *Add/Remove Snap-Ins*. The **Add or Remove Snap-ins** window is displayed:



You can select snap-ins for this console from those available on your computer and configure the selected set of snap-ins. For extensible snap-ins, you can configure which extensions are enabled.

Available snap-ins:

Snap-in	Vendor
ActiveX Control	Microsoft Cor...
Authorization Manager	Microsoft Cor...
Certificates	Microsoft Cor...
Component Services	Microsoft Cor...
Computer Managem...	Microsoft Cor...
Device Manager	Microsoft Cor...
Disk Management	Microsoft and...
Event Viewer	Microsoft Cor...
Folder	Microsoft Cor...
Group Policy Object ...	Microsoft Cor...
IP Security Monitor	Microsoft Cor...
IP Security Policy M...	Microsoft Cor...
Link to Web Address	Microsoft Cor...

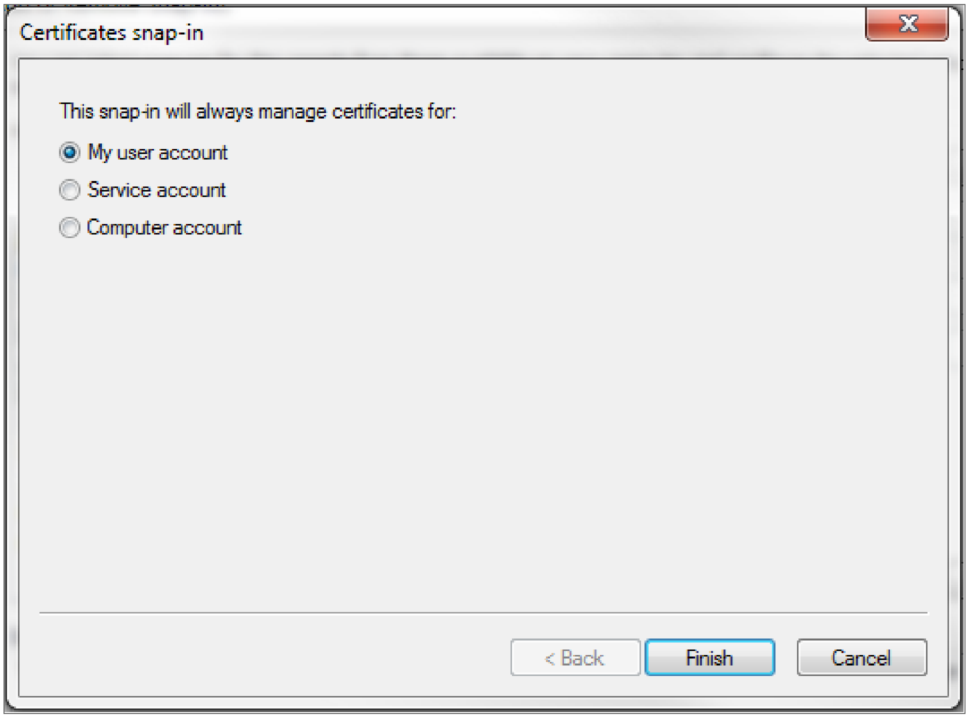
Selected snap-ins:

Console Root

Description:

4. In the ***Available snap-ins*** list, select *Certificates*.

5. Click the **[Add >]** button. The **Certificates snap-in** window is displayed:



This snap-in will always manage certificates for:

● My user account

○ Service account

○ Computer account

6. Select *Computer account*.
7. Click the **[Next >]** button.
8. Click the **[Finish]** button.
9. In the **Add or Remove Snap-ins** window, click the **[OK]** button.
10. In the left pane of the **Microsoft Management Console** window, navigate to Console Root > Certificates (Local Computer) > Personal.
11. Right-click in the middle pane and select *All Tasks > Request New Certificate...*. The **Certificate Enrollment** window is displayed.
12. Click the **[Next]** button. The **Select Certificate Enrollment Policy** page is displayed.
13. Select *Active Directory Enrollment Policy*.
14. Click the **[Next]** button. The **Request Certificates** page is displayed.
15. Select the ***Computer*** checkbox.
16. Click the **[Enroll]** button.
17. After the certificate is installed, click the **[Finish]** button.

Option 2: Using the MakeCert Tool to Create a Self-Signed Authentication Certificate

If your Windows system includes Windows Software Development Kit (SDK), you can use the MakeCert tool that is included in the kit to create a self-signed certificate.

- For information on the MakeCert tool, see:

  https://msdn.microsoft.com/library/windows/desktop/aa386968.aspx

- For details on creating a self-signed certificate with MakeCert and installing the certificate in the Trusted Root Certification Authorities store, see:

  https://msdn.microsoft.com/en-us/library/ms733813%28v=vs.110%29.aspx

Option 3: Using PowerShell Commands to Create a Self-Signed Authentication Certificate

If your Windows system includes PowerShell 4.0 or later, you can use the following PowerShell commands to create a self-signed certificate:

- You can use the **New-SelfSignCertificate** command to create a self-signed certificate. For information on **New-SelfSignCertificate**, see:

  https://docs.microsoft.com/en-us/powershell/module/pkiclient/new-selfsignedcertificate?view=win10-ps

- You can use the **Export-PfxCertificate** command to export the private certificate. For information on the **Export-PfxCertificate**, see:

https://docs.microsoft.com/en-us/powershell/module/pkiclient/export-pfxcertificate?view=win10-ps

Step 3: Configuring Windows Remote Management

To provide SL1 remote access to the Windows Servers you want to monitor, you must configure Windows Remote Management.

NOTE: This step is required regardless of the user account type that SL1 will use to connect to the Windows Server.

There are three ways to configure Windows Remote Management:

- **Option 1:** *Use the script provided by ScienceLogic.*
- **Option 2:** *Manually perform the configuration*.
- **Option 3:** *Use a group policy*.

Option 1: Using a Script to Configure Windows Remote Management

ScienceLogic provides a PowerShell script on the ScienceLogic portal that automates configuration of Windows Remote Management and permissions required for the user account that will be used in the SL1 credential. The script configures all of the base Windows permissions required, except for opening up Windows Firewall ports for HTTP and/or HTTPS traffic. The configuration performed by the script is useful primarily for running collection with the **Microsoft: Windows Server**, **Microsoft: Windows Server Services**, **Microsoft: Windows Server Event Logs**, and **Microsoft: SQL Server Enhanced** PowerPacks. (Microsoft: SQL Server Enhanced requires further instance-specific permissions. See the ***Monitoring SQL Servers*** manual for more information.)

To use the PowerShell script, perform the following steps:

1. Log in to the ScienceLogic portal, go to **Downloads > Miscellaneous**, and download the PowerShell script named ***WinRM Configuration Wizard Script (winrm_configuration_wizard.ps1)***. The link is : https://portal-cdn.sciencelogic.com/powerpackextras/5819/18486/winrm_configuration_wizard.zip
2. Unzip the downloaded file.
3. Using the credentials for an account that is a member of the Administrator's group, log in to the Windows server you want to monitor. You can log in directly or use Remote Desktop to log in.
4. Copy the PowerShell script named ***winrm_configuration_wizard.ps1*** to the Windows server that you want to monitor with SL1.
5. Right-click on the PowerShell icon and select ***Run As Administrator***.
6. At the PowerShell prompt, navigate to the directory where you copied the PowerShell script named ***winrm_configuration_wizard.ps1***.
7. At the PowerShell prompt, enter the following to enable execution of the script:

```
Set-ExecutionPolicy -ExecutionPolicy Unrestricted -Scope Process -Force
```

NOTE: The execution policy setting persists only during the current PowerShell session.

8. After the warning text, select Y.

NOTE: If your Windows configuration requires further steps to allow execution of the script, PowerShell will display prompts. Follow the prompts.

9. To run the script with interactive dialogs, enter the following at the PowerShell prompt:

```
.\winrm_configuration_wizard.ps1 -user <domain>\<username>
```

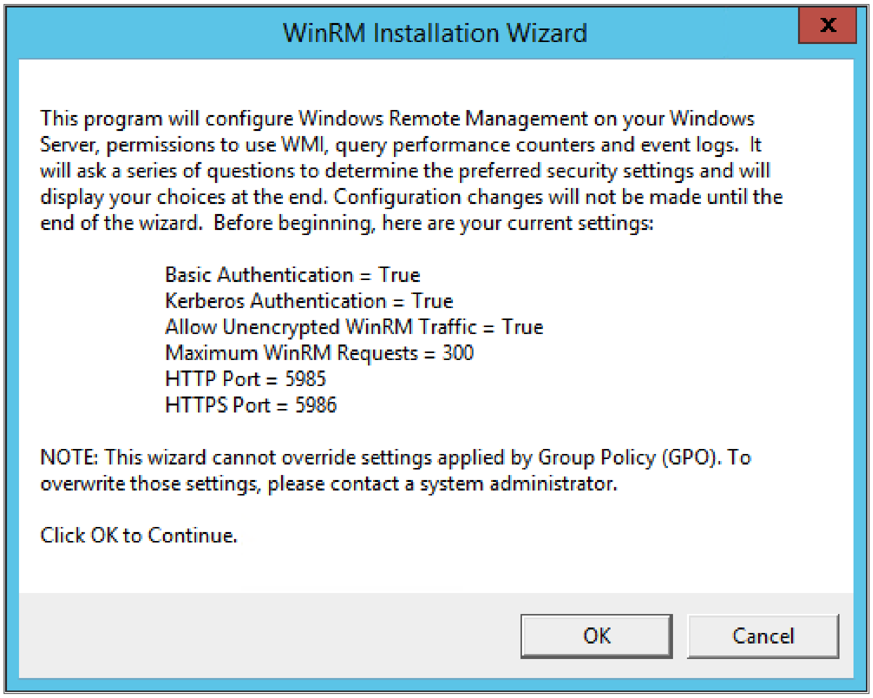
The user account you wish to use for SL1 collection must be specified with the `-user` command-line argument regardless of other arguments used. You can obtain the full help for the PowerShell configuration script by entering the following:

```
help .\winrm_configuration_wizard.ps1 -full
```

The most common way to run the script is silently:

```
.\winrm_configuration_wizard.ps1 -user <domain>\<username> -silent
```

10. If you start the script without using the `-silent` command-line argument, the **WinRM Installation Wizard** modal page appears. Click **[OK]**.



WinRM Installation Wizard

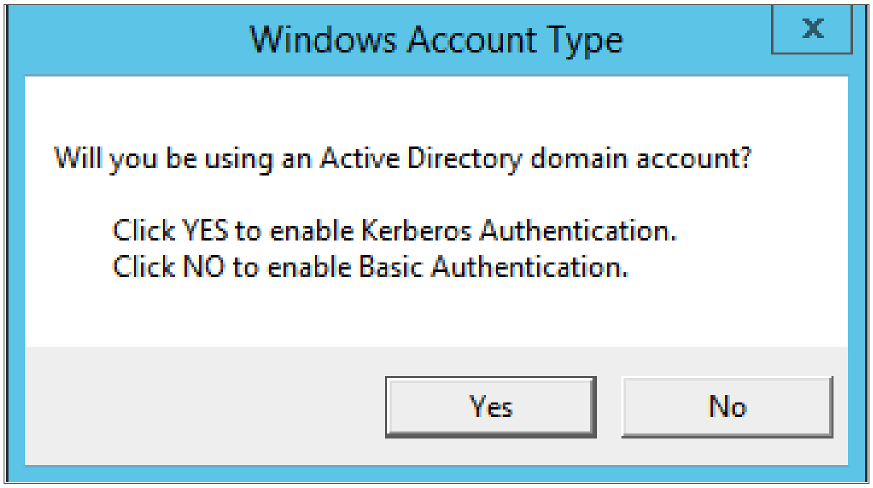
This program will configure Windows Remote Management on your Windows Server, permissions to use WMI, query performance counters and event logs. It will ask a series of questions to determine the preferred security settings and will display your choices at the end. Configuration changes will not be made until the end of the wizard. Before beginning, here are your current settings:

Basic Authentication = True
Kerberos Authentication = True
Allow Unencrypted WinRM Traffic = True
Maximum WinRM Requests = 300
HTTP Port = 5985
HTTPS Port = 5986

NOTE: This wizard cannot override settings applied by Group Policy (GPO). To overwrite those settings, please contact a system administrator.

Click OK to Continue.

11. The **Windows Account Type** modal page appears. Select the appropriate choice for your environment.

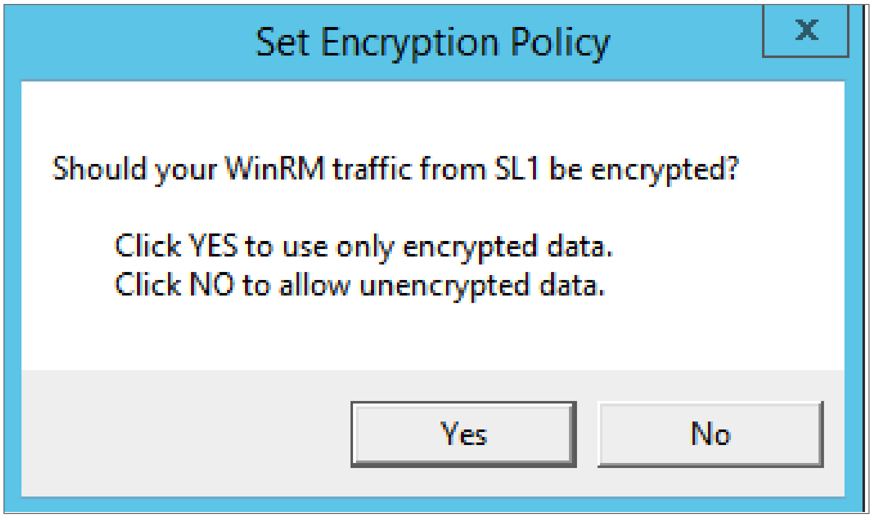


Windows Account Type

Will you be using an Active Directory domain account?

Click YES to enable Kerberos Authentication.
Click NO to enable Basic Authentication.

12. The **Set Encryption Policy** modal page appears. Select the appropriate choice for your environment.



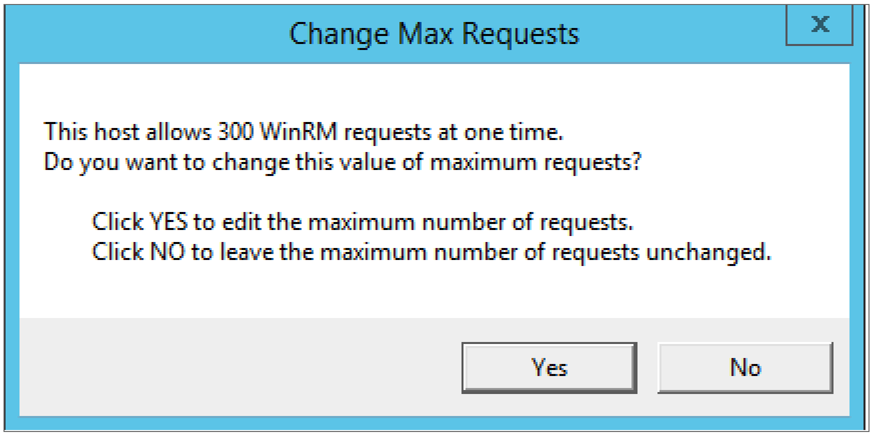
Set Encryption Policy

Should your WinRM traffic from SL1 be encrypted?

Click YES to use only encrypted data.
Click NO to allow unencrypted data.

- ***Click YES to us only encrypted data***. Click Yes to configure an HTTPS listener for using encrypted communications between the SL1 collectors and the Windows server. Setting up an HTTPS listener requires a digital certificate with Server Authentication EKU to be available on the server. For information on creating a self-signed certificate, see *Configuring a Server Authentication Certificate*.
- ***Click NO to allow unencrypted data***. For communication between SL1 collectors and the Windows server, if unencrypted traffic is allowed, an HTTP listener will be configured for communication.

13. The **Change Max Requests** modal page appears. Click **[Yes]**.

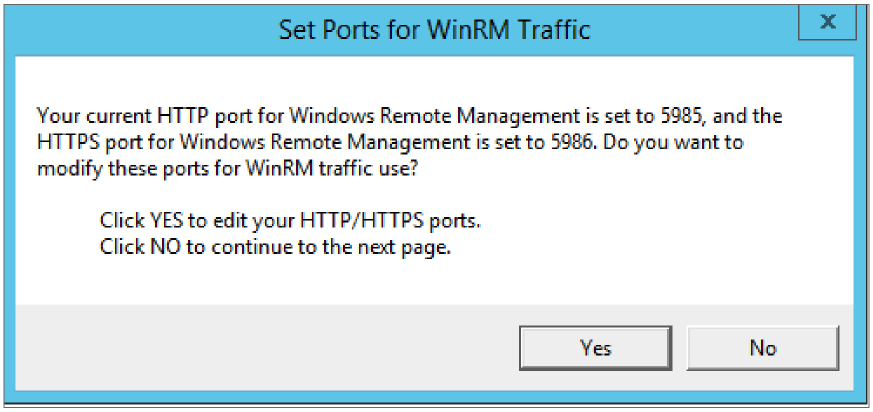


Change Max Requests

This host allows 300 WinRM requests at one time.
Do you want to change this value of maximum requests?

Click YES to edit the maximum number of requests.
Click NO to leave the maximum number of requests unchanged.

14. The **Set Ports for WinRM Traffic** modal page appears, and it shows the current settings for the HTTP and HTTPS ports. If you want to make a change to these, click **[YES]**; otherwise, click **[NO]** to continue.

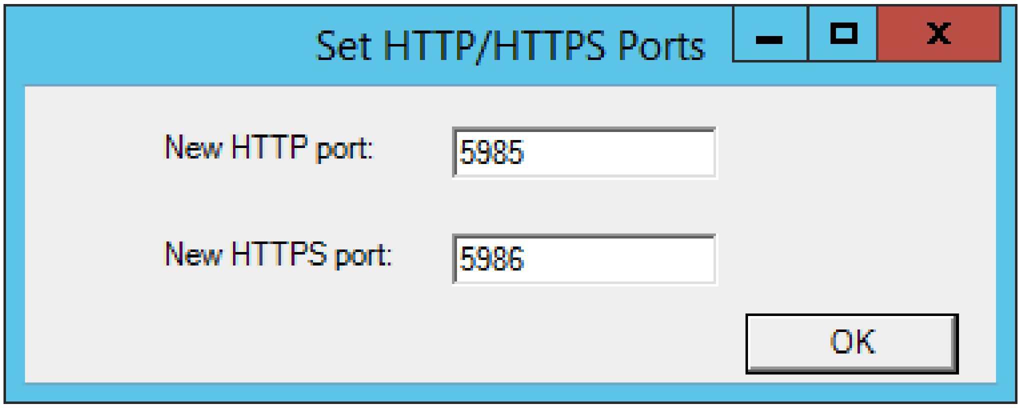


Set Ports for WinRM Traffic

Your current HTTP port for Windows Remote Management is set to 5985, and the HTTPS port for Windows Remote Management is set to 5986. Do you want to modify these ports for WinRM traffic use?

Click YES to edit your HTTP/HTTPS ports.
Click NO to continue to the next page.

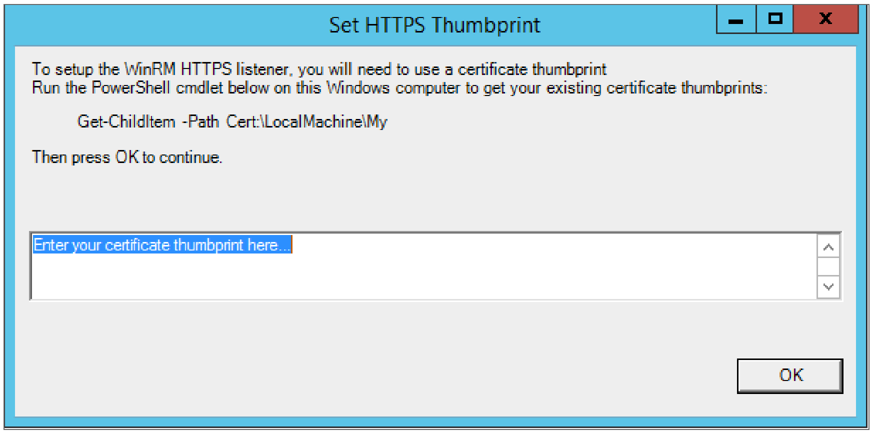
15. Choose which port values you would like SL1 to use when communicating with the Windows server.


Set HTTP/HTTPS Ports

New HTTP port: 5985

New HTTPS port: 5986

16. The **Set HTTPS Thumbprint** modal page appears. Enter the information for your certificate thumbprint, which is used to create an HTTPS listener, then click **[OK]**.


Set HTTPS Thumbprint

To setup the WinRM HTTPS listener, you will need to use a certificate thumbprint
Run the PowerShell cmdlet below on this Windows computer to get your existing certificate thumbprints:

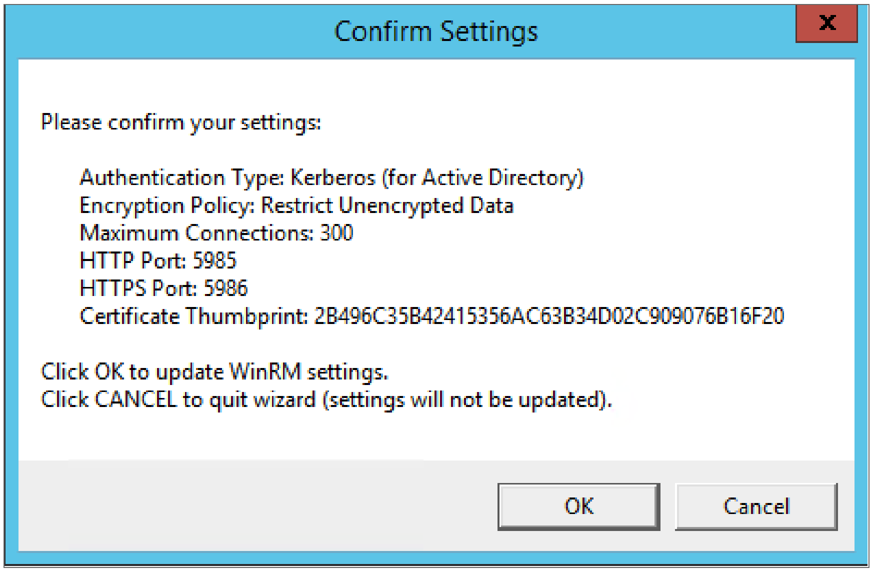
```
Get-ChildItem -Path Cert:\LocalMachine\My
```

Then press OK to continue.

Enter your certificate thumbprint here...

NOTE: If the certificate structure for your certificate thumbprint is incomplete or incorrect, an error message appears indicating that the WinRM client cannot process the request. If you think you made an error, click **[OK]** and try to correct it. Otherwise, contact a system administrator for help.

17. The **Confirm Settings** modal page appears. If the settings are as you specified, click **[OK]**.

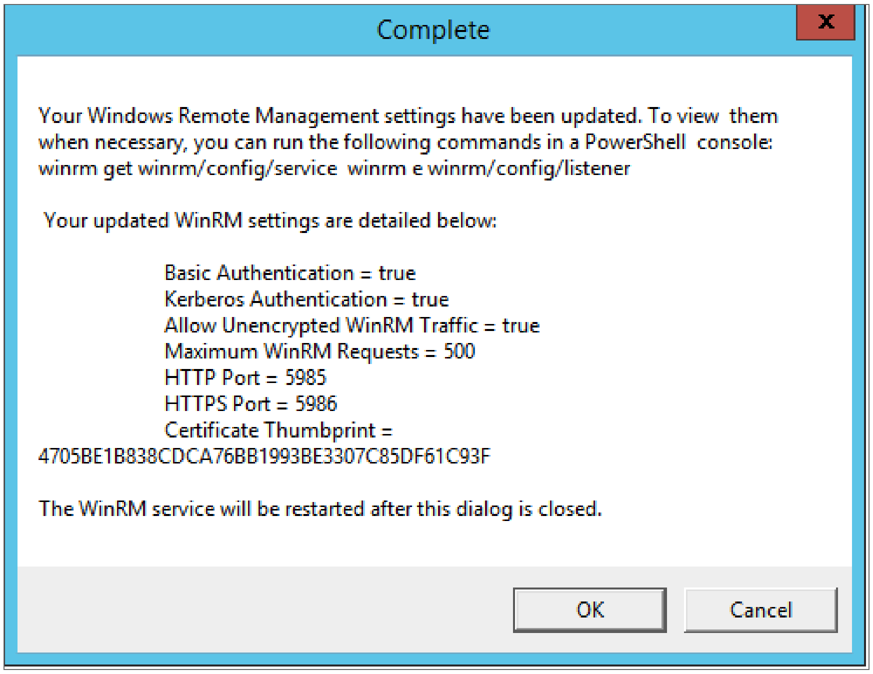


Please confirm your settings:

Authentication Type: Kerberos (for Active Directory)
Encryption Policy: Restrict Unencrypted Data
Maximum Connections: 300
HTTP Port: 5985
HTTPS Port: 5986
Certificate Thumbprint: 2B496C35B42415356AC63B34D02C909076B16F20

Click OK to update WinRM settings.
Click CANCEL to quit wizard (settings will not be updated).

18. The **Complete** modal page appears. If the settings are correct, click **[OK]**.



Your Windows Remote Management settings have been updated. To view them when necessary, you can run the following commands in a PowerShell console:
winrm get winrm/config/service winrm e winrm/config/listener

Your updated WinRM settings are detailed below:

Basic Authentication = true
Kerberos Authentication = true
Allow Unencrypted WinRM Traffic = true
Maximum WinRM Requests = 500
HTTP Port = 5985
HTTPS Port = 5986
Certificate Thumbprint =
4705BE1B838CDCA76BB1993BE3307C85DF61C93F

The WinRM service will be restarted after this dialog is closed.

19. Exit the PowerShell session.

Option 2: Manually Configuring Windows Remote Management

To configure a Windows server for monitoring via PowerShell directly, perform the following steps:

1. Log in to the server with an account that is a member of the local Administrators group, or a Domain Administrator's account if on a Windows server with the Domain Controller role installed.
2. Right-click on the PowerShell icon in the taskbar or the **Start** menu, and select *Run as Administrator*.
3. Execute the following command:

   ```
   Get-ExecutionPolicy
   ```

4. If the output is "Restricted", execute the following command:

   ```
   Set-ExecutionPolicy RemoteSigned
   ```

5. Enter "Y" to accept.
6. Execute the following command:

   ```
   winrm quickconfig
   ```

7. Enter "Y" to accept.
8. If you are configuring this Windows server for encrypted communication, execute the following command:

   ```
   winrm quickconfig -transport:https
   ```

9. Enter "Y" to accept.
10. Execute the following command:

    ```
    winrm get winrm/config
    ```

    The output should look like this (additional lines indicated by ellipsis):

    ```
    Config
      ...
      Client
        ...
        Auth
          Basic = true
          ...
          Kerberos = true
          ...
        ...
      Service
        ...
        AllowUnencrypted = false
        ...
        DefaultPorts
          HTTP = 5985
          HTTPS = 5986
        ...
        AllowRemoteAccess = true
      Winrs
        AllowRemoteShellAccess = true
        ...
    ```

11. In the Service section, if the parameter ***AllowRemoteAccess*** is set to *false*, execute the following command:

NOTE: This setting does not appear for all versions of Windows. If this setting does not appear, no action is required.

```
Set-Item WSMan:\Localhost\Service\AllowRemoteAccess -value true
```

12. In the Winrs section, if the parameter ***AllowRemoteShellAccess*** is set to *false*, execute the following command:

    ```
    Set-Item WSMan:\Localhost\Winrs\AllowRemoteShellAccess -value true
    ```

13. If you are configuring this Windows server for unencrypted communication and the parameter ***AllowUnencrypted*** (in the Service section) is set to *false*, execute the following command:

    ```
    Set-Item WSMan:\Localhost\Service\AllowUnencrypted -value true
    ```

14. If you are configuring this Windows server for unencrypted communication, verify that "HTTP = 5985" appears in the DefaultPorts section.

NOTE: ScienceLogic recommends using encrypted communication, particularly if you are also using an Active Directory account. Using an Active Directory account for encrypted authentication enables you to use Kerberos ticketing for authentication.

15. If you are configuring this Windows server for encrypted communication, verify that "HTTPS = 5986" appears in the DefaultPorts section.
16. If you are using an Active Directory account to communicate with this Windows server and in the Auth section, the parameter ***Kerberos*** is set to *false*, execute the following command:

    ```
    Set-Item WSMan:\Localhost\Service\Auth\Kerberos -value true
    ```

NOTE: ScienceLogic recommends using an Active Directory account.

17. If you are using a local account to communicate with this Windows server and in the Auth section, the parameter ***Basic*** is set to *false*, execute the following command:

    ```
    Set-Item WSMan:\Localhost\Service\Auth\Basic -value true
    ```

Option 3: Using a Group Policy to Configure Windows Remote Management

You can use a group policy object (GPO) to configure the following Windows Remote Management settings on Windows Server 2012 or Windows Server 2016:

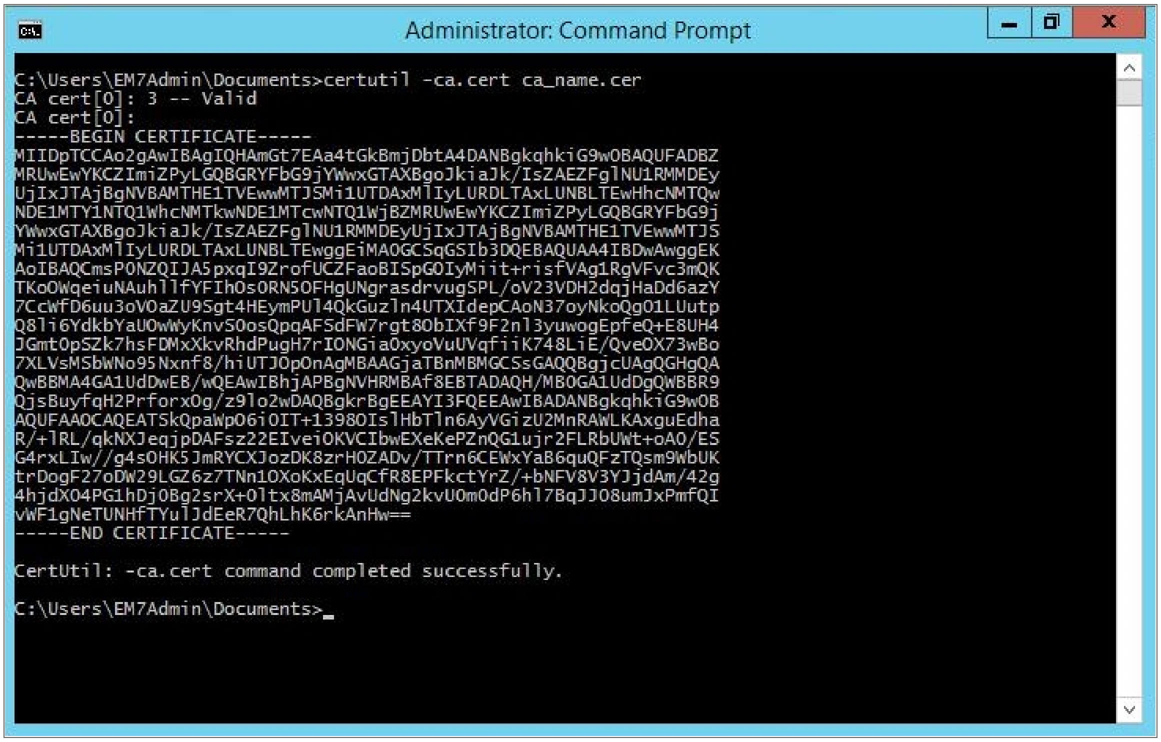
- A registry key to enable Local Account access to Windows Remote Management
- Firewall rules
- Certificates
- HTTP and HTTPS listeners, including authentication and encryption settings
- Service start and recovery settings

To create the group policy object, perform the following steps:

1. Log in to the server as an administrator.
2. Right-click on the PowerShell icon in the taskbar and select *Run as Administrator*.
3. At the PowerShell prompt, use the change directory (CD) command to navigate to a folder where you can create new files.

4. Save the root Certification Authority certificate to the local directory by executing the following command:

```
certutil.exe -ca.cert ca_name.cer
```



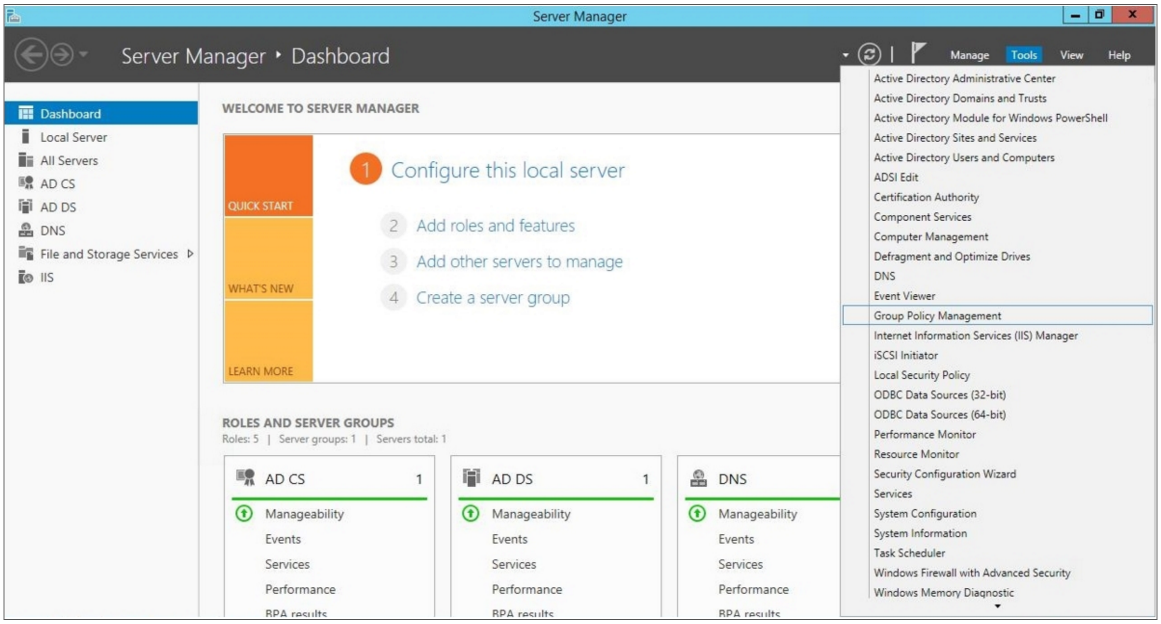
```
C:\Users\EM7Admin\Documents>certutil -ca.cert ca_name.cer
CA cert[0]: 3 -- Valid
CA cert[0]:
-----BEGIN CERTIFICATE-----
MIIDpTCCAo2gAwIBAgIQHAmGt7EAa4tGkBmjDbtA4DANBgkqhkiG9w0BAQUFADBZ
MRUwEwYKCZImiZPyLGQBGRYFbG9jYWwxGTAXBgoJkiaJk/IsZAEZFglNU1RMMDEy
UjIxJTAjBgNVBAMTHE1TVEwwMTJSMi1UTDAxMlIyLURDLTAxLUNBLTEwHhcNMTQw
NDE1MTY1NTQ1WhcNMTkwNDE1MTcwNTQ1WjBZMRUwEwYKCZImiZPyLGQBGRYFbG9j
YWwxGTAXBgoJkiaJk/IsZAEZFglNU1RMMDEyUjIxJTAjBgNVBAMTHE1TVEwwMTJS
Mi1UTDAxMlIyLURDLTAxLUNBLTEwggEiMA0GCSqGSIb3DQEBAQUAA4IBDwAwggEK
AoIBAQCmsP0NZQIJA5pxqI9ZrofUCZFaoBISpGOIyMiit+risfVAg1RgVFvc3mQK
TKoOWqeiuNAuhllfYFIhOs0RN5OFHgUNgrasdrvugSPL/oV23VDH2dqjHaDd6azY
7CcWfD6uu3oVOaZU9Sgt4HEymPUl4QkGuzln4UTXIdepCAoN37oyNkoQg01LUutp
Q8li6YdkbYaUOwWyKnvSOosQpqAFSdFW7rgt8ObIXf9F2nl3yuwogEpfeQ+E8UH4
JGmtOpSZk7hsFDMxXkvRhdPugH7rIONGia0xyoVuUVqfiiK748LiE/QveOX73wBo
7XLVsMSbWNo95Nxnf8/hiUTJOpOnAgMBAAGjaTBnMBMGCSsGAQQBgjcUAgQGHgQA
QwBBMA4GA1UdDwEB/wQEAwIBhjAPBgNVHRMBAf8EBTADAQH/MB0GA1UdDgQWBBR9
QjsBuyfqH2PrforxOg/z9lo2wDAQBgkrBgEEAYI3FQEEAwIBADANBgkqhkiG9w0B
AQUFAAOCAQEATSkQpaWpO6iOIT+1398OIslHbTln6AyVGizU2MnRAWLKAxguEdha
R/+lRL/qkNXJeqjpDAFsz22EIveiOKVCIbwEXeKePZmQG1ujr2FLRbUWt+oAO/ES
G4rxLIw//g4sOHK5JmRYCXJozDK8zrHOZADv/TTrn6CEWxYaB6quQFzTQsm9WbUK
trDogF27oDW29LGZ6z7TNn1OXoKxEqUqCfR8EPFkctYrZ/+bNFV8V3YJjdAm/42g
4hjdXO4PG1hDjOBg2srX+Oltx8mAMjAvUdNg2kvUOmOdP6hl7BqJJO8umJxPmfQI
vWF1gNeTUNHfTYulJdEeR7QhLhK6rkAnHw==
-----END CERTIFICATE-----

CertUtil: -ca.cert command completed successfully.

C:\Users\EM7Admin\Documents>_
```

TIP: You will import this certificate into the new group policy in step 21.

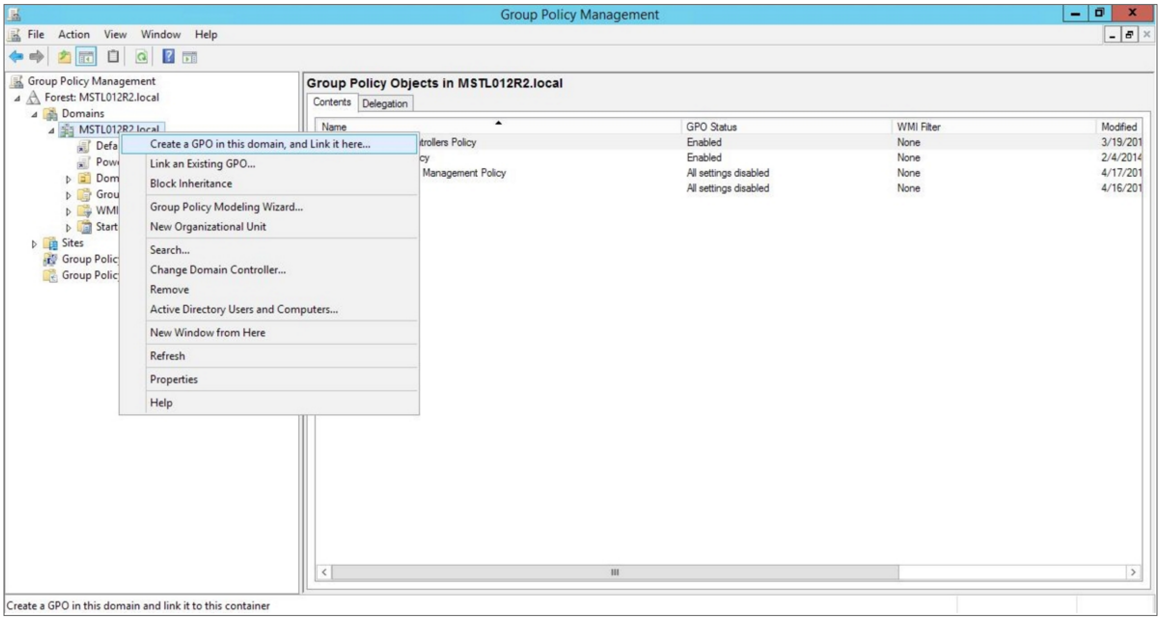
5. Exit the command prompt.

6. Log in to a domain controller in your Active Directory forest and navigate to the System Manager dashboard.

7. Click the **Tools** menu, then select *Group Policy Management*.


Server Manager
Server Manager ▸ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD CS
AD DS
DNS
File and Storage Services ▷
IIS
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
ROLES AND SERVER GROUPS
Roles: 5 | Server groups: 1 | Servers total: 1
AD CS 1
AD DS 1
DNS
Manageability
Events
Services
Performance
BPA results
Active Directory Administrative Center
Active Directory Domains and Trusts
Active Directory Module for Windows PowerShell
Active Directory Sites and Services
Active Directory Users and Computers
ADSI Edit
Certification Authority
Component Services
Computer Management
Defragment and Optimize Drives
DNS
Event Viewer
Group Policy Management
Internet Information Services (IIS) Manager
iSCSI Initiator
Local Security Policy
ODBC Data Sources (32-bit)
ODBC Data Sources (64-bit)
Performance Monitor
Resource Monitor
Security Configuration Wizard
Services
System Configuration
System Information
Task Scheduler
Windows Firewall with Advanced Security
Windows Memory Diagnostic

8. On the **Group Policy Management** page, in the left panel, right-click the domain name where you want the new group policy to resideand then select *Create a GPO in this domain and Link it here*.

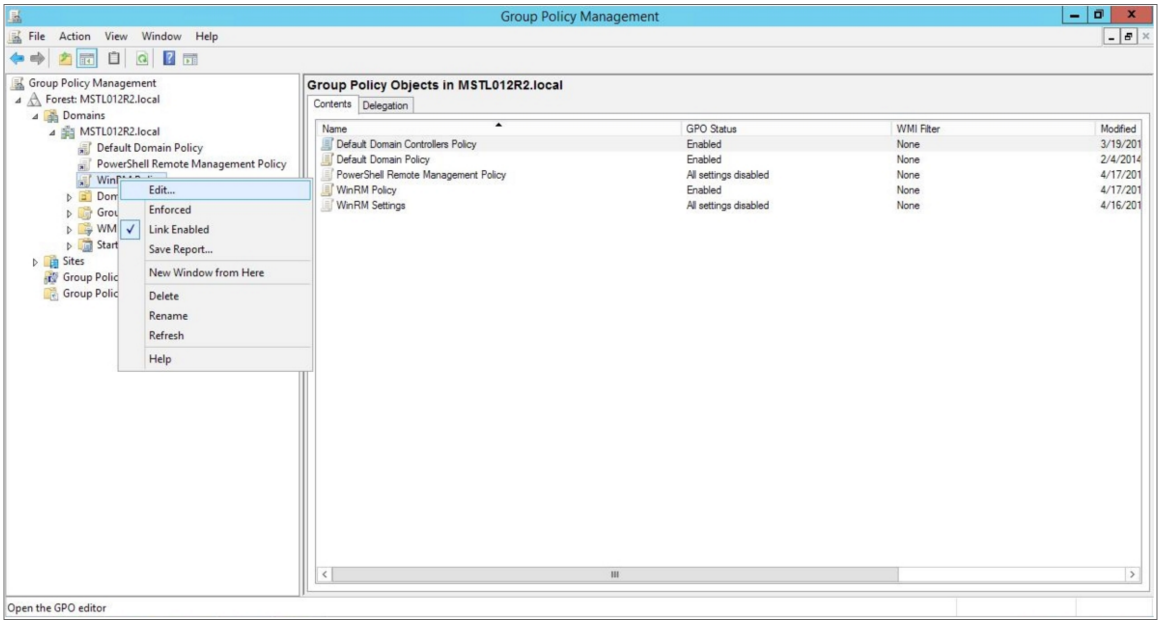


Group Policy Objects in MSTL012R2.local

Name	GPO Status	WMI Filter	Modified
trollers Policy	Enabled	None	3/19/201
cy	Enabled	None	2/4/2014
Management Policy	All settings disabled	None	4/17/201
	All settings disabled	None	4/16/201

Create a GPO in this domain and link it to this container

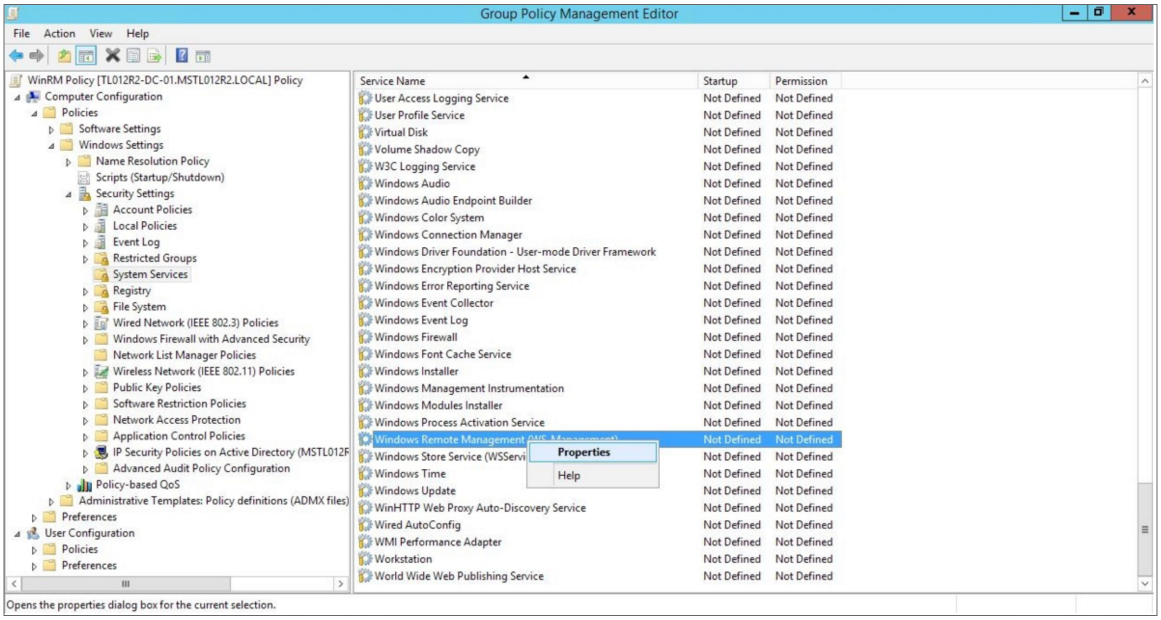
9. In the left panel, right-click the new group policy and select *Edit*. The **Group Policy Management Editor** page for the new Windows Remote Management group policy appears.



Group Policy Objects in MSTL012R2.local

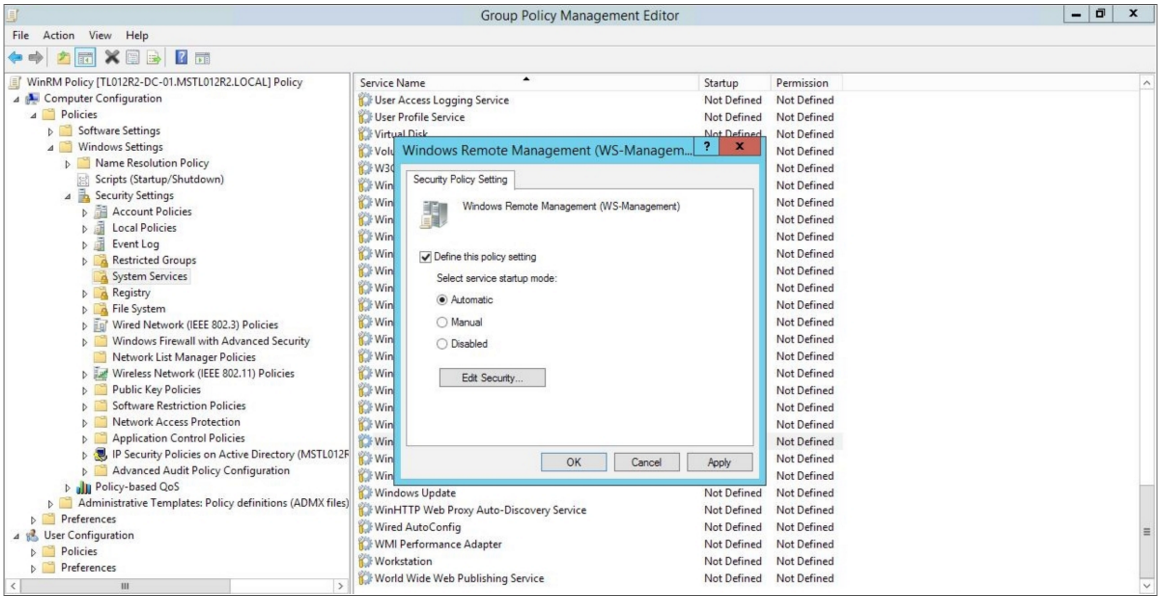
Name	GPO Status	WMI Filter	Modified
Default Domain Controllers Policy	Enabled	None	3/19/201
Default Domain Policy	Enabled	None	2/4/2014
PowerShell Remote Management Policy	All settings disabled	None	4/17/201
WinRM Policy	Enabled	None	4/17/201
WinRM Settings	All settings disabled	None	4/16/201

10. In the left panel, navigate to **Computer Configuration > Policies > Windows Settings > Security Settings > System Services**. In the right panel, locate the **Windows Remote Management (WS-Management)** service. Right-click the service, then select *Properties*.


Group Policy Management Editor
File Action View Help
WinRM Policy [TL012R2-DC-01.MSTL012R2.LOCAL] Policy
Computer Configuration
Policies
Software Settings
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
Windows Firewall with Advanced Security
Network List Manager Policies
Wireless Network (IEEE 802.11) Policies
Public Key Policies
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL012F
Advanced Audit Policy Configuration
Policy-based QoS
Administrative Templates: Policy definitions (ADMX files)
Preferences
User Configuration
Policies
Preferences
Properties
Help
Opens the properties dialog box for the current selection.

Service Name	Startup	Permission
User Access Logging Service	Not Defined	Not Defined
User Profile Service	Not Defined	Not Defined
Virtual Disk	Not Defined	Not Defined
Volume Shadow Copy	Not Defined	Not Defined
W3C Logging Service	Not Defined	Not Defined
Windows Audio	Not Defined	Not Defined
Windows Audio Endpoint Builder	Not Defined	Not Defined
Windows Color System	Not Defined	Not Defined
Windows Connection Manager	Not Defined	Not Defined
Windows Driver Foundation - User-mode Driver Framework	Not Defined	Not Defined
Windows Encryption Provider Host Service	Not Defined	Not Defined
Windows Error Reporting Service	Not Defined	Not Defined
Windows Event Collector	Not Defined	Not Defined
Windows Event Log	Not Defined	Not Defined
Windows Firewall	Not Defined	Not Defined
Windows Font Cache Service	Not Defined	Not Defined
Windows Installer	Not Defined	Not Defined
Windows Management Instrumentation	Not Defined	Not Defined
Windows Modules Installer	Not Defined	Not Defined
Windows Process Activation Service	Not Defined	Not Defined
Windows Remote Management	Not Defined	Not Defined
Windows Store Service (WSServi	Not Defined	Not Defined
Windows Time	Not Defined	Not Defined
Windows Update	Not Defined	Not Defined
WinHTTP Web Proxy Auto-Discovery Service	Not Defined	Not Defined
Wired AutoConfig	Not Defined	Not Defined
WMI Performance Adapter	Not Defined	Not Defined
Workstation	Not Defined	Not Defined
World Wide Web Publishing Service	Not Defined	Not Defined

11. The **Windows Remote Management (WS-Management)** modal page appears. Select the **Define this policy setting** check box and the **Automatic** radio button, then click **[OK]**.


Group Policy Management Editor
File Action View Help
WinRM Policy [TL012R2-DC-01.MSTL012R2.LOCAL] Policy
Computer Configuration
Policies
Software Settings
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
Windows Firewall with Advanced Security
Network List Manager Policies
Wireless Network (IEEE 802.11) Policies
Public Key Policies
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL012F
Advanced Audit Policy Configuration
Policy-based QoS
Administrative Templates: Policy definitions (ADMX files)
Preferences
User Configuration
Policies
Preferences
Windows Remote Management (WS-Managem...
?
Security Policy Setting
Edit Security...
OK
Cancel
Apply

Windows Remote Management (WS-Management)

☑ Define this policy setting

Select service startup mode:

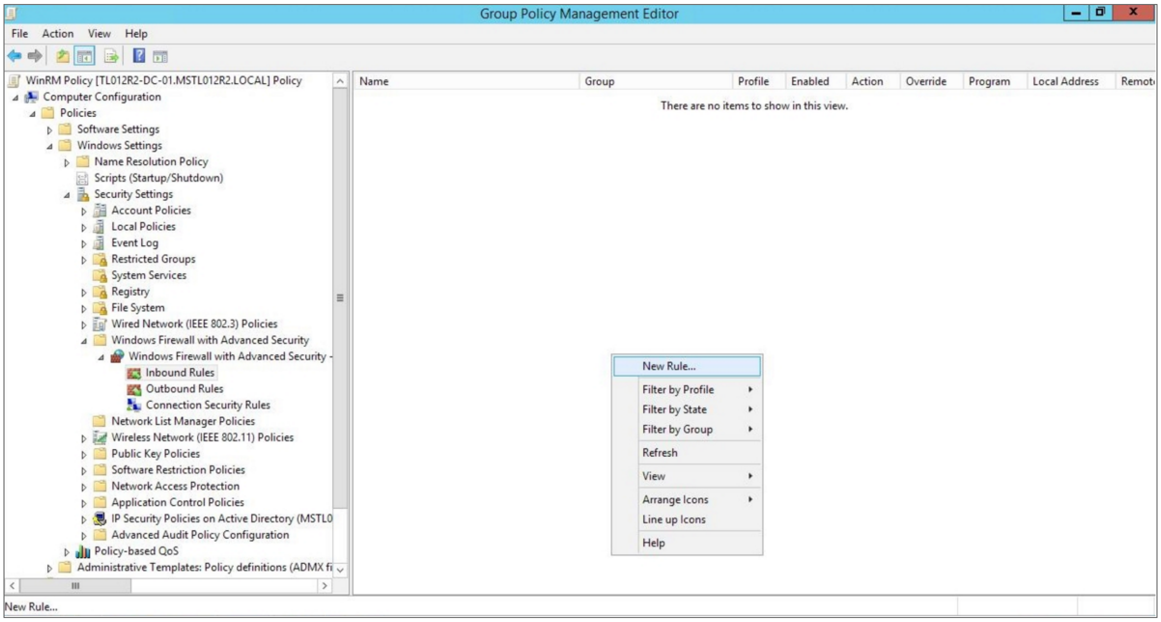
● Automatic

○ Manual

○ Disabled

Service Name	Startup	Permission
User Access Logging Service	Not Defined	Not Defined
User Profile Service	Not Defined	Not Defined
Virtual Disk	Not Defined	Not Defined
Vol		Not Defined
W3		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Win		Not Defined
Windows Update	Not Defined	Not Defined
WinHTTP Web Proxy Auto-Discovery Service	Not Defined	Not Defined
Wired AutoConfig	Not Defined	Not Defined
WMI Performance Adapter	Not Defined	Not Defined
Workstation	Not Defined	Not Defined
World Wide Web Publishing Service	Not Defined	Not Defined

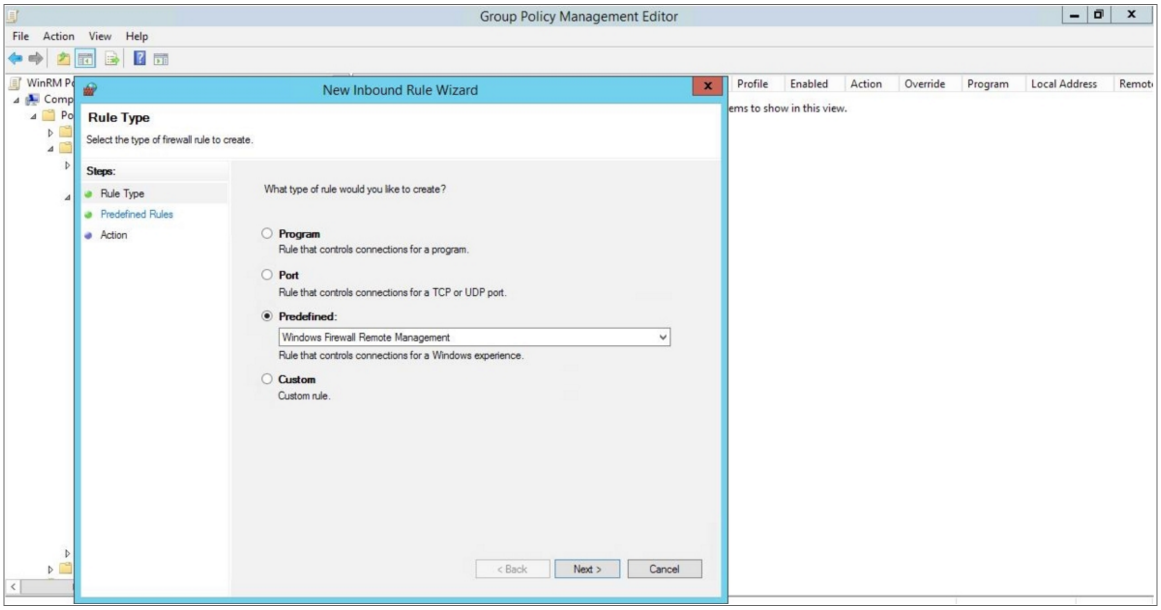
12. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Policies > Windows Settings > Security Settings > Windows Firewall with Advanced Security > Windows Firewall with Advanced Security - LDAP > Inbound Rules**. In the right panel, right-click and select *New Rule*.


Group Policy Management Editor
File Action View Help
WinRM Policy [TL012R2-DC-01.MSTL012R2.LOCAL] Policy
Computer Configuration
Policies
Software Settings
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
Windows Firewall with Advanced Security
Windows Firewall with Advanced Security -
Inbound Rules
Outbound Rules
Connection Security Rules
Network List Manager Policies
Wireless Network (IEEE 802.11) Policies
Public Key Policies
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0
Advanced Audit Policy Configuration
Policy-based QoS
Administrative Templates: Policy definitions (ADMX fi
New Rule...
Filter by Profile
Filter by State
Filter by Group
Refresh
View
Arrange Icons
Line up Icons
Help
New Rule...

Name	Group	Profile	Enabled	Action	Override	Program	Local Address	Remot

There are no items to show in this view.

13. The **New Inbound Rule Wizard** modal page appears. Click the **Predefined** radio button, select *Windows Firewall Remote Management* from the list, and then click **[Next]**.


Group Policy Management Editor
File Action View Help
WinRM P
Comp
Po
Profile Enabled Action Override Program Local Address Remot
ems to show in this view.
New Inbound Rule Wizard
< Back
Next >
Cancel

Rule Type

Select the type of firewall rule to create.

Steps:

- Rule Type
- Predefined Rules
- Action

What type of rule would you like to create?

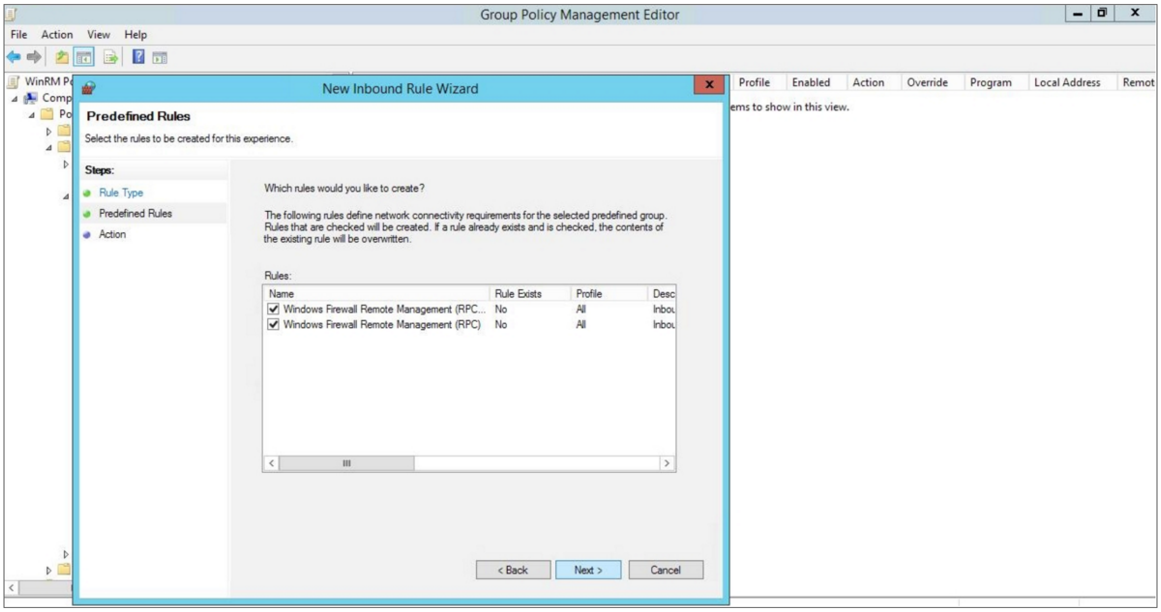
○ **Program**
Rule that controls connections for a program.

○ **Port**
Rule that controls connections for a TCP or UDP port.

● **Predefined:**
Windows Firewall Remote Management
Rule that controls connections for a Windows experience.

○ **Custom**
Custom rule.

14. Select the *Windows Firewall Remote Management (RPC)* and *Windows Firewall Remote Management (RPC-EPMAP)* check boxes, then click **[Next]**.


Group Policy Management Editor
File Action View Help
WinRM P
Comp
Po
Profile Enabled Action Override Program Local Address Remot
ems to show in this view.
New Inbound Rule Wizard
< Back
Next >
Cancel

Predefined Rules

Select the rules to be created for this experience.

Steps:

- Rule Type
- Predefined Rules
- Action

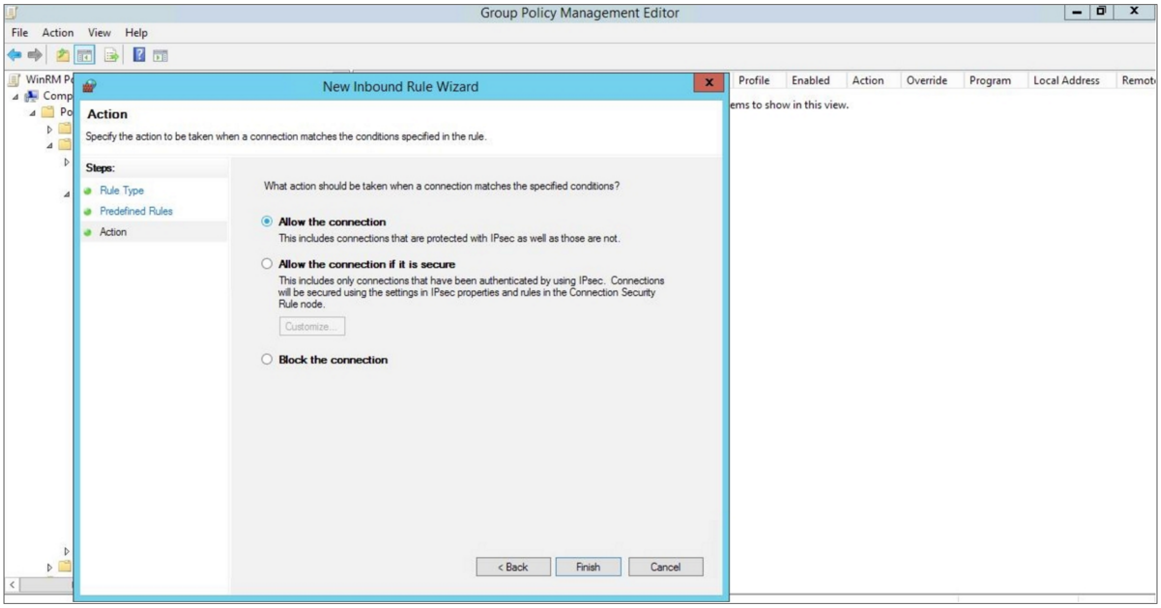
Which rules would you like to create?

The following rules define network connectivity requirements for the selected predefined group. Rules that are checked will be created. If a rule already exists and is checked, the contents of the existing rule will be overwritten.

Rules:

Name	Rule Exists	Profile	Desc
☑ Windows Firewall Remote Management (RPC...	No	All	Inbou
☑ Windows Firewall Remote Management (RPC)	No	All	Inbou

15. Select the *Allow the connection* radio button, then click **[Finish]**.



Action

Specify the action to be taken when a connection matches the conditions specified in the rule.

Steps:

- Rule Type
- Predefined Rules
- Action

What action should be taken when a connection matches the specified conditions?

● **Allow the connection**
This includes connections that are protected with IPsec as well as those are not.

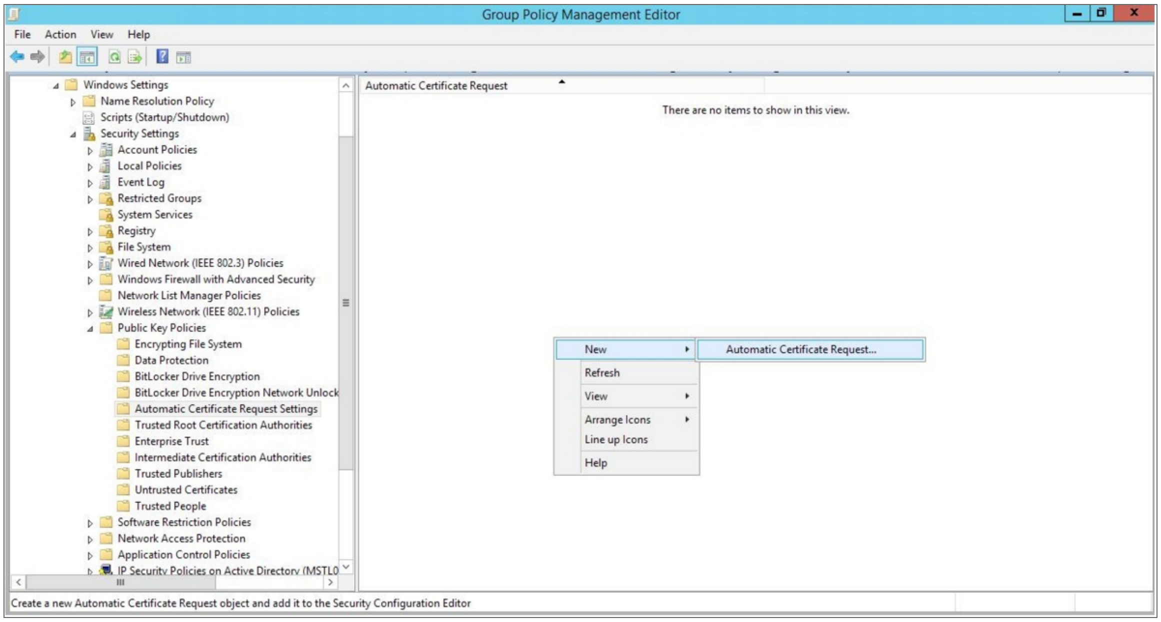
○ **Allow the connection if it is secure**
This includes only connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.

Customize...

○ **Block the connection**

< Back Finish Cancel

16. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Policies > Windows Settings > Security Settings > Public Key Policies > Automatic Certificate Request Settings**. In the right panel, right-click and select *New > Automatic Certificate Request*.

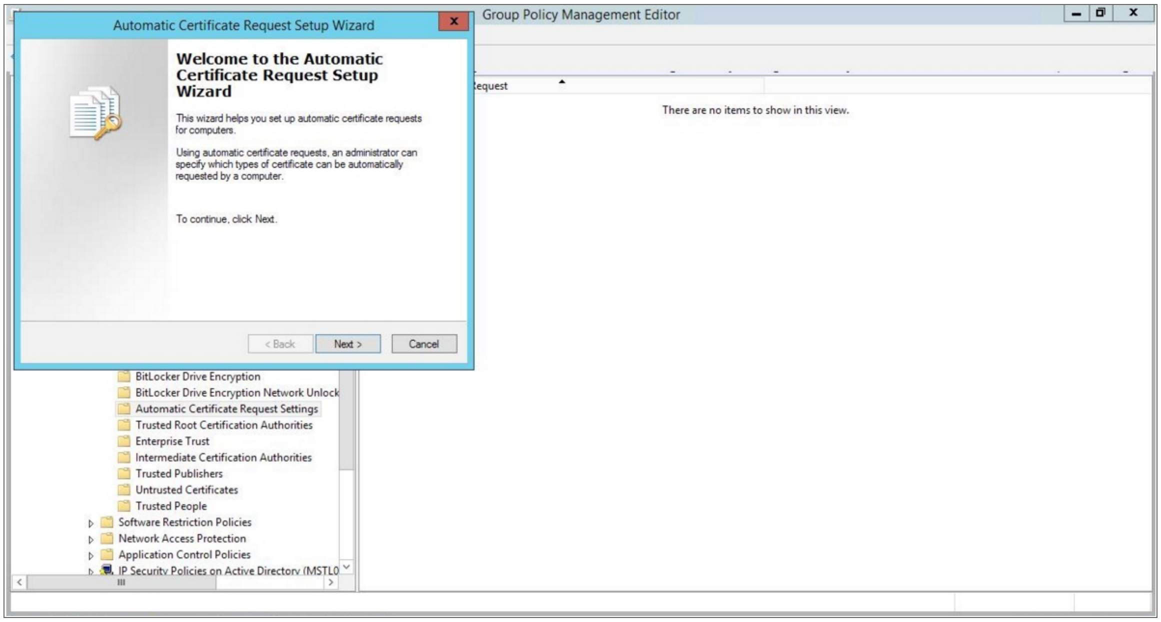


Group Policy Management Editor
File Action View Help
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
Windows Firewall with Advanced Security
Network List Manager Policies
Wireless Network (IEEE 802.11) Policies
Public Key Policies
Encrypting File System
Data Protection
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unlock
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0
Automatic Certificate Request
New
Automatic Certificate Request...
Refresh
View
Arrange Icons
Line up Icons
Help

There are no items to show in this view.

Create a new Automatic Certificate Request object and add it to the Security Configuration Editor

17. The **Automatic Certificate Request Setup Wizard** modal page appears. Click **[Next]**.


Automatic Certificate Request Setup Wizard
Group Policy Management Editor
equest
< Back
Next >
Cancel
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unlock
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0

Welcome to the Automatic Certificate Request Setup Wizard

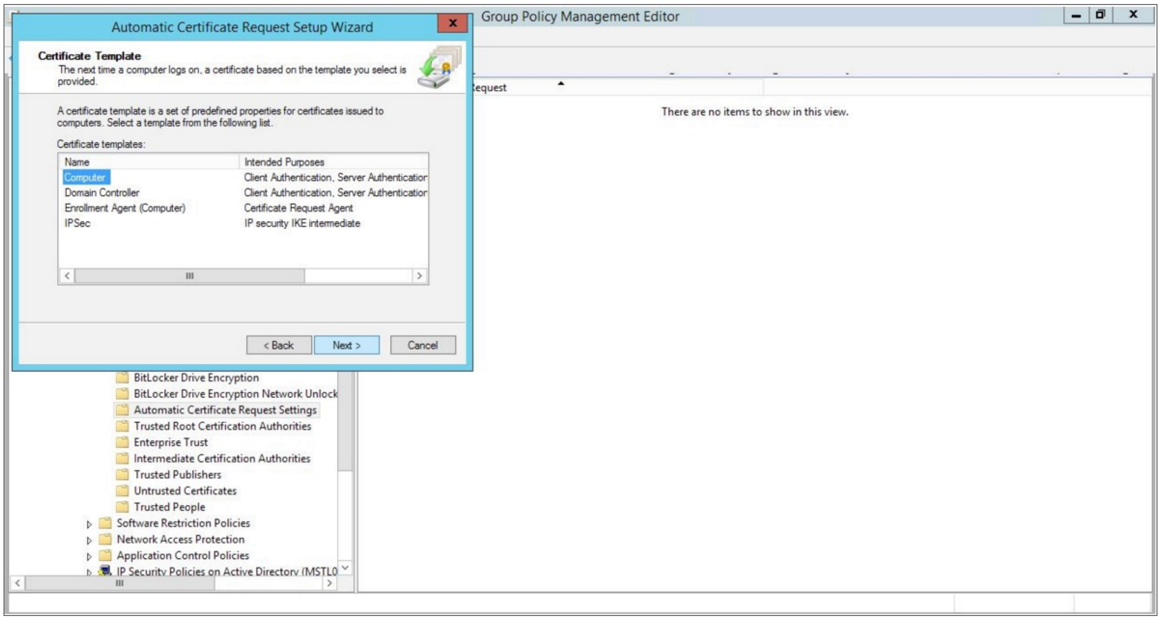
This wizard helps you set up automatic certificate requests for computers.

Using automatic certificate requests, an administrator can specify which types of certificate can be automatically requested by a computer.

To continue, click Next.

There are no items to show in this view.

18. Select the *Computer* certificate template. Click **[Next]**, and then click **[Finish]**.


Automatic Certificate Request Setup Wizard
Group Policy Management Editor
equest
< Back
Next >
Cancel
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unlock
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0

Certificate Template

The next time a computer logs on, a certificate based on the template you select is provided.

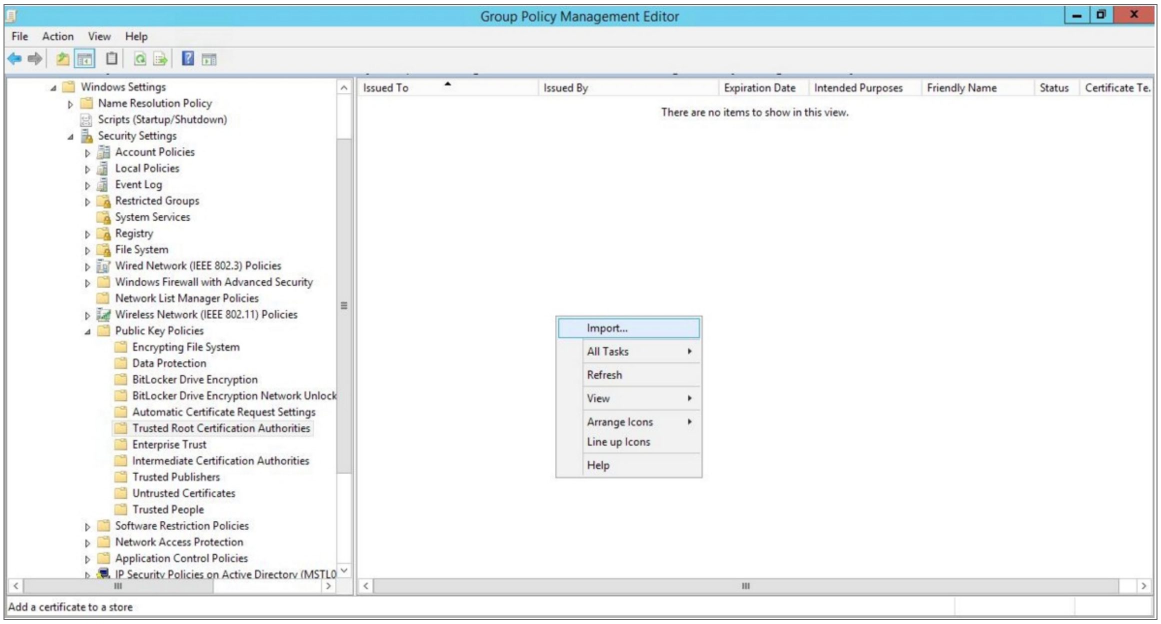
A certificate template is a set of predefined properties for certificates issued to computers. Select a template from the following list.

Certificate templates:

Name	Intended Purposes
Computer	Client Authentication, Server Authenticatior
Domain Controller	Client Authentication, Server Authenticatior
Enrollment Agent (Computer)	Certificate Request Agent
IPSec	IP security IKE intermediate

There are no items to show in this view.

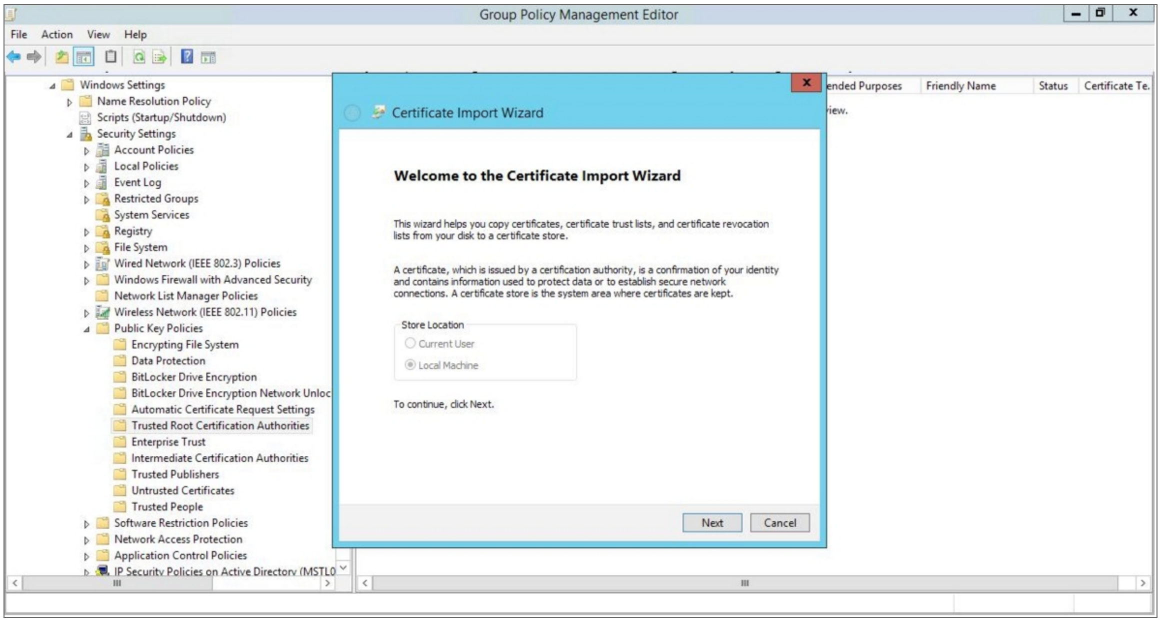
19. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Policies > Windows Settings > Security Settings > Public Key Policies > Trusted Root Certification Authorities**. In the right panel, right-click and select *Import*.


Group Policy Management Editor
File
Action
View
Help
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
Windows Firewall with Advanced Security
Network List Manager Policies
Wireless Network (IEEE 802.11) Policies
Public Key Policies
Encrypting File System
Data Protection
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unlock
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0
Issued To
Issued By
Expiration Date
Intended Purposes
Friendly Name
Status
Certificate Te.
Import...
All Tasks
Refresh
View
Arrange Icons
Line up Icons
Help

There are no items to show in this view.

Add a certificate to a store

20. The **Certificate Import Wizard** modal page appears. Click **[Next]**.



Welcome to the Certificate Import Wizard

This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

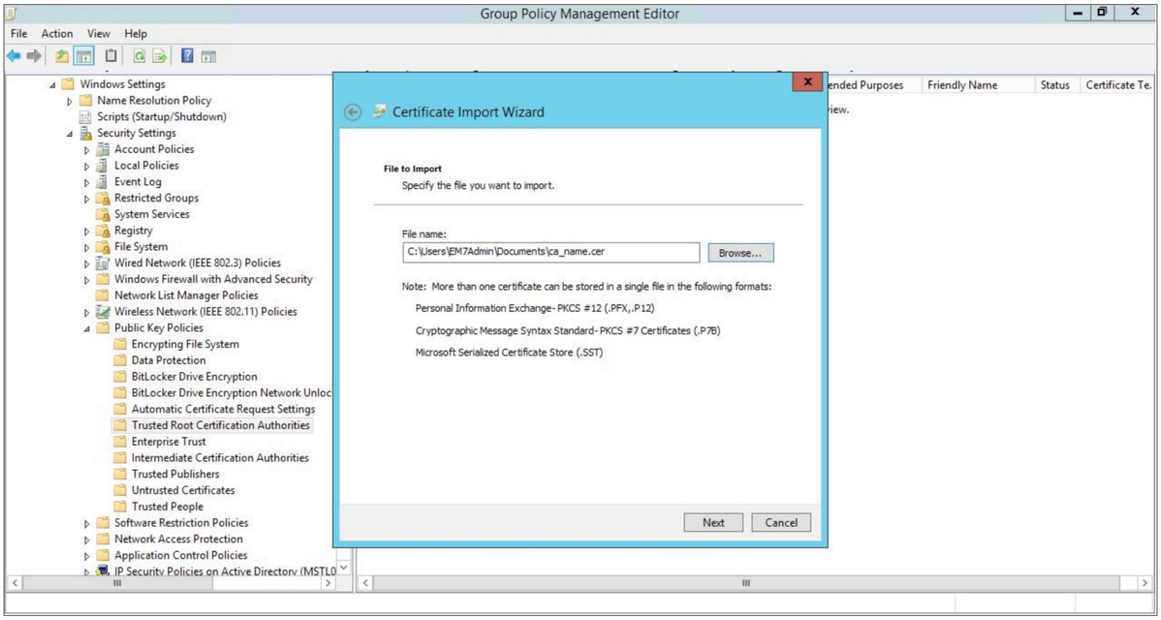
Store Location

○ Current User

● Local Machine

To continue, click Next.

21. Browse to the Certification Authority certificate that you saved to your local directory in step 4, then click **[Next]**.


Group Policy Management Editor
File
Action
View
Help
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
Windows Firewall with Advanced Security
Network List Manager Policies
Wireless Network (IEEE 802.11) Policies
Public Key Policies
Encrypting File System
Data Protection
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unloc
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0
ended Purposes
Friendly Name
Status
Certificate Te.
iew.
Browse...
Next
Cancel

Certificate Import Wizard

File to Import

Specify the file you want to import.

File name: C:\Users\EM7Admin\Documents\ca_name.cer

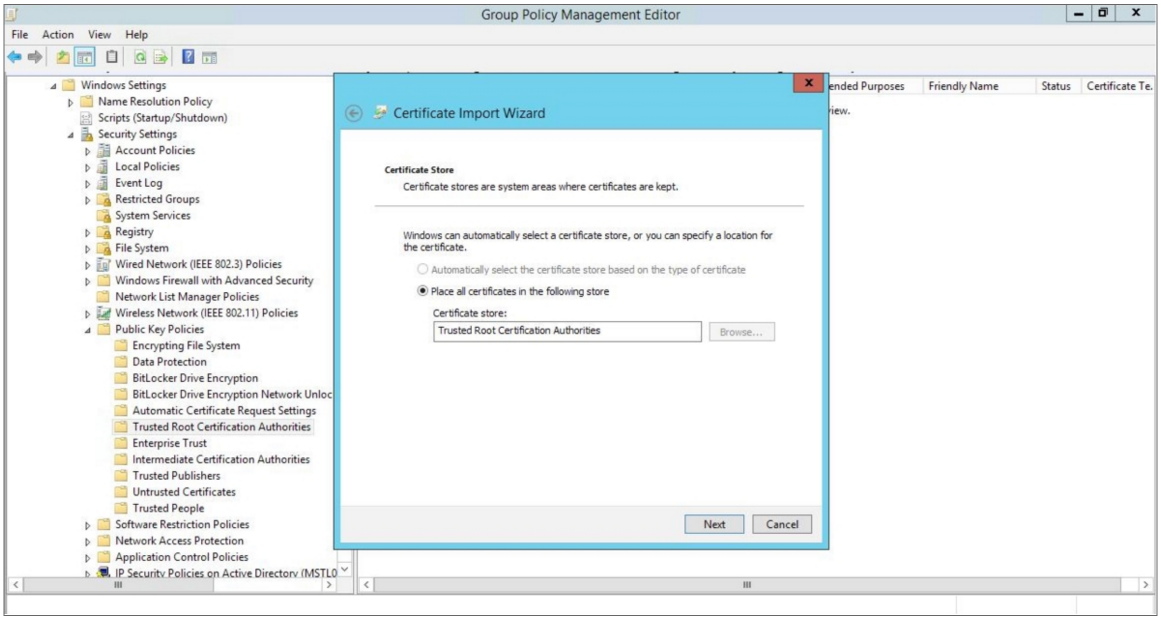
Note: More than one certificate can be stored in a single file in the following formats:

Personal Information Exchange- PKCS #12 (.PFX,.P12)

Cryptographic Message Syntax Standard- PKCS #7 Certificates (.P7B)

Microsoft Serialized Certificate Store (.SST)

22. Select the **Place all certificates in the following store** radio button, then select the *Trusted Root Certification Authorities* certificate store and click **[Next]**.


Group Policy Management Editor
File
Action
View
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Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
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Public Key Policies
Encrypting File System
Data Protection
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unloc
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0
ended Purposes
Friendly Name
Status
Certificate Te.
iew.
Browse...
Next
Cancel

Certificate Import Wizard

Certificate Store

Certificate stores are system areas where certificates are kept.

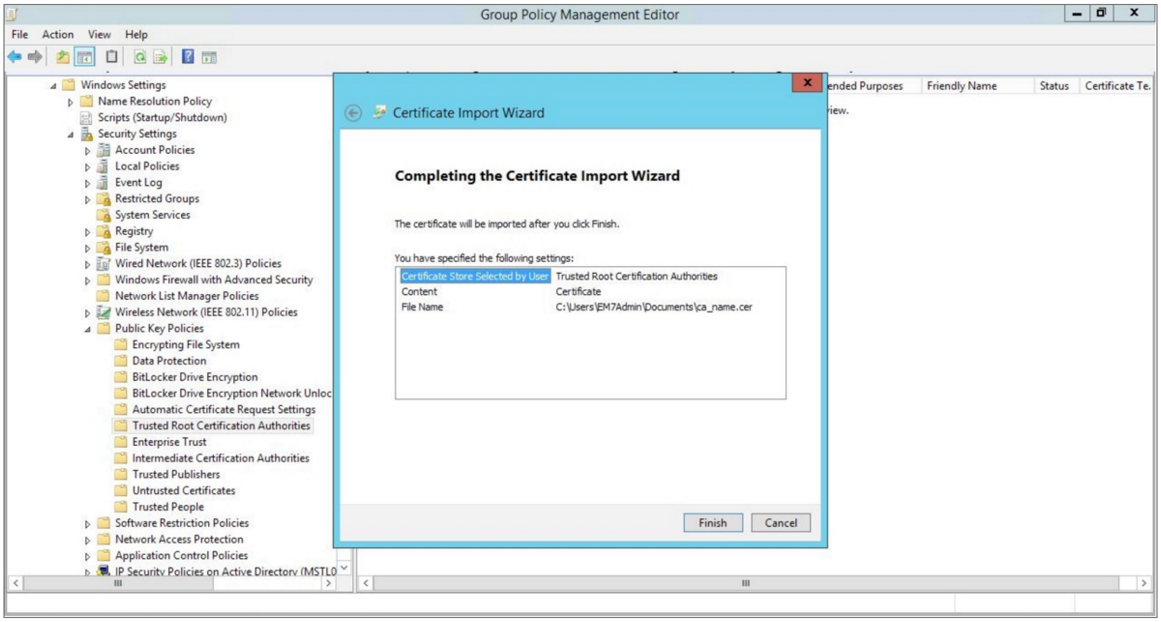
Windows can automatically select a certificate store, or you can specify a location for the certificate.

○ Automatically select the certificate store based on the type of certificate

● Place all certificates in the following store

Certificate store: Trusted Root Certification Authorities

23. Click **[OK]** to confirm that the certificate was successfully imported, and then click **[Finish]**.


Group Policy Management Editor
File Action View Help
Windows Settings
Name Resolution Policy
Scripts (Startup/Shutdown)
Security Settings
Account Policies
Local Policies
Event Log
Restricted Groups
System Services
Registry
File System
Wired Network (IEEE 802.3) Policies
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Data Protection
BitLocker Drive Encryption
BitLocker Drive Encryption Network Unloc
Automatic Certificate Request Settings
Trusted Root Certification Authorities
Enterprise Trust
Intermediate Certification Authorities
Trusted Publishers
Untrusted Certificates
Trusted People
Software Restriction Policies
Network Access Protection
Application Control Policies
IP Security Policies on Active Directory (MSTL0
ended Purposes
Friendly Name
Status
Certificate Te
iew.
Certificate Import Wizard
Finish
Cancel

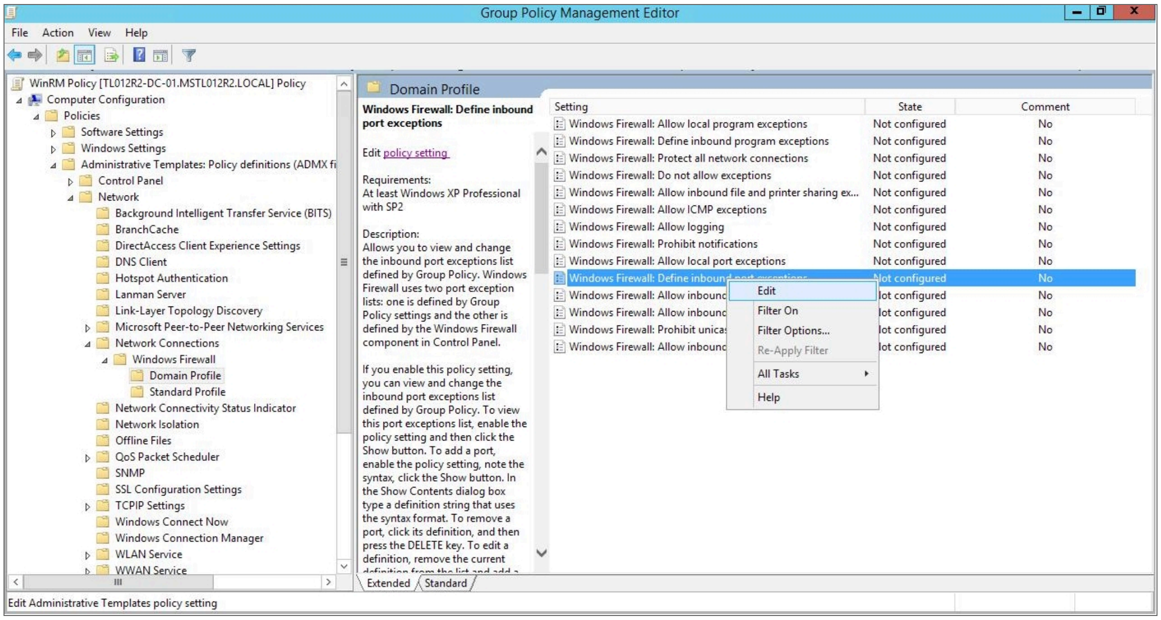
Completing the Certificate Import Wizard

The certificate will be imported after you click Finish.

You have specified the following settings:

Certificate Store Selected by User	Trusted Root Certification Authorities
Content	Certificate
File Name	C:\Users\EM7Admin\Documents\ca_name.cer

24. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Policies > Administrative Templates > Network > Network Connections > Windows Firewall > Domain Profile**. In the right panel, right-click **Windows Firewall: Define inbound port exceptions** and select *Edit*.



Windows Firewall: Define inbound port exceptions

Edit policy setting

Requirements:
At least Windows XP Professional with SP2

Description:
Allows you to view and change the inbound port exceptions list defined by Group Policy. Windows Firewall uses two port exception lists: one is defined by Group Policy settings and the other is defined by the Windows Firewall component in Control Panel.

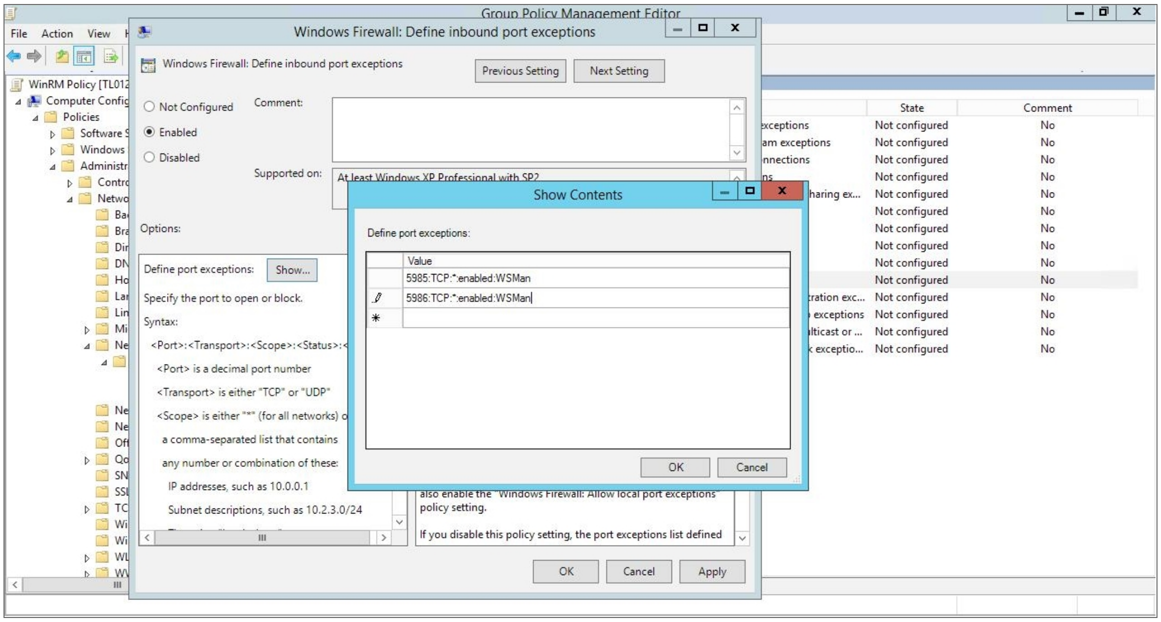
If you enable this policy setting, you can view and change the inbound port exceptions list defined by Group Policy. To view this port exceptions list, enable the policy setting and then click the Show button. To add a port, enable the policy setting, note the syntax, click the Show button. In the Show Contents dialog box type a definition string that uses the syntax format. To remove a port, click its definition, and then press the DELETE key. To edit a definition, remove the current definition from the list and add a

Setting	State	Comment
Windows Firewall: Allow local program exceptions	Not configured	No
Windows Firewall: Define inbound program exceptions	Not configured	No
Windows Firewall: Protect all network connections	Not configured	No
Windows Firewall: Do not allow exceptions	Not configured	No
Windows Firewall: Allow inbound file and printer sharing ex...	Not configured	No
Windows Firewall: Allow ICMP exceptions	Not configured	No
Windows Firewall: Allow logging	Not configured	No
Windows Firewall: Prohibit notifications	Not configured	No
Windows Firewall: Allow local port exceptions	Not configured	No
Windows Firewall: Define inbound	lot configured	No
Windows Firewall: Allow inbounc	lot configured	No
Windows Firewall: Allow inbounc	lot configured	No
Windows Firewall: Prohibit unica:	lot configured	No
Windows Firewall: Allow inbounc	lot configured	No

Edit Administrative Templates policy setting

25. The **Windows Firewall: Define inbound port exceptions** modal page appears. Under **Options**, click **[Show]**.

26. The **Show Contents** modal page appears. Enter the following values:



Windows Firewall: Define inbound port exceptions

○ Not Configured
● Enabled
○ Disabled

Comment:

Supported on: At least Windows XP Professional with SP2

Options:

Define port exceptions: Show...

Specify the port to open or block.

Syntax:

<Port>:<Transport>:<Scope>:<Status>:<

<Port> is a decimal port number

<Transport> is either "TCP" or "UDP"

<Scope> is either "*" (for all networks) o

a comma-separated list that contains

any number or combination of these:

IP addresses, such as 10.0.0.1

Subnet descriptions, such as 10.2.3.0/24

also enable the "Windows Firewall: Allow local port exceptions" policy setting.

If you disable this policy setting, the port exceptions list defined

Show Contents

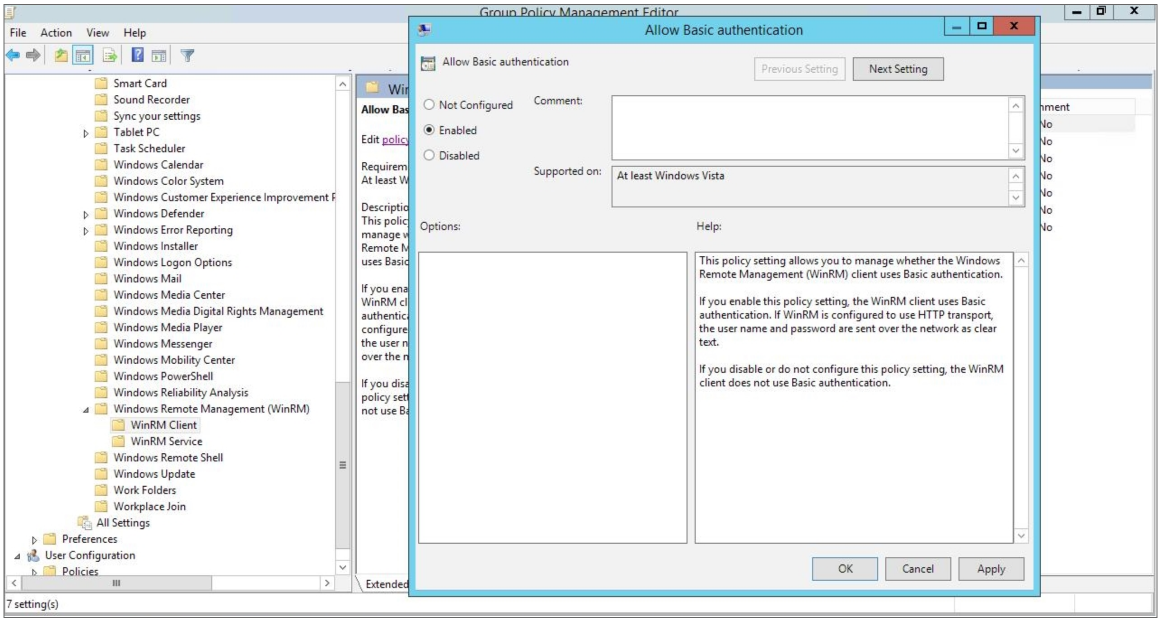
Define port exceptions:

Value
5985:TCP:*:enabled:WSMan
5986:TCP:*:enabled:WSMan

- 5985:TCP:*:enabled:WSMan
- 5986:TCP:*:enabled:WSMan

27. Click **[OK]**, then click **[OK]** again.

28. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Policies > Administrative Templates > Windows Components > Windows Remote Management (WinRM) > WinRM Client**. In the right panel, double-click the **Allow Basic authentication** setting.



Allow Basic authentication

○ Not Configured
● Enabled
○ Disabled

Comment:

Supported on: At least Windows Vista

Options:

Help:

This policy setting allows you to manage whether the Windows Remote Management (WinRM) client uses Basic authentication.

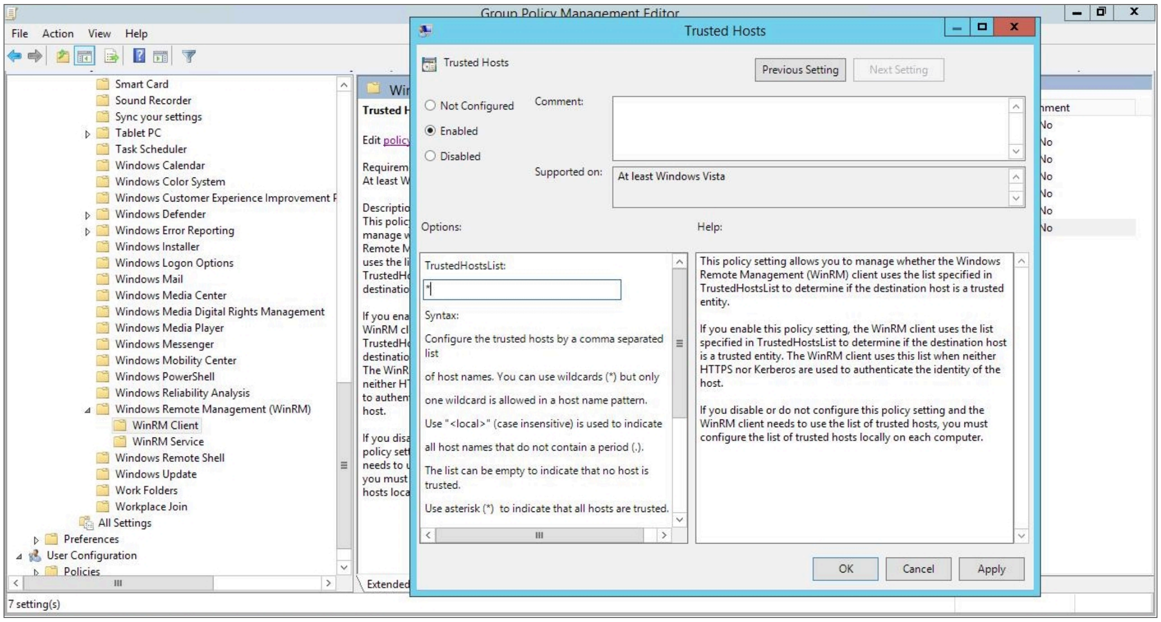
If you enable this policy setting, the WinRM client uses Basic authentication. If WinRM is configured to use HTTP transport, the user name and password are sent over the network as clear text.

If you disable or do not configure this policy setting, the WinRM client does not use Basic authentication.

29. Select the **Enabled** radio button, then click **[OK]**.

30. Repeat steps 28 and 29 for the **Allow unencrypted traffic** setting.

31. Double-click the **Trusted Hosts** setting. Select the **Enabled** radio button, enter an asterisk (*) in the **TrustedHostsList** field (under **Options**), and then click **[OK]**.



Trusted Hosts

○ Not Configured
● Enabled
○ Disabled

Comment:

Supported on: At least Windows Vista

Options:

TrustedHostsList: *

Syntax:

Configure the trusted hosts by a comma separated list

of host names. You can use wildcards (*) but only

one wildcard is allowed in a host name pattern.

Use "<local>" (case insensitive) is used to indicate

all host names that do not contain a period (.).

The list can be empty to indicate that no host is trusted.

Use asterisk (*) to indicate that all hosts are trusted.

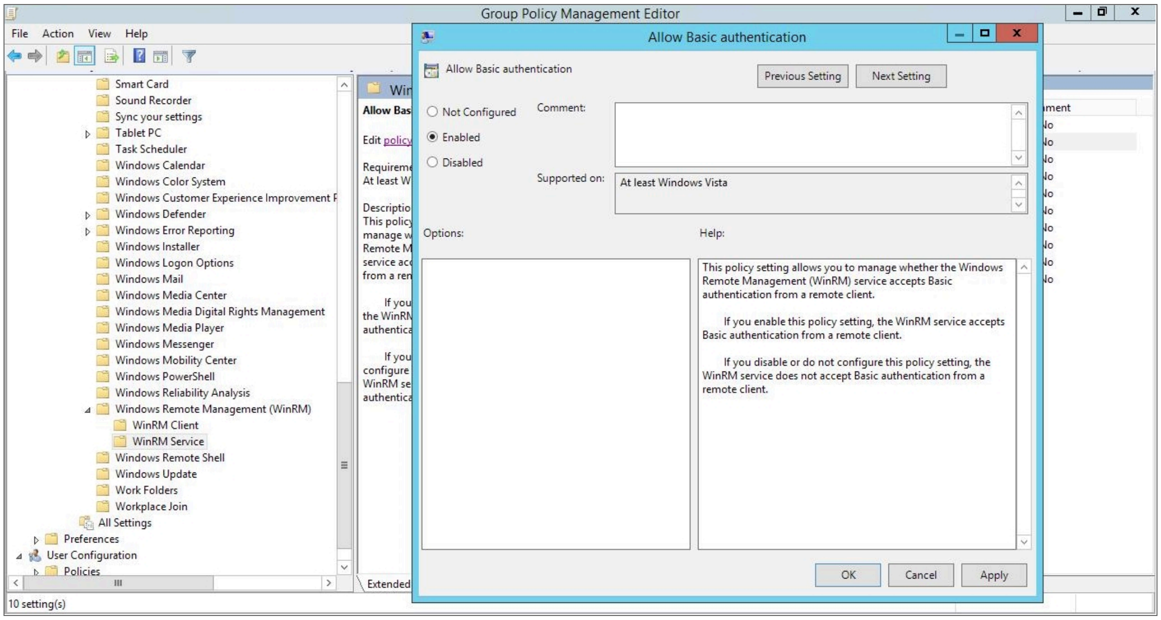
Help:

This policy setting allows you to manage whether the Windows Remote Management (WinRM) client uses the list specified in TrustedHostsList to determine if the destination host is a trusted entity.

If you enable this policy setting, the WinRM client uses the list specified in TrustedHostsList to determine if the destination host is a trusted entity. The WinRM client uses this list when neither HTTPS nor Kerberos are used to authenticate the identity of the host.

If you disable or do not configure this policy setting and the WinRM client needs to use the list of trusted hosts, you must configure the list of trusted hosts locally on each computer.

32. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Policies > Administrative Templates > Windows Components > Windows Remote Management (WinRM) > WinRM Service**. In the right panel, double-click the **Allow Basic authentication** setting.



Allow Basic authentication

○ Not Configured
● Enabled
○ Disabled

Comment:

Supported on: At least Windows Vista

Options:

Help:

This policy setting allows you to manage whether the Windows Remote Management (WinRM) service accepts Basic authentication from a remote client.

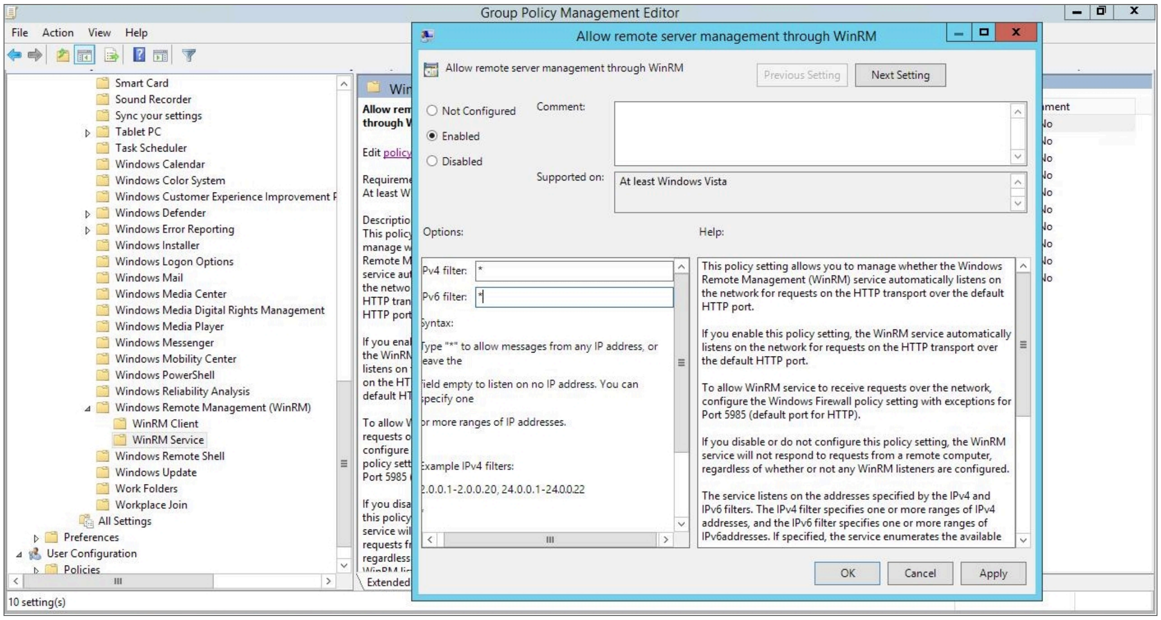
If you enable this policy setting, the WinRM service accepts Basic authentication from a remote client.

If you disable or do not configure this policy setting, the WinRM service does not accept Basic authentication from a remote client.

33. Select the **Enabled** radio button, then click **[OK]**.

34. Repeat steps 32 and 33 for the **Allow unencrypted traffic** setting.

35. Double-click the **Allow remote server management through WinRM** setting. Select the **Enabled** radio button, enter an asterisk (*) in the **Pv4 filter** and **Pv6 filter** fields (under **Options**), and then click **[OK]**.



Allow remote server management through WinRM

○ Not Configured
● Enabled
○ Disabled

Comment:

Supported on: At least Windows Vista

Options:

Pv4 filter: *

Pv6 filter: *

Syntax:

Type "*" to allow messages from any IP address, or leave the field empty to listen on no IP address. You can specify one or more ranges of IP addresses.

Example IPv4 filters:

2.0.0.1-2.0.0.20, 24.0.0.1-24.0.0.22

Help:

This policy setting allows you to manage whether the Windows Remote Management (WinRM) service automatically listens on the network for requests on the HTTP transport over the default HTTP port.

If you enable this policy setting, the WinRM service automatically listens on the network for requests on the HTTP transport over the default HTTP port.

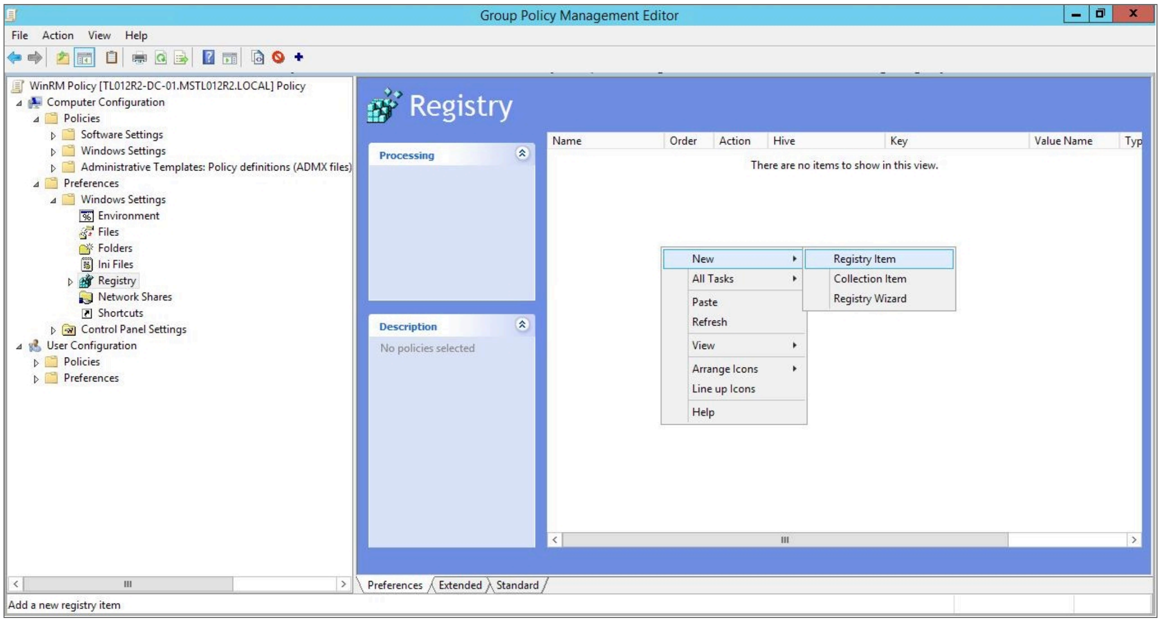
To allow WinRM service to receive requests over the network, configure the Windows Firewall policy setting with exceptions for Port 5985 (default port for HTTP).

If you disable or do not configure this policy setting, the WinRM service will not respond to requests from a remote computer, regardless of whether or not any WinRM listeners are configured.

The service listens on the addresses specified by the IPv4 and IPv6 filters. The IPv4 filter specifies one or more ranges of IPv4 addresses, and the IPv6 filter specifies one or more ranges of IPv6addresses. If specified, the service enumerates the available

10 setting(s)

36. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Preferences > Windows Settings > Registry**. In the right panel, right-click and select *New > Registry Item*.

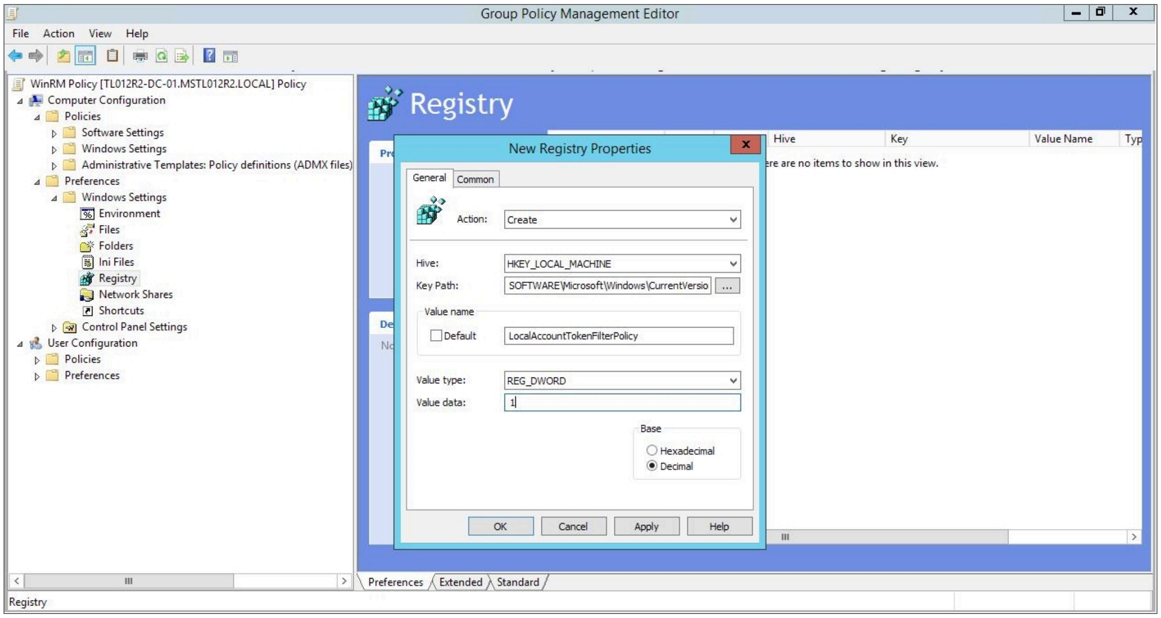


There are no items to show in this view.

No policies selected

Add a new registry item

37. In the **New Registry Properties** modal page, edit the values in one or more of the following fields:



Action: Create

Hive: HKEY_LOCAL_MACHINE

Key Path: SOFTWARE\Microsoft\Windows\CurrentVersio

Value name

□ Default LocalAccountTokenFilterPolicy

Value type: REG_DWORD

Value data: 1

Base

○ Hexadecimal

● Decimal

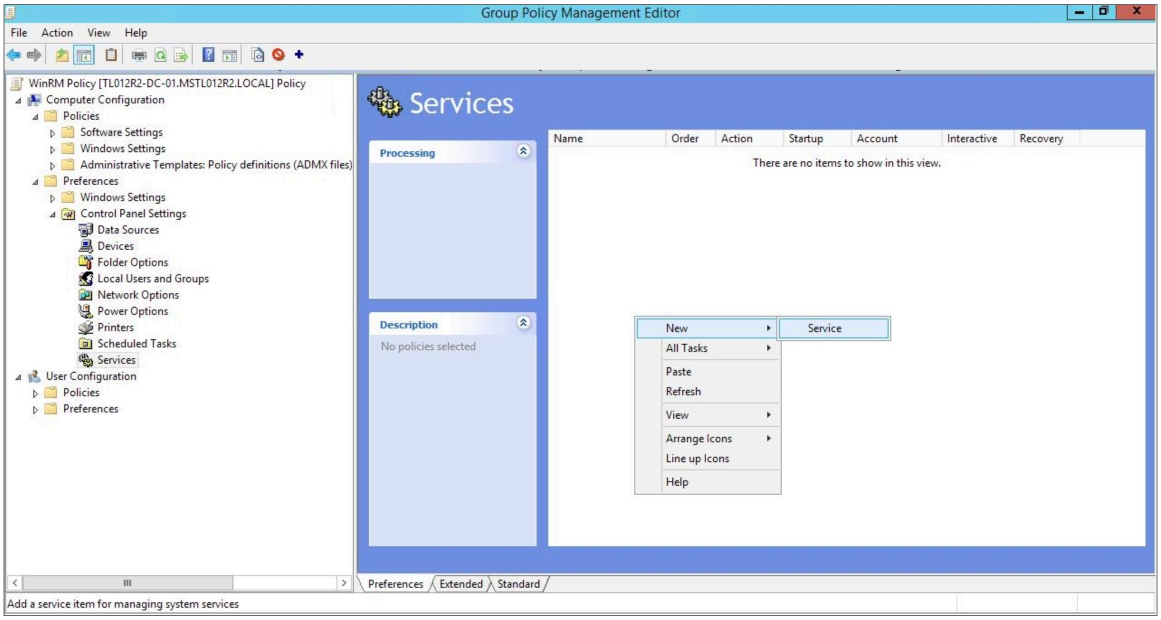
- ***Action***. Select *Create*.
- ***Hive***. Select *HKEY_LOCAL_MACHINE*.
- ***Key Path***. Enter "SOFTWARE\Microsoft\Windows\CurrentVersion\policies\system".
- ***Value name***. Enter "LocalAccountTokenFilterPolicy".
- ***Value type***. Enter "REG_DWORD".
- ***Value data***. Enter "1".
- ***Base***. Select *Decimal*.

38. Click the **[OK]** button.

39. Repeat steps 36-38 to make an additional registry change to increase the maximum number of users who can access Windows Remote Management. In the **New Registry Properties** modal page, edit the following values:

- ***Action***. Select *Create*.
- ***Hive***. Select *HKEY_LOCAL_MACHINE*.
- ***Key Path***. Enter "SOFTWARE\Policies\Microsoft\Windows\WinRM\Service\".
- ***Value name***. Enter "WinRS!MaxConcurrentUsers".
- ***Value type***. Enter "REG_DWORD".
- ***Value data***. Enter "0x64 (100)".
- ***Base***. Select *Decimal*.

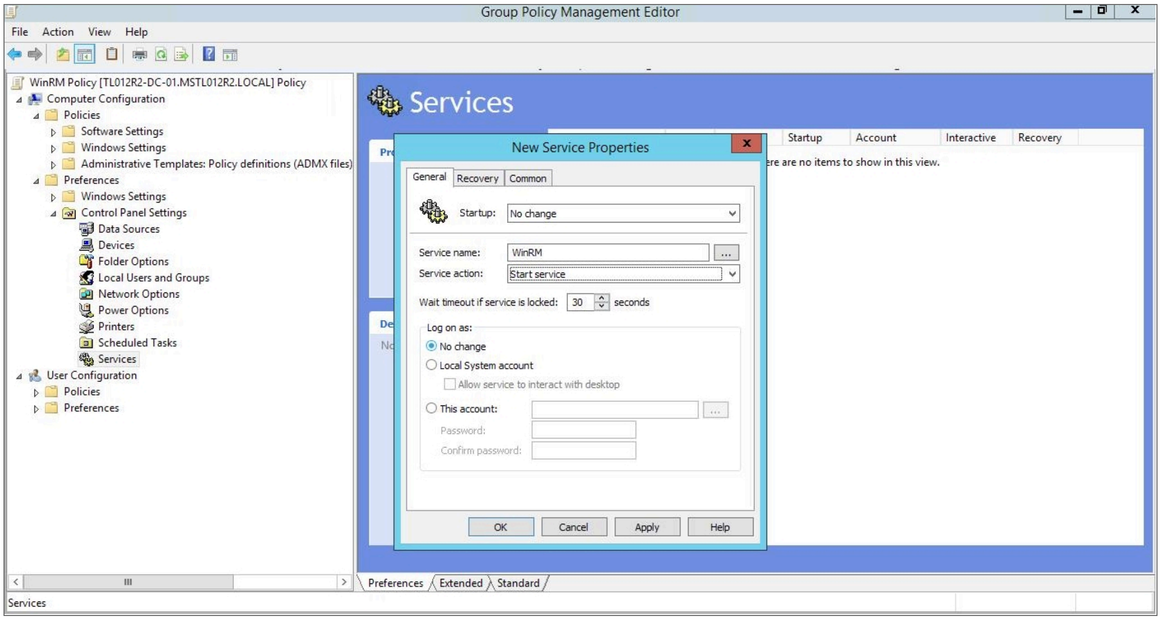
40. In the left panel of the **Group Policy Management Editor** page, navigate to **Computer Configuration > Preferences > Control Panel Settings > Services**. In the right panel, right-click and select *New > Service*.



There are no items to show in this view.

Add a service item for managing system services

41. In the **New Service Properties** modal page, edit the values in one or more of the following fields:



re are no items to show in this view.

Startup: No change

Service name: WinRM

Service action: Start service

Wait timeout if service is locked: 30 seconds

Log on as:

● No change

○ Local System account

□ Allow service to interact with desktop

○ This account:

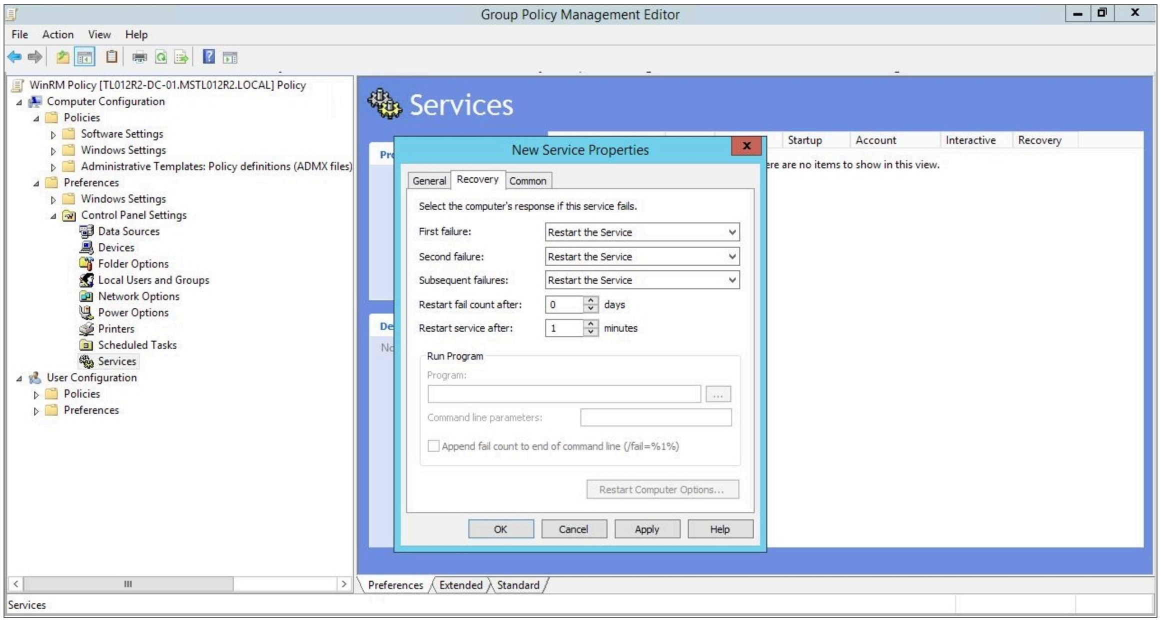
Password:

Confirm password:

- ***Startup***. Select *No change*.

- ***Service name***. Enter "WinRM".
- ***Service action***. Select *Start service*.
- ***Wait timeout if service is locked***. Select *30* seconds.
- ***Log on as***. Select *No change*.

42. Click the **[Recovery]** tab, then edit the values in one or more of the following fields:



There are no items to show in this view.

Select the computer's response if this service fails.

First failure: Restart the Service

Second failure: Restart the Service

Subsequent failures: Restart the Service

Restart fail count after: 0 days

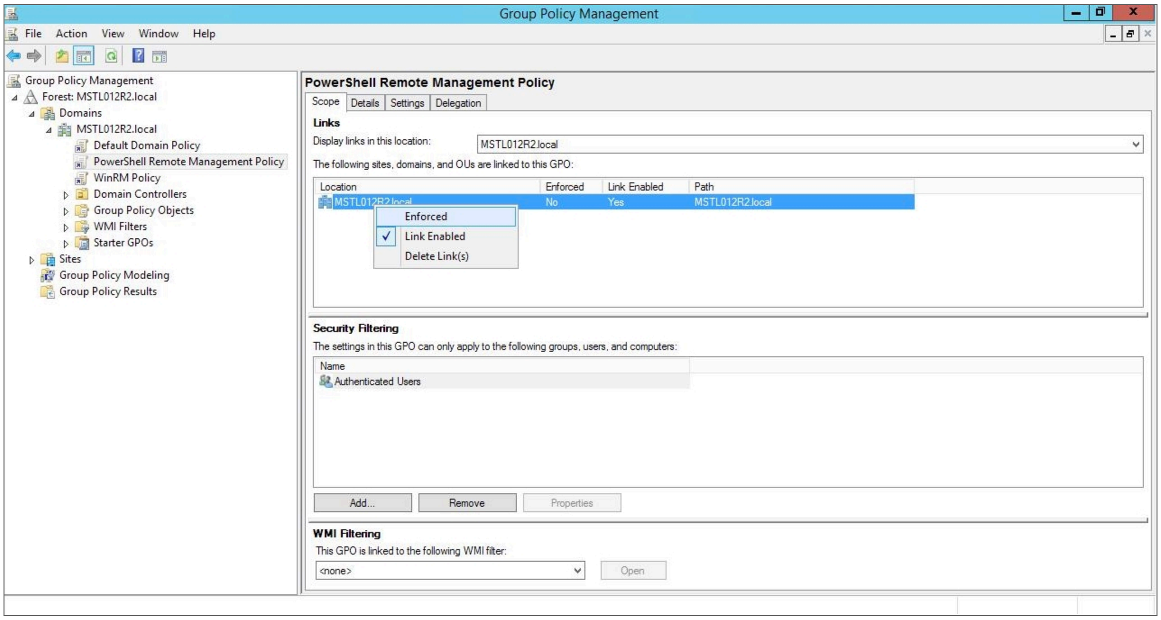
Restart service after: 1 minutes

□ Append fail count to end of command line (/fail=%1%)

- ***First failure***. Select *Restart the Service*.
- ***Second failure***. Select *Restart the Service*.
- ***Subsequent failures***. Select *Restart the Service*.
- ***Restart fail count after***. Select *0* days.
- ***Restart service after***. Select *1* minute.

43. Click the **[OK]** button.

44. To enforce your group policy, in the left panel of the **Group Policy Management Editor** page, navigate to **Forest > Domains > [your local domain] > PowerShell Remote Management Policy**. In the **PowerShell Remote Management Policy** panel on the right, right-click the local domain name under ***The following sites, domains, and OUs are linked to this GPO*** and select *Enforced*.



Display links in this location: MSTL012R2.local

The following sites, domains, and OUs are linked to this GPO:

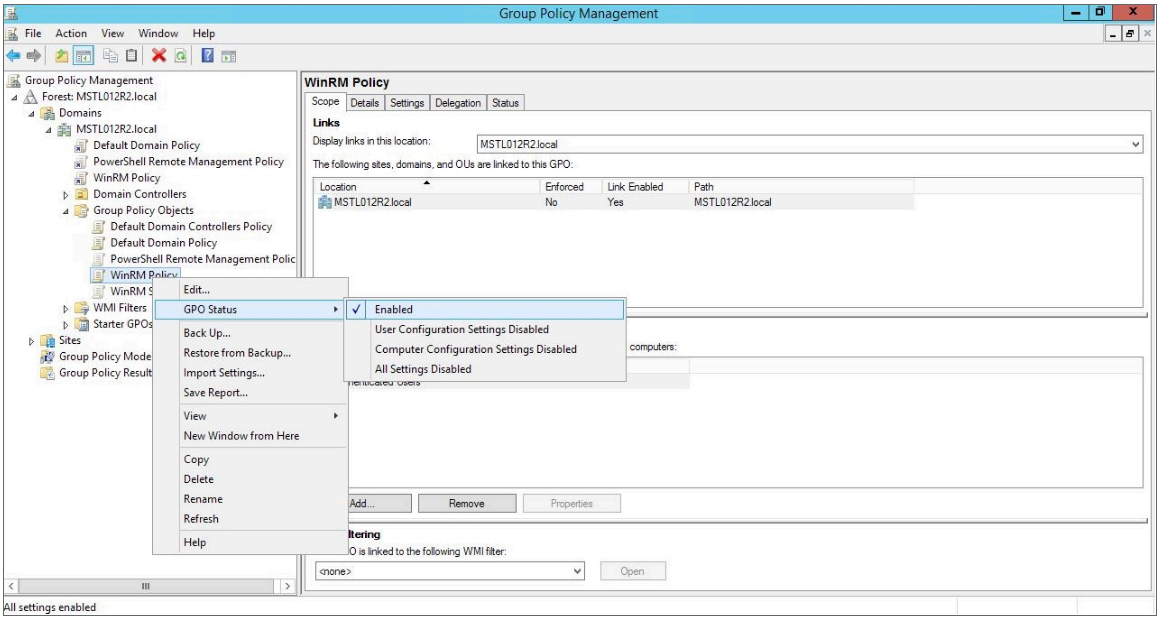
Location	Enforced	Link Enabled	Path
MSTL012R2.local	No	Yes	MSTL012R2.local

The settings in this GPO can only apply to the following groups, users, and computers:

Name
Authenticated Users

This GPO is linked to the following WMI filter: <none>

45. To enable your group policy, in the left panel of the **Group Policy Management Editor** page, navigate to **Forest > Domains > [your local domain] > Group Policy Objects > WinRM Policy**. Right-click **WinRM Policy**, then select *GPO Status > Enabled*.



Display links in this location: MSTL012R2.local

The following sites, domains, and OUs are linked to this GPO:

Location	Enforced	Link Enabled	Path
MSTL012R2.local	No	Yes	MSTL012R2.local

This GPO is linked to the following WMI filter: <none>

Step 4: Configuring a Windows Management Proxy

If SL1 cannot execute PowerShell requests directly on a Windows server, you can optionally configure an additional Windows server to act as a proxy for those PowerShell requests. To use a proxy, you must configure at least two Windows servers:

- A target server that SL1 cannot communicate with directly.
- A proxy server that SL1 will communicate with to execute PowerShell requests on the target server.

To configure the target and proxy servers, perform the following steps:

1. Configure a user account that SL1 will use to connect to the proxy server and the proxy server will use to connect to the target server. The user account can either be a local account or an Active Directory account; however, the user account must have the same credentials on the target and proxy servers and be in the Local Administrator's group on both servers.
2. If you have created a local user account on the Windows Server instead of an Active Directory account, you must configure encrypted communication between SL1 and the Windows server. To do this, you must ***configure a Server Authentication certificate***.
3. ***Configure Windows Remote Management*** on the target server and the proxy server.
4. Log in to the proxy server as an administrator.
5. Open the PowerShell command window.
6. Right-click on the PowerShell icon in the taskbar and select *Run as Administrator*.
7. Execute one of the following commands on the proxy server to allow the proxy server to trust one or more target servers:
   - To allow the proxy server to trust all servers (not recommended), execute the following command:

     ```
     Set-Item WSMan:\Localhost\Client\TrustedHosts -value *
     ```

   - To allow the proxy server to trust only specific target servers, execute the following command, inserting a list that includes the IP address for each target server. Separate the list of IP addresses with commas.

     ```
     Set-Item WSMan:\Localhost\Client\TrustedHosts -value <comma-delimited-list-
     of-target-server-IPs>
     ```

8. Execute the following command on the proxy server to configure the LocalAccountTokenFilterPolicy:

   ```
   New-ItemProperty
   “HKLM:\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System” -Name
   “LocalAccountTokenFilterPolicy” -Value 1 -PropertyType “DWORD"
   ```

NOTE: If the proxy server is in a different Windows domain (domain A) than the target servers (domain B), and the proxy server uses a user account from Active Directory, and Active Directory is in the same Windows domain as the target servers (domain B), you must perform the following to allow the proxy server to send PowerShell commands to the target servers:

- On the domain controller for each domain (domain A and domain B), create new forward-lookup zones and reverse-lookup zones that allow name resolution to work between the two domains.
- On the domain controller for each domain (domain A and domain B), create a non-transitive realm trust between the two domains.
- Login to the proxy server and add the Active Directory account (from domain A) to the Local Administrator's group for the proxy server. You should be able to select the account on the proxy server after you create the non-transitive realm trust between the two domains.

Step 5: Increasing the Number of PowerShell Dynamic Applications That Can Run Simultaneously

You can optionally execute a series of commands that will allow SL1 to increase the default maximum number of PowerShell Dynamic Applications that can run simultaneously.

To do so:

1. Determine the number of Dynamic Applications that will be used to monitor the Windows server. Multiply this number by three.
2. Open a PowerShell command prompt. Log in as an Administrator.
3. At the prompt, execute the following commands:

```
Set-Item WSMan:\Localhost\Shell\MaxShellsPerUser -value <number you
calculated in step 1>

Set-Item WSMan:\Localhost\Service\MaxConcurrentOperationsPerUser -value
<number you calculated in step 1>

Restart-Service WinRM
```

4. Repeat these steps on each Windows server that will be monitored by SL1.

Chapter

4

SNMP and PowerShell Dynamic Applications for Windows Devices

Overview

The following sections describe the SNMP and PowerShell Dynamic Applications that SL1 uses to monitor Windows devices:

SNMP Dynamic Applications for Windows Devices

If you configure your Windows system to respond to SNMP requests from SL1, you can discover your Windows system as an SNMP device. When SL1 discovers a Windows system as an SNMP device, the platform will automatically collect the same data from the Windows system that the platform collects from most network devices. This data includes interface usage, file system usage, CPU usage, memory usage, and hardware configuration information.

In addition to the common SNMP data collection, you can install an optional agent that reports WMI information through SNMP. The following SNMP Dynamic Applications can be used to collect the information reported by the optional agent:

- MSSQL: General
- MSSQL: Memory
- MSSQL: SQL Stats

PowerShell Dynamic Applications

If you configure your Windows system to respond to PowerShell requests from SL1, you can use PowerShell Dynamic Applications to collect information from your Windows system.

All of the PowerShell Dynamic Applications include a discovery object. If you include a credential for PowerShell Dynamic Applications in the discovery session that includes your Windows system, SL1 will automatically align the appropriate PowerShell Dynamic Applications to the Windows system. For more information about creating a discovery session, see the ***Discovery & Credentials*** manual.

The following PowerPacks include PowerShell Dynamic Applications for Microsoft Servers.

Microsoft: Active Directory Server

NOTE: The Dynamic Applications in this PowerPack support Windows Server 2012 R2.

The following PowerShell Dynamic Applications can be used to collect performance data from Active Directory servers:

- Microsoft: Active Directory Address Book Performance
- Microsoft: Active Directory Async Thread Queue Performance
- Microsoft: Active Directory Database Performance
- Microsoft: Active Directory Directory Services Reads Performance

- Microsoft: Active Directory Directory Services Searches Performance
- Microsoft: Active Directory Directory Services Writes Performance
- Microsoft: Active Directory DRA Performance
- Microsoft: Active Directory LDAP Performance
- Microsoft: Active Directory Security Account Management Performance
- Microsoft: Active Directory Services General Performance
- Microsoft: Active Directory Web Service Performance

Microsoft: DHCP Server

NOTE: The Dynamic Applications in this PowerPack support Windows Server 2012.

The following PowerShell Dynamic Applications can be used to collect performance data from DHCP servers:

- Microsoft: DHCP IPv4 Performance
- Microsoft: DHCP IPv4 Scope Performance
- Microsoft: DHCP Service Performance

The following PowerShell Dynamic Applications can be used to collect configuration data from DHCP servers:

- Microsoft: DHCP IPv4 Lease Configuration
- Microsoft: DHCP IPv6 Lease Configuration
- Microsoft: DHCP Server Performance

Microsoft: DNS Server

NOTE: The Dynamic Applications in this PowerPack support Windows Server 2008 R2, 2012, and 2012 R2.

The following PowerShell Dynamic Applications can be used to collect performance data from DNS servers:

- Microsoft: DNS AXFR Performance
- Microsoft: DNS Dynamic Update Performance
- Microsoft: DNS IXFR Performance
- Microsoft: DNS Memory Performance
- Microsoft: DNS Notification Performance
- Microsoft: DNS Recursion Performance
- Microsoft: DNS Secure Dynamic Update Performance
- Microsoft: DNS TCP Performance

- Microsoft: DNS Total Overall Performance
- Microsoft: DNS UDP Performance
- Microsoft: DNS WINS Performance
- Microsoft: DNS Zone Transfer Performance

Microsoft: Exchange Server

The following PowerShell Dynamic Applications can be used to collect performance data from Exchange 2013 and Exchange 2016 servers:

- Microsoft: Exchange CAS ActiveSync Performance
- Microsoft: Exchange CAS Address Book Load Performance
- Microsoft: Exchange CAS Address Book Service Performance
- Microsoft: Exchange CAS Availability Service Performance
- Microsoft: Exchange CAS OWA Performance
- Microsoft: Exchange CAS Performance
- Microsoft: Exchange CAS RPC Client Access Load Performance
- Microsoft: Exchange CAS RPC Client Access Performance
- Microsoft: Exchange MBS Database Performance
- Microsoft: Exchange MBS Info Store RPC Processing Stats
- Microsoft: Exchange MBS Information Store Performance
- Microsoft: Exchange MBS Replay Log I/O Latency Requirements
- Microsoft: Exchange TPS Disk Performance
- Microsoft: Exchange TPS Transport Database Performance
- Microsoft: Exchange TPS Transport Load Assessment Stats
- Microsoft: Exchange UMS General Performance

Microsoft: Exchange Server 2010

The following PowerShell Dynamic Applications can be used to collect performance data from Exchange 2010 servers:

- Microsoft: Exchange 2010 CAS Address Book Load Performance
- Microsoft: Exchange 2010 CAS Address Book Service Performance
- Microsoft: Exchange 2010 CAS Availability Service Performance
- Microsoft: Exchange 2010 CAS OWA Performance
- Microsoft: Exchange 2010 CAS Performance
- Microsoft: Exchange 2010 CAS RPC Client Access Load Performance
- Microsoft: Exchange 2010 CAS RPC Client Access Performance

- Microsoft: Exchange 2010 MBS Client-Related Search Performance
- Microsoft: Exchange 2010 MBS Database Performance
- Microsoft: Exchange 2010 MBS Info Store RPC Processing Stats
- Microsoft: Exchange 2010 MBS Information Store Performance
- Microsoft: Exchange 2010 MBS Message Queuing Performance
- Microsoft: Exchange 2010 MBS Replay Log I/O Latency Requirements
- Microsoft: Exchange 2010 MBS RPC Client Throttling Performance
- Microsoft: Exchange 2010 MBS Store Client Request Performance
- Microsoft: Exchange 2010 TPS Disk Performance
- Microsoft: Exchange 2010 TPS Transport Database Performance
- Microsoft: Exchange 2010 TPS Transport Load Assessment Stats
- Microsoft: Exchange 2010 TPS Transport Queue Length Performance
- Microsoft: Exchange 2010 UMS General Performance

Microsoft: Hyper-V Server

NOTE: The Dynamic Applications in this PowerPack support Hyper-V Server 2008 R2, 2012, and 2012 R2.

The following PowerShell Dynamic Applications can be used to collect performance data from Hyper-V servers:

- Microsoft: Hyper-V Component Count
- Microsoft: Hyper-V Logical Processor Performance
- Microsoft: Hyper-V Overall Guest CPU Performance
- Microsoft: Hyper-V Process Performance
- Microsoft: Hyper-V Root Virtual Processor Performance
- Microsoft: Hyper-V Virtual Processor Performance
- Microsoft: Hyper-V Virtual Storage Device Performance
- Microsoft: Hyper-V Virtual Switch Performance

The following PowerShell Dynamic Applications can be used to collect configuration data from Hyper-V servers:

- Microsoft: Hyper-V Component Count Configuration
- Microsoft: Hyper-V Host Configuration

This PowerPack also includes Snippet Dynamic Applications that discover virtual machines managed by the Hyper-V host. Although the Dynamic Applications are of type "Snippet", the snippets themselves perform PowerShell requests to collect data and use PowerShell credentials. See the ***Discovering Component Devices on Hyper-V Systems*** section for more information.

- Microsoft: Hyper-V Guest Configuration

- Microsoft: Hyper-V Guest Configuration Cache
- Microsoft: Hyper-V Guest Discovery

This PowerPack also includes Snippet Dynamic Applications that retrieve performance data from virtual machines managed by the Hyper-V host. Although the Dynamic Applications are of type "Snippet", the snippets themselves perform PowerShell requests to collect data and use PowerShell credentials:

- Microsoft: Hyper-V Connected Clients
- Microsoft: Hyper-V Guest CPU Performance
- Microsoft: Hyper-V Guest IDE Controller Performance
- Microsoft: Hyper-V Guest Interface Performance
- Microsoft: Hyper-V Guest Memory Performance

Microsoft: IIS Server

NOTE: The Dynamic Applications in this PowerPack support Internet Information Services (ISS) versions 7.5, 8.0, 8.5, and 10.0.

The following PowerShell Dynamic Applications can be used to collect performance data from IIS servers:

- Microsoft: IIS Active Server Pages Performance
- Microsoft: IIS Core Performance
- Microsoft: IIS Web Service Performance

The following PowerShell Dynamic Applications can be used to collect configuration data from IIS servers:

- Microsoft: IIS Server Configuration

Microsoft: Lync Server 2010

The following PowerShell Dynamic Applications can be used to collect performance data from Lync 2010 servers:

- Microsoft: Lync 2010 Announcement Service Performance
- Microsoft: Lync 2010 AS MCU Performance
- Microsoft: Lync 2010 Auto Attendant Performance
- Microsoft: Lync 2010 AV MCU Performance
- Microsoft: Lync 2010 AV SIP/MRAS/QOE Performance
- Microsoft: Lync 2010 Call Park Service Performance
- Microsoft: Lync 2010 Conferencing Compatibility Performance
- Microsoft: Lync 2010 Data Conferencing Performance
- Microsoft: Lync 2010 IM MCU Performance

- Microsoft: Lync 2010 Response Group Performance
- Microsoft: Lync 2010 SIP Load Management Performance
- Microsoft: Lync 2010 SIP Networking Performance
- Microsoft: Lync 2010 SIP Peers Performance
- Microsoft: Lync 2010 SIP Protocol Performance
- Microsoft: Lync 2010 SIP Response Performance
- Microsoft: Lync 2010 SipEps Incoming Message Performance
- Microsoft: Lync 2010 User Services Performance
- Microsoft: Lync 2010 Web Services Performance

The following PowerShell Dynamic Applications can be used to collect configuration data from Lync 2010 servers:

- Microsoft: Lync 2010 AS MCU Configuration
- Microsoft: Lync 2010 AV MCU Configuration
- Microsoft: Lync 2010 Conferencing Compatibility Configuration
- Microsoft: Lync 2010 Data Conferencing Configuration
- Microsoft: Lync 2010 Service Health Configuration
- Microsoft: Lync 2010 User Services Configuration

Microsoft: SharePoint Server

NOTE: The Dynamic Applications in this PowerPack support SharePoint Server 2010 SE.

The following PowerShell Dynamic Applications can be used to collect performance data from SharePoint servers:

- Microsoft: SharePoint Core Performance
- Microsoft: SharePoint Indexer Performance
- Microsoft: SharePoint Query Performance

Microsoft: Skype for Business

NOTE: This PowerPack was previously named *Microsoft: Lync Server 2013*.

The following PowerShell Dynamic Applications can be used to collect performance data from Lync 2013 servers:

- Microsoft: Lync 2013 AS MCU Performance
- Microsoft: Lync 2013 AV MCU Performance
- Microsoft: Lync 2013 AV SIP/MRAS/QOE Performance

- Microsoft: Lync 2013 Bandwidth Services Performance
- Microsoft: Lync 2013 Call Park Service Performance
- Microsoft: Lync 2013 Data Conferencing Performance
- Microsoft: Lync 2013 IM MCU Performance
- Microsoft: Lync 2013 Mediation Server Performance
- Microsoft: Lync 2013 Response Group Performance
- Microsoft: Lync 2013 SIP Load Management Performance
- Microsoft: Lync 2013 SIP Networking Performance
- Microsoft: Lync 2013 SIP Peers Performance
- Microsoft: Lync 2013 SIP Protocol Performance
- Microsoft: Lync 2013 SIP Response Performance
- Microsoft: Lync 2013 SipEps Incoming Message Performance
- Microsoft: Lync 2013 User Services Performance
- Microsoft: Lync 2013 Web Services Performance

The following PowerShell Dynamic Applications can be used to collect configuration data from Lync 2013 servers:

- x Microsoft: Lync 2013 AS MCU Configuration
- x Microsoft: Lync 2013 AV MCU Configuration
- x Microsoft: Lync 2013 Data Conferencing Configuration
- x Microsoft: Lync 2013 Service Health Configuration
- x Microsoft: Lync 2013 User Services Configuration

Microsoft: SQL Server

NOTE: The Dynamic Applications in this PowerPack support SQL Server 2008, 2012, 2014, and 2016.

The following PowerShell Dynamic Applications can be used to collect performance data from SQL servers:

- Microsoft: SQL 2008 Buffer Pages Performance
- Microsoft: SQL Buffer Performance
- Microsoft: SQL Database Performance
- Microsoft: SQL Memory Performance
- Microsoft: SQL Plan Cache Performance
- Microsoft: SQL Query Performance
- Microsoft: SQL Session Performance
- Microsoft: SQL Table Lock/Latch Performance

Microsoft: Windows Server

NOTE: The Dynamic Applications in this PowerPack support Windows Server 2008 R2, 2012, 2012 R2, and 2016, as well as Windows 10.

The following PowerShell Dynamic Applications can be used to collect configuration data from Windows servers:

- Microsoft: Print Server Performance
- Microsoft: Windows Server Configuration Cache
- Microsoft: Windows Server BIOS Configuration
- Microsoft: Windows Server CPU Configuration
- Microsoft: Windows Server Device Discovery
- Microsoft: Windows Server Disk Configuration
- Microsoft: Windows Server Interface Configuration
- Microsoft: Windows Server Memory Configuration
- Microsoft: Windows Server OS Configuration
- Microsoft: Windows Server Software Configuration

NOTE: The "Microsoft: Windows Server Configuration Cache" Dynamic Application caches data that is consumed by all of the other configuration Dynamic Applications in the list.

NOTE: When the "Microsoft: Windows Server OS Configuration" or "Microsoft: Windows Server Device Discovery" Dynamic Applications automatically align to Windows servers, they trigger events and Run Book Actions that classify the server.

The following PowerShell Dynamic Applications can be used to collect performance data from Windows servers:

- Microsoft: Windows Server Performance Cache
- Microsoft: Windows Server CPU Performance
- Microsoft: Windows Server Disk Performance
- Microsoft: Windows Server Interface Performance
- Microsoft: Windows Server IPStats Performance
- Microsoft: Windows Server Memory Performance
- Microsoft: Windows Server TCPStats Performance
- Microsoft: Windows Server UDPStats Performance

NOTE: The "Microsoft: Windows Server Performance Cache" Dynamic Application caches data that is consumed by all of the other performance Dynamic Applications in the list.

The following Snippet Dynamic Application, which uses PowerShell requests to collect data, can be used to collect journal data from Windows servers:

- Microsoft: Windows Server Process List

The following Dynamic Applications use PowerShell to collect data as a supplement to SL1's internal collection capabilities:

- Microsoft: Windows Server IC Availability
- Microsoft: Windows Server IC Detail
- Microsoft: Windows Server IC Filesystem Inventory
- Microsoft: Windows Server IC Filesystem Performance
- Microsoft: Windows Server IC Interface Inventory
- Microsoft: Windows Server IC Interface Performance

Microsoft: Windows Server Event Logs

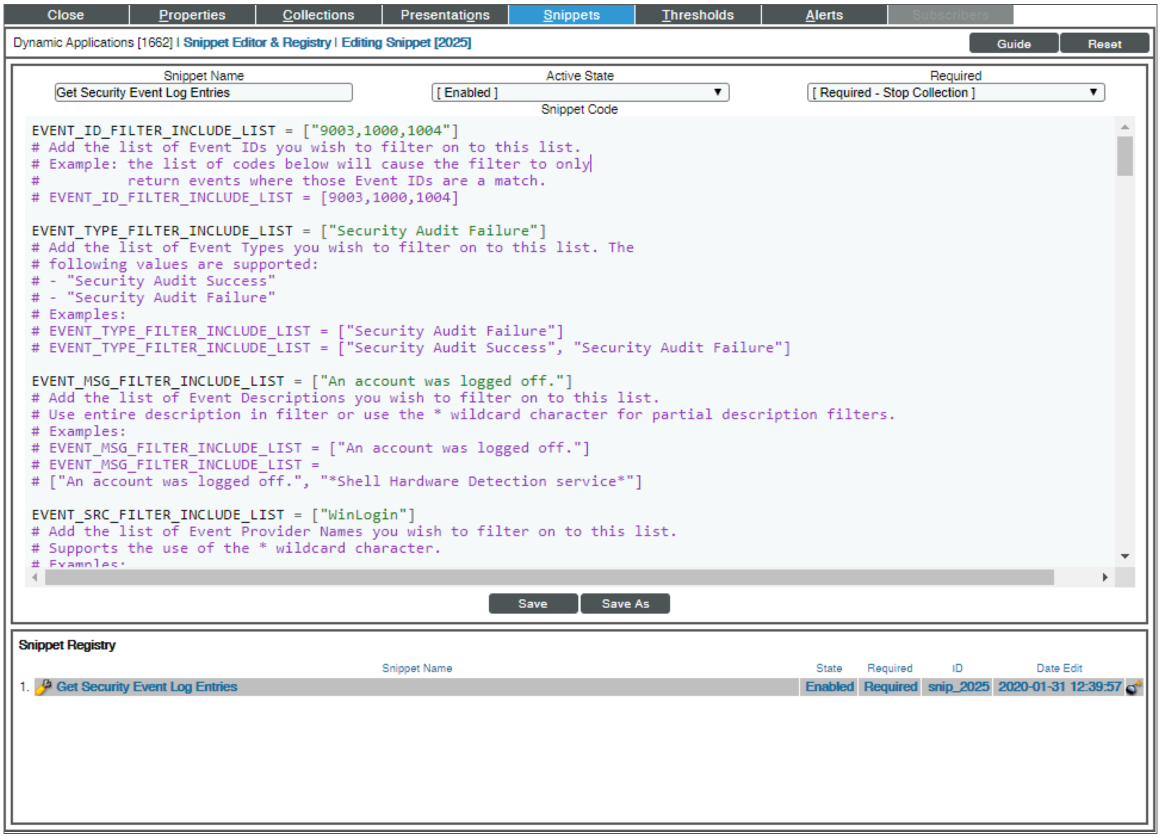
The following Snippet Dynamic Applications can be used to collect data from system, application, and security event logs on Microsoft Windows servers:

- Microsoft: Windows Server Application Events
- Microsoft: Windows Server Security Events
- Microsoft: Windows Server System Events

To customize how the *Microsoft: Windows Server Event Logs* Dynamic Applications filter event logs, perform the following steps for each Dynamic Application:

1. Go to the **Dynamic Applications Manager** page (System > Manage > Applications) and search for the Dynamic Application you want to customize in the **Dynamic Application Name** column.
2. Click the wrench icon (🔧) for the Dynamic Application you want to edit.
3. In the **[Snippets]** tab, click the wrench icon (🔧) next to the item in the **Snippet Registry** pane.
4. In the Snippet Editor, you can edit the following fields:
    - ***EVENT_ID_FILTER_INCLUDE_LIST***. Enter a list of Event IDs to include in your event logs.
    - ***EVENT_TYPE_FILTER_INCLUDE_LIST***. Enter a list of Event Types to include in your event logs.
    - ***EVENT_MSG_FILTER_INCLUDE_LIST***. Enter a list of Event Descriptions to include in your event logs. This field supports the use of the * wildcard character.
    - ***EVENT_SRC_FILTER_INCLUDE_LIST***. Enter a list of Event Provider names to include in your event logs. This field supports the use of the * wildcard character.

5. Click the **[Save]** button.



Dynamic Applications [1662] | Snippet Editor & Registry | Editing Snippet [2025]

Snippet Name: Get Security Event Log Entries

Active State: [Enabled]

Required: [Required - Stop Collection]

Snippet Code

```
EVENT_ID_FILTER_INCLUDE_LIST = ["9003,1000,1004"]
# Add the list of Event IDs you wish to filter on to this list.
# Example: the list of codes below will cause the filter to only
#          return events where those Event IDs are a match.
# EVENT_ID_FILTER_INCLUDE_LIST = [9003,1000,1004]

EVENT_TYPE_FILTER_INCLUDE_LIST = ["Security Audit Failure"]
# Add the list of Event Types you wish to filter on to this list. The
# following values are supported:
# - "Security Audit Success"
# - "Security Audit Failure"
# Examples:
# EVENT_TYPE_FILTER_INCLUDE_LIST = ["Security Audit Failure"]
# EVENT_TYPE_FILTER_INCLUDE_LIST = ["Security Audit Success", "Security Audit Failure"]

EVENT_MSG_FILTER_INCLUDE_LIST = ["An account was logged off."]
# Add the list of Event Descriptions you wish to filter on to this list.
# Use entire description in filter or use the * wildcard character for partial description filters.
# Examples:
# EVENT_MSG_FILTER_INCLUDE_LIST = ["An account was logged off."]
# EVENT_MSG_FILTER_INCLUDE_LIST =
# ["An account was logged off.", "*Shell Hardware Detection service*"]

EVENT_SRC_FILTER_INCLUDE_LIST = ["WinLogin"]
# Add the list of Event Provider Names you wish to filter on to this list.
# Supports the use of the * wildcard character.
# Examples:
```

Snippet Registry

	Snippet Name	State	Required	ID	Date Edit
1.	Get Security Event Log Entries	Enabled	Required	snip_2025	2020-01-31 12:39:57

Microsoft: Windows Server Services

> **NOTE:** The Dynamic Applications in this PowerPack support Windows Server 2008 R2, 2012, and 2012 R2.

The following PowerShell Dynamic Applications can be used to collect configuration data from a Windows server about each Windows Service running on the Windows server:

- Microsoft: Windows Server Service Configuration

Run Book Automations and Actions Associated with PowerShell Dynamic Applications for Windows Servers

You can use the following Run Book Automation Policy and Run Book Action Policy to assign a device class to each Windows device that does not support SNMP:

- Microsoft: Windows Server Device Class Alignment (Run Book Automation Policy)
- Microsoft: Windows Server Device Class Alignment (Run Book Action Policy)

Devices that do not support SNMP are assigned a device class of type "pingable".

The automation policy is configured to trigger when the "Microsoft: Windows Server OS Configuration" or "Microsoft: Windows Server Device Discovery" Dynamic Applications are aligned with a device during discovery. These Dynamic Applications collect the name of the Windows operating system and store the name in a collection object named "Edition". The Run Book Automation policy and Run Book Action policy use the value of the collection object named "Edition" to assign a device class to each Windows device that does not support SNMP.

For example, if the collection object named "Edition" contains the value "Microsoft Windows Server 2012 R2 Datacenter", the Run Book Automation policy and the Run Book Action policy will assign the device to the device class "Microsoft Windows Server 2012 R2".

Error Messages for PowerShell Collection

The following table lists error messages that SL1 can generate during PowerShell collection.

Error Message	Possible Issue(s)
Preauthentication failed while getting initial credentials	Incorrect Password (Active Directory Accounts only)
Client not found in Kerberos database	Username does not exist in Active Directory (Active Directory Accounts only)
KRB5 error code 68 while getting initial credentials	Incorrect domain name (Active Directory Accounts only)
Bad HTTP response returned from server. Code 401, basic auth failed	Incorrect username/password or target server does not allow user account to perform WinRM operations.
ParseError	Incorrect port specified in credential
[Errno 111] Connection refused	Mismatch between server configuration and credential, e.g. encryption option selected but not enabled on server.
Hostname cannot be canonicalized	Forward and/or reverse name resolution are not working from the Data Collector or All-In-One Appliance

Error Message	Possible Issue(s)
Cannot resolve network address for KDC in requested realm	Forward and/or reverse name resolution are not working from the Data Collector or All-In-One Appliance
Configuration file does not specify default realm	Forward and/or reverse name resolution are not working from the Data Collector or All-In-One Appliance
No credentials cache found	Forward and/or reverse name resolution are not working from the Data Collector or All-In-One Appliance
Server not found in Kerbers database	Forward and/or reverse name resolution are not working from the Data Collector or All-In-One Appliance

Relationships with Other Types of Component Devices

Additionally, the Dynamic Applications in the *Microsoft: Windows Server* PowerPack can automatically build relationships between Windows servers and other associated devices:

- If you discover Dynatrace devices using the Dynamic Applications in the *Dynatrace* PowerPack, SL1 will automatically create relationships between Windows servers and Dynatrace hosts.
- If you discover Cisco AppDynamics devices using the Dynamic Applications in the *Cisco: AppDynamics* PowerPack, SL1 will automatically create relationships between Windows servers and AppDynamics nodes.
- If you discover New Relic devices using the Dynamic Applications in the *New Relic APM Pro* PowerPack, SL1 will automatically create relationships between Windows servers and New Relic servers.

Chapter 5

Creating SNMP and PowerShell Credentials for Windows Devices

Overview

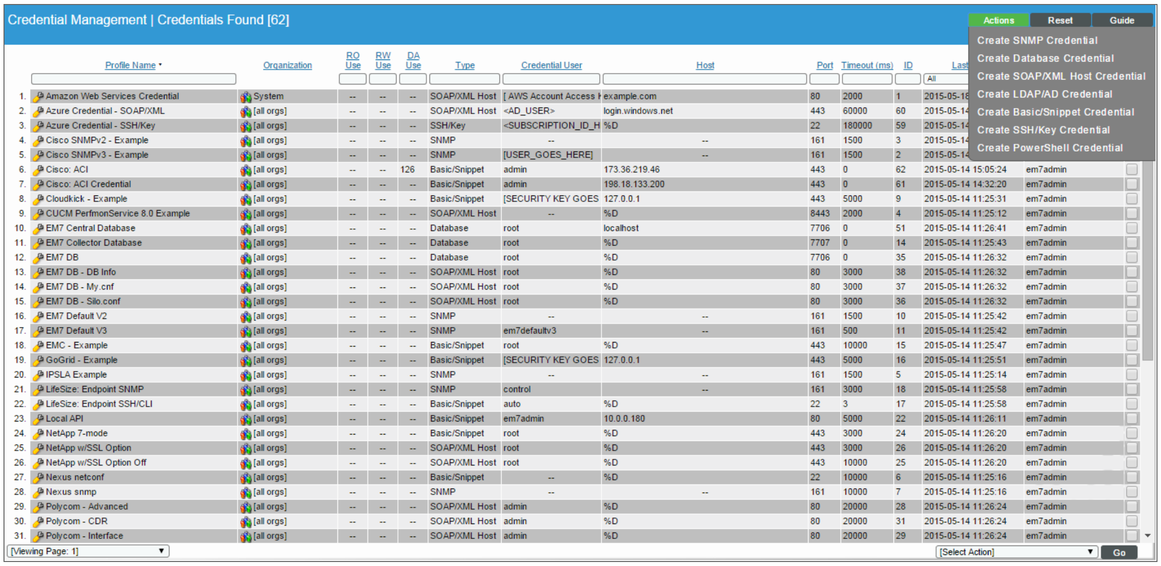
The following sections describe how to create SNMP and PowerShell credentials for Windows devices that you want to monitor with SL1, as well as how to discover component devices on Hyper-V systems:

Creating an SNMP Credential

SNMP Credentials allow SL1 to access SNMP data on a managed device. SL1 uses SNMP credentials to perform discovery, run auto-discovery, and gather information from SNMP Dynamic Applications.

To create an SNMP credential:

1. Go to the **Credential Management** page (System > Manage > Credentials).

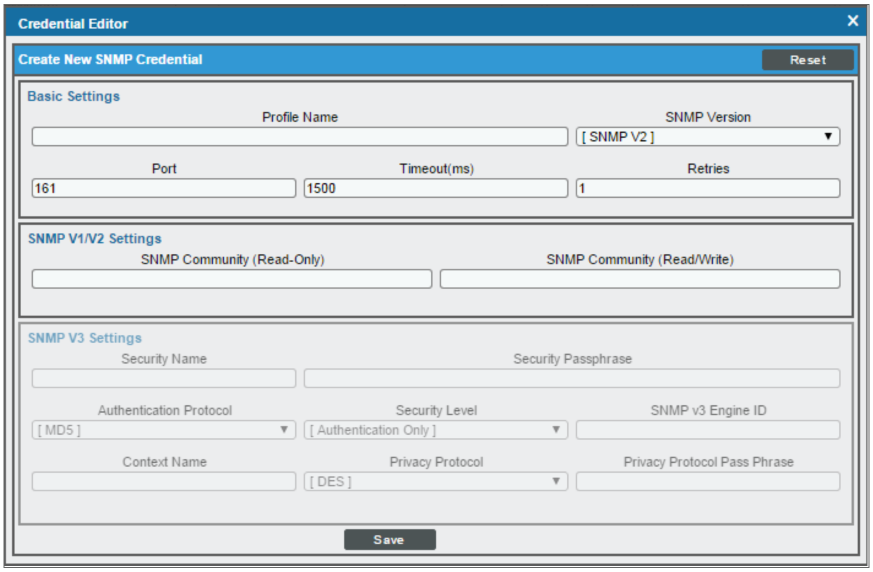


Credential Management | Credentials Found [62]

Actions
Reset
Guide
Create SNMP Credential
Create Database Credential
Create SOAP/XML Host Credential
Create LDAP/AD Credential
Create Basic/Snippet Credential
Create SSH/Key Credential
Create PowerShell Credential

	Profile Name	Organization	RO Use	RW Use	DA Use	Type	Credential User	Host	Port	Timeout (ms)	ID	Last		
												All		
1.	Amazon Web Services Credential	System	--	--	--	SOAP/XML Host	[AWS Account Access I	example.com	80	2000	1	2015-05-18		
2.	Azure Credential - SOAP/XML	[all orgs]	--	--	--	SOAP/XML Host	<AD_USER>	login.windows.net	443	60000	60	2015-05-14		
3.	Azure Credential - SSH/Key	[all orgs]	--	--	--	SSH/Key	<SUBSCRIPTION_ID_H	%D	22	180000	59	2015-05-14		
4.	Cisco SNMPv2 - Example	[all orgs]	--	--	--	SNMP	--	--	161	1500	3	2015-05-14		
5.	Cisco SNMPv3 - Example	[all orgs]	--	--	--	SNMP	[USER_GOES_HERE]	--	161	1500	2	2015-05-14		
6.	Cisco: ACI	[all orgs]	--	--	126	Basic/Snippet	admin	173.36.219.46	443	0	62	2015-05-14 15:05:24	em7admin	☐
7.	Cisco: ACI Credential	[all orgs]	--	--	--	Basic/Snippet	admin	198.18.133.200	443	0	61	2015-05-14 14:32:20	em7admin	☐
8.	Cloudkick - Example	[all orgs]	--	--	--	Basic/Snippet	[SECURITY KEY GOES	127.0.0.1	443	5000	9	2015-05-14 11:25:31	em7admin	☐
9.	CUCM PerfmonService 8.0 Example	[all orgs]	--	--	--	SOAP/XML Host	--	%D	8443	2000	4	2015-05-14 11:25:12	em7admin	☐
10.	EM7 Central Database	[all orgs]	--	--	--	Database	root	localhost	7706	0	51	2015-05-14 11:26:41	em7admin	☐
11.	EM7 Collector Database	[all orgs]	--	--	--	Database	root	%D	7707	0	14	2015-05-14 11:25:43	em7admin	☐
12.	EM7 DB	[all orgs]	--	--	--	Database	root	%D	7706	0	35	2015-05-14 11:26:32	em7admin	☐
13.	EM7 DB - DB Info	[all orgs]	--	--	--	SOAP/XML Host	root	%D	80	3000	38	2015-05-14 11:26:32	em7admin	☐
14.	EM7 DB - My.cnf	[all orgs]	--	--	--	SOAP/XML Host	root	%D	80	3000	37	2015-05-14 11:26:32	em7admin	☐
15.	EM7 DB - Silo.conf	[all orgs]	--	--	--	SOAP/XML Host	root	%D	80	3000	36	2015-05-14 11:26:32	em7admin	☐
16.	EM7 Default V2	[all orgs]	--	--	--	SNMP	--	--	161	1500	10	2015-05-14 11:25:42	em7admin	☐
17.	EM7 Default V3	[all orgs]	--	--	--	SNMP	em7defaultv3	--	161	500	11	2015-05-14 11:25:42	em7admin	☐
18.	EMC - Example	[all orgs]	--	--	--	Basic/Snippet	root	%D	443	10000	15	2015-05-14 11:25:47	em7admin	☐
19.	GoGrid - Example	[all orgs]	--	--	--	Basic/Snippet	[SECURITY KEY GOES	127.0.0.1	443	5000	16	2015-05-14 11:25:51	em7admin	☐
20.	IPSLA Example	[all orgs]	--	--	--	SNMP	--	--	161	1500	5	2015-05-14 11:25:14	em7admin	☐
21.	LifeSize: Endpoint SNMP	[all orgs]	--	--	--	SNMP	control	--	161	3000	18	2015-05-14 11:25:58	em7admin	☐
22.	LifeSize: Endpoint SSH/CLI	[all orgs]	--	--	--	Basic/Snippet	auto	%D	22	3	17	2015-05-14 11:25:58	em7admin	☐
23.	Local API	[all orgs]	--	--	--	Basic/Snippet	em7admin	10.0.0.180	80	5000	22	2015-05-14 11:26:11	em7admin	☐
24.	NetApp 7-mode	[all orgs]	--	--	--	Basic/Snippet	root	%D	443	3000	24	2015-05-14 11:26:20	em7admin	☐
25.	NetApp w/SSL Option	[all orgs]	--	--	--	SOAP/XML Host	root	%D	443	3000	26	2015-05-14 11:26:20	em7admin	☐
26.	NetApp w/SSL Option Off	[all orgs]	--	--	--	SOAP/XML Host	root	%D	443	10000	25	2015-05-14 11:26:20	em7admin	☐
27.	Nexus netconf	[all orgs]	--	--	--	Basic/Snippet	--	%D	22	10000	6	2015-05-14 11:25:16	em7admin	☐
28.	Nexus snmp	[all orgs]	--	--	--	SNMP	--	--	161	10000	7	2015-05-14 11:25:16	em7admin	☐
29.	Polycom - Advanced	[all orgs]	--	--	--	SOAP/XML Host	admin	%D	80	20000	28	2015-05-14 11:26:24	em7admin	☐
30.	Polycom - CDR	[all orgs]	--	--	--	SOAP/XML Host	admin	%D	80	20000	31	2015-05-14 11:26:24	em7admin	☐
31.	Polycom - Interface	[all orgs]	--	--	--	SOAP/XML Host	admin	%D	80	20000	29	2015-05-14 11:26:24	em7admin	☐

2. Click the **[Actions]** button and select *Create SNMP Credential*. The **Credential Editor** page appears.



Credential Editor

Create New SNMP Credential

Basic Settings

Profile Name	SNMP Version	
	[SNMP V2]	

Port	Timeout(ms)	Retries
161	1500	1

SNMP V1/V2 Settings

SNMP Community (Read-Only):

SNMP Community (Read/Write):

SNMP V3 Settings

Security Name:

Security Passphrase:

Authentication Protocol	Security Level	SNMP v3 Engine ID
[MD5]	[Authentication Only]	

Context Name	Privacy Protocol	Privacy Protocol Pass Phrase
	[DES]	

3. Supply values in the following fields:

    - ***Profile Name***. Name of the credential. Can be any combination of alphanumeric characters.
    - ***SNMP Version***. SNMP version. Choices are *SNMP V1*, *SNMP V2*, and *SNMP V3*. The default value is *SNMP V2*.

- ***Port***. The port SL1 will use to communicate with the external device or application. The default value is *161*.
- ***Timeout (ms)***. Time, in milliseconds, after which SL1 will stop trying to communicate with the SNMP device. The default value is *1500*.
- ***Retries***. Number of times SL1 will try to authenticate and communicate with the external device. The default value is *1*.

SNMP V1/V2 Settings

These fields appear if you selected *SNMP V1* or *SNMP V2* in the ***SNMP Version*** field. The fields are inactive if you selected SNMP V3.

- ***SNMP Community (Read-Only)***. The SNMP community string (password) required for read-only access of SNMP data on the remote device or application. For SNMP V1 and SNMP V2 credentials, you must supply a community string, either in this field or in the ***SNMP Community (Read/Write)*** field.
- ***SNMP Community (Read/Write)***. The SNMP community string (password) required for read and write access of SNMP data on the remote device or application. For SNMP V1 and SNMP V2 credentials, you must supply a community string, either in this field or in the ***SNMP Community (Read Only)*** field.

SNMP V3 Settings

These fields appear if you selected *SNMP V3* in the ***SNMP Version*** field. These fields are inactive if you selected SNMP V1 or SNMP V2.

- ***Security Name***. Name for SNMP authentication. This field is required.
- ***Security Passphrase***. Password to authenticate the credential. This value must contain at least 8 characters. This value is required if you use a ***Security Level*** that includes authentication.
- ***Authentication Protocol***. Select an authentication algorithm for the credential. Choices are MD5 or SHA. The default value is *MD5*. This field is required.
- ***Security Level***. Specifies the combination of security features for the credentials. This field is required. Choices are:
  - *No Authentication / No Encryption*.
  - *Authentication Only*. This is the default value.
  - *Authentication and Encryption*.
- ***SNMP v3 Engine ID***. The unique engine ID for the SNMP agent you want to communicate with. (SNMPv3 authentication and encryption keys are generated based on the associated passwords and the engine ID.) This field is optional.
- ***Context Name***. A context is a mechanism within SNMPv3 (and AgentX) that allows you to use parallel versions of the same MIB objects. For example, one version of a MIB might be associated with SNMP Version 2 and another version of the same MIB might be associated with SNMP Version 3. For SNMP Version 3, specify the context name in this field. This field is optional.

- ***Privacy Protocol***. The privacy service encryption and decryption algorithm. This field is required. Choices are:
  - *DES*. This is the default value.
  - *AES-128*
  - *AES-192*
  - *AES-256*
- ***Privacy Protocol Passphrase***. Privacy password for the credential. This field is optional.

4. Click the **[Save]** button to save the new SNMP credential.
5. Repeat steps 1-4 for each SNMP-enabled device in your network that you want to monitor with SL1.

NOTE: When you define an SNMP Credential, SL1 automatically aligns the credential with all organizations of which you are a member.

Creating a PowerShell Credential

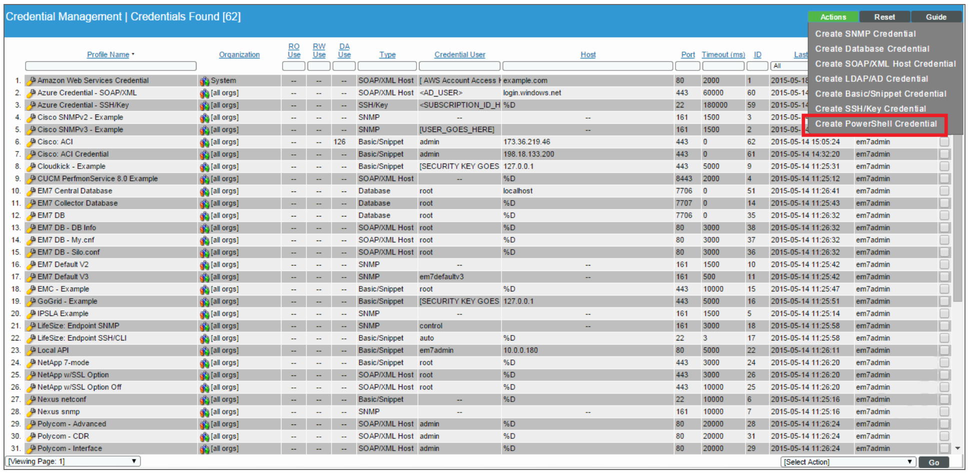
If you configure your Windows system to respond to PowerShell requests from SL1, you can use PowerShell Dynamic Applications to collect information from your Windows system.

All of the PowerShell Dynamic Applications include a discovery object. If you include a credential for PowerShell Dynamic Applications in the discovery session that includes your Windows system, SL1 will automatically align the appropriate PowerShell Dynamic Applications to the Windows system. For more information about creating a discovery session, see the ***Discovery & Credentials*** manual.

To define a PowerShell credential in SL1:

1. Collect the information you need to create the credential:
   - The username and password for a user on the Windows device.
   - If the user is an Active Directory account, the hostname or IP address of the Active Directory server and the domain.
   - Determine if an encrypted connection should be used.
   - If you are using a Windows Management Proxy, the hostname or IP address of the proxy server.
2. Go to the **Credential Management** page (System > Manage > Credentials).

3. In the **Credential Management** page, click the **[Actions]** menu. Select ***Create PowerShell Credential***.

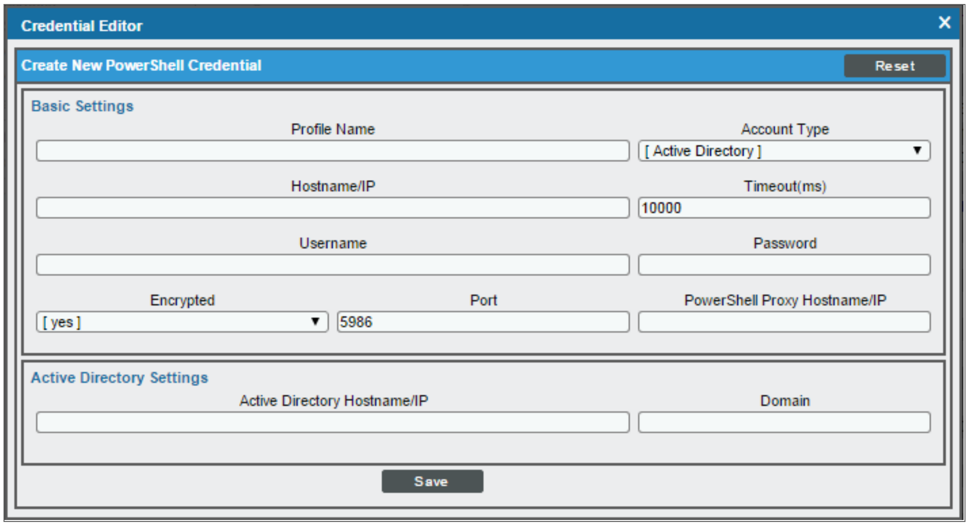


Credential Management | Credentials Found [62]

Actions
Reset
Guide
Create SNMP Credential
Create Database Credential
Create SOAP/XML Host Credential
Create LDAP/AD Credential
Create Basic/Snippet Credential
Create SSH/Key Credential
Create PowerShell Credential

	Profile Name	Organization	RO Use	RW Use	DA Use	Type	Credential User	Host	Port	Timeout (ms)	ID	Last		
1.	Amazon Web Services Credential	System	--	--	--	SOAP/XML Host	[AWS Account Access K	example.com	80	2000	1	2015-05-18		
2.	Azure Credential - SOAP/XML	[all orgs]	--	--	--	SOAP/XML Host	<AD_USER>	login.windows.net	443	60000	60	2015-05-14		
3.	Azure Credential - SSH/Key	[all orgs]	--	--	--	SSH/Key	<SUBSCRIPTION_ID_H	%D	22	180000	59	2015-05-14		
4.	Cisco SNMPv2 - Example	[all orgs]	--	--	--	SNMP	--	--	161	1500	3	2015-05-		
5.	Cisco SNMPv3 - Example	[all orgs]	--	--	--	SNMP	[USER_GOES_HERE]	--	161	1500	2	2015-05-		
6.	Cisco: ACI	[all orgs]	--	--	126	Basic/Snippet	admin	173.36.219.46	443	0	62	2015-05-14 15:05:24	em7admin	□
7.	Cisco: ACI Credential	[all orgs]	--	--	--	Basic/Snippet	admin	198.18.133.200	443	0	61	2015-05-14 14:32:20	em7admin	□
8.	Cloudkick - Example	[all orgs]	--	--	--	Basic/Snippet	[SECURITY KEY GOES	127.0.0.1	443	5000	9	2015-05-14 11:25:31	em7admin	□
9.	CUCM PerfmonService 8.0 Example	[all orgs]	--	--	--	SOAP/XML Host	--	%D	8443	2000	4	2015-05-14 11:25:12	em7admin	□
10.	EM7 Central Database	[all orgs]	--	--	--	Database	root	localhost	7706	0	51	2015-05-14 11:26:41	em7admin	□
11.	EM7 Collector Database	[all orgs]	--	--	--	Database	root	%D	7707	0	14	2015-05-14 11:25:43	em7admin	□
12.	EM7 DB	[all orgs]	--	--	--	Database	root	%D	7706	0	35	2015-05-14 11:26:32	em7admin	□
13.	EM7 DB - DB Info	[all orgs]	--	--	--	SOAP/XML Host	root	%D	80	3000	38	2015-05-14 11:26:32	em7admin	□
14.	EM7 DB - My.cnf	[all orgs]	--	--	--	SOAP/XML Host	root	%D	80	3000	37	2015-05-14 11:26:32	em7admin	□
15.	EM7 DB - Silo.conf	[all orgs]	--	--	--	SOAP/XML Host	root	%D	80	3000	36	2015-05-14 11:26:32	em7admin	□
16.	EM7 Default V2	[all orgs]	--	--	--	SNMP	--	--	161	1500	10	2015-05-14 11:25:42	em7admin	□
17.	EM7 Default V3	[all orgs]	--	--	--	SNMP	em7defaultv3	--	161	500	11	2015-05-14 11:25:42	em7admin	□
18.	EMC - Example	[all orgs]	--	--	--	Basic/Snippet	root	%D	443	10000	15	2015-05-14 11:25:47	em7admin	□
19.	GoGrid - Example	[all orgs]	--	--	--	Basic/Snippet	[SECURITY KEY GOES	127.0.0.1	443	5000	16	2015-05-14 11:25:51	em7admin	□
20.	IPSLA Example	[all orgs]	--	--	--	SNMP	--	--	161	1500	5	2015-05-14 11:25:14	em7admin	□
21.	LifeSize: Endpoint SNMP	[all orgs]	--	--	--	SNMP	control	--	161	3000	18	2015-05-14 11:25:58	em7admin	□
22.	LifeSize: Endpoint SSH/CLI	[all orgs]	--	--	--	Basic/Snippet	auto	%D	22	3	17	2015-05-14 11:25:58	em7admin	□
23.	Local API	[all orgs]	--	--	--	Basic/Snippet	em7admin	10.0.0.180	80	5000	22	2015-05-14 11:26:11	em7admin	□
24.	NetApp 7-mode	[all orgs]	--	--	--	Basic/Snippet	root	%D	443	3000	24	2015-05-14 11:26:20	em7admin	□
25.	NetApp w/SSL Option	[all orgs]	--	--	--	SOAP/XML Host	root	%D	443	3000	26	2015-05-14 11:26:20	em7admin	□
26.	NetApp w/SSL Option Off	[all orgs]	--	--	--	SOAP/XML Host	root	%D	443	10000	25	2015-05-14 11:26:20	em7admin	□
27.	Nexus netconf	[all orgs]	--	--	--	Basic/Snippet	--	%D	22	10000	6	2015-05-14 11:25:16	em7admin	□
28.	Nexus snmp	[all orgs]	--	--	--	SNMP	--	--	161	10000	7	2015-05-14 11:25:16	em7admin	□
29.	Polycom - Advanced	[all orgs]	--	--	--	SOAP/XML Host	admin	%D	80	20000	28	2015-05-14 11:26:24	em7admin	□
30.	Polycom - CDR	[all orgs]	--	--	--	SOAP/XML Host	admin	%D	80	20000	31	2015-05-14 11:26:24	em7admin	□
31.	Polycom - Interface	[all orgs]	--	--	--	SOAP/XML Host	admin	%D	80	20000	29	2015-05-14 11:26:24	em7admin	□

4. The **Credential Editor** page appears, where you can define the following fields:



Credential Editor

Create New PowerShell Credential

Basic Settings

Profile Name:

Account Type: [Active Directory]

Hostname/IP:

Timeout(ms): 10000

Username:

Password:

Encrypted: [yes]

Port: 5986

PowerShell Proxy Hostname/IP:

Active Directory Settings

Active Directory Hostname/IP:

Domain:

- ***Profile Name***. Name of the credential. Can be any combination of alphanumeric characters.

- ***Hostname/IP***. Hostname or IP address of the device from which you want to retrieve data.
  - You can include the variable **%D** in this field. SL1 will replace the variable with the IP address of the device that is currently using the credential.
  - You can include the variable **%N** in this field. SL1 will replace the variable with the hostname of the device that is currently using the credential. If SL1 cannot determine the hostname, SL1 will replace the variable with the primary, management IP address for the current device.
  - You can include the prefix **HOST** or **WSMAN** before the variable **%D** in this field if the device you want to monitor uses a service principal name (for example, "HOST://%D" or "WSMAN://%D"). SL1 will use the WinRM service HOST or WSMan instead of HTTP and replace the variable with the IP address of the device that is currently using the credential.
- ***Username***. Type the username for an account on the Windows device to be monitored or on the proxy server.

NOTE: The user should not include the domain name prefix in the username for Active Directory accounts. For example, use "em7admin" instead of "MSDOMAIN\em7admin".

- ***Encrypted***. Select whether SL1 will communicate with the device using an encrypted connection. Choices are:
  - *yes*. When communicating with the Windows server, SL1 will use a local user account with authentication of type "Basic Auth". You must then use HTTPS and can use a Microsoft Certificate or a self-signed certificate.
  - *no*. When communicating with the Windows server, SL1 will not encrypt the connection.
- ***Port***. Type the port number used by the WinRM service on the Windows device. This field is automatically populated with the default port based on the value you selected in the ***Encrypted*** field.
- ***Account Type***. Type of authentication for the username and password in this credential. Choices are:
  - *Active Directory*. On the Windows device, Active Directory will authenticate the username and password in this credential.
  - *Local*. Local security on the Windows device will authenticate the username and password in this credential.
- ***Timeout (ms)***. Type the time, in milliseconds, after which SL1 will stop trying to collect data from the authenticating server. For collection to be successful, SL1 must connect to the authenticating server, execute the PowerShell command, and receive a response within the amount of time specified in this field.
- ***Password***. Type the password for the account on the Windows device to be monitored or on the proxy server.
- ***PowerShell Proxy Hostname/IP***. If you use a proxy server in front of the Windows devices you want to communicate with, type the fully-qualified domain name or the IP address of the proxy server in this field.

- ***Active Directory Hostname/IP***. If you selected Active Directory in the ***Account Type*** field, type the hostname or IP address of the Active Directory server that will authenticate the credential.
- ***Domain***. If you selected Active Directory in the ***Account Type*** field, type the domain where the monitored Windows device resides.

5. To save the credential, click the **[Save]** button. To clear the values you set, click the **[Reset]** button.

Testing Windows Credentials

Credential Tests define a series of steps that SL1 can execute on-demand to validate whether a credential works as expected. This section describes the SNMP and PowerShell Credential Tests that are included in the default installation of SL1.

SNMP Credential Test

The SNMP Credential Test can be used to test an SNMP credential for connectivity. The SNMP Credential Test performs the following steps:

- ***Test Reachability***. Performs an ICMP ping request to the host specified in the credential.
- ***Test Port Availability***. Performs an NMAP request to the UDP port specified in the credential on the host specified in the credential.
- ***Test SNMP Availability***. Attempts an SNMP getnext request to .1.3.6.1 using the credential.

PowerShell Credential Test

The PowerShell Credential Test can be used to test a PowerShell credential for connectivity. The PowerShell Credential Test performs the following steps:

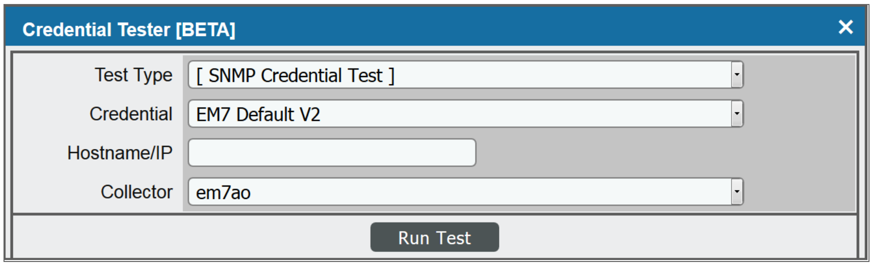
- ***Test Reachability***. Performs an ICMP ping request to the host specified in the credential.
- ***Test Port Availability***. Performs an NMAP request to the TCP port specified in the credential on the host specified in the credential.
- ***Test Name Resolution***. Performs an nslookup request on the host specified in the credential.
- ***Test Kerberos***. If the credential does not specify local authentication, attempts to acquire a kerberos ticket using the credential.
- ***Test WinRM Connection***. Attempts a WinRM connection using the credential.
- ***Execute PowerShell Cmdlet***. Attempts to execute the 'Get-WmiObject Win32_Process | Select Name' PowerShell Cmdlet using the credential.

Running a Windows Credential Test

To run a Windows credential test from the **Credential Management** page:

1. Go to the **Credential Management** page (System > Manage > Credentials).

2. Click the **[Actions]** menu, and then select *Test Credential*. The **Credential Tester** modal page appears:



Credential Tester [BETA]

Test Type: [SNMP Credential Test]

Credential: EM7 Default V2

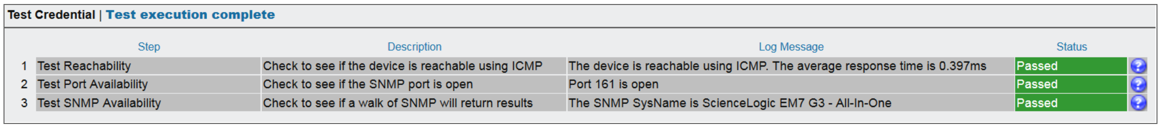
Hostname/IP:

Collector: em7ao

3. Supply values in the following fields:

   - ***Test Type***. Select a credential test to run.
   - ***Credential***. Select the credential you want to test. This drop-down list includes only credentials that you have access to that can be tested using the selected credential test.
   - ***Hostname/IP***. Enter a hostname or IP address that will be used during the test. For example, if you are testing an SNMP credential, the hostname/IP address you supply will be used to perform a test SNMP request.
   - ***Collector***. Select the All-In-One Appliance or Data Collector that will run the test.

4. Click the **[Run Test]** button to run the credential test. The **Test Credential** window appears:



Test Credential | Test execution complete

	Step	Description	Log Message	Status	
1	Test Reachability	Check to see if the device is reachable using ICMP	The device is reachable using ICMP. The average response time is 0.397ms	Passed	?
2	Test Port Availability	Check to see if the SNMP port is open	Port 161 is open	Passed	?
3	Test SNMP Availability	Check to see if a walk of SNMP will return results	The SNMP SysName is ScienceLogic EM7 G3 - All-In-One	Passed	?

   The **Test Credential** window displays a log entry for each step in the credential test. The steps performed are different for each credential test. The log entry for each step includes the following information:

   - ***Step***. The name of the step.
   - ***Description***. A description of the action performed during the step.
   - ***Log Message***. The result of the step for this execution of the credential test.
   - ***Status***. Whether the result of this step indicates the credential and/or the network environment is configured correctly (Passed) or incorrectly (Failed).
   - ***Step Tip***. Mouse over the question mark icon (?) to display the tip text. The tip text recommends what to do to change the credential and/or the network environment if the step has a status of "Failed".

5. Optionally, you can click the **[Execute Discovery Session]** button to run a discovery session using the ***Credential***, ***Hostname/IP***, and ***Collector*** you selected in the **Credential Tester** modal page.

Discovering Component Devices on Hyper-V Systems

The *Microsoft: Hyper-V Server* PowerPack includes two Dynamic Applications that allow SL1 to collect information about the virtual machines running on a Hyper-V system.

To discover the virtual machines on a Hyper-V system as component devices, align the following two Dynamic Applications with a Hyper-V system:

- Microsoft: Hyper-V Guest Configuration Cache
- Microsoft: Hyper-V Gust Discovery

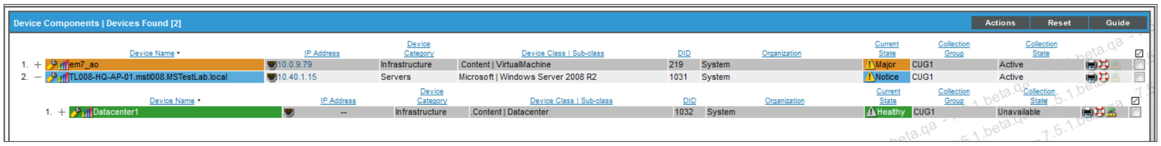
When these Dynamic Applications are aligned to a Hyper-V system, the platform will automatically create a device record for each virtual machine. The platform will also automatically align other Dynamic Applications from the *Microsoft: Hyper-V Server* PowerPack to each virtual machine.

Viewing Component Devices

When SL1 performs collection for the "Microsoft Hyper-V Guest Configuration Cache" and "Microsoft Hyper-V Guest Discovery" Dynamic Applications, SL1 will create component devices for the virtual machines on the Hyper-V and align other Dynamic Applications to those component devices. All component devices appear in the **Device Manager** page just like devices discovered using the ScienceLogic discovery process.

In addition to the **Device Manager** page, you can view the Hyper-V system and all associated component devices in the following places in the user interface:

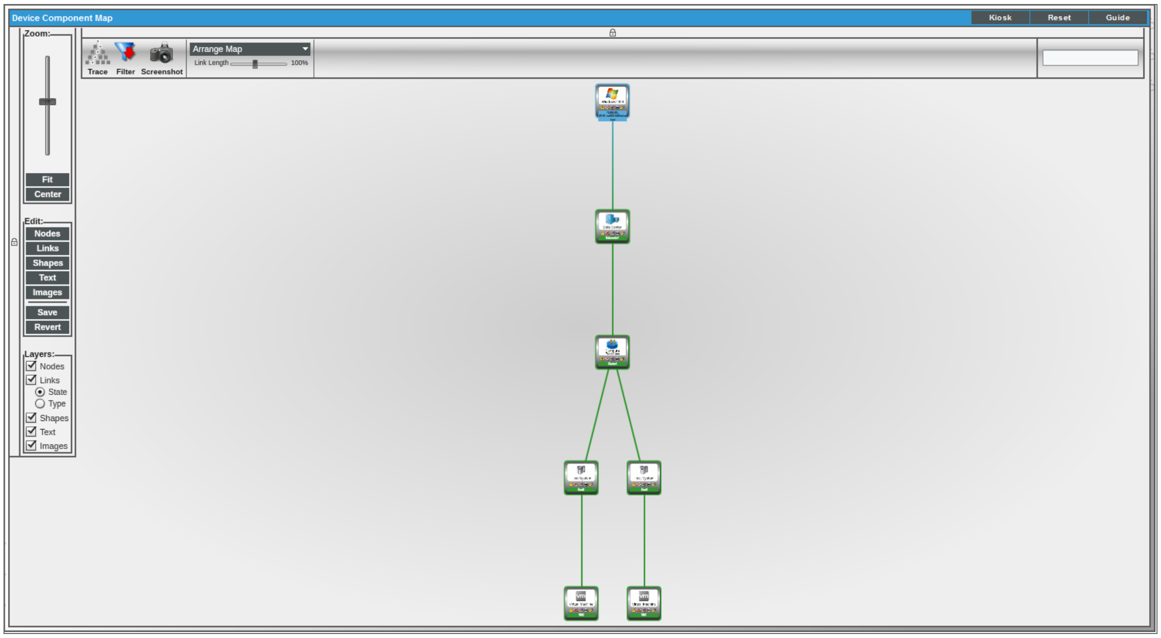
- The **Device Components** page (Registry > Devices > Device Components) displays a list of all root devices and component devices discovered by the platform. The **Device Components** page displays all root devices and component devices in an indented view, so you can easily view the hierarchy and relationships between child devices, parent devices, and root devices. To view the component devices associated with a Hyper-V system, find the Hyper-V system and select its plus icon (**+**):



	Device Name	IP Address	Device Category	Device Class | Sub-class	DID	Organization	Current State	Collection Group	Collection State	☑
1. +	em7_ao	10.0.9.79	Infrastructure	.Content | VirtualMachine	219	System	Major	CUG1	Active	□
2. –	TL008-HQ-AP-01.mstl008.MSTestLab.local	10.40.1.15	Servers	Microsoft | Windows Server 2008 R2	1031	System	Notice	CUG1	Active	□

	Device Name	IP Address	Device Category	Device Class | Sub-class	DID	Organization	Current State	Collection Group	Collection State	☑
1. +	Datacenter1	--	Infrastructure	.Content | Datacenter	1032	System	Healthy	CUG1	Unavailable	□

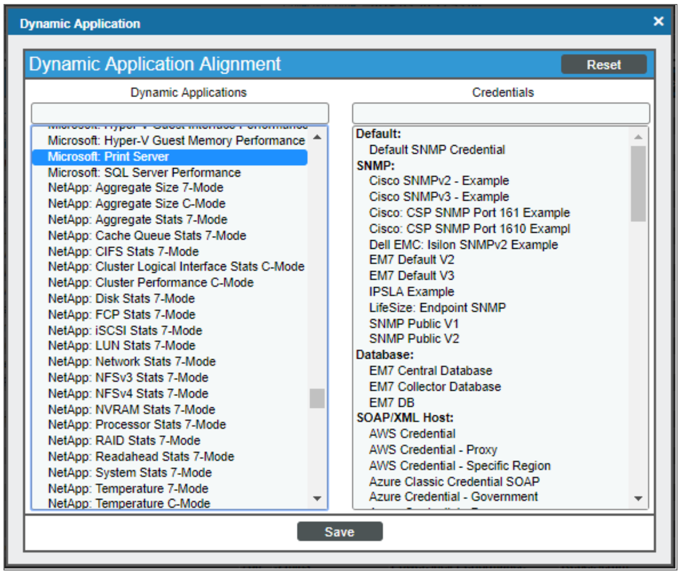
- The **Component Map** page (Views > Device Maps > Components) allows you to view devices by root node and view the relationships between root nodes, parent components, and child components in a map. This makes it easy to visualize and manage root nodes and their components. SL1 automatically updates the **Component Map** as new component devices are discovered. SL1 also updates each map with the latest status and event information. To view the map for a Hyper-V system, select the Hyper-V system from the left NavBar. To learn more about the **Component Map** page, see the ***Views*** manual.



Manually Aligning the Microsoft: Print Server Dynamic Application

The Microsoft: Print Server Dynamic Application must be manually aligned. To do so, perform the following steps:

1. Find your Windows device in the **Device Manager** page (Registry > Devices > Device Manager and click its wrench icon ().
2. From the **Device Properties** page for the Windows system, click the **[Collections]** tab. The **Dynamic Application Collections** page appears.
3. Click the **[Action]** button and then select *Add Dynamic Application*. The **Dynamic Application Alignment** page appears:



Dynamic Applications

Microsoft: Hyper-V Guest Interface Performance
Microsoft: Hyper-V Guest Memory Performance
Microsoft: Print Server
Microsoft: SQL Server Performance
NetApp: Aggregate Size 7-Mode
NetApp: Aggregate Size C-Mode
NetApp: Aggregate Stats 7-Mode
NetApp: Cache Queue Stats 7-Mode
NetApp: CIFS Stats 7-Mode
NetApp: Cluster Logical Interface Stats C-Mode
NetApp: Cluster Performance C-Mode
NetApp: Disk Stats 7-Mode
NetApp: FCP Stats 7-Mode
NetApp: iSCSI Stats 7-Mode
NetApp: LUN Stats 7-Mode
NetApp: Network Stats 7-Mode
NetApp: NFSv3 Stats 7-Mode
NetApp: NFSv4 Stats 7-Mode
NetApp: NVRAM Stats 7-Mode
NetApp: Processor Stats 7-Mode
NetApp: RAID Stats 7-Mode
NetApp: Readahead Stats 7-Mode
NetApp: System Stats 7-Mode
NetApp: Temperature 7-Mode
NetApp: Temperature C-Mode

Credentials

Default:
Default SNMP Credential
SNMP:
Cisco SNMPv2 - Example
Cisco SNMPv3 - Example
Cisco: CSP SNMP Port 161 Example
Cisco: CSP SNMP Port 1610 Exampl
Dell EMC: Isilon SNMPv2 Example
EM7 Default V2
EM7 Default V3
IPSLA Example
LifeSize: Endpoint SNMP
SNMP Public V1
SNMP Public V2
Database:
EM7 Central Database
EM7 Collector Database
EM7 DB
SOAP/XML Host:
AWS Credential
AWS Credential - Proxy
AWS Credential - Specific Region
Azure Classic Credential SOAP
Azure Credential - Government

4. In the ***Dynamic Applications*** field, select the "Microsoft: Print Server" Dynamic Application.
5. In the ***Credentials*** field, select the credential you created for your Windows system.
6. Click the **[Save]** button.

Chapter

6

Executing the SL1 Agent with Windows PowerShell

Overview

The following sections provide an overview of local Agent execution on Windows devices with PowerShell:

What is an SL1 Agent?

The ***SL1 Agent*** is a program that you can optionally install on a device or element monitored by SL1. The SL1 Agent collects data from the device, interface, or other element and pushes that data back to SL1. You can install and use multiple SL1 Agents, as needed.

Because an agent is always running on a device, the SL1 Agent can collect more granular data than can be collected by polling the device periodically with a Data Collector. You can collect data from devices using only the SL1 Agent or using a combination of the SL1 Agent and Data Collectors.

For more information, see the ***Monitoring with the SL1 Agent*** manual .

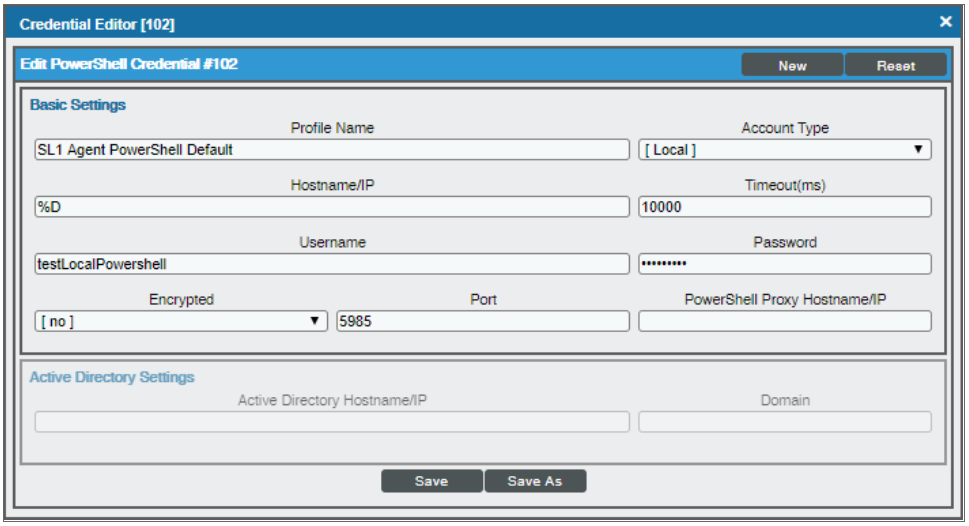
Agent-Compatible PowerPacks

The following PowerPacks include the SL1 Agent PowerShell Default credential and SL1 Agent device template, which you can use to execute the SL1 Agent on Windows devices with PowerShell:

- Microsoft: Windows Server
- SL1 Agent Templates for Microsoft PowerPacks, which includes templates for the following:
    - Microsoft: DHCP Server
    - Microsoft: DNS Server
    - Microsoft: Exchange Server
    - Microsoft: IIS Server
    - Microsoft: Lync Server
    - Microsoft: SharePoint Server
    - Microsoft: SQL Server
    - Microsoft: Windows Server

The Credential for the SL1 Agent

The "SL1 Agent PowerShell Default" credential does not need to be configured and can be used as-is. You can find the credential in the **Credential Management** page (System > Manage > Credentials):



Credential Editor [102]

Edit PowerShell Credential #102

Basic Settings

Profile Name: SL1 Agent PowerShell Default

Account Type: [Local]

Hostname/IP: %D

Timeout(ms): 10000

Username: testLocalPowershell

Password: •••••••••

Encrypted: [no]

Port: 5985

PowerShell Proxy Hostname/IP:

Active Directory Settings

Active Directory Hostname/IP:

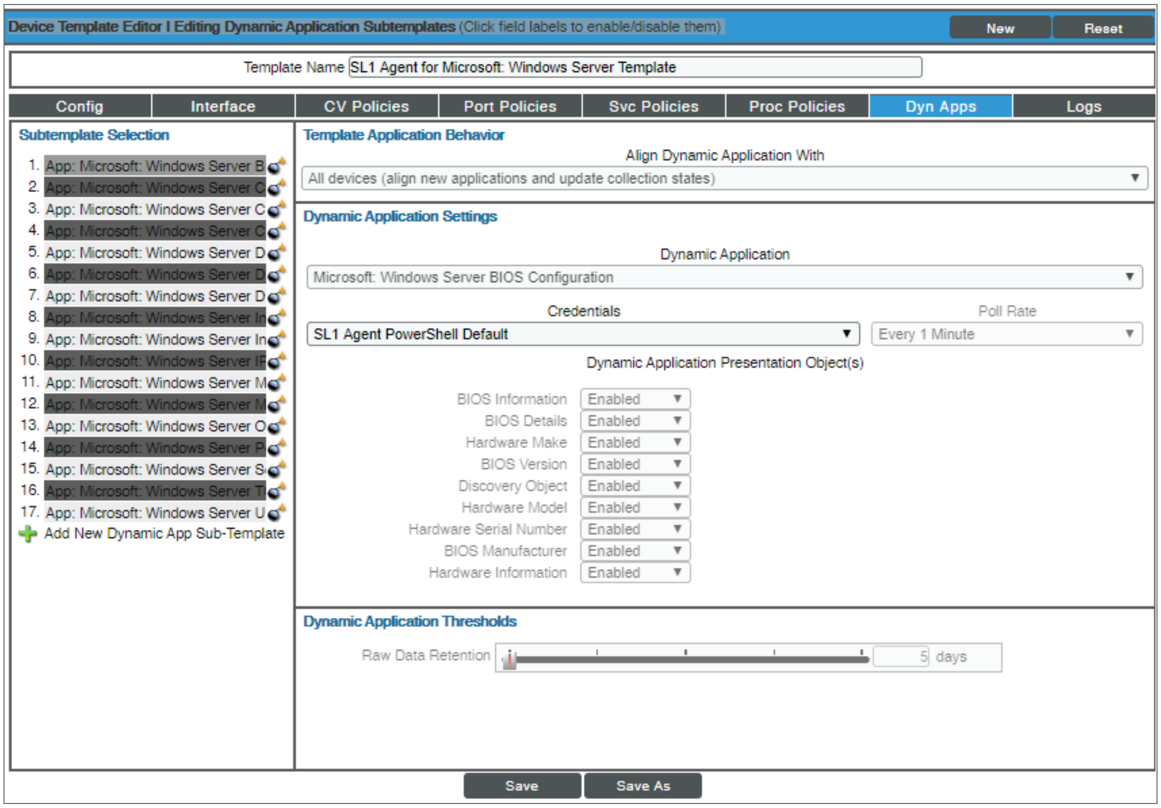
Domain:

Configuring the SL1 Agent Device Template

A ***device template*** allows you to save a device configuration and apply it to multiple devices. Windows PowerPacks include a device template for executing the SL1 Agent with PowerShell. If you apply this device template during discovery, SL1 aligns the appropriate Dynamic Applications to the discovered PowerShell device.

This device template does not need to be edited and will work as-is, unless you would like to remove a Dynamic Application from the template. To remove any Dynamic Applications you may not need:

1. Go to the **Configuration Templates** page (Registry > Devices > Templates).
2. Locate the SL1 Agent template (for example, "SL1 Agent for Microsoft: Windows Server Template") and click its wrench icon (🔧). The **Device Template Editor** page appears.
3. Click the **[Dyn Apps]** tab. The **Editing Dynamic Application Subtemplates** page appears:



Device Template Editor I Editing Dynamic Application Subtemplates (Click field labels to enable/disable them)

Template Name: SL1 Agent for Microsoft: Windows Server Template

Subtemplate Selection

1. App: Microsoft: Windows Server B
2. App: Microsoft: Windows Server C
3. App: Microsoft: Windows Server C
4. App: Microsoft: Windows Server C
5. App: Microsoft: Windows Server D
6. App: Microsoft: Windows Server D
7. App: Microsoft: Windows Server D
8. App: Microsoft: Windows Server In
9. App: Microsoft: Windows Server In
10. App: Microsoft: Windows Server IF
11. App: Microsoft: Windows Server M
12. App: Microsoft: Windows Server M
13. App: Microsoft: Windows Server O
14. App: Microsoft: Windows Server P
15. App: Microsoft: Windows Server S
16. App: Microsoft: Windows Server T
17. App: Microsoft: Windows Server U

Add New Dynamic App Sub-Template

Template Application Behavior

Align Dynamic Application With: All devices (align new applications and update collection states)

Dynamic Application Settings

Dynamic Application: Microsoft: Windows Server BIOS Configuration

Credentials: SL1 Agent PowerShell Default

Poll Rate: Every 1 Minute

Dynamic Application Presentation Object(s)

BIOS Information	Enabled
BIOS Details	Enabled
Hardware Make	Enabled
BIOS Version	Enabled
Discovery Object	Enabled
Hardware Model	Enabled
Hardware Serial Number	Enabled
BIOS Manufacturer	Enabled
Hardware Information	Enabled

Dynamic Application Thresholds

Raw Data Retention: 5 days

5. To remove a Dynamic Application listed in the **Subtemplate Selection** section on the left side of the page, click it's bomb icon (💣) and then click **[OK]** when asked to confirm. select the SL1 Agent PowerShell credential in the ***Credentials*** field.
6. Click **[Save]**.

Chapter 7

Windows Dashboards

Overview

The following sections describe how to install the dashboards included in SL1 for Microsoft servers and a description of each:

Installing the Microsoft Server Dashboards

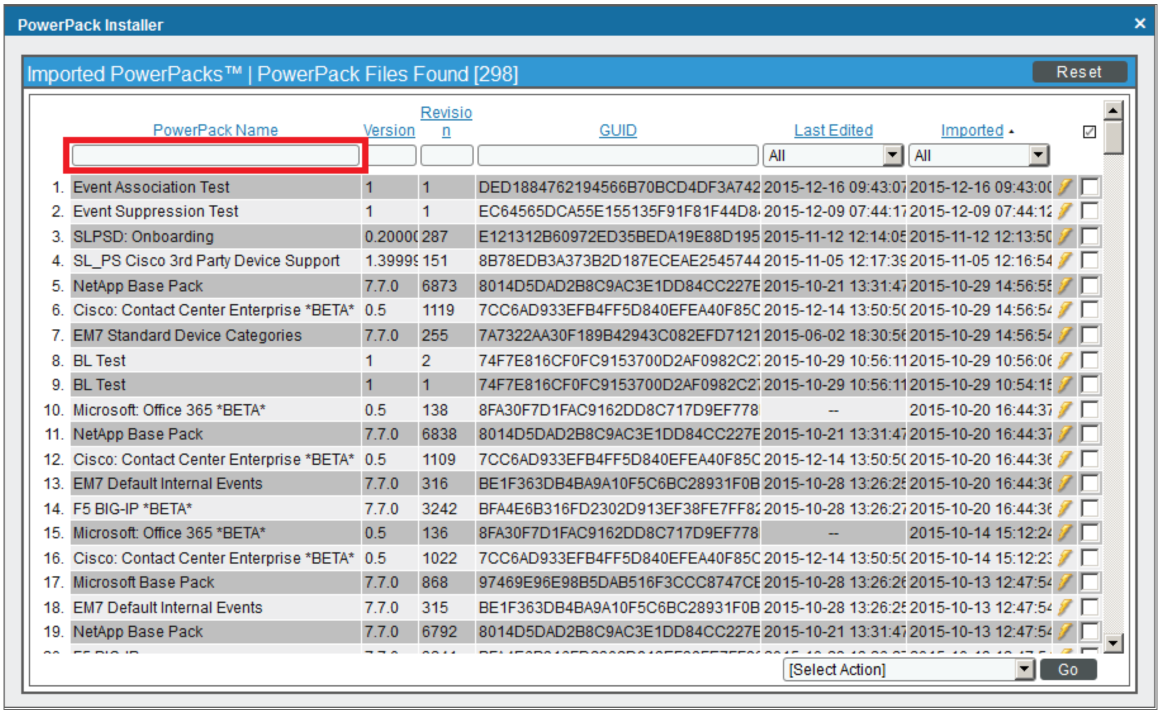
The following PowerPacks contain dashboards for Microsoft servers:

- Microsoft: Active Directory Server Dashboards

- Microsoft: DNS Server Dashboards
- Microsoft: Exchange Server 2010 Dashboards
- Microsoft: Exchange Server 2013 Dashboards
- Microsoft: IIS Server Dashboards
- Microsoft: Lync Server 2010 Dashboards
- Microsoft: Skype for Business Dashboards
- Microsoft: SQL Server Dashboards

To view these dashboards in SL1, you must first install the corresponding PowerPack. To do so:

1. Go to the **PowerPack Manager** page (System > Manage > PowerPacks).
2. Click the **[Actions]** button, then select *Install PowerPack*. The **Imported PowerPacks** modal page appears.
3. Use the search filter in the ***PowerPack Name*** column heading to locate the PowerPack you want to install. To do so, enter text to match, including special characters, and the **Imported PowerPacks** modal page displays only PowerPacks that have a matching name.

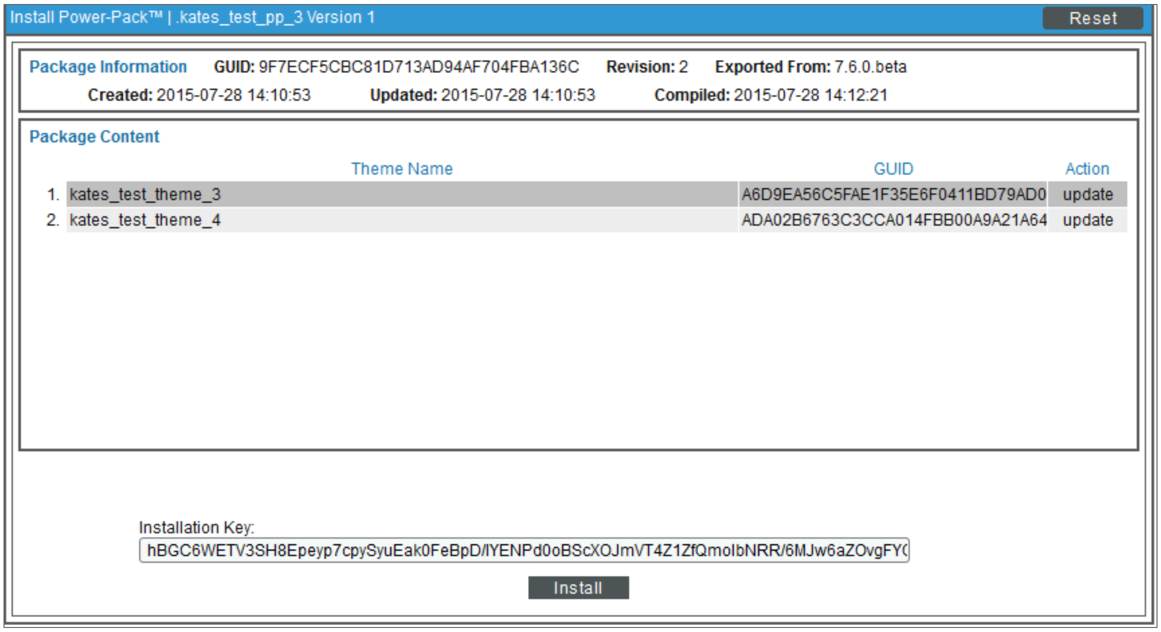


Imported PowerPacks™ | PowerPack Files Found [298]

	PowerPack Name	Version	Revision	GUID	Last Edited	Imported ▲		☑
					All	All		
1.	Event Association Test	1	1	DED1884762194566B70BCD4DF3A742	2015-12-16 09:43:07	2015-12-16 09:43:0	⚡	□
2.	Event Suppression Test	1	1	EC64565DCA55E155135F91F81F44D8	2015-12-09 07:44:17	2015-12-09 07:44:12	⚡	□
3.	SLPSD: Onboarding	0.20000	287	E121312B60972ED35BEDA19E88D195	2015-11-12 12:14:05	2015-11-12 12:13:50	⚡	□
4.	SL_PS Cisco 3rd Party Device Support	1.39999	151	8B78EDB3A373B2D187ECEAE2545744	2015-11-05 12:17:39	2015-11-05 12:16:54	⚡	□
5.	NetApp Base Pack	7.7.0	6873	8014D5DAD2B8C9AC3E1DD84CC227E	2015-10-21 13:31:47	2015-10-29 14:56:55	⚡	□
6.	Cisco: Contact Center Enterprise *BETA*	0.5	1119	7CC6AD933EFB4FF5D840EFEA40F85C	2015-12-14 13:50:50	2015-10-29 14:56:54	⚡	□
7.	EM7 Standard Device Categories	7.7.0	255	7A7322AA30F189B42943C082EFD7121	2015-06-02 18:30:56	2015-10-29 14:56:54	⚡	□
8.	BL Test	1	2	74F7E816CF0FC9153700D2AF0982C27	2015-10-29 10:56:11	2015-10-29 10:56:06	⚡	□
9.	BL Test	1	1	74F7E816CF0FC9153700D2AF0982C27	2015-10-29 10:56:11	2015-10-29 10:54:15	⚡	□
10.	Microsoft: Office 365 *BETA*	0.5	138	8FA30F7D1FAC9162DD8C717D9EF778	--	2015-10-20 16:44:37	⚡	□
11.	NetApp Base Pack	7.7.0	6838	8014D5DAD2B8C9AC3E1DD84CC227E	2015-10-21 13:31:47	2015-10-20 16:44:37	⚡	□
12.	Cisco: Contact Center Enterprise *BETA*	0.5	1109	7CC6AD933EFB4FF5D840EFEA40F85C	2015-12-14 13:50:50	2015-10-20 16:44:36	⚡	□
13.	EM7 Default Internal Events	7.7.0	316	BE1F363DB4BA9A10F5C6BC28931F0B	2015-10-28 13:26:25	2015-10-20 16:44:36	⚡	□
14.	F5 BIG-IP *BETA*	7.7.0	3242	BFA4E6B316FD2302D913EF38FE7FF82	2015-10-28 13:26:27	2015-10-20 16:44:36	⚡	□
15.	Microsoft: Office 365 *BETA*	0.5	136	8FA30F7D1FAC9162DD8C717D9EF778	--	2015-10-14 15:12:24	⚡	□
16.	Cisco: Contact Center Enterprise *BETA*	0.5	1022	7CC6AD933EFB4FF5D840EFEA40F85C	2015-12-14 13:50:50	2015-10-14 15:12:23	⚡	□
17.	Microsoft Base Pack	7.7.0	868	97469E96E98B5DAB516F3CCC8747CE	2015-10-28 13:26:26	2015-10-13 12:47:54	⚡	□
18.	EM7 Default Internal Events	7.7.0	315	BE1F363DB4BA9A10F5C6BC28931F0B	2015-10-28 13:26:25	2015-10-13 12:47:54	⚡	□
19.	NetApp Base Pack	7.7.0	6792	8014D5DAD2B8C9AC3E1DD84CC227E	2015-10-21 13:31:47	2015-10-13 12:47:54	⚡	□

4. Click the lightning-bolt icon (⚡) for the PowerPack that you want to install.

5. The **Install PowerPack** modal page appears. To install the PowerPack, click **[Install]**.



Install Power-Pack™ | .kates_test_pp_3 Version 1

Reset

Package Information **GUID:** 9F7ECF5CBC81D713AD94AF704FBA136C **Revision:** 2 **Exported From:** 7.6.0.beta

Created: 2015-07-28 14:10:53 **Updated:** 2015-07-28 14:10:53 **Compiled:** 2015-07-28 14:12:21

Package Content

	Theme Name	GUID	Action
1.	kates_test_theme_3	A6D9EA56C5FAE1F35E6F0411BD79AD0	update
2.	kates_test_theme_4	ADA02B6763C3CCA014FBB00A9A21A64	update

Installation Key:

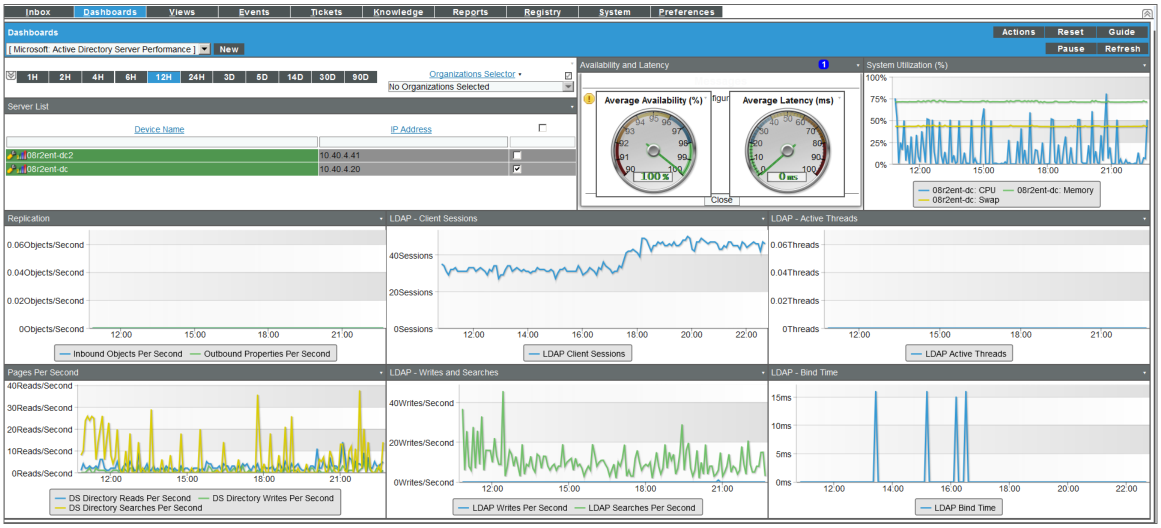
hBGC6WETV3SH8Epeyp7cpySyuEak0FeBpD/lYENPd0oBScXOJmVT4Z1ZfQmoIbNRR/6MJw6aZOvgFY(

Install

6. The PowerPack now appears in the **PowerPack Manager** page. The contents of the PowerPack are automatically installed in your SL1 System.

Microsoft: Active Directory Server Performance

The Microsoft: Active Directory Server Performance dashboard provides an overview of the health and performance of a selected Active Directory server.



Context Quick Selector. This widget contains buttons for time span preset and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Active Directory servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of Active Directory servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Active Directory server, in percent.
- The latency of the selected Active Directory server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected Active Directory server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector***widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

Replication. Replication is the process by which the changes that are made on one domain controller are synchronized with and written to all other domain controllers in the domain or forest. The Replication widget displays a line graph. The line graph displays information about data that is replicated from the current Active Directory server to other Active Directory servers (the Outbound Properties Per Second) and information about data that is replicated from other Active Directory server to the current Active Directory server (Inbound Objects Per Second).

- The y axis displays objects per second.
- The x axis displays time. The increments vary, depending upon the date ranges selected in the***Context Quick Selector***widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

LDAP - Client Sessions. This widget displays the number of connected LDAP client sessions over time.

- The y axis displays number of sessions .
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.

- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

LDAP - Active Threads. This widget displays the number of threads in use by the LDAP subsystem of the local directory service.

- The y axis displays number of threads.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

Pages Per Second. This widget displays a line graph. The line graph displays DS (domain server) directory reads per second, DS directory writes per second, and DS directory searches per second. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

LDAP - Writes and Searches. This widget displays a line graph. The line graph displays LDAP writes per second and LDAP searches per second. Each parameter is represented by a color-coded line.

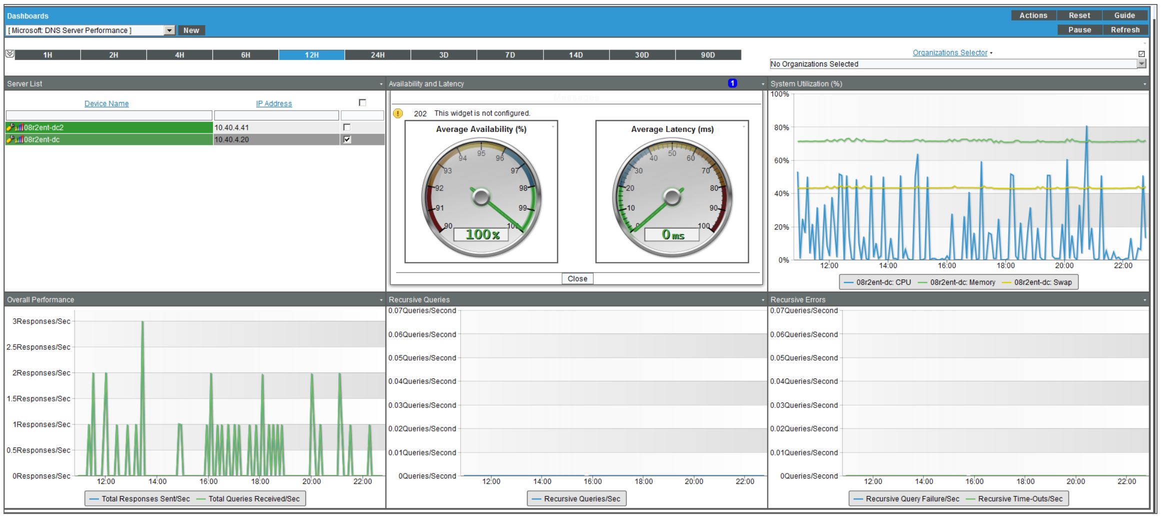
- The y axis displays writers per second and searches per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

LDAP - Bind Time. This widget displays a line graph. The line graph displays the time required for completion of each successful LDAP binding.

- The y axis displays duration in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Active Directory server.

Microsoft: DNS Server Performance

The Microsoft: DNS Server Performance dashboard provides an overview of the health and performance of a selected DNS server.



Device Name	IP Address	□
08r2ent-dc2	10.40.4.41	□
08r2ent-dc	10.40.4.20	☑

202 This widget is not configured.

Context Quick Selector. This widget contains buttons for time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of DNS servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of DNS servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected DNS server, in percent.
- The latency of the selected DNS server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected DNS server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.

- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected DNS server.

Overall Performance. This widget displays a line graph. The line graph displays Total Responses Sent per Second and Total Queries Received per Second. Each parameter is represented by a color-coded line.

- The y axis displays responses per second and queries per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected DNS server.

Recursive Queries. This widget displays a line graph. The line graph displays Recursive Queries per Second.

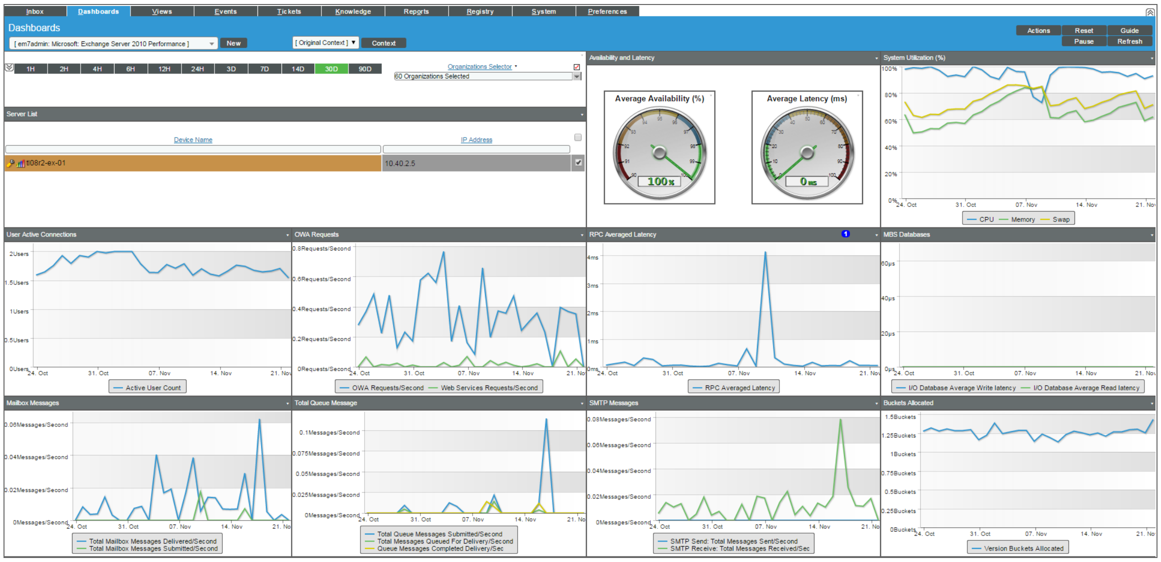
- The y axis displays number of queries per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected DNS server.

Recursive Errors. This widget displays a line graph. The line graph displays Recursive Query Failures per Second and Recursive Time-Outs per Second. Each parameter is represented by a color-coded line..

- The y axis displays number of queries per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected DNS server.

Microsoft: Exchange Server 2010 Performance

The Microsoft: Exchange Server 2010 Performance dashboard provides an overview of the health and performance of a selected Exchange 2010 server.



Context Quick Selector. This widget contains buttons for time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Exchange 2010 servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of Exchange 2010 servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Exchange 2010 server, in percent.
- The latency of the selected Exchange 2010 server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, swap memory usage, and CPU usage for the selected Exchange 2010 server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.

- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

User Active Connections. This widget displays a line graph. The line graph displays the number of active user connections for the selected Exchange 2010 server during the selected duration.

- The y axis displays the number of users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in the line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

OWA Requests. This widget displays a line graph. The line graph displays two lines: One for the frequency of Outlook Web Access requests for the selected Exchange 2010 server during the selected duration and another for the frequency of Web Services requests for the selected Exchange 2010 server during the selected duration.

- The y axis displays the number of requests per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

RPC Averaged Latency. This widget displays a line graph. The line graph displays the average latency of remote procedure calls (RPCs) for the selected Exchange 2010 server during the selected duration.

- The y axis displays the average RPC latency, in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

MBS Databases. This widget displays a line graph. The line graph displays two lines: One for I/O write latency for the mailbox server database for the selected Exchange 2010 and one for I/O read latency to the mailbox server for the selected Exchange 2010 server during the selected duration.

- The y axis displays the write and read latency statistics in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

Mailbox Messages.This widget displays a line graph. The line graph displays two lines: One for the number of mailbox messages sent to the selected Exchange 2010 server and one for the number of mailbox message sent from the selected Exchange 2010 server during the selected duration.

- The y axis displays the number of messages per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

Total Queue Messages. This widget displays a line graph. The line graph includes three lines: One for the number of messages in the submission queue, one for the number of messages in the delivery queue, and one for the number of queued message that were delivered for the selected Exchange 2010 server during the selected duration.

- The y axis displays the number of messages per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

SMTP Messages. This widget displays a line graph. The line graphs includes two lines: One for the number of SMTP messages sent from the selected Exchange 2010 server and one for the number of SMTP messages received by the selected Exchange 2010 server during the selected duration.

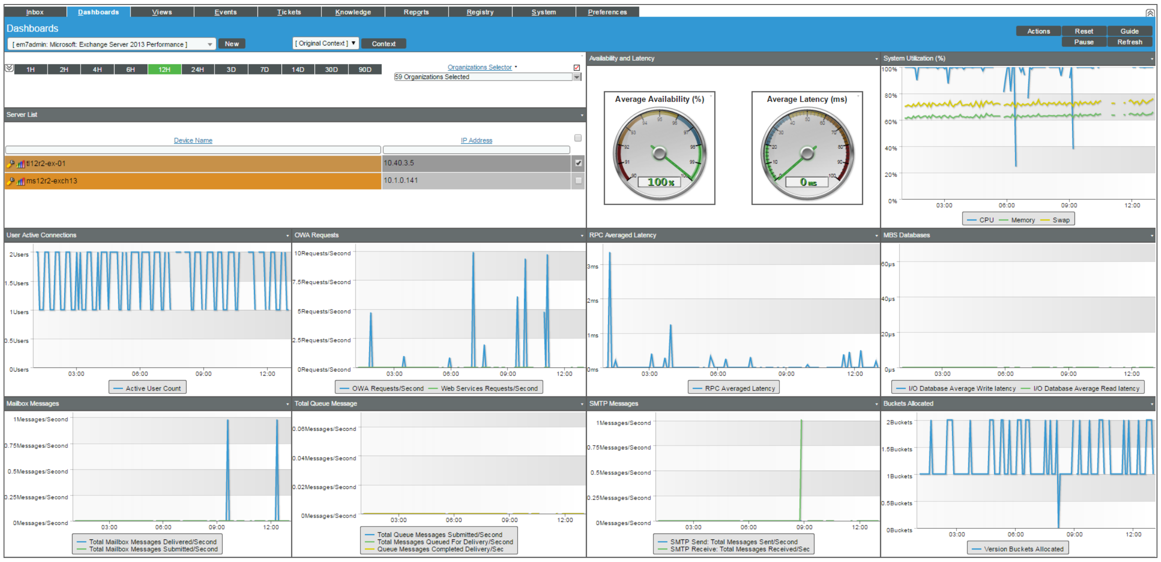
- The y axis displays the number of messages per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

Buckets Allocated. This widget displays a line graph. The line graph displays the number of buckets of version store memory used by the selected Exchange 2010 server during the selected duration.

- The y axis displays the number of allocated buckets.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2010 server.

Microsoft: Exchange Server 2013 Performance

The Microsoft: Exchange Server 2013 Performance dashboard provides an overview of the health and performance of a selected Exchange 2013 server.



Device Name	IP Address	□
tl12r2-ex-01	10.40.3.5	☑
ms12r2-exch13	10.1.0.141	□

Context Quick Selector. This widget contains buttons for time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Exchange 2013 servers that appear in the ***Server List***widget.

Server List. This widget displays a list of Exchange 2013 servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Exchange 2013 server, in percent.
- The latency of the selected Exchange 2013 server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays three lines: One for memory usage, one for swap memory usage, and one for CPU usage for the selected Exchange 2013 server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.

- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

User Active Connections. This widget displays a line graph. The line graph displays the number of active user connections for the selected Exchange 2013 server during the selected duration.

- The y axis displays the number of users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in the line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

OWA Requests. This widget displays a line graph. The line graph displays two lines: One for the frequency of Outlook Web Access requests and one for the frequency of Web Services requests for the selected Exchange 2013 server during the selected duration.

- The y axis displays the number of requests per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

RPC Averaged Latency. This widget displays a line graph. The line graph displays the average latency for remote procedure calls (RPCs) for the selected Exchange 2013 server during the selected duration.

- The y axis displays the average RPC latency, in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

MBS Databases. This widget displays a line graph. The line graph displays two lines: One for I/O write latency to the mailbox server database and one for I/O read latency to the mailbox server database for the selected Exchange 2013 server during the selected duration.

- The y axis displays the average write and read latency in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

Mailbox Messages. This widget displays a line graph. The line graph displays two lines: One for the number of mailbox messages sent from the selected Exchange 2013 and one for the number of mailbox messages delivered to the selected Exchange 2013 server during the selected duration.

- The y axis displays the number of messages per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

Total Queue Messages. This widget displays a line graph. The line graph displays three lines: One for the the number of messages in the submission queue, one for the number of messages in the delivery queue, and one for the number of queued message that were delivered for the selected Exchange 2013 server during the selected duration.

- The y axis displays the number of messages per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

SMTP Messages. This widget displays a line graph. The line graph displays two lines: One for the number of SMTP messages sent from the selected Exchange 2013 server and one for the number of SMTP messages received by the selected Exchange 2013 server during the selected duration.

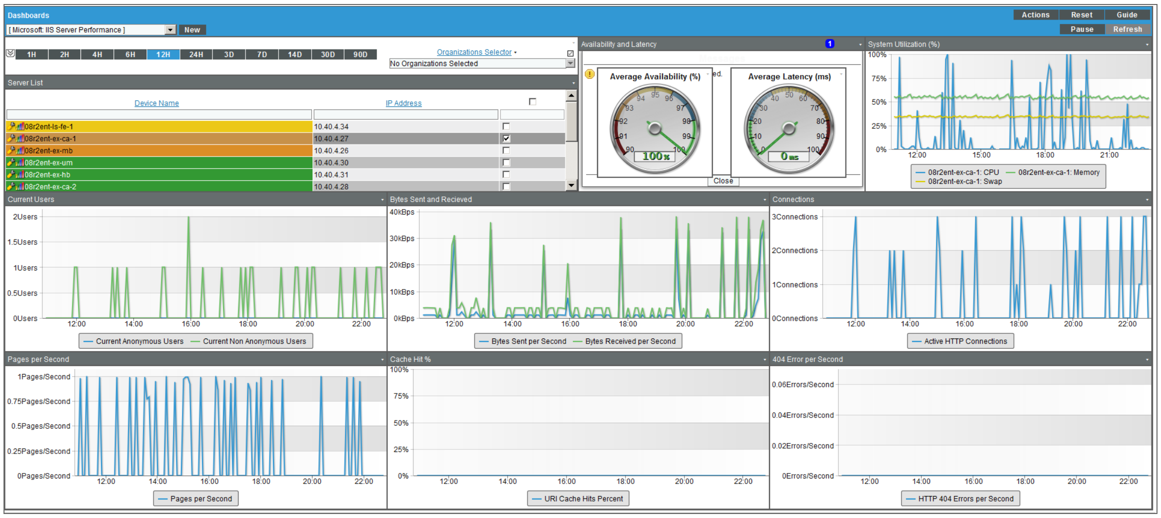
- The y axis displays the number of messages per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

Buckets Allocated. This widget displays a line graph. The line graph displays the number of buckets of version store memory used by the selected Exchange 2013 server during the selected duration.

- The y axis displays the number of allocated buckets.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Exchange 2013 server.

Microsoft: IIS Server Performance

The Microsoft: IIS Server Performance dashboard provides an overview of the health and performance of a selected IIS server.



Device Name	IP Address	□
08r2ent-ls-fe-1	10.40.4.34	□
08r2ent-ex-ca-1	10.40.4.27	☑
08r2ent-ex-mb	10.40.4.26	□
08r2ent-ex-um	10.40.4.30	□
08r2ent-ex-hb	10.40.4.31	□
08r2ent-ex-ca-2	10.40.4.28	□

Context Quick Selector. This widget contains buttons for time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of IIS servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of IIS servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected IIS server, in percent.
- The latency of the selected IIS server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected IIS server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.

- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

Current Users. This widget displays a line graph. The line graph displays Current Anonymous Users and Current Non Anonymous Users. Each parameter is represented by a color-coded line.

- The y axis displays number of users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

Bytes Sent and Received. This widget displays a line graph. The line graph displays Bytes Sent Per Second and Bytes Received Per Second. Each parameter is represented by a color-coded line.

- The y axis displays kB of data per second..
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

Connections. This widget displays a line graph. The line graph displays the number of Active HTTP Connections.

- The y axis displays number of connections.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

Pages Per Second. This widget displays a line graph. The line graph displays the number of Pages (served) Per Second.

- The y axis displays number of pages per second..
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

Cache Hit %. The IIS server caches (in memory) frequently requested files. This widget displays a line graph. The line graph displays the ratio of kernel URI cache hits to total cache requests.

- The y axis displays percent of URI cache hits.

- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

404 Errors Per Second. This widget displays a line graph. The line graph displays the number of errors due to requests that couldn't be satisfied by the server because the requested document couldn't be found, per second.

- The y axis displays number of errors per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected IIS server.

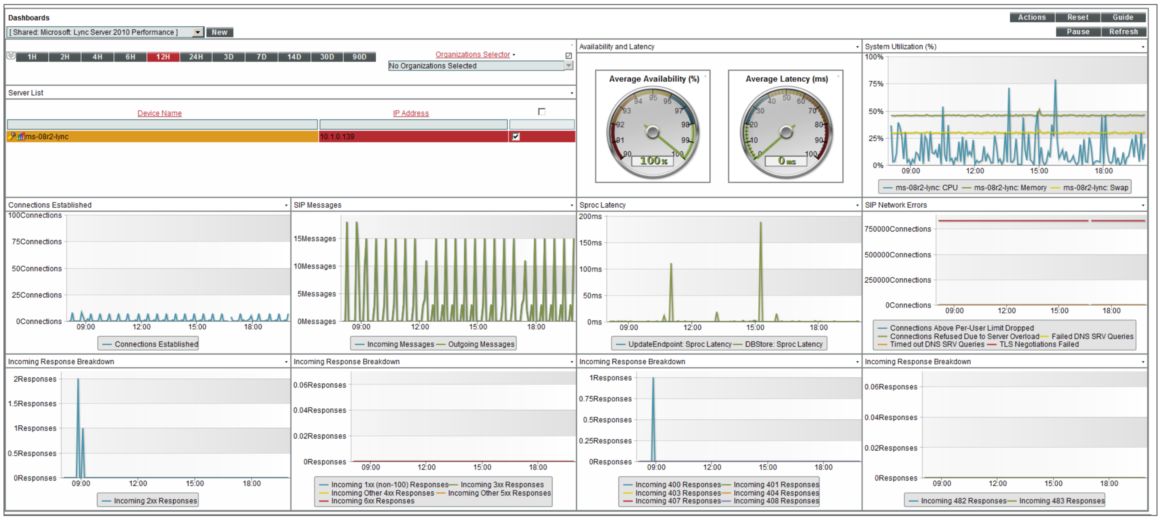
Microsoft: Lync Server 2010 Dashboards

The *Microsoft: Lync Server 2010 Dashboards* PowerPack includes the following dashboards:

- Microsoft: Lync Server 2010 Performance
- Microsoft: Lync Server 2010 Utilization

Microsoft: Lync Server 2010 Performance

The Microsoft: Lync 2010 Server Performance dashboard provides an overview of the health and performance of a selected Lync 2010 server.



Dashboards

[Shared: Microsoft: Lync Server 2010 Performance]

Organizations Selector

No Organizations Selected

Server List

Device Name	IP Address	□
ms-08r2-lync	10.1.0.139	☑

Context Quick Selector. This widget contains buttons for time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Lync 2010 servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of Lync 2010 servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Lync 2010 server, in percent.
- The latency of the selected Lync 2010 server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected Lync 2010 server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Connections Established. This widget displays a line graph. The line graph displays Connections Established.

- The y axis displays number of connections.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

SIP Message. SIP is a protocol for instant messaging and VOIP. This widget displays a line graph. The line graph displays Incoming Message and Outgoing Messages. Each parameter is represented by a color-coded line.

- The y axis displays number of messages.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Sproc Latency. Stored Procedure Call (sproc) latency is the time it takes for the Lync database to process the stored procedure call.

- The y axis displays the duration, in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

SIP Network Errors. This widget displays information about errors during instant messaging or VOIP. This widget displays a line graph. The line graph displays Connections Above Per-User Limit Dropped, Connections Refused Due to Server Overload, Failed DNS SRV Queries, Time Out DNS SRV Queries, and TLS Negotiations Failed. Each parameter is represented by a color-coded line.

- The y axis displays the number of connections that resulted in errors.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Incoming Response Breakdown. This widget displays information about the number of responses generated by the server. This widget displays a line graph. The line graph displays Incoming 2xx Responses. A 2xx Response means that a connection has been established.

- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Incoming Response Breakdown. This widget displays information about the number of responses generated by the server. This widget displays a line graph. The line graph displays Incoming 1xx (non-100) Responses, Incoming 3xx Responses, Incoming Other 4xx Responses, Incoming Other 5xx Responses, and Incoming 6xx Responses. Each parameter is represented by a color-coded line. For a description of SIP response codes, see the Wikipedia page http://en.wikipedia.org/wiki/List_of_SIP_response_codes.

- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Incoming Response Breakdown. This widget displays information about the number of responses generated by the server. This widget displays a line graph. The line graph displays Incoming 400 Responses, Incoming 401 Responses, Incoming Other 403 Responses, Incoming 404 Responses, Incoming 407 Responses, and Incoming 408 Responses. Each parameter is represented by a color-coded line. For a description of SIP response codes, see the Wikipedia page http://en.wikipedia.org/wiki/List_of_SIP_response_codes.

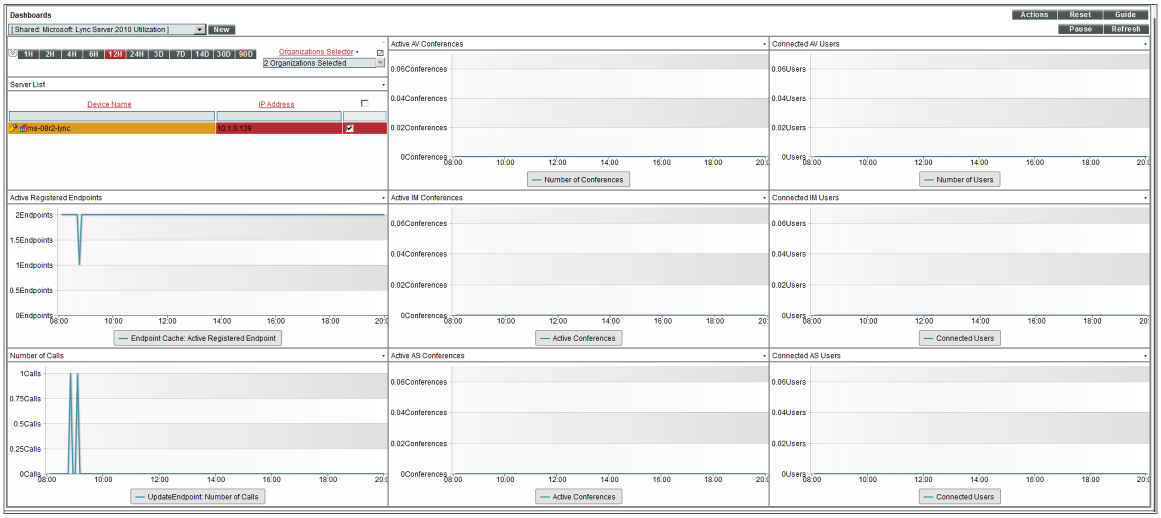
- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Incoming Response Breakdown. This widget displays information about the number of responses generated by the server. This widget displays a line graph. The line graph displays Incoming 482 Responses and Incoming 483 Responses. Each parameter is represented by a color-coded line. For a description of SIP response codes, see the Wikipedia page http://en.wikipedia.org/wiki/List_of_SIP_response_codes.

- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Microsoft: Lync Server 2010 Utilization

The Microsoft: Lync 2010 Server Utilization dashboard provides an overview of how users are using a selected Lync 2010 server.



Context Quick Selector. This widget contains the time span preset buttons and Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Lync 2010 servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of Lync 2010 servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Lync 2010 server, in percent.
- The latency of the selected Lync 2010 server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected Lync 2010 server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent t.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Active Registered Endpoints. Endpoints are devices that are connected to the Lync front-end server. This widget displays a line graph. The line graph displays Endpoint Cache: Active Registered Endpoints.

- The y axis displays numbered of registered endpoints.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Active IM Conferences. This widget displays the current number of IM conversations on the Lync server. Conferences usually include more than two users. This widget displays a line graph. The line graph displays Active Conferences.

- The y axis displays numbered of IM conferences.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Connected IM Users. This widget displays the current number of connected IM users. This widget displays a line graph. The line graph displays Connected Users.

- The y axis displays numbered of IM users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Number of Calls. This widget displays the current number of voice calls on the Lync server. This widget displays a line graph. The line graph displays UpdateEndpoint: Number of Calls.

- The y axis displays numbered of calls.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Active AS Conferences. This widget displays the number of active conferences using Application Sharing (AS). This widget displays a line graph. The line graph displays Active Conferences.

- The y axis displays numbered of AS conferences.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

Connected AS Users. This widget displays the number of users connected to conferences using Application Sharing (AS). This widget displays a line graph. The line graph displays Connected Users.

- The y axis displays numbered of AS users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

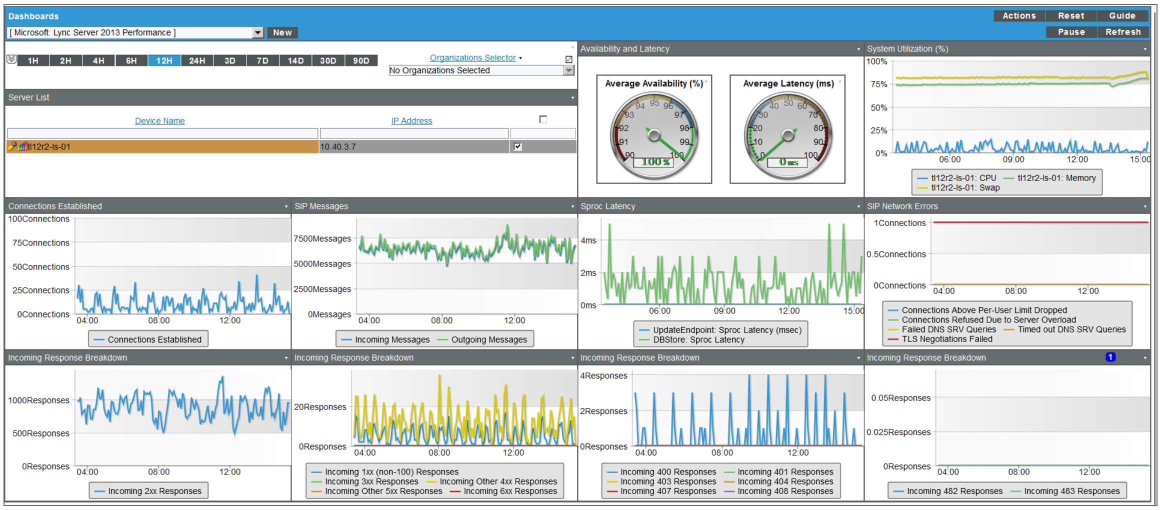
Microsoft: Skype for Business Dashboards

The *Microsoft: Skype for Business Dashboards* PowerPack includes the following dashboards:

- Microsoft: Lync Server 2013 Performance
- Microsoft: Lync Server 2013 Utilization

Microsoft: Lync Server 2013 Performance

The Microsoft: Lync 2013 Server Performance dashboard provides an overview of the health and performance of a selected Lync 2013 server.



Device Name	IP Address	□
tl12r2-ls-01	10.40.3.7	☑

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Context Quick Selector. This widget contains the time span preset buttons and Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Lync 2013 servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of Lync 2013 servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Lync 2013 server, in percent.
- The latency of the selected Lync 2013 server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected Lync 2013 server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Connections Established. This widget displays a line graph. The line graph displays Connections Established.

- The y axis displays number of connections.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2010 server.

SIP Message. SIP is a protocol for instant messaging and VOIP. This widget displays a line graph. The line graph displays Incoming Message and Outgoing Messages. Each parameter is represented by a color-coded line.

- The y axis displays number of messages.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Sproc Latency. Stored Procedure Call (sproc) latency is the time it takes for the Lync database to process the stored procedure call.

- The y axis displays the duration, in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.

- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

SIP Network Errors. This widget displays information about errors during instant messaging or VOIP. This widget displays a line graph. The line graph displays Connections Above Per-User Limit Dropped, Connections Refused Due to Server Overload, Failed DNS SRV Queries, Time Out DNS SRV Queries, and TLS Negotiations Failed. Each parameter is represented by a color-coded line.

- The y axis displays the number of connections that resulted in errors.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Incoming Response Breakdown. This widget displays information about the number of responses that are being generated by the server. This widget displays a line graph. The line graph displays Incoming 2xx Responses. A 2xx Response means that a connection has been established.

- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Incoming Respond Breakdown. This widget displays information about the number of responses that are being generated by the server. This widget displays a line graph. The line graph displays Incoming 1xx (non-100) Responses, Incoming 3xx Responses, Incoming Other 4xx Responses, Incoming Other 5xx Responses, and Incoming 6xx Responses. Each parameter is represented by a color-coded line. For a description of all SIP response codes, see the Wikipedia page http://en.wikipedia.org/wiki/List_of_SIP_response_codes.

- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
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Incoming Response Breakdown. This widget displays information about the number of responses that are being generated by the server. This widget displays a line graph. The line graph displays Incoming 400 Responses, Incoming 401 Responses, Incoming Other 403 Responses, Incoming 404 Responses, Incoming 407 Responses, and Incoming 408Responses. Each parameter is represented by a color-coded line. For a description of all SIP response codes, see the Wikipedia page http://en.wikipedia.org/wiki/List_of_SIP_response_codes.

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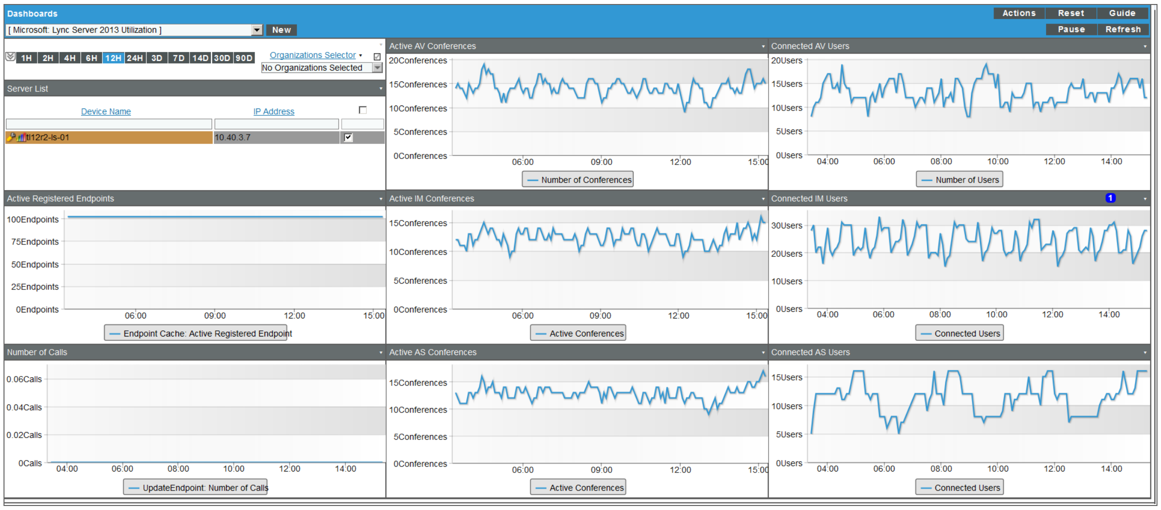
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Incoming Response Breakdown. This widget displays information about the number of responses that are being generated by the server. This widget displays a line graph. The line graph displays Incoming 482 Responses and Incoming 483 Responses. Each parameter is represented by a color-coded line. For a description of all SIP responses codes, see the Wikipedia page http://en.wikipedia.org/wiki/List_of_SIP_response_codes.

- The y axis displays the number of responses.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Microsoft: Lync Server 2013 Utilization

The Microsoft: Lync 2013 Server Utilization dashboard provides an overview of how users are using a selected Lync 2013 server.



Device Name	IP Address	□
tl12r2-ls-01	10.40.3.7	☑

Context Quick Selector. This widget contains buttons for time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of Lync 2013 servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of Lync 2013 servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected Lync 2013 server, in percent.
- The latency of the selected Lync 2013 server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected Lync 2013 server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Active Registered Endpoints. Endpoints are devices that are connected to the Lync front-end server. This widget displays a line graph. The line graph displays Endpoint Cache: Active Registered Endpoints.

- The y axis displays the number of registered endpoints.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Active IM Conferences. This widget displays the number of IM conversations on the Lync server. Conferences usually include more than two users. This widget displays a line graph. The line graph displays Active Conferences.

- The y axis displays the number of IM conferences.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Connected IM Users. This widget displays the current number of connected IM users. This widget displays a line graph. The line graph displays Connected Users.

- The y axis displays the number of IM users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Number of Calls. This widget displays the current number of voice calls on the Lync server. This widget displays a line graph. The line graph displays UpdateEndpoint: Number of Calls.

- The y axis displays the number of calls.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Active AS Conferences. This widget displays the number of active conferences using Application Sharing (AS). This widget displays a line graph. The line graph displays Active Conferences.

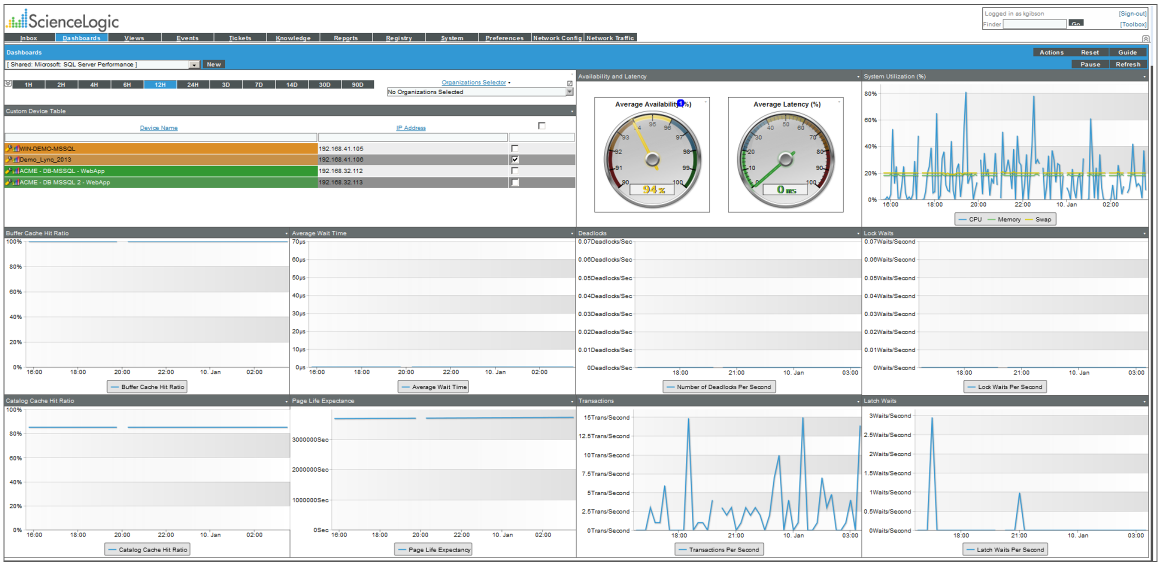
- The y axis displays the number of AS conferences.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Connected AS Users. This widget displays the number of users connected to conferences using Application Sharing (AS). This widget displays a line graph. The line graph displays Connected Users.

- The y axis displays the number of AS users.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected Lync 2013 server.

Microsoft: SQL Server Performance

The Microsoft: SQL Server Performance dashboard provides an overview of the health and performance of a selected SQL server.



Dashboards: [Shared: Microsoft: SQL Server Performance] New

No Organizations Selected

Device Name	IP Address	□
WIN-DEMO-MSSQL	192.168.41.105	□
Demo_Lync_2013	192.168.41.106	☑
ACME - DB-MSSQL - WebApp	192.168.32.112	□
ACME - DB MSSQL 2 - WebApp	192.168.32.113	□

Context Quick Selector. This widget contains buttons for the time span presets and the Organizations Selector.

- *Time span presets*. Users select the time span over which they want to view data. Selections range from one hour to 90 days.
- *Organizations Selector*. This drop-down list allows a user to select specific organizations for which they want to view data. This field filters the list of SQL servers that appear in the ***Server List*** widget.

Server List. This widget displays a list of SQL servers. Selecting a server drives the context for the other widgets in the dashboard.

Availability and Latency. This widget displays two gauges:

- The availability of the selected SQL server, in percent.
- The latency of the selected SQL server, in milliseconds.

System Utilization (%). This widget displays a line graph. The line graph displays memory usage, virtual-memory usage, and CPU usage for the selected SQL server during the selected duration. Each parameter is represented by a color-coded line.

- The y axis displays usage, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Buffer Cache Hit Ratio. This widget displays information about the percentage of page requests that are satisfied by data pages from the buffer cache without having to read from disk. The ratio is the total number of pages found in the buffer divided by the total number of requests. This widget displays a line graph. The line graph displays Buffer Cache Hit Ratio.

- The y axis displays the ratio, in percent.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Average Wait Time. This widget displays information about the average wait time to acquire a lock. This widget displays a line graph. The line graph displays Average Wait Time.

- The y axis displays the wait time, in milliseconds.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Deadlocks. This widget displays information about deadlocks. A deadlock occurs when two or more tasks permanently block each other because each task tries to lock a resource which the other tasks are also trying to lock. This widget displays a line graph. The line graph displays Number of Deadlocks Per Second.

- The y axis displays the number of deadlocks per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Lock Waits. This widget displays information about the number of lock requests per second that require the requester to wait. This widget displays a line graph. The line graph displays Lock Waits Per Second.

- The y axis displays the number of waits per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Catalog Cache Hit Ratio. This widget displays information about the ratio between catalog metadata cache hits and lookups. The ratio is the total number of pages found in the catalog metadata cache divided by the total number of lookups. This widget displays a line graph. The line graph displays Catalog Cache Hit Ratio.

- The y axis displays the ratio.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Page Life Expectancy. This widget displays information about the number of seconds a page will stay in the buffer pool (memory cache) without references. This widget displays a line graph. The line graph displays Page Life Expectancy.

- The y axis displays the number of seconds a page will stay in the buffer pool.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Transactions. A transaction is a sequence of operations that make up a single logical unit of work, usually a change to the database. This widget displays information about the number of transactions per second to the SQL server. This widget displays a line graph. The line graph displays Transactions Per Second.

- The y axis displays the number of transactions per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Latch Waits. A latch is an object that ensures data integrity for objects in the buffer pool (memory cache). This widget displays a line graph. The line graph displays Latch Waits Per Second.

- The y axis displays the number of waits per second.
- The x axis displays time. The increments vary, depending upon the date range selected in the ***Context Quick Selector*** widget.
- Mousing over any point in any line displays the average value at that time-point.
- Clicking on a data point displays the Device Performance graph for the selected parameter on the selected SQL server.

Chapter

8

Troubleshooting

Overview

The following sections describe some of the error messages that you might see when configuring SL1 to monitor Windows devices:

Troubleshooting WinRM Error Messages

SL1 can generate the following error messages when problems occur in Windows Remote Management (WinRM). For each error message, the top-most cause listed is the most likely reason for the error message.

Error / Message	Cause / Resolution
Incorrect username and/or password provided in the PowerShell Credential.	Bad HTTP response returned from server. Basic authentication failed. Code 401. (For more information, see the section ***Debugging Code 401 Errors***.)
	Pre-authentication failed while getting initial credentials.
	Client not found in Kerberos database.

Error / Message	Cause / Resolution
The device cannot respond to WinRM requests or the PowerShell credential settings do not match the device's WinRM configuration.	Kerberos-based authentication failed. Code 500. (For more information, see the section ***Debugging Code 500 Errors***.)
	[Errno 111] Connection refused.
	ParseError.
Server is offline.	Increase the ***Timeout*** value on your ScienceLogic credential.

NOTE: If you receive an error message that is a combination of the first two error messages, then you must run debugging steps for both Code 401 and Code 500.

Debugging Code 401 Errors

If you encounter a Code 401 error, perform the following troubleshooting steps to debug the error:

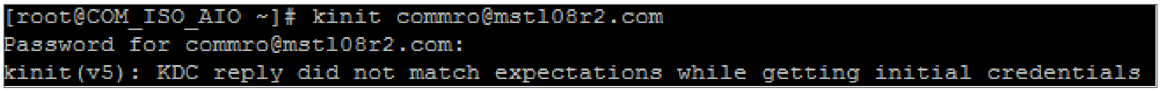
- Determine if the error is caused by an issue with the Kerberos ticket:
  - Ensure forward and reverse DNS are configured correctly when using Active Directory authentication:

```
# nslookup [IP address]
# nslookup [hostname]
```

  - Ensure you are able to run the following command without error from the collector:

```
# kinit [username@DOMAINNAME]
```

  - If you see the following error, change the domain name to all capital letters:



```
[root@COM_ISO_AIO ~]# kinit commro@mstl08r2.com
Password for commro@mstl08r2.com:
kinit(v5): KDC reply did not match expectations while getting initial credentials
```

- Ensure that your WinRM settings match your ScienceLogic credential.
  - To print out current WinRM settings:

```
# winrm get winrm/config
```

  - If your ScienceLogic credential says no encryption, AllowUnencrypted should be set to True for both the Client and the Service:

```
# winrm set winrm/config/client ‘@{AllowUnencrypted="$true"}’
# winrm set winrm/config/service ‘@{AllowUnencrypted="$true"}’
```

  - If you are using local type credentials, basic Authentication should be set to True for both Client and Service:

```
# winrm set winrm/config/client/Auth '@{Basic="$true"}'
# winrm set winrm/config/service/Auth '@{Basic="$true"}'
```

  - If you are using AD type credentials, Kerberos Authentication should be set to True for both Client and Service:

```
# winrm set winrm/config/client/Auth '@{Kerberos="$true"}'
# winrm set winrm/config/service/Auth '@{Kerberos="$true"}'
```

- In the ScienceLogic credential, ensure the Active Directory ***Hostname/IP*** field contains the FQDN and the ***LDAP Domain*** field includes the domain.
- In the ScienceLogic credential, the value in the ***LDAP Domain*** field might need to be entered in all capital letters.
- Ensure your ScienceLogic credentials are correct:
  - SSH to your Data Collector and try running the following command:

```
# wmic -U 'user%password' //IP "select * from Win32_ComputerSystem"
```

> NOTE: If you choose to copy and paste the above command from this document into a shell session, you might have to replace the single and double quotation marks.

- If you are using Windows Servers 2012 and above, make sure that the user you are using belongs to the group: WinRMRemoteWMIUsers__
- If you are using Windows Server 2008, 2008r2, or below, ensure that the user you are using is an administrator. This is a Windows requirement.
- If multiple domains are in use, ensure that they are mapped in the [domain_realm] section of the Kerberos krb5.conf file.
  - The [domain_realm] section provides a translation from a domain name or hostname to a Kerberos realm name.
- Ensure that the username and password are correct and that you can log on to the system.
- Ensure your credential cache is up-to-date:
  - SSH to your Data Collector and cd to the /tmp/ directory.
  - Do an 'ls' to list all the contents of the /tmp/ directory.
  - If you see any files that being with "krb5cc_", delete those files.

Debugging Code 500 Errors

If you encounter a Code 500 error, perform the following troubleshooting steps to debug the error:

- In the ScienceLogic credential, increase the value in the ***Timeout*** field (e.g., 180000 ms.).

- Increase the timeout in the WinRM settings:

```
winrm set winrm/config ‘@{MaxTimeoutms=”30000”}’
```

- Increase the maximum number of concurrent operations per user:

```
winrm set winrm/config/service ‘@{MaxConcurrentOperationsPerUser=”100”}’
```

- Increase the maximum number of connections:

```
winrm set winrm/config/service ‘@{MaxConnections=”100”}’
```

- Increase the maximum number of concurrent operations:

```
winrm set winrm/config/service ‘@{MaxConcurrentOperations=”500”}’
```

- Ensure that the Windows device being monitored is not exceeding its resource thresholds. You can do this by opening Resource Monitor on the Windows Device and monitoring the CPU usage.

Troubleshooting PowerShell Error Messages

SL1 can generate the following error message when monitoring Windows devices using PowerShell. This error message usually indicates that an issue with WinRM is not causing the error.

Error / Message	Cause / Resolution
Get-Counter The specified object was not found on the computer.	The PowerShell object was not found on the device that is being monitored. To test this, copy the PowerShell request from the Dynamic Application and run it on the Windows device in a PowerShell shell as Administrator. If you get a similar error message, then the counter does not exist on your Windows device. This means that the user must install the necessary service on the Windows device.

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800-SCI-LOGIC (1-800-724-5644)

International: +1-703-354-1010