SolarWinds Network Management Guide

solarwinds

SBA FOR GOVERNMENT

Revision: H2CY10

The Purpose of this Guide

In keeping with the blueprint theme of the Cisco Smart Business Architecture (SBA) for Government Midsize Agencies, this guide describes the SolarWinds' Orion family of network management products which are designed with an 'out of the box' deployment that is simple, fast, affordable, scalable, and flexible.

This guide organizes the various tasks by Day 0, Day 1, and Day 2+ to help clarify the recommended timing of tasks when using the Orion products in conjunction with the configuration modules in this guide.

Related Documents

Before reading this guide

DC — Data Center Deployment Guide

DC — Data Center Configuration Guide

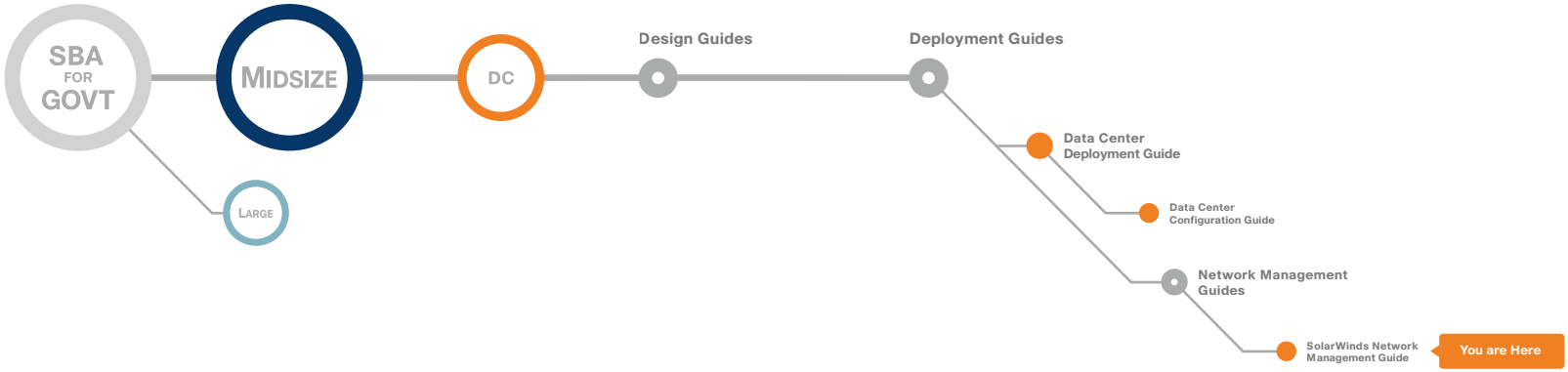


Table of Contents

SBA Overview

The Cisco® SBA is a comprehensive design for networks with up to 1000 users. This out-of-the-box design is simple, fast, affordable, scalable, and flexible.

The Cisco SBA for Midsize Agencies incorporates LAN, WAN, wireless, security, WAN optimization, and unified communication technologies tested together as a solution. This solution-level approach simplifies the system integration normally associated with multiple technologies, allowing you to select the modules that solve your agency's problems rather than worrying about the technical details.

We have designed the Cisco SBA to be easy to configure, deploy, and manage. This architecture:

- Provides a solid network foundation
- Makes deployment fast and easy
- Accelerates ability to easily deploy additional services
- Avoids the need for re-engineering of the core network

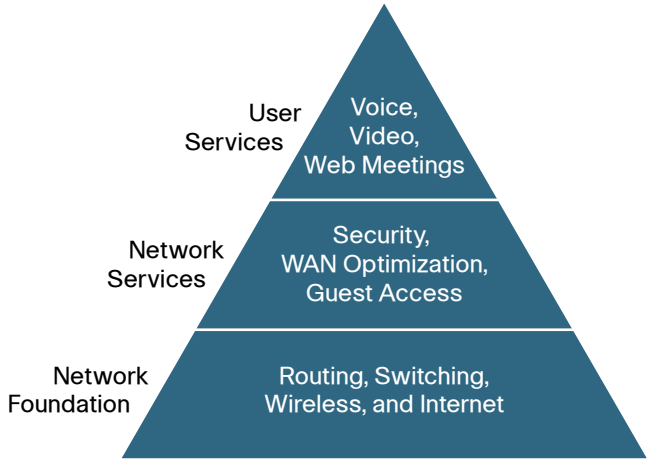
By deploying the Cisco SBA, your agency can gain:

- A standardized design, tested and supported by Cisco
- Optimized architecture for midsize agencies with up to 1000 users and up to 20 remote sites
- Flexible architecture to help ensure easy migration as the agency grows
- Seamless support for quick deployment of wired and wireless network access for data, voice, teleworker, and wireless guest
- Security and high availability for agency information resources, servers, and Internet-facing applications
- Improved WAN performance and cost reduction through the use of WAN optimization
- Simplified deployment and operation by IT workers with CCNA® certification or equivalent experience
- Cisco enterprise-class reliability in products designed for midsize agencies

Guiding Principles

We divided the deployment process into modules according to the following principles:

- **Ease of use:** A top requirement of Cisco SBA was to develop a design that could be deployed with the minimal amount of configuration and day-two management.
- **Cost-effective:** Another critical requirement as we selected products was to meet the budget guidelines for midsize agencies.
- **Flexibility and scalability:** As the agency grows, so too must its infrastructure. Products selected must have the ability to grow or be repurposed within the architecture.
- **Reuse:** We strived, when possible, to reuse the same products throughout the various modules to minimize the number of products required for spares.



The Cisco SBA can be broken down into the following three primary, modular yet interdependent components for the midsize agency.

- **Network Foundation:** A network that supports the architecture
- **Network Services:** Features that operate in the background to improve and enable the user experience without direct user awareness
- **User Services:** Applications with which a user interacts directly

Introduction

With a network management system, you can automate configuration tasks and monitor network health, giving you the visibility you need to quickly troubleshoot issues.

Cisco offers a number of Network Management options. This guide is focused on our partnership with SolarWinds and their Orion products, which meet our goal to deliver affordable, easy-to-use network configuration and change management.

The Orion family of products has been tested and validated with the components described in the *SBA for Midsize Agencies—Borderless Networks Foundation Deployment Guide* and the *Data Center Deployment Guide*.

This guide includes two SolarWinds Orion products:

- Orion Network Configuration Manager (NCM) for managing and monitoring network configuration changes
- Orion Network Performance Monitor (NPM) for quickly detecting, diagnosing, and resolving network performance problems and outages

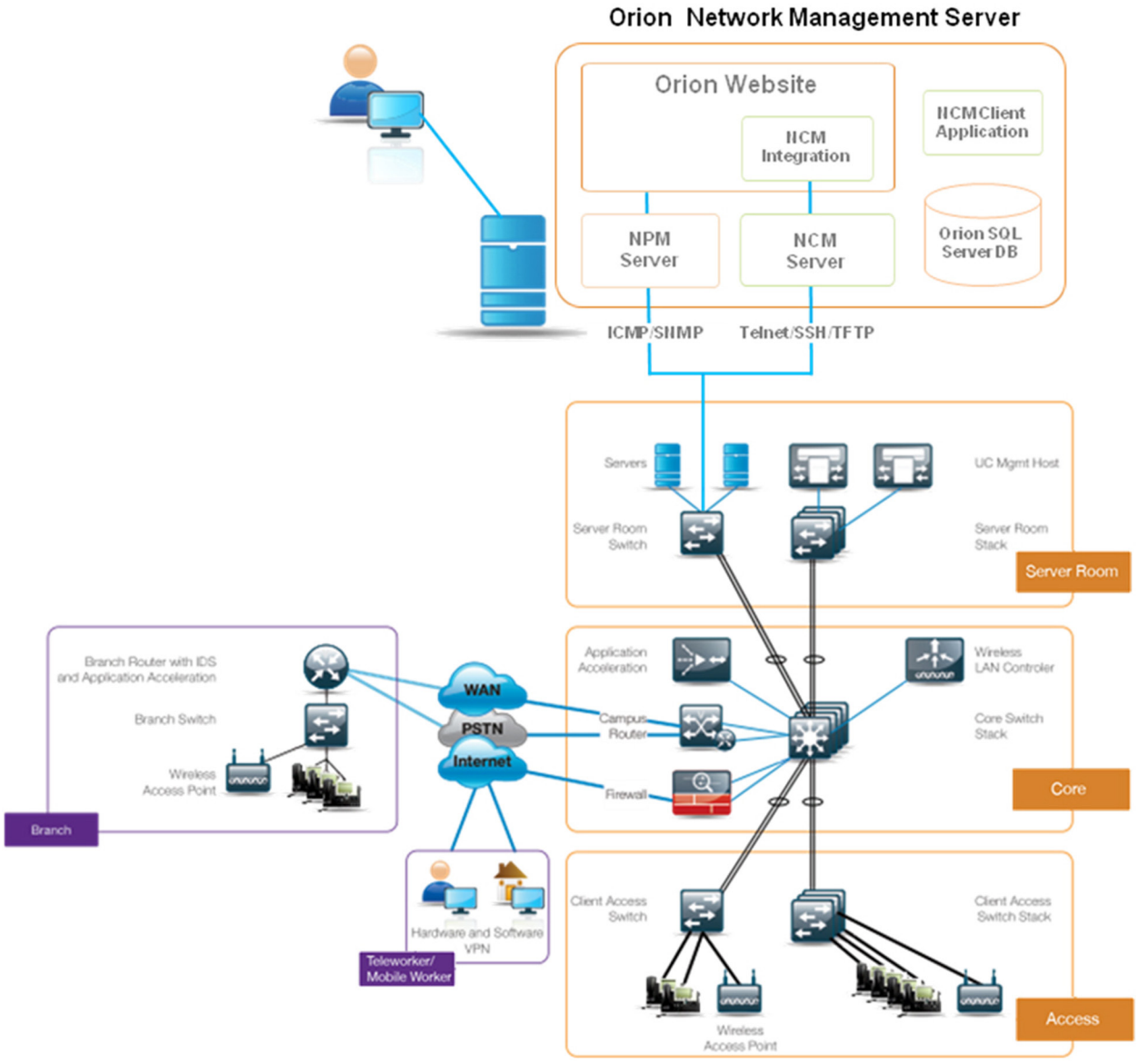
The SolarWinds Orion network management products leverage SNMP for gathering availability and performance data and Secure Shell (SSH) (Telnet or TFTP) for executing configuration management operations across your network devices. Prior to continuing with this module, please ensure you follow the steps outlined in the Global Configuration module in the Cisco SBA Foundation Deployment Guide to setup IP addresses and configure these standard management protocols for each device you want to manage.

You can download a free trial of NPM and NCM from http://www.solarwinds. com/Cisco_Orion.

Notes

Architectural Overview

Figure 1. Network Management Architecture

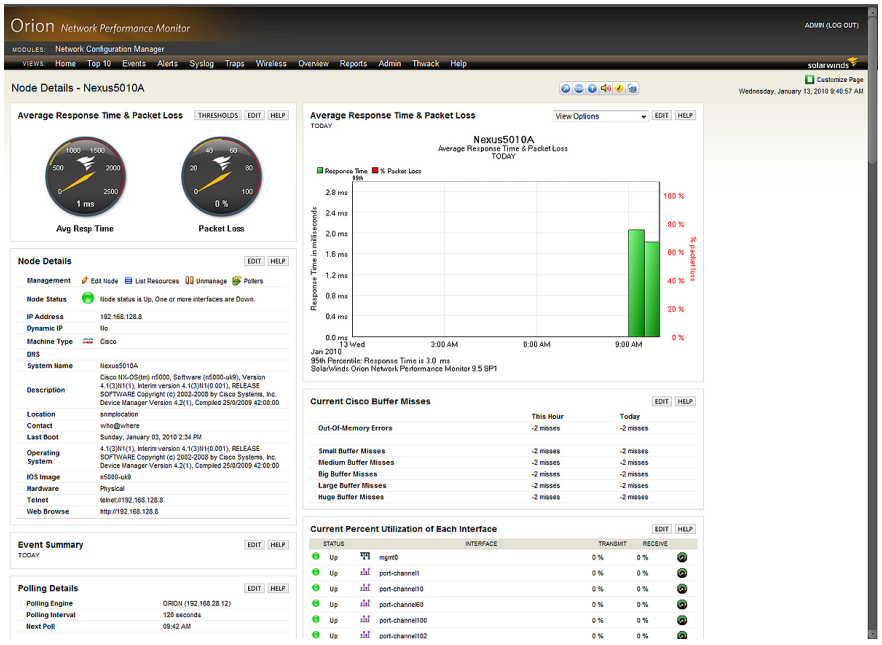


Deploying SolarWinds

This section explains how to deploy SolarWinds in three phases:

- **Day 0: Setup Network Management System / Assess and Configure Network Devices:** This section will guide you through the initial setup of the Orion network management system, which should take less than an hour, and how to use the system to assess and manage the device configurations of your Cisco SBA Data Center network. Cisco recommends that you perform the steps in this section immediately following the Ethernet Data Center, Resilient Wide-Area Network (WAN) and Resilient Wireless modules in the Cisco SBA Data Center Deployment Guide and the Global Configuration module in the Cisco SBA Foundation Deployment Guide so that you may use Orion Network Configuration Monitor (NCM) to inventory the existing network, assess the differences in the network device configurations from Cisco baseline configurations, and push the configuration changes required for subsequent module deployments.

Figure 2. Orion Network Configuration Monitor



- **Day 1: Baseline the Network and Start Monitoring:** The Day 1 section will guide you through the steps necessary to baseline the network and start monitoring. Perform this section immediately following the deployment of all required modules so that you may backup your configurations and gain visibility into any problems affecting network performance.
- **Day 2+: Optimize and Maintain the Health of the Network**: The final section, Day 2+, will guide you through the steps necessary to optimize and maintain the health of your network. This section can be performed at any time, but we recommend it be performed immediately after the Day 1 section tasks to allow you to determine if there are opportunities for performance optimization and if there are any capacity issues that need to be resolved.

Process

Setting Up Network Management (Day 0)

1. Install NPM Server and Website
2. Install NCM Server and Client Application
3. Install NCM Integration Module

Installation and configuration of Orion Network Performance Monitor (NPM) and Network Configuration Monitor (NCM) should take less than an hour by following the steps outlined below.

Before you begin the setup, make sure your Windows Server meets all of the Orion required specifications, including:

Hardware

- Dual core processor, 3GHz
- 3 GB memory
- 20 GB available disk space

Software

- Windows 2003 Server (32-bit or 64-bit) including R2, with IIS 6.0 or later installed, running in 32 bit mode
- Windows 2008 Server (32-bit or 64-bit) with IIS 6.0 or later installed, running in 32 bit mode
- .NET Framework Version 3.5 or later
- Microsoft SNMP Trap Services

Database

- The Orion NPM evaluation will automatically install SQL 2005 Express by default, which can be used by NCM as well.
- Use SQL Server 2005/2008 Standard or Enterprise for production deployments.

During the installation of Orion you will be asked for several pieces of data that you may want to record here for future reference. Use the following section to keep track of the details specific to your network.

Network Device Connectivity

Login username =

Login password =

Enable password =

Community string =

Orion Login Credentials

NCM Administrator password =

NPM Administrator password =

Procedure 1 Install NPM Server and Website

First, you'll install the Orion NPM Server and Website.

Step 1: Download a fully functional 30-day trial of the Orion network management software required to complete this module from http://www.solarwinds.com/Cisco_Orion.

Step 2: Log into the Windows server using an account with Administrator privileges.

Step 3: Run the Orion NPM executable and select the Express installation option. This will automatically install Orion NPM and configure a SQL 2005 Express database server for monitoring data storage.

Step 4: After Orion NPM Configuration Wizard has completed, the Orion Web Console will automatically open in your default browser.

Step 5: Log in using "Admin" and "blank" as the password (you may change this later) and follow the steps in the automated discovery wizard to import your devices.

Procedure 2 Install NCM Server and Client Application

Step 1: Run the NCM "server" executable on the same server where you installed Orion NPM and, when the Configuration Wizard starts up, use the same SQL server as NPM: (local)\SOLARWINDS_ORION. You may leave the default NCM database name (ConfigMgmt) and website settings.

When you reach the System Default Settings portion of the wizard, ensure you have entered the correct community string and default authentication settings as configured in the Global Configuration module.

Tech Tip

The default authentication settings will be used by NCM to connect to your devices and perform the initial device inventory and configuration backups.

Step 2: When you reach the Import Devices section of the wizard, uncheck the "Populate Node List with Devices" option and click "Next". The next screen will allow you to quickly import nodes you previously discovered in Orion NPM.

Step 3: Check the option to enable synchronization of Orion NPM nodes into NCM and specify **Windows Authentication** for the SQL Server authentication method. Enter **`(local)\SOLARWINDS_ORION`** for the database server and enter **`NetPerfMon`** for the database name.

Step 4: After the Configuration Wizard has completed, the NCM client application will automatically open. Change your Administrator password and write this down in your setup notes as you will need this for authentication to NCM from the Orion Web Console.

Procedure 3 Install NCM Integration Module

Now you'll install the NCM Integration Module for your Orion Web Console.

Step 1: Run the NCM "NPM Integration" executable on your Orion server. After the installation and configuration wizard have completed, login to the Orion Web Console.

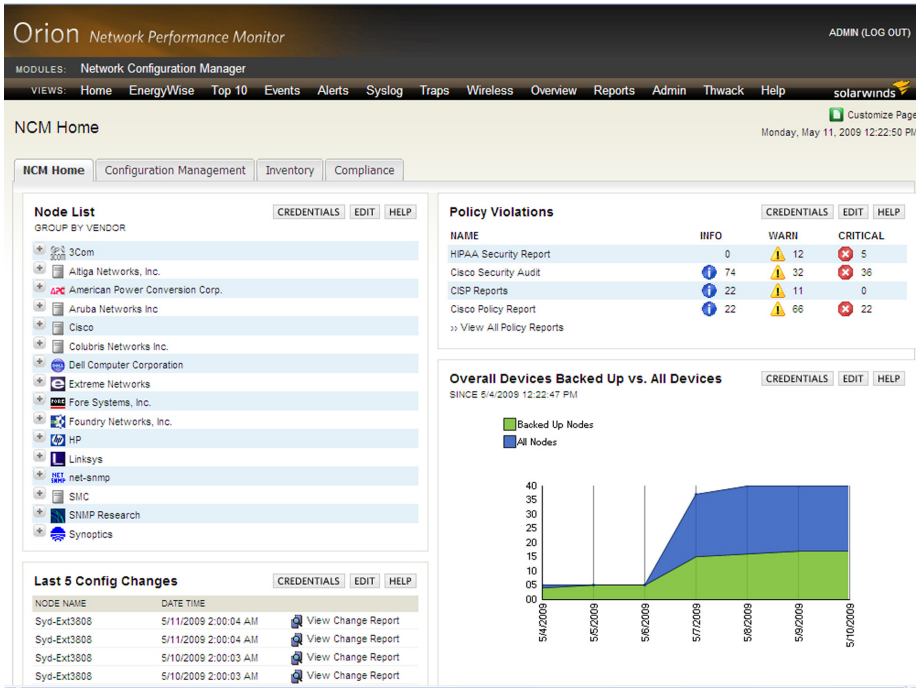
Step 2: Click **Admin** link in the menu bar and navigate to **NCM Settings > Connection Settings** and enter the IP address of your NCM server and click **Submit**.

Step 3: Click **Network Configuration Manager** in the menu bar to navigate to the NCM summary view.

Step 4: Click **Credential** on one of the NCM resources and enter your NCM Administrator account credentials (use the built-in Administrator account for now) and click **Submit**.

The NCM Home view should now be fully functional.

Figure 3. NCM Home



Process

Assessing and Configuring Network Devices (Day 0)

1. Take Inventory
2. Deploy Configuration Snippets
3. Assess Your Network Variance

Procedure 1 Take Inventory

Now you will inventory the existing network infrastructure to determine compatibility with this architecture.

Step 1: Log into the NCM client application and select **Schedule > Display/ Edit Jobs**.

Step 2: Right-click on the default **Nightly Network Inventory** job and select **Test Job**. Click **Start** to start the process.

Step 3: If there are any devices with inventories that were unsuccessful, edit each failing device and validate your SNMP credentials.

Step 4: Once you have verified that the job completes for all devices, click **Reports > View Reports** and run the following reports to help assess hardware and firmware compatibility of the existing devices:

- Cisco IOS Image Details: This report displays the feature level, image, system description, and IOS version for each Cisco device.
- Cisco Card Data: This report displays the hardware details for each Cisco device, including card name, description, class, position, hardware revision, serial number, and model.

Procedure 2 Deploy Configuration Snippets

For this example, assume that Cisco Catalyst 3750G switches are being deployed in the data center as described in the Ethernet Data Center Design section in the *Cisco SBA Data Center Deployment Guide*.

Below is a description of enabling Syslog and Traps on all Cisco Catalyst 3750 switches you configured in the data center without having to manually login to each device. Other global config snippets referenced in the guide can be created and deployed in a similar fashion, including Nexus 5000/2000 switches if used in your data center design.

Step 1: Download the Cisco 3750 Enable Syslog-Trap script from the SolarWinds Thwack Content Exchange, http://thwack.com/media/p/65229.aspx, to your Orion server.

Step 2: Log into the NCM client application. The NCM client application is available from the Start Menu (All Programs > SolarWinds Orion Network Configuration Manager > Orion Network Configuration Manager)

Step 3: Right-click in the devices tree and select **Execute Script**.

Step 4: Click **Load Script** to browse and select the Catalyst 3750 script you downloaded above:

```
${EnterConfigMode}
service timestamps log datetime localtime
logging host <Orion server IP>
snmp-server enable traps
snmp-server host <Orion server IP> public
exit
write memory
```

Step 5: Select the Data Center module 3750 switches you configured and click **Execute Command Script**.

Tech Tip

The ${EnterConfigMode} macro will automatically enter into global configuration mode for each target device. For a complete list of macros and variables available for use with command line scripting, please consult the Orion NCM Administrator Guide.

Procedure 3 Assess Your Network Variance

If your agency has an existing network infrastructure referenced in this deployment guide, perform the following steps to assess its variance from the Cisco baseline configurations for those device types.

Step 1: Log into the NCM client application. The NCM client application is available from the Start Menu (All Programs > SolarWinds Orion Network Configuration Manager > Orion Network Configuration Manager).

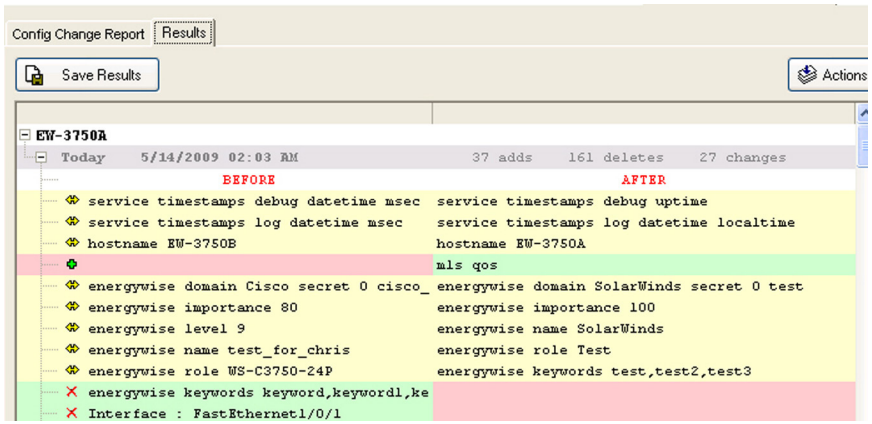
Step 2: Download the Cisco Baseline Configurations from Cisco.com and import them into your Orion NCM server following the instructions in the "Importing Configuration Files" section of NCM Administrator Guide, which is available at: http://www.solarwinds.com/support/orionNCM/docs/orionNCMAdministratorGuide.pdf.

Step 3: Right-click and select **Set Baseline** to set each imported config as the baseline configuration within NCM.

Step 4: Right-click and select **Download Configs**. Add all devices you wish to compare against baseline configs you set above and click **Download** to download the running config into NCM for comparison.

Step 5: Run the Config Change Report to compare each selected device against their imported Cisco baseline

Figure 4. configs (Configs > Config Comparison Report)



Step 6: Select **Compare most recent Download to the last Baseline Config** and click **Generate Report**.

Step 7: If you see discrepancies that need to be resolved, you may right-click anywhere in the config and select **Edit Config** to see the full configuration.

Step 8: From there, make any changes necessary and upload to the devices.

Process

Baseline the Network and Start Monitoring (Day 1)

1. Backup All Your Network Devices
2. Enable Configuration Change Reports
3. Configure Fault and Performance Alerts
4. Define Custom Monitoring (optional)
5. Crete Network Maps (optional)
6. Customize Your Dashboard (optional)

After you have completed the set up steps from any of the associated modules, use Orion to quickly baseline your network configuration and start monitoring performance. Baselining the network will provide you with an automated way to validate the network against recommended settings in this guide in the future.

Procedure 1 Backup All Your Network Devices

Step 1: Log into the NCM client application and select **Schedule > Display/Edit Jobs**. The NCM client application is available from the Start Menu (All Programs > SolarWinds Orion Network Configuration Manager > Orion Network Configuration Manager).

Step 2: Right-click the default **Nightly Config Backup** job and select **Test Job**. Click **Start** to start downloading configurations.

Step 3: If there are any devices with backups that were unsuccessful, edit each failing device and validate your login credentials. After you have verified that the job completes for all devices, you may perform ad hoc backups as necessary through the Orion Web Console.

Tech Tip

For additional information about the Orion product family or to connect with the SolarWinds Thwack community of over 25,000 network professionals, please visit http://www.thwack.com.

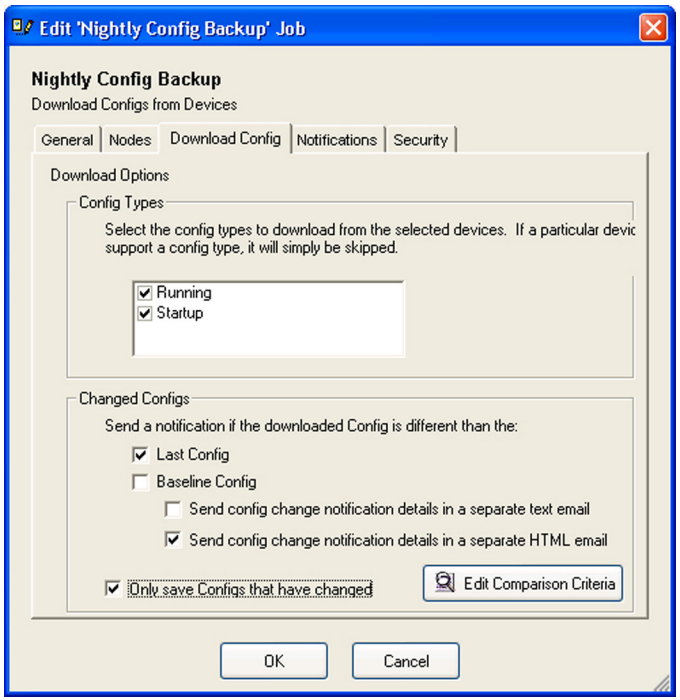
Procedure 2 Enable Configuration Change Reports

Step 1: To enable config change reporting, log into the NCM client application and select **Schedule > Display/Edit Jobs**.

Step 2: Edit the default **Nightly Config Backup** job and navigate to the **Download Config** tab.

Step 3: Under the Changed Configs section, select checkboxes next to **Last Config** and **Send config change notifications details in a separate HTML email** as shown in Figure 5.

Figure 5. Nightly Config Backup



Step 4: Select the **Notifications** tab and check the box next to **E-mail results**. Enter the appropriate information in the Email To, Email From, and Simple Mail Transfer Protocol (SMTP) Server sections.

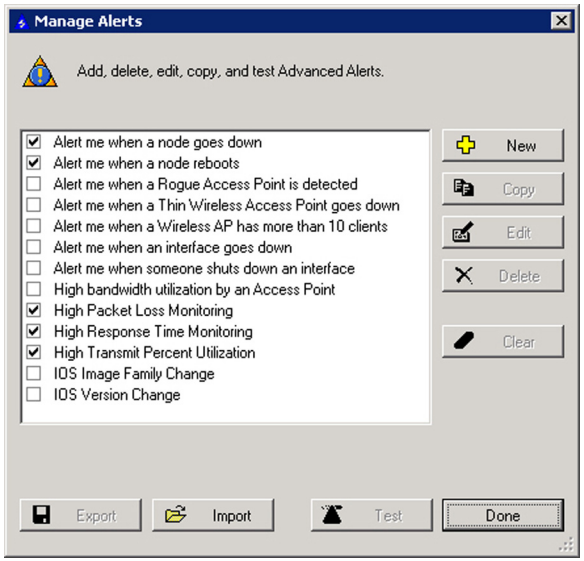
Procedure 3 Configure Fault & Performance Alerts

By default, Orion provides a number of advanced alerts that are configured at install. If, when you first log on to the Orion Web Console 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.

Step 1: To view the configured alerts, open the Advanced Alert Manager and click **Configure Alerts**. The Advanced Alert Manager is available from the Start Menu (All Programs > SolarWinds Orion > Alerting, Reporting, and Mapping > Advanced Alert Manager).

Step 2: If you are implementing the Resilient Wireless Design module in the *SBA Data Center Deployment Guide*, check the boxes next to the wireless alerts as appropriate. You will notice that several alerts are already enabled by default. Check additional alerts as necessary or create new ones.

Figure 6. Manage Alerts

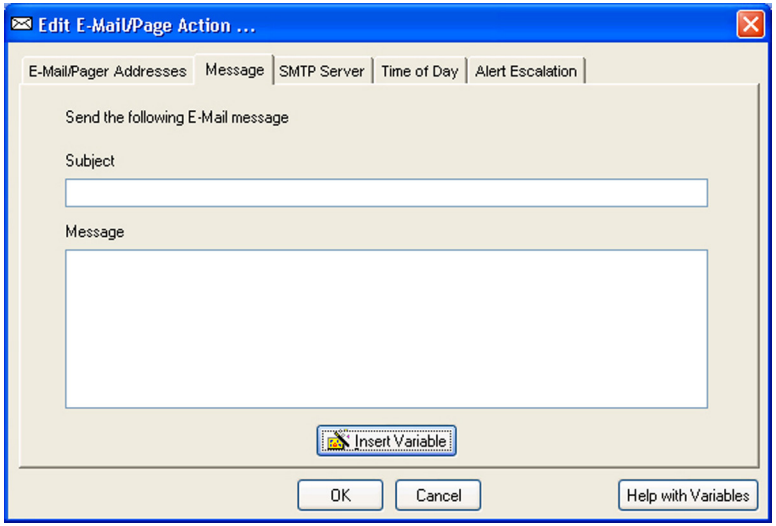


Step 3: Add an email notification action to the desired alerts by editing the alert and selecting the **Trigger Actions** tab. Click **Add New Action** and select **Send an Email/Page** from the list of alert actions.

Step 4: You may also use alert variables within the messages that are parsed dynamically when an alert is triggered or reset.

For example: The variable ${AvgResponseTime} will parse to the average response time of the node that is triggering the alert.

Figure 7. Edit Email/Page Action



Tech Tip

For detailed information about alert variables, configuring sustained state trigger and reset conditions, multiple condition matching, and automatic alert escalation, please reference the online help.

Procedure 4 Define Custom Monitoring (optional)

If you wish, you may use Orion's Universal Device Pollers (UnDPs) to configure custom monitoring.

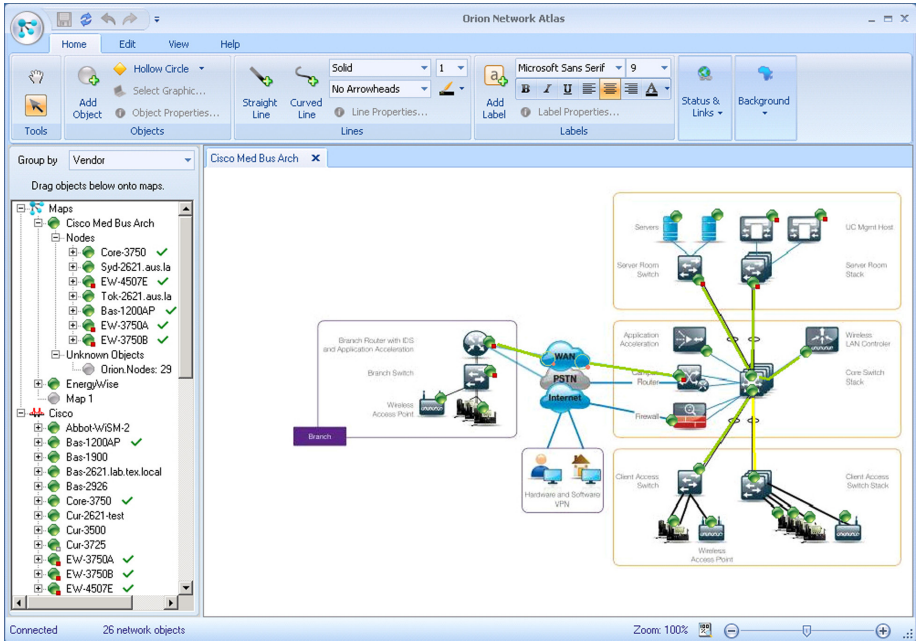
While Orion NPM comprehensively monitors a broad set of device statistics and data out-of-the-box, there may be cases where you wish to monitor additional device attributes. You can quickly configure an UnDP to support these custom situations, or a UnDP may have already been created for the information you're looking for by the extensive SolarWinds user community.

Step 1: Access and review the UnDPs and other community shared content in the Content Exchange area on the SolarWinds Thwack community site at: http://thwack.com/media/.

Procedure 5 Create Network Maps (optional)

Orion Network Atlas gives you the ability to create custom maps and network diagrams, which can then be made visible in the Orion Web Console.

Figure 8. Network Atlas



Step 1: Use Network Atlas to document the network deployment and print and export the diagram so that you can refer to it later should you need it. Access Network Atlas from the Start Menu (All Programs > SolarWinds Orion > Alerting, Reporting, and Mapping > Network Atlas).

Step 2: To create a basic map, select a background image, drag nodes to the image, and connect them with lines. You may assign a status to each line to reflect the actual status of each link.

Tech Tip

For examples of network maps with drill-down and Orion View customizations, check out the Orion online demo: http://oriondemo.solarwinds.com.

Procedure 6 Customize your Dashboard (optional)

Views in the Orion Web Console are configurable presentations of network information. A view can include maps, charts, summary lists, reports, events, and links to other resources.

Step 1: You can assign views to menu bars and customize each view.

Step 2: You may also select the charts and device properties that are displayed on each view.

Step 3: To edit a view from within the Orion Web Console, click **Customize Page** in the upper-right corner when viewing a page you would like to customize.

Step 4: Consider creating an Orion Web Console login account for your customer to give them visibility into their network deployment.

Process

Optimizing and Maintaining Network Health (Day 2)

1. Run Historical Reports
2. Analyze Future Trends
3. Analyze Compliance (optional)

Use Orion reporting to determine if there are opportunities for performance optimization and if there are any capacity or security issues that need to be resolved.

Procedure 1 Run Historical Reports

Step 1: Log into the Orion Web Console and click "Reports" on the menu bar to access the list of built-in reports.

Step 2: Review the following reports to determine if there are any anomalies worth exploring:

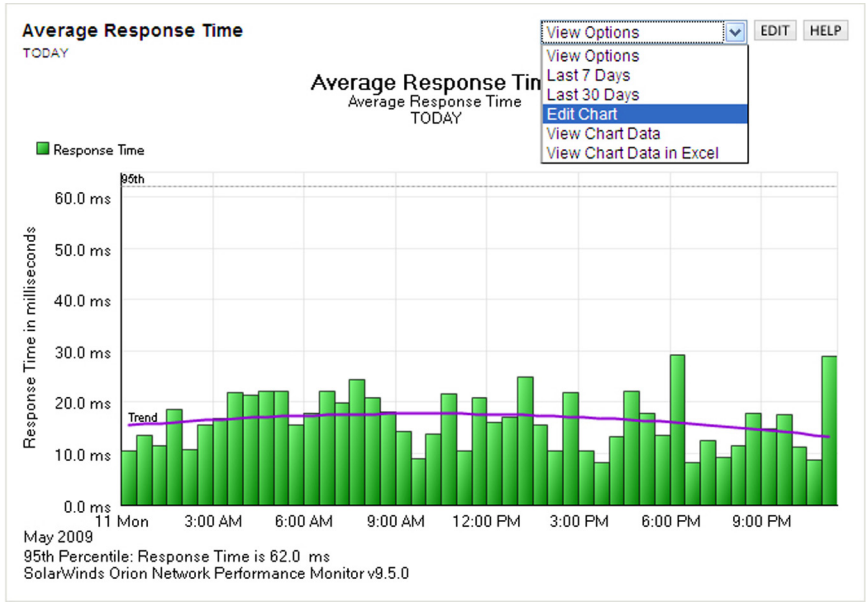
- Events > Triggered Alerts - Last 30 Days: This report displays a list of all triggered alerts over the past 30 days. For each triggered alert event, this report displays the date and time of the alert trigger, the node that triggered the alert, and a message describing the triggered alert event.
- Historical Cisco Buffer Miss Reports > Cisco Buffer Misses - Last 7 Days: This report displays all buffer misses (small, medium, big, large, and huge) on monitored Cisco devices over the past 7 days.
- Historical Traffic Reports > Average and Peak Traffic Rates - Last 7 Days: This report displays the average and peak response times for the top ten monitored nodes over the last month.
- Historical Traffic Reports > 95th Percentile Traffic Rate - Last 7 Days: This report displays the 95th percentile traffic rates (receive, transmit, maximum) for all monitored interfaces over the last 7 days.

Procedure 2 Analyze Future Trends

Orion includes trend lines on charts to help with analyzing future requirements on network devices.

Step 1: To leverage trend lines, select **Edit** in the drop-down of any chart and customize the chart to a future timeframe.

Figure 9. Average Response Time



Tech Tip

You can modify reports to suit your specific requirements. For more information about using Orion Report Writer, see "Getting Started with Orion Report Writer" in the online help.

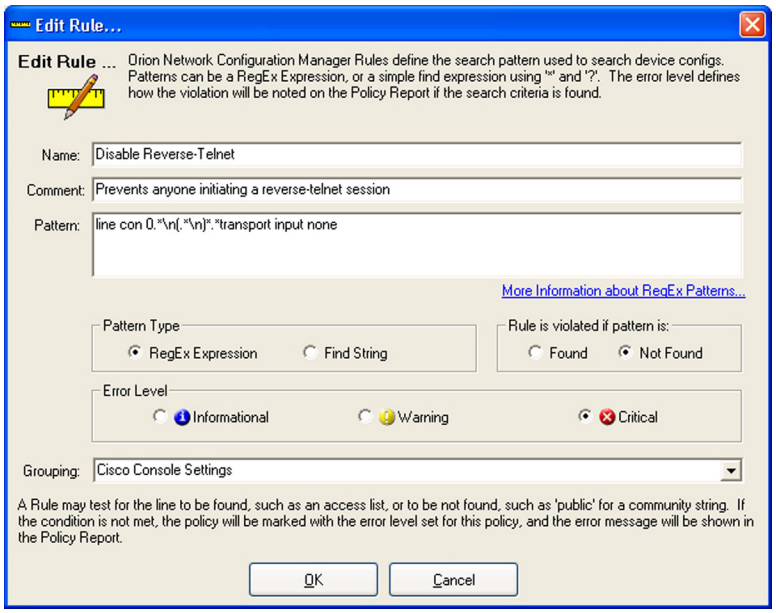
Procedure 3 Analyze Compliance (optional)

Orion NCM includes policy reporting which allows you to scan configuration files and report any discovered rule violations. For example: A rule may dictate that configurations should not include the read-only community string “public”.

Step 1: To access the built-in policy reports from the Orion Web Console, navigate to the **Network Configuration Manager** link, click on the **Compliance** tab, and run the desired report.

Step 2: To create new policy reports, policies, and rules, open the Orion NCM Policy Reporter application from the Start Menu (All Programs > SolarWinds Orion Network Configuration Manager > Orion NCM Policy Reporter).

Figure 10. Edit Rule



Tech Tip

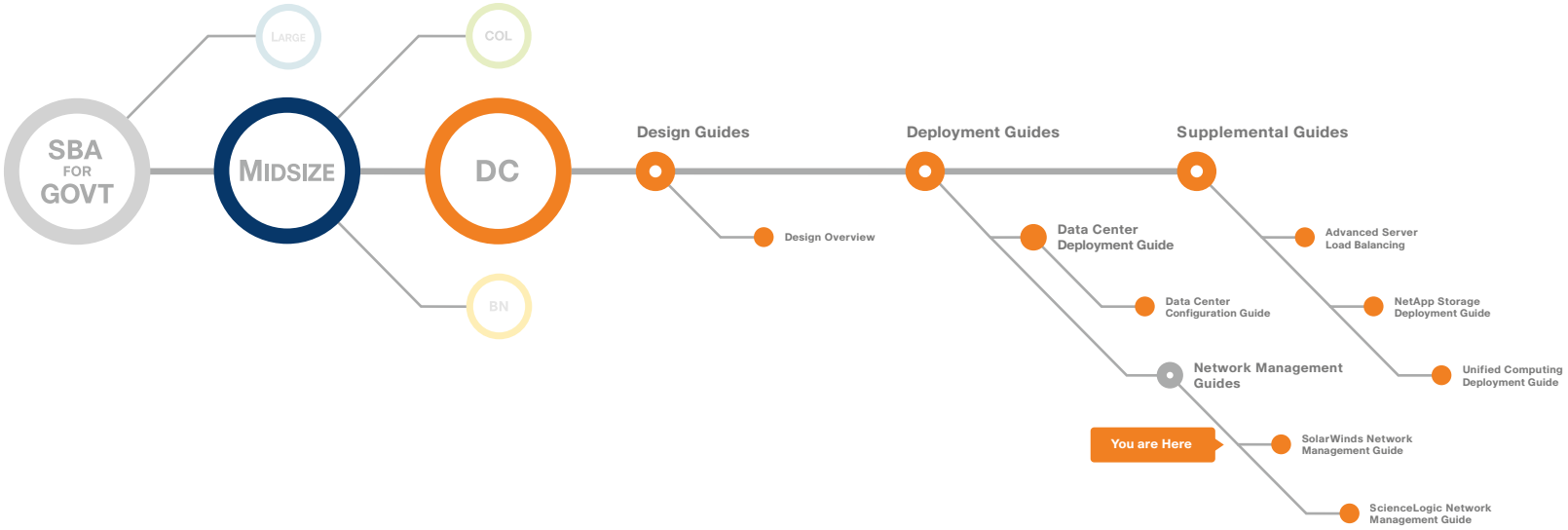
If you used the 30-day trial versions of the Orion products to set up your network, be sure to convert them to a full license before the end of the 30-day evaluation period. All settings will be maintained in the conversion from the 30-day trial to the full license.

Reader Tip

If you are an end user, please contact sales@solarwinds.com for any questions. You can also submit an Inquiry about SolarWinds and the Cisco SBA

If you are a reseller, please contact reseller@solarwinds.com for any questions. For more information on how to become a SolarWinds reseller, please visit the Partner Section of our website.

Appendix A:
SBA for Midsize Agencies Document System



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