

SolarWinds Orion

IP Address Manager Administrator Guide

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SolarWinds, Inc develops and markets an array of network management, monitoring, and discovery tools to meet the diverse requirements of today's network management and consulting professionals. SolarWinds products continue to set benchmarks for quality and performance and have positioned the company as the leader in network management and discovery technology. The SolarWinds customer base includes over 45 percent of the Fortune 500 and customers from over 90 countries. Our global business partner distributor network exceeds 100 distributors and resellers.

Contacting SolarWinds

You can contact SolarWinds in a number of ways, including the following:

Team	Contact Information
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Technical Support	www.solarwinds.com/support
User Forums	www.thwack.com

Conventions

The documentation uses consistent conventions to help you identify items throughout the printed and online library.

Convention	Specifying
Bold	Window items, including buttons and fields.
<i>Italics</i>	Book and CD titles, variable names, new terms
Fixed font	File and directory names, commands and code examples, text typed by you
Straight brackets, as in [value]	Optional command parameters
Curly braces, as in {value}	Required command parameters
Logical OR, as in value1 value2	Exclusive command parameters where only one of the options can be specified

SolarWinds Orion IP Address Manager Documentation

The following documents are included in the SolarWinds Orion IP Address Manager documentation library:

Document	Purpose
Administrator Guide	Provides detailed setup, configuration, and conceptual information.
Evaluation Guide	Provides an introduction to Orion Network Performance Monitor features and instructions for installation and initial configuration.
Page Help	Provides help for every window in the Orion IP Address Manager user interface
Release Notes	Provides the latest information about known issues, and updates. The latest Release Notes can be found at www.solarwinds.com .

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Chapter 1

Introduction

IP Address Manager (Orion IPAM) leverages Orion NPM's intuitive point-and-click interface to allow you to easily investigate IP address space issues. By periodically scanning the network for IP address changes, Orion IPAM maintains a dynamic list of IP addresses and allows engineers to plan for network growth, ensure IP space usage meets corporate standards, and reduce IP conflicts. Using Orion IPAM, network engineers can discover non-responsive IP addresses and coordinate team access to address IP space and track changes.

Why Install SolarWinds Orion IPAM

Built on the enterprise Orion core, Orion IPAM allows network engineers to create, schedule, and share IP space reports from a single reporting engine. Finally, network engineers can monitor network devices for fault, performance, configuration, and now IP address health indicators.

- Manage your entire IP infrastructure from an intuitive Web-Console
- Consolidate your IP addresses into a single repository
- Monitor DHCP Server and Scope capacity
- Keep better records by periodically scanning your network for IP address changes
- Create, schedule and share reports on the IP address space percent utilization
- Keep network devices up by identifying and eliminating IP address conflicts
- Coordinate team access to your address space with role-based access control and track changes
- Identify non-responsive IP addresses to optimize your IP space

Key Features of Orion IPAM

Orion IPAM provides the following valuable features to help manage IP addresses. These features are the foundation upon which IPAM is built.

Microsoft DHCP support

Monitor DHCP Servers and Scopes with capacity monitoring

Alerting capabilities

Alert on high Subnet and DHCP Scope utilizations.

Scheduled Scanning

Schedule and automatically scan your network on a regular basis to ensure your IP space is correctly configured

Scan Segmentation

Allows to manage some IP addresses manually and others with automatic scanning to ensure your network is running smoothly

Subnet Allocation Wizard

Specify a supernet and subnet sizes and Orion IPAM automatically allocates the correct sized subnet for your network

Change Auditing

Enables you to investigate IP address issues by knowing who made what changes when

User-defined Grouping

Create your own unique groups to categorize IP addresses by department, geography, device vendor, or your own custom fields

Global Search

Track down any specific IP address on your entire network in seconds by performing a global search directly from the Orion IPAM web console

Engineer's Toolset Integration

Integrate with SolarWinds Engineer's Toolset for right-click access to your favorite network management troubleshooting tools

Flexible Reporting

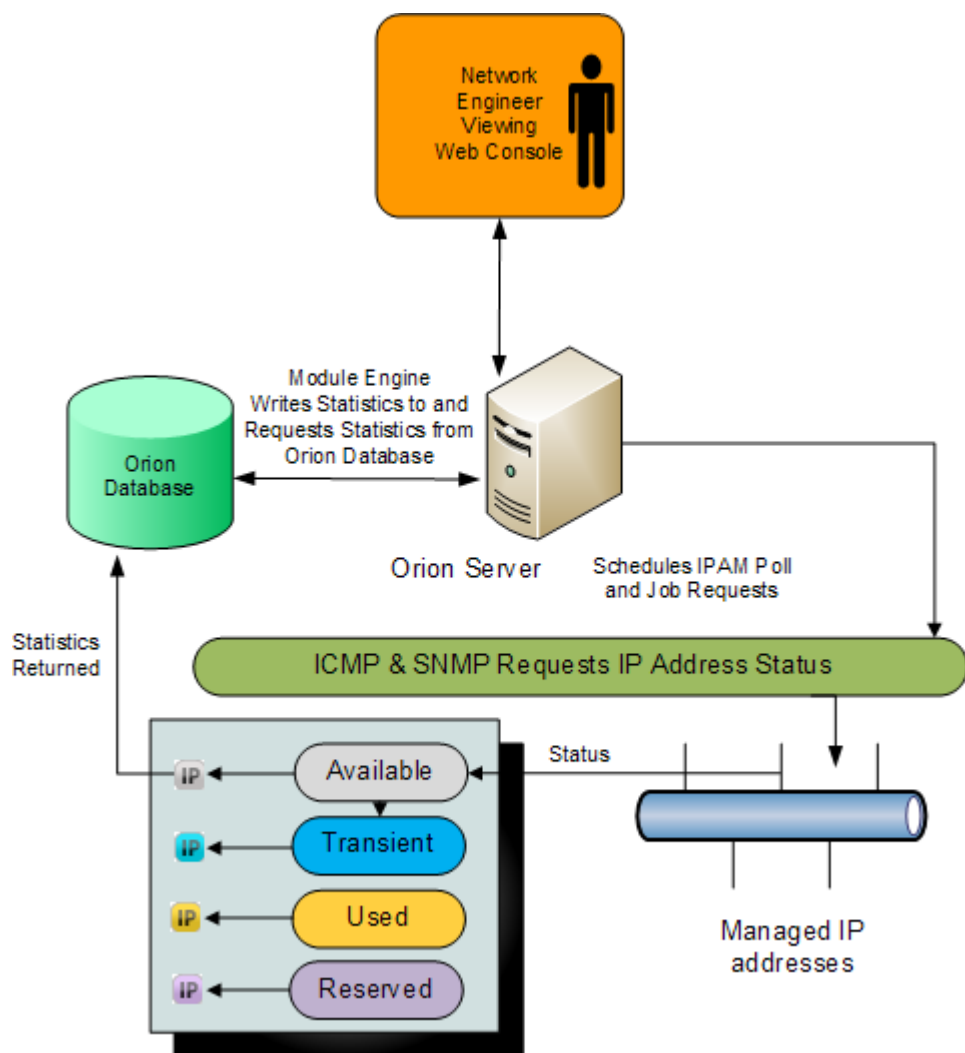
Generate IP address reports using out-of-the-box templates that can be easily customized with a few mouse clicks; automate report creation and distribution

IPv6 Capable

View and track dual-stacked IPv4 and IPv6 enabled devices

How Orion IPAM Works

Orion IP Address Manager joins the proven performance and solidity of Orion NPM and extends Orion NPM functionality into the realm of IP address management. Using ICMP and SNMP calls to collect details from devices on your network, IPAM tracks and displays IP address usage, in addition to automatically marking IP addresses that are no longer in use. Additionally, calls to DHCP servers are made to retrieve lease and scope details. Change logs and user activity is stored for tracking and auditing purposes in the Orion NPM database. All statistics are accessible using the Orion web interface.



Installing and Configuring Orion IPAM

Orion IPAM employs a simple, wizard-driven install process allowing you to quickly start managing your network. Refer to the following sections for more information about licensing, system requirements and detailed installation and configuration procedures.

Licensing Orion IPAM

Orion IPAM is licensed in accordance with the number of IP addresses you manage in one of three statuses; Used, Reserved and Transient. Unused and available IPs do not count towards managed IP count. The following licensing tiers of Orion IPAM are currently available:

- IPAM IP1000 for managing up to 1024 managed IP addresses.
- IPAM IP4000 for managing up to 4096 managed IP addresses.
- IPAM IP16000 for managing up to 16384 managed IP addresses.
- IPAM IPX for managing an unlimited number of managed IP addresses.

Orion IPAM allows you to designate managed IP addresses for management up to your license limit using any of the following methods:

- Importing your own network definitions and settings. For more information about importing network definitions and settings into Orion IPAM, see “Importing IP Addresses and Settings” on page 32.
- Adding a range of IP addresses within a previously unfilled subnet. For more information about adding IP address ranges, see “Adding a Range of IP Addresses” on page 37.
- DHCP Server and scope monitoring. For more information about adding DHCP servers, see “DHCP Scope Monitoring” on page 63.
- Using the Subnet Allocation Wizard to create managed subnets, and then select IP addresses existing within your new managed subnets. For more information about the Subnet Allocation Wizard, see “Using the Subnet Allocation Wizard” on page 45.

Orion IPAM Requirements

As an Orion module, Orion IPAM requires an installation of Orion NPM v9.5 Service Pack 5. At this time, system requirements for Orion IPAM do not exceed Orion NPM requirements.

Software	Requirements
Operating System	Windows 2008 Server (32-bit or 64-bit, running in 32-bit mode) Windows 2003 Server (32-bit or 64-bit, running in 32-bit mode) R2 IIS must be installed. SolarWinds recommends that Orion NPM administrators have local administrator privileges to ensure full functionality of local Orion NPM tools. Accounts limited to use of the web console do not require administrator privileges. Note: SolarWinds does not support installation of Orion NPM on Windows XP or Vista in production environments. If you are installing Orion NPM on these operating systems for evaluation purposes, you must confirm that Shared Memory, Named Pipes, and TCP/IP are enabled on remote databases.
Web Server	Microsoft IIS version 6.0 and later. DNS specifications require that hostnames be composed of alphanumeric characters (A-Z, 0-9), the minus sign (-), and periods (.). Underscore characters (_) are not allowed. For more information, see <i>RFC 952</i> . Note: SolarWinds neither recommends nor supports the installation of Orion NPM on the same server or using the same database server as a Research in Motion (RIM) Blackberry server.
.NET Framework	Version 3.5 or later
SNMP Trap Services	Windows operating system management and monitoring tools component
SQL Server	SQL Server 2005 Service Pack 1 (Express, Standard or Enterprise) SQL Server 2008 Express, Standard, or Enterprise The selected database instance must support mixed-mode or SQL authentication, and the following x86 components must be installed: - SQL Server System Common Language Runtime (CLR) Types - Microsoft SQL Server Native Client - Microsoft SQL Server Management Objects You can use the following database select statement to check your SQL Server version, service pack or release level, and edition: <code>select SERVERPROPERTY ('productversion'), SERVERPROPERTY ('productlevel'), SERVERPROPERTY ('edition')</code> Note: SQL Express is unable to manage databases larger than 4GB. It is limited to a single processor and will use no more than 1MB RAM. Use a SQL Server instance for larger networks requiring larger databases.
DHCP Monitoring	Microsoft Server 2003/2008
ESX Server	Version 3.5 or later Note: VMware ESX Server version 3.5 or later is only required where Orion NPM is used to monitor VMware ESX Servers.
Web Console Browser	Microsoft Internet Explorer version 6 or later with Active scripting Firefox 3.0 or later

Note: Orion IPAM v1.5 requires the installation Orion NPM 9.5 SP5.

Installing Orion IPAM

The following procedure guides you through the installation of Orion IPAM. Ensure that the server on which you install Orion IPAM meets or exceeds the stated requirements for both Orion Network Performance Monitor (Orion NPM) and Orion IPAM. For more information about Orion IPAM requirements, see “Orion IPAM Requirements” on page 8. Complete the following procedure to install Orion IPAM.

To install Orion IP Address Manager:

1. Log on to the Orion NPM server that you want to use for IP address management.
Note: Consider backing up your Orion database before performing any upgrade.
2. Navigate to your download location and launch the executable.
3. Review the Welcome text, and then click **Next**.
4. Accept the terms in the license agreement, and then click **Next**.
5. Click **Install**, and then click **Finish**.
6. Click **Enter Licensing Information**.
7. ***If the computer on which you installed IPAM is connected to the Internet***, complete the following procedure.
 - a. Click **I want to activate my license over the Internet**.
 - b. Browse to <http://www.solarwinds.com/customerportal/>.
 - c. Login to the customer portal using your CustomerID and Password.
 - d. Copy your IPAM Activation Key to the clipboard, and then paste it into the Activation Key field on the Activate IPAM window.
 - e. Click **Next**.
 - f. Enter your contact information.
 - g. ***If you use a proxy server to access the Internet***, check the Proxy Server checkbox, and then type the proxy address and port number.
 - h. Click **Next**.
8. When the Orion IP Address Manager Setup Wizard completes, click **Finish**.
9. ***If the Configuration Wizard does not start automatically***, click **Start > All Programs > SolarWinds Orion > Configuration Wizard**.
10. Review the Orion Configuration Wizard welcome text, and then click **Next**.

11. Confirm that all services that you want to install are checked in the Service Settings window, and then click **Next**.
12. Click **Finish** when the Orion Configuration Wizard completes.

Checking License Status

Orion IPAM provides a tool to display the current usage of your license by indicating the number of currently managed addresses. This number also appears in the bottom right of the Manage Subnets page.

1. Click **Start > All Programs > SolarWinds Orion > Orion IP Address Manager > Orion IP Address Manager Licensing**.
2. Click **Restart IPAM Services** to update the website with the license change.
3. Click **Close**.

Maintaining Licenses with License Manager

SolarWinds License Manager is an easily installed, free utility that gives you the ability to migrate Orion licenses from one computer to another without contacting SolarWinds Customer Service. The following sections provide procedures for installing and using License Manager.

Installing License Manager

Install License Manager on the computer from which you are migrating currently licensed products.

Note: You must install License Manager on a computer with the correct time. If the time on the computer is off by as little as 5 minutes, in either direction, from Greenwich Mean Time (GMT), you will be unable to reset licenses without calling SolarWinds Customer Service. Time zone settings do not affect and do not cause this issue.

To install License Manager:

1. Navigate to <http://support.solarwinds.com/support/default.cfm>.
2. Provide your SolarWinds Customer ID and password, and then click **Login**.
3. Click **Downloads & Updates** in the left navigation pane.
4. Locate the Download Licensed Software section of the page, and click **SolarWinds License Manager**.
5. Unzip the downloaded file, and then run `LicenseManager.exe`.

Using License Manager

You must run License Manager on the computer where the currently licensed SolarWinds product is installed before you can move licenses to a new installation. The following procedure deactivates currently installed licenses that can then be transferred to a new installation.

To deactivate currently installed licenses:

1. Click **Start > All Programs > SolarWinds > SolarWinds License Manager**.
2. Check products to deactivate on this computer, and then click **Deactivate**.
3. Specify your SolarWinds Customer ID and password when prompted, and then click **Deactivate**.

Note: Deactivated licenses are now available to activate on a new computer.

When you have successfully deactivated your products, log on to the computer on which you want to install your products, and then begin installation. When asked to specify your licenses, provide the appropriate information. The license you deactivated earlier is then assigned to the new installation.

Configuring Orion IPAM

Orion IPAM provides an easily configurable, custom user interface. The following sections detail available options for configuring the customizable aspects of your Orion IPAM installation.

Configuring Subnet Scan Settings

Orion IPAM is capable of using both SNMP and ICMP scanning to continuously determine the status of your monitored network. The Subnet Scan Settings view allows you to select how Orion IPAM automatically scans your network for changes.

To configure Orion IPAM subnet scan settings:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **Subnet Scans**.
4. Provide an appropriate value for the **Transient Period**. The Transient period must be a value from .2 to 340 days.

Note: Orion IPAM continuously scans all managed IP addresses on your network. If a device fails to respond to any SNMP or ICMP requests for the period of time designated as the **Transient Period**, Orion IPAM changes the status of the unresponsive IP address from *Used* to *Available*. Any associated custom attribute will be overwritten.

5. **If you want to collect device details using SNMP to scan your network subnets**, complete the following steps:
 - a. Check **Enable SNMP Scanning** in the SNMP Scanning section.
 - b. Provide an appropriate number of **SNMP Retries**.
 - c. Designate the **SNMP Timeout** for SNMP requests on your network. The timeout value is measured in milliseconds.
6. **ICMP is used by default to scan your network subnets for changes**, complete the following steps to configure ICMP:
 - a. Provide an appropriate number of **Pings per address**.
 - b. Designate both the **Delay between Pings** and the **Ping Timeout**, in ms, for ICMP requests on your network.
7. Click **Save**.

Note: You can disable scanning on a per subnet basis. For more information about editing subnet properties, see “Editing Subnets” on page 44.

Configuring DHCP Scan settings

DHCP Scope Monitoring allows you to add/edit DHCP Servers or Scopes and configure the scan settings.

To configure DHCP scan settings

1. Click on the **DHCP Scope Monitoring** tab.
2. Click **Add New DHCP Server**.
3. Select the DHCP node to be added from the list of nodes.
4. Choose or create the necessary Windows Credentials from the drop down list. Then click **TEST** to verify the credential.
5. Select the **Server Scan Settings**. Default is set to 4 hours.
6. **If you want to automatically add new scopes and subnets after scanning**, check the box.
7. **If you want to IPAM to scan using ICMP and SNMP to obtain additional IP Address details**, check the **Enable subnet scanning box** and select the scanning interval.
8. To finish, click **ADD DHCP SERVER**

Note: Only Microsoft DHCP Servers on Windows 2003 and 2008 are supported. DHCP Servers must already be defined as Nodes within Orion NPM.

Note: All Windows credentials are sent in clear text during configuration only. Consider updating credentials while locally logged into the IPAM server or over

an HTTPS connection. The Windows account specified within IPAM must be on the DHCP server and of the three following groups: DHCP Users, DHCP Administrators and or local Administrators. IPAM impersonates the specified account on the local computer in order gain access. If the IPAM computer is not within the same windows domain as the DHCP server, the IPAM computer must have the identical account and password.

Managing Windows Credentials

The Windows Credentials view allows you to configure and save Windows credentials for use when scanning DHCP devices on your network. The following sections provide instructions for managing Windows credentials for your devices.

Adding Windows Credentials

The following procedure helps you store Windows credentials for Orion IPAM. Orion IPAM attempts to communicate with your DHCP network devices using these credentials.

To add a Windows Credential to Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **Manage Windows Credentials for Scope scans**.
4. Click **Add** in the tool bar.
5. Provide an appropriate **Display Name** for your new credential.

Note: The Windows Credentials view uses the Display Name to reference the different Windows credentials you have saved.

6. Enter the **Password** of your new credential.
7. Click **Save**.

Note: All Windows credentials are sent in clear text during configuration only. Consider updating credentials while locally logged into the IPAM server or over an HTTPS connection. The Windows account specified within IPAM must be on the DHCP server and of the three following groups: DHCP Users, DHCP Administrators and or local Administrators. IPAM impersonates the specified account on the local computer in order gain access. If the IPAM computer is not within the same windows domain as the DHCP server, the IPAM computer must have the identical account and password.

Managing SNMP Credentials

The SNMP Credentials view allows you to configure and save SNMP credentials for use when scanning SNMP devices on your network. The following sections provide instructions for managing SNMP credentials for your devices.

Adding SNMP Credentials

The following procedure helps you store SNMP credentials for Orion IPAM. Orion IPAM attempts to communicate with your network devices using the credentials in the order they are entered. To change the SNMP credential order see [Ordering SNMP Credentials](#) page 10.

To add an SNMP credential to Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **SNMP Credentials**.
4. Click **Add** in the tool bar.
5. Provide an appropriate **Display Name** for your new credential.

Note: The SNMP Credentials view uses the Display Name to reference the different SNMP credentials you have saved.

6. Select the **SNMP Version** of your new credential.

Notes:

- Orion IPAM uses SNMPv2c by default. If the credential you are adding is required to scan devices using the enhanced security features of SNMPv3, select **SNMPv3**
 - If you select SNMPv2c and you do not want Orion IPAM to use SNMP v1 if an SNMPv2c request fails, confirm that **Use SNMP v2 only** is checked.
7. *If the default SNMP port for the devices requiring your new credential is not 161*, provide the actual **SNMP Port** number for these devices.
 8. *If you want to use either SNMPv1 or SNMPv2c for subnet scanning with your new SNMP credential*, provide at least one valid read-only **Community String** for the devices you want to scan with your new credential.

Note: Orion IPAM requires the `public` **Community String**, at minimum, for subnet scanning.

9. ***If you want to use SNMPv3 for subnet scanning with your new SNMP credential***, you will need the following information:

- SNMPv3 User Name and Context
- SNMPv3 Authentication Method and Password/Key
- SNMPv3 Privacy/Encryption Method and Password/Key

10. Click **Save**.

Ordering SNMP Credentials

The following procedure provides the steps required to reorder stored SNMP credentials. Orion IPAM attempts SNMP communication using the stored credentials in the order provided.

To order SNMP credentials in Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **SNMP Credentials**.
4. Check the credentials you want to reorder, and then click **Up** or **Down** in the tool bar, as appropriate, to move selected credentials up or down, respectively, in the list of stored credentials.

Editing SNMP Credentials

The following procedure guides you through editing stored SNMP credentials Orion IPAM uses to monitor your network.

To edit an SNMP credential in Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **SNMP Credentials**.
4. Check the Display Name of the credential you want to edit, and then click **Edit** in the tool bar.
5. ***If you want to edit the credential Display Name***, provide the new **Display Name** for the selected credential in the designated field.

Note: The SNMP Credentials view uses the Display Name to reference the different SNMP credentials you have saved.

6. **If you want to edit the SNMP version of the selected credential**, select a different **SNMP Version** for the selected credential.

Notes:

- Orion IPAM uses **SNMPv2c** by default.
- **If you select SNMPv2c and you do not want Orion IPAM to use SNMP v1**, confirm that **Do not drop down to SNMP v1** is checked.
- **If the credential you are editing is required to scan devices that require the enhanced security features of SNMPv3**, confirm that **SNMPv3** is selected.

7. **If you want to provide a different SNMP port number for the selected credential**, provide the new **SNMP Port** number.
8. **If you want Orion IPAM to use either SNMPv1 or SNMPv2c for subnet scanning with the selected credential**, provide at least one valid read-only **Community String** for the devices to scan with the selected credential.

Note: Orion IPAM requires the `public` Community String, at minimum, for subnet scanning.

9. **If you want Orion IPAM to use SNMPv3 for subnet scanning with the selected credential**, provide the following settings:
 - SNMPv3 User Name and Context
 - SNMPv3 Authentication Method and Password/Key
 - SNMPv3 Privacy/Encryption Method and Password/Key

10. Click **Save**.

Deleting SNMP Credentials

Complete the following procedure to delete an SNMP credential from the credential library.

To delete an SNMP credential from Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **SNMP Credentials**.
4. Check the Display Name of the credential you want to delete, and then click **Delete** in the tool bar.
5. Click **Yes** to confirm that you want to delete the selected credential.

Creating and Configuring Custom Fields

Depending on the type of component, Orion IPAM provides a number of predefined text properties to help organize your network. Orion IPAM also offers the ability to add descriptive text fields to addresses, subnets, supernets, and groups.

Note: The Orion Custom Property Editor capabilities are not integrated with the Orion IPAM module at this time.

To create or edit an Orion IPAM custom field:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **IPAM Custom Fields**.
4. *If you want to add a custom field*, click **Add**.
5. *If you want to edit an existing custom field*, check the field to edit, and then click **Edit**.
6. Provide a **Database Column** for your custom field. The Database Column is the label used wherever Orion IPAM references the custom field you are defining in the Orion Web Console.
7. Edit the **Database Column** entry, as appropriate. The value is the alphanumeric label used in the Orion IPAM table of your Orion database for the custom field you are defining. By default, Orion IPAM generates this value automatically.
8. Edit the **Description** of this field as necessary. The Description text is displayed if the custom field you are defining may be edited.
9. Provide a **Max String Length** for your custom field. The Max String Length sets a limit to the number of characters you may use for any value of the custom field you are defining.
10. *If you want to make this custom field available to all network components defined in Orion IPAM*, check **Add to Groups, Supernets, and Subnets**. Making this custom field available to all network components defined in Orion IPAM gives you the option to edit this field whenever you edit any network component.
11. *If you want to make this custom field available to all IP addresses monitored by Orion IPAM*, check **Add to IP addresses**. Making this custom field available to all IP addresses monitored by Orion IPAM gives you the option to edit this field whenever you edit any IP address.
12. When you have completed configuration of your custom field, click **Save**.


Customizing the IP Address Manager View

The IP Address Manager view provides a highly customizable display of the current status of managed IP addresses on your monitored network. By default, the IP Address Manager view provides the following resources:

- Top 10 Subnets by % IP Address Space Usage
- Top 10 DHCP Scopes by % IP Address Space Usage
- Search for IP Address
- Custom List of Reports
- Manage Subnets and IP Addresses
- thwack Recent IP Address Manager Posts

You can customize your IP Address Manager view by adding, deleting, or reordering any available Orion resources.

To customize the IP Address Manager view:

1. Click **IP Address Manager** in the Modules toolbar.
2. Click **Customize Page**.
3. **If you want to change the column layout of your IP Address Manager view**, click **Edit** and then configure the column layout of your view as follows:
 - a. Select the number of columns under Layout.
 - b. Provide the width, in pixels, of each column in the appropriate fields.
 - c. **If you have finished setting the column layout for your view**, click **Submit**.
4. **If you want to add a resource**, repeat the following steps for each resource that you want to add:
 - a. Click **+** next to the column in which you want to add a resource.
 - b. Click **+** next to a resource group on the Add Resources page to expand the resource group tree displaying all available resources for the group.
 - c. Check the resources you want to add.
 - d. **If you have completed the addition of resources to the selected view**, click **Submit**.
5. **If you want to delete a resource from a column**, select the resource, and then click **X** next to the resource column.
6. **If you want to copy a resource in a column**, select the resource, and then click  next to the resource column to copy the selected resource.

7. **If you want to change the order in which resources appear in your view**, select resources, and then use the arrow keys to arrange them.
8. **If you have finished configuring your view**, click **Preview**.

A preview of your custom view displays in a new window. A message acting as a placeholder may display in some assigned resource locations, and resources will display as empty if resource information has not been polled yet. For more information, see “Resource Configuration Examples” in the *SolarWinds Orion Network Performance Monitor Administrator Guide*.
9. Close the preview window.
10. **If you still want to change aspects of your view**, repeat the preceding steps as needed.
11. **If you are satisfied with the configuration of your view**, click **Done**.

Notes:

- For more information about adding your customized view to menu bars as a custom item, see “Adding a Custom Menu Item” in the *SolarWinds Orion Network Performance Monitor Administrator Guide*.
- For more information about assigning your customized view as the default view for a user, see “Editing User Accounts” in the *SolarWinds Orion Network Performance Monitor Administrator Guide*.

Personalizing Manage Subnets and IP Addresses Views

Depending on the network component currently selected, the right pane of the dual-paned Manage Subnets and IP Addresses view displays either the Network View or the IP Address view. Both the Network View and the IP Address View may be personalized by reordering their respective default column arrangements. To personalize either the Network View or the IP Address View, simply click a column header and drag it to your preferred location. Your view personalization is saved immediately, and it is retained for the next time you use Orion IPAM. Select which resources to add and resize the columns to fit your needs.

Managing Orion IPAM Users

As a site administrator, you can use role definitions to adaptively restrict user access, as necessary, to maintain security without limiting your ability to delegate required network management activities. The following sections describe how to use role definitions to manage Orion IPAM users.

User Role Definitions

Orion IPAM allows site administrators to securely grant varying privilege levels to different types of Orion IPAM users. The following user roles are available:

Read-Only

Granted the basic level of access to Orion IPAM, Read-Only users are given read-only access to the following Orion IPAM views and features:

- All Orion IPAM web console resources, including search and Top XX resources not previously limited by Orion NPM account limitations. For more information, see “Understanding the IP Address Manager Summary View” on page 28.
- All IP address and network component properties and custom fields on the Manage Subnets and IP Addresses page. For more information, see “Manage Subnets and IP Addresses Page” on page 30.
- The Chart View on the Manage Subnets and IP Addresses page. For more information, see “For more information, see “Manage Subnets and IP Addresses Page” on page 30.

Operator

Operators maintain the same rights granted to Read-Only users with the addition of the following abilities:

- IP address property and custom field management, including the ability to edit IP address properties on portions of the network made available by the site administrator. For more information, see “Manage Subnets and IP Addresses Page” on page 30.
- Addition and deletion of IP address ranges from portions of the network made available by the site administrator. For more information, see “Manage Subnets and IP Addresses Page” on page 30.
- Subnet status selection on the Manage Subnets and IP Addresses page. For more information, see “Manage Subnets and IP Addresses Page” on page 30.

Power User

Power Users maintain the same rights granted to Operators with the addition of the following abilities:

- Drag-and-drop reorganization of network components in the left pane of the Manage Subnets and IP Addresses view. For more information, see “Manage Subnets and IP Addresses Page” on page 30.
- IP address and network settings import and export. For more information about importing and exporting see “Importing IP Addresses and Settings” on page 32 and “Importing IPs and Subnets Using the SolarWinds Engineer's Toolset
-

To import subnets and IP Addresses from the Engineer'sToolset:

1. Locate the ToolsetIP Address Manager database on your Toolset server.

Note: TheToolset IP Address Manager database has an .ipdbextension.

2. Copy the Toolset IPAddress Manager database to an appropriate location on your Orion server.

3. Open a CommandPrompt on the Orion server.

4. Enter CD "%Program Files\SolarWinds\Orion\IPAM"

5. Enter NET STOP "SolarWinds IPAM Information Service"

6. Enter SolarWinds.IPAM.Init.exe -import <Fullpath to your Toolset IP Address Manager database>

7. Enter NET START "SolarWinds IPAM Information Service"

- Exporting IP Addresses and Settings” on page 33.
- Supernet and group properties management, including the ability to edit supernet and group properties and custom fields on portions of the network made available by the site administrator. For more information, see “Manage Subnets and IP Addresses Page” on page 30.

Administrator

Administrators are granted the same access to Orion IPAM that is granted to Power Users with the following added privileges:

SNMP credentials management. For more information see “7. Click **Save**.

Note: All Windows credentials are sent in clear text during configuration only. Consider updating credentials while locally logged into the IPAM server or over an HTTPS connection. The Windows account specified within IPAM must be on the DHCP server and of the three following groups: DHCP Users, DHCP Administrators and or local Administrators. IPAM impersonates the specified account on the local computer in order gain access. If the IPAM computer is not within the same windows domain as the DHCP server, the IPAM computer must have the identical account and password.

- Managing SNMP Credentials ” on page 13.
- Custom fields management. For more information see “Creating and Configuring Custom Fields” on page 17.
- Subnet scan settings configuration. For more information see “Managing Subnet Scans” on page 44.

Default

The Default role will have full, unlimited access to the Orion IPAM application, if the user is an Orion NPM administrator. This role will act as read only for non-Orion administrators.

Assigning User Roles

Orion IPAM user roles are assigned using the Orion Web Console Account Manager. The following procedure assigns Orion IPAM user roles.

To define Orion IPAM user roles:

1. Click **Admin** in the Views menu bar.
2. Click **Account Manager** in the Accounts grouping of the Orion Website Administration page.
3. Select the Orion Web Console account corresponding to which Orion IPAM user role you are defining, and then click **Edit**.

Note: For more information about Orion Web Console accounts, see “Managing Web Accounts” in the *SolarWinds Orion Network Performance Monitor Administrator Guide*.

4. Expand *User’s* IP Address Manager Settings.
5. Select the appropriate **IPAM Role** for the selected user.
6. Click **Submit**.

Using Orion IPAM

Orion IPAM gives you the ability to easily monitor IP address space usage and to optimally manage IP address availability on your network. The following sections describe the various tools Orion IPAM provides to keep you informed of your network capacity.

Launching Orion IPAM

As an Orion module, Orion IPAM may be launched both from the within the Orion Web Console and from the Windows Start menu, as follows:

- To open Orion IPAM from within the Orion Web Console, click **IP Address Manager** in the Modules menu bar.
- To open Orion IPAM from the Windows Start menu, click **Start > All Programs > SolarWinds Orion > Orion IP Address Manager > Orion IP Address Manager**.

Networking Concepts and Terminology

The following sections define the networking concepts and terminology that are used within Orion IPAM. Some Orion IPAM terms correspond specifically to status icons. For more information about the icons used in Orion IPAM, see “Orion IPAM Status Icons” on page 27.

Available

All addresses in defined groups, subnets, and supernets are, by default, considered **Available** until they are otherwise assigned unless they are typically reserved, as in the case of the network and broadcast addresses. In Orion IPAM, available IP addresses are indicated with a gray IP icon. For more information, see “Orion IPAM Status Icons” on page 27.

Classless Inter-Domain Routing (CIDR)

CIDR is the standard, scalable method for both designating and organizing IP addresses using variable-length subnet masking to optimize packet routing efficiency over the Internet. In the CIDR standard, IP address blocks are represented using an IP address with a suffix, as in `214.100.48.00/20`, where the suffix, `/20`, indicates the number of leading bits in the binary form of the IP address corresponding to the intended subnet.

The following examples, with the leading bits of the binary expansion underlined, show equivalent representations of the same subnet:

11010110.01100100.00111001.11010101 = 214.100.57.213/32

11010110.01100100.00111001.11010000 = 214.100.57.208/28

11010110.01100100.00111001.00000000 = 214.100.57.00/24

11010110.01100100.00110000.00000000 = 214.100.48.00/20

Using CIDR, network administrators have a great amount of flexibility in terms of defining the size of available IP address allocations. The basic formula for determining the size of a CIDR subnet is $S = 2^{(n-32)}$, where S = the number of available IP addresses and n = the CIDR suffix. The following table displays the correlation between the CIDR suffix ($/n$) and the number of available IP addresses, or hosts, for multiple, different CIDR suffixes.

CIDR Suffix ($/n$)	Available IP Addresses (S)	CIDR Suffix ($/n$)	Available IP Addresses (S)
$/31$	2	$/22$	$1022 = S - 2$
$/30$	$2 = S - 2$	$/20$	$4094 = S - 2$
$/28$	$14 = S - 2$	$/18$	$16382 = S - 2$
$/26$	$62 = S - 2$	$/16$	$65534 = S - 2$
$/24$	$254 = S - 2$	$/12$	$1048574 = S - 2$

Note: In subnets defined to contain more than 2 IP addresses, typically the smallest address identifies the subnet to the rest of the network and the largest address is designated as the broadcast address for all addresses contained within the subnet.

As a simple example case of CIDR notation with respect to subnets, both 214.100.50.20 and 214.100.61.45 are in the subnet 214.100.00.00/16 because they both share the same sixteen leading bits, represented by the decimal digits 214.100. These two IP addresses also exist in an even smaller subnet, 214.100.48.00/20, as revealed when the two addresses are expressed in binary, as follows, where the twenty leading bits, which are identical, are underlined:

11010110.01100100.00110010.00000100 = 214.100.50.04

11010110.01100100.00111101.00101101 = 214.100.61.45

11010110.01100100.00110000.00000000 = 214.100.48.00/20

Group

In Orion IPAM, groups serve as containers for the subnets, supernets, and even other groups you define to organize and manage your network. For more information about creating and using groups in Orion IPAM, see “Managing Groups in Orion IPAM” on page 41.

Reserved

Typically, in subnets defined to contain more than 2 IP addresses, the smallest address—the network address—identifies the subnet to the rest of the network and the largest address—the broadcast address—is used to communicate to all addresses within the subnet. Both the network address and the broadcast address are considered to be **Reserved** for a defined subnet. In Orion IPAM, reserved IP addresses are indicated with a purple IP icon. For more information, see “Orion IPAM Status Icons” on page 27.

Subnet

A subnet is any logical or physical subdivision of a network consisting of a collection of IP addresses for which some number of the leading address bits, commonly called an IP address routing prefix, are identical.

For example, as a simple case, both 214.100.50.20 and 214.100.61.45 are in the subnet 214.100.00.00/16, as they both share the same sixteen leading bits, represented by the decimal digits 214.100. Less obviously, these two IP addresses exist in an even smaller subnet, 214.100.48.00/20, as revealed when the two addresses are expressed in binary, as follows, where the twenty leading bits, which are identical, are underlined:

214.100.50.04 = 11010110.01100100.00110010.00000100

214.100.61.45 = 11010110.01100100.00111101.00101101

11010110.01100100.00110000.00000000 = 214.100.48.00/20

Organizing your network using well-defined subnets can greatly increase the efficiency and minimize the bandwidth load on your network. At a basic level, assigning IP addresses to devices on your network in such a way that highly interactive devices reside within smaller or closer subnets reduces the amount of network traffic that must be routed over longer network distances. For more information about creating and managing subnets in Orion IPAM, see “Managing Subnets in Orion IPAM” on page 43.

Supernet

A supernet is an element of network organization consisting of contiguous CIDR blocks, or subnets. In networks with well-defined subnets, supernets allow network administrators to consolidate and limit IP traffic to optimize routing efficiency across a network. As an example, given the following two subnets, 222.22.12.0/24 and 222.22.10.0/24, 222.22.0.0/20 is a

supernet, as shown in the following expansions, where the underlining highlights the common address bits of the supernet.

222.22.12.0/24 = 11011110.00010110.00001100.00000000

222.22.10.0/24 = 11011110.00010110.00001010.00000000

222.22.0.0/20 = 11011110.00010110.00000000.00000000

Transient

Orion IPAM uses the term **Transient** to describe IP addresses that are dynamically assigned to devices. IP addresses designated as **Transient** may be assigned to any of the following types of devices:

- devices that power on and off regularly like laptops or some user workstations
- devices that enter and exit the network frequently, like laptops on a wireless network
- any devices on a DHCP-enabled network

In Orion IPAM, **Transient** IP addresses are indicated with a cyan colored IP icon. For more information, see “Orion IPAM Status Icons” on page 27.

Used













The **Used** label is provided to indicate any IP address that is currently assigned and not otherwise available. For more information, see “Orion IPAM Status Icons” on page 27.





Viewing Networks with Orion IPAM

Orion IPAM provides direct insight into the organization and availability of IP addresses on your network. This information is displayed using the resources of the IP Address Manager view and the three views of the Manage Subnets and IP Addresses page. The following sections describe the information available on these views.

Orion IPAM Status Icons

In Orion IPAM, network components are represented by colored icons indicating the extent to which each component is used, as shown in the following table.

Icon	Component	Status	Status Description
	Group	Used (Closed)	The group is closed, but it contains at least one other component (group, subnet, or supernet).
	Group	Used (Opened)	The group is open, and it contains at least one other component (group, subnet, or supernet).
 Grey	IP Address	Available	All addresses in defined groups, subnets, and supernets are, by default, considered Available unless they are typically reserved, as in the case of the network and broadcast addresses, or until they are otherwise assigned.
 Purple	IP Address	Reserved	Typically, in subnets defined to contain more than 2 IP addresses, the smallest address—the network address—identifies the subnet to the rest of the network and the largest address—the broadcast address—is used to communicate to all addresses within the subnet. Both addresses are considered to be Reserved for a defined subnet.
 Cyan	IP Address	Transient	Addresses that are dynamically assigned to devices that may power on and off regularly or that may enter and exit the network frequently are designated as Transient .
 Yellow	IP Address	Used	Any address currently assigned to a monitored device is considered Used .
 Red	Subnet	Critical	At least 80 percent of all possible addresses in the subnet are designated as Used .
 Yellow	Subnet	Warning	60 to 80 percent of all possible addresses in the subnet are designated as Used .
 Green	Subnet	Good	Less than 60 percent of all possible subnet addresses are designated as Used .
 Red	Supernet	Critical	At least 80 percent of all possible addresses in the supernet are designated as Used .
 Yellow	Supernet	Warning	60 to 80 percent of all possible addresses in the supernet are designated as Used .
 Green	Supernet	Good	Less than 60 percent of all possible addresses in the supernet are designated as Used .

Icon	Component	Status	Status Description
 Red	DHCP Scope	Critical	At least 80 percent of all possible addresses in the Scope are designated as Used.
 Yellow	DHCP Scope	Warning	60 to 80 percent of all possible addresses in the Scope are designated as Used.
 Green	DHCP Scope	Good	Less than 60 percent of all possible addresses in the Scope are designated as Used.
 Disabled	DHCP Scope	Disabled	DHCP scope is currently disabled.

Understanding the IP Address Manager Summary View

The IP Address Manager view is the interactive center of your managed IP network. The following sections describe the default resources available on this view for managing your network.

Top 10 Subnets by % IP Address Space Usage

The Top 10 Subnets by % IP Address Space Usage resource provides an easily accessible report of IP address availability by defined subnet. Defined subnets are listed in decreasing order of IP address space percentage used (**% IP Address Space Used**). For each defined subnet, this resource provides a colored bar graph indicating the percentage of the total IP address space of your network that is currently in use or reserved. To provide further detail, this resource displays both the number of IP addresses designated for a selected subnet (**IPs Used**) and the number of IP addresses currently available for assignment (**IPs Available**) such that the **% IP Address Space Used** value is calculated as follows:

$$\% \text{ IP Address Space Used} = \frac{\text{All IPs in Subnet} - \text{IPs Available}}{\text{All IPs in Subnet}}$$

Top 10 DHCP Scopes by % IP Address Space Usage

This view displays the Top XX DHCP Scope availability. Defined Scopes are listed in decreasing order of IP address space percentage used (**% IP Address Space Used**). For each defined Scope, this resource provides a colored bar graph representing the percentage of IP address space available. To provide further detail, this resource displays both the number of IP addresses designated for a selected subnet (**IPs Used**) and the number of IP addresses currently available for assignment (**IPs Available**).

Search for IP Address

The Search for IP Address resource allows you to search the Orion IPAM table of your Orion database for IP addresses you are managing with Orion IPAM. For more information about searching the Orion IPAM table of your Orion database, see “Searching for IP Addresses” on page 36.

Custom List of Reports

The Custom List of Reports resource provides a list of selected Orion reports. Any report that is either predefined or subsequently created using Orion Report Writer may be listed in this resource. For more information about creating your own custom Orion IPAM reports, see "Creating Reports with Orion IPAM" on page 53.

To edit the displayed list of reports, click **Edit** in the resource title bar. The Edit Custom List of Reports page opens, and then you can select from available network reports to list in this resource and edit the resource Title and Subtitle.

Manage Subnets and IP Addresses

Clicking anywhere in the Manage Subnets and IP Addresses resource provides direct access to the Manage Subnets and IP Addresses page. For more information about the Manage Subnets and IP Addresses page, see “Manage Subnets and IP Addresses Page” on page 30.

thwack Recent IPAM Posts

thwack.com is the online SolarWinds community for network engineers. The thwack Recent IPAM Posts resource shows the most recent Orion IPAM-related posts submitted by users to the Orion IPAM forum.

Clicking the title of any listed post opens the corresponding thwack.com post in a new browser.

Clicking **Edit** gives you the option to set the **Maximum Number of Posts to Display** in the resource. Type the number of post titles you want to display in the resource, and then click **Submit**.

Clicking **View All** opens the thwack.com Orion IPAM forum, where you can read all posts related to Orion IPAM.

Manage Subnets and IP Addresses Page

The Manage Subnets and IP Addresses page is the primary management interface for Orion IPAM. The page is divided into two panes. The left pane displays your entire managed network as it is organized into subnets, supernets and groups. For more information about organizing your network with subnets, see “Managing Subnets in Orion IPAM” on page 43. For more information about organizing your network with supernets, see “Managing Supernets in Orion IPAM” on page 46. For more information about organizing your network with groups, see “Managing Groups” on page 41.

Depending on the current selection in the left pane, the right pane contains two tabs, each of which provides one of the following views: IP Address, Network, and Chart. The following sections describe the information that is available on each these Manage Subnets and IP Addresses views.

IP Address View

The IP Address View displays whenever a subnet is selected, either in the Network View on the right or in the network organization pane on the left of the Manage Subnets and IP Addresses page. This view provides a list of all IP addresses that are within the selected subnet. This view can be filtered by selecting the DHCP Managed dropdown menu.

Each IP address is listed with a selection of IP address properties. With the exception of **Last Update**, which is reported by Orion IPAM as the result of a network scan, values for displayed IP address properties are set using the Edit IP Address window. For more information about editing IP address properties, see “Adding IP Address” on page 36.

Network View

The Network View displays whenever a group or supernet is selected in the network organization pane on the left of the Manage Subnets and IP Addresses page. If a group is selected, this view provides a list of all other groups, supernets, and subnets that are defined within the selected group. If a supernet is selected, this view provides a list of all subnets that are defined within the selected supernet.

The status of displayed network components is designated using colored icons. For more information about network component icons, see “Orion IPAM Status Icons” on page 27.

Each network component (group, subnet, and supernet) is listed with a selection of component properties. With the exception of **Last Discovery**, which is reported by Orion IPAM as the result of a network scan, values for displayed network component properties are set using the appropriate *Edit Network Component Properties* window. For more information about editing group properties, see “Editing Groups” on page 42. For more information about editing subnet properties, see “Editing Subnets” on page 44. For more information about editing supernet properties, see “Editing Supernets” on page 47.

Chart View

The Chart View is always available in the right pane of the Manage Subnets and IP Addresses page, and it provides a concise, visual report of your IP address allocation for any network component selected in the network organization pane to the left. A pie chart displays the designated states monitored IP addresses, and an availability report displays both the percentage of all possible IP addresses in the selected group, subnet, or supernet that are present for monitoring and the percentage of present IP addresses that are available for assignment. For more information about IP address states in Orion IPAM, see “Orion IPAM Status Icons” on page 27.

DHCP Scope Monitoring Page

The DHCP Scope Monitoring page is divided into two panes. The left pane displays your entire managed network as it is organized into Scopes or Servers. You can filter how these are grouped by using the drop down arrow.

The right pane contains two tabs, each of which provides one of the following views: Scopes tab and the DHCP Servers tab. The following sections describe the information that is available on each these views.

Scopes tab

The Scopes View displays a list of all DHCP Scopes that are monitored with IPAM. Selecting a Scope switches the view to the Manage Subnets & IP Addresses view where all the IP Addresses within that scope are displayed. Information such as Type, Status, MAC address, DNS, Lease Expiration and Lease Remaining time frames are displayed. This selection of properties is reported by Orion IPAM as the result of a network scan. For more information about editing DHCP Scope properties, see “Monitoring DHCP Scopes in Orion IPAM” on page 36.

DHCP Servers tab

The DHCP Servers View displays a list of all DHCP Scopes that are monitored with IPAM. Selecting a Server switches the view to the Manage Subnets & IP Addresses view where all the IP Addresses within that server are displayed. Information such as Type, Status, MAC address, DNS, Lease Expiration and Lease Remaining time frames are displayed. This selection of properties is reported by Orion IPAM as the result of a network scan. For more information about editing DHCP Server properties, see “Monitoring DHCP Servers on page 48.

Importing IP Addresses and Settings

Orion IPAM supports the import of IP addresses and settings from Microsoft Excel (.xls and .csv) files. The following table lists the types of network information that Orion IPAM can import directly.

Importable Settings and Properties		
Comments	Contact	DNS
Description	IPv4 Address	Last Boot Time
Last Synchronization	Machine Type	Response Time
Status	System Location	System Name
System Object ID	Vendor	

The following procedure imports IP addresses and settings into the Orion IPAM table of your Orion database.

To import IP addresses and settings into Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.
3. Click **IP Address & Subnet Import**.
4. Next to the **File to Upload** field, click **Browse**.
5. Locate the file containing the IP addresses, subnets, or settings you want to import, and then click **Open**.
6. Select the **File Type** for the file you want to upload, and then click **Next**.
7. For each **Spreadsheet Column** value from the import file select a corresponding **Database Column** name to use in the Orion IPAM table of your Orion database.

Notes:

- An **IPv4 Address** column is required for all imports. Confirm that at least one spreadsheet column maps to an **IPv4 Address** column in the Orion IPAM table of your Orion database.
 - Only rows appearing to have a valid IPv4 address are imported.
 - Orion IPAM uses the data in the first non-empty row of the imported file to suggest appropriate labels for the columns in the Orion IPAM table of your Orion database.
 - Attempt to map all unlabeled Spreadsheet Columns to a provided Database Column name. Orion IPAM provides a preview before any changes are made permanent.
8. Click **Next**.
 9. ***If the spreadsheet column values from the import file do not match the column types you have selected for the Orion IPAM table of your Orion database, complete the following steps to correct the indicated mismatches, repeating as necessary:***
 - a. Hover over an incorrect value, as indicated by a red icon or underline, to determine the cause of the mismatch.
 - b. Click **Back** to correct your column selections.
 - c. Click **Next**.
 10. ***If the spreadsheet column values match the column types you have selected, click Next to complete the import.***
 11. ***If a subnet does not exist for any of your imported IP addresses, click Next to create subnets for these orphaned IP addresses. For more information about creating and assigning subnets to orphaned IP addresses, see "Viewing and Managing Orphaned IP Addresses" on page 35.***

Importing IPs and Subnets Using the SolarWinds Engineer's Toolset

To import subnets and IP Addresses from the Engineer's Toolset:

1. Locate the ToolsetIP Address Manager database on your Toolset server.
- Note:** The Toolset IP Address Manager database has an .ipdb extension.
2. Copy the Toolset IP Address Manager database to an appropriate location on your Orion server.
 3. Open a Command Prompt on the Orion server.
 4. Enter `CD "\Program Files\SolarWinds\Orion\IPAM"`

5. Enter NET STOP "SolarWinds IPAM Information Service"
6. Enter SolarWinds.IPAM.Init.exe -import <Fullpath to your Toolset IP Address Manager database>
7. Enter NET START "SolarWinds IPAM Information Service"

Exporting IP Addresses and Settings

Orion IPAM also allows you to export IP addresses and settings, including any custom fields you have defined, as Microsoft Excel (.xls and .csv) files. The following table lists the types of network information that Orion IPAM can export from the Orion IPAM table of your Orion database to a new spreadsheet.

Exportable Settings and Properties		
Comments	Contact	DNS
Description	IPv4 Address	Last Boot Time
Last Synchronization	Machine Type	Response Time
Status	System Location	System Name
System Object ID	Vendor	

The following procedure exports IP addresses and settings from the Orion IPAM table of your Orion database as columns in a new spreadsheet.

To export IP addresses and settings from Orion IPAM:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. **If you want to export an entire group**, click the parent group of the group you want to export in the network organization pane on the left, and then check the group in the Network View on the right.
4. **If you want to export an entire supernet**, click a parent group or supernet of the supernet you want to export in the network organization pane on the left, and then check the supernets in the Network View on the right.

Note: Before Orion IPAM can export any supernet, the supernet must be populated with at least one defined subnet.

5. **If you want to export an entire subnet**, click a parent group or supernet of the subnet you want to export in the network organization pane on the left, and then check the subnets in the Network View on the right.

Note: Orion IPAM can only export subnets that have been properly defined and populated with IP addresses.

6. **If you want to export IP addresses**, click the parent subnet of the IP address you want to export in the network organization pane on the left, and then check the IP addresses to export in the Network View on the right.
7. Click **Export** in the toolbar.
8. Check the columns you want to export.
Note: The IPv4 Address column is selected automatically, and it becomes the first column in the generated spreadsheet. Each additional setting or property you check becomes an additional column in the generated spreadsheet.
9. Click **Export**.
10. When you are prompted to open or save the file, click **Save**.
11. Provide an appropriate file name and location for the generated spreadsheet, and then click **Save**.

Viewing and Managing Orphaned IP Addresses

After importing of IP addresses from a spreadsheet it is possible that one or more IP addresses may have been imported without being assigned to a managed subnet. In order to properly manage your network, Orion IPAM requires that all IP addresses are assigned to a managed subnet, even if the managed subnet contains only a single IP address. If Orion IPAM is unable to locate a configured subnet for each imported IP address, the following warning banner displays above the Manage Subnets and IP Addresses view:

X imported IP addresses do not have a parent subnet. These orphaned IP addresses will not appear in Orion until parent subnets are assigned.

The following procedure assigns parent subnets to orphaned IP addresses to enable their management by Orion IPAM.

Notes:

- /31 is the smallest subnet that IPAM recognizes. To create a subnet with one IP address, create a /31 subnet and assign a single IP address to that subnet.
- If you try to manage more IP addresses than your current license allows, Orion IPAM will add as many IP addresses as allowed. The remaining addresses will be added as orphaned IP addresses.

To assign a parent subnet to an orphaned IP address:

1. Click **Assign parent subnets to orphaned IPs** in the warning banner.
2. Check a single orphaned IP address.

3. Click **Assign Subnet**.
4. *If you do not want to use the default Subnet Name provided by Orion IPAM*, provide a new **Subnet Name** for the new parent subnet. Orion IPAM suggests both a Subnet Address and a CIDR prefix length based on the actual orphaned IP address. The default Subnet Name provided by Orion IPAM is a concatenation of the Subnet Address and the CIDR prefix length.
5. *If you do not want to use the default Subnet Address and CIDR prefix length provided by Orion IPAM*, provide a new **Subnet Address** and an appropriate **CIDR** prefix length for the new parent subnet.

Notes:

- Orion IPAM suggests both a **Subnet Address** and a **CIDR** prefix length based on the actual orphaned IP address. For more information about CIDR and subnet addressing, see “Networking Concepts and Terminology” on page 23.
 - Orion IPAM instantly confirms the validity of provided **Subnet Address** and **CIDR** prefix length combinations. For more information about CIDR and subnet addressing, see “Networking Concepts and Terminology” on page 23.
6. These fields are optional; provide a **Description**, **VLAN ID**, and **Location** for the new parent subnet.
 7. Use the slider to set the **Scan Interval**.
 8. *If you do not want Orion IPAM to automatically scan your new parent subnet for changes*, check **Disable Automatic Scanning**.
 9. Click **Save** when you have completed configuring your new parent subnet.

Managing IP Addresses with Orion IPAM

Orion IPAM automatically monitors all IP addresses in subnets defined with 2048 IP addresses (/21 or 255.255.248.0 mask) or fewer. IP address ranges allow you to manage IP addresses in larger subnets. The following sections provide details with respect to managing IP addresses on your network.

Adding IP Addresses

To help you maintain an organized network, Orion IPAM does not allow for the addition of an individual IP address unless it exists within a subnet previously designated for monitoring. The following options are available for adding IP addresses to Orion IPAM:

- A range of IP addresses can be added to any defined subnet. This is usually done when you want to monitor specific addresses within a large subnet. For smaller subnets containing 2048 or fewer IP addresses (/21 or

255.255.248.0 and higher mask), Orion IPAM automatically monitors all included IP addresses. For more information, see “Adding a Range of IP Addresses” on page 37.

- IP addresses may be added for monitoring by adding a parent subnet into any existing group, supernet, or subnet that Orion IPAM is already monitoring. Adding such a subnet is a straightforward process. For more information about adding subnets, see “Creating Subnets” on page 43.
- The Subnet Allocation Wizard allows you to directly define subnets and allocate included IP addresses. For more information about the Subnet Allocation Wizard, see “Using the Subnet Allocation Wizard” on page 45.

Adding a Range of IP Addresses

Particularly in the case of larger subnets, it can be useful to deal with IP addresses in terms of defined IP address ranges, such as 6.6.16.1–6.6.16.15 in a 6.6.16.0 / 20 subnet. The following procedure provides the steps required to add a range of IP addresses within a defined subnet.

Note: By default, Orion IPAM displays all IP addresses in a subnet if the selected subnet contains 2048 or fewer IP addresses (/21 or 255.255.248.0 and higher mask). For these smaller subnets, it is not necessary to add IP address ranges for monitoring unless you have previously deleted the addresses in the range you want to add.

To add a range of IP addresses within a defined subnet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**
3. In the network tree pane on the left, click the subnet into which you want to add your new range of IP address range.

Note: For subnets with more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), the right pane displays **No IP addresses have previously been added** unless you have already added a range of IP addresses within the selected subnet.

4. Click **IP Range > Add** in the IP Address view in the right pane.
5. Provide both the **Starting IP Address** and the **Ending IP Address** of your new IP address range. Orion IPAM will not allow IP address ranges defined outside the subnet indicated in the Parent Address field.
6. Click **Save**.

Deleting IP Addresses from Monitoring

Complete the following procedure provides the steps required to delete monitored IP addresses from within a defined subnet. If a defined subnet contains more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), Orion IPAM only displays IP addresses in previously added ranges. For these larger subnets, you must add IP address ranges for monitoring before Orion IPAM can display addresses that may be deleted.

To delete IP addresses from within a defined subnet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. Click the subnet from which you want to delete a range in the left tree pane of IP addresses.

Note: For subnets with more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), the right pane displays **No IP addresses have previously been added** unless you have already added a range of IP addresses within the selected subnet.

4. Check the IP addresses to delete in the right pane IP Address view.
5. Click **IP Range > Remove**.
6. Click **Yes** to confirm the deletion, and then click **Save**.

Setting IP Address Status

The status of any monitored IP address within a defined subnet may be set from the IP Address View on the Manage Subnets and IP Addresses page, as shown in the following procedure.

Note: If a subnet contains more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), Orion IPAM only displays IP addresses in previously added ranges. For these larger subnets, you must add IP address ranges for monitoring before Orion IPAM can display addresses that may be managed.

To set the status of an IP address within a defined subnet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**, and then click the subnet containing the IP address for which you want to set the status in the left tree pane.

Note: For subnets with more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), the right pane displays **No IP addresses have previously been added** unless you have already added a range of IP addresses within the selected subnet.

3. Check the IP addresses to modify in the right pane IP Address view.
4. Click **Set Status**, and then select the appropriate status. For more information about the definition of available status icons, see “Orion IPAM Status Icons” on page 27.

Editing IP Address Properties

Orion IPAM can store a wide array of information about the devices to which IP addresses are assigned. The following table lists the properties Orion IPAM can record in the Orion IPAM table of your Orion database.

IP Address Properties		
Comment	DNS	IPv6 Address
Last Credential	Last Response Time	Last Synchronization
MAC Address	Machine Type	Node Alias
Status	System Contact	System Description
System Location	System Name	Type
Vendor	Static	Dynamic

You can edit IP address properties directly from the IP Address View on the Manage Subnets and IP Addresses page. The following procedure provides the steps required to edit the properties of an IP address within a defined subnet.

Note: If a defined subnet contains more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), Orion IPAM only displays IP addresses in previously added ranges. For these larger subnets, you must add IP address ranges for monitoring before Orion IPAM can display addresses that may be managed.

To edit an IP address within a defined subnet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. Click the subnet containing the IP address you want to edit in the left tree pane.

Note: For subnets with more than 2048 IP addresses (lower than /21 or 255.255.248.0 mask), the right pane will display **No IP addresses have previously been added** unless you have already added a range of IP addresses within the selected subnet.

4. Check the IP address to edit in the in the right IP Address view pane.

5. Click **Edit** and then select or provide appropriate values for each listed IP address property.

Note: If you have defined custom fields for IP addresses, they are available for editing. For more information about configuring custom fields in Orion IPAM, see “Creating and Configuring Custom Fields” on page 17.

6. Click **Save** when you have completed configuration of IP address properties.

Note: The Skip Scan option will not modify values normally overwritten by network scanning.

Searching for IP Addresses

Orion IPAM provides a powerful yet straightforward and easy-to-use network search ability with the Search for IP Address resource on the IP Address Manager view. The following table provides available search criteria.

Search Criteria	Description
Alias	Search by the address alias
Comments	Search for a specific comment
Contact	Search for a contact name
DNS	Search using the DNS
Description	Search by an address description
IPv4 Address	Search for a IPv4-formatted address
IPv6 Address	Search for a IPv6-formatted address
MAC Address	Search by a specific MAC address
Machine Type	Search by the machine type
Status	Search by status; Used, Available, Reserved, Transient
System Location	Search by a physical location
System Name	Search by system name
Custom Property	Search by a custom property

The following procedure shows how to use the Search for IP Address resource to search the Orion IPAM table of your Orion database.

To search the Orion IPAM table of your Orion database:

1. Click **IP Address Manager** in the Modules menu bar.
2. Check criteria relevant to your search in the Search for IP Address resource.

3. Type a string or IP address and then click **Search**.

Note: Wildcards (*,?) are permitted, as shown in the following examples:

Cisco*, 10.15.*.*, W?ndows, Server-*, *.SolarWinds.com

Orion IPAM queries the Orion IPAM table of your Orion database and displays a list of IP addresses matching the provided criteria. Each IP address is listed, in numerical order, with the following information, if available:

- DNS
- Status
- System Description
- System Location
- System Contact
- Comments

Clicking any listed IP address opens the IP Address View for that IP address. From the IP Address View you can edit properties and set the status of the selected IP address. For more information about the IP Address View, see “Understanding the IP Address View” on page 30.

Managing Groups in Orion IPAM

Orion IPAM provides groups as a general aid to network organization. The drag-and-drop user interface makes it easy to create groups that contain any number of other groups, supernets, subnets or individual IP addresses. For example, in the case of a large network spread over multiple offices, each with its own sales, marketing and development, departments, Orion IPAM allows you to create groups to organize your entire network:

BranchOffice1	BranchOffice2	BranchOffice3	BranchOffice4
Sales1	Sales2	Sales3	Sales4
Marketing1	Marketing2	Marketing3	Marketing4
Development1	Development2	Development3	Development4

Each branch office unit may have its own assigned IP addresses or subnet of your entire network. Using Orion IPAM, you can group all the various network components related to each department of each branch office into its own group. The following sections provide general instructions for creating and editing IP network groups in Orion IPAM.

Creating Groups

The following procedure creates a group for organizing your network components.

To create a network group:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. Click the network or group into which you want to add your new group in the left network tree pane.
4. Click **Add > Group**.
5. Provide an appropriate **Group Name** and **Description** for your new group.
6. *If you have defined custom fields for groups*, provide appropriate values in the available custom fields. For more information about configuring custom fields in Orion IPAM, see “Creating and Configuring Custom Fields” on page 17.
7. Click **Save**.
8. Drag-and-drop other groups, subnets, and supernets into your new group to organize your network.

Editing Groups

The following procedure edits the properties of an existing group.

To edit an existing network group:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. Click the group you want to edit in the left tree pane.
4. Click **Properties**.
5. Edit the existing **Group Name** and **Description** as appropriate.
6. *If you have defined custom fields for groups*, edit the values in the available custom fields, as necessary. For more information about configuring custom fields in Orion IPAM, see “Creating and Configuring Custom Fields” on page 17.
7. Click **Save**.

Managing Subnets in Orion IPAM

Subnet creation and editing are primary functions Orion IPAM provides for network managers. The following sections detail the creation and editing of subnets with Orion IPAM.

Creating Subnets

Orion IPAM provides two methods for creating subnets. The Orion IPAM Subnet Allocation Wizard creates subnets within a designated supernet based on a desired subnet size. For more information about the Subnet Allocation Wizard, see “Using the Subnet Allocation Wizard” on page 45. The second method creates individual subnets within selected subnets, supernets, and groups, directly from the Manage Subnets and IP Addresses page, as shown in the following procedure.

Note: /31 is the smallest subnet that IPAM recognizes. To create a subnet with one IP address, create a /31 subnet and assign a single IP address to that subnet.

To create a new network subnet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. In the network tree pane on the left, click the network, group, or supernet into which you want to add your new subnet.
4. Click **Add > Subnet**.
5. Provide an appropriate **Subnet Name** for your new subnet. If you leave this field empty, Orion IPAM automatically generates a name based on the **Subnet Address** and **CIDR** prefix length you provide.
6. Provide a new **Subnet Address** and an appropriate **CIDR** prefix length for the new subnet.

Note: Orion IPAM instantly confirms the validity of provided **Subnet Address** and **CIDR** prefix length combinations. For more information about CIDR and subnet addressing, see “Networking Concepts and Terminology” on page 23.

7. **If you want to further identify your new subnet**, provide a **Description**, **VLAN ID**, or **Location** for the new subnet.
8. **If you have defined custom fields for subnets**, provide appropriate values. For more information about configuring custom fields in Orion IPAM, see “Creating and Configuring Custom Fields” on page 17.
9. Use the slider to set the **Scan Interval**.

10. If you do not want Orion IPAM to automatically scan your new subnet for changes, check **Disable Automatic Scanning.**

11. Click **Save** when you have completed configuring your new subnet.

You can now drag-and-drop your new subnet into other groups and supernets, to organize your network.

Editing Subnets

The following procedure edits the properties of an existing subnet.

To edit an existing network subnet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. Click the subnet you want to edit in the left tree pane.
4. Click **Properties**.
5. Edit the existing **Subnet Name** and the **CIDR** prefix length for your subnet.
6. Edit the **Description**, **VLAN ID**, or **Location** for your subnet, as necessary.
7. Click **Save** when you have completed configuring your subnet.

Managing Subnet Scans

Orion IPAM is capable of conducting both automatic and manual scans of monitored subnets, and the Subnet Scan Status view displays all subnet scans that are either currently in progress or scheduled for completion. Subnet scans are listed according to the Database Column property for each scanned subnet. For more information about subnet properties, see “Editing Subnets” on page 44. For each subnet scan listed, the Subnet Scan Status view displays the following:

- **Status** provides the time when the next scan of the corresponding subnet will begin. If the scan is in progress, Status displays the time elapsed since the scan started.
- The **Scan Type** is either `Automated` or
- **Last Discovery** indicates the date and time when the corresponding subnet was last scanned.

The following procedure provides the steps required to manage subnet scans from the Subnet Scan Status view.

To manage subnet scans:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **IPAM Settings**.

3. Click **View subnet scan status** in the Subnet Scans grouping.
4. *If you want to change the settings of any listed subnet scan*, click **Edit** at the end of the corresponding row.

Clicking **Edit** at the end of a listed subnet scan row opens the Edit Subnet Properties window wherein you can enable or disable automatic scanning and set an appropriate scan interval for the selected subnet. For more information about editing subnet properties, see “Editing Subnets” on page 44.

Using the Subnet Allocation Wizard

Orion IPAM provides the Subnet Allocation Wizard to help you most efficiently organize your managed IP address space into subnets that are sized appropriately for the extent and traffic of your network. With its realtime subnet calculator, the Orion IPAM Subnet Allocation Wizard allows you to quickly determine the most efficient way to subdivide any supernet, as shown in the following procedure.

To create subnets from supernets using the Subnet Allocation Wizard:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. In the network tree pane on the left, click **Add > Subnet Allocation Wizard**.
4. Type the address of the supernet to divide in the **Supernet Address** field.
5. Select an appropriate **CIDR** prefix length.

Note: Orion IPAM instantly confirms the validity of provided **Supernet Address** and **CIDR** prefix length combinations. For more information about CIDR, see “Networking Concepts and Terminology” on page 23.

6. Select the **Desired Subnet Size**.

Note: Typically, in subnets defined to contain more than 2 IP addresses, the first and last addresses are reserved as the network address, for identifying the subnet to the rest of the network, and the broadcast address, for communicating with all addresses within the subnet, respectively. As a result, the number of available IP addresses is always two fewer than the number actually contained within a given subnet.

7. *If you only want to see subnets that have already been allocated*, clear **Show subnets not already allocated**.
8. Click **Refresh** to display a list of all possible subnets that may be allocated, based on your provided criteria.
9. Check the subnets you want to manage in Orion IPAM, and then click **Next**.
10. *If you want to view the subnets you are currently adding*, click **+** next to the **XX Selected Subnets** header.

11. *If you do not want to keep the supernet you used on the previous view to define the subnets you are adding*, clear **Add Supernet** 'X.X.X.X / X'.

Note: By default, Orion IPAM adds the supernet you used to define your subnets to make it easier to organize your network. Although it is optional, SolarWinds recommends that you check this option and use the supernet unless you are only adding a few subnets.

12. *If you do not want to organize your added subnets into the smallest available supernet*, clear **Move newly added subnets into smallest appropriate supernet**.

Note: Adding subnets either to an existing supernet or to a newly defined supernet can make it easier to organize your network. Although it is optional, SolarWinds recommends that you check this option and keep the supernet unless you are only adding a few subnets.

13. *If you want to further identify your new subnets*, provide a **Description**, **VLAN ID**, or **Location** for the new subnets.
14. *If you do not want Orion IPAM to automatically scan your new subnets for changes*, check **Disable Automatic Scanning**.
15. *If you want Orion IPAM to automatically scan your new subnets for changes*, use the slider to set the **Scan Interval**.
16. Click **Done** when you have completed configuring your new subnets.

Managing Supernets in Orion IPAM

Supernets are extremely useful organizational tools for managing your network. The following sections detail the creation and editing of supernets in Orion IPAM.

Creating Supernets

The following procedure creates a new supernet for organizing your network components.

To create a new network supernet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. In the network tree pane on the left, click the network, supernet, or group into which you want to add your new supernet.
4. Click **Add > Supernet**.
5. Provide an appropriate **Supernet Name** for your new subnet.

Note: If you leave this field empty, Orion IPAM automatically generates a name based on the **Supernet Address** and **CIDR** prefix length you provide.

6. Provide a new **Supernet Address** and an appropriate **CIDR** prefix length for the new subnet.

Note: Orion IPAM instantly confirms the validity of provided **Supernet Address** and **CIDR** prefix length combinations. For more information about CIDR and supernet addressing, see “Networking Concepts and Terminology” on page 23.

7. *If you want to further identify your new supernet*, provide a **Description** for the new supernet.
8. *If you have already defined any custom fields for supernets*, provide appropriate values in the available custom fields. For more information about configuring custom fields in Orion IPAM, see “Creating and Configuring Custom Fields” on page 17.
9. When you have completed configuring your new supernet, click **Save**.

You can now drag-and-drop your new supernet into other groups and supernets and drag-and-drop other supernets and subnets into your new supernet to organize your network.

Editing Supernets

The following procedure edits the properties of an existing supernet.

To edit an existing network supernet:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **Manage Subnets & IP Addresses**.
3. Click the supernet you want to edit in the left tree pane.
4. Click **Properties**.
5. Edit the existing **Supernet Name** and the **CIDR** prefix length for your supernet.

Note: Orion IPAM instantly confirms the validity of provided **Supernet Address** and **CIDR** prefix length combinations. For more information about CIDR and supernet addressing, see “Networking Concepts and Terminology” on page 23.

6. Edit the **Description** for your subnet, as necessary.
7. *If you have defined custom fields for supernets*, edit the values in the available custom fields, as necessary. For more information about configuring custom fields in Orion IPAM, see “Creating and Configuring Custom Fields” on page 17.
8. When you have completed configuring your supernet, click **Save**.

Monitoring DHCP Servers

DHCP Scope Monitoring allows you to add/edit DHCP Servers and configure their scan settings.

To add a DHCP server

1. Click on the **DHCP Scope Monitoring** tab.
2. Click **DHCP Servers**.
3. Click **Add New > DHCP Server**.
4. Select the DHCP node to be added from the list of nodes.
5. Choose or create the necessary Windows Credentials from the drop down list. Then click **TEST** to verify the credential.
6. Select the **Server Scan Settings**. Default is set to 4 hours.
7. If you want to automatically add new scopes and subnets after scanning, check the box.
8. If you want to IPAM to scan using ICMP and SNMP to obtain additional IP Address details, check the **Enable subnet scanning box** and select the scanning interval.
9. To finish, click **ADD DHCP SERVER**

Note: Only Microsoft DHCP Servers on Windows 2003 and 2008 are supported. DHCP Servers must already be defined as Nodes within Orion NPM. All Windows credentials are sent in clear text during configuration only. The Windows account specified within IPAM must be on the DHCP server and one of the three following groups: DHCP Users, DHCP Administrators and or local Administrators. IPAM impersonates the specified account on the local computer to gain access. If the IPAM computer is not within the same windows domain as the DHCP server, the IPAM computer must have the identical account and password.

Editing DHCP Servers

The following procedure edits the properties of an existing DHCP Server.

To edit an existing DHCP Server:

1. Click on the **DHCP Scope Monitoring** tab.
2. Select the DHCP Server that you want to edit by checking the box.
3. Click **Edit Server**.
4. Edit as necessary and then click **Save**.

Note: The edited properties are fields specific to IPAM and not related to any data in the DHCP server.

Removing Servers

The following procedure will remove an existing DHCP Server.

To remove an existing DHCP Server:

1. Click on the **DHCP Servers** tab.
2. Select the DHCP Servers that you want to remove by checking the boxes.
3. Click **Remove Servers**.
4. Click **Delete Listed Items**

DHCP Graph View

The Graph View tab presents a graphical representation of the selected DHCP Servers IP Address percentage use. Unless certain Scopes/Servers are selected, the DHCP graph view will collect statistics for what is visible in the current tab.

To view a DHCP Server Graph View:

1. Click on the **DHCP Servers** tab.
2. Select the DHCP Servers that you want to graph by checking the boxes.
3. Click **Graph View**.

Monitoring DHCP Scopes in Orion IPAM

The following sections detail the creation and editing of DHCP Scopes in Orion IPAM.

Creating Scopes

The following procedure creates a new DHCP Scope for organizing your network components.

To create a new DHCP Scope:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **DHCP Scope Monitoring**.
3. Click **Scopes**.
4. Click **Add New > Found DHCP Scope**.

5. Select the DHCP node to be added from the list of nodes.

Note: All DHCP servers must already exist as nodes within Orion NPM.

Choose or create the necessary Windows Credentials from the drop down list. Then click **TEST** to verify the credential.

6. Select the **Server Scan Settings**. Default is set to 4 hours.
7. *If you want to automatically add new scopes and subnets after scanning*, check the box.
8. *If you want to IPAM to scan using ICMP and SNMP to obtain additional IP Address details*, check the **Enable subnet scanning box** and select the scanning interval.
9. To finish, click **ADD DHCP Scope**

Note: Only Microsoft DHCP Servers on Windows 2003 and 2008 are supported. DHCP Servers must already be defined as Nodes within Orion NPM. All Windows credentials are sent in clear text during configuration only. The Windows account specified within IPAM must be on the DHCP server and one of the three following groups: DHCP Users, DHCP Administrators and or local Administrators. IPAM impersonates the specified account on the local computer to gain access. If the IPAM computer is not within the same windows domain as the DHCP server, the IPAM computer must have the identical account and password.

Editing DHCP Scopes

The following procedure edits the text properties of an existing IPAM DHCP Scope.

To edit an existing DHCP Scope:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **DHCP Scope Monitoring**.
3. Click **Scopes**.
4. Select the Scope Name that you want to edit by using the check box.
5. Click **Edit Scope** in the Modules menu bar.
6. Edit as necessary and then click **Save**.

Note: The edited properties are fields specific to IPAM and not related to any data in the DHCP server.

Removing Scopes

The following procedure will remove an existing DHCP Scope.

To remove an existing DHCP Scope:

1. Click **IP Address Manager** in the Modules menu bar.
2. Click **DHCP Scope Monitoring**.
3. Click **Scopes**.
4. Click on the **Scopes** tab.
5. Select the DHCP Servers that you want to remove by checking the boxes.
6. Click **Remove Servers**.
7. Click **Delete Listed Items**

Creating Reports with Orion IPAM

Orion IPAM uses the Orion NPM Report Writer to create reports for viewing on the web console or for scheduling reports to email and printout. By using the capabilities of Orion Report Writer, Orion IPAM data can be extracted and presented in a useful format. Orion Report Writer allows you to format your data and preview reports before you display them. When you have finished editing your reports, you can use the scheduler tool to schedule report emails and enable them for viewing through the Orion Web Console. For more information about adding reports to Orion Web Console views, see "Customizing Views" in the *SolarWinds Orion Network Performance Monitor Administration Guide*.

Getting Started with Report Writer

Before you can use Orion Report Writer, you must have collected at least a few minutes worth of data. The following procedure starts Report Writer.

To start Report Writer:

1. Click **Start > All Programs > SolarWinds Orion > Alerting, Reporting, and Mapping > Report Writer**.
2. Click **File > Settings**.
3. In the General tab of the Report Writer Settings window, select either of the following as a default viewing mode:
 - **Preview** displays the report as it will appear in printed form. For more information, see "Report Writer Preview" in the *SolarWinds Orion Network Performance Monitor Administration Guide*.
 - **Report Designer** is the report creation and editing interface. For more information, see "Design Mode" on page 54.

Note: You can toggle between Preview and Report Designer modes at any time by clicking **Preview** or **Design**, respectively, on the toolbar.

4. **If you want to separate the data for individual network objects with horizontal lines**, click **Report Style**, and then check **Display horizontal lines between each row**.
5. Click **OK** to exit Report Writer Settings.

Preview Mode

Preview mode shows a report as it will print. When you open a report in Preview mode, or switch to Preview mode from Design mode, Orion NPM runs the query to generate the report and Report Writer displays the results.

The Preview window toolbar provides the following actions and information:

- Current page number and total number of pages in the report in the form *current# / total#*
- Page navigation buttons: First Page, Page Up, Page Down, and Last Page
- Zoom views
Note: Double-click on a report preview to zoom in and double-right-click to zoom out.
- Print report

Design Mode

Use Design mode to create new reports and modify or rename existing reports. The options available for both creating and modifying reports are the same. Design mode options are also dynamic, based upon the type of report, included report data, and report presentation. Available options differ according to the type of report that you are designing, but all reports require that you select the data to include and decide how that data will be sorted, ordered, filtered, and presented.

Using Predefined Orion IPAM Reports

Orion IPAM provides a number of predefined reports that may be viewed and edited in Orion Report Writer.

To access these reports by clicking on **Start > All Programs > SolarWinds Orion > Alerting, Reporting, and Mapping > Report Writer**.

The left pane presents all the currently available reports. IPAM related reports are grouped under Current IPAM Statistics. The following section provides brief descriptions of the predefined reports that are available with Orion IPAM.

Predefined Orion IPAM Current IPAM Statistics Report

The following predefined statistics reports are included with Orion IPAM and can be modified to your needs.

IPAM - All available IP Addresses

Displays all available IP addresses on your network designated as Available. For each IP address, this report provides the Display Name, Reverse DNS, System Name and MAC Address.

IPAM - All reserved IP Addresses

Displays All reserved IP Addresses in IP Networks including the Display Name, Ipv4 Address, Reverse DNS, and System Name.

IPAM - All used IP Addresses

Displays All used IP Addresses in IP Networks including the Display Name, Ipv4 Address, Reverse DNS, and System Name.

IPAM - All Subnets

Displays the total usage percentage of all Subnets including the total percentage of allocated, used, transient, available and reserved IPs.

Predefined Orion IPAM Events Report

The following predefined Event reports are included with Orion IPAM and can be modified to your needs.

IPAM Last 250 Events

Displays the last 250 IPAM events including event time, event type icon, username, event type names, and event message.

Opening Predefined IPAM Reports

Use the following procedure to modify or create reports in Report Writer.

To open a predefined report with Report Writer:

1. ***If you want to modify an existing report***, click an existing report from the inventory in the left pane of the main Report Writer window.
2. ***If you want to create a new report***, click **File > New Report**, select the type of report that you would like to create, and then click **OK**.

Each report offers different configuration options on the separate tabs of the Report Designer, so, depending on the report, some of the formatting tabs described in the following sections may not be available.

Notes:

- The SQL query used to generate a report may be viewed in an additional tab. Click **Report > Show SQL** to add a read-only SQL tab to the Design window.
- A preview of your report is also available at any time. Click **Preview** to enter Preview Mode, and then click **Design** to return to Design Mode.

Orion IPAM Report Attributes

The following sections provide attributes for use within Orion IPAM reports.

IPAM Network Statistics Attributes

Values for reporting on IPAM Network Statistics include the following attributes.

Statistics Attributes	Description
Network Address	Network address
Address Sort Key	IP Address sort key
CIDR	Classless Inter-Domain Routing
Display Name	Name given to particular IP addresses
Group Type	Group name given to a particular group of IP addresses
MASK	Subnet Mask
Comments	User supplied comments
VLAN ID	VLAN ID
Location	Location of subnet
Scan Interval	Selected scanning interval
Last Discovery	Last completed discovery
IP: Allocated	Allocated IP Address's
IP: Used	IP address in a used state
IP: Transient	IP address in transient state
IP: Total	Total number of IP Addresses
IP: Reserved	Number of IP addresses in reserved state
IP Available	Number IP addresses available
IP: % Usage	Total % of IP usage
IP: % Allocated	Total % of allocated IPs

IPAM Node Attributes

Values for reporting on specific IP nodes include the following attributes.

Node Attributes	Description
SubnetID	Subnet Identifier
IPv4 Address	Displays IPv4 addresses
IPv4 Sort Key	Key Sort
IPv6 Address	Displays IPv6 addresses
Alias	Device know as
Reverse DNS	DNS Name
System Name	System Name
MAC	MAC Address
Contact	Who to Contact
Description	Description
Location	Location of the Device
System ObjectID	System Object Identifier
Vendor	Device manufacturer
VendorIcon	Icon of the device vendor
Machine Type	Machine Type given
Comments	User Comments
Response Time	Current Response Time
Last Synchronization	Last Synchronization with database
Status	Current IP Status
Type	Type of device
Last Boot Time	Last time entered for reboot

IPAM Event Attributes

Values for reporting on specific IPAM Events Log include the following attributes:

Event Attributes	Description
Event Time	Time the event occurred
Message	Displays the message event
Event Type	Displays the event type
Event Type Icon	Event type icon
Event Type Name	Event type name
Acknowledged	Event has been acknowledged
Username	Username
Common Event Type	Displays Object Type

General Options Tab

The General tab opens by default and shows titling and display options that may be configured as follows.

To configure General options:

1. Specify the **Report Group**, **Report Title**, **Subtitle**, and **Description**.

Note: If you use an existing report group name, the new report is added to that existing group in the left pane of the main window.

2. Select the display **Orientation** of your report.
3. ***If you do not want to make this report available on your Orion Web Console***, clear **Make this Report available from the Orion website**.

Note: By default, most reports are made available for display in the Orion Web Console. For more information about adding reports to Orion Web Console views, see “Viewing Reports” on page 62.

Select Fields Options Tab

The Select Fields tab allows you to select the data fields in a report, as shown in the following procedure.

To select and configure fields:

1. Click **Select Fields**.
2. **If you are creating a new report or adding fields to an existing report**, click the ellipsis, select **Add a new field**, and then dynamically define each new report field as follows:
 - a. Click the asterisk after **Field:** and select the type of information that you want to include in the current report field.
 - b. **If you want to sort the data in the current field**, click the **sort** asterisk and select a sort order.
 - c. **If you want to perform an operation on the data in the current field**, click the **function** asterisk and select an operation.
3. **If you are modifying an existing report**, click the **Field**, **sort**, or **function** that you want to change and select a new value as follows.
 - a. Click the asterisk after **Field:** and select the type of information that you want to include in the current report field.
 - b. **If you want to sort the data in the current field**, click the **sort** asterisk and select a sort order.
 - c. **If you want to perform an operation on the data in the current field**, click the **function** asterisk and select an operation.
4. **If you want to test your selections as you assemble your report**, click **Execute SQL Query** to view the current query results.
5. **If you want to preview your report**, click **Preview**.

Note: Click **Design** in the toolbar to return to the Design Mode window.
6. **If you want to delete a field or rearrange the order of the fields that are listed in your report**, select a field, click **Browse (...)**, and then select the appropriate action.

Note: Unchecked fields are not displayed in your report, but their sort and function configurations are retained.

Report Grouping Options Tab

The Report Grouping tab allows you to group results by field descriptor within your report. Add, edit and delete report groups to organize the data in your report. Establish and edit report groups as follows.

To add and edit report groups:

1. **If you want to add a new report group**, select a field from the list to define your group, and then click **Add Report Group** to add your selected field to the **Report Groups** list.

Note: Use up and down arrows to change the grouping order accordingly.

2. **If you want to edit an existing report group**, select the field from the Report Groups list, and then click **Edit Report Group**.
3. The following options may be changed as needed:
 - The **Group Header** is the text that designates groups on your report.
 - The **Web URL** is the dynamic location of your published report with respect to your Orion Web Console.
 - **Font** size, face, color, and background may all be modified by clicking associated ellipses.
 - **Alignment** may be left, center, or right.
 - Check **Transparent Background** for better results when publishing your report to the Web.
 - If you want to change the grouping order, use the up and down arrows to change the grouping order accordingly.

Field Formatting Options Tab

The Field Formatting tab allows you to customize the format of the various results fields in your report. To format results fields, select the field you want to format, and then edit labels and select options as appropriate.

Notes:

- The formatting options available for each field may be different according to the nature of the data contained in that field.
- Check **Hidden Field** to hide any field in your report.
- To view your changes at any time, click **Preview**.

Customizing the Report Header and Footer Image

The image that is displayed at the top and bottom of each report can be changed. To add your company logo as the report header and footer, save your logo as `Header.jpg` in the `SolarWinds\Common\WebResources` folder, typically located in `C:\Program Files\`, and then click **Refresh**.

Note: The image must be in JPEG format with a height of 150 pixels or less.

Exporting Reports

Orion Report Writer gives you the ability to present your created reports in a variety of different, industry-standard formats. The following formats (and extensions) are currently supported:

- Comma-delimited (*.csv, *.cdf)
- Text (*.txt)
- HTML (*.htm, *.html)
- MIME HTML, with embedded images (*.mhtml)
- Excel® spreadsheet (*.xls)
- Adobe® PDF (*.pdf)
- Image (*.gif)

The following procedure presents the steps required to export an open report from Orion Report Writer into any of the previously listed formats.

To export a report from Report Writer:

1. Select a report to export by clicking any of the following:
 - Select a report from the file tree in the left pane
 - **File > Open** to open an existing report
 - **File > New Report** to create a new report. For more information about creating reports, see “**Error! Reference source not found.**” on page **Error! Bookmark not defined.**
2. Select **File > Export** and then click the format in which you want to export your report:
3. Check the fields in your open report that you want to export into the selected format, and then click **OK**.
4. Select a location to save your file.
5. Provide a **File name**, and then click **Save**.

Viewing Reports

All reports, custom or predefined, are available for viewing in Report Writer, as shown in the following procedures.

To view reports with Orion IPAM Report Writer:

1. Click **Start > All Programs > SolarWinds Orion > Alerting, Reporting, and Mapping > Report Writer**.
2. Click **+** next to a report group name to expand the group.
3. Click the title of the report you want to view.
4. Click **Preview**.

Scheduling Reports

Orion NPM provides a scheduling tool to schedule report emails and printouts.

To schedule a report:

1. Click **Start > All Programs > SolarWinds Orion > Alerting, Reporting, and Mapping > Orion Report Scheduler**.
2. Click **Edit > Add New Job**.
3. Type a name for your new report scheduler job, and then click **Continue**.
4. Click **Browse (...)** button, and then browse to the report you want to send in the Orion Web Console.
5. Click **Use Current URL**.
6. *If you want to exclude the Orion NPM web page banner and menu bar, check **Retrieve a Printable Version of this Page**.*
7. Check **Send Orion Username / Password in URL**.
8. Provide the user account credentials needed to view the Orion NPM web report.
9. *If you need to provide Windows login credentials, click the NT Account login tab, and then provide the user account details needed to log in.*
10. Click **Continue**.
11. Provide the appropriate schedule interval for your job, and then click **Continue**.

12. **If you want to email the report**, complete the following procedure:
 - a. Ensure **Email the Web Page** is selected.
 - b. Provide the email addresses and subject in the appropriate fields on the Email To tab.
 - c. Provide name and reply address in the appropriate fields on the Email From tab.
 - d. Type the hostname or IP address of the SMTP server and port number on the SMTP Server tab.
13. **If you want to print the report**, click **Print the Web Page**, select the printer, orientation, and number of copies you want to print.
14. Click **Continue**.
15. Type the Windows user account details, and then click **Continue**.
16. Type any comments you want to add to the job description, and then click **Finish**.

Using Alerts with Orion IPAM

Orion IPAM provides the ability to alert on high Subnet and DHCP scope utilizations. By default, Orion IPAM provides advanced alerts that are configured at install. The following alerts are available and functional as soon as Orion IPAM is installed, giving you immediate insight into the status and performance of your subnets and DHCP scope management:

- High DHCP Scope Usage Monitoring. This alert will write to IPAM event log when a scopes usage surpasses 75%
- High Subnet Usage Monitoring. This alert will write to IPAM event log when a subnets usage surpasses 75%

When you first log on to the Orion Web Console, if there are any devices on your network that trigger any of these alerts, the Active Alerts resource on the Network Summary Home view displays the triggered alerts with a brief description. You can then acknowledge these alerts from the Alerts view.

Viewing Alerts in the Orion IPAM Web Console

The Triggered Alerts for All Network Devices page provides a table view of your alerts log. You can customize the list view by using the following procedure to select your preferred alert grouping criteria.

To view alerts in the Web Console:

1. Click **Start > All Programs > SolarWinds Orion > Orion Web Console**.
2. Click **Alerts** in the Views toolbar.
3. *If you want to filter your alerts table view by Scopes*, select the Scope to which you want to limit your alerts view in the **Network Object** field.
4. *If you want to filter your alerts table by type of Scope*, select the Scope type to which you want to limit your alerts view in the **Type of Device** field.
5. *If you want to limit your alerts table to show a specific type of alert*, select the alert type in the **Alert Name** field.
6. In the **Show Alerts** field, provide the number of alerts you want to view.
7. *If you want to show all alerts, even if they have already been cleared or acknowledged*, check **Show Acknowledged Alerts**.
8. Click **Refresh** to complete your Alerts view configuration.

Viewing Alerts in Orion NPM System Manager

The Active Alerts window displays a table view of your alerts log. You can customize the list view by using the following procedure to select your preferred alert grouping criteria.

To view alerts in System Manager:

1. Click **Start > All Programs > SolarWinds Orion > System Manager**.
2. Click **Alerts > Active Alerts**.
3. Select **Advanced Alerts**.

4. **If you are viewing advanced alerts**, customize your Active Alerts display as follows:
 - a. Select from the following options in the **Group By** list to change your Active Alerts view: **Alert Name, Object Type, Object Name, Alert State, Acknowledged, Acknowledged By, or No Grouping**.
 - b. Order your Alerts list by any of the following criteria by clicking the appropriate column: **Acknowledged, Alert Name, Alert State, Object Name, Triggered Time, Acknowledged By, or Acknowledge Time**.
5. Click **Refresh** at any time to display the most recently triggered alerts.

Creating and Configuring Advanced Alerts

The Orion IPAM advanced alert engine allows you to configure alerts with the following features:

- Sustained state trigger and reset conditions
- Multiple condition matching
- Automatic alert escalation
- Separate actions for triggers and resets

Advanced alerts are configured using the Advanced Alert Manager. For more information about the Advanced Alert Manager, see "Creating and Configuring Advanced Alerts" in the *SolarWinds Orion Network Performance Monitor Administrator Guide*.

Note: If you want to configure advanced alert features, such as timed alert checking, delayed alert triggering, timed alert resets, or alert suppression, check **Show Advanced Features** at the lower left of any Advanced Alert windows. For the purposes of this document, **Show Advanced Features** should always be enabled.

IPAM Advanced Alert Example

The following procedure modifies an existing advanced alert.

To modify a default advanced alert:

To set the trigger conditions for an advanced alert:

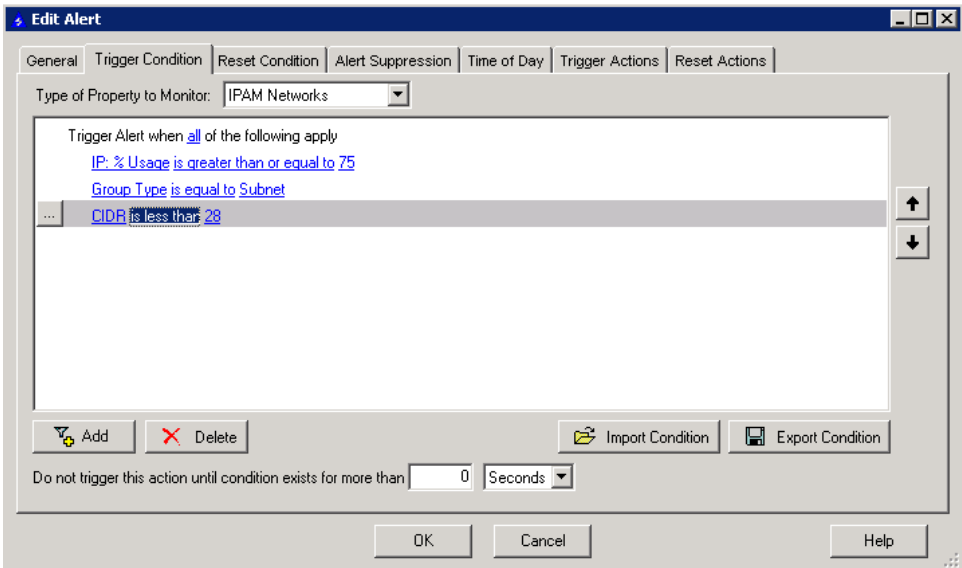
1. Click **Start > SolarWinds Orion > Alerting, Reporting, and Mapping > Advanced Alert Manager**.
2. Click **View > Configure Alerts**.

3. Click **High Subnet Usage Monitoring**.
4. Click **Edit**.
5. Click **Trigger Condition**.
6. **Add a Simple Condition**
7. Click **Add a Simple Condition**.
8. Click **Browse (...)** and set to *CIDR*:
9. **If you need an additional condition**, click **Add**, and then select the type of condition you want to add.
10. **If you need to delete a condition**, select the condition from the condition list, and then click **Delete**.

Notes:

- Conditions may be exported for use with other alerts by clicking **Export Conditions** and saving as appropriate.
- Click **Import Conditions** to import existing conditions from other alerts.

Warning: Imported trigger conditions automatically overwrite any existing trigger conditions.



11. **If you want to specify a time duration for the condition to be valid**, type the time interval and select Seconds, Minutes, or Hours from the list.

Note: You may need to delay alert trigger actions until a condition has been sustained for a certain amount of time. For example, an alert based on CPU load would not trigger unless the CPU Load of a node has been over 80% for

more than 10 minutes. To set up a sustained-state trigger condition, at the bottom of the Trigger Condition tab, provide an appropriate amount of time the alert engine should wait before any actions are performed. By default, the alert triggers immediately, if the trigger condition exists. The maximum alert action delay is eight hours after the trigger condition is met.

12. If you are finished configuring your advanced alert, click OK.

To learn more about the Advanced Alerting capabilities, including reset conditions, alert suppression, trigger and reset actions for an Advanced Alert see "Creating and Configuring Advanced Alerts" in the *SolarWinds Orion Network Performance Monitor Administrator Guide*.

Additional Orion IPAM Features

As an Orion module, Orion IPAM provides access to both the SolarWinds Engineer Toolset integration and thwack, the SolarWinds online community.

Integrating SolarWinds Engineer's Toolset with Orion IPAM

When you are browsing the Orion Web Console from a computer that has SolarWinds Engineer's Toolset installed, you can launch Toolset tools directly from your web browser. Right-clicking on any node, interface, or volume will display a menu of available Engineer's Toolset tools and functions. The following procedure configures SolarWinds Engineer's Toolset for integration within the Orion Web Console.

Note: The first time the Toolset tools are accessed, a security warning may be displayed. Click **Yes** to allow the toolset integration.

To configure Engineer's Toolset integration settings:

1. Right-click on any node, interface, or volume from within the web console.
2. Click **Settings**, and then click SNMP Community String.

Note: The first time a tool requiring an SNMP community string is launched from the right-click menu, the **Add Community String** window is displayed. If the option **Remember this community string** is checked, the community string will be saved for future access.

3. **If you want to delete any or all saved community strings**, select the strings that you want to delete, and then click **Remove**, or click **Remove All**.
4. Click Menu Options, and then configure the right-click menu as follows:
 - a. **If you want to add or remove menu items from the right-click menu**, move menu items between the list of **Available Menu Options** on the left and **Selected Menu Options** on the right by selecting items in either column and clicking the right and left arrows, as appropriate.
 - b. **If you want to change the order of menu items**, select items and then click the up and down arrows next to the **Selected Menu Options** list.
 - c. **If you want to add a separator between items**, move the "-----" menu option from the **Available** list to the **Selected** list, and then move it to your preferred location within the **Selected Menu Options** list.

5. Click Automatic Menu Items.
6. Check either or both of the following options:
 - **Automatically add sub-menu items to the “MIB Browser (Query MIB)” menu option from the MIB Brower’s Bookmarks.**
 - **Automatically add sub-menu items to the “Real Time Interface Monitor” menu option from the Real-Time Interface Monitor saved report types.**

Note: These options expand the list of available menu items by incorporating menu links to MIB browser bookmarks and Real-time Interface Monitor saved reports, respectively.

Interacting with the thwack User Community

thwack is a community site that SolarWinds developed to provide users and the broader networking community with useful information, tools and valuable resources related to SolarWinds network management solutions. Resources that allow you both to view recent posts and to search all posts are available from the Orion Web Console, providing direct access to the thwack community. IPAM comes with the Thwack integration imbedded in the resource page.

thwack Recent Orion Posts Resource

This resource shows the most recent Orion IPAM posts that have been submitted to thwack.com, the online SolarWinds user community. Clicking any post title listed in the resource opens the associated post in the IPAM forum.

1. Click the title of a listed post to open in a new browser.
2. Click **Edit** to set the number of posts to display in the resource.
3. Click **View All** to see a list of all Orion IPAM posts
4. Click Submit when you are done.
5. To remove this resource from view Click **Customize Page** and select thwack.com in the resource column.
6. Click the red **x**. and click **Done**.

Providing Feedback

thwack also offers the ability to submit product feedback and feature requests via the IPAM Feature requests forum. You may navigate to that forum via the thwack forums page.

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