



ExtremeSwitching™

Quick Start Configuration for VSP Operating System Software

NN47227-102
Issue 12.01
September 2017

© 2017, Extreme Networks, Inc.
All Rights Reserved.

Notice

While reasonable efforts have been made to ensure that the information in this document is complete and accurate at the time of printing, Extreme Networks, Inc. assumes no liability for any errors. Extreme Networks, Inc. reserves the right to make changes and corrections to the information in this document without the obligation to notify any person or organization of such changes.

Documentation disclaimer

"Documentation" means information published in varying mediums which may include product information, operating instructions and performance specifications that are generally made available to users of products. Documentation does not include marketing materials. Extreme Networks shall not be responsible for any modifications, additions, or deletions to the original published version of Documentation unless such modifications, additions, or deletions were performed by or on the express behalf of Extreme Networks. End User agrees to indemnify and hold harmless Extreme Networks, Extreme Networks' agents, servants and employees against all claims, lawsuits, demands and judgments arising out of, or in connection with, subsequent modifications, additions or deletions to this documentation, to the extent made by End User.

Link disclaimer

Extreme Networks is not responsible for the contents or reliability of any linked websites referenced within this site or Documentation provided by Extreme Networks. Extreme Networks is not responsible for the accuracy of any information, statement or content provided on these sites and does not necessarily endorse the products, services, or information described or offered within them. Extreme Networks does not guarantee that these links will work all the time and has no control over the availability of the linked pages.

Warranty

Extreme Networks provides a limited warranty on Extreme Networks hardware and software. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Extreme Networks' standard warranty language, as well as information regarding support for this product while under warranty is available to Extreme Networks customers and other parties through the Extreme Networks Support website: <http://www.extremenetworks.com/support> under the link "Policies" or such successor site as designated by Extreme Networks. Please note that if You acquired the product(s) from an authorized Extreme Networks Channel Partner outside of the United States and Canada, the warranty is provided to You by said Extreme Networks Channel Partner and not by Extreme Networks.

"Hosted Service" means an Extreme Networks hosted service subscription that You acquire from either Extreme Networks or an authorized Extreme Networks Channel Partner (as applicable) and which is described further in Hosted SAS or other service description documentation regarding the applicable hosted service. If You purchase a Hosted Service subscription, the foregoing limited warranty may not apply but You may be entitled to support services in connection with the Hosted Service as described further in your service description documents for the applicable Hosted Service. Contact Extreme Networks or Extreme Networks Channel Partner (as applicable) for more information.

Hosted Service

THE FOLLOWING APPLIES ONLY IF YOU PURCHASE AN EXTREME NETWORKS HOSTED SERVICE SUBSCRIPTION FROM EXTREME NETWORKS OR AN EXTREME NETWORKS CHANNEL PARTNER (AS APPLICABLE), THE TERMS OF USE FOR HOSTED SERVICES ARE AVAILABLE ON THE EXTREME NETWORKS WEBSITE, <https://extremeportal.force.com> OR SUCH SUCCESSOR SITE AS DESIGNATED BY EXTREME NETWORKS, AND ARE APPLICABLE TO ANYONE WHO ACCESSES OR USES THE HOSTED SERVICE. BY ACCESSING OR USING THE HOSTED SERVICE, OR AUTHORIZING OTHERS TO DO SO, YOU, ON BEHALF OF YOURSELF AND THE ENTITY FOR WHOM YOU ARE DOING SO (HEREINAFTER REFERRED TO INTERCHANGEABLY AS "YOU" AND "END USER"), AGREE TO THE TERMS OF USE. IF YOU ARE ACCEPTING THE TERMS OF USE ON BEHALF A COMPANY OR OTHER LEGAL ENTITY, YOU

REPRESENT THAT YOU HAVE THE AUTHORITY TO BIND SUCH ENTITY TO THESE TERMS OF USE. IF YOU DO NOT HAVE SUCH AUTHORITY, OR IF YOU DO NOT WISH TO ACCEPT THESE TERMS OF USE, YOU MUST NOT ACCESS OR USE THE HOSTED SERVICE OR AUTHORIZE ANYONE TO ACCESS OR USE THE HOSTED SERVICE.

Licenses

THE SOFTWARE LICENSE TERMS AVAILABLE ON THE EXTREME NETWORKS WEBSITE, <https://extremeportal.force.com> OR SUCH SUCCESSOR SITE AS DESIGNATED BY EXTREME NETWORKS, ARE APPLICABLE TO ANYONE WHO DOWNLOADS, USES AND/OR INSTALLS EXTREME NETWORKS SOFTWARE, PURCHASED FROM EXTREME NETWORKS, INC., ANY EXTREME NETWORKS AFFILIATE, OR AN EXTREME NETWORKS CHANNEL PARTNER (AS APPLICABLE) UNDER A COMMERCIAL AGREEMENT WITH EXTREME NETWORKS OR AN EXTREME NETWORKS CHANNEL PARTNER. UNLESS OTHERWISE AGREED TO BY EXTREME NETWORKS IN WRITING, EXTREME NETWORKS DOES NOT EXTEND THIS LICENSE IF THE SOFTWARE WAS OBTAINED FROM ANYONE OTHER THAN EXTREME NETWORKS, AN EXTREME NETWORKS AFFILIATE OR AN EXTREME NETWORKS CHANNEL PARTNER; EXTREME NETWORKS RESERVES THE RIGHT TO TAKE LEGAL ACTION AGAINST YOU AND ANYONE ELSE USING OR SELLING THE SOFTWARE WITHOUT A LICENSE. BY INSTALLING, DOWNLOADING OR USING THE SOFTWARE, OR AUTHORIZING OTHERS TO DO SO, YOU, ON BEHALF OF YOURSELF AND THE ENTITY FOR WHOM YOU ARE INSTALLING, DOWNLOADING OR USING THE SOFTWARE (HEREINAFTER REFERRED TO INTERCHANGEABLY AS "YOU" AND "END USER"), AGREE TO THESE TERMS AND CONDITIONS AND CREATE A BINDING CONTRACT BETWEEN YOU AND EXTREME NETWORKS, INC. OR THE APPLICABLE EXTREME NETWORKS AFFILIATE ("EXTREME NETWORKS").

Extreme Networks grants You a license within the scope of the license types described below. Where the order documentation does not expressly identify a license type, the applicable license will be a Designated System License as set forth below in the Designated System(s) License (DS) section as applicable. The applicable number of licenses and units of capacity for which the license is granted will be one (1), unless a different number of licenses or units of capacity is specified in the documentation or other materials available to You. "Software" means computer programs in object code, provided by Extreme Networks or an Extreme Networks Channel Partner, whether as stand-alone products, pre-installed on hardware products, and any upgrades, updates, patches, bug fixes, or modified versions thereto. "Designated Processor" means a single stand-alone computing device. "Server" means a set of Designated Processors that hosts (physically or virtually) a software application to be accessed by multiple users. "Instance" means a single copy of the Software executing at a particular time: (i) on one physical machine; or (ii) on one deployed software virtual machine ("VM") or similar deployment.

License type(s)

Designated System(s) License (DS). End User may install and use each copy or an Instance of the Software only: 1) on a number of Designated Processors up to the number indicated in the order; or 2) up to the number of Instances of the Software as indicated in the order, Documentation, or as authorized by Extreme Networks in writing. Extreme Networks may require the Designated Processor(s) to be identified in the order by type, serial number, feature key, Instance, location or other specific designation, or to be provided by End User to Extreme Networks through electronic means established by Extreme Networks specifically for this purpose.

Copyright

Except where expressly stated otherwise, no use should be made of materials on this site, the Documentation, Software, Hosted Service, or hardware provided by Extreme Networks. All content on this site, the documentation, Hosted Service, and the product provided by Extreme Networks including the selection, arrangement and design of the content is owned either by Extreme Networks or its licensors and is protected by copyright and other intellectual property laws including the sui generis rights relating to the protection of databases. You may not modify, copy, reproduce, republish, upload, post, transmit or distribute in any way any content, in whole or in part,

including any code and software unless expressly authorized by Extreme Networks. Unauthorized reproduction, transmission, dissemination, storage, and or use without the express written consent of Extreme Networks can be a criminal, as well as a civil offense under the applicable law.

Virtualization

The following applies if the product is deployed on a virtual machine. Each product has its own ordering code and license types. Note, unless otherwise stated, that each Instance of a product must be separately licensed and ordered. For example, if the end user customer or Extreme Networks Channel Partner would like to install two Instances of the same type of products, then two products of that type must be ordered.

Third Party Components

"Third Party Components" mean certain software programs or portions thereof included in the Software or Hosted Service may contain software (including open source software) distributed under third party agreements ("Third Party Components"), which contain terms regarding the rights to use certain portions of the Software ("Third Party Terms"). As required, information regarding distributed Linux OS source code (for those products that have distributed Linux OS source code) and identifying the copyright holders of the Third Party Components and the Third Party Terms that apply is available in the products, Documentation or on Extreme Networks' website at: <http://www.extremenetworks.com/support/policies/software-licensing> or such successor site as designated by Extreme Networks. The open source software license terms provided as Third Party Terms are consistent with the license rights granted in these Software License Terms, and may contain additional rights benefiting You, such as modification and distribution of the open source software. The Third Party Terms shall take precedence over these Software License Terms, solely with respect to the applicable Third Party Components to the extent that these Software License Terms impose greater restrictions on You than the applicable Third Party Terms.

The following applies only if the H.264 (AVC) codec is distributed with the product. THIS PRODUCT IS LICENSED UNDER THE AVC PATENT PORTFOLIO LICENSE FOR THE PERSONAL USE OF A CONSUMER OR OTHER USES IN WHICH IT DOES NOT RECEIVE REMUNERATION TO (i) ENCODE VIDEO IN COMPLIANCE WITH THE AVC STANDARD ("AVC VIDEO") AND/OR (ii) DECODE AVC VIDEO THAT WAS ENCODED BY A CONSUMER ENGAGED IN A PERSONAL ACTIVITY AND/OR WAS OBTAINED FROM A VIDEO PROVIDER LICENSED TO PROVIDE AVC VIDEO. NO LICENSE IS GRANTED OR SHALL BE IMPLIED FOR ANY OTHER USE. ADDITIONAL INFORMATION MAY BE OBTAINED FROM MPEG LA, L.L.C. SEE [HTTP://WWW.MPEGLA.COM](http://WWW.MPEGLA.COM).

Service Provider

THE FOLLOWING APPLIES TO EXTREME NETWORKS CHANNEL PARTNER'S HOSTING OF EXTREME NETWORKS PRODUCTS OR SERVICES. THE PRODUCT OR HOSTED SERVICE MAY USE THIRD PARTY COMPONENTS SUBJECT TO THIRD PARTY TERMS AND REQUIRE A SERVICE PROVIDER TO BE INDEPENDENTLY LICENSED DIRECTLY FROM THE THIRD PARTY SUPPLIER. AN EXTREME NETWORKS CHANNEL PARTNER'S HOSTING OF EXTREME NETWORKS PRODUCTS MUST BE AUTHORIZED IN WRITING BY EXTREME NETWORKS AND IF THOSE HOSTED PRODUCTS USE OR EMBED CERTAIN THIRD PARTY SOFTWARE, INCLUDING BUT NOT LIMITED TO MICROSOFT SOFTWARE OR CODECS, THE EXTREME NETWORKS CHANNEL PARTNER IS REQUIRED TO INDEPENDENTLY OBTAIN ANY APPLICABLE LICENSE AGREEMENTS, AT THE EXTREME NETWORKS CHANNEL PARTNER'S EXPENSE, DIRECTLY FROM THE APPLICABLE THIRD PARTY SUPPLIER.

WITH RESPECT TO CODECS, IF THE EXTREME NETWORKS CHANNEL PARTNER IS HOSTING ANY PRODUCTS THAT USE OR EMBED THE G.729 CODEC, H.264 CODEC, OR H.265 CODEC, THE EXTREME NETWORKS CHANNEL PARTNER ACKNOWLEDGES AND AGREES THE EXTREME NETWORKS CHANNEL PARTNER IS RESPONSIBLE FOR ANY AND ALL RELATED FEES AND/OR ROYALTIES. THE G.729 CODEC IS LICENSED BY SIPRO LAB TELECOM INC. SEE WWW.SIPRO.COM/CONTACT.HTML. THE H.264 (AVC) CODEC IS LICENSED UNDER THE AVC PATENT PORTFOLIO LICENSE FOR

THE PERSONAL USE OF A CONSUMER OR OTHER USES IN WHICH IT DOES NOT RECEIVE REMUNERATION TO: (I) ENCODE VIDEO IN COMPLIANCE WITH THE AVC STANDARD ("AVC VIDEO") AND/OR (II) DECODE AVC VIDEO THAT WAS ENCODED BY A CONSUMER ENGAGED IN A PERSONAL ACTIVITY AND/OR WAS OBTAINED FROM A VIDEO PROVIDER LICENSED TO PROVIDE AVC VIDEO. NO LICENSE IS GRANTED OR SHALL BE IMPLIED FOR ANY OTHER USE. ADDITIONAL INFORMATION FOR H.264 (AVC) AND H.265 (HEVC) CODECS MAY BE OBTAINED FROM MPEG LA, L.L.C. SEE [HTTP://WWW.MPEGLA.COM](http://WWW.MPEGLA.COM).

Compliance with Laws

You acknowledge and agree that it is Your responsibility for complying with any applicable laws and regulations, including, but not limited to laws and regulations related to call recording, data privacy, intellectual property, trade secret, fraud, and music performance rights, in the country or territory where the Extreme Networks product is used.

Preventing Toll Fraud

"Toll Fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there can be a risk of Toll Fraud associated with your system and that, if Toll Fraud occurs, it can result in substantial additional charges for your telecommunications services.

Security Vulnerabilities

Information about Extreme Networks' security support policies can be found in the Global Technical Assistance Center Knowledgebase at <https://gtacknowledge.extremenetworks.com/>.

Downloading Documentation

For the most current versions of Documentation, see the Extreme Networks Support website: <http://documentation.extremenetworks.com>, or such successor site as designated by Extreme Networks.

Contact Extreme Networks Support

See the Extreme Networks Support website: <http://www.extremenetworks.com/support> for product or Hosted Service notices and articles, or to report a problem with your Extreme Networks product or Hosted Service. For a list of support telephone numbers and contact addresses, go to the Extreme Networks Support website: <http://www.extremenetworks.com/support/contact/> (or such successor site as designated by Extreme Networks), scroll to the bottom of the page, and select Contact Extreme Networks Support.

Contact Avaya Support

See the Avaya Support website: <https://support.avaya.com> for product or Hosted Service notices and articles, or to report a problem with your Avaya product or Hosted Service. For a list of support telephone numbers and contact addresses, go to the Avaya Support website: <https://support.avaya.com> (or such successor site as designated by Avaya), scroll to the bottom of the page, and select Contact Avaya Support.

Trademarks

The trademarks, logos and service marks ("Marks") displayed in this site, the Documentation, Hosted Service(s), and product(s) provided by Extreme Networks are the registered or unregistered Marks of Extreme Networks, Inc., its affiliates, its licensors, its suppliers, or other third parties. Users are not permitted to use such Marks without prior written consent from Extreme Networks or such third party which may own the Mark. Nothing contained in this site, the Documentation, Hosted Service(s) and product(s) should be construed as granting, by implication, estoppel, or otherwise, any license or right in and to the Marks without the express written permission of Extreme Networks or the applicable third party.

Extreme Networks is a registered trademark of Extreme Networks, Inc.

All non-Extreme Networks trademarks are the property of their respective owners. Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.

For additional information on Extreme Networks trademarks, please see: <http://www.extremenetworks.com/company/legal/>

Contents

Chapter 1: Preface	7
Purpose.....	7
Training.....	7
Providing Feedback to Us.....	7
Getting Help.....	8
Extreme Networks Documentation.....	9
Chapter 2: New in this document	10
Notice about feature support.....	10
Chapter 3: Fundamentals	11
Important operational note for VSP 4000 switches.....	11
ERS 4850 and VSP 4000 quick conversion.....	12
spbm-config-mode boot flag.....	12
System connections.....	13
System logon.....	13
Secure and nonsecure protocols.....	14
Password encryption.....	15
Enterprise Device Manager.....	15
Enterprise Device Manager access.....	15
Default user name and password.....	16
Device Physical View.....	16
EDM window.....	17
IP address for the management port.....	18
Static routes.....	18
Chapter 4: Provisioning	19
Configuring the switch.....	19
Connecting a terminal.....	20
Changing passwords.....	20
Configuring system identification.....	23
Configuring the CLI banner.....	24
Configuring the time zone.....	26
Configuring the date.....	27
Configuring an IP address for the management port.....	28
Configuring static routes	29
Configuring static routes using EDM.....	32
Enabling remote access services.....	34
Using Telnet to log on to the device.....	35
Enabling the web management interface.....	36
Setting the TLS protocol version.....	38
Accessing the switch through the Web interface.....	41

Contents

Configuring the minimum version of the TLS protocol.....	41
Configuring a VLAN using CLI.....	43
Configuring a VLAN using Enterprise Device Manager.....	45
Installing a license file.....	49
Saving the configuration.....	50
Backing up configuration files.....	51
Resetting the platform.....	52
Installing a new software build.....	53
Removing a software build.....	53
Chapter 5: Verification	55
Pinging an IP device.....	55
Verifying boot configuration flags.....	57
Verifying the software release.....	58
Verifying the software version on the slots.....	59
Displaying local alarms.....	59
Displaying log files.....	60
Chapter 6: Next steps	62
Glossary	63

Chapter 1: Preface

Purpose

This document provides information on features in VSP Operating System Software (VOSS). VOSS runs on the following product families:

- Extreme Networks Virtual Services Platform 4000 Series
- Extreme Networks Virtual Services Platform 7200 Series
- Extreme Networks Virtual Services Platform 8000 Series (includes VSP 8200 and VSP 8400 Series)
- Extreme Networks Virtual Services Platform 8600

This document provides basic instructions to install the hardware and perform basic configuration of the chassis and software.

Examples and network illustrations in this document may illustrate only one of the supported platforms. Unless otherwise noted, the concept illustrated applies to all supported platforms.

Training

Ongoing product training is available. For more information or to register, you can access the Web site at www.extremenetworks.com/education/.

Providing Feedback to Us

We are always striving to improve our documentation and help you work better, so we want to hear from you! We welcome all feedback but especially want to know about:

- Content errors or confusing or conflicting information.
- Ideas for improvements to our documentation so you can find the information you need faster.
- Broken links or usability issues.

If you would like to provide feedback to the Extreme Networks Information Development team about this document, please contact us using our short [online feedback form](#). You can also email us directly at internalinfodev@extremenetworks.com

Getting Help

Product purchased from Extreme Networks

If you purchased your product from Extreme Networks, use the following support contact information to get help.

If you require assistance, contact Extreme Networks using one of the following methods:

- [GTAC \(Global Technical Assistance Center\) for Immediate Support](#)
 - Phone: 1-800-998-2408 (toll-free in U.S. and Canada) or +1 408-579-2826. For the support phone number in your country, visit: www.extremenetworks.com/support/contact
 - Email: support@extremenetworks.com. To expedite your message, enter the product name or model number in the subject line.
- [GTAC Knowledge](#) – Get on-demand and tested resolutions from the GTAC Knowledgebase, or create a help case if you need more guidance.
- [The Hub](#) – A forum for Extreme customers to connect with one another, get questions answered, share ideas and feedback, and get problems solved. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.
- [Support Portal](#) – Manage cases, downloads, service contracts, product licensing, and training and certifications.

Before contacting Extreme Networks for technical support, have the following information ready:

- Your Extreme Networks service contract number and/or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any action(s) already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

Product purchased from Avaya

If you purchased your product from Avaya, use the following support contact information to get help.

Go to the Avaya Support website at <http://support.avaya.com> for the most up-to-date documentation, product notices, and knowledge articles. You can also search for release notes, downloads, and resolutions to issues. Use the online service request system to create a service request. Chat with live agents to get answers to questions, or request an agent to connect you to a support team if an issue requires additional expertise.

Extreme Networks Documentation

To find Extreme Networks product guides, visit our documentation pages at:

Current Product Documentation

www.extremenetworks.com/documentation/

Archived Documentation (for previous
versions and legacy products)

www.extremenetworks.com/support/documentation-archives/

Release Notes

www.extremenetworks.com/support/release-notes

Open Source Declarations

Some software files have been licensed under certain open source licenses. More information is available at: www.extremenetworks.com/support/policies/software-licensing.

Chapter 2: New in this document

There are no feature changes in this document.

Notice about feature support

This document includes content for multiple hardware platforms across different software releases. As a result, the content can include features not supported by your hardware in the current software release.

If a documented command, parameter, tab, or field does not appear on your hardware, it is not supported.

For information about feature support, see *Release Notes*.

For information about physical hardware restrictions, see your hardware documentation.

Chapter 3: Fundamentals

Perform provisioning after hardware installation.

Quick Start Configuration includes the minimum, but essential, configuration steps to:

- provide a default, starting point configuration
- establish a management interface
- establish basic security on the node

For more information about hardware specifications and installation procedures, see the following documents:

- *Installing Extreme Networks Virtual Services Platform 4850GTS Series, NN46251–300*
- *Installing Extreme Networks Virtual Services Platform 4450GTX-HT-PWR+ Switch, NN46251–304*
- *Installing the Extreme Networks Virtual Services Platform 4450GSX-PWR+ Switch, NN46251–307*
- *Installing the Virtual Services Platform 7200 Series, NN47228-302*
- *Installing the Virtual Services Platform 8000 Series, NN47227-300*
- *Installing the Virtual Services Platform 8600, NN47229–300*

For more information about how to configure security, see *Configuring Security*.

To download and print selected technical publications and release notes directly from the Internet, go to <http://www.extremenetworks.com/support>.

Important operational note for VSP 4000 switches

This section provides information to take into consideration to prevent system operation failure.

Operational consideration for USB Flash Drive on factory supplied and converted VSP 4000 switches

 **Warning:**

The USB FLASH drive on all models of VSP 4850 (factory built and converted from ERS 4850) must be treated as a permanent non-removable part of the switch and must NEVER be removed from the switch to ensure proper operation. Additionally, the USB cover must be installed to ensure additional protection against removal. The USB FLASH drive on the VSP 4850 switch is uniquely and

Operational consideration for USB Flash Drive on factory supplied and converted VSP 4000 switches

permanently bound to the operating system of the switch it is first used on and cannot be transferred to a different switch. Removal (and reinsertion) of the USB FLASH drive from the switch is not supported as it can permanently compromise the switch functionality and render it non-functional.

ERS 4850 and VSP 4000 quick conversion

* Note:

ERS 4850 and VSP 4000 conversion kit (part number EC4810003–3.0) has reached End-Of-Sale; however, it is still supported for anyone who has purchased it.

You can convert an ERS 4850 switch to a VSP 4000 switch, if there is a network requirement.

USB considerations for factory supplied and converted VSP 4000 switches

Warning:

The USB FLASH drive on all models of VSP 4850 (factory built and converted from ERS 4850) must be treated as a permanent non-removable part of the switch and must NEVER be removed from the switch to ensure proper operation. Additionally, the USB cover must be installed to ensure additional protection against removal. The USB FLASH drive on the VSP 4850 switch is uniquely and permanently bound to the operating system of the switch it is first used on and cannot be transferred to a different switch. Removal (and reinsertion) of the USB FLASH drive from the switch is not supported as it can permanently compromise the switch functionality and render it non-functional.

On a converted VSP 4000 switch, you can also use the CLI to perform a conversion back to the ERS 4850.

For the conversion to be successful, you must ensure that you have satisfied the hardware and software criteria on the system being converted. For more information, see *ERS 4850 to VSP 4000 Quick Conversion, NN46251-400*.

spbm-config-mode boot flag

Shortest Path Bridging (SPB) and Protocol Independent Multicast (PIM) cannot interoperate with each other on the switch at the same time. To ensure that SPB and PIM stay mutually exclusive, the software uses a boot flag called `spbm-config-mode`.

- The `spbm-config-mode` boot flag is enabled by default. This enables you to configure SPB and IS-IS, but you cannot configure PIM and IGMP either globally or on an interface.
- If you disable the boot flag, save the config and reboot with the saved config. When the flag is disabled, you can configure PIM and IGMP Snooping, but you cannot configure SPB or IS-IS.

! Important:

Whenever you change the `spbm-config-mode` boot flag, you should save the configuration and reboot the switch for the change to take effect.

For information about verifying boot flags, see [Verifying boot configuration flags](#) on page 57. For more information about this boot flag and Simplified vIST, see *Configuring IP Multicast Routing Protocols*.

System connections

Connect the serial console interface (an RJ45 jack) to a PC or terminal to monitor and configure the switch. The port uses a RJ45 connector that operates as data terminal equipment (DTE). The default communication protocol settings for the console port are:

- Baud rate:
 - VSP 4000 Series — 9600
 - VSP 7200 Series — 9600
 - VSP 8000 Series — 9600
 - VSP 8600 — 115200
- 8 data bits
- 1 stop bit
- No parity

To use the console port, you need a terminal or teletypewriter (TTY)-compatible terminal, or a portable computer with a serial port and terminal-emulation software. Depending on the hardware platform, the console port can display as console port or 10101.

System logon

After the platform boot sequence is complete, a logon prompt appears. The following table shows the default values for logon and password for console and Telnet sessions.

*** Note:**

With enhanced secure mode enabled, the person in the role-based authentication level of administrator configures the login and password values for the other role-based authentication levels. The administrator initially logs on to the switch using the default login of `admin` and the default password of `admin`. After the initial login, the switch prompts the administrator to create a new password.

The administrator then configures default logins and passwords for the other users based on the role-based authentication levels of the user. For more information on system access fundamentals and configuration, see *Administering*.

Table 1: Access levels and default logon values

Access level	Description	Default logon	Default password
Read-only	Permits view-only configuration and status information. Is equivalent to Simple Network Management Protocol (SNMP) read-only community access.	ro	ro
Layer 1 read/write	View most switch configuration and status information and change physical port settings.	l1	l1
Layer 2 read/write	View and change configuration and status information for Layer 2 (bridging and switching) functions.	l2	l2
Layer 3 read/write	View and change configuration and status information for Layer 2 and Layer 3 (routing) functions.	l3	l3
Read/write	View and change configuration and status information across the switch. You cannot change security and password settings. This access level is equivalent to SNMP read/write community access.	rw	rw
Read/write/all	Permits all the rights of read/write access and the ability to change security settings, including CLI and Web-based management user names and passwords and the SNMP community strings.	rwa	rwa



Secure and nonsecure protocols

The following table describes the secure and nonsecure protocols that the switch supports.

Table 2: Secure and nonsecure protocols for IPv4 and IPv6

Nonsecure protocols	Default status	Equivalent secure protocols	Default status
FTP and Trivial FTP	Disabled	Secure Copy (SCP) and Secure File Transfer Protocol (SFTP)	Disabled

Table continues...

Nonsecure protocols	Default status	Equivalent secure protocols	Default status
<p> Note: File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP) support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.</p>			
Telnet	Disabled	Secure Shell version 2 (SSHv2)	Disabled
SNMPv1, SNMPv2	Enabled	SNMPv3	Enabled
Rlogin	Disabled	SSHv2	Disabled
HTTP	Disabled	HTTPS  Important: Take the appropriate security precautions within the network if you use HTTP. You must use the <code>web-server enable</code> command in CLI before you can access EDM.	Enabled

Password encryption

The platform stores passwords in encrypted format and not in the configuration file.

 **Important:**

For security reasons, configure the passwords to values other than the factory defaults.

Enterprise Device Manager

The switch includes Enterprise Device Manager (EDM), an embedded graphical user interface (GUI) that you can use to manage and monitor the platform through web-based access without additional installations.

For more information about EDM, see *Using CLI and EDM*.

Enterprise Device Manager access

To access EDM, enter one of the following addresses in your web browser:

- `http://<A.B.C.D>`
- `https://<A.B.C.D>`

Where <A.B.C.D> is the device IP address.

Ensure you use a supported browser version. For more information about supported browsers, see *Using CLI and EDM*.

! Important:

- You must enable the Web server from CLI to enable HTTP access to the EDM. If you want HTTP access to the device, you must also disable the web server secure-only option. The web server secure-only option, allowing for HTTPS access to the device, is enabled by default. Take the appropriate security precautions within the network if you use HTTP.
- EDM access is available to read-write users only.

If you experience any issues while connecting to the EDM, check the proxy settings. Proxy settings may affect EDM connectivity to the switch. Clear the browser cache and do not use proxy when connecting to the device. This should resolve the issue.

Default user name and password

The following table contains the default user name and password that you can use to log on to the switch using EDM. For more information about changing the passwords, see *Configuring Security*.

Table 3: EDM default username and password

Username	Password
admin	password

! Important:

The default passwords and community strings are documented and well known. It is strongly recommended that you change the default passwords and community strings immediately after you first log on. For more information about changing user names and passwords, see *Configuring Security*.

Device Physical View

After you access EDM, the system displays a real-time physical view of the front panel of the device. From the front panel view, you can view fault, configuration, and performance information for the device or a single port. You can open this tab by clicking the Device Physical View tab above the device view.

You can use the device view to determine the operating status of the various ports in your hardware configuration. You can also use the device view to perform management tasks on specific objects. In the device view, you can select a port or the entire chassis. To select an object, click the object. EDM outlines the selected object in yellow, indicating your selection.

The conventions on the device view are similar to the actual device appearance. The port LEDs and the ports are color-coded to provide status. Green indicates the module or port is up and running, red indicates the module or port is disabled, dark pink indicates a protocol is down, and amber indicates an enabled port that is not connected to anything. For information about LED behavior, see your hardware documentation.

EDM window

The following figure shows the different sections of the EDM window:

- Navigation pane—Located on the left side of the window, the navigation pane displays all the available command tabs in a tree format. A row of buttons at the top of the navigation pane provides a quick method to perform common functions.
- Menu bar—Located at the top of the window, the menu bar shows the most recently accessed primary tabs and their respective secondary tabs.
- Toolbar—Located just below the menu bar, the toolbar gives you quick access to the most common operational commands such as Apply, Refresh, and Help.
- Work area—Located on the right side of the window, the work area displays the dialog boxes where you can view or configure parameters on the switch.

The following figure shows an example of the Device Physical View window.

*** Note:**

The Device Physical View on your hardware can appear differently than the following example.



Figure 1: EDM window

IP address for the management port

At startup, the system loads the runtime configuration file, which is stored in the internal flash of the CPU. If the file is present, the system assigns the IP address for the management port from that file.

You can configure an IP address for the management port if one is not in the configuration file. For more information, see [Configuring an IP address for the management port](#) on page 28. This procedure only applies to hardware with a dedicated, physical management interface.

Static routes

A static route is a route to a destination IP address that you manually create.

The Layer 3 redundancy feature supports the creation of static routes to enhance network stability. Use the local next hop option to configure a static route with or without local next hop.

You can configure static routes with a next hop that is not directly connected, but that hop must be reachable. Otherwise, the static route is not enabled.

Layer 3 redundancy supports only address resolution protocol (ARP) and static route. Static ARP must configure the nonlocal next-hop of static routes. No other dynamic routing protocols provide nonlocal next-hop.

You can use a default static route to specify a route to all networks for which no explicit routes exist in the forwarding information base or the routing table. This route has a prefix length of zero (RFC1812). You can configure the switch with a route through the IP static routing table.

To create a default static route, you must configure the destination address and subnet mask to 0.0.0.0.

Static route tables

A router uses the system routing table to make forwarding decisions. In the static route table, you can change static routes directly. Although the two tables are separate, the static route table manager entries are automatically reflected in the system routing table if the next-hop address in the static route is reachable, and if the static route is enabled.

The system routing table displays only active static routes with a best preference. A static route is active only if the route is enabled and the next-hop address is reachable (for example, if a valid ARP entry exists for the next hop).

You can enter multiple routes (for example, multiple default routes) that have different costs, and the routing table uses the lowest cost route that is available. However, if you enter multiple next hops for the same route with the same cost, the software does not replace the existing route. If you enter the same route with the same cost and a different next-hop, the first route is used. If the first route becomes unreachable, the second route (with a different next-hop) is activated with no connectivity loss.

Static ARP entries

Static ARP entries are not supported for NLB Unicast or NLB Multicast operations.

Chapter 4: Provisioning

This section contains procedures for the initial provisioning of the switch. These procedures should always be performed when provisioning the switch.

Configuring the switch

You can use the information below to configure the switch. The examples show you how to enable the access service, change the root level prompt, configure the CLI logon banner, enable the web-server, and specify a gateway address route.

Before you begin

You must enable Global Configuration mode in CLI.

About this task

Configure the switch. You can copy and paste the configuration in the example or modify it as desired.

Example

```
boot config flags ftpd
boot config flags sshd
boot config flags telnetd
boot config flags tftpd
save config

prompt "Lab4Switch"
banner custom
banner "Welcome to Switch located in Lab 4, Blue Zone"
banner displaymotd

web-server enable
no web-server secure-only
```

The following example describes the procedure for assigning an IP address to a VLAN interface.

```
interface vlan <vid>
ip address x.x.x.x 255.255.255.0
```

The following example describes the procedure for assigning an IP address to a port interface.

```
interface gigabitEthernet 1/1
brouter vlan <vid> subnet x.x.x.x 255.255.255.0
```

Connecting a terminal

Before you begin

- To use the console port, you need the following equipment:
 - A terminal or TeleTypewriter (TTY)-compatible terminal, or a portable computer with a serial port and terminal-emulation software
 - A specific cable with an RJ-45 connector for the console port on the switch that is provided with the switch. The other end of the cable must use a connector appropriate to the serial port on your computer or terminal
- You must shield the cable that connects to the console port to comply with emissions regulations and requirements.

About this task

Connect a terminal to the serial console interface to monitor and configure the system directly.

Procedure

1. Configure the terminal protocol as follows:
 - 9600 baud or 115200 baud depending on the hardware platform.
 - 8 data bits
 - 1 stop bit
 - No parity
2. Connect the RJ-45 cable to the console port on the switch.
3. Connect the other end of the cable to the terminal or computer serial port.
4. Turn on the terminal.
5. Log on to the switch.

Changing passwords

Configure new passwords for each access level, or change the logon or password for the different access levels of the switch. After you receive the switch, use default passwords to initially access CLI. If you use Simple Network Management Protocol version 3 (SNMPv3), you can change encrypted passwords.

If you enable the `hsecure` flag, after the aging time expires, the system prompts you to change your password. If you do not configure the aging time, the default is 90 days.

If you enable enhanced secure mode with the `boot config flags enhancedsecure-mode` command, you enable new access levels, along with stronger password complexity, length, and minimum change intervals. For more information on system access fundamentals and configuration, see *Administering*.

Before you begin

- You must use an account with read-write-all privileges to change passwords. For security, the switch saves passwords to a hidden file.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Change a password:

```
cli password WORD<1-20> {layer1|layer2|layer3|read-only|read-write|
read-write-all}
```

3. Enter the old password.

4. Enter the new password.

5. Re-enter the new password.

6. Configure password options:

```
password [access-level WORD<2-8>] [aging-time day <1-365>] [default-
lockout-time <60-65000>] [lockout WORD<0-46> time <60-65000>] [min-
passwd-len <10-20>] [password-history <3-32>]
```

Example

```
Switch:1> enable
```

```
Switch:1# configure terminal
```

Change a password:

```
Switch:1(config)# cli password rwa read-write-all
```

Enter the old password: ***

Enter the new password: ***

Re-enter the new password: ***

Set password to an access level of read-write-all and the expiration period for the password to 60 days:

```
Switch:1(config)# password access-level rwa aging-time 60
```

Variable definitions

Use the data in the following table to use the `cli password` command.

Table 4: Variable definitions

Variable	Value
<i>layer1 layer2 layer3 read-only read-write read-write-all</i>	Changes the password for the specific access level.
<i>WORD<1–20></i>	Specifies the user logon name.

Use the data in the following table to use the `password` command.

Table 5: Variable definitions

Variable	Value
<code>access-level WORD<2–8></code>	Permits or blocks this access level. The available access level values are as follows: <ul style="list-style-type: none"> • layer1 • layer2 • layer3 • read-only • read-write • read-write-all
<code>aging-time day <1-365></code>	Configures the expiration period for passwords in days, from 1–365. The default is 90 days.
<code>default-lockout-time <60-65000></code>	Changes the default lockout time after three invalid attempts. Configures the lockout time, in seconds, and is in the 60–65000 range. The default is 60 seconds. To configure this option to the default value, use the default operator with the command.
<code>lockout WORD<0–46> time <60-65000></code>	Configures the host lockout time. <ul style="list-style-type: none"> • <i>WORD<0–46></i> is the host IPv4 or IPv6 address. • <i><60-65000></i> is the lockout-out time, in seconds, in the 60–65000 range. The default is 60 seconds.
<code>min-passwd-len <10-20></code>	Configures the minimum length for passwords in high-secure mode. The default is 10 characters. To configure this option to the default value, use the default operator with the command.
<code>password-history <3-32></code>	Specifies the number of previous passwords the switch stores. You cannot reuse a password that is stored in the password history. The default is 3. To configure this option to the default value, use the default operator with the command.

Configuring system identification

Configure system identification to specify the system name, contact person, and location of the switch.

Procedure

1. Log on as rwa.
2. Enter Global Configuration mode:

```
enable
configure terminal
```
3. Change the system name:

```
sys name WORD<0-255>
```
4. Configure the system contact:

```
snmp-server contact WORD<0-255>
```
5. Configure the system location:

```
snmp-server location WORD<0-255>
```

Example

Change the system name, configure the system contact, and configure the system location:

```
Switch:1>enable
Switch:1#configure terminal
Switch:1(config)#sys name Floor3Lab2
Floor3Lab2:1(config)#snmp-server contact http://companyname.com
Floor3Lab2:1(config)#snmp-server location "12 Street, City, State, Zip"
```

Variable definitions

Use the data in the following table to use the system-level commands.

Table 6: Variable definitions

Variable	Value
contact <i>WORD<0-255></i>	Identifies the contact person who manages the node. To include blank spaces in the contact, use quotation marks (") around the text. Use the no operator to remove this configuration. To configure this option to the default value, use the default operator with the command.
location <i>WORD<0-255></i>	Identifies the physical location of the node. To include blank spaces in the location, use quotation marks (") around the text. Use the no operator to remove this

Table continues...

Variable	Value
	configuration. To configure this option to the default value, use the default operator with the command.
name <i>WORD<0–255></i>	Configures the system or root level prompt name for the switch. <i>WORD<0–255></i> is an ASCII string from 1–255 characters (for example, LabSC7 or Closet4).

Configuring the CLI banner

Configure the logon banner to display a message to users before authentication and configure a system login message-of-the-day in the form of a text banner that appears after each successful logon.

About this task

You can use the custom logon banner to display company information, such as company name and contact information. For security, you can change the default logon banner of the switch, which contains specific system information, including platform type and software release.

Use the custom message-of-the-day to update users on a configuration change, a system update or maintenance schedule. For security purposes, you can also create a message-of-the-day with a warning message to users that, “Unauthorized access to the system is forbidden.”

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Configure the switch to use a custom banner or use the default banner:

```
banner <custom|static>
```

3. Create a custom banner:

```
banner WORD<1–80>
```

 **Note:**

To enter multiple lines for a message, use the **banner** command before each new line of the message. To provide a string with spaces, include the text in quotation marks.

4. Create the message-of-the-day:

```
banner motd WORD<1–1516>
```


*** Note:**

To enter multiple lines for a message, use the **banner motd** command before each new line of the message. To provide a string with spaces, include the text in quotation marks.

5. Enable the custom message-of-the-day:

```
banner displaymotd
```

6. Save the configuration:

```
save config
```

7. Display the banner information:

```
show banner
```

8. Logon again to verify the configuration.

9. **(Optional)** Disable the banner:

```
no banner [displaymotd] [motd]
```

Example

Configure the custom banner to “Company, www.Companyname.com.” and configure the message of the day to “Unauthorized access to this system is forbidden. Please logout now.”

```
Switch:1> enable
Switch:1#configure terminal
Switch:1(config)# banner custom
Switch:1(config)# banner Company
Switch:1(config)# banner www.Companyname.com
Switch:1(config)# banner motd "Unauthorized access to this system is forbidden"
Switch:1(config)# banner motd "Please logout now"
Switch:1(config)#banner displaymotd
Switch:1(config)#show banner
Company
www.company.com
        defaultbanner : false
        custom banner :

        displaymotd : true
        custom motd :
Unauthorized access to this system is forbidden
Please logout now
```

Variable definitions

Use the data in the following table to use the **banner** command.

Variable	Value
<i>custom</i>	Disables the use of the default banner.
<i>static</i>	Activates the use of the default banner.

Table continues...

Variable	Value
<code>WORD <1-80></code>	Adds lines of text to the CLI logon banner.
<code>motd WORD<1-1516></code>	Create the message of the day. To provide a string with spaces, include the text in quotation marks (").
<code>displaymotd</code>	Enable the custom message of the day.

Configuring the time zone

About this task

Configure the time zone to use an internal system clock to maintain accurate time. The time zone data in Linux includes daylight changes for all time zones up to the year 2038. You do not need to configure daylight savings.

The default time zone is Coordinated Universal Time (UTC).

Important:

In October 2014, the government of Russia moved Moscow from UTC+4 into the UTC+3 time zone with no daylight savings.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Configure the time zone by using the following command:

```
clock time-zone WORD<1-10> WORD<1-20> WORD<1-20>
```

3. Save the changed configuration.

Example

Configure the system to use the time zone data file for Vevay:

```
Switch:1(config)# clock time-zone America Indiana Vevay
```

Variable definitions

Use the data in the following table to use the `clock time-zone` command.

Variable	Value
<code>WORD<1-10></code>	Specifies a directory name or a time zone name in <code>/usr/share/zoneinfo</code> , for example, Africa, Australia, Antarctica, or US. To see a list of options, enter

Table continues...

Variable	Value
	<p><code>clock time-zone</code></p> <p>at the command prompt without variables.</p>
<i>WORD<1-20></i> <i>WORD<1-20></i>	<p>The first instance of <i>WORD<1-20></i> is the area within the timezone. The value represents a time zone data file in <code>/usr/share/zoneinfo/WORD<1-10>/</code>, for example, Shanghai in Asia.</p> <p>The second instance of <i>WORD<1-20></i> is the subarea. The value represents a time zone data file in <code>/usr/share/zoneinfo/WORD<1-10>/WORD<1-20>/</code>, for example, Vevay in America/Indiana.</p> <p>To see a list of options, enter <code>clock time-zone</code> at the command prompt without variables.</p>

Configuring the date

About this task

Configure the calendar time in the form of month, day, year, hour, minute, and second.

Procedure

1. Log on as rwa.
2. Enter Privileged EXEC mode:


```
enable
```
3. Configure the date:


```
clock set <MMddyyyyhhmmss>
```
4. Verify the configuration:


```
show clock
```

Example

Configure the date and time, and then verify the configuration.

```
Switch:1>enable
Switch:1#clock set 19042014063030
Switch:1#show clock
Wed Mar 19 06:30:32 2014 EDT
```

Variable definitions

Use the data in the following table to use the `clock set` command.

Table 7: Variable definitions

Variable	Value
<i>MMddyyyyhhmmss</i>	Specifies the date and time in the format month, day, year, hour, minute, and second.

Configuring an IP address for the management port

Configure an IP address for the management port so that you can remotely access the device using the out-of-band (OOB) management port. The management port runs on a dedicated VRF.

The configured IP subnet has to be globally unique because the management protocols can go through in-band (Global Router) or out-of-band ports (Management VRF).

Note:

This procedure applies only to hardware with a dedicated physical management interface. Also, not all speeds are supported on hardware platforms that support a management interface. For more information about supported interfaces and speeds, see your hardware documentation.

Before you begin

- Do not configure a default route in the Management VRF.
- If you want out-of-band management, define a specific static route in the Management Router VRF to the IP subnet where your management application resides.
- If you initiate an FTP session from a client device behind a firewall, you should set FTP to passive mode.
- The switch gives priority to out-of-band management when there is reachability from both in-band and out-of-band. To avoid a potential conflict, do not configure any overlapping between in-band and out-of-band networks.

Procedure

1. Enter mgmtEthernet Interface Configuration mode:

```
enable
configure terminal
interface mgmtEthernet <mgmt | mgmt2>
```

2. Configure the IP address and mask for the management port:

```
ip address {<A.B.C.D/X> | <A.B.C.D> <A.B.C.D>}
```

3. Configure an IPv6 address and prefix length for the management port:

```
ipv6 interface address WORD<0-255>
```

4. Show the complete network management information:

```
show interface mgmtEthernet
```

5. Show the management interface packet/link errors:

```
show interface mgmtEthernet error
```

6. Show the management interface statistics information:

```
show interface mgmtEthernet statistics
```

Example

Configure the IP address for the management port:

```
Switch:1>enable
Switch:1#configure terminal
Switch:1(config)#interface mgmtethernet mgmt
Switch:1(config-if)#ip address 192.0.2.24 255.255.255.0
```

Variable definitions

Use the data in the following table to use the `ip address` command.

Variable	Value
{<A.B.C.D/X> <A.B.C.D> <A.B.C.D>}	Specifies the IP address followed by the subnet mask.

Use the data in the following table to use the `ipv6 interface address` command.

Variable	Value
WORD<0-255>	Specifies the IPv6 address and prefix length.

Configuring static routes

Before you begin

- Ensure no black hole static route exists.

About this task

Configure a static route when you want to manually create a route to a destination IP address.

If a black hole route is enabled, you must first delete or disable it before you can add a regular static route to that destination.

For route scaling information and for information on the maximum number of static routes supported on your hardware platform, see *Release Notes*.

* Note:

It is recommended that you do not configure static routes on a DvR Leaf node unless the configuration is for reachability to a management network using a Brouter port.

Also, configuring the preference of static routes is not supported on a Leaf node.

Procedure

1. Enter either Global Configuration mode or VRF Router Configuration mode for a specific VRF context:

```
enable
configure terminal
router vrf WORD<1-16>
```

2. Create an IP static route:

```
ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> weight <1-65535>
```

3. Enable an IP static route:

```
ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> enable
```

4. Use the following variable definitions table to configure other static route parameters as required.

5. View existing IP static routes for the device, or for a specific network or subnet:

```
show ip route static
```

6. Delete a static route:

```
no ip route <A.B.C.D> <A.B.C.D> <A.B.C.D>
```

Example

Create an IP static route, enable a static route, and view the existing IP static routes for the device, or for a specific network or subnet.

```
Switch:1>enable
Switch:1#configure terminal
Switch:1(config)#ip route 192.0.2.2 255.255.0.0 198.51.100.24 weight 20 preference 1
Switch:1(config)#ip route 192.0.2.2 255.255.0.0 198.51.100.24 enable
Switch:1(config)#show ip route static
=====
                        IP Static Route - GlobalRouter
=====
DEST          MASK          NEXT          NH-VRF        COST  PREF  LCLNHOP  STATUS  ENABLE
-----
192.0.2.2     255.255.255.0 198.51.100.24 GlobalRouter  20    1     TRUE     ACTIVE  TRUE
```

Variable definitions

Use the data in the following table to use the `ip route` command.

Table 8: Variable definitions

Variable	Value
<A.B.C.D> <A.B.C.D> <A.B.C.D>	The first and second <A.B.C.D> specify the IP address and mask for the route destination. The third <A.B.C.D> specifies the IP address of the next-hop router (the next router at which packets must arrive on this route). When you create a black hole static route, configure this parameter to 255.255.255.255 as the IP address of the router through which the specified route is accessible.
disable	Disables a route to the router or VRF.
enable	Adds a static route to the router or VRF. The no form of this command is <code>no ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> enable</code> . The default form of this command is <code>default ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> enable</code> .
local-next-hop enable	Enables the local next hop for this static route. The default form of this command is <code>default ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> local-next-hop enable</code> . The no form of this command is <code>no ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> local-next-hop enable</code> .
next-hop-vrf <WORD 0-16>	Specifies the next-hop VRF instance by name. After you configure the next-hop-vrf parameter, the static route is created in the local VRF, and the next-hop route is resolved in the next-hop VRF instance (next-hop-vrf). The default form of this command is <code>default ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> next-hop-vrf <WORD 0-16></code> . The no form of this command is <code>no ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> next-hop-vrf <WORD 0-16></code> .
weight <1-65535>	Specifies the static route cost. The default form of this command is <code>default ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> weight</code> .
preference <1-255>	Specifies the route preference. The default form of this command is <code>default ip route <A.B.C.D> <A.B.C.D> <A.B.C.D> preference</code> .

Use the data in the following table to use the `show ip route static` command.

Table 9: Variable definitions

Variable	Value
<A.B.C.D>	Specifies the route by IP address.

Table continues...

Variable	Value
-s { <A.B.C.D> <A.B.C.D> default}	Specifies the route by IP address and subnet mask.
vrf WORD<0-16>	Specifies a VRF by name.
vrfids WORD<0-512>	Specifies a range of VRF IDs.

Configuring static routes using EDM

About this task

Use static routes to force the router to make certain forwarding decisions. Create IP static routes to manually provide a path to destination IP address prefixes.

* Note:

It is recommended that you do not configure static routes on a DvR Leaf node unless the configuration is for reachability to a management network using a Brouter port.

Also, configuring the preference of static routes is not supported on a Leaf node.

For route scaling information, see *Release Notes*.

Procedure

1. In the navigation tree, expand the following folders: **Configuration > IP**.
2. Click **IP**.
3. Click the **Static Routes** tab.
4. Click **Insert**.
5. If required, in the **OwnerVrflid** check box, select the appropriate VRF ID. By default, the VRF is the GlobalRouter VRF 0.
6. In the **Dest** field, type the IP address.
7. In the **Mask** field, type the subnet mask.
8. In the **NextHop** field, type the IP address of the router through which the specified route is accessible.
9. **(Optional)** In the **NextHopVrflid** field, select the appropriate value.
10. **(Optional)** To enable the static route, select the **Enable** check box.
11. **(Optional)** In the **Metric** field, type the metric.
12. **(Optional)** In the **Preference** field, type the route preference.
13. **(Optional)** If required, select the **LocalNextHop** check box.
Use this option to create Layer 3 static routes.
14. Click **Insert**.

The new route appears in the **IP** dialog box, **Static Routes** tab.

Static Routes field descriptions

Use the data in the following table to use the **Static Routes** tab.

Name	Description
OwnerVrflid	Specifies the VRF ID for the static route.
Dest	Specifies the destination IP address of this route. A value of 0.0.0.0 is a default route. Multiple routes to a single destination can appear in the table, but access to such multiple entries is dependent on the table-access mechanisms defined by the network management protocol in use.
Mask	Indicates the mask that the system operates a logically AND function on, with the destination address, to compare the result to the Route Destination. For systems that do not support arbitrary subnet masks, an agent constructs the Route Mask by determining whether it belongs to a class A, B, or C network, and then uses one of: 255.0.0.0—Class A 255.255.0.0—Class B 255.255.255.0—Class C If the Route Destination is 0.0.0.0 (a default route) then the mask value is also 0.0.0.0.
NextHop	Specifies the IP address of the next hop of this route. In the case of a route bound to an interface which is realized through a broadcast media, the Next Hop is the IP address of the agent on that interface. When you create a black hole static route, configure this parameter to 255.255.255.255.
NextHopVrflid	Specifies the next-hop VRF ID in interVRF static route configurations. Identifies the VRF in which the ARP entry resides.
Enable	Determines whether the static route is available on the port. The default is enable. If a static route is disabled, it must be enabled before it can be added to the system routing table.
Status	Specifies the status of the route. The default is enabled.
Metric	Specifies the primary routing metric for this route. The semantics of this metric are determined by the routing protocol specified in the route RouteProto value. If this metric is not used, configure the value to 1. The default is 1.
IfIndex	Specifies the route index of the Next Hop. The interface index identifies the local interface through which the next hop of this route is reached.

Table continues...

Name	Description
Preference	Specifies the routing preference of the destination IP address. If more than one route can be used to forward IP traffic, the route that has the highest preference is used. The higher the number, the higher the preference.
LocalNextHop	Enables and disables LocalNextHop. If enabled, the static route becomes active only if the system has a local route to the network. If disabled, the static route becomes active if the system has a local route or a dynamic route.

Enabling remote access services

Before you begin

- When you enable the rlogin flag, you must configure an access policy to specify the user name of who can access the switch. For more information about the access policy commands, see *Configuring Security*.

About this task

Enable the remote access service to provide multiple methods of remote access.

File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP) and Telnet server support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.

On IPv6 networks, the switch supports SSH server and remote login (rlogin) server only. The switch does not support outbound SSH client over IPv6 or rlogin over IPv6. On IPv4 networks, the switch supports both server and client for SSH and rlogin.

Procedure

- Enter Global Configuration mode:


```
enable
configure terminal
```
- Enable the access service:


```
boot config flags <ftpd|rlogind|sshd|telnetd|tftpd>
```
- Repeat as necessary to activate the desired services.
- Save the configuration.

Example

Enable the access service for Telnet:

```
Switch:1>enable
Switch:1#configure terminal
Switch:1(config)#boot config flags telnetd
```

Variable definitions

Use the data in the following table to use the `boot config flags` command.

Table 10: Variable definitions

Variable	Value
ftpd	Enables the File Transfer Protocol remote-access service type. Use the <code>no</code> operator to remove this configuration. To configure this option to the default value, use the default operator with the command.
rlogind	Enables the rlogin remote-access service type. Use the <code>no</code> operator to remove this configuration. To configure this option to the default value, use the default operator with the command.
spbm-config-mode	Enables you to configure SPB and IS-IS, but you cannot configure PIM and IGMP either globally or on an interface. Use the <code>no</code> operator so that you can configure PIM and IGMP. The boot flag is enabled by default. To set this flag to the default value, use the default operator with the command.
sshd	Enables the Secure Shell remote-access service type. Use the <code>no</code> operator to remove this configuration. To configure this option to the default value, use the default operator with the command.
telnetd	Enables the Telnet remote-access service type. Use the <code>no</code> operator to remove this configuration. To configure this option to the default value, use the default operator with the command.
tftpd	Enables the Trivial File Transfer Protocol remote-access service type. Use the <code>no</code> operator to remove this configuration. To configure this option to the default value, use the default operator with the command.

Using Telnet to log on to the device

About this task

Use Telnet to log on to the device and remotely manage the switch.

Procedure

1. From a PC or terminal, start a Telnet session:
`telnet <ipv4 or ipv6 address>`
2. Enter the logon and password when prompted.

Example

```
C:\Users\jsmith>telnet 192.0.2.40
Connecting to 192.0.2.40.....
Login:rwa
Password:rwa
```

Enabling the web management interface

About this task

Enable the web management interface to provide management access to the switch using a web browser.

HTTP and HTTPS, and FTP support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.

Important:

If you want to allow HTTP access to the device, then you must disable the web server secure-only option. If you want to allow HTTPS access to the device, the web server secure-only option is enabled by default. The TFTP server supports both IPv4 and IPv6 TFTP clients.

Procedure

1. Enter Global Configuration mode:
`enable`
`configure terminal`
2. Enable the web server:
`web-server enable`
3. To enable the secure-only option (for HTTPS access), enter:
`web-server secure-only`
4. **(Optional)** To disable the secure-only option (for HTTP access), enter:
`no web-server secure-only`
5. Configure the username and the access password:
`web-server password rwa WORD<1-20> WORD<1-32>`

! Important:

The default passwords and community strings are documented and well known. You are strongly recommended to change the default passwords and community strings immediately after you first log on.

6. Save the configuration:

```
save config
```

7. Display the web server status:

```
show web-server
```

Example

Enable the secure-only web-server, and configure the access level to read-write-all, for a username of smith2 and the password to 90Go2434.

```
Switch:1>enable
Switch:1#configure terminal
Switch:1(config)#web-server enable
Switch:1(config)#web-server secure-only
Switch:1(config)#web-server password rwa smith2 90Go2434
Switch:1(config)#show web-server

Web Server Info :

      Status                : on
      Secure-only           : enabled
      TLS-minimum-version   : tlsv12
      RWA Username          : smith2
      RWA Password          : *****
      Def-display-rows      : 30
      Inactivity timeout    : 900 sec
      Html help tftp source-dir : 192.0.2.253:/Help_04052017
      HttpPort              : 80
      HttpsPort             : 443
      NumHits               : 163
      NumAccessChecks       : 13
      NumAccessBlocks       : 1
      NumRxErrors           : 66
      NumTxErrors           : 0
      NumSetRequest         : 0
      Minimum password length : 8
      Last Host Access Blocked : 198.51.100.13
```

Variable definitions

Use the data in the following table to use the `web-server` command.

Variable	Value
def-display-rows <10-100>	Configures the number of rows each page displays, between 10 and 100.

Table continues...

Variable	Value
enable	Enables the Web interface. To disable the web server, use the no form of this command: no web-server [enable]
help-tftp <WORD/0-256>	Configures the TFTP or FTP directory for Help files, in one of the following formats: a.b.c.d:/ peer:/ [<dir>]. The path can use 0–256 characters. The following example paths illustrate the correct format: <ul style="list-style-type: none"> • 192.0.2.1:/help • 192.0.2.1:/
http-port <80-49151>	Configures the web server HTTP port. The default port is 80.
https-port <443-49151>	Configure the web server HTTPS port. The default port is 443.
inactivity-timeout<30–65535>	Configures the web-server session inactivity timeout. The default is 900 seconds (15 minutes).
password {ro rw rwa} WORD<1-20> WORD<1-32>	Configures the logon and password for the web interface, where the first WORD<1-20> is the new logon and the second WORD<1-32> is the new password.
password min-passwd-len<1–32>	Configures the minimum password length. By default, the minimum password length is 8 characters.
secure-only	Enables secure-only access for the web server.
tls-min-ver<t1sv10 t1sv11 t1sv12>	Configures the minimum version of the TLS protocol supported by the web-server. You can select among the following: <ul style="list-style-type: none"> • t1sv10 – Configures the version to TLS 1.0. • t1sv11 – Configures the version to TLS 1.1. • t1sv12 – Configures the version to TLS 1.2 The default is t1sv12.

Setting the TLS protocol version

The switch by default supports version TLS 1.2 and above. You can explicitly configure TLS 1.0 and TLS 1.1 version support using CLI.

About this task

Disable the web server before changing the TLS version. By disabling the web server, other existing users with a connection to the web server are not affected from changing to a different version after you run the `tls-min-ver` command.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Disable the Web server:

```
no web-server enable
```

3. Set the TLS protocol version:

```
web-server tls-min-ver [tlsv10 | tlsv11 | tlsv12]
```

4. Enable the Web server:

```
web-server enable
```

5. Verify the protocol version:

```
show web-server
```

Example

```
Switch> enable
Switch# configure terminal
Switch(config)# web-server tls-min-ver tlsv11
```

Verify the protocol version.

```
Switch> show web-server

Web Server Info :

      Status                : on
      Secure-only           : disabled
      TLS-minimum-version   : tlsv11
      RWA Username          : admin
      RWA Password          : *****
      Def-display-rows      : 30
      Inactivity timeout    : 900 sec
      Html help tftp source-dir :
      HttpPort              : 80
      HttpsPort             : 443
      NumHits                : 198
      NumAccessChecks       : 8
      NumAccessBlocks       : 0
      NumRxErrors            : 198
      NumTxErrors           : 0
      NumSetRequest         : 0
      Minimum password length : 8
      Last Host Access Blocked : 0.0.0.0
```

Variable definitions

Use the data in the following table to use the `web-server` command.

Variable	Value
<code>def-display-rows <10-100></code>	Configures the number of rows each page displays, between 10 and 100.
<code>enable</code>	Enables the Web interface. To disable the web server, use the no form of this command: <code>no web-server [enable]</code>
<code>help-tftp <WORD/0-256></code>	Configures the TFTP or FTP directory for Help files, in one of the following formats: <code>a.b.c.d:/ peer:/ [dir]</code> . The path can use 0–256 characters. The following example paths illustrate the correct format: <ul style="list-style-type: none"> • <code>192.0.2.1:/help</code> • <code>192.0.2.1/</code>
<code>http-port <80-49151></code>	Configures the web server HTTP port. The default port is 80.
<code>https-port <443-49151></code>	Configure the web server HTTPS port. The default port is 443.
<code>inactivity-timeout<30–65535></code>	Configures the web-server session inactivity timeout. The default is 900 seconds (15 minutes).
<code>password {ro rw rwa} WORD<1-20> WORD<1-32></code>	Configures the logon and password for the web interface, where the first <code>WORD<1-20></code> is the new logon and the second <code>WORD<1-32></code> is the new password.
<code>password min-passwd-len<1–32></code>	Configures the minimum password length. By default, the minimum password length is 8 characters.
<code>secure-only</code>	Enables secure-only access for the web server.
<code>tls-min-ver<t/1sv10 t/1sv11 t/1sv12></code>	Configures the minimum version of the TLS protocol supported by the web-server. You can select among the following: <ul style="list-style-type: none"> • <code>1sv10</code> – Configures the version to TLS 1.0. • <code>1sv11</code> – Configures the version to TLS 1.1. • <code>1sv12</code> – Configures the version to TLS 1.2 The default is <code>1sv12</code> .

Accessing the switch through the Web interface

Before you begin

- You must enable the Web server using CLI.

About this task

Monitor the switch through a Web browser from anywhere on the network. The Web interface uses a 15-minute timeout period. If no activity occurs for 15 minutes, the system logs off the switch Web interface, and you must reenter the password information.

Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol Secure (HTTPS) support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.

Note:

By default the Web server is configured with the secure-only option, which requires you to use HTTPS to access EDM. To access EDM using HTTP, you must disable the secure-only option. For more information about configuring the secure-only option, see [Enabling the Web management interface](#) on page 36.

Procedure

1. Start your Web browser.
2. Type the switch IP address as the URL in the Web address field.
3. In the **User Name** box type `admin` and **Password** box type `password`.
4. Click **Login**.

Configuring the minimum version of the TLS protocol

Use the following procedure to configure the minimum version of the TLS protocol.

Earlier releases used a self-signed certificate generated using the OpenSSL API, and this self-signed certificate was installed in `/inflash/.ssh`. The self-signed certificate is now generated with the Mocana API.

Disable the web server before changing the TLS version. By disabling the web server, other existing users with a connection to the web server are not affected by changing to a different version.

The switch by default supports version TLS 1.2 and above. You can explicitly configure TLS 1.0 and TLS 1.1 version support.

Procedure

1. In the navigation tree, open the following folders: **Configuration** > **Security** > **Control Path**.
2. Click **General** and select **Web** tab.
3. In the **TlsMinimumVersion** field, select the TLS version you want to configure as the minimum on the system.

Web field descriptions

Use the data in the following table to use the Web tab.

Name	Description
WebUserName	Specifies the username from 1–20 characters. The default is admin.
WebUserPassword	Specifies the password from 1–32 characters. The default is password.
MinimumPasswordLength	Configures the minimum password length. By default, the minimum password length is 8 characters.
HttpPort	Specifies the HTTP port for web access. The default value is 80.
HttpsPort	Specifies the HTTPS port for web access. The default value is 443.
SecureOnly	Controls whether the secure-only option is enabled. The default is enabled.
InactivityTimeout	Specifies the idle time (in seconds) to wait before the EDM login session expires. The default value is 900 seconds (15 minutes).
TlsMinimumVersion	Configures the minimum version of the TLS protocol supported by the web-server. You can select from the following options: <ul style="list-style-type: none"> • tlsv10 – Configures the version to TLS 1.0. • tlsv11 – Configures the version to TLS 1.1. • tlsv12 – Configures the version to TLS 1.2 The default is tlsv12.
HelpTftp/Ftp_SourceDir	Configures the TFTP or FTP directory for Help files, in one of the following formats: a.b.c.d:/ peer:/ [<dir>]. The path can use 0–256 characters. The following example paths illustrate the correct format: <ul style="list-style-type: none"> • 192.0.2.1:/Help • 192.0.2.1/
DefaultDisplayRows	Configures the web server display row width between 10–100. The default is 30.
LastChange	Shows the last web-browser initiated configuration change.
NumHits	Shows the number of hits to the web server.

Table continues...

Name	Description
NumAccessChecks	Shows the number of access checks performed by the web server.
NumAccessBlocks	Shows the number of access attempts blocked by the web server.
LastHostAccessBlocked	Shows the IP address of the last host access blocked the web server.
NumRxErrors	Shows the number of receive errors the web server encounters.
NumTxErrors	Shows the number of transmit errors the web server encounters.
NumSetRequest	Shows the number of set-requests sent to the web server.

Configuring a VLAN using CLI

Create a VLAN using CLI by port, protocol, or SPBM. Create a private VLAN by port. Optionally, you can choose to assign the VLAN a name and color.

Assign an IP address to the VLAN. You can also assign a MAC-offset value.

For more information on configuring a VLAN, see *Configuring VLANs, Spanning Tree, and NLB*.

About this task

Create a VLAN and assign an IP address in CLI.

Procedure

1. Enter Global Configuration mode:

```
enable
configure terminal
```

2. Create one of the following VLANs using CLI:

- Create a port-based VLAN:

```
vlan create <2-4059> [name WORD<0-64>] type port-mstprstp <0-63>
[color <0-32>]
```

- Create a VLAN using a user-defined protocol and specify the frame encapsulation header type:

```
vlan create <2-4059> [name WORD<0-64>] type protocol-mstprstp <0-63>
ipv6 [color <0-32>]
```

- Create a spbm-bvlan VLAN:

```
vlan create <2-4059>[name WORD<0-64>] type spbm-bvlan [color
<0-32>]
```

- Create a private-vlan VLAN:

```
vlan create <2-4059> [name WORD<0-64>] type pvlan-mstprstp <0-63>
secondary <2-4059>[color <0-32>]
```

3. Enter VLAN Interface Configuration mode:

```
enable
configure terminal
interface vlan <1-4059>
```

4. Assign an IP address to a VLAN with or without specifying the MAC-offset. Do not assign an IP address to a spbm-bvlan or private-vlan type of VLAN.

```
ip address <A.B.C.D/X>|<A.B.C.D> <A.B.C.D> [<0-511>]
```

Example


```
Switch:1>enable
Switch:1#configure terminal
Switch:1(config)#vlan create 2 type port-mstprstp 6 color 4
Switch:1(config)#interface vlan 2
Switch:1(config-if)#ip address 192.0.2.40/24
```

Variable Definitions

Use the data in the following table to use the `vlan create` command.

Variable	Value
<2-4059>	Specifies the VLAN ID in the range of 2 to 4059. VLAN ID 1 is the default VLAN and you cannot create or delete VLAN ID 1. By default, the system reserves VLAN IDs 4060 to 4094 for internal use. On switches that support the vrf-scaling and spbm-config-mode boot configuration flags, if you enable these flags, the system also reserves VLAN IDs 3500 to 3998.
name WORD<0-64>	Specifies the VLAN name. The name attribute is optional.
type port-mstprstp <0-63> [color <0-32>]	Creates a VLAN by port: <ul style="list-style-type: none"> • <0-63> is the STP instance ID from 0 to 63. • color <0-32> is the color of the VLAN in the range of 0 to 32.

Table continues...

Variable	Value
	<p> Note:</p> <p>MSTI instance 62 is reserved for SPBM if SPBM is enabled on the switch.</p>
type pvlan-mstprstp <0-63> [color <0-32>]	<p>Creates a private VLAN by port:</p> <ul style="list-style-type: none"> • <0-63> is the STP instance ID from 0 to 63. • color <0-32> is the color of the VLAN in the range of 0 to 32.
type protocol-mstprstp <0-63> ipv6	<p>Creates a VLAN by protocol:</p> <ul style="list-style-type: none"> • <0-63> is the STP instance ID. • color <0-32> is the color of the VLAN in the range of 0 to 32.
type spbm-bvlan	Creates a SPBM B-VLAN.

Use the data in the following table to use the **ip address** command.

Variable	Value
<A.B.C.D/X> <A.B.C.D> <A.B.C.D>	Specifies the IP address and subnet mask in the format A.B.C.D/X or A.B.C.D A.B.C.D.
<0-511>	Specifies the MAC-offset value.

Use the data in the following table to use the **vlan i-sid** command.

Variable	Value
<1-4059>	Specifies the VLAN ID in the range of 1 to 4059. By default, VLAN IDs 1 to 4059 are configurable and the system reserves VLAN IDs 4060 to 4094 for internal use. On switches that support the vrf-scaling and spbm-config-mode boot configuration flags, if you enable these flags, the system also reserves VLAN IDs 3500 to 3998. VLAN ID 1 is the default VLAN and you cannot create or delete VLAN ID 1.
<0-16777215>	Specifies the i-sid number. The value is in the range of <0-16777215>.

Configuring a VLAN using Enterprise Device Manager

Create a VLAN by port, protocol, or SPBM address using the Enterprise Device Manager (EDM). Additionally you can choose to assign the VLAN a name and a color.

Assign an IP address to the VLAN. You can also assign a MAC-offset value that ensures a given VLAN has the same MAC address across reboots.

Before you begin

Ensure you follow the VLAN configuration rules for the switch. For more information on the VLAN configuration rules and on configuring a VLAN, see *Configuring VLANs, Spanning Tree, and NLB*.

About this task

Create a VLAN and assign an IP address to a VLAN to enable routing on the VLAN.

Procedure

1. In the navigation tree, open the following folders: **Configuration > VLAN**.
2. Click **VLANs**.
3. In the **Basic** tab, click **Insert**.
4. In the **Id** box, enter an unused VLAN ID, or use the ID provided.
5. In the **Name** box, type the VLAN name, or use the name provided.
6. In the **Color Identifier** box, click the down arrow and choose a color from the list, or use the color provided.
7. In the **MstpInstance** box, click the down arrow and choose an msti instance from the list.
8. In the **Type** box, select the type of VLAN you want to create.
 - To create a VLAN by port, choose **byPort**.
 - To create a VLAN by protocol, choose **byProtocolId**. The supported protocol type is ipv6.
 - To create an SPBM B-VLAN, choose **spbm-bvlan**.
 - To create a private VLAN, choose **private**.
9. In the **PortMembers** box, click the (...) button .

Note:

This **PortMembers** box does not apply to all VLAN types.

10. Click on the ports to add as member ports.

The ports that are selected are recessed, while the non-selected ports are not recessed. Port numbers that appear dimmed cannot be selected as VLAN port members.
11. Click **OK**.
12. Click **Insert**.
13. Close the **VLANs** tab.

The VLAN is added to the **Basic** tab.
14. Assign an IP address to a VLAN to enable routing on the VLAN. In the Navigation tree, open the following folders: **Configuration > VLAN**.
15. Click **VLANs**.
16. In the **Basic** tab, select the VLAN for which you are configuring an IP address.

17. Click **IP**.
The IP, Default tab appears.
18. Click **Insert**.
19. Configure the required parameters.
20. Click **Insert**.

Basic field descriptions

Use the data in the following table to use the Basic tab.

Name	Description
Id	Specifies the VLAN ID in the range of 2 to 4059. VLAN ID 1 is the default VLAN and you cannot create or delete VLAN ID 1. By default, the system reserves VLAN IDs 4060 to 4094 for internal use. On switches that support the vrf-scaling and spbm-config-mode boot configuration flags, if you enable these flags, the system also reserves VLAN IDs 3500 to 3998.
Name	Specifies the name of the VLAN.
IfIndex	Specifies the logical interface index assigned to the VLAN.
Color Identifier	Specifies a proprietary color scheme to associate a color with the VLAN. Color does not affect how frames are forwarded.
Type	Specifies the type of VLAN: <ul style="list-style-type: none"> • byPort • byProtocolId • spbm-bvlan • private
MstpInstance	Identifies the MSTP instance.
VrfId	Indicates the Virtual Router to which the VLAN belongs.
VrfName	Indicates the name of the Virtual Router to which the VLAN belongs.
PortMembers	Specifies the slot/port of each VLAN member. The sub-port only appears for channelized ports.
ActiveMembers	Specifies the slot/port of each VLAN member. The sub-port only appears for channelized ports.

Table continues...

Name	Description
StaticMembers	Specifies the slot/port of each static member of a policy-based VLAN. The sub-port only appears for channelized ports.
NotAllowToJoin	Specifies the slot/ports that are never allowed to become a member of the policy-based VLAN. The sub-port only appears for channelized ports.
ProtocolId	Specifies the network protocol for protocol-based VLANs. This value is taken from the Assigned Numbers of remote function call (RFC). If the VLAN type is port-based, none is displayed in the Basic tab ProtocolId field.

*** Note:**

If you or another user changes the name of an existing VLAN using the VLAN **Basic** tab (or using CLI), the new name does not initially appear in EDM. To display the updated name, perform one of the following actions:

- Refresh your browser to reload EDM.
- Log out of EDM and log in again to restart EDM.
- Click **Refresh** in the VLAN **Basic** tab toolbar. If the old VLAN name appears in other tabs, click **Refresh** on those tabs as well.

IP Address field descriptions

Use the data in the following table to use the IP Address tab.

Name	Description
Interface	Shows the interface to which this entry applies.
Ip Address	Specifies the IP address to associate with the VLAN.
Net Mask	Specifies the subnet mask associated with the IP address of this entry. The value of the mask is an IP address with all the network bits configured to 1 and all the hosts bits configured to 0.
BcastAddrFormat	Shows the IP broadcast address format on this interface.
ReasmMaxSize	Shows the size of the largest IP datagram which this entity can reassemble from incoming IP fragmented datagrams received on this interface.
VlanId	Specifies the VLAN ID in the range of 1 to 4059. By default, VLAN IDs 1 to 4059 are configurable and the system reserves VLAN IDs 4060 to 4094 for internal use. On switches that support the vrf-scaling and

Table continues...

Name	Description
	spbm-config-mode boot configuration flags, if you enable these flags, the system also reserves VLAN IDs 3500 to 3998. VLAN ID 1 is the default VLAN and you cannot create or delete VLAN ID 1.
BrouterPort	Indicates whether this entry corresponds to a brouter port, as oppose to a routable VLAN.
MacOffset	Specifies the MAC offset value. Routable VLANS are assigned MAC addresses arbitrarily or by offset. Their MAC addresses are: <ul style="list-style-type: none"> • 24 bits: Vendor ID • 12 bits: Chassis ID • 12 bits: 0xA00-0xFFF If you enter the MAC offset, the lowest 12 bits are 0xA00 plus the offset. If not, they are arbitrary.
Vrflid	Associates the VLAN or brouter port with a VRF. VRF ID 0 is reserved for the administrative VRF.

Installing a license file

Before you begin

- File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP) support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.
- You must enable the File Transfer Protocol (FTP) or Trivial File Transfer Protocol (TFTP) server depending on which protocol you use to download the license file to the device.
- Ensure that you have the correct license file with the base MAC address of the switch on which you need to install the license. Otherwise, the system does not unblock the licensed features.

About this task

Install a license file on the switch to enable licensed features.

You can use the same procedure to load legacy license files, license.dat, on a VSP 4000 switch.

Note:

You can enable FTP or TFTP in the boot config flags, and then initiate an FTP or a TFTP session from your workstation to put the file on the switch.

Procedure

1. From a remote station or PC, use FTP or TFTP to download the license file to the device and store the license file in the /intflash directory.
2. Enter Global Configuration mode:

```
enable
```

```
configure terminal
```

3. Load the license:

```
load-license WORD<0-63>
```

*** Note:**

If more than one valid .xml license file exists in the /intflash/ directory, the switch uses the license with the highest capability.

! Important:

If the loading fails, or if the switch restarts and cannot locate a license file in the specified location, the switch cannot unlock the licensed features and reverts to base functionality.

Example

Use FTP to transfer a license file from a PC to the internal flash on the device:

```
C:\Users\jsmith>ftp 192.0.2.16
Connected to 192.0.2.16 (192.0.2.16).
220 FTP server ready
Name (192.0.2.16:(none)): rwa
331 Password required
Password:
230 User logged in
ftp> bin
200 Type set to I, binary mode
ftp> put L3VWithMACsec.xml /intflash/L3VWithMACsec.xml
local: L3VWithMACsec.xml remote: /intflash/L3VWithMACsec.xml
227 Entering Passive Mode (192,0,2,16,4,2)
150 Opening BINARY mode data connection
226 Transfer complete
101 bytes sent in 2.7e-05 secs (3740.74 Kbytes/sec)
ftp>
```

Log in to the device and load the license. The following example shows a successful operation.

```
Switch:1(config)#load-license L3VWithMACsec.xml
Switch:1(config)#CP1 [06/12/15 15:59:57.636:UTC] 0x000005bc 00000000 GlobalRouter SW INFO
License Successfully Loaded From </intflash/L3VWithMACsec.xml> License Type -- L3V with
MACsec
```

The following example shows an unsuccessful operation.

```
Switch:1(config)#load-license license_Switch_example.xml
Switch:1(config)#CP1 [06/12/15 15:58:48.376:UTC] 0x000006b9 00000000 GlobalRouter SW
INFO Invalid license file /intflash/license_Switch_example.xml HostId is not Valid

CP1 [06/12/15 15:58:48.379:UTC] 0x000005c4 00000000 GlobalRouter SW INFO No Valid
License found.
```

Saving the configuration

Save the configuration to a file to retain the configuration settings.

About this task

File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP) support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.

* Note:

If you use File Transfer Protocol (FTP) or Trivial File Transfer Protocol (TFTP), ensure that you enable the FTP or TFTP server.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Save the running configuration:

```
save config [backup WORD<1-99>] [file WORD<1-99>] [verbose]
```

Example

```
Switch:1> enable
```

Save the file to the default location:

```
Switch:1# save config
```

Backing up configuration files

Before and after you upgrade your switch software, make copies of the configuration files. If an error occurs, use backup configuration files to return the switch to a previous state.

Before you begin

- If you use File Transfer Protocol (FTP) or Trivial File Transfer Protocol (TFTP), ensure that you enable the FTP or TFTP server. File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP) support both IPv4 and IPv6 addresses, with no difference in functionality or configuration.

About this task

Keep several copies of backup files.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Determine the configuration file names:

```
show boot config choice
```

3. Save the configuration files. Assuming the files use the default file names, enter:

```
save config
```

4. Copy the files to a safe place:

```
copy /intflash/config.cfg /intflash/config_backup.cfg
copy /intflash/config.cfg a.b.c.d:/dir/config_backup.cfg
```

Example

Determine the configuration file names, save the configuration files, and copy the files to a safe place.

```
Switch:1>enable
Switch:1#show boot config choice
choice primary config-file "/intflash/config.cfg"
choice primary backup-config-file "/intflash/config.cfg"
Switch:1#save config
Switch:1#copy /intflash/config.cfg 00:11:f9:5b:10:42/dir/config_backup.cfg
Do you want to continue? (y/n)
y
```

Resetting the platform

About this task

Reset the platform to reload system parameters from the most recently saved configuration file.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Reset the switch:

```
reset [-y]
```

Example

Reset the switch:

```
Switch:1>enable
Switch:1#reset
Are you sure you want to reset the switch? (y/n)
y
```

Variable definitions

Use the data in the following table to use the `reset` command.

Table 11: Variable definitions

Variable	Value
-y	Suppresses the confirmation message before the switch resets. If you omit this parameter, you must confirm the action before the system resets.

Installing a new software build

Use the following procedure to install a new software build for the switch.

For full upgrade instructions, see *Administering*.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Extract the release distribution files to the `/intflash/release/` directory:

```
software add WORD<1-99>
```

3. Install the image:

```
software activate WORD<1-99>
```

4. Restart the switch:

```
reset
```

Example

Extract the release distribution files to the `/intflash/release/` directory, extract the module files to the `/intflash/release` directory, and install the image.

```
Switch:1>enable
Switch:1#software add VSPX.X.X.X.X.tgz
Switch:1#software activate VSPX.X.X.X.X
Switch:1#reset
```

Removing a software build

Use the following procedure to remove a software build for the switch.

Important:

A maximum of 6 software distributions can be installed. Once the limit is reached, one or more distributions must be removed to accommodate new distributions.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Remove the software build:

```
software remove WORD<1-99>
```

Example

Remove the software build:

```
Switch:1>enable  
Switch:1#software remove w.x.y.z
```

Chapter 5: Verification

This section contains information about how to verify that your provisioning procedures result in a functional switch.

Pinging an IP device

About this task

Ping a device to test the connection between the switch and another network device. After you ping a device, the switch sends an Internet Control Message Protocol (ICMP) packet to the target device. If the device receives the packet, it sends a ping reply. After the switch receives the reply, a message appears that indicates traffic can reach the specified IP address. If the switch does not receive a reply, the message indicates the address does not respond.

Procedure

1. Log on to the switch to enter User EXEC mode.
2. Ping an IP network connection:

```
ping WORD<0-256> [-d] [-I <1-60>] [-s] [-t <1-120>] [count <1-9999>]
[datasize <28-51200>] [interface <gigabitEthernet {slot/port[/sub-
port]}|mgmtEthernet mgmt|tunnel <1-2000>|vlan <1-4059>] [scopeid <1-
9999>] [Source WORD<1-256>][vrf WORD<0-16>]
```

Note:

The mgmtEthernet interface only applies to hardware with a dedicated, physical management interface.

Example

Ping an IP network connection through the management interface for IPv4, and for IPv6:

```
Switch:1>ping 192.0.2.2 vrf mgmtrouter
Switch:1>ping 2001:0db8:0000:0000:0000:0000:0000:0001 vrf mgmtrouter
```

Variable definitions

Use the data in the following table to use the `ping` command.


Variable	Value
count <1–9999>	Specifies the number of times to ping (1–9999).
-d	Configures the ping debug mode. This variable detects local software failures (ping related threads creation or write to sending socket) and receiving issues (icmp packet too short or wrong icmp packet type).
datasize <28–9216> or datasize <28–51200>	Specifies the size of ping data sent in bytes: 28–9216 for IPv4 and 28–51200 for IPv6 .
interface <gigabitEthernet {slot/port[/sub-port]} mgmtEthernet mgmt tunnel <1–2000> vlan <1–4059>	<p>Specifies a specific outgoing interface to use by IP address.</p> <p>Additional ping interface filters:</p> <ul style="list-style-type: none"> • gigabitEthernet: {slot/port} gigabit ethernet port • mgmtEthernet: mgmt <p> Note:</p> <p>The mgmtEthernet interface only applies to hardware with a dedicated, physical management interface.</p> <ul style="list-style-type: none"> • tunnel: tunnel ID as a value from 1 to 2000 • vlan: <ul style="list-style-type: none"> Specifies the VLAN ID in the range of 1 to 4059. By default, VLAN IDs 1 to 4059 are configurable and the system reserves VLAN IDs 4060 to 4094 for internal use. On switches that support the vrf-scaling and spbm-config-mode boot configuration flags, if you enable these flags, the system also reserves VLAN IDs 3500 to 3998. VLAN ID 1 is the default VLAN and you cannot create or delete VLAN ID 1.
-l <1–60>	Specifies the interval between transmissions in seconds (1–60).
-s	Configures the continuous ping at the interval rate defined by the [-l] parameter.
scopeid <1–9999>	<p>Specifies the scope ID.</p> <p><1–9999> specifies the circuit ID for IPv6.</p>
source WORD <1–256>	Specifies an IP address that will be used as the source IP address in the packet header.
-t <1–120>	Specifies the no-answer timeout value in seconds (1–120).

Table continues...

Variable	Value
vrf <i>WORD</i> <0–16>	Specifies the virtual router and forwarder (VRF) name from 1–16 characters.
<i>WORD</i> <0–256>	Specifies the host name or IPv4 (a.b.c.d) or IPv6 (x:x:x:x:x:x) add. Specifies the address to ping.

Verifying boot configuration flags

Verify the boot configuration flags to verify boot configuration settings. Boot configuration settings only take effect after you reset the system. Verification of these parameters is essential to minimize system downtime and the resets to change them.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Verify the flags:

```
show boot config flags
```

Example

```
Switch:1>enable
Switch:1#show boot config flags
flags block-snmp false
flags debug-config file
flags debugmode false
flags dvr-leaf-mode false
flags enhancedsecure-mode false
flags factorydefaults false
flags flow-control-mode false
flags ftpd true
flags ha-cpu true
flags hsecure false
flags linerate-directed-broadcast false
flags ipv6-mode false
flags logging true
flags nni-mstp false
flags reboot true
flags rlogind false
flags savetostandby true
flags spanning-tree-mode mstp
flags spbm-config-mode false
flags sshd true
flags telnetd true
flags tftpd true
flags trace-logging false
flags urpf-mode false
flags verify-config true
flags vrf-scaling false
flags vxlan-gw-full-interworking-mode false
```

*** Note:**

The following **boot config flags** are not supported on all hardware models:

- ha-cpu flag
- ipv6-mode flag
- savetostandby flag

Verifying the software release

About this task

Use CLI to verify your installed software. It is important to verify your software version before you place a device into a production environment.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Verify the software release:

```
show software detail
```

Example

The following is an example of the output of the `show software detail` command.

```
Switch:1#show software detail

=====
                        software releases in /intflash/release/
=====
VSPSwitch.X.X.X.X_GA
MP
  UBOOT                int009
  KERNEL                2.6.32_int29
  ROOTFS                2.6.32_int29
  APPFS                 VSPSwitch.X.X.X.X_GA
AVAILABLE ENCRYPTION MODULES
  No Modules Added

VSPSwitch.X.X.X.X_GA (Backup Release)
MP
  UBOOT                int009
  KERNEL                2.6.32_int29
  ROOTFS                2.6.32_int29
  APPFS                 VSPSwitch.X.X.X.X_GA
AVAILABLE ENCRYPTION MODULES
  No Modules Added

VSPSwitch.X.X.X.X_GA (Primary Release)
MP
  UBOOT                int009
  KERNEL                2.6.32_int29
```

```

ROOTFS                2.6.32_int29
APPFS                VSPSwitch.X.X.X.X_GA
AVAILABLE ENCRYPTION MODULES
No Modules Added

```

```

-----
Auto Commit      : enabled
Commit Timeout   : 10 minutes

```

Verifying the software version on the slots

About this task

* Note:

This procedure is not supported on all hardware platforms.

Use CLI to verify the software version running on each slot.

Procedure

1. Enter Privileged EXEC mode:

```
enable
```

2. Verify the software version running on each slot:

```
show software slot
```

Example

The following is an example of the output of the `show software slot` command.

```
Switch:1#show software slot
```

```

=====
=====
                               Software running on chassis
=====
=====

```

```

Slot      Release
-----
1         VOSS8600.voss_4.5.0.0int011
2         VOSS8600.voss_4.5.0.0int011
4         VOSS8600.voss_4.5.0.0int011
SF 1     VOSS8600.voss_4.5.0.0int011
SF 2     VOSS8600.voss_4.5.0.0int011

```

Displaying local alarms

View local alarms to monitor alarm conditions.

Local alarms are raised and cleared by applications running on the switch. Local alarms are an automatic mechanism run by the system that do not require any additional user configuration. The raising and clearing of local alarms also creates a log entry for each event. Check alarms occasionally to ensure no alarms require additional operator attention.

For more information, see *Troubleshooting*.

Procedure

Display local alarms:

```
show alarm database
```

Example

Display local alarms:

*** Note:**

The switches that support SF cards display warning messages when SFIs are down.

```
Switch:1#show alarm database
```

SLOT REASON	ALARM ID	EVENT CODE	ALARM TYPE	ALARM STATUS	SEVERITY	FREQ	CREATION TIME	UPDATED TIME	CLEARED TIME
	00400021.3	0x00010848	DYNAMIC	SET	ERROR	1	[04/06/17 09:01:09.790]	[04/06/17 09:01:09.790]	[--/--/--]
		Power supply unit 3 attention state detected							
CP2	00400005	0x000045e5	DYNAMIC	SET	INFO	1	[04/06/17 09:05:53.584]	[04/06/17 09:05:53.584]	[--/--/--]
		Sending Cold-Start Trap							
CP2	00300001.257	0x0000c5e7	DYNAMIC	SET	INFO	1	[04/06/17 14:25:37.604]	[04/06/17 14:25:37.604]	[--/--/--]
		Link Down (2/2)							
CP2	01900001.53	0x00000009	DYNAMIC	SET	INFO	1	[04/06/17 14:41:06.941]	[04/06/17 14:41:06.941]	[--/--/--]
		SMLT 53 Link is DOWN							
CP2	01900001.54	0x00000009	DYNAMIC	SET	INFO	1	[04/06/17 14:41:06.941]	[04/06/17 14:41:06.941]	[--/--/--]
		SMLT 54 Link is DOWN							

Displaying log files

Use this procedure to display log files.

Procedure

Display log files:

```
show logging file
```

Example

Display log files:

```
Switch:1>show logging file
CP1 [02/05/15 12:35:28.690:UTC] 0x00270428 00000000 GlobalRouter SW INFO Lifecy
cle: Start
CP1 [02/05/15 12:35:29.906:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s sockserv started, pid:4950
CP1 [02/05/15 12:35:29.907:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s oom95 started, pid:4951
CP1 [02/05/15 12:35:29.907:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s oom90 started, pid:4952
CP1 [02/05/15 12:35:29.908:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s imgsinc.x started, pid:4953
CP1 [02/05/15 12:35:30.346:UTC] 0x0026452f 00000000 GlobalRouter SW INFO No pat
```

```

ch set.
CP1 [02/05/15 12:35:30.909:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s logServer started, pid:4996
CP1 [02/05/15 12:35:30.910:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s trcServer started, pid:4997
CP1 [02/05/15 12:35:30.910:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s oobServer started, pid:4998
CP1 [02/05/15 12:35:30.911:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s cbcp-main.x started, pid:4999
CP1 [02/05/15 12:35:30.912:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s rssServer started, pid:5000
CP1 [02/05/15 12:35:30.912:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s dbgServer started, pid:5001
CP1 [02/05/15 12:35:30.913:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s dbgShell started, pid:5002
CP1 [02/05/15 12:35:30.914:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s coreManager.x started, pid:5003
CP1 [02/05/15 12:35:30.914:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s ssio started, pid:5004
CP1 [02/05/15 12:35:30.915:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s hckServer started, pid:5005
CP1 [02/05/15 12:35:30.916:UTC] 0x0027042b 00000000 GlobalRouter SW INFO Proces
s remCmdAgent.x started, pid:5006
CP1 [02/05/15 12:35:32.910:UTC] 0x000006cc 00000000 GlobalRouter SW INFO rcStar
t: FIPS Power Up Self Test SUCCESSFUL - 0
CP1 [02/05/15 12:35:32.911:UTC] 0x000006c2 00000000 GlobalRouter SW INFO rcStar
t: Security Stack Init SUCCESSFUL - 0
CP1 [02/05/15 12:35:32.911:UTC] 0x000006c3 00000000 GlobalRouter SW INFO rcStar
t: IPSEC Init SUCCESSFUL
CP1 [02/05/15 12:35:32.911:UTC] 0x000006bf 00000000 GlobalRouter SW INFO rcStar
t: Security Stack Log init SUCCESSFUL - 0
CP1 [02/05/15 12:35:34.330:UTC] 0x000005c0 00000000 GlobalRouter SW INFO Licens
eLoad = ZERO, loading premier license for developer debugging
IO1 [02/05/15 12:35:35.177:UTC] 0x0011054a 00000000 GlobalRouter COP-SW INFO De
tected Master CP in slot 1

--More-- (q = quit)

```

Chapter 6: Next steps

For more information about documents on how to configure other switch features, see *Documentation Reference*.

For more information on new features of the switch, and important information about the latest release, see *Release Notes*.

For more information about how to configure security, see *Configuring Security*.

For the current documentation, see the Extreme Networks Support website: <http://www.extremenetworks.com/support>.

Glossary

command line interface (CLI)	A textual user interface. When you use CLI, you respond to a prompt by typing a command. After you enter the command, you receive a system response.
Data Terminating Equipment (DTE)	A computer or terminal on the network that is the source or destination of signals.
Enterprise Device Manager (EDM)	A web-based embedded management system to support single-element management. EDM provides complete configuration management functionality for the supported devices and is supplied to the customer as embedded software in the device.
File Transfer Protocol (FTP)	A protocol that governs transferring files between nodes, as documented in RFC 959. FTP is not secure and does not encrypt transferred data. Use FTP access only after you determine it is safe in your network.
Simple Network Management Protocol (SNMP)	SNMP administratively monitors network performance through agents and management stations.
Trivial File Transfer Protocol (TFTP)	A protocol that governs transferring files between nodes without protection against packet loss.