

# SecureStack B2

Stackable Switches

---

## Configuration Guide

Firmware Version 4.1.xx



## Notice

Enterasys Networks reserves the right to make changes in specifications and other information contained in this document and its web site without prior notice. The reader should in all cases consult Enterasys Networks to determine whether any such changes have been made.

The hardware, firmware, or software described in this document is subject to change without notice.

IN NO EVENT SHALL ENTERASYS NETWORKS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS DOCUMENT, WEB SITE, OR THE INFORMATION CONTAINED IN THEM, EVEN IF ENTERASYS NETWORKS HAS BEEN ADVISED OF, KNEW OF, OR SHOULD HAVE KNOWN OF, THE POSSIBILITY OF SUCH DAMAGES.

Enterasys Networks, Inc.  
50 Minuteman Road  
Andover, MA 01810

© 2008 Enterasys Networks, Inc. All rights reserved.

Part Number: 9034133-13 February 2008

ENTERASYS, ENTERASYS NETWORKS, ENTERASYS NETSIGHT, WEBVIEW, and any logos associated therewith, are trademarks or registered trademarks of Enterasys Networks, Inc. in the United States and other countries.

All other product names mentioned in this manual may be trademarks or registered trademarks of their respective companies.

**Documentation URL:** <http://www.enterasys.com/support/manuals>

**Documentacion URL:** <http://www.enterasys.com/support/manuals>

**Dokumentation im Internet:** <http://www.enterasys.com/support/manuals>

<b>Version:</b> Information in this guide refers to SecureStack B2 firmware version 4.1.xx
--

# ENTERASYS NETWORKS, INC. FIRMWARE LICENSE AGREEMENT

## BEFORE OPENING OR UTILIZING THE ENCLOSED PRODUCT, CAREFULLY READ THIS LICENSE AGREEMENT.

This document is an agreement ("Agreement") between the end user ("You") and Enterasys Networks, Inc., on behalf of itself and its Affiliates (as hereinafter defined) ("Enterasys") that sets forth Your rights and obligations with respect to the Enterasys software program/firmware (including any accompanying documentation, hardware or media) ("Program") in the package and prevails over any additional, conflicting or inconsistent terms and conditions appearing on any purchase order or other document submitted by You. "Affiliate" means any person, partnership, corporation, limited liability company, other form of enterprise that directly or indirectly through one or more intermediaries, controls, or is controlled by, or is under common control with the party specified. This Agreement constitutes the entire understanding between the parties, with respect to the subject matter of this Agreement. The Program may be contained in firmware, chips or other media.

BY INSTALLING OR OTHERWISE USING THE PROGRAM, YOU REPRESENT THAT YOU ARE AUTHORIZED TO ACCEPT THESE TERMS ON BEHALF OF THE END USER (IF THE END USER IS AN ENTITY ON WHOSE BEHALF YOU ARE AUTHORIZED TO ACT, "YOU" AND "YOUR" SHALL BE DEEMED TO REFER TO SUCH ENTITY) AND THAT YOU AGREE THAT YOU ARE BOUND BY THE TERMS OF THIS AGREEMENT, WHICH INCLUDES, AMONG OTHER PROVISIONS, THE LICENSE, THE DISCLAIMER OF WARRANTY AND THE LIMITATION OF LIABILITY. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT OR ARE NOT AUTHORIZED TO ENTER INTO THIS AGREEMENT, ENTERASYS IS UNWILLING TO LICENSE THE PROGRAM TO YOU AND YOU AGREE TO RETURN THE UNOPENED PRODUCT TO ENTERASYS OR YOUR DEALER, IF ANY, WITHIN TEN (10) DAYS FOLLOWING THE DATE OF RECEIPT FOR A FULL REFUND.

IF YOU HAVE ANY QUESTIONS ABOUT THIS AGREEMENT, CONTACT ENTERASYS NETWORKS, LEGAL DEPARTMENT AT (978) 684-1000.

### You and Enterasys agree as follows:

1. **LICENSE.** You have the non-exclusive and non-transferable right to use only the one (1) copy of the Program provided in this package subject to the terms and conditions of this Agreement.
2. **RESTRICTIONS.** Except as otherwise authorized in writing by Enterasys, You may not, nor may You permit any third party to:
  - (a) Reverse engineer, decompile, disassemble or modify the Program, in whole or in part, including for reasons of error correction or interoperability, except to the extent expressly permitted by applicable law and to the extent the parties shall not be permitted by that applicable law, such rights are expressly excluded. Information necessary to achieve interoperability or correct errors is available from Enterasys upon request and upon payment of Enterasys' applicable fee.
  - (b) Incorporate the Program in whole or in part, in any other product or create derivative works based on the Program, in whole or in part.
  - (c) Publish, disclose, copy reproduce or transmit the Program, in whole or in part.
  - (d) Assign, sell, license, sublicense, rent, lease, encumber by way of security interest, pledge or otherwise transfer the Program, in whole or in part.
  - (e) Remove any copyright, trademark, proprietary rights, disclaimer or warning notice included on or embedded in any part of the Program.
3. **APPLICABLE LAW.** This Agreement shall be interpreted and governed under the laws and in the state and federal courts of the Commonwealth of Massachusetts without regard to its conflicts of laws provisions. You accept the personal jurisdiction and venue of the Commonwealth of Massachusetts courts. None of the 1980 United Nations Convention on the Limitation Period in the International Sale of Goods, and the Uniform Computer Information Transactions Act shall apply to this Agreement.
4. **EXPORT RESTRICTIONS.** You understand that Enterasys and its Affiliates are subject to regulation by agencies of the U.S. Government, including the U.S. Department of Commerce, which prohibit export or diversion of certain technical products to certain countries, unless a license to export the product is obtained from the U.S. Government or an exception from obtaining such license may be relied upon by the exporting party.

If the Program is exported from the United States pursuant to the License Exception CIV under the U.S. Export Administration Regulations, You agree that You are a civil end user of the Program and agree that You will use the Program for civil end uses only and not for military purposes.

If the Program is exported from the United States pursuant to the License Exception TSR under the U.S. Export Administration Regulations, in addition to the restriction on transfer set forth in Section 1 or 2 of this Agreement, You agree not to (i) reexport or release the Program, the source code for the Program or technology to a national of a country in Country Groups D:1 or E:2 (Albania, Armenia, Azerbaijan, Belarus, Cambodia, Cuba, Georgia, Iraq, Kazakhstan, Laos, Libya, Macau,

Moldova, Mongolia, North Korea, the People's Republic of China, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam, or such other countries as may be designated by the United States Government), (ii) export to Country Groups D:1 or E:2 (as defined herein) the direct product of the Program or the technology, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List, or (iii) if the direct product of the technology is a complete plant or any major component of a plant, export to Country Groups D:1 or E:2 the direct product of the plant or a major component thereof, if such foreign produced direct product is subject to national security controls as identified on the U.S. Commerce Control List or is subject to State Department controls under the U.S. Munitions List.

**5. UNITED STATES GOVERNMENT RESTRICTED RIGHTS.** The enclosed Program (i) was developed solely at private expense; (ii) contains "restricted computer software" submitted with restricted rights in accordance with section 52.227-19 (a) through (d) of the Commercial Computer Software-Restricted Rights Clause and its successors, and (iii) in all respects is proprietary data belonging to Enterasys and/or its suppliers. For Department of Defense units, the Program is considered commercial computer software in accordance with DFARS section 227.7202-3 and its successors, and use, duplication, or disclosure by the U.S. Government is subject to restrictions set forth herein.

**6. DISCLAIMER OF WARRANTY.** EXCEPT FOR THOSE WARRANTIES EXPRESSLY PROVIDED TO YOU IN WRITING BY ENTERASYS, ENTERASYS DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT WITH RESPECT TO THE PROGRAM. IF IMPLIED WARRANTIES MAY NOT BE DISCLAIMED BY APPLICABLE LAW, THEN ANY IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THIRTY (30) DAYS AFTER DELIVERY OF THE PROGRAM TO YOU.

**7. LIMITATION OF LIABILITY.** IN NO EVENT SHALL ENTERASYS OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS, PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR RELIANCE DAMAGES, OR OTHER LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM, EVEN IF ENTERASYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS FOREGOING LIMITATION SHALL APPLY REGARDLESS OF THE CAUSE OF ACTION UNDER WHICH DAMAGES ARE SOUGHT.

THE CUMULATIVE LIABILITY OF ENTERASYS TO YOU FOR ALL CLAIMS RELATING TO THE PROGRAM, IN CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED THE TOTAL AMOUNT OF FEES PAID TO ENTERASYS BY YOU FOR THE RIGHTS GRANTED HEREIN.

**8. AUDIT RIGHTS.** You hereby acknowledge that the intellectual property rights associated with the Program are of critical value to Enterasys, and, accordingly, You hereby agree to maintain complete books, records and accounts showing (i) license fees due and paid, and (ii) the use, copying and deployment of the Program. You also grant to Enterasys and its authorized representatives, upon reasonable notice, the right to audit and examine during Your normal business hours, Your books, records, accounts and hardware devices upon which the Program may be deployed to verify compliance with this Agreement, including the verification of the license fees due and paid Enterasys and the use, copying and deployment of the Program. Enterasys' right of examination shall be exercised reasonably, in good faith and in a manner calculated to not unreasonably interfere with Your business. In the event such audit discovers non-compliance with this Agreement, including copies of the Program made, used or deployed in breach of this Agreement, You shall promptly pay to Enterasys the appropriate license fees. Enterasys reserves the right, to be exercised in its sole discretion and without prior notice, to terminate this license, effective immediately, for failure to comply with this Agreement. Upon any such termination, You shall immediately cease all use of the Program and shall return to Enterasys the Program and all copies of the Program.

**9. OWNERSHIP.** This is a license agreement and not an agreement for sale. You acknowledge and agree that the Program constitutes trade secrets and/or copyrighted material of Enterasys and/or its suppliers. You agree to implement reasonable security measures to protect such trade secrets and copyrighted material. All right, title and interest in and to the Program shall remain with Enterasys and/or its suppliers. All rights not specifically granted to You shall be reserved to Enterasys.

**10. ENFORCEMENT.** You acknowledge and agree that any breach of Sections 2, 4, or 9 of this Agreement by You may cause Enterasys irreparable damage for which recovery of money damages would be inadequate, and that Enterasys may be entitled to seek timely injunctive relief to protect Enterasys' rights under this Agreement in addition to any and all remedies available at law.

**11. ASSIGNMENT.** You may not assign, transfer or sublicense this Agreement or any of Your rights or obligations under this Agreement, except that You may assign this Agreement to any person or entity which acquires substantially all of Your stock assets. Enterasys may assign this Agreement in its sole discretion. This Agreement shall be binding upon and inure to the benefit of the parties, their legal representatives, permitted transferees, successors and assigns as permitted by this Agreement. Any attempted assignment, transfer or sublicense in violation of the terms of this Agreement shall be void and a breach of this Agreement.

**12. WAIVER.** A waiver by Enterasys of a breach of any of the terms and conditions of this Agreement must be in writing and will not be construed as a waiver of any subsequent breach of such term or condition. Enterasys' failure to enforce a term upon Your breach of such term shall not be construed as a waiver of Your breach or prevent enforcement on any other occasion.

**13. SEVERABILITY.** In the event any provision of this Agreement is found to be invalid, illegal or unenforceable, the validity, legality and enforceability of any of the remaining provisions shall not in any way be affected or impaired thereby, and that provision shall be reformed, construed and enforced to the maximum extent permissible. Any such invalidity, illegality, or unenforceability in any jurisdiction shall not invalidate or render illegal or unenforceable such provision in any other jurisdiction.

**14. TERMINATION.** Enterasys may terminate this Agreement immediately upon Your breach of any of the terms and conditions of this Agreement. Upon any such termination, You shall immediately cease all use of the Program and shall return to Enterasys the Program and all copies of the Program.

---

# Contents

## About This Guide

Using This Guide .....	xix
Structure of This Guide .....	xix
Related Documents .....	xx
Conventions Used in This Guide .....	xxi
Getting Help .....	xxi

## Chapter 1: Introduction

SecureStack B2 CLI Overview .....	1-1
Switch Management Methods .....	1-1
Factory Default Settings .....	1-2
Using the Command Line Interface .....	1-5
Starting a CLI Session .....	1-5
Logging In .....	1-6
Navigating the Command Line Interface .....	1-6

## Chapter 2: Configuring Switches in a Stack

About SecureStack B2 Switch Operation in a Stack .....	2-1
Installing a New Stackable System of Up to Eight Units .....	2-2
Installing Previously-Configured Systems in a Stack .....	2-3
Adding a New Unit to an Existing Stack .....	2-3
Creating a Virtual Switch Configuration .....	2-4
Considerations About Using Clear Config in a Stack .....	2-5
Issues Related to Mixed Type Stacks .....	2-5
Feature Support .....	2-5
Configuration .....	2-5
Stacking Configuration and Management Commands .....	2-6
Purpose .....	2-6
Commands .....	2-6
show switch .....	2-6
show switch switchtype .....	2-7
show switch stack-ports.....	2-8
set switch.....	2-9
set switch copy-fw .....	2-9
set switch description .....	2-10
set switch movemanagement.....	2-11
set switch member.....	2-11
clear switch member.....	2-12

## Chapter 3: Basic Configuration

Setting User Accounts and Passwords .....	3-1
Purpose .....	3-1
Commands .....	3-1
show system login .....	3-2
set system login.....	3-3
clear system login.....	3-3
set password .....	3-4
set system password length .....	3-5
set system password aging .....	3-5
set system password history .....	3-6
show system lockout .....	3-6

set system lockout .....	3-7
Setting Basic Switch Properties .....	3-8
Purpose .....	3-8
Commands .....	3-8
show ip address .....	3-9
set ip address .....	3-9
clear ip address .....	3-10
show ip protocol .....	3-10
set ip protocol .....	3-11
show system .....	3-11
show system hardware .....	3-12
show system utilization .....	3-13
set system enhancedbuffermode .....	3-14
show time .....	3-15
set time .....	3-15
show summertime .....	3-16
set summertime .....	3-16
set summertime date .....	3-17
set summertime recurring .....	3-17
clear summertime .....	3-18
set prompt .....	3-19
show banner motd .....	3-19
set banner motd .....	3-20
clear banner motd .....	3-20
show version .....	3-21
set system name .....	3-22
set system location .....	3-22
set system contact .....	3-23
set width .....	3-23
set length .....	3-24
show logout .....	3-24
set logout .....	3-25
show console .....	3-25
set console baud .....	3-26
Activating Licensed Features .....	3-26
License Key Field Descriptions .....	3-26
Licensing Procedure in a Stack Environment .....	3-27
Adding a New Member to a Licensed Stack .....	3-27
Clearing, Showing, and Moving Licenses .....	3-28
Commands .....	3-28
set license .....	3-28
show license .....	3-29
clear license .....	3-30
Configuring Power over Ethernet (PoE) .....	3-31
Purpose .....	3-31
Commands .....	3-31
show inlinepower .....	3-31
set inlinepower threshold .....	3-32
set inlinepower trap .....	3-32
show port inlinepower .....	3-33
set port inlinepower .....	3-33
Downloading a New Firmware Image .....	3-34
Downloading from a TFTP Server .....	3-34
Downloading via the Serial Port .....	3-35
Reviewing and Selecting a Boot Firmware Image .....	3-36
Purpose .....	3-36



Commands .....	3-37
show boot system .....	3-37
set boot system .....	3-37
Starting and Configuring Telnet .....	3-38
Purpose .....	3-38
Commands .....	3-38
show telnet .....	3-38
set telnet .....	3-38
telnet .....	3-39
Managing Switch Configuration and Files .....	3-40
Configuration Persistence Mode .....	3-40
Purpose .....	3-40
Commands .....	3-40
show snmp persistmode .....	3-41
set snmp persistmode .....	3-41
save config .....	3-42
dir .....	3-42
show file .....	3-43
show config .....	3-44
configure .....	3-45
copy .....	3-45
delete .....	3-46
show tftp settings .....	3-46
set tftp timeout .....	3-47
clear tftp timeout .....	3-48
set tftp retry .....	3-48
clear tftp retry .....	3-49
Clearing and Closing the CLI .....	3-49
Purpose .....	3-49
Commands .....	3-49
cls (clear screen) .....	3-49
exit .....	3-50
Resetting the Switch .....	3-50
Purpose .....	3-50
Commands .....	3-50
reset .....	3-51
clear config .....	3-51
Using and Configuring WebView .....	3-52
Purpose .....	3-52
Commands .....	3-53
show webview .....	3-53
set webview .....	3-53
show ssl .....	3-54
set ssl .....	3-54

## Chapter 4: Discovery Protocol Configuration

Configuring CDP .....	4-1
Purpose .....	4-1
Commands .....	4-1
show cdp .....	4-1
set cdp state .....	4-3
set cdp auth .....	4-3
set cdp interval .....	4-4
set cdp hold-time .....	4-5
clear cdp .....	4-5

show neighbors .....	4-6
Configuring Cisco Discovery Protocol .....	4-6
Purpose .....	4-6
Commands .....	4-7
show ciscodp .....	4-7
show ciscodp port info .....	4-8
set ciscodp status .....	4-9
set ciscodp timer .....	4-9
set ciscodp holdtime .....	4-10
set ciscodp port .....	4-10
clear ciscodp .....	4-12
Configuring Link Layer Discovery Protocol and LLDP-MED .....	4-13
Overview .....	4-13
Purpose .....	4-13
Commands .....	4-13
Configuration Tasks .....	4-15
show lldp .....	4-15
show lldp port status .....	4-16
show lldp port trap .....	4-16
show lldp port tx-tlv .....	4-17
show lldp port location-info .....	4-17
show lldp port local-info .....	4-18
show lldp port remote-info .....	4-20
set lldp tx-interval .....	4-22
set lldp hold-multiplier .....	4-22
set lldp trap-interval .....	4-23
set lldp med-fast-repeat .....	4-24
set lldp port status .....	4-24
set lldp port trap .....	4-25
set lldp port med-trap .....	4-25
set lldp port location-info .....	4-26
set lldp port tx-tlv .....	4-26
clear lldp .....	4-28
clear lldp port status .....	4-29
clear lldp port trap .....	4-29
clear lldp port med-trap .....	4-29
clear lldp port location-info .....	4-30
clear lldp port tx-tlv .....	4-30

## Chapter 5: Port Configuration

Port Configuration Summary .....	5-1
B2H124-48 and B2H124-48P Switch Ports .....	5-1
B2G124-24, B2G124-48, and B2G124-48P Switch Ports .....	5-1
Port String Syntax Used in the CLI .....	5-2
Reviewing Port Status .....	5-3
Purpose .....	5-3
Commands .....	5-3
show port .....	5-3
show port status .....	5-4
show port counters .....	5-5
Disabling / Enabling and Naming Ports .....	5-6
Purpose .....	5-6
Commands .....	5-6
set port disable .....	5-6
set port enable .....	5-7

show port alias .....	5-7
set port alias .....	5-8
Setting Speed and Duplex Mode .....	5-9
Purpose .....	5-9
Commands .....	5-9
show port speed .....	5-9
set port speed .....	5-10
show port duplex .....	5-10
set port duplex .....	5-11
Enabling / Disabling Jumbo Frame Support .....	5-11
Purpose .....	5-11
Commands .....	5-11
show port jumbo .....	5-11
set port jumbo .....	5-12
clear port jumbo .....	5-13
Setting Auto-Negotiation and Advertised Ability .....	5-13
Purpose .....	5-13
Commands .....	5-13
show port negotiation .....	5-14
set port negotiation .....	5-14
show port advertise .....	5-15
set port advertise .....	5-16
clear port advertise .....	5-16
Setting Flow Control .....	5-17
Purpose .....	5-17
Commands .....	5-17
show flowcontrol .....	5-17
set flowcontrol .....	5-18
Setting Port Link Traps and Link Flap Detection .....	5-18
Purpose .....	5-18
Commands .....	5-19
show port trap .....	5-19
set port trap .....	5-20
show linkflap .....	5-20
set linkflap globalstate .....	5-22
set linkflap portstate .....	5-23
set linkflap interval .....	5-23
set linkflap action .....	5-24
clear linkflap action .....	5-25
set linkflap threshold .....	5-25
set linkflap downtime .....	5-26
clear linkflap down .....	5-26
clear linkflap .....	5-27
Configuring Broadcast Suppression .....	5-27
Purpose .....	5-27
Commands .....	5-27
show port broadcast .....	5-28
set port broadcast .....	5-28
clear port broadcast .....	5-29
Port Mirroring .....	5-29
Mirroring Features .....	5-29
Purpose .....	5-30
Commands .....	5-30
show port mirroring .....	5-30
set port mirroring .....	5-31
clear port mirroring .....	5-31

Link Aggregation Control Protocol (LACP) .....	5-32
LACP Operation .....	5-32
LACP Terminology .....	5-33
SecureStack B2 Usage Considerations .....	5-34
Commands .....	5-34
show lacp.....	5-35
set lacp .....	5-36
set lacp asyspri.....	5-37
set lacp aadminkey .....	5-37
clear lacp .....	5-38
set lacp static.....	5-38
clear lacp static.....	5-39
set lacp singleportlag.....	5-40
clear lacp singleportlag.....	5-40
show port lacp .....	5-41
set port lacp .....	5-42
clear port lacp .....	5-44
Configuring Protected Ports .....	5-45
Protected Port Operation .....	5-45
Commands .....	5-45
set port protected.....	5-46
show port protected.....	5-46
clear port protected.....	5-47
set port protected name.....	5-47
show port protected name .....	5-48
clear port protected name.....	5-48

## Chapter 6: SNMP Configuration

SNMP Configuration Summary .....	6-1
SNMPv1 and SNMPv2c .....	6-1
SNMPv3 .....	6-2
About SNMP Security Models and Levels .....	6-2
Using SNMP Contexts to Access Specific MIBs .....	6-3
Configuration Considerations .....	6-3
Reviewing SNMP Statistics .....	6-3
Purpose .....	6-3
Commands .....	6-4
show snmp engineid.....	6-4
show snmp counters.....	6-5
Configuring SNMP Users, Groups, and Communities .....	6-7
Purpose .....	6-7
Commands .....	6-8
show snmp user .....	6-8
set snmp user .....	6-9
clear snmp user .....	6-10
show snmp group .....	6-10
set snmp group.....	6-12
clear snmp group.....	6-12
show snmp community .....	6-13
set snmp community.....	6-13
clear snmp community.....	6-14
Configuring SNMP Access Rights .....	6-15
Purpose .....	6-15
Commands .....	6-15
show snmp access .....	6-15

set snmp access .....	6-17
clear snmp access .....	6-18
Configuring SNMP MIB Views .....	6-18
Purpose .....	6-18
Commands .....	6-18
show snmp view .....	6-19
show snmp context .....	6-20
set snmp view .....	6-20
clear snmp view .....	6-21
Configuring SNMP Target Parameters .....	6-22
Purpose .....	6-22
Commands .....	6-22
show snmp targetparams .....	6-22
set snmp targetparams .....	6-23
clear snmp targetparams .....	6-24
Configuring SNMP Target Addresses .....	6-25
Purpose .....	6-25
Commands .....	6-25
show snmp targetaddr .....	6-25
set snmp targetaddr .....	6-26
clear snmp targetaddr .....	6-27
Configuring SNMP Notification Parameters .....	6-28
About SNMP Notify Filters .....	6-28
Purpose .....	6-28
Commands .....	6-28
show newaddrtrap .....	6-28
set newaddrtrap .....	6-29
show snmp notify .....	6-30
set snmp notify .....	6-31
clear snmp notify .....	6-32
show snmp notifyfilter .....	6-32
set snmp notifyfilter .....	6-33
clear snmp notifyfilter .....	6-34
show snmp notifyprofile .....	6-34
set snmp notifyprofile .....	6-35
clear snmp notifyprofile .....	6-35
Creating a Basic SNMP Trap Configuration .....	6-36
Example .....	6-37

## Chapter 7: Spanning Tree Configuration

Spanning Tree Configuration Summary .....	7-1
Overview: Single, Rapid, and Multiple Spanning Tree Protocols .....	7-1
Spanning Tree Features .....	7-2
Loop Protect .....	7-2
Configuring Spanning Tree Bridge Parameters .....	7-3
Purpose .....	7-3
Commands .....	7-4
show spantree stats .....	7-5
set spantree .....	7-7
show spantree version .....	7-7
set spantree version .....	7-8
clear spantree version .....	7-8
show spantree bpdu-forwarding .....	7-9
set spantree bpdu-forwarding .....	7-9
show spantree bridgeprioritymode .....	7-10

set spantree bridgeprioritymode .....	7-10
clear spantree bridgeprioritymode .....	7-11
show spantree mstlist .....	7-12
set spantree msti .....	7-12
clear spantree msti .....	7-13
show spantree mstmap .....	7-13
set spantree mstmap .....	7-14
clear spantree mstmap .....	7-14
show spantree vlanlist .....	7-15
show spantree mstcfgid .....	7-15
set spantree mstcfgid .....	7-16
clear spantree mstcfgid .....	7-16
set spantree priority .....	7-17
clear spantree priority .....	7-17
set spantree hello .....	7-18
clear spantree hello .....	7-18
set spantree maxage .....	7-19
clear spantree maxage .....	7-19
set spantree fwddelay .....	7-20
clear spantree fwddelay .....	7-20
show spantree backuproot .....	7-21
set spantree backuproot .....	7-21
clear spantree backuproot .....	7-22
show spantree tctrapsuppress .....	7-22
set spantree tctrapsuppress .....	7-23
clear spantree tctrapsuppress .....	7-23
set spantree protomigration .....	7-24
show spantree spanguard .....	7-24
set spantree spanguard .....	7-25
clear spantree spanguard .....	7-26
show spantree spanguardtimeout .....	7-26
set spantree spanguardtimeout .....	7-26
clear spantree spanguardtimeout .....	7-27
show spantree spanguardlock .....	7-27
clear / set spantree spanguardlock .....	7-28
show spantree spanguardtrapenable .....	7-28
set spantree spanguardtrapenable .....	7-29
clear spantree spanguardtrapenable .....	7-29
show spantree legacypathcost .....	7-30
set spantree legacypathcost .....	7-30
clear spantree legacypathcost .....	7-31
Configuring Spanning Tree Port Parameters .....	7-31
Purpose .....	7-31
Commands .....	7-32
set spantree portadmin .....	7-32
clear spantree portadmin .....	7-32
show spantree portadmin .....	7-33
show spantree portpri .....	7-33
set spantree portpri .....	7-34
clear spantree portpri .....	7-35
show spantree adminpathcost .....	7-35
set spantree adminpathcost .....	7-36
clear spantree adminpathcost .....	7-36
show spantree adminedge .....	7-37
set spantree adminedge .....	7-37
clear spantree adminedge .....	7-38

Configuring Spanning Tree Loop Protect Parameters .....	7-39
Purpose .....	7-39
Commands .....	7-39
set spantree lp .....	7-40
show spantree lp .....	7-40
clear spantree lp .....	7-41
show spantree lblock .....	7-42
clear spantree lblock .....	7-42
set spantree lpcapablepartner .....	7-43
show spantree lpcapablepartner .....	7-44
clear spantree lpcapablepartner .....	7-44
set spantree lpthreshold .....	7-45
show spantree lpthreshold .....	7-45
clear spantree lpthreshold .....	7-46
set spantree lpwindow .....	7-46
show spantree lpwindow .....	7-47
clear spantree lpwindow .....	7-47
set spantree lptrapenable .....	7-48
show spantree lptrapenable .....	7-48
clear spantree lptrapenable .....	7-49
set spantree disputedbpduthreshold .....	7-49
show spantree disputedbpduthreshold .....	7-50
clear spantree disputedbpduthreshold .....	7-50
show spantree nonforwardingreason .....	7-51

## Chapter 8: 802.1Q VLAN Configuration

VLAN Configuration Summary .....	8-1
Port String Syntax Used in the CLI .....	8-1
Creating a Secure Management VLAN .....	8-1
Viewing VLANs .....	8-2
Purpose .....	8-2
Command .....	8-3
show vlan .....	8-3
Creating and Naming Static VLANs .....	8-4
Purpose .....	8-4
Commands .....	8-4
set vlan .....	8-4
set vlan name .....	8-5
clear vlan .....	8-5
clear vlan name .....	8-6
Assigning Port VLAN IDs (PVIDs) and Ingress Filtering .....	8-6
Purpose .....	8-6
Commands .....	8-7
show port vlan .....	8-7
set port vlan .....	8-7
clear port vlan .....	8-8
show port ingress filter .....	8-9
set port ingress filter .....	8-9
show port discard .....	8-10
set port discard .....	8-11
Configuring the VLAN Egress List .....	8-12
Purpose .....	8-12
Commands .....	8-12
show port egress .....	8-12
set vlan forbidden .....	8-13

set vlan egress .....	8-13
clear vlan egress .....	8-14
show vlan dynamic egress .....	8-15
set vlan dynamic egress .....	8-16
Setting the Host VLAN .....	8-16
Purpose .....	8-16
Commands .....	8-17
show host vlan .....	8-17
set host vlan .....	8-17
clear host vlan .....	8-18
Enabling/Disabling GVRP (GARP VLAN Registration Protocol) .....	8-18
About GARP VLAN Registration Protocol (GVRP) .....	8-18
Purpose .....	8-20
Commands .....	8-20
show gvrp .....	8-20
show garp timer .....	8-21
set gvrp .....	8-22
clear gvrp .....	8-22
set garp timer .....	8-23

## Chapter 9: Differentiated Services Configuration

Globally Enabling or Disabling Diffserv .....	9-1
Purpose .....	9-1
Command .....	9-1
set diffserv adminmode .....	9-2
Creating Diffserv Classes and Matching Conditions .....	9-2
Purpose .....	9-2
Commands .....	9-2
show diffserv info .....	9-2
show diffserv class .....	9-3
set class create .....	9-4
set diffserv class delete .....	9-4
set diffserv class match .....	9-5
set diffserv class rename .....	9-8
Configuring Diffserv Policies and Assigning Classes .....	9-9
Purpose .....	9-9
Commands .....	9-9
show diffserv policy .....	9-9
set diffserv policy create .....	9-10
set diffserv policy delete .....	9-10
set diffserv policy class .....	9-11
set diffserv policy mark .....	9-11
set diffserv policy police style simple .....	9-12
set diffserv policy police action conform .....	9-13
set diffserv policy police action nonconform .....	9-13
set diffserv policy rename .....	9-14
Assigning Policies to Service Ports .....	9-15
Purpose .....	9-15
Commands .....	9-15
show diffserv service info .....	9-15
show diffserv service stats .....	9-16
set diffserv service .....	9-16



DiffServ Configuration Examples .....	9-17
---------------------------------------	------

## Chapter 10: Policy Classification Configuration

Policy Classification Configuration Summary .....	10-1
Configuring Policy Profiles .....	10-1
Purpose .....	10-1
Commands .....	10-2
show policy profile .....	10-2
set policy profile .....	10-3
clear policy profile .....	10-5
Configuring Classification Rules .....	10-5
Purpose .....	10-5
Commands .....	10-5
show policy rule .....	10-6
show policy capability .....	10-8
set policy rule .....	10-9
clear policy rule .....	10-12
clear policy all-rules .....	10-13
Assigning Ports to Policy Profiles .....	10-14
Purpose .....	10-14
Commands .....	10-14
set policy port .....	10-14
clear policy port .....	10-15
Configuring Policy Class of Service (CoS) .....	10-15
Using Port-Based or Policy-Based CoS Settings .....	10-15
About Policy-Based CoS Configurations .....	10-16
Commands .....	10-18
set cos state .....	10-18
show cos state .....	10-19
clear cos state .....	10-19
set cos settings .....	10-20
clear cos settings .....	10-21
show cos settings .....	10-21
set cos port-config .....	10-22
show cos port-config .....	10-23
clear cos port-config .....	10-24
set cos port-resource .....	10-25
show cos port-resource .....	10-26
clear cos port-resource .....	10-26
set cos reference .....	10-27
show cos reference .....	10-28
clear cos reference .....	10-29
show cos unit .....	10-30
clear cos all-entries .....	10-30
show cos port-type .....	10-31

## Chapter 11: Port Priority and Rate Limiting Configuration

Port Priority Configuration Summary .....	11-1
Configuring Port Priority .....	11-1
Purpose .....	11-1
Commands .....	11-2
show port priority .....	11-2
set port priority .....	11-2
clear port priority .....	11-3

Configuring Priority to Transmit Queue Mapping .....	11-4
Purpose .....	11-4
Commands .....	11-4
show port priority-queue .....	11-4
set port priority-queue .....	11-5
clear port priority-queue .....	11-6
Configuring Quality of Service (QoS) .....	11-6
Purpose .....	11-6
Commands .....	11-6
show port txq .....	11-7
set port txq .....	11-7
clear port txq .....	11-8
Configuring Port Traffic Rate Limiting .....	11-9
Purpose .....	11-9
Commands .....	11-10
show port ratelimit .....	11-10
set port ratelimit .....	11-11
clear port ratelimit .....	11-12

## Chapter 12: IGMP Configuration

IGMP Overview .....	12-1
About IP Multicast Group Management .....	12-1
About Multicasting .....	12-1
Configuring IGMP at Layer 2 .....	12-2
Purpose .....	12-2
Commands .....	12-2
show igmpsnooping .....	12-2
set igmpsnooping adminmode .....	12-3
set igmpsnooping interfacemode .....	12-3
set igmpsnooping groupmembershipinterval .....	12-4
set igmpsnooping maxresponse .....	12-5
set igmpsnooping mcrtrexpiretime .....	12-5
set igmpsnooping add-static .....	12-6
set igmpsnooping remove-static .....	12-7
show igmpsnooping static .....	12-7
show igmpsnooping mfdb .....	12-8
clear igmpsnooping .....	12-8

## Chapter 13: Logging and Network Management

Configuring System Logging .....	13-1
Purpose .....	13-1
Commands .....	13-1
show logging server .....	13-2
set logging server .....	13-3
clear logging server .....	13-4
show logging default .....	13-4
set logging default .....	13-5
clear logging default .....	13-5
show logging application .....	13-6
set logging application .....	13-7
clear logging application .....	13-8
show logging local .....	13-9
set logging local .....	13-9
clear logging local .....	13-10
show logging buffer .....	13-10

Monitoring Network Events and Status .....	13-11
Purpose .....	13-11
Commands .....	13-11
history .....	13-11
show history .....	13-12
set history .....	13-12
ping .....	13-13
show users .....	13-13
disconnect .....	13-14
Managing Switch Network Addresses and Routes .....	13-15
Purpose .....	13-15
Commands .....	13-15
show arp .....	13-15
set arp .....	13-16
clear arp .....	13-17
tracert .....	13-17
show mac .....	13-18
show mac agetime .....	13-19
set mac agetime .....	13-20
clear mac agetime .....	13-20
set mac algorithm .....	13-21
show mac algorithm .....	13-21
clear mac algorithm .....	13-22
set mac multicast .....	13-22
clear mac address .....	13-23
show mac unreserved-flood .....	13-24
set mac unreserved-flood .....	13-24
Configuring Simple Network Time Protocol (SNTP) .....	13-25
Purpose .....	13-25
Commands .....	13-25
show snmp .....	13-25
set snmp client .....	13-27
clear snmp client .....	13-27
set snmp server .....	13-28
clear snmp server .....	13-28
set snmp poll-interval .....	13-29
clear snmp poll-interval .....	13-29
set snmp poll-retry .....	13-30
clear snmp poll-retry .....	13-30
set snmp poll-timeout .....	13-31
clear snmp poll-timeout .....	13-31
Configuring Node Aliases .....	13-32
Purpose .....	13-32
Commands .....	13-32
show nodealias config .....	13-32
set nodealias .....	13-33
clear nodealias config .....	13-34

## Chapter 14: RMON Configuration

RMON Monitoring Group Functions .....	14-1
Statistics Group Commands .....	14-3
Purpose .....	14-3
Commands .....	14-3
show rmon stats .....	14-3
set rmon stats .....	14-5

clear rmon stats .....	14-6
History Group Commands .....	14-6
Purpose .....	14-6
Commands .....	14-6
show rmon history .....	14-7
set rmon history .....	14-7
clear rmon history .....	14-8
Alarm Group Commands .....	14-9
Purpose .....	14-9
Commands .....	14-9
show rmon alarm .....	14-9
set rmon alarm properties .....	14-10
set rmon alarm status .....	14-11
clear rmon alarm .....	14-12
Event Group Commands .....	14-13
Purpose .....	14-13
Commands .....	14-13
show rmon event .....	14-13
set rmon event properties .....	14-14
set rmon event status .....	14-15
clear rmon event .....	14-15
Filter Group Commands .....	14-16
Commands .....	14-16
show rmon channel .....	14-16
set rmon channel .....	14-17
clear rmon channel .....	14-18
show rmon filter .....	14-18
set rmon filter .....	14-19
clear rmon filter .....	14-20
Packet Capture Commands .....	14-20
Purpose .....	14-20
Commands .....	14-21
show rmon capture .....	14-21
set rmon capture .....	14-22
clear rmon capture .....	14-22

## Chapter 15: DHCP Server Configuration

DHCP Overview .....	15-1
DHCP Server .....	15-1
Configuring a DHCP Server .....	15-2
Configuring General DHCP Server Parameters .....	15-3
Purpose .....	15-3
Commands .....	15-3
set dhcp .....	15-3
set dhcp bootp .....	15-4
set dhcp conflict logging .....	15-4
show dhcp conflict .....	15-5
clear dhcp conflict .....	15-5
set dhcp exclude .....	15-6
clear dhcp exclude .....	15-6
set dhcp ping .....	15-7
clear dhcp ping .....	15-7
show dhcp binding .....	15-8
clear dhcp binding .....	15-9
show dhcp server statistics .....	15-9
clear dhcp server statistics .....	15-10

Configuring IP Address Pools .....	15-10
Manual Pool Configuration Considerations .....	15-10
Purpose .....	15-11
Commands .....	15-11
set dhcp pool .....	15-12
clear dhcp pool .....	15-12
set dhcp pool network.....	15-13
clear dhcp pool network.....	15-14
set dhcp pool hardware-address .....	15-14
clear dhcp pool hardware-address .....	15-15
set dhcp pool host .....	15-15
clear dhcp pool host .....	15-16
set dhcp pool client-identifier .....	15-16
clear dhcp pool client-identifier .....	15-17
set dhcp pool client-name.....	15-18
clear dhcp pool client-name.....	15-18
set dhcp pool bootfile.....	15-19
clear dhcp pool bootfile.....	15-19
set dhcp pool next-server .....	15-20
clear dhcp pool next-server .....	15-20
set dhcp pool lease.....	15-21
clear dhcp pool lease.....	15-21
set dhcp pool default-router .....	15-22
clear dhcp pool default-router .....	15-22
set dhcp pool dns-server .....	15-23
clear dhcp pool dns-server .....	15-23
set dhcp pool domain-name .....	15-24
clear dhcp pool domain-name .....	15-24
set dhcp pool netbios-name-server .....	15-25
clear dhcp pool netbios-name-server .....	15-25
set dhcp pool netbios-node-type .....	15-26
clear dhcp pool netbios-node-type .....	15-26
set dhcp pool option .....	15-27
clear dhcp pool option .....	15-28
show dhcp pool configuration .....	15-28

## Chapter 16: Security Configuration

Overview of Security Methods .....	16-1
RADIUS Filter-ID Attribute and Dynamic Policy Profile Assignment .....	16-2
Configuring RADIUS .....	16-3
Purpose .....	16-3
Commands .....	16-3
show radius .....	16-4
set radius .....	16-5
clear radius .....	16-7
show radius accounting .....	16-7
set radius accounting.....	16-8
clear radius accounting.....	16-9
Configuring 802.1X Authentication .....	16-9
Purpose .....	16-9
Commands .....	16-10
show dot1x .....	16-10
show dot1x auth-config.....	16-11
set dot1x .....	16-13
set dot1x auth-config .....	16-13
clear dot1x auth-config .....	16-15
show eapol .....	16-15

set eapol .....	16-17
clear eapol .....	16-18
Configuring MAC Authentication .....	16-19
Purpose .....	16-19
Commands .....	16-19
show macauthentication .....	16-20
show macauthentication session .....	16-21
set macauthentication .....	16-22
set macauthentication password .....	16-22
clear macauthentication password .....	16-23
set macauthentication port .....	16-23
set macauthentication portinitialize .....	16-24
set macauthentication portquietperiod .....	16-25
clear macauthentication portquietperiod .....	16-25
set macauthentication macinitialize .....	16-26
set macauthentication reauthentication .....	16-26
set macauthentication portreauthenticate .....	16-27
set macauthentication macreauthenticate .....	16-27
set macauthentication reauthperiod .....	16-28
clear macauthentication reauthperiod .....	16-28
set macauthentication significant-bits .....	16-29
clear macauthentication significant-bits .....	16-29
Configuring Multiple Authentication Methods .....	16-30
About Multiple Authentication Types .....	16-30
Configuring Multi-User Authentication (User + IP phone) .....	16-30
Commands .....	16-31
show multiauth .....	16-31
set multiauth mode .....	16-32
clear multiauth mode .....	16-32
set multiauth precedence .....	16-33
clear multiauth precedence .....	16-34
show multiauth port .....	16-34
set multiauth port .....	16-35
clear multiauth port .....	16-35
show multiauth station .....	16-36
show multiauth session .....	16-36
show multiauth idle-timeout .....	16-37
set multiauth idle-timeout .....	16-38
clear multiauth idle-timeout .....	16-39
show multiauth session-timeout .....	16-39
set multiauth session-timeout .....	16-40
clear multiauth session-timeout .....	16-41
Configuring VLAN Authorization (RFC 3580) .....	16-41
Purpose .....	16-41
Commands .....	16-42
show policy mactable response .....	16-42
set policy mactable response .....	16-42
set vlanauthorization .....	16-43
set vlanauthorization egress .....	16-44
clear vlanauthorization .....	16-44
show vlanauthorization .....	16-45
Configuring MAC Locking .....	16-46
Purpose .....	16-46
Commands .....	16-46
show maclock .....	16-47
show maclock stations .....	16-48

set maclock enable .....	16-49
set maclock disable .....	16-50
set maclock .....	16-50
clear maclock .....	16-51
set maclock static .....	16-52
clear maclock static .....	16-52
set maclock firstarrival .....	16-53
clear maclock firstarrival .....	16-54
set maclock agefirstarrival .....	16-54
clear maclock agefirstarrival .....	16-55
set maclock move .....	16-55
set maclock trap .....	16-56
Configuring Port Web Authentication (PWA) .....	16-57
About PWA .....	16-57
Purpose .....	16-57
Commands .....	16-57
show pwa .....	16-58
set pwa .....	16-59
show pwa banner .....	16-60
set pwa banner .....	16-60
clear pwa banner .....	16-61
set pwa displaylogo .....	16-61
set pwa ipaddress .....	16-62
set pwa protocol .....	16-62
set pwa guestname .....	16-63
clear pwa guestname .....	16-63
set pwa guestpassword .....	16-64
set pwa gueststatus .....	16-64
set pwa initialize .....	16-65
set pwa quietperiod .....	16-66
set pwa maxrequest .....	16-66
set pwa portcontrol .....	16-67
show pwa session .....	16-67
set pwa enhancedmode .....	16-68
Configuring Secure Shell (SSH) .....	16-69
Purpose .....	16-69
Commands .....	16-69
show ssh status .....	16-69
set ssh .....	16-69
set ssh hostkey .....	16-70

## Index

## Figures

1-1	SecureStack B2 Startup Screen .....	1-5
1-2	Sample CLI Defaults Description .....	1-7
1-3	Performing a Keyword Lookup .....	1-7
1-4	Performing a Partial Keyword Lookup .....	1-7
1-5	Scrolling Screen Output .....	1-8
1-6	Abbreviating a Command .....	1-8
8-7	Example of VLAN Propagation via GVRP .....	8-19

## Tables

1-1	Default Settings for Basic Switch Operation .....	1-2
1-2	Basic Line Editing Commands .....	1-9

3-3	show system lockout Output Details.....	3-7
3-4	show system Output Details .....	3-12
3-5	show version Output Details .....	3-21
4-6	show cdp Output Details.....	4-2
4-7	show ciscodp Output Details .....	4-7
4-8	show ciscodp port info Output Details .....	4-8
4-9	show lldp port local-info Output Details .....	4-19
4-10	show lldp port remote-info Output Display.....	4-21
5-11	show port status Output Details.....	5-4
5-12	show port counters Output Details .....	5-6
5-13	show linkflap parameters Output Details .....	5-22
5-14	show linkflap metrics Output Details.....	5-22
5-15	LACP Terms and Definitions .....	5-33
5-16	show lacp Output Details.....	5-36
6-17	SNMP Security Levels.....	6-2
6-18	show snmp engineid Output Details .....	6-4
6-19	show snmp counters Output Details.....	6-6
6-20	show snmp user Output Details.....	6-9
6-21	show snmp group Output Details .....	6-11
6-22	show snmp access Output Details .....	6-16
6-23	show snmp view Output Details .....	6-20
6-24	show snmp targetparams Output Details .....	6-23
6-25	show snmp targetaddr Output Details .....	6-26
6-26	show snmp notify Output Details.....	6-31
6-27	Basic SNMP Trap Configuration.....	6-36
7-28	show spantree Output Details .....	7-6
8-29	Command Set for Creating a Secure Management VLAN .....	8-2
8-30	show vlan Output Details.....	8-4
8-31	show gvrp configuration Output Details.....	8-21
9-32	Valid IP DSCP Numeric and Keyword Values.....	9-6
10-33	show policy profile Output Details .....	10-3
10-34	show policy rule Output Details .....	10-7
10-35	Valid Values for Policy Classification Rules .....	10-11
11-36	show port ratelimit Output Details.....	11-10
13-37	show logging server Output Details.....	13-2
13-38	show logging application Output Details.....	13-7
13-39	Mnemonic Values for Logging Applications.....	13-8
13-40	show arp Output Details .....	13-16
13-41	show mac Output Details.....	13-19
13-42	show snmp Output Details.....	13-26
13-43	show nodealias config Output Details .....	13-33
14-44	RMON Monitoring Group Functions and Commands.....	14-2
14-45	show rmon stats Output Details.....	14-4
14-46	show rmon alarm Output Details .....	14-10
14-47	show rmon event Output Details .....	14-14
16-48	show radius Output Details.....	16-4
16-49	show eapol Output Details.....	16-16
16-50	show macauthentication Output Details .....	16-20
16-51	show macauthentication session Output Details .....	16-22
16-52	show vlanauthorization Output Details .....	16-46
16-53	show maclock Output Details .....	16-48
16-54	show maclock stations Output Details.....	16-49
16-55	show pwa Output Details.....	16-59



---

# About This Guide

Welcome to the Enterasys Networks SecureStack B2 *Configuration Guide*. This manual explains how to access the device's Command Line Interface (CLI) and how to use it to configure SecureStack B2 switch devices.

---

## Important Notice

Depending on the firmware version used in your SecureStack device, some features described in this document may not be supported. Refer to the Release Notes shipped with your device to determine which features are supported.

---

## Using This Guide

A general working knowledge of basic network operations and an understanding of CLI management applications is helpful before configuring the SecureStack device.

This manual describes how to do the following:

- Access the SecureStack CLI.
- Use CLI commands to perform network management and device configuration operations
- Establish and manage Virtual Local Area Networks (VLANs).
- Establish and manage static and dynamically-assigned policy classifications.
- Establish and manage priority classification.
- Configure security protocols, including 802.1X and RADIUS, SSHv2, MAC locking, and MAC authentication.

## Structure of This Guide

The guide is organized as follows:

[Chapter 1, Introduction](#), provides an overview of the tasks that can be accomplished using the CLI interface, an overview of local management requirements, an overview of the device's factory default settings, and information about using the Command Line Interface (CLI).

[Chapter 2, Configuring Switches in a Stack](#), provides information about how to configure and manage stacked switches.

[Chapter 3, Basic Configuration](#), provides how to set basic system properties, how to download a firmware image, how to configure WebView and Telnet, how to manage configuration files, how to set the login password, and how to exit the CLI.

[Chapter 4, Discovery Protocol Configuration](#) provides how to configure discovery protocols supported by the device.

[Chapter 5, Port Configuration](#), describes how to review and configure console port settings, and how to enable or disable switch ports and configure switch port settings, including port speed, duplex mode, auto-negotiation, flow control, port mirroring, link aggregation and broadcast suppression.

**Chapter 6, SNMP Configuration**, describes how to configure SNMP users and user groups, access rights, target addresses, and notification parameters.

**Chapter 7, Spanning Tree Configuration**, describes how to review and set Spanning Tree bridge parameters for the device, including bridge priority, hello time, maximum aging time and forward delay; and how to review and set Spanning Tree port parameters, including port priority and path costs. Configuring the SpanGuard and Loop Protect functions is also described.

**Chapter 8, 802.1Q VLAN Configuration**, describes how to create static VLANs, select the mode of operation for each port, establish VLAN forwarding (egress) lists, route frames according to VLAN ID, display the current ports and port types associated with a VLAN and protocol, create a secure management VLAN, and configure ports on the device as GVRP-aware ports.

**Chapter 9, Differentiated Services Configuration**, describes how to display and configure Diffserv parameters.

**Chapter 10, Policy Classification Configuration**, describes how to create, change or remove user roles or profiles based on business-specific use of network services; how to permit or deny access to specific services by creating and assigning classification rules which map user profiles to frame filtering policies; how to classify frames to a VLAN or Class of Service (CoS); and how to assign or unassign ports to policy profiles so that only ports activated for a profile will be allowed to transmit frames accordingly.

**Chapter 11, Port Priority and Rate Limiting Configuration**, describes how to set the transmit priority of each port and configure a rate limit for a given port and list of priorities.

**Chapter 12, IGMP Configuration**, describes how to configure Internet Group Management Protocol (IGMP) settings for multicast filtering.

**Chapter 13, Logging and Network Management**, describes how to configure Syslog, how to manage general switch settings, how to monitor network events and status, and how to configure SNMP and node aliases.

**Chapter 14, RMON Configuration**, describes how to use RMON (Remote Network Monitoring), which provides comprehensive network fault diagnosis, planning, and performance tuning information and allows for interoperability between SNMP management stations and monitoring agents.

**Chapter 15, DHCP Server Configuration**, describes how to review and configure DHCP server parameters, how to review and configure DHCP address pools, and how to display DHCP server information.

**Chapter 16, Security Configuration**, describes how to configure 802.1X authentication using EAPOL, how to configure RADIUS server, Secure Shell server, MAC authentication, MAC locking, and Port Web Authentication.

## Related Documents

The following Enterasys Networks documents may help you to set up, control, and manage the SecureStack device:

- *Ethernet Technology Guide*
- *Cabling Guide*
- *SecureStack B2 Installation Guide(s)*
- *SecureStack Redundant Power System Installation Guide*

Documents listed above, can be obtained from the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following web site:

<http://www.enterasys.com/support/manuals/>

## Conventions Used in This Guide

The following conventions are used in the text of this document:

Convention	Description
<b>Bold</b> font	Indicates mandatory keywords, parameters or keyboard keys.
<i>italic</i> font	Indicates complete document titles.
<code>Courier</code> font	Used for examples of information displayed on the screen.
<i>Courier</i> font in italics	Indicates a user-supplied value, either required or optional.
[ ]	Square brackets indicate an optional value.
{ }	Braces indicate required values. One or more values may be required.
	A vertical bar indicates a choice in values.
[x   y   z]	Square brackets with a vertical bar indicate a choice of a value.
{x   y   z}	Braces with a vertical bar indicate a choice of a required value.
[x {y   z} ]	A combination of square brackets with braces and vertical bars indicates a required choice of an optional value.

The following icons are used in this guide:



**Note:** Calls the reader's attention to any item of information that may be of special importance.



**Caution:** Contains information essential to avoid damage to the equipment.

## Getting Help

For additional support related to this switch or document, contact Enterasys Networks using one of the following methods:

World Wide Web	<a href="http://www.enterasys.com/support">http://www.enterasys.com/support</a>
Phone	1-800-872-8440 (toll-free in U.S. and Canada) or 1-978-684-1000  For the Enterasys Networks Support toll-free number in your country: <a href="http://www.enterasys.com/support">http://www.enterasys.com/support</a>
Internet mail	<a href="mailto:support@enterasys.com">support@enterasys.com</a>  To expedite your message, type <b>[SWITCHING]</b> in the subject line.
To send comments or suggestions concerning this document to the Technical Publications Department: <a href="mailto:techpubs@enterasys.com">techpubs@enterasys.com</a> Make sure to include the document Part Number in the email message.	

**Before calling Enterasys Networks, have the following information ready:**

- Your Enterasys Networks service contract number
- A description of the failure

- A description of any action(s) already taken to resolve the problem (for example, changing mode switches or rebooting the unit)
- The serial and revision numbers of all involved Enterasys Networks products in the network
- A description of your network environment (for example, layout, cable type)
- Network load and frame size at the time of trouble (if known)
- The switch history (for example, have you returned the switch before, is this a recurring problem?)
- Any previous Return Material Authorization (RMA) numbers

## Introduction

This chapter provides an overview of the SecureStack B2's unique features and functionality, an overview of the tasks that may be accomplished using the CLI interface, an overview of ways to manage the switch, factory default settings, and information about how to use the Command Line Interface to configure the switch.

For information about...	Refer to page...
<a href="#">SecureStack B2 CLI Overview</a>	<a href="#">1-1</a>
<a href="#">Switch Management Methods</a>	<a href="#">1-1</a>
<a href="#">Factory Default Settings</a>	<a href="#">1-2</a>
<a href="#">Using the Command Line Interface</a>	<a href="#">1-5</a>

### SecureStack B2 CLI Overview

Enterasys Networks' SecureStack B2 CLI interface allows you to perform a variety of network management tasks, including the following:

- Use CLI commands to perform network management and switch configuration operations.
- Download a new firmware image.
- Assign IP address and subnet mask.
- Select a default gateway.
- Establish and manage Virtual Local Area Networks (VLANs).
- Establish and manage policy profiles and classifications.
- Establish and manage priority classification.
- Configure security protocols, including 802.1X and RADIUS, SSHv2, PWA, MAC locking, and MAC authentication.

### Switch Management Methods

The SecureStack B2 switch can be managed using the following methods:

- Locally using a VT type terminal connected to the console port.
- Remotely using a VT type terminal connected through a modem.
- Remotely using an SNMP management station.
- In-band through a Telnet connection.
- In-band using the Enterasys NetSight® management application.

- Remotely using WebView™, Enterasys Networks' embedded web server application.

The *Installation Guide* for your SecureStack B2 device provides setup instructions for connecting a terminal or modem to the switch.

## Factory Default Settings

The following tables list factory default settings available on the SecureStack B2 switch.

**Table 1-1 Default Settings for Basic Switch Operation**

Feature	Default Setting
<b>Switch Mode Defaults</b>	
CDP discovery protocol	Auto enabled on all ports.
CDP authentication code	Set to 00-00-00-00-00-00-00
CDP hold time	Set to 180 seconds.
CDP interval	Transmit frequency of CDP messages set to 60 seconds.
Cisco discovery protocol	Auto enabled on all ports.
Cisco DP hold time	Set to 180 seconds.
Cisco DP interval timer	Set to 60 seconds.
Community name	Public.
Console (serial) port required settings	Baud rate: 9600 Data bits: 8 Flow control: disabled Stop bits: 1 Parity: none
DHCP server	Disabled.
Diffserv	Disabled.
EAPOL	Disabled.
EAPOL authentication mode	When enabled, set to auto for all ports.
GARP timer	Join timer set to 20 centiseconds; leave timer set to 60 centiseconds; leaveall timer set to 1000 centiseconds.
GVRP	Globally enabled.
History buffer size	20 lines.
IEEE 802.1 authentication	Disabled.
IGMP snooping	Disabled. When enabled, query interval is set to 260 seconds and response time is set to 10 seconds.
IP mask and gateway	Subnet mask set to 0.0.0.0; default gateway set to 0.0.0.0.
IP routes	No static routes configured.
Jumbo frame support	Enabled on all ports.
Link aggregation control protocol (LACP)	Enabled.

**Table 1-1 Default Settings for Basic Switch Operation (Continued)**

Feature	Default Setting
Link aggregation admin key	Set to 32768 for all ports.
Link aggregation flow regeneration	Disabled.
Link aggregation system priority	Set to 32768 for all ports.
Link aggregation output algorithm	Set to DIP-SIP.
Lockout	Set to disable Read-Write and Read-Only users, and to lockout the default admin (Super User) account for 15 minutes, after 3 failed login attempts.
Logging	Syslog port set to UDP port number 514. Logging severity level set to 6 (significant conditions) for all applications.
MAC aging time	Set to 300 seconds.
MAC locking	Disabled (globally and on all ports).
Passwords	Set to an empty string for all default user accounts. User must press ENTER at the password prompt to access CLI.
Password aging	Disabled.
Password history	No passwords are checked for duplication.
Policy classification	Classification rules are automatically enabled when created.
Port auto-negotiation	Enabled on all ports.
Port advertised ability	Maximum ability advertised on all ports.
Port broadcast suppression	Enabled and set to limit broadcast packets to 14,881 per second on all switch ports.
Port duplex mode	Set to half duplex, except for 100BASE-FX and 1000BASE-X, which is set to full duplex.
Port enable/disable	Enabled.
Port priority	Set to 0.
Port speed	Set to 10 Mbps, except for 1000BASE-X, which is set to 1000 Mbps, and 100BASE-FX, which is set to 100 Mbps.
Port trap	All ports are enabled to send link traps.
Power over Ethernet port admin state	Administrative state is on (auto).
Priority classification	Classification rules are automatically enabled when created.
RADIUS client	Disabled.
RADIUS last resort action	When the client is enabled, set to Challenge.
RADIUS retries	When the client is enabled, set to 3.
RADIUS timeout	When the client is enabled, set to 20 seconds.
Rate limiting	Disabled (globally and on all ports).
SNMP	Enabled.

**Table 1-1 Default Settings for Basic Switch Operation (Continued)**

Feature	Default Setting
SNTP	Disabled.
Spanning Tree	Globally enabled and enabled on all ports.
Spanning Tree edge port administrative status	Edge port administrative status begins with the value set to <b>false</b> initially after the device is powered up. If a Spanning Tree BDPU is not received on the port within a few seconds, the status setting changes to <b>true</b> .
Spanning Tree edge port delay	Enabled.
Spanning Tree forward delay	Set to 15 seconds.
Spanning Tree hello interval	Set to 2 seconds.
Spanning Tree ID (SID)	Set to 0.
Spanning Tree maximum aging time	Set to 20 seconds.
Spanning Tree port priority	All ports with bridge priority are set to 128 (medium priority).
Spanning Tree priority	Bridge priority is set to 32768.
Spanning Tree topology change trap suppression	Enabled.
Spanning Tree version	Set to mstp (Multiple Spanning Tree Protocol).
SSH	Disabled.
System baud rate	Set to 9600 baud.
System contact	Set to empty string.
System location	Set to empty string.
System name	Set to empty string.
Terminal	CLI display set to 80 columns and 24 rows.
Timeout	Set to 5 minutes.
User names	Login accounts set to <b>ro</b> for Read-Only access; <b>rw</b> for Read-Write access; and <b>admin</b> for Super User access.
VLAN dynamic egress	Disabled on all VLANs.
VLAN ID	All ports use a VLAN identifier of 1.
Host VLAN	Default host VLAN is 1.



# Using the Command Line Interface

## Starting a CLI Session

### Connecting Using the Console Port

Connect a terminal to the local console port as described in your SecureStack B2 *Installation Guide*. The startup screen, [Figure 1-1](#), will display on the terminal. You can now start the Command Line Interface (CLI) by

- using a default user account, as described in [“Using a Default User Account”](#) on page 1-6, or
- using an administratively-assigned user account as described in [“Using an Administratively Configured User Account”](#) on page 1-6.

**Figure 1-1 SecureStack B2 Startup Screen**

```
Username:admin
Password:

Enterasys SecureStack B2
Command Line Interface

Enterasys Networks, Inc.
50 Minuteman Rd.
Andover, MA 01810-1008 U.S.A.

Phone: +1 978 684 1000
E-mail: support@enterasys.com
WWW: http://www.enterasys.com

(c) Copyright Enterasys Networks, Inc. 2006

Chassis Serial Number:      041800249041
Chassis Firmware Revision:  4.1.xx

B2(su)->
```

### Connecting Using Telnet

Once the SecureStack B2 device has a valid IP address, you can establish a Telnet session from any TCP/IP based node on the network. For information about setting the switch's IP address, refer to [“set ip address”](#) on page 3-9.

To establish a Telnet session:

1. Telnet to the switch's IP address.
2. Enter login (user name) and password information in one of the following ways:
  - If the switch's default login and password settings have not been changed, follow the steps listed in [“Using a Default User Account”](#) on page 1-6, or
  - Enter an administratively-configured user name and password.

The notice of authorization and the prompt displays as shown in [Figure 1-1](#).

For information about configuring Telnet settings, refer to [“Starting and Configuring Telnet”](#) on page 3-38.

Refer to the instructions included with the Telnet application for information about establishing a Telnet session.

## Logging In

By default, the SecureStack B2 switch is configured with three user login accounts—**ro** for Read-Only access, **rw** for Read-Write access, and **admin** for super-user access to all modifiable parameters. The default password is set to a blank string. For information on changing these default settings, refer to “[Setting User Accounts and Passwords](#)” on page 3-1.

### Using a Default User Account

If this is the first time you are logging in to the SecureStack B2 switch, or if the default user accounts have not been administratively changed, proceed as follows:

1. At the login prompt, enter one of the following default user names:
  - **ro** for Read-Only access.
  - **rw** for Read-Write access.
  - **admin** for Super User access.
2. Press ENTER. The Password prompt displays.
3. Leave this string blank and press ENTER. The switch information and prompt displays as shown in [Figure 1-1](#).

### Using an Administratively Configured User Account

If the switch’s default user account settings have been changed, proceed as follows:

1. At the login prompt, enter your administratively-assigned user name and press ENTER.
2. At the Password prompt, enter your password and press ENTER.

The notice of authorization and the prompt displays as shown in [Figure 1-1](#).



**Note:** Users with Read-Write (rw) and Read-Only access can use the [set password](#) command (page 3-4) to change their own passwords. Administrators with Super User (su) access can use the [set system login](#) command (page 3-3) to create and change user accounts, and the [set password](#) command to change any local account password.

## Navigating the Command Line Interface

### Getting Help with CLI Syntax

The SecureStack B2 switch allows you to display usage and syntax information for individual commands by typing **help** or **?** after the command.

### CLI Command Defaults Descriptions

Each command description in this guide includes a section entitled “Defaults” which contains different information from the factory default settings on the switch described in [Table 1-1](#). The section defines CLI behavior if the user enters a command without typing optional parameters (indicated by square brackets [ ]). For commands without optional parameters, the defaults section lists “None”. For commands with optional parameters, this section describes how the CLI responds if the user opts to enter only the keywords of the command syntax. [Figure 1-2](#) provides an example.

**Figure 1-2 Sample CLI Defaults Description****Syntax**

```
show port status [port-string]
```

**Defaults**

If *port-string* is not specified, status information for all ports will be displayed.

**CLI Command Modes**

Each command description in this guide includes a section entitled “Mode” which states whether the command is executable in Admin (Super User), Read-Write, or Read-Only mode. Users with Read-Only access will only be permitted to view Read-Only (**show**) commands. Users with Read-Write access will be able to modify all modifiable parameters in **set** and **show** commands, as well as view Read-Only commands. Administrators or Super Users will be allowed all Read-Write and Read-Only privileges, and will be able to modify local user accounts. The SecureStack B2 switch indicates which mode a user is logged in as by displaying one of the following prompts:

- Admin: B2(su)->
- Read-Write: B2(rw)->
- Read-Only: B2(ro)->

**Performing Keyword Lookups**

Entering a space and a question mark (?) after a keyword will display all commands beginning with the keyword. [Figure 1-3](#) shows how to perform a keyword lookup for the **show snmp** command. In this case, four additional keywords are used by the **show snmp** command. Entering a space and a question mark (?) after any of these parameters (such as **show snmp community**) will display additional parameters nested within the syntax.

**Figure 1-3 Performing a Keyword Lookup**

```
B2(su)->show snmp ?
```

community	SNMP v1/v2c community name configuration
notify	SNMP notify configuration
targetaddr	SNMP target address configuration
targetparams	SNMP target parameters configuration

Entering a question mark (?) without a space after a partial keyword will display a list of commands that begin with the partial keyword. [Figure 1-4](#) shows how to use this function for all commands beginning with **co**:

**Figure 1-4 Performing a Partial Keyword Lookup**

```
B2(rw)->co?
configure          copy
B2(su)->co
```



**Note:** At the end of the lookup display, the system will repeat the command you entered without the ?.

## Displaying Scrolling Screens

If the CLI screen length has been set using the **set length** command as described on page 3-24, CLI output requiring more than one screen will display `--More--` to indicate continuing screens. To display additional screen output:

- Press any key other than ENTER to advance the output one screen at a time.
- Press ENTER to advance the output one line at a time.

The example in Figure 1-5 shows how the **show mac** command indicates that output continues on more than one screen.

**Figure 1-5 Scrolling Screen Output**

```
B2(su)->show mac
```

MAC Address	FID	Port	Type
-----	-----	-----	-----
00-00-1d-67-68-69	1	host	Management
00-00-02-00-00-00	1	ge.1.2	Learned
00-00-02-00-00-01	1	ge.1.3	Learned
00-00-02-00-00-02	1	ge.1.4	Learned
00-00-02-00-00-03	1	ge.1.5	Learned
00-00-02-00-00-04	1	ge.1.6	Learned
00-00-02-00-00-05	1	ge.1.7	Learned
00-00-02-00-00-06	1	ge.1.8	Learned
00-00-02-00-00-07	1	ge.1.9	Learned
00-00-02-00-00-08	1	ge.1.10	Learned
--More--			

## Abbreviating and Completing Commands

The SecureStack B2 switch allows you to abbreviate CLI commands and keywords down to the number of characters that will allow for a unique abbreviation. Figure 1-6 shows how to abbreviate the **show netstat** command to **sh net**.

**Figure 1-6 Abbreviating a Command**

```
B2(su)->sh net
```

Active Internet connections (including servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
-----	-----	-----	-----	-----	-----
TCP	0	0	10.21.73.13.23	134.141.190.94.51246	ESTABLISHED
TCP	0	275	10.21.73.13.23	134.141.192.119.4724	ESTABLISHED
TCP	0	0	*.80	*.*	LISTEN
TCP	0	0	*.23	*.*	LISTEN
UDP	0	0	10.21.73.13.1030	134.141.89.113.514	
UDP	0	0	*.161	*.*	
UDP	0	0	*.1025	*.*	
UDP	0	0	*.123	*.*	

## Basic Line Editing Commands

The CLI supports EMACs-like line editing commands. [Table 1-2](#) lists some commonly used commands.

**Table 1-2 Basic Line Editing Commands**

Key Sequence	Command
Ctrl+A	Move cursor to beginning of line.
Ctrl+B	Move cursor back one character.
Ctrl+D	Delete a character.
Ctrl+E	Move cursor to end of line.
Ctrl+F	Move cursor forward one character.
Ctrl+H	Delete character to left of cursor.
Ctrl+I or TAB	Complete word.
Ctrl+K	Delete all characters after cursor.
Ctrl+N	Scroll to next command in command history (use the CLI history command to display the history).
Ctrl+P	Scroll to previous command in command history.
Ctrl+Q	Resume the CLI process.
Ctrl+S	Pause the CLI process (for scrolling).
Ctrl+T	Transpose characters.
Ctrl+U or Ctrl+X	Delete all characters before cursor.
Ctrl+W	Delete word to the left of cursor.
Ctrl+Y	Restore the most recently deleted item.



## Configuring Switches in a Stack

This chapter provides information about configuring SecureStack B2 switches in a stack.

For information about ...	Refer to page ...
<a href="#">About SecureStack B2 Switch Operation in a Stack</a>	<a href="#">2-1</a>
<a href="#">Installing a New Stackable System of Up to Eight Units</a>	<a href="#">2-2</a>
<a href="#">Installing Previously-Configured Systems in a Stack</a>	<a href="#">2-3</a>
<a href="#">Adding a New Unit to an Existing Stack</a>	<a href="#">2-3</a>
<a href="#">Creating a Virtual Switch Configuration</a>	<a href="#">2-4</a>
<a href="#">Considerations About Using Clear Config in a Stack</a>	<a href="#">2-5</a>
<a href="#">Issues Related to Mixed Type Stacks</a>	<a href="#">2-5</a>
<a href="#">Stacking Configuration and Management Commands</a>	<a href="#">2-6</a>

### About SecureStack B2 Switch Operation in a Stack

The SecureStack B2 products are stackable switches that can be adapted and scaled to help meet your network needs. These switches provide a management platform and uplink to a network backbone for a stacked group of up to eight SecureStack B2 switches.



**Note:** You can mix SecureStack B2 and B3 switches in a single stack, although only the lowest common denominator of functionality will be supported in a mixed stack. Refer to [“Issues Related to Mixed Type Stacks”](#) on page 2-5 for information about configuring a mixed stack.

Once installed in a stack, the switches behave and perform as a single switch product. As such, you can start with a single unit and add more units as your network expands. You can also mix different products in the family in a single stack to provide a desired combination of port types and functions to match the requirements of individual applications. In all cases, a stack of units performs as one large product, and is managed as a single network entity.

When switches are installed and connected as described in the SecureStack B2 Installation Guides, the following occurs during initialization:

- The switch that will manage the stack is automatically established. This is known as the manager switch.
- All other switches are established as members in the stack.
- The hierarchy of the switches that will assume the function of backup manager is also determined in case the current manager malfunctions, is powered down, or is disconnected from the stack.

- The console port on the manager switch remains active for out-of-band (local) switch management, but the console port on each member switch is deactivated. This enables you to set the IP address and system password using a single console port. Now each switch can be configured locally using only the manager's console port, or inband using a remote device and the CLI set of commands described in this section.

Once a stack is created (more than one switch is interconnected), the following procedure occurs:

1. By default, unit IDs are arbitrarily assigned on a first-come, first-served basis.
2. Unit IDs are saved against each module. Then, every time a board is power-cycled, it will initialize with the same unit ID. This is important for port-specific information (for example: ge.4.12 is the 12th Gigabit Ethernet port on Unit # 4).
3. The management election process uses the following precedence to assign a management switch:
  - a. Previously assigned / elected management unit
  - b. Management assigned priority (values 1-15)
  - c. Hardware preference level
  - d. Highest MAC Address

Use the following recommended procedures when installing a new stackable system or adding a new unit to an existing stack.

---

### Important

The following procedures assume that all units have a clean configuration from manufacturing. When adding a new unit to an already running stack, it is also assumed that the new unit is using the same firmware image version as other units in the stack.

---

## Installing a New Stackable System of Up to Eight Units

Use the following procedure for installing a new stack of up to eight units out of the box.

1. Before applying power, make **all** physical connections with the stack cables as described in the SecureStack B2 Installation Guides.
2. Once all of the stack cables have been connected, individually power on each unit from top to bottom.



**Notes:** Ensure that each switch is fully operational before applying power to the next switch. Since unit IDs are assigned on a first-come, first-served basis, this will ensure that unit IDs are ordered sequentially.

Once unit IDs are assigned, they are persistent and will be retained during a power cycle to any or all of the units.

3. (Optional) If desired, change the management unit using the **set switch movemanagement** command as described in "[set switch movemanagement](#)" on page 2-11.
4. Once the desired master unit has been selected, reset the system using the **reset** command as described in "[reset](#)" on page 3-51.
5. After the stack has been configured, you can use the **show switch unit** command ("[show switch](#)" on page 2-6) to physically identify each unit. When you enter the command with a unit number, the MGR LED of the specified switch will blink for 10 seconds. The normal state of this LED is off for member units and steady green for the manager unit.



## Installing Previously-Configured Systems in a Stack

If member units in a stack have been previous members of a different stack, you may need to configure the renumbering of the stack as follows:

1. Stack the units in the method desired, and connect the stack cables.
2. Power up only the unit you wish to be manager.
3. Once the management unit is powered up, log into the CLI, and use the **show switch** command as described in “[show switch](#)” on page 2-6 to display stacking information.
4. Clear any switches which are listed as “unassigned” using the **clear switch member** command as described in “[clear switch member](#)” on page 2-12.
5. Power up the member of the stack you wish to become unit 2. Once the second unit is fully powered, the COM session of the CLI will state that a new CPU was added.
6. Use the **show switch** command to redisplay stacking information.
  - a. If the new member displays as unit 2, you can proceed to repeat this step with the next unit.
  - b. If the new member displays a different unit number, you must:
    - (1) Renumber the stack using the **set switch renumber** command as described in “[set switch](#)” on page 2-9, then
    - (2) Clear the original unit number using the **clear switch member** command.
7. Repeat Step 6 until all members have been renumbered in the order you desire.
8. After the stack has been reconfigured, you can use the **show switch unit** command (“[show switch](#)” on page 2-6) to physically confirm the identity of each unit. When you enter the command with a unit number, the MGR LED of the specified switch will blink for 10 seconds. The normal state of this LED is off for member units and steady green for the manager unit.

## Adding a New Unit to an Existing Stack

Use the following procedure for installing a new unit to an existing stack configuration. This procedure assumes that the new unit being added has a clean configuration from manufacturing and is running the same firmware image version as other units in the stack.

1. Ensure that power is off on the new unit being installed.
2. Use one of the following methods to complete stack cable connections:
  - If the running stack uses a daisy chain topology, make the stack cable connections from the bottom of the stack to the new unit (that is, STACK DOWN port from the bottom unit of the running stack to the STACK UP port on the new unit).
  - If the running stack uses a ring stack topology, break the ring and make the stack cable connections to the new unit to close the ring.
3. Apply power to the new unit.

## Creating a Virtual Switch Configuration

You can create a configuration for a SecureStack B2 switch before adding the actual physical device to a stack. This preconfiguration feature includes configuring protocols on the ports of the “virtual switch.”

To create a virtual switch configuration in a stack environment:

1. Display the types of switches supported in the stack, using the **show switch switchtype** command (page 2-7).
2. Using the output of the **show switch switchtype** command, determine the switch index (SID) of the model of switch being configured.
3. Add the virtual switch to the stack using the **set switch member** command (page 2-11). Use the SID of the switch model, determined in the previous step, and the unit ID that you want to assign to this switch member.
4. Proceed to configure the ports of the virtual switch as you would do for physically present devices.

The following example adds a B2G124-24 model to a stack as unit 2 of the stack. The first port on that virtual switch is then associated with VLAN 555.

```
B2(su)->show switch switchtype
```

SID	Switch Model ID	Mgmt Pref	Code Version
1	B2G124-24	1	0xa08245
2	B2G124-48	1	0xa08245
3	B2G124-48P	1	0xa08245
4	B2H124-48	1	0xa08245
5	B2H124-48P	1	0xa08245
6	B3G124-24P	1	0xa08245
7	B3G124-48P	1	0xa08245
8	B3G124-48	1	0xa08245
9	B3G124-24	1	0xa08245

```
B2(su)->set switch member 2 1
```

```
B2(su)->show switch
```

Switch	Management Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Switch	B2G124-48	B2G124-48	OK	4.1.xx
2	Unassigned	B2G124-24		Not Present	00.00.00

```
B2(su)->set vlan create 555
```

```
B2(su)->clear vlan egress 1 ge.2.1
```

```
B2(su)->set port vlan ge.2.1 555 untagged
```

```
B2(su)->show port vlan ge.2.1
```

```
ge.2.1 is set to 555
```



**Note:** If you preconfigure a virtual switch and then add a physical switch of a different type to the stack as that unit number, any configured functionality that cannot be supported on the physical switch will cause a configuration mismatch status for that device and the ports of the new device will join detached. You must clear the mismatch before the new device will properly join the stack.

## Considerations About Using Clear Config in a Stack

When using the **clear config** command (page 3-51) to clear configuration parameters in a stack, it is important to remember the following:

- Use **clear config** to clear config parameters without clearing stack unit IDs. This command WILL NOT clear stack parameters or the IP address and avoids the process of renumbering the stack.
- Use **clear config all** when it is necessary to clear all config parameters, including stack unit IDs and switch priority values. This command will not clear the IP address nor will it remove an applied advanced feature license.
- Use **clear ip address** to remove the IP address of the stack.
- Use **clear license** to remove an applied license from a switch.

Configuration parameters and stacking information can also be cleared **on the master unit only** by selecting the “restore configuration to factory defaults” option from the boot menu on switch startup. This selection will leave stacking priorities on all other units.

## Issues Related to Mixed Type Stacks

### Feature Support

Because the SecureStack B2 and B3 switches have different hardware architectures, the functionality supported by the two switch types is different. When the two types of switches are mixed in a stack, the functionality supported will be the lowest common denominator of features supported on all platforms. Refer to the firmware Release Notes for information about supported features.

### Configuration

#### Common Firmware Version

Mixed stacking is only supported by SecureStack B2 firmware version 4.00.xx and higher. In order to mix SecureStack B3 switches with B2 switches, you must install the B2 firmware (version 4.00.xx or higher) on the B3 switch. You can install the B2 firmware first, with the B3 switch in stand-alone mode, or you can add the B3 switch to the stack and then copy the B2 firmware to the B3 switch using the [set switch copy-fw](#) command (page 2-9). After copying the B2 firmware to the B3 switch, you must reset the stack.

#### Switch Manager

It is recommended that a SecureStack B3 switch be made the manager of a mixed stack. Use the [set switch movemanagement](#) command (page 2-11) to change the manager unit.

# Stacking Configuration and Management Commands

## Purpose

To review, individually configure and manage switches in a SecureStack B2 stack.

## Commands

For information about...	Refer to page...
show switch	<a href="#">2-6</a>
show switch switchtype	<a href="#">2-7</a>
show switch stack-ports	<a href="#">2-8</a>
set switch	<a href="#">2-9</a>
set switch copy-fw	<a href="#">2-9</a>
set switch description	<a href="#">2-10</a>
set switch movemanagement	<a href="#">2-11</a>
set switch member	<a href="#">2-11</a>
clear switch member	<a href="#">2-12</a>

## show switch

Use this command to display information about one or more units in the stack.

### Syntax

```
show switch [status] [unit]
```

### Parameters

<b>status</b>	(Optional) Displays power and administrative status information for one or more units in the stack.
<i>unit</i>	(Optional) Specifies the unit(s) for which information will display.

### Defaults

If not specified, status and other configuration information about all units will be displayed.

### Mode

Switch command, read-only.

### Usage

After a stack has been configured, you can use this command to physically confirm the identity of each unit. When you enter the command with a unit number, the MGR LED of the specified switch will blink for 10 seconds. The normal state of this LED is off for member units and steady green for the manager unit.

## Examples

This example shows how to display information about all switch units in the stack:

```
B2(rw)->show switch
```

Switch	Management Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Switch	B2G124-24	B2G124-24	OK	04.1.xx
2	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx
3	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx
4	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx
5	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx
6	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx
7	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx
8	Stack Member	B2G124-24	B2G124-24	OK	04.1.xx

This example shows how to display information about switch unit 1 in the stack:

```
B2(ro)->show switch 1
```

Switch	1
Management Status	Management Switch
Hardware Management Preference	Unassigned
Admin Management Preference	Unassigned
Switch Type	B2G124-24
Preconfigured Model Identifier	B2G124-24
Plugged-in Model Identifier	B2G124-24
Switch Status	OK
Switch Description	Enterasys Networks, Inc. B2 -- Model B2G124-24
Detected Code Version	04.1.xx
Detected Code in Flash	03.01.20
Detected Code in Back Image	02.01.37
Up Time	0 days 6 hrs 37 mins 54 secs

This example shows how to display status information for switch unit 1 in the stack:

```
B2(ro)->show switch status 1
```

Switch	1
Switch Status	Full
Admin State	
Power State	
Inserted Switch:	
Model Identifier	B2G124-24
Description	Enterasys Networks, Inc. B2 -- Model B2G124-24
Configured Switch:	
Model Identifier	B2G124-24
Description	Enterasys Networks, Inc. B2 -- Model B2G124-24

## show switch switchtype

Use this command to display information about supported switch types in the stack.

### Syntax

```
show switch switchtype [switchindex]
```

Parameters

<i>switchindex</i>	(Optional) Specifies the switch index (SID) of the switch type to display.
--------------------	--

Defaults

None.

Mode

Switch command, read-only.

Examples

This example shows how to display switch type information about all switches in the stack:

```
B2(su)->show switch switchtype
```

SID	Switch Model ID	Mgmt Pref	Code Version
1	B2G124-24	1	0xa08245
2	B2G124-48	1	0xa08245
3	B2G124-48P	1	0xa08245
4	B2H124-48	1	0xa08245
5	B2H124-48P	1	0xa08245

This example shows how to display switch type information about SID1:

```
B2(rw)->show switch switchtype 1
Switch Type..... 0x56950200
Model Identifier..... B2G124-24
Switch Description..... Enterasys Networks, Inc. B2 -- Model
                        B2G124-24
Management Preference..... 1
Expected Code Version..... 0xa08245

Supported Cards:
  Slot..... 0
  Card Index (CID)..... 1
  Model Identifier..... B2G124-24
```

show switch stack-ports

Use this command to display various data flow and error counters on stack ports.

Syntax

```
show switch stack-ports [unit]
```

Parameters

<i>unit</i>	(Optional) Specifies the switch unit ID, an integer ranging from 1 to 8.
-------------	--

Defaults

None.

Mode

Switch command, read-only.

## Example

This example shows how to display data and error information on stack ports:

```
B2(ro)->show switch stack-ports
```

Switch	Stacking Port	-----TX-----			-----RX-----		
		Data Rate (Mb/s)	Error Rate (Errors/s)	Total Errors	Data Rate (Mb/s)	Error Rate (Errors/s)	Total Errors
1	Up	0	0	0	0	0	0
	Down	0	0	0	0	0	0


## set switch

Use this command to assign a switch ID, to set a switch's priority for becoming the management switch if the previous management switch fails, or to change the switch unit ID for a switch in the stack.

### Syntax

```
set switch {unit [priority value / renumber newunit]}
```

### Parameters

<i>unit</i>	Specifies a unit number for the switch. Value can range from 1 to 8.
<b>priority</b> <i>value</i>	Specifies a priority value for the unit. Valid values are 1 to 15 with higher values assigning higher priority.
<b>renumber</b> <i>newunit</i>	Specifies a new number for the unit.
 <b>Note:</b> This number must be a previously unassigned unit ID number.	

### Defaults

None.

### Mode

Switch command, read-write.

### Examples

This example shows how to assign priority 3 to switch 5:

```
B2(su)->set switch 5 priority 3
```

This example shows how to renumber switch 5 to switch 7:

```
B2(su)->set switch 5 renumber 7
```

## set switch copy-fw

Use this command to replicate the code image file from the management switch to other switch(es) in the stack.

### Syntax

```
set switch copy-fw [destination-system unit]
```

### Parameters

<b>destination-system</b> <i>unit</i>	(Optional) Specifies the unit number of unit on which to copy the management image file.
--	--

### Defaults

If **destination-system** is not specified, the management image file will be replicated to all switches in the stack.

### Mode

Switch command, read-write.

### Example

This example shows how to replicate the management image file to all switches in the stack:

```
B2(su)->set switch copy-fw
Are you sure you want to copy firmware? (y/n) y

Code transfer completed successfully.
```

## set switch description

Use this command to assign a name to a switch in the stack.

### Syntax

```
set switch description unit description
```

### Parameters

<i>unit</i>	Specifies a unit number for the switch.
<i>description</i>	Specifies a text description for the unit.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to assign the name “FirstUnit” to switch unit 1 in the stack:

```
B2(su)->set switch description 1 FirstUnit
```



## set switch movemanagement

Use this command to move management switch functionality from one switch to another.

### Syntax

```
set switch movemanagement fromunit tounit
```

### Parameters

<i>fromunit</i>	Specifies the unit number of the current management switch.
<i>tounit</i>	Specifies the unit number of the newly-designated management switch.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to move management functionality from switch 1 to switch 2:

```
B2(su)->set switch movemanagement 1 2
Moving stack management will unconfigure entire stack including all interfaces.
Are you sure you want to move stack management? (y/n) y
```

## set switch member

Use this command to add a virtual member to a stack. This allows you to preconfigure a switch before the physical device is actually added to the stack.

### Syntax

```
set switch member unit switch-id
```

### Parameters

<i>unit</i>	Specifies a unit number for the switch.
<i>switch-id</i>	Specifies a switch ID (SID) for the switch. SIDs can be displayed with the <a href="#">show switch switchtype</a> command.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Refer to “[Creating a Virtual Switch Configuration](#)” on page 2-4 for more information about how to add a virtual switch to a stack.

## Example

This example shows how to specify a switch as unit 1 with a switch ID of 1:

```
B2(su)->set switch member 1 1
```

## clear switch member

Use this command to remove a member entry from the stack.

### Syntax

```
clear switch member unit
```

### Parameters

<i>unit</i>	Specifies the unit number of the switch.
-------------	--

### Defaults

None.

### Mode

Switch command, read-write.

## Example

This example shows how to remove the switch 5 entry from the stack:

```
B2(su)->clear switch member 5
```

## Basic Configuration

At startup, the SecureStack B2 switch is configured with many defaults and standard features. This chapter describes how to customize basic system settings to adapt to your work environment.

For information about...	Refer to page...
<a href="#">Setting User Accounts and Passwords</a>	<a href="#">3-1</a>
<a href="#">Setting Basic Switch Properties</a>	<a href="#">3-8</a>
<a href="#">Activating Licensed Features</a>	<a href="#">3-26</a>
<a href="#">Configuring Power over Ethernet (PoE)</a>	<a href="#">3-31</a>
<a href="#">Downloading a New Firmware Image</a>	<a href="#">3-34</a>
<a href="#">Reviewing and Selecting a Boot Firmware Image</a>	<a href="#">3-36</a>
<a href="#">Starting and Configuring Telnet</a>	<a href="#">3-38</a>
<a href="#">Managing Switch Configuration and Files</a>	<a href="#">3-40</a>
<a href="#">Clearing and Closing the CLI</a>	<a href="#">3-49</a>
<a href="#">Resetting the Switch</a>	<a href="#">3-50</a>
<a href="#">Using and Configuring WebView</a>	<a href="#">3-52</a>

## Setting User Accounts and Passwords

### Purpose

To change the switch's default user login and password settings, and to add new user accounts and passwords.

### Commands

The commands used to configure user accounts and passwords are listed below.

For information about...	Refer to page...
<code>show system login</code>	<a href="#">3-2</a>
<code>set system login</code>	<a href="#">3-3</a>
<code>clear system login</code>	<a href="#">3-3</a>
<code>set password</code>	<a href="#">3-4</a>

For information about...	Refer to page...
set system password length	<a href="#">3-5</a>
set system password aging	<a href="#">3-5</a>
set system password history	<a href="#">3-6</a>
show system lockout	<a href="#">3-6</a>
set system lockout	<a href="#">3-7</a>

## show system login

Use this command to display user login account information.

### Syntax

`show system login`

### Parameters

None.

### Defaults

None.

### Mode

Switch command, super user.

### Example

This example shows how to display login account information. In this case, switch defaults have not been changed:

```
B2(su)->show system login
Password history size: 0
Password aging       : disabled

Username      Access      State
admin         super-user  enabled
ro            read-only   enabled
rw            read-write  enabled
```

[Table 3-1](#) provides an explanation of the command output.

**Table 3-1 show system login Output Details**

Output	What It Displays...
Password history size	Number of previously used user login passwords that will be checked for duplication when the set password command is executed. Configured with <a href="#">set system password history (page 3-6)</a> .
Password aging	Number of days user passwords will remain valid before aging out. Configured with <a href="#">set system password aging (page 3-5)</a> .
Username	Login user names.

**Table 3-1 show system login Output Details (Continued)**

Output	What It Displays...
Access	Access assigned to this user account: super-user, read-write or read-only.
State	Whether this user account is enabled or disabled.

## set system login

Use this command to create a new user login account, or to disable or enable an existing account. The SecureStack B2 switch supports up to 16 user accounts, including the admin account, which cannot be deleted.

### Syntax

```
set system login username {super-user | read-write | read-only} {enable | disable}
```

### Parameters

<i>username</i>	Specifies a login name for a new or existing user. This string can be a maximum of 80 characters, although a maximum of 16 characters is recommended for proper viewing in the <b>show system login</b> display.
<b>super-user</b>   <b>read-write</b>   <b>read-only</b>	Specifies the access privileges for this user.
<b>enable</b>   <b>disable</b>	Enables or disables the user account.

### Defaults

None.

### Mode

Switch command, super user.

### Example

This example shows how to enable a new user account with the login name “netops” with super user access privileges:

```
B2(su)->set system login netops super-user enable
```

## clear system login


Use this command to remove a local login user account.

### Syntax

```
clear system login username
```

### Parameters

<i>username</i>	Specifies the login name of the account to be cleared.
-----------------	--



**Note:** The default admin (su) account cannot be deleted.

**Defaults**

None.

**Mode**

Switch command, super user.

**Example**

This example shows how to remove the “netops” user account:

```
B2(su)->clear system login netops
```

**set password**

Use this command to change system default passwords or to set a new login password on the CLI.

**Syntax**

```
set password [username]
```

**Parameters**

<i>username</i>	(Only available to users with super-user access.) Specifies a system default or a user-configured login account name. By default, the SecureStack B2 switch provides the following account names:  <b>ro</b> for Read-Only access.  <b>rw</b> for Read-Write access.  <b>admin</b> for Super User access. (This access level allows Read-Write access to all modifiable parameters, including user accounts.)
-----------------	---

**Defaults**

None.

**Mode**

Switch command, read-write.

Switch command, super-user.

**Usage**

Read-Write users can change their own passwords.

Super Users (Admin) can change any password on the system.

**Examples**

This example shows how a super-user would change the Read-Write password from the system default (blank string):

```
B2(su)->set password rw
Please enter new password: *****
Please re-enter new password: *****
Password changed.
B2(su)->
```

This example shows how a user with Read-Write access would change his password:

```
B2(su)->set password
Please enter old password: *****
Please enter new password: *****
Please re-enter new password: *****
Password changed.
B2(su)->
```

## set system password length

Use this command to set the minimum user login password length.

### Syntax

```
set system password length characters
```

### Parameters

<i>characters</i>	Specifies the minimum number of characters for a user account password. Valid values are 0 to 40.
-------------------	---

### Defaults

None.

### Mode

Switch command, super user.

### Example

This example shows how to set the minimum system password length to 8 characters:

```
B2(su)->set system password length 8
```

## set system password aging

Use this command to set the number of days user passwords will remain valid before aging out, or to disable user account password aging.

### Syntax

```
set system password aging {days | disable}
```

### Parameters

<i>days</i>	Specifies the number of days user passwords will remain valid before aging out. Valid values are 1 to 365.
<b>disable</b>	Disables password aging.

### Defaults

None.

### Mode

Switch command, super user.

### Example

This example shows how to set the system password age time to 45 days:

```
B2(su)->set system password aging 45
```

## set system password history

Use this command to set the number of previously used user login passwords that will be checked for password duplication. This prevents duplicate passwords from being entered into the system with the **set password** command.

### Syntax

```
set system password history size
```

### Parameters

<i>size</i>	Specifies the number of passwords checked for duplication. Valid values are 0 to 10.
-------------	--

### Defaults

None.

### Mode

Switch command, super user.

### Example

This example shows how to configure the system to check the last 10 passwords for duplication

```
B2(su)->set system password history 10
```

## show system logout

Use this command to display settings for locking out users after failed attempts to log in to the system.

### Syntax

```
show system logout
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, super user.



## Example

This example shows how to display user lockout settings. In this case, switch defaults have not been changed:

```
B2(su)->show system logout
Logout attempts: 3
Logout time:      15 minutes.
```

[Table 3-3](#) provides an explanation of the command output. These settings are configured with the **set system logout** command ("[set system logout](#)" on page 3-7).

**Table 3-3 show system logout Output Details**

Output	What It Displays...
Logout attempts	Number of failed login attempts allowed before a read-write or read-only user's account will be disabled.
Logout time	Number of minutes the default admin user account will be locked out after the maximum login attempts.

## set system logout

Use this command to set the number of failed login attempts before locking out (disabling) a read-write or read-only user account, and the number of minutes to lockout the default admin super user account after maximum login attempts. Once a user account is locked out, it can only be re-enabled by a super user with the **set system login** command ([page 3-3](#)).

### Syntax

```
set system logout {[attempts attempts] [time time]}
```

### Parameters

<b>attempts</b> <i>attempts</i>	Specifies the number of failed login attempts allowed before a read-write or read-only user's account will be disabled. Valid values are 1 to 10.
<b>time</b> <i>time</i>	Specifies the number of minutes the default admin user account will be locked out after the maximum login attempts. Valid values are 0 to 60.

### Defaults

None.

### Mode

Switch command, super user.

### Example

This example shows how to set login attempts to 5 and lockout time to 30 minutes:

```
B2(su)->set system logout attempts 5 time 30
```

# Setting Basic Switch Properties

## Purpose

To display and set the system IP address and other basic system (switch) properties.

## Commands

The commands used to set basic system information are listed below.

For information about...	Refer to page...
show ip address	<a href="#">3-9</a>
set ip address	<a href="#">3-9</a>
clear ip address	<a href="#">3-10</a>
show ip protocol	<a href="#">3-10</a>
set ip protocol	<a href="#">3-11</a>
show system	<a href="#">3-11</a>
show system hardware	<a href="#">3-12</a>
show system utilization	<a href="#">3-13</a>
set system enhancedbuffermode	<a href="#">3-14</a>
show time	<a href="#">3-15</a>
set time	<a href="#">3-15</a>
show summertime	<a href="#">3-16</a>
set summertime	<a href="#">3-16</a>
set summertime date	<a href="#">3-17</a>
set summertime recurring	<a href="#">3-17</a>
clear summertime	<a href="#">3-18</a>
set prompt	<a href="#">3-19</a>
show banner motd	<a href="#">3-19</a>
set banner motd	<a href="#">3-20</a>
clear banner motd	<a href="#">3-20</a>
show version	<a href="#">3-21</a>
set system name	<a href="#">3-22</a>
set system location	<a href="#">3-22</a>
set system contact	<a href="#">3-23</a>
set width	<a href="#">3-23</a>
set length	<a href="#">3-24</a>
show logout	<a href="#">3-24</a>
set logout	<a href="#">3-25</a>

For information about...	Refer to page...
show console	<a href="#">3-25</a>
set console baud	<a href="#">3-26</a>

## show ip address

Use this command to display the system IP address and subnet mask.

### Syntax

```
show ip address
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the system IP address and subnet mask:

```
B2(su)->show ip address
Name                               Address                               Mask
-----
host                               10.42.13.20                          255.255.0.0
```

## set ip address

Use this command to set the system IP address, subnet mask and default gateway.

### Syntax

```
set ip address ip-address [mask ip-mask] [gateway ip-gateway]
```

### Parameters

<i>ip-address</i>	Sets the IP address for the system. For SecureStack B2 systems, this is the IP address of the management switch as described in “ <a href="#">About SecureStack B2 Switch Operation in a Stack</a> ” on page 2-1.
<b>mask</b> <i>ip-mask</i>	(Optional) Sets the system’s subnet mask.
<b>gateway</b> <i>ip-gateway</i>	(Optional) Sets the system’s default gateway (next-hop device).

### Defaults

If not specified, *ip-mask* will be set to the natural mask of the *ip-address* and *ip-gateway* will be set to the *ip-address*.

**Mode**

Switch command, read-write.

**Example**

This example shows how to set the system IP address to 10.1.10.1 with a mask of 255.255.128.0 and a default gateway of 10.1.0.1:

```
B2(su)->set ip address 10.1.10.1 mask 255.255.128.0 gateway 10.1.0.1
```

## clear ip address

Use this command to clear the system IP address.

**Syntax**

```
clear ip address
```

**Parameters**

None.

**Defaults**

None.

**Mode**

Switch command, read-write.

**Example**

This example shows how to clear the system IP address:

```
B2(rw)->clear ip address
```

## show ip protocol

Use this command to display the method used to acquire a network IP address for switch management.

**Syntax**

```
show ip protocol
```

**Parameters**

None.

**Defaults**

None.

**Mode**

Switch command, read-only.

## Example

This example shows how to display the method used to acquire a network IP address:

```
B2(su)->show ip protocol
System IP address acquisition method: dhcp
```

## set ip protocol

Use this command to specify the protocol used to acquire a network IP address for switch management.

### Syntax

```
set ip protocol {bootp | dhcp | none}
```

### Parameters

<b>bootp</b>	Selects BOOTP as the protocol to use to acquire the system IP address.
<b>dhcp</b>	Selects DHCP as the protocol to use to acquire the system IP address.
<b>none</b>	No protocol will be used to acquire the system IP address.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the method used to acquire a network IP address to DHCP.

```
B2(su)->set ip protocol dhcp
```

## show system

Use this command to display system information, including contact information, power and fan tray status and uptime.

### Syntax

```
show system
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

Example

This example shows how to display system information:

```
B2(su)->show system
System contact:
System location:
System name:
Primary PS Status          Secondary PS Status
-----
Ok                          Not Installed
Fan1-Status                Fan2-Status
-----
Ok                          Ok
Fan3-Status
-----
Ok
Thermal Sensor 1
-----
+28 degrees Celsius (82 degrees Fahrenheit)
Thermal Sensor 2
-----
+31 degrees Celsius (87 degrees Fahrenheit)

Uptime d,h:m:s  Logout
-----
0,0:26:52      3 min
```

Table 3-4 provides an explanation of the command output.

Table 3-4 show system Output Details

Output	What It Displays...
System contact	Contact person for the system. Default of a blank string can be changed with the <b>set system contact</b> command (" <a href="#">set system contact</a> " on page 3-23).
System location	Where the system is located. Default of a blank string can be changed with the <b>set system location</b> command (" <a href="#">set system location</a> " on page 3-22).
System name	Name identifying the system. Default of a blank string can be changed with the <b>set system name</b> command (" <a href="#">set system name</a> " on page 3-22).
Primary PS Status	Operational status for the primary power supply.
Fan Status	Operational status of the fan trays.
Thermal Sensor	Temperature reading from thermal sensor(s).
Uptime d,h:m:s	System uptime.
Logout	Time an idle console or Telnet CLI session will remain connected before timing out. Default of 5 minutes can be changed with the <b>set logout</b> command (" <a href="#">set logout</a> " on page 3-25).

show system hardware

Use this command to display the system’s hardware configuration.

Syntax

```
show system hardware
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the system's hardware configuration. Please note that the information you see displayed may differ from this example.

```
B2(su)->show system hardware
SLOT HARDWARE INFORMATION
-----
Model:                               B2G124-24
Serial Number:                       041800129041
Vendor ID:                           0x0e10
Base MAC Address:                     00:01:F4:5F:1D:E0
Hardware Version:                     BCM56504 REV 19
FirmWare Version:                     4.1.xx
Boot Code Version:                    01.00.17
```

# show system utilization

Use this command to display detailed information about the processor running on the switch, or the overall memory usage of the Flash and SDRAM storage devices on the unit, or the processes running on the switch. Only the memory usage in the master unit of a stack is shown.

## Syntax

```
show system utilization {cpu | storage | process}
```

## Parameters

<b>cpu</b>	Display information about the processor running on the switch.
<b>storage</b>	Display information about the overall memory usage on the switch.
<b>process</b>	Display information about the processes running on the switch.

## Defaults

None.

## Mode

Switch command, read-only.

## Examples

This example shows how to display the system's CPU utilization:

```
B2(ro)->show system utilization cpu
Total CPU Utilization:
```

Switch	CPU	5 sec	1 min	5 min
1	1	3%	1%	1%

This example shows how to display the system's overall memory usage:

```
B2(ro)->show system utilization storage
Storage Utilization:
```

Type	Description	Size(Kb)	Available (Kb)
RAM	RAM device	262144	97173
Flash	Images, Config, Other	31095	8094

This example shows how to display information about the processes running on the system. Only partial output is shown.

```
B2(ro)->show system utilization process
```

TID	Name	5Sec	1Min	5Min
8d45148	captureTask	0.00%	0.00%	0.00%
8e264f8	poe_monitor	0.00%	0.01%	0.05%
8ea6d38	poe_read	0.80%	0.22%	0.20%
8eb7140	vlanDynEg	0.00%	0.00%	0.00%
8f0be10	tcdpSendTask	0.00%	0.00%	0.00%
8f1c0e8	tcdpTask	0.00%	0.00%	0.00%

## set system enhancedbuffermode

Use this command to enable or disable enhanced buffer mode, which optimizes buffer distribution for non-stacking single CoS queue operation. Executing this command will reset the switch, so the system prompts you to confirm whether you want to proceed.

### Syntax

```
set system enhancedbuffermode {enable | disable}
```

### Parameters

---

<b>enable   disable</b>	Enables or disables enhanced buffer mode.
-------------------------	---

---

### Defaults

None.

### Mode

Switch command, read-write.



## Example

This example shows how to enable enhanced buffer mode:

```
B2(su)->set system enhancedbuffermode enable
```

Changes in the enhanced buffer mode will require resetting this unit.  
Are you sure you want to continue? (y/n)

## show time

Use this command to display the current time of day in the system clock.

### Syntax

```
show time
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the current time. The output shows the day of the week, month, day, and the time of day in hours, minutes, and seconds and the year:

```
B2(su)->show time
THU SEP 05 09:21:57 2002
```

## set time

Use this command to change the time of day on the system clock.

### Syntax

```
set time [mm/dd/yyyy] [hh:mm:ss]
```

### Parameters

[mm/dd/yyyy]	Sets the time in:
[hh:mm:ss]	month, day, year and/or
	24-hour format
	At least one set of time parameters must be entered.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the system clock to 7:50 a.m:

```
B2(su)->set time 7:50:00
```

## show summertime

Use this command to display daylight savings time settings.

### Syntax

```
show summertime
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display daylight savings time settings:

```
B2(su)->show summertime
Summertime is disabled and set to ''
Start : SUN APR 04 02:00:00 2004
End   : SUN OCT 31 02:00:00 2004
Offset: 60 minutes (1 hours 0 minutes)
Recurring: yes, starting at 2:00 of the first Sunday of April and ending at 2:00
of the last Sunday of October
```

## set summertime

Use this command to enable or disable the daylight savings time function.

### Syntax

```
set summertime {enable | disable} [zone]
```

### Parameters

<b>enable   disable</b>	Enables or disables the daylight savings time function.
<i>zone</i>	(Optional) Applies a name to the daylight savings time settings.

### Defaults

If a *zone* name is not specified, none will be applied.

## Mode

Switch command, read-only.

## Example

This example shows how to enable daylight savings time function:

```
B2(su)->set summertime enable
```

# set summertime date

Use this command to configure specific dates to start and stop daylight savings time. These settings will be non-recurring and will have to be reset annually.

## Syntax

```
set summertime date start_month start_date start_year start_hr_min end_month  
end_date end_year end_hr_min [offset_minutes]
```

## Parameters

<i>start_month</i>	Specifies the month of the year to start daylight savings time.
<i>start_date</i>	Specifies the day of the month to start daylight savings time.
<i>start_year</i>	Specifies the year to start daylight savings time.
<i>start_hr_min</i>	Specifies the time of day to start daylight savings time. Format is hh:mm.
<i>end_month</i>	Specifies the month of the year to end daylight savings time.
<i>end_date</i>	Specifies the day of the month to end daylight savings time.
<i>end_year</i>	Specifies the year to end daylight savings time.
<i>end_hr_min</i>	Specifies the time of day to end daylight savings time. Format is hh:mm.
<i>offset_minutes</i>	(Optional) Specifies the amount of time in minutes to offset daylight savings time from the non-daylight savings time system setting. Valid values are 1 - 1440.

## Defaults

If an *offset* is not specified, none will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to set a daylight savings time start date of April 4, 2004 at 2 a.m. and an ending date of October 31, 2004 at 2 a.m. with an offset time of one hour:

```
B2(su)->set summertime date April 4 2004 02:00 October 31 2004 02:00 60
```

# set summertime recurring

Use this command to configure recurring daylight savings time settings. These settings will start and stop daylight savings time at the specified day of the month and hour each year and will not have to be reset annually.

## Syntax

```
set summertime recurring start_week start_day start_month start_hr_min end_week  
end_day end_month end_hr_min [offset_minutes]
```

## Parameters

<i>start_week</i>	Specifies the week of the month to restart daylight savings time. Valid values are: first, second, third, fourth, and last.
<i>start_day</i>	Specifies the day of the week to restart daylight savings time.
<i>start_hr_min</i>	Specifies the time of day to restart daylight savings time. Format is hh:mm.
<i>end_week</i>	Specifies the week of the month to end daylight savings time.
<i>end_day</i>	Specifies the day of the week to end daylight savings time.
<i>end_hr_min</i>	Specifies the time of day to end daylight savings time. Format is hh:mm.
<i>offset_minutes</i>	(Optional) Specifies the amount of time in minutes to offset daylight savings time from the non-daylight savings time system setting. Valid values are 1 - 1440.

## Defaults

If an *offset* is not specified, none will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how set daylight savings time to recur starting on the first Sunday of April at 2 a.m. and ending the last Sunday of October at 2 a.m. with an offset time of one hour:

```
B2(su)->set summertime recurring first Sunday April 02:00 last Sunday October  
02:00 60
```

# clear summertime

Use this command to clear the daylight savings time configuration.

## Syntax

```
clear summertime
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the daylight savings time configuration:

```
B2(su)->clear summertime
```

## set prompt

Use this command to modify the command prompt.

### Syntax

```
set prompt prompt_string
```

### Parameters

<i>prompt_string</i>	Specifies a text string for the command prompt.
----------------------	---



**Note:** A prompt string containing a space in the text must be enclosed in quotes as shown in the example below.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the command prompt to Switch 1:

```
B2(su)->set prompt "Switch 1"
Switch 1(su)->
```

## show banner motd

Use this command to show the banner message of the day that will display at session login.

### Syntax

```
show banner motd
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

## Example

This example shows how to display the banner message of the day:

```
B2(rw)->show banner motd
O Knights of Ni, you are just and
fair, and we will return with a shrubbery
-King Arthur
```

## set banner motd

Use this command to set the banner message of the day displayed at session login.

### Syntax

```
set banner motd message
```

### Parameters

<i>message</i>	Specifies a message of the day. This is a text string that needs to be in double quotes if any spaces are used. Use a \n for a new line and \t for a tab (eight spaces).
----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the message of the day banner to read “O Knights of Ni, you are just and fair, and we will return with a shrubbery - King Arthur”:

```
B2(rw)->set banner motd "O Knights of Ni, you are just and \n fair, and we will
return with a shrubbery \n \t -King Arthur"
```

## clear banner motd

Use this command to clear the banner message of the day displayed at session login to a blank string.

### Syntax

```
clear banner motd
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

## Example

This example shows how to clear the message of the day banner to a blank string:

```
B2(rw)->clear banner motd
```

## show version

Use this command to display hardware and firmware information. Refer to [“Downloading a New Firmware Image”](#) on page 3-34 for instructions on how to download a firmware image.

### Syntax

```
show version
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

## Example

This example shows how to display version information. Please note that you may see different information displayed, depending on the type of hardware.

```
B2(su)->show version
```

```
Copyright (c) 2007 by Enterasys Networks, Inc.
```

Model	Serial #	Versions
B2G124-48P	001188021035	Hw:BCM5665 REV 17 Bp:01.00.29 Fw:4.1.xx BuFw:03.01.13 PoE:500_3

[Table 3-5](#) provides an explanation of the command output.

**Table 3-5 show version Output Details**

Output	What It Displays...
Model	Switch's model number.
Serial #	Serial number of the switch.
Versions	<ul style="list-style-type: none"> <li>Hw: Hardware version number.</li> <li>Bp: BootPROM version.</li> <li>Fw: Current firmware version number.</li> <li>BuFw: Backup firmware version number.</li> <li>PoE: Power over Ethernet driver version. (Displays only for PoE switches.)</li> </ul>

## set system name

Use this command to configure a name for the system.

### Syntax

```
set system name [string]
```

### Parameters

---

*string*

(Optional) Specifies a text string that identifies the system.



**Note:** A name string containing a space in the text must be enclosed in quotes as shown in the example below.

---

### Defaults

If *string* is not specified, the system name will be cleared.

### Mode

Switch command, read-write.

### Example

This example shows how to set the system name to Information Systems:

```
B2(su)->set system name "Information Systems"
```

## set system location

Use this command to identify the location of the system.

### Syntax

```
set system location [string]
```

### Parameters

---

*string*

(Optional) Specifies a text string that indicates where the system is located.



**Note:** A location string containing a space in the text must be enclosed in quotes as shown in the example below.

---

### Defaults

If *string* is not specified, the location name will be cleared.

### Mode

Switch command, read-write.

### Example

This example shows how to set the system location string:

```
B2(su)->set system location "Bldg N32-04 Closet 9"
```



## set system contact

Use this command to identify a contact person for the system.

### Syntax

```
set system contact [string]
```

### Parameters

<i>string</i>	(Optional) Specifies a text string that contains the name of the person to contact for system administration.
---------------	---



**Note:** A contact string containing a space in the text must be enclosed in quotes as shown in the example below.

### Defaults

If *string* is not specified, the contact name will be cleared.

### Mode

Switch command, read-write.

### Example

This example shows how to set the system contact string:

```
B2(su)->set system contact "Joe Smith"
```

## set width

Use this command to set the number of columns for the terminal connected to the switch's console port.

### Syntax

```
set width screenwidth [default]
```

### Parameters

<i>screenwidth</i>	Sets the number of terminal columns. Valid values are 50 to 150.
<i>default</i>	(Optional) Makes this setting persistent for all future sessions (written to NV-RAM).

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The number of rows of CLI output displayed is set using the **set length** command as described in "[set length](#)" on page 3-24.

## Example

This example shows how to set the terminal columns to 50:

```
B2(su)->set width 50
```

## set length

Use this command to set the number of lines the CLI will display. This command is persistent (written to NV-RAM).

### Syntax

```
set length screenlength
```

### Parameters

<i>screenlength</i>	Sets the number of lines in the CLI display. Valid values are 0, which disables the scrolling screen feature described in “ <a href="#">Displaying Scrolling Screens</a> ” on page 1-8, and from 5 to 512.
---------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the terminal length to 50:

```
B2(su)->set length 50
```

## show logout

Use this command to display the time (in seconds) an idle console or Telnet CLI session will remain connected before timing out.

### Syntax

```
show logout
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the CLI logout setting:

```
B2(su)->show logout
Logout currently set to: 10 minutes.
```

## set logout

Use this command to set the time (in minutes) an idle console or Telnet CLI session will remain connected before timing out.

### Syntax

```
set logout timeout
```

### Parameters

<i>timeout</i>	Sets the number of minutes the system will remain idle before timing out.
----------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the system timeout to 10 minutes:

```
B2(su)->set logout 10
```

## show console

Use this command to display console settings.

### Syntax

```
show console [baud] [bits] [flowcontrol] [parity] [stopbits]
```

### Parameters

<b>baud</b>	(Optional) Displays the input/output baud rate.
<b>bits</b>	(Optional) Displays the number of bits per character.
<b>flowcontrol</b>	(Optional) Displays the type of flow control.
<b>parity</b>	(Optional) Displays the type of parity.
<b>stopbits</b>	(Optional) Displays the number of stop bits.

### Defaults

If no parameters are specified, all settings will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display all console settings:

```
B2(su)->show console
Baud      Flow      Bits  StopBits  Parity
-----  -
9600      Disable  8      1          none
```

## set console baud

Use this command to set the console port baud rate.

### Syntax

```
set console baud rate
```

### Parameters

<i>rate</i>	Sets the console baud rate. Valid values are: 300, 600, 1200, 2400, 4800, 5760, 9600, 14400, 19200, 38400, and 115200.
-------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the console port baud rate to 19200:

```
B2(su)->set console baud 19200
```

## Activating Licensed Features

In order to enable the B2 advanced features, such as Policy, you must purchase and activate a license key. If you have purchased a license, you can proceed to activate your license as described in this section. If you wish to obtain a permanent or evaluation license, use the Enterasys Customer Portal or contact the Enterasys Networks Sales Department.



**Note:** All members of a stack must be licensed in order to support licensed features in a stack environment. If the master unit in a stack has an activated license, all member units also must have an activated license in order to operate. If the master unit in a stack does not have an activated license, then the licensed functionality will not be available to member units, even if they have licenses installed.

## License Key Field Descriptions

When Enterasys supplies a license, it will be sent to you as a character string similar to the following:

```
INCREMENT B2Policy 2006.0127 27-jan-2011 0123456789AB 0123456789AB
```

The contents of the six fields, from the left, indicate:

- **Type**—the type of license. For the SecureStack B2, the value in this field is always “INCREMENT.”
- **Feature**—description of the feature being licensed. For example, “B2Policy” as shown in the character string above.
- **Date-based version (DBV)**—a date-related string. For the SecureStack B2, the value in this field is not significant.
- **Expiration type**—indicates whether the license is a permanent or an evaluation license. If the license is an evaluation license, this field will contain the expiration date of the license. If the license is a permanent license, this field will contain the word “permanent.”
- **Key**—the license key.
- **Host ID**—the serial number of the switch to which this license applies.

When activating licenses on SecureStack devices, we recommend that you copy and paste the license character string, rather than entering the text manually.

## Licensing Procedure in a Stack Environment

The licenses for all members of an operating stack can be activated during a single CLI session, by following these steps:

1. Obtain valid licenses for all members of the stack from the Enterasys Customer Portal.
2. Optionally, note the serial numbers of the switches in the stack. You can use the **show system hardware** command (page 3-12) to display the switch serial numbers.



**Note:** Since license keys are applied to the correct stack member switch automatically, based on the switch serial number that is part of the license string, you should know the serial numbers of the switches in order to enable the licenses of the member switches first, before the master unit.

3. Enable the licenses on the stack members first, before enabling the master unit, using the **set license** command (page 3-28). For example:

```
B2(rw)->set license INCREMENT B2Policy 2006.0127 27-jan-2011 0123456789AB
0123456789AB
```

4. Enable the license on the switch master unit last, using the **set license** command.

## Adding a New Member to a Licensed Stack

When a SecureStack B2 switch without a license is added to a stack that has licensing enabled, the ports on the new switch will not pass traffic until a license has been applied to the new switch. To add a new member to a licensed stack:

1. Obtain a license for the new switch from the Enterasys Customer Portal.
2. Add the new unit to the stack, following the procedure in “[Adding a New Unit to an Existing Stack](#)” on page 2-3.
3. Use the **set license** command to install and activate the new switch’s license. The new switch will then join the stack and its ports will be attached.

Alternatively, you can install and activate the new switch’s license first, before adding the switch to the stack.

## Clearing, Showing, and Moving Licenses

Licenses can be displayed, applied, and cleared only with the license commands described in this chapter. General configuration commands such as **show config** or **clear config** do not apply to licenses.

Every license is associated with a specific hardware platform, based on the serial number of the hardware platform. If you need to move a license from one hardware platform to another, you must contact Enterasys Customer Support to arrange for re-hosting of the license.

## Commands

The commands used to activate and verify licensed features are listed below.

For information about...	Refer to page...
<a href="#">set license</a>	3-28
<a href="#">show license</a>	3-29
<a href="#">clear license</a>	3-30

## set license

Use this command to activate the SecureStack B2 licensed features.

### Syntax

```
set license type feature DBV expiration key hostid
```

### Parameters

<i>type</i>	Specifies the type of license. For the SecureStack B2, the value in this field is always INCREMENT.
<i>feature</i>	The name of the feature being licensed.
<i>DBV</i>	A date-related string generated as part of the license.
<i>expiration</i>	Indicates whether the license is a permanent or an evaluation license. If the license is an evaluation license, this field will contain the expiration date of the license. If the license is a permanent license, this field will contain the word “permanent.”
<i>key</i>	The license key.
<i>hostid</i>	The serial number of the switch to which this license applies.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

If multiple switches are used in a stack, an individual license is required for each stack member. Refer to “[Licensing Procedure in a Stack Environment](#)” on page 3-27 for more information.

When activating licenses with this command, Enterasys Networks recommends that you copy and paste the entire license character string, rather than enter the text manually. If you enter the character string manually, ensure that you exactly match the capitalization of the character string sent to you.

Every license is associated with a specific hardware platform, based on the serial number of the hardware platform. If you need to move a license from one hardware platform to another, you must contact Enterasys Customer Support to arrange for re-hosting of the license.

## Example

This example shows how to activate a permanent license key on the switch with serial number 045100039001. In this example, the switch is a stand-alone unit so its unit number is 1.

```
B2(rw)->set license INCREMENT B2Policy 2006.0728 permanent 31173CAC6495
045100039001
Validating license on unit 1
License successfully validated and set on unit 1
B2(rw)->
```

## show license

Use this command to display license key information for switches with activated licenses.

## Syntax

```
show license [unit number]
```

## Parameters

<b>unit number</b>	(Optional) Specifies the switch in a stack for which to display license information.  Refer to <a href="#">Chapter 2, Configuring Switches in a Stack</a> , for more information about stack unit IDs, or numbers.
--------------------	--

## Defaults

If no unit number is specified, license key information for all switches in the stack is displayed.

## Mode

Switch command, read-only.

## Usage

Licenses can be displayed, applied, and cleared only with the license commands described in this chapter. General configuration commands such as **show config** or **clear config** do not affect licenses.

## Example

This example shows how to display license key information for switch unit 1 in the stack.

```
B2(ro)->show license unit 1
unit 1
key: INCREMENT B2Policy 2006.0728 permanent 31173CAC6495 045100039001
status: Active
```

# clear license

Use this command to clear the license key settings. If multiple switches are used in the stack, you can use the **all** parameter to clear all the switches at once.

## Syntax

```
clear license featureId feature {all | unit number}
```

## Parameters

<b>featureID</b> <i>feature</i>	The name of the feature being cleared.
<b>all</b>	Clears the license key settings on all units in the stack.
<b>unit</b> <i>number</i>	Clears the license key settings on the specified switch. Unit <i>number</i> can range from 1 to 8.  Refer to <a href="#">Chapter 2, Configuring Switches in a Stack</a> for more information about stack unit IDs, or numbers.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

If you clear a license from a member unit in a stack while the master unit has an activated license, the status of the member unit will change to “ConfigMismatch” and its ports will be detached from the stack (that is, will not pass traffic).

If you clear a license from the master unit of a stack, the member units will remain attached to the stack but the licensed functionality will no longer be available to the member units, even if they have licenses installed.

Licenses can be displayed, applied, and cleared only with the license commands described in this chapter. General configuration commands such as **show config** or **clear config** do not affect licenses.

## Examples

This example shows how to clear the B2Policy licensed feature on stack unit 3.

```
B2(rw)->clear license featureId B2Policy unit 3
```

This example shows how to clear the B2Policy licensed feature on all the units in a stack:

```
B2(rw)->clear license featureId B2Policy all
```



# Configuring Power over Ethernet (PoE)

## Important Notice

This section applies only to PoE-equipped SecureStack B2 devices. Consult the Installation Guide shipped with your product to determine if it is PoE-equipped.

## Purpose

To review and set PoE parameters, including the power available to the system, the usage threshold for each module, whether or not SNMP trap messages will be sent when power status changes, and per-port PoE settings.

## Commands

The commands used to review and set PoE port parameters are listed below.

For information about...	Refer to page...
show inlinepower	<a href="#">3-31</a>
set inlinepower threshold	<a href="#">3-32</a>
set inlinepower trap	<a href="#">3-32</a>
show port inlinepower	<a href="#">3-33</a>
set port inlinepower	<a href="#">3-33</a>

## show inlinepower

Use this command to display switch PoE properties.

### Syntax

```
show inlinepower
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display switch PoE properties. In this case, modules in slots 2 and 3 are PoE modules, so their power configurations display:

```
B2(su)->show inlinepower
Detection Mode      : auto
Total Power Detected : 400 Watts
Total Power Available : 250 Watts
Total Power Assigned : 0 Watts
Power Allocation Mode : auto
Power Trap Status    : enable
Power Redundancy Status: not redundant
Power Supply 1 Status : Ok
Power Supply 2 Status : Not Installed
```

Slot	Status	Power(W)	Consumption(W)	Usage(%)	Threshold(%)	Trap
----	-----	-----	-----	-----	-----	----
2	auto	360	0.00	0.00	80	enable
3	auto	360	5.20	1.44	80	enable

## set inlinepower threshold

Use this command to set the PoE usage threshold on a specified unit or module.

### Syntax

```
set inlinepower threshold usage-threshold unit-number
```

### Parameters

<i>threshold value</i>	Specifies a PoE threshold as a percentage of total system power usage. Valid values are <b>11</b> to <b>100</b> .
<i>module-number</i>	Specifies the module on which to set the PoE threshold.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the PoE threshold to 50 on module/unit 1:

```
B2(su)->set inlinepower threshold 50 1
```

## set inlinepower trap

Use this command to enable or disable the sending of an SNMP trap message for a unit or module whenever the status of its ports changes, or whenever the unit's PoE usage threshold is crossed. The unit's PoE usage threshold must be set using the **set inlinepower threshold** command as described on page [3-32](#).

## Syntax

```
set inlinepower trap {disable | enable} module-number
```

## Parameters

<b>disable   enable</b>	Disables or enables PoE trap messaging.
<i>module-number</i>	Specifies the module on which to disable or enable trap messaging.

## Mode

Switch command, read-write.

## Example

This example shows how to enable PoE trap messaging on module 1:

```
B2(su)->set inlinepower trap enable 1
```

# show port inlinepower

Use this command to display all ports supporting PoE.

## Syntax

```
show port inlinepower [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays information for specific PoE port(s).
--------------------	---

## Defaults

If not specified, information for all PoE ports will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display PoE information for port `ge.2.1`. In this case, the port's administrative state, PoE priority and class have not been changed from default values:

```
B2(su)->show port inlinepower ge.2.1
```

Port	Type	Admin	Oper	Priority	Class	Power (W)
----	----	-----	----	-----	-----	-----
ge.2.1	wireless	auto	searching	low	0	360

# set port inlinepower

Use this command to configure PoE parameters on one or more ports.

## Syntax

```
set port inlinepower port-string [{admin {off | auto}}] [priority {critical | high  
| low}] [type type]
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to configure PoE.
<b>admin</b> <i>off</i>   <i>auto</i>	Sets the PoE administrative state to off (disabled) or auto (on).
<b>priority</b> <i>critical</i>   <i>high</i>   <i>low</i>	Sets the port(s) priority for the PoE allocation algorithm to critical (highest), high or low.
<b>type</b> <i>type</i>	Specifies a string describing the type of device connected to a port.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable PoE on port `ge.3.1` with critical priority:

```
B2(su)->set port inlinepower ge.3.1 admin auto priority critical
```

# Downloading a New Firmware Image

You can upgrade the operational firmware in the SecureStack B2 switch without physically opening the switch or being in the same location. There are two ways to download firmware to the switch:

- Via TFTP download. This procedure uses a TFTP server connected to the network and downloads the firmware using the TFTP protocol. For details on how to perform a TFTP download using the **copy** command, refer to “[copy](#)” on page 3-45. For information on setting TFTP timeout and retry parameters, refer to “[set tftp timeout](#)” on page 3-47 and “[set tftp retry](#)” on page 3-48.
- Via the serial (console) port. This procedure is an out-of-band operation that copies the firmware through the serial port to the switch. It should be used in cases when you cannot connect the switch to perform the in-band **copy** download procedure via TFTP. Serial console download has been successfully tested with the following applications:
  - HyperTerminal Copyright 1999
  - Tera Term Pro Version 2.3

Any other terminal applications may work but are not explicitly supported.

The B2 switch allows you to download and store dual images. The backup image can be downloaded and selected as the startup image by using the commands described in this section.

## Downloading from a TFTP Server

To perform a TFTP download, proceed as follows:

1. If you have not already done so, set the switch’s IP address using the **set ip address** command as detailed in “[set ip address](#)” on page 3-9.
2. Download a new image file using the **copy** command as detailed in “[copy](#)” on page 3-45.

## Downloading via the Serial Port

To download switch firmware via the serial (console) port, proceed as follows:

1. With the console port connected, power up the switch. The following message displays:

```
Version 01.00.29 05-09-2005

Computing MD5 Checksum of operational code...
Select an option. If no selection in 2 seconds then
operational code will start.

1 - Start operational code.
2 - Start Boot Menu.
Select (1, 2):2

Password: *****
```

2. Before the boot up completes, type **2** to select “Start Boot Menu”. Use “administrator” for the Password.



**Note:** The above “Boot Menu” password “administrator” can be changed using boot menu option 11.

```
Boot Menu Version 01.00.29 05-09-2005

Options available
1 - Start operational code
2 - Change baud rate
3 - Retrieve event log using XMODEM (64KB).
4 - Load new operational code using XMODEM
5 - Display operational code vital product data
6 - Run Flash Diagnostics
7 - Update Boot Code
8 - Delete operational code
9 - Reset the system
10 - Restore Configuration to factory defaults (delete config files)
11 - Set new Boot Code password
[Boot Menu] 2
```

3. Type **2**. The following baud rate selection screen displays:

```
1 - 1200
2 - 2400
3 - 4800
4 - 9600
5 - 19200
6 - 38400
7 - 57600
8 - 115200
0 - no change
```

4. Type **8** to set the switch baud rate to 115200. The following message displays:  
Setting baud rate to 115200, you must change your terminal baud rate.
5. Set the terminal baud rate to **115200** and press ENTER.

6. From the boot menu options screen, type **4** to load new operational code using XMODEM. When the XMODEM transfer is complete, the following message and header information will display:

```
[Boot Menu] 4
Ready to receive the file with XMODEM/CRC....
Ready to RECEIVE File xcode.bin in binary mode
Send several Control-X characters to cCKCKCKCKCKCKCK
```

```
XMODEM transfer complete, checking CRC....
Verified operational code CRC.
```

The following Enterasys Header is in the image:

```
MD5 Checksum.....fe967970996c4c8c43a10cd1cd7be99a
Boot File Identifier.....0x0517
Header Version.....0x0100
Image Type.....0x82
Image Offset.....0x004d
Image length.....0x006053b3
Ident Strings Length.....0x0028
Ident Strings.....
B2G124-24
B2G124-48
B2H124-48
B2K124_24
Image Version Length.....0x7
Image Version Bytes.....0x30 0x2e 0x35 0x2e 0x30 0x2e 0x34 (0.5.0.4)
```

7. From the boot menu options screen, type **2** to display the baud rate selection screen again.
8. Type **4** set the switch baud rate to **9600**. The following message displays:  
Setting baud rate to 9600, you must change your terminal baud rate.
9. Set the terminal baud rate to **9600** and press ENTER.
10. From the boot menu options screen, type **1** to start the new operational code. The following message displays:

```
Operational Code Date: Tue Jun 29 08:34:05 2004
Uncompressing.....
```

## Reviewing and Selecting a Boot Firmware Image

### Purpose

To display and set the image file the switch loads at startup. The B2 switch allows you to download and store a backup image, which can be selected as the startup image by using the commands described in this section.

## Commands

The commands used to review and select the switch's boot image file are listed below.

For information about...	Refer to page...
show boot system	<a href="#">3-37</a>
set boot system	<a href="#">3-37</a>

## show boot system

Use this command to display the firmware image the switch loads at startup.

### Syntax

```
show boot system
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the switch's boot firmware image:

```
B2(su)->show boot system
Current system image to boot: bootfile
```

## set boot system

Use this command to set the firmware image the switch loads at startup.

### Syntax

```
set boot system filename
```

### Parameters

<i>filename</i>	Specifies the name of the firmware image file.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the boot firmware image file to “newimage”:

```
B2(su)->set boot system newimage
```

## Starting and Configuring Telnet

### Purpose

To enable or disable Telnet, and to start a Telnet session to a remote host. The SecureStack B2 switch allows a total of four inbound and / or outbound Telnet session to run simultaneously.

### Commands

The commands used to enable, start and configure Telnet are listed below.

For information about...	Refer to page...
show telnet	<a href="#">3-38</a>
set telnet	<a href="#">3-38</a>
telnet	<a href="#">3-39</a>

### show telnet

Use this command to display the status of Telnet on the switch.

#### Syntax

```
show telnet
```

#### Parameters

None.

#### Defaults

None.

#### Mode

Switch command, read-only.

### Example

This example shows how to display Telnet status:

```
B2(su)->show telnet
Telnet inbound is currently: ENABLED
Telnet outbound is currently: ENABLED
```

### set telnet

Use this command to enable or disable Telnet on the switch.



## Syntax

```
set telnet {enable | disable} [inbound | outbound | all]
```

## Parameters

<b>enable   disable</b>	Enables or disables Telnet services.
<b>inbound   outbound   all</b>	(Optional) Specifies inbound service (the ability to Telnet to this switch), outbound service (the ability to Telnet to other devices), or all (both inbound and outbound).

## Defaults

If not specified, both inbound and outbound Telnet service will be enabled or disabled.

## Mode

Switch command, read-write.

## Example

This example shows how to disable inbound and outbound Telnet services:

```
B2(su)->set telnet disable all
Disconnect all telnet sessions and disable now (y/n)? [n]: y
All telnet sessions have been terminated, telnet is now disabled.
```

# telnet

Use this command to start a Telnet connection to a remote host. The SecureStack B2 switch allows a total of four inbound and / or outbound Telnet session to run simultaneously.

## Syntax

```
telnet host [port]
```

## Parameters

<i>host</i>	Specifies the name or IP address of the remote host.
<i>port</i>	(Optional) Specifies the server port number.

## Defaults

If not specified, the default *port* number 23 will be used.

## Mode

Switch command, read-write.

## Example

This example shows how to start a Telnet session to a host at 10.21.42.13:

```
B2(su)->telnet 10.21.42.13
```

# Managing Switch Configuration and Files

## Configuration Persistence Mode

The default state of configuration persistence mode is “auto,” which means that when CLI configuration commands are entered, or when a configuration file stored on the switch is executed, the configuration is saved to NVRAM automatically at the following intervals:

- On a stand-alone unit, the configuration is checked every two minutes and saved if there has been a change.
- On a stack, the configuration is saved across the stack every 30 minutes if there has been a change.

If you want to save a running configuration to NVRAM more often than the automatic intervals, execute the **save config** command and wait for the system prompt to return. After the prompt returns, the configuration will be persistent.

You can change the persistence mode from “auto” to “manual” with the **set snmp persistmode** command. If the persistence mode is set to “manual,” configuration commands will not be automatically written to NVRAM. Although the configuration commands will actively modify the running configuration, they will not persist across a reset unless the **save config** command has been executed.

## Purpose

To set and view the persistence mode for CLI configuration commands, manually save the running configuration, view, manage, and execute configuration files and image files, and set and view TFTP parameters.

## Commands

For information about...	Refer to page...
show snmp persistmode	<a href="#">3-41</a>
set snmp persistmode	<a href="#">3-41</a>
save config	<a href="#">3-42</a>
dir	<a href="#">3-42</a>
show file	<a href="#">3-43</a>
show config	<a href="#">3-44</a>
configure	<a href="#">3-45</a>
copy	<a href="#">3-45</a>
delete	<a href="#">3-46</a>
show tftp settings	<a href="#">3-46</a>
set tftp timeout	<a href="#">3-47</a>
clear tftp timeout	<a href="#">3-48</a>
set tftp retry	<a href="#">3-48</a>
clear tftp retry	<a href="#">3-49</a>

## show snmp persistmode

Use this command to display the configuration persistence mode setting.

### Syntax

```
show snmp persistmode
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Usage

By default, the mode is set to “auto save,” which automatically saves configuration changes at specific intervals. If the mode is set to “manual,” configuration commands are never automatically saved. In order to make configuration changes persistent when the mode is manual, the **save config** command must be issued as described in “[Configuration Persistence Mode](#)” on page 3-40.

### Example

This example shows how to display the configuration persistence mode setting. In this case, persistence mode is set to “manual”, which means configuration changes are not being automatically saved.

```
B2(su)->show snmp persistmode
persistmode is manual
```

## set snmp persistmode

Use this command to set the configuration persistence mode, which determines whether user-defined configuration changes are saved automatically, or require issuing the **save config** command. See “[Configuration Persistence Mode](#)” on page 3-40 for more information.

### Syntax

```
set snmp persistmode {auto | manual}
```

### Parameters

<b>auto</b>	Sets the configuration persistence mode to automatic. This is the default state.
<b>manual</b>	Sets the configuration persistence mode to manual. In order to make configuration changes persistent, the <b>save config</b> command must be issued as described in “ <a href="#">save config</a> ” on page 3-42. This mode is useful for reverting back to old configurations.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the configuration persistence mode to manual:

```
B2(su)->set snmp persistmode manual
```

# save config

Use this command to save the running configuration. If applicable, this command will save the configuration to all switch members in a stack.

## Syntax

```
save config
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to save the running configuration:

```
B2(su)->save config
```

# dir

Use this command to list configuration and image files stored in the file system.

## Syntax

```
dir [filename]
```

## Parameters

---

<i>filename</i>	(Optional) Specifies the file name or directory to list.
-----------------	--

---

## Defaults

If **filename** is not specified, all files in the system will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to list all the configuration and image files in the system:

```
B2(su)->dir
Images:
=====
Filename:      b2-series_03.01.13
Version:       03.01.13
Size:          6275072 (bytes)
Date:          Wed Jun 21 00:57:48 2006
Checksum:      d064e2420f57c8b03636e6652b4f8ff5
Compatibility: B2G124-24, B2G124-48, B2H124-48, B2G124-48P, B2H124-48P
               B2K122-24, B2G170-24, B2G134-24P

Filename:      b2-series_03.00.14 (Active) (Boot)
Version:       03.00.14
Size:          6109184 (bytes)
Date:          Tue Apr 25 13:06:18 2006
Checksum:      e60e044f0e340e994d4124c86f0d40f5
Compatibility: B2G124-24, B2G124-48, B2H124-48, B2G124-48P, B2H124-48P
               B2K122-24, B2G170-24, B2G134-24P

Files:                                     Size
=====
configs:
logs:
current.log                                32529
```

## show file

Use this command to display the contents of a file.

### Syntax

```
show file filename
```

### Parameters

<i>filename</i>	Specifies the name of the file to display.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display a text file named “mypolicy” in the configs/ directory. Note that only a portion of the file is shown in this example.

```
B2(rw)->show file configs/mypolicy
1 :
2 :
3 : #policy
```

```
4 :
5 : set policy profile 1 name "Check GUEST" pvid-status enable pvid 4095 untagged-
vlangs 1
6 :
7 : set policy profile 2 name "User LABORATORIES" pvid-status enable pvid 680 cos-
status enable cos 4 untagged-vlangs 680
8 :
9 : set policy profile 3 name "Administrator" pvid-status enable pvid 4095
10 :
11 : set policy profile 4 name "Guest" pvid-status enable pvid 999 cos-status
enable cos 3 untagged-vlangs 999
12 :
13 : set policy port ge.1.1 4
14 :
15 : set policy port ge.1.2 4
```

# show config

Use this command to display the system configuration or write the configuration to a file.

## Syntax

```
show config [all | facility] [outfile {configs/filename}]
```

## Parameters

<b>all</b>	(Optional) Displays default and non-default configuration settings.
<i>facility</i>	(Optional) Specifies the exact name of one facility for which to show configuration. For example, enter “router” to show only router configuration.
<b>outfile</b>	(Optional) Specifies that the current configuration will be written to a text file in the configs/ directory.
<b>configs/filename</b>	Specifies a filename in the configs/ directory to display.

## Defaults

By default, **show config** will display all non-default configuration information for all facilities.

## Mode

Switch command, read-only.

## Usage

The separate facilities that can be displayed by this command are identified in the display of the current configuration by a # preceding the facility name. For example, “#port” indicates the facility name “port.”

## Examples

This example shows how to write the current configuration to a file named save\_config2:

```
B2(rw)->show config all outfile configs/save_config2
```

This example shows how to display configuration for the facility “port”.

```
B2(rw)->show config port
This command shows non-default configurations only.
Use 'show config all' to show both default and non-default configurations.
```

```

begin
!
#***** NON-DEFAULT CONFIGURATION *****
!
!

#port
set port jumbo disable ge.1.1

!
end

```

## configure

Use this command to execute a previously downloaded configuration file stored on the switch.

### Syntax

```
configure filename [append]
```

### Parameters

<i>filename</i>	Specifies the path and file name of the configuration file to execute.
<b>append</b>	(Optional) Appends the configuration file contents to the current configuration. This is equivalent to typing the contents of the config file directly into the CLI and can be used, for example, to make incremental adjustments to the current configuration.

### Defaults

If **append** is not specified, the current running configuration will be replaced with the contents of the configuration file, which will require an automated reset of the chassis.

### Mode

Switch command, read-write.

### Example

This example shows how to execute the “Jan1\_2004.cfg” configuration file:

```
B2(su)->configure configs/Jan1_2004.cfg
```

## copy

Use this command to upload or download an image or a CLI configuration file.

### Syntax

```
copy source destination
```

### Parameters

<i>source</i>	Specifies location and name of the source file to copy. Options are a local file path in the configs directory, or the URL of a TFTP server.
---------------	--

<i>destination</i>	Specifies location and name of the destination where the file will be copied. Options are a slot location and file name, or the URL of a TFTP server.
--------------------	---

---

## Defaults

None.

## Mode

Switch command, read-write.

## Examples

This example shows how to download an image via TFTP:

```
B2(su)->copy tftp://10.1.192.34/version01000 system:image
```

This example shows how to download a configuration file to the configs directory:

```
B2(su)->copy tftp://10.1.192.1/Jan1_2004.cfg configs/Jan1_2004.cfg
```

# delete

Use this command to remove an image or a CLI configuration file from the switch.

## Syntax

```
delete filename
```

## Parameters

<i>filename</i>	Specifies the local path name to the file. Valid directories are /images and /configs.44.
-----------------	---

---

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Use the [dir](#) command ([page 3-42](#)) to display current image and configuration file names.

## Example

This example shows how to delete the “Jan1\_2004.cfg” configuration file:

```
B2(su)->delete configs/Jan1_2004.cfg
```

# show tftp settings

Use this command to display TFTP settings used by the switch during data transfers using TFTP.

## Syntax

```
show tftp settings
```



## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Usage

The TFTP timeout value can be set with the **set tftp timeout** command. The TFTP retry value can be set with the **set tftp retry** command.

## Example

This example shows the output of this command.

```
B2(ro)->show tftp settings
TFTP packet timeout (seconds): 2
TFTP max retry: 5
```

# set tftp timeout

Use this command to configure how long TFTP will wait for a reply of either an acknowledgement packet or a data packet during a data transfer.

## Syntax

```
set tftp timeout seconds
```

## Parameters

<i>seconds</i>	Specifies the number of seconds to wait for a reply. The valid range is from 1 to 30 seconds. Default value is 2 seconds.
----------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example sets the timeout period to 4 seconds.

```
B2(rw)->set tftp timeout 4
```

## clear tftp timeout

Use this command to reset the TFTP timeout value to the default value of 2 seconds.

### Syntax

```
clear tftp timeout
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the timeout value to the default of 2 seconds.

```
B2(rw)-> clear tftp timeout
```

## set tftp retry

Use this command to configure how many times TFTP will resend a packet, either an acknowledgement packet or a data packet.

### Syntax

```
set tftp retry retry
```

### Parameters

<i>retry</i>	Specifies the number of times a packet will be resent. The valid range is from 1 to 1000. Default value is 5 retries.
--------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example sets the retry count to 3.

```
B2(rw)->set tftp retry 3
```

## clear tftp retry

Use this command to reset the TFTP retry value to the default value of 5 retries.

### Syntax

```
clear tftp retry
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the retry value to the default of 5 retries.

```
B2(rw)-> clear tftp retry
```

## Clearing and Closing the CLI

### Purpose

To clear the CLI screen or to close your CLI session.

### Commands

The commands used to clear and close the CLI session are listed below.

For information about...	Refer to page...
cls	<a href="#">3-49</a>
exit	<a href="#">3-50</a>

## cls (clear screen)

Use this command to clear the screen for the current CLI session.

### Syntax

```
cls
```

### Parameters

None.

**Defaults**

None.

**Mode**

Switch command, read-only.

**Example**

This example shows how to clear the CLI screen:

```
B2(su)->cls
```

**exit**

Use either of these commands to leave a CLI session.

**Syntax**

```
exit
```

**Parameters**

None.

**Defaults**

None.

**Mode**

Switch command, read-only.

**Usage**

By default, switch timeout occurs after 15 minutes of user inactivity, automatically closing your CLI session. Use the [set logout](#) command ([page 3-25](#)) to change this default.

**Example**

This example shows how to exit a CLI session:

```
B2(su)->exit
```

**Resetting the Switch**

**Purpose**

To reset one or more switches, and to clear the user-defined configuration parameters.

**Commands**

For information about...	Refer to page...
reset	<a href="#">3-51</a>

For information about...	Refer to page...
clear config	<a href="#">3-51</a>

## reset

Use this command to reset the switch without losing any user-defined configuration settings.

### Syntax

```
reset [unit]
```

### Parameters

<i>unit</i>	(Optional) Specifies a unit to be reset.
-------------	--

#### Defaults

If no *unit* ID is specified, the entire system will be reset.

#### Mode

Switch command, read-write.

### Usage

A SecureStack B2 switch can also be reset with the RESET button located on its front panel. For information on how to do this, refer to the SecureStack B2 Installation Guide shipped with your switch.

### Examples

This example shows how to reset the system:

```
B2(su)->reset
Are you sure you want to reload the stack? (y/n) y

Saving Configuration to stacking members
Reloading all switches.
```

This example shows how to reset unit 1:

```
B2(su)->reset 1
Are you sure you want to reload the switch? (y/n) y

Reloading switch 1.
This switch is manager of the stack.
STACK: detach 3 units
```

## clear config

Use this command to clear the user-defined configuration parameters.

### Syntax

```
clear config [all]
```

### Parameters

### Defaults

---

<b>all</b>	(Optional) Clears user-defined configuration parameters (and stack unit numbers and priorities, if applicable).
------------	---

---

If **all** is not specified, stacking configuration parameters will not be cleared.

### Mode

Switch command, read-write.

### Usage

Executing this command will clear the configuration in both NVRAM and on the memory card, if one is installed on the switch.

This command will **not** clear the IP address of the switch. Use the **clear ip address** command to clear the IP address.

When using the **clear config** command to clear configuration parameters in a stack, it is important to remember the following:

- Use **clear config** to clear configuration parameters without clearing stack unit IDs. This command WILL NOT clear stack parameters and avoids the process of re-numbering the stack.
- Use **clear config all** when it is necessary to clear all configuration parameters, including stack unit IDs (if applicable) and switch priority values.
- Use the **clear ip address** command to clear the IP address.

Configuration parameters and stacking information can also be cleared on the master unit only by selecting option 10 (restore configuration to factory defaults) from the boot menu on switch startup. This selection will leave stacking priorities on all other units, if applicable.

### Example

This example shows how to clear configuration parameters (including stacking parameters, if applicable):

```
B2(su)->clear config all
```

## Using and Configuring WebView

### Purpose

By default, WebView (The Enterasys Networks embedded web server for switch configuration and management tasks) is enabled on TCP port number 80 on the SecureStack B2 switch. You can verify WebView status, and enable or disable WebView using the commands described in this section. WebView can also be securely used over SSL port 443, if SSL is enabled on the switch. By default, SSL is disabled.

To use WebView, type the IP address of the switch in your browser. To use WebView over SSL, type in https:// then the IP address of the switch. For example, https://172.16.2.10.

## Commands

For information about...	Refer to page...
show webview	<a href="#">3-53</a>
set webview	<a href="#">3-53</a>
show ssl	<a href="#">3-54</a>
set ssl	<a href="#">3-54</a>

### show webview

Use this command to display WebView status.

#### Syntax

```
show webview
```

#### Parameters

None.

#### Defaults

None.

#### Mode

Switch command, read-only.

#### Example

This example shows how to display WebView status:

```
B2(rw)->show webview
WebView is Enabled.
```

### set webview

Use this command to enable or disable WebView on the switch.

#### Syntax

```
set webview {enable | disable}
```

#### Parameters

<b>enable   disable</b>	Enable or disable WebView on the switch.
-------------------------	--

#### Defaults

None.

#### Mode

Switch command, read-write.

### Usage

It is good practice for security reasons to disable HTTP access on the switch when finished configuring with WebView, and then to only enable WebView on the switch when changes need to be made.

### Example

This example shows how to disable WebView on the switch:

```
B2(rw)->set webview disable
```

## show ssl

Use this command to display SSL status.

### Syntax

```
show ssl
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display SSL status:

```
B2(rw)->show ssl
SSL status: Enabled
```

## set ssl

Use this command to enable or disable the use of WebView over SSL port 443. By default, SSL is disabled on the switch. This command can also be used to reinitialize the hostkey that is used for encryption.

### Syntax

```
set ssl {enabled | disabled | reinitialize | hostkey reinitialize}
```

### Parameters

<b>enabled   disabled</b>	Enable or disable the ability to use WebView over SSL.
<b>reinitialize</b>	Stops and then restarts the SSL process.
<b>hostkey reinitialize</b>	Stops SSL, regenerates new keys, and then restarts SSL.

### Defaults

None.



## Mode

Switch command, read-write.

## Example

This example shows how to enable SSL:

```
B2(rw)->set ssl enabled
```



## Discovery Protocol Configuration

This chapter describes how to configure discovery protocols.

For information about...	Refer to page...
<a href="#">Configuring CDP</a>	<a href="#">4-1</a>
<a href="#">Configuring Cisco Discovery Protocol</a>	<a href="#">4-6</a>
<a href="#">Configuring Link Layer Discovery Protocol and LLDP-MED</a>	<a href="#">4-13</a>

### Configuring CDP

#### Purpose

To review and configure the Enterasys CDP discovery protocol. This protocol is used to discover network topology. When enabled, this protocol allows Enterasys devices to send periodic PDUs about themselves to neighboring devices.

#### Commands

The commands used to review and configure the CDP discovery protocol are listed below.

For information about...	Refer to page...
<code>show cdp</code>	<a href="#">4-1</a>
<code>set cdp state</code>	<a href="#">4-3</a>
<code>set cdp auth</code>	<a href="#">4-3</a>
<code>set cdp interval</code>	<a href="#">4-4</a>
<code>set cdp hold-time</code>	<a href="#">4-5</a>
<code>clear cdp</code>	<a href="#">4-5</a>
<code>show neighbors</code>	<a href="#">4-6</a>

#### show cdp

Use this command to display the status of the CDP discovery protocol and message interval on one or more ports.

Syntax

```
show cdp [port-string]
```

Parameters

<i>port-string</i>	(Optional) Displays CDP status for a specific port. For a detailed description of possible port-string values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

Defaults

If *port-string* is not specified, all CDP information will be displayed.

Mode

Switch command, read-only.

Example

This example shows how to display CDP information for ports ge.1.1 through ge.1.9:

```
B2(su)->show cdp ge.1.1-9
CDP Global Status      :auto-enable
CDP Version Supported  :30 hex
CDP Hold Time          :180
CDP Authentication Code :00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 hex
CDP Transmit Frequency :60

Port      Status
-----
ge.1.1    auto-enable
ge.1.2    auto-enable
ge.1.3    auto-enable
ge.1.4    auto-enable
ge.1.5    auto-enable
ge.1.6    auto-enable
ge.1.7    auto-enable
ge.1.8    auto-enable
ge.1.9    auto-enable
```

[Table 4-6](#) provides an explanation of the command output.

**Table 4-6 show cdp Output Details**

Output	What It Displays...
CDP Global Status	Whether CDP is globally auto-enabled, enabled or disabled. The default state of auto-enabled can be reset with the set cdp state command. For details, refer to <a href="#">“set cdp state”</a> on page 4-3.
CDP Versions Supported	CDP version number(s) supported by the switch.
CDP Hold Time	Minimum time interval (in seconds) at which CDP configuration messages can be set. The default of 180 seconds can be reset with the set cdp hold-time command. For details, refer to <a href="#">“set cdp hold-time”</a> on page 4-5.
CDP Authentication Code	Authentication code for CDP discovery protocol. The default of 00-00-00-00-00-00-00-00 can be reset using the set cdp auth command. For details, refer to <a href="#">“set cdp auth”</a> on page 4-3.

**Table 4-6 show cdp Output Details (Continued)**

Output	What It Displays...
CDP Transmit Frequency	Frequency (in seconds) at which CDP messages can be transmitted. The default of 60 seconds can be reset with the <code>set cdp interval</code> command. For details, refer to “ <a href="#">set cdp interval</a> ” on page 4-4.
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
Status	Whether CDP is enabled, disabled or auto-enabled on the port.

## set cdp state

Use this command to enable or disable the CDP discovery protocol on one or more ports.

### Syntax

```
set cdp state {auto | disable | enable} [port-string]
```

### Parameters

<b>auto   disable   enable</b>	Auto-enables, disables or enables the CDP protocol on the specified port(s). In auto-enable mode, which is the default mode for all ports, a port automatically becomes CDP-enabled upon receiving its first CDP message.
<i>port-string</i>	(Optional) Enables or disables CDP on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

### Defaults

If *port-string* is not specified, the CDP state will be globally set.

### Mode

Switch command, read-write.

### Examples

This example shows how to globally enable CDP:

```
B2(su)->set cdp state enable
```

This example shows how to enable the CDP for port `ge.1.2`:

```
B2(su)->set cdp state enable ge.1.2
```

This example shows how to disable the CDP for port `ge.1.2`:

```
B2(su)->set cdp state disable ge.1.2
```

## set cdp auth

Use this command to set a global CDP authentication code.

## Syntax

```
set cdp auth auth-code
```

## Parameters

---

<i>auth-code</i>	Specifies an authentication code for the CDP protocol. This can be up to 16 hexadecimal values separated by commas.
------------------	---

---

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The authentication code value determines a switch's CDP domain. If two or more switches have the same CDP authentication code, they will be entered into each other's CDP neighbor tables. If they have different authentication codes, they are in different domains and will not be entered into each other's CDP neighbor tables.

A switch with the default authentication code (16 null characters) will recognize all switches, no matter what their authentication code, and enter them into its CDP neighbor table.

## Example

This example shows how to set the CDP authentication code to 1,2,3,4,5,6,7,8:

```
B2(su)->set cdp auth 1,2,3,4,5,6,7,8:
```

# set cdp interval

Use this command to set the message interval frequency (in seconds) of the CDP discovery protocol.

## Syntax

```
set cdp interval frequency
```

## Parameters

---

<i>frequency</i>	Specifies the transmit frequency of CDP messages in seconds. Valid values are from 5 to 900 seconds.
------------------	--

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the CDP interval frequency to 15 seconds:

```
B2(su)->set cdp interval 15
```

## set cdp hold-time

Use this command to set the hold time value for CDP discovery protocol configuration messages.

### Syntax

```
set cdp hold-time hold-time
```

### Parameters

<i>hold-time</i>	Specifies the hold time value for CDP messages in seconds. Valid values are from 15 to 600.
------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set CDP hold time to 60 seconds:

```
B2(su)->set cdp hold-time 60
```

## clear cdp

Use this command to reset CDP discovery protocol settings to defaults.

### Syntax

```
clear cdp {[state] [port-state port-string] [interval] [hold-time] [auth-code]}
```

### Parameters

<b>state</b>	(Optional) Resets the global CDP state to auto-enabled.
<b>port-state</b> <i>port-string</i>	(Optional) Resets the port state on specific port(s) to auto-enabled.
<b>interval</b>	(Optional) Resets the message frequency interval to 60 seconds.
<b>hold-time</b>	(Optional) Resets the hold time value to 180 seconds.
<b>auth-code</b>	(Optional) Resets the authentication code to 16 bytes of 00 (00-00-00-00-00-00-00-00).

### Defaults

At least one optional parameter must be entered.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the CDP state to auto-enabled:

```
B2(su)->clear cdp state
```

# show neighbors

This command displays Neighbor Discovery information for either the CDP or Cisco DP protocols.

## Syntax

```
show neighbors [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Specifies the port or ports for which to display Neighbor Discovery information.
--------------------	---

## Defaults

If no port is specified, all Neighbor Discovery information is displayed.

## Mode

Switch command, read-only.

## Usage

This command displays information discovered by both the CDP and the Cisco DP protocols.

## Example

This example displays Neighbor Discovery information for all ports.

```
B2(su)->show neighbors
```

Port	Device ID	Port ID	Type	Network Address
ge.1.1	00036b8b1587	12.227.1.176	ciscodp	12.227.1.176
ge.1.6	0001f496126f	140.2.3.1	ciscodp	140.2.3.1
ge.1.6	00-01-f4-00-72-fe	140.2.4.102	cdp	140.2.4.102
ge.1.6	00-01-f4-00-70-8a	140.2.4.104	cdp	140.2.4.104
ge.1.6	00-01-f4-c5-f7-20	140.2.4.101	cdp	140.2.4.101
ge.1.6	00-01-f4-89-4f-ae	140.2.4.105	cdp	140.2.4.105
ge.1.6	00-01-f4-5f-1f-c0	140.2.1.11	cdp	140.2.1.11
ge.1.19	0001f400732e	165.32.100.10	ciscodp	165.32.100.10

# Configuring Cisco Discovery Protocol

## Purpose

To review and configure the Cisco discovery protocol. Discovery protocols are used to discover network topology. When enabled, they allow Cisco devices to send periodic PDUs about themselves to neighboring devices. Specifically, this feature enables recognizing PDUs from Cisco phones. A table of information about detected phones is kept by the switch and can be queried by the network administrator.



## Commands

The commands used to review and configure the Cisco discovery protocol are listed below. Refer also to “[show neighbors](#)” on page 4-6.

For information about...	Refer to page...
show ciscodp	<a href="#">4-7</a>
show ciscodp port info	<a href="#">4-8</a>
set ciscodp status	<a href="#">4-9</a>
set ciscodp timer	<a href="#">4-9</a>
set ciscodp holdtime	<a href="#">4-10</a>
set ciscodp port	<a href="#">4-10</a>
clear ciscodp	<a href="#">4-12</a>

## show ciscodp

Use this command to display global Cisco discovery protocol information.

### Syntax

```
show ciscodp
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display global Cisco DP information.

```
B2(su)->show ciscodp
CiscoDP :Enabled
Timer :5
Holdtime (Ttl): 180
Device ID : 001188554A60
Last Change : WED NOV 08 13:19:56 2006
```

[Table 4-7](#) provides an explanation of the command output.

**Table 4-7 show ciscodp Output Details**

Output	What It Displays...
CiscoDP	Whether Cisco DP is globally enabled or disabled. Auto indicates that Cisco DP will be globally enabled only if Cisco DP PDUs are received. Default setting of auto-enabled can be reset with the <b>set ciscodp status</b> command.

Table 4-7 show ciscodp Output Details (Continued)

Output	What It Displays...
Timer	The number of seconds between Cisco discovery protocol PDU transmissions. The default of 60 seconds can be reset with the <b>set ciscodp timer</b> command.
Holdtime	Number of seconds neighboring devices will hold PDU transmissions from the sending device. Default value of 180 can be changed with the <b>set ciscodp holdtime</b> command.
Device ID	The MAC address of the switch.
Last Change	The time that the last Cisco DP neighbor was discovered.

## show ciscodp port info

Use this command to display summary information about the Cisco discovery protocol on one or more ports.

### Syntax

`show ciscodp port info [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays Cisco DP information for a specific port. For a detailed description of possible port-string values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

If *port-string* is not specified, Cisco DP information for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display Cisco DP information for Gigabit Ethernet port 1 in slot 1.

B2(su)->show ciscodp port info ge.1.1

port	state	vvid	trusted	cos
-----				
ge.1.1	enable	none	yes	0

[Table 4-8](#) provides an explanation of the command output.

Table 4-8 show ciscodp port info Output Details

Output	What It Displays...
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
State	Whether Cisco DP is enabled, disabled or auto-enabled on the port. Default state of enabled can be changed using the <b>set ciscodp port</b> command.
vvid	Whether a voice VLAN ID has been set on this port. Default of none can be changed using the <b>set ciscodp port</b> command.

**Table 4-8 show ciscodp port info Output Details (Continued)**

Output	What It Displays...
trusted	The trust mode of the port. Default of trusted can be changed using the <b>set ciscodp port</b> command.
cos	The Class of Service priority value for untrusted traffic. The default of 0 can be changed using the <b>set ciscodp port</b> command.

## set ciscodp status

Use this command to enable or disable the Cisco discovery protocol globally on the switch.

### Syntax

```
set ciscodp state {auto | disable / enable}
```

### Parameters

<b>auto</b>	Globally enable only if Cisco DP PDUs are received.
<b>disable</b>	Globally disable Cisco discovery protocol.
<b>enable</b>	Globally enable Cisco discovery protocol.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to globally enable CiscoDP:

```
B2(su)->set ciscodp state enable
```

## set ciscodp timer

Use this command to set the number of seconds between Cisco discovery protocol PDU transmissions.

### Syntax

```
set ciscodp timer seconds
```

### Parameters

<i>seconds</i>	Specifies the number of seconds between Cisco DP PDU transmissions. Valid values are from 5 to 254 seconds.
----------------	---

### Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the Cisco DP timer to 120 seconds.

```
B2(su)->set ciscodp timer 120
```

# set ciscodp holdtime

Use this command to set the time to live (TTL) for Cisco discovery protocol PDUs. This is the amount of time, in seconds, neighboring devices will hold PDU transmissions from the sending device.

## Syntax

```
set ciscodp holdtime hold-time
```

## Parameters

<i>hold-time</i>	Specifies the time to live for Cisco DP PDUs. Valid values are from 10 to 255 seconds.
------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set Cisco DP hold time to 180 seconds:

```
B2(su)->set ciscodp hold-time 180
```

# set ciscodp port

Use this command to set the status, voice VLAN, extended trust mode, and CoS priority for untrusted traffic for the Cisco Discovery Protocol on one or more ports.

## Syntax

```
set ciscodp port {[status {disable | enable}] [vvid {vlan-id | none | dot1p |  
untagged}] [trusted {yes | no}] [cos value]} port-string
```

## Parameters

<b>status</b>	Sets the CiscoDP port operational status.
<b>disable</b>	Does not transmit or process CiscoDP PDUs.
<b>enable</b>	Transmits and processes CiscoDP PDUs.
<b>vvid</b>	Sets the port voice VLAN for CiscoDP PDU transmission.
<i>vlan-id</i>	Specifies the VLAN ID, range 1-4094.
<b>none</b>	No voice VLAN will be used in CiscoDP PDUs. This is the default.
<b>dot1p</b>	Instructs attached phone to send 802.1p tagged frames.
<b>untagged</b>	Instructs attached phone to send untagged frames.
<b>trusted</b>	Sets the extended trust mode on the port.
<b>yes</b>	Instructs attached phone to allow the device connected to it to transmit traffic containing any CoS or Layer 2 802.1p marking. This is the default value.
<b>no</b>	Instructs attached phone to overwrite the 802.1p tag of traffic transmitted by the device connected to it to 0, by default, or to the value configured with the <b>cos</b> parameter.
<b>cos value</b>	Instructs attached phone to overwrite the 802.1p tag of traffic transmitted by the device connected to it with the specified <i>value</i> , when the trust mode of the port is set to untrusted. <i>Value</i> can range from 0 to 7, with 0 indicating the lowest priority.
<i>port-string</i>	Specifies the port(s) on which status will be set.

## Defaults

Status: enabled

Voice VLAN: none

Trust mode: trusted

CoS value: 0

## Mode

Switch mode, read-write.

## Usage

The following points describe how the Cisco DP extended trust settings work on the switch.

- A Cisco DP port trust status of trusted or untrusted is only meaningful when a Cisco IP phone is connected to a switch port and a PC or other device is connected to the back of the Cisco IP phone.
- A Cisco DP port state of trusted or untrusted only affects tagged traffic transmitted by the device connected to the Cisco IP phone. Untagged traffic transmitted by the device connected to the Cisco IP phone is unaffected by this setting.
- If the switch port is configured to a Cisco DP trust state of **trusted** (with the **trusted yes** parameter of this command), this setting is communicated to the Cisco IP phone instructing it to allow the device connected to it to transmit traffic containing any CoS or Layer 2 802.1p marking.

- If the switch port is configured to a Cisco DP trust state of **untrusted** (**trusted no**), this setting is communicated to the Cisco IP phone instructing it to overwrite the 802.1p tag of traffic transmitted by the device connected to it to 0, by default, or to the value specified by the **cos** parameter of this command.
- There is a one-to-one correlation between the value set with the **cos** parameter and the 802.1p value assigned to ingress traffic by the Cisco IP phone. A value of 0 equates to an 802.1p priority of 0. Therefore, a value of 7 is given the highest priority.



**Note:** The Cisco Discovery Protocol must be globally enabled using the **set ciscodp status** command before operational status can be set on individual ports.

## Examples

This example shows how to set the Cisco DP port voice VLAN ID to 3 on port `ge.1.6` and enable the port operational state.

```
B2(rw)->set ciscodp port status enable vvid 3 ge.1.6
```

This example shows how to set the Cisco DP extended trust mode to **untrusted** on port `ge.1.5` and set the CoS priority to 1.

```
B2(rw)->set ciscodp port trusted no cos 1 ge.1.5
```

## clear ciscodp

Use this command to clear the Cisco discovery protocol back to the default values.

### Syntax

```
clear ciscodp [status | timer | holdtime | {port {status | vvid | trust | cos}
[port-string]]]
```

### Parameters

<b>status</b>	Clears global CiscoDP enable status to default of auto.
<b>timer</b>	Clears the time between CiscoDP PDU transmissions to default of 60 seconds.
<b>holdtime</b>	Clears the time-to-live for CiscoDP PDU data to default of 180 seconds.
<b>port</b>	Clears the CiscoDP port configuration.
<b>status</b>	Clears the individual port operational status to the default of enabled.
<b>vvid</b>	Clears the individual port voice VLAN for CiscoDP PDU transmission to 0.
<b>trust</b>	Clears the trust mode configuration of the port to trusted.
<b>cos</b>	Clears the CoS priority for untrusted traffic of the port to 0.
<i>port-string</i>	(Optional) Specifies the port(s) on which status will be set.

### Defaults

If no parameters are entered, all Cisco DP parameters are reset to the defaults globally and for all ports.

### Mode

Switch mode, read-write.

## Examples

This example shows how to clear all the Cisco DP parameters back to the default settings.

```
B2(rw)->clear ciscodp
```

This example shows how to clear the Cisco DP status on port ge.1.5.

```
B2(rw)->clear ciscodp port status ge.1.5
```

# Configuring Link Layer Discovery Protocol and LLDP-MED

## Overview

The Link Layer Discovery Protocol (LLPD) is similar to the Enterasys Discovery Protocol and the Cisco Discovery Protocol in that it provides an industry standard, vendor-neutral way to allow network devices to advertise their identities and capabilities on a local area network, and to discover that information about their neighbors.

LLDP-MED is an enhancement to LLDP that provides the following benefits:

- Extended and automated power management of Power over Ethernet endpoints
- Inventory management, allowing network administrators to track their network devices and to determine their characteristics, such as manufacturer, software and hardware versions, and serial or asset numbers

The information sent by an LLDP-enabled device is extracted and tabulated by its peers. The communication can be done when information changes or on a periodic basis. The information tabulated is aged to ensure that it is kept up to date. Ports can be configured to send this information, receive this information, or both send and receive.

Either LLDP or LLDP-MED, but not both, can be used on an interface between two devices. A switch port uses LLDP-MED when it detects that an LLDP-MED-capable device is connected to it.

LLDP information is contained within a Link Layer Discovery Protocol Data Unit (LLDPDU) sent in a single 802.3 Ethernet frame. The information fields in LLDPDU are a sequence of short, variable-length, information elements known as TLVs — type, length, and value fields where:

- Type identifies what kind of information is being sent
- Length indicates the length of the information string in octets
- Value is the actual information that needs to be sent

The LLDP standard specifies that certain TLVs are mandatory in transmitted LLDPDUs, while others are optional. You can configure on a port-specific basis which optional LLDP and LLDP-MED TLVs should be sent in LLDPDUs.

## Purpose

To review and configure LLPD and LLPD-MED.

## Commands

The commands used to review and configure the CDP discovery protocol are listed below.

For information about...	Refer to page...
show lldp	<a href="#">4-15</a>
show lldp port status	<a href="#">4-16</a>
show lldp port trap	<a href="#">4-16</a>
show lldp port tx-tlv	<a href="#">4-17</a>
show lldp port location-info	<a href="#">4-17</a>
show lldp port local-info	<a href="#">4-18</a>
show lldp port remote-info	<a href="#">4-20</a>
set lldp tx-interval	<a href="#">4-22</a>
set lldp hold-multiplier	<a href="#">4-22</a>
set lldp trap-interval	<a href="#">4-23</a>
set lldp med-fast-repeat	<a href="#">4-24</a>
set lldp port status	<a href="#">4-24</a>
set lldp port trap	<a href="#">4-25</a>
set lldp port med-trap	<a href="#">4-25</a>
set lldp port location-info	<a href="#">4-26</a>
set lldp port tx-tlv	<a href="#">4-26</a>
clear lldp	<a href="#">4-28</a>
clear lldp port status	<a href="#">4-29</a>
clear lldp port trap	<a href="#">4-29</a>
clear lldp port med-trap	<a href="#">4-29</a>
clear lldp port location-info	<a href="#">4-30</a>
clear lldp port tx-tlv	<a href="#">4-30</a>
clear lldp port tx-tlv	<a href="#">4-30</a>



## Configuration Tasks

The commands included in this implementation allow you to perform the following configuration tasks:

Step	Task	Command(s)
1.	Configure global system LLDP parameters	<pre>set lldp tx-interval set lldp hold-multiplier set lldp trap-interval set lldp med-fast-repeat clear lldp</pre>
2.	Enable/disable specific ports to: <ul style="list-style-type: none"> <li>Transmit and process received LLDPDUs</li> <li>Send LLDP traps</li> <li>Send LLDP-MED traps</li> </ul>	<pre>set/clear lldp port status set/clear lldp port trap set/clear lldp port med-trap</pre>

## show lldp

Use this command to display LLDP configuration information.

### Syntax

```
show lldp
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display LLDP configuration information.

```
B2(ro)->show lldp
Message Tx Interval      : 30
Message Tx Hold Multiplier : 4
Notification Tx Interval : 5
MED Fast Start Count     : 3

Tx-Enabled Ports        : ge.1.1-60; ge.2.1-24; ge.3.1-30; ge.4.1-12;
Rx-Enabled Ports        : ge.1.1-60; ge.2.1-24; ge.3.1-30; ge.4.1-12;

Trap-Enabled Ports      : ge.1.1-60; ge.2.1-24; ge.3.1-30; ge.4.1-12;
MED Trap-Enabled Ports  : ge.1.1-60; ge.2.1-24; ge.3.1-30; ge.4.1-12;
```

## show lldp port status

Use this command to display the LLDP status of one or more ports. The command lists the ports that are enabled to send and receive LLDP PDUs. Ports are enabled or disabled with the [set lldp port status](#) command.

### Syntax

```
show lldp port status [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays LLDP status for one or a range of ports.
--------------------	--

### Defaults

If *port-string* is not specified, LLDP status information will be displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display LLDP port status information for all ports.

```
B2(ro)->show lldp port status
```

```
Tx-Enabled Ports      : ge.1.1-60; ge.2.1-24; ge.3.1-30; ge.4.1-12
```

```
Rx-Enabled Ports      : ge.1.1-60; ge.2.1-24; ge.3.1-30; ge.4.1-12
```

## show lldp port trap

Use this command to display the ports that are enabled to send an LLDP notification when a remote system change has been detected or an LLDP-MED notification when a change in the topology has been sensed. Ports are enabled to send LLDP notifications with the [set lldp port trap](#) command and to send LLDP-MED notifications with the [set lldp port med-trap](#) command.

### Syntax

```
show lldp port trap [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays the port or range of ports that have been enabled to send LLDP and/or LLDP-MED notifications.
--------------------	---

### Defaults

If *port-string* is not specified, LLDP port trap information will be displayed for all ports.

### Mode

Switch command, read-only.

## Example

This example shows how to display LLDP port trap information for all ports.

```
B2(ro)->show lldp port trap
```

```
Trap-Enabled Ports      :
MED Trap-Enabled Ports:
```

## show lldp port tx-tlv

Use this command to display information about which optional TLVs have been configured to be transmitted on ports. Ports are configured to send optional TLVs with the [set lldp port tx-tlv](#) command.

## Syntax

```
show lldp port tx-tlv [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays information about TLV configuration for one or a range of ports.
--------------------	--

## Defaults

If *port-string* is not specified, TLV configuration information will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display transmit TLV information for three ports.

```
B2(ro)->show lldp port tx-tlv ge.1.1-3
```

```
* Means TLV is supported and enabled on this port
```

```
o Means TLV is supported on this port
```

```
Means TLV is not supported on this port
```

```
Column Pro Id uses letter notation for enable: s-stp, l-lacp, g-gvrp
```

Ports	Port Desc	Sys Name	Sys Desc	Sys Cap	Mgmt Addr	Vlan Id	Pro Id	MAC PHY	PoE	Link Aggr	Max Frame	MED Cap	MED Pol	MED Loc	MED PoE
ge.1.1	*	*	*	*	*	*	slg	*	*	*	*	*		*	
ge.1.2	*	*	*	*	*	*	slg	*	*	*	*	*			
ge.1.3	*	*	*	*	*	*	slg	*	*	*	*	*		*	

## show lldp port location-info

Use this command to display configured location information for one or more ports. Ports are configured with a location value using the [set lldp port location-info](#) command.

## Syntax

```
show lldp port location-info [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays port location information for one or a range of ports.
--------------------	--

## Defaults

If *port-string* is not specified, port location configuration information will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display port location information for three ports.

```
B2(ro)->show lldp port location-info ge.1.1-3
```

Ports	Type	Location
-----	-----	-----
ge.1.1	ELIN	1234567890
ge.1.2	ELIN	1234567890
ge.1.3	ELIN	1234567890

# show lldp port local-info

Use this command to display the local system information stored for one or more ports. You can use this information to detect misconfigurations or incompatibilities between the local port and the attached endpoint device (remote port).

## Syntax

```
show lldp port local-info [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays local system information for one or a range of ports.
--------------------	---

## Defaults

If *port-string* is not specified, local system information will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display the local system information stored for port ge.4.1. [Table 4-9](#) describes the output fields of this command.

```
B2(rw)->show lldp port local-info ge.4.1
```

```
Local Port   : ge.4.1      Local Port Id: ge.4.1
-----
Port Desc    : ... 1000BASE-TX RJ45 Gigabit Ethernet Frontpanel Port
```

```

Mgmt Addr      : 10.21.64.100
Chassis ID     : 00-E0-63-93-74-A5
Sys Name       : LLDP PoE test Chassis
Sys Desc       : Enterasys Networks, Inc.
Sys Cap Supported/Enabled : bridge,router/bridge

Auto-Neg Supported/Enabled : yes/yes
Auto-Neg Advertised       : 10BASE-T, 10BASE-TFD,
                           100BASE-TX, 100BASE-TXFD,
                           1000BASE-TFD,
                           Bpause
Operational Speed/Duplex/Type : 100 full tx
Max Frame Size (bytes)       : 1522

Vlan Id         : 1
LAG Supported/Enabled/Id     : no/no/0
Protocol Id      : Spanning Tree v-3 (IEEE802.1s)
                   LACP v-1
                   GVRP

PoE Device      : PSE device
PoE Power Source : primary
PoE MDI Supported/Enabled : yes/yes
PoE Pair Controllable/Used : false/spare
PoE Power Class  : 2
PoE Power Limit (mW) : 15400
PoE Power Priority : high

```

Table 4-9 describes the information displayed by the **show lldp port local-info** command.

**Table 4-9 show lldp port local-info Output Details**

Output Field	What it Displays...
Local Port	Identifies the port for which local system information is displayed.
Local Port Id	Mandatory basic LLDP TLV that identifies the port transmitting the LLDPDU. Value is ifName object defined in RFC 2863.
Port Desc	Optional basic LLDP TLV. Value is ifDescr object defined in RFC 2863.
Mgmt Addr	Optional basic LLDP TLV. IPv4 address of host interface.
Chassis ID	Mandatory basic LLDP TLV that identifies the chassis transmitting the LLDPDU. Value is MAC address of chassis.
Sys Name	Optional basic LLDP TLV. Value is the administratively assigned name for the system.
Sys Desc	Optional basic LLDP TLV. Value is sysDescr object defined in RFC 3418.
Sys Cap Supported/Enabled	Optional basic LLDP TLV. System capabilities, value can be bridge and/or router.
Auto-Neg Supported/Enabled	IEEE 802.3 Extensions MAC-PHY Configuration/Status TLV. Auto-negotiation supported and enabled settings should be the same on the two systems attached to the same link.
Auto-Neg Advertised	IEEE 802.3 Extensions MAC-PHY Configuration/Status TLV. Lists the configured advertised values on the port.
Operational Speed/Duplex/Type	IEEE 802.3 Extensions MAC-PHY Configuration/Status TLV. Lists the operational MAU type, duplex, and speed of the port. If the received TLV indicates that auto-negotiation is supported but not enabled, these values will be used by the port.

**Table 4-9 show lldp port local-info Output Details (Continued)**

Output Field	What it Displays...
Max Frame Size (bytes)	IEEE 802.3 Extensions Maximum Frame Size TLV. Value indicates maximum frame size capability of the device's MAC and PHY. In normal mode, max frame size is 1522 bytes. In jumbo mode, max frame size is 10239 bytes.
Vlan Id	IEEE 802.1 Extensions Port VLAN ID TLV. Value is port VLAN ID (pvid).
LAG Supported/Enabled/Id	IEEE 802.3 Extensions Link Aggregation TLV. Values indicate whether the link associated with this port can be aggregated, whether it is currently aggregated, and if aggregated, the aggregated port identifier.
Protocol Id	IEEE 802.1 Extensions Protocol Identity TLV. Values can include Spanning tree, LACP, and GARP protocols and versions. Only those protocols enabled on the port are displayed.
ECS ELIN	LLDP-MED Extensions Location Identification TLV. Emergency Call Services (ECS) Emergency Location Identification Number (ELIN) is currently the only type supported. Value is the ELIN configured on this port.
PoE Device	LLDP-MED Extensions Extended Power via MDI TLV. Displayed only when a port has PoE capabilities. Value is the Power Type of the device. On a switch port, the value is Power Sourcing Entity (PSE).
PoE Power Source	LLDP-MED Extensions Extended Power via MDI TLV. Displayed only when a port has PoE capabilities. Value can be primary or backup, indicating whether the PSE is using its primary or backup power source.
PoE MDI Supported/Enabled	IEEE 802.3 Extensions Power via MDI TLV. Displayed only when a port has PoE capabilities. Indicates whether sending the Power via MDI TLV is supported/enabled. Value can be yes or no.
PoE Pair Controllable/Used	IEEE 802.3 Extensions Power via MDI TLV. Displayed only when a port has PoE capabilities. Indicates whether pair selection can be controlled on the given port (refer to RFC 3621). Value for Controllable can be true or false. Value of Used can be signal (signal pairs only are in use) or spare (spare pairs only are in use).
PoE Power Class	IEEE 802.3 Extensions Power via MDI TLV. Displayed only when a port has PoE capabilities. Indicates the power class supplied by the port. Value can range from 0 to 4.
PoE Power Limit (mW)	LLDP-MED Extensions Extended Power via MDI TLV. Displayed only when a port has PoE capabilities. Indicates the total power the port is capable of sourcing over a maximum length cable, based on its current configuration, in milli-Watts.
PoE Power Priority	LLDP-MED Extensions Extended Power via MDI TLV. Displayed only when a port has PoE capabilities. Indicates the power priority configured on the port. Value can be critical, high, or low.

## show lldp port remote-info

Use this command to display the remote system information stored for a remote device connected to a local port. You can use this information to detect misconfigurations or incompatibilities between the local port and the attached endpoint device (remote port).

### Syntax

```
show lldp port remote-info [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays remote system information for one or a range of ports.
--------------------	--

## Defaults

If *port-string* is not specified, remote system information will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display the remote system information stored for port ge.3.1. The remote system information was received from an IP phone, which is an LLDP-MED-enabled device. [Table 4-10](#) describes the output fields that are unique to the remote system information displayed for a MED-enabled device.

```
B2(ro)->show lldp port remote-info ge.3.1
Local Port   : ge.3.1      Remote Port Id : 00-09-6e-0e-14-3d
-----
Mgmt Addr    : 0.0.0.0
Chassis ID   : 0.0.0.0
Device Type  : Communication Device Endpoint (class III)
Sys Name     : AVE0E143D
Sys Cap Supported/Enabled : bridge,telephone/bridge

Auto-Neg Supported/Enabled : yes/yes
Auto-Neg Advertised       : 10BASE-T, 10BASE-TFD
                          : 100BASE-TX, 100BASE-TXFD
                          : pause, Spause

Operational Speed/Duplex/Type : 100/full/TX

Hardware Revision           : 4610D01A
Firmware Revision          : b10d01b2_7.bin
Software Revision          : a10d01b2_7.bin
Serial Number              : 05GM42004348
Manufacturer               : Avaya
Model Number               : 4610
```

Note that the information fields displayed by the **show lldp port remote-info** command will vary, depending on the type of remote device that is connected to the port.

[Table 4-10](#) describes the output fields that are unique to the remote system information database. Refer to [Table 4-9](#) on page 19 for descriptions of the information fields that are common to both the local and the remote system information databases.

**Table 4-10 show lldp port remote-info Output Display**

Output Field	What it Displays...
Remote Port Id	Displays whatever port Id information received in the LLDPDU from the remote device. In this case, the port Id is MAC address of remote device.
Device Type	Mandatory LLDP-MED Capabilities TLV. Displayed only when the port is connected to an LLDP-MED-capable endpoint device.
Hardware Revision	LLDP-MED Extensions Inventory Management TLV component.
Firmware Revision	LLDP-MED Extensions Inventory Management TLV component.

**Table 4-10 show lldp port remote-info Output Display**

Output Field	What it Displays...
Software Revision	LLDP-MED Extensions Inventory Management TLV component.
Serial Number	LLDP-MED Extensions Inventory Management TLV component.
Manufacturer	LLDP-MED Extensions Inventory Management TLV component.
Model Number	LLDP-MED Extensions Inventory Management TLV component.
Asset ID	LLDP-MED Extensions Inventory Management TLV component. In the above example, no asset ID was received from the remote device so the field is not displayed.

## set lldp tx-interval

Use this command to set the time, in seconds, between successive LLDP frame transmissions initiated by changes in the LLDP local system information.

### Syntax

```
set lldp tx-interval frequency
```

### Parameters

<i>frequency</i>	Specifies the number of seconds between transmissions of LLDP frames. Value can range from 5 to 32,768 seconds. The default is 30 seconds.
------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example sets the transmit interval to 20 seconds.

```
B2(rw)->set lldp tx-interval 20
```

## set lldp hold-multiplier

Use this command to set the time-to-live value used in LLDP frames sent by this device. The time-to-live for LLDPDU data is calculated by multiplying the transmit interval by the hold multiplier value.

### Syntax

```
set lldp hold-multiplier multiplier-val
```



## Parameters

<i>multiplier-val</i>	Specifies the multiplier to apply to the transmit interval to determine the time-to-live value. Value can range from 2 to 10. Default value is 4.
-----------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example sets the transmit interval to 20 seconds and the hold multiplier to 5, which will configure a time-to-live of 100 to be used in the TTL field in the LLDPDU header.

```
B2(rw)->set lldp tx-interval 20
B2(rw)->set lldp hold-multiplier 5
```

# set lldp trap-interval

Use this command to set the minimum interval between LLDP notifications sent by this device. LLDP notifications are sent when a remote system change has been detected.

## Syntax

```
set lldp trap-interval frequency
```

## Parameters

<i>frequency</i>	Specifies the minimum time between LLDP trap transmissions, in seconds. The value can range from 5 to 3600 seconds. The default value is 5 seconds.
------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example sets the minimum interval between LLDP traps to 10 seconds.

```
B2(rw)->set lldp trap-interval 10
```

# set lldp med-fast-repeat

Network connectivity devices transmit only LLDP TLVs in LLDPDUs until they detect that an LLDP-MED endpoint device has connected to a port. At that point, the network connectivity device starts sending LLDP-MED TLVs at a fast start rate on that port. Use this command to set the number of successive LLDPDUs (with LLDP-MED TLVs) to be sent for one complete fast start interval.

## Syntax

`set lldp med-fast-repeat count`

## Parameters

<i>count</i>	Specifies the number of fast start LLDPDUs to be sent when an LLDP-MED endpoint device is detected. Value can range from 1 to 10. Default is 3.
--------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example sets the number of fast start LLDPDUs to be sent to 4.

B2(rw)->set lldp med-fast-repeat 4

# set lldp port status

Use this command to enable or disable transmitting and processing received LLDPDUs on a port or range of ports.

## Syntax

`set lldp port status {tx-enable | rx-enable | both | disable} port-string`

## Parameters

<b>tx-enable</b>	Enables transmitting LLDPDUs on the specified ports.
<b>rx-enable</b>	Enables receiving and processing LLDPDUs from remote systems on the specified ports.
<b>both</b>	Enables both transmitting and processing received LLDPDUs on the specified ports.
<b>disable</b>	Disables both transmitting and processing received LLDPDUs on the specified ports.
<i>port-string</i>	Specifies the port or range of ports to be affected.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example enables both transmitting LLDPDUs and receiving and processing LLDPDUs from remote systems on ports ge.1.1 through ge.1.6.

```
B2(rw)->set lldp port status both ge.1.1-6
```

# set lldp port trap

Use this command to enable or disable sending LLDP notifications (traps) when a remote system change is detected.

## Syntax

```
set lldp port trap {enable | disable} port-string
```

## Parameters

<b>enable</b>	Enable transmitting LLDP traps on the specified ports.
<b>disable</b>	Disable transmitting LLDP traps on the specified ports.
<i>port-string</i>	Specifies the port or range of ports to be affected.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example enables transmitting LLDP traps on ports ge.1.1 through ge.1.6.

```
B2(rw)->set lldp port trap enable ge.1.1-6
```

# set lldp port med-trap

Use this command to enable or disable sending an LLDP-MED notification when a change in the topology has been sensed on the port (that is, a remote endpoint device has been attached or removed from the port).

## Syntax

```
set lldp port med-trap {enable | disable} port-string
```

## Parameters

<b>enable</b>	Enables transmitting LLDP-MED traps on the specified ports.
<b>disable</b>	Disables transmitting LLDP-MED traps on the specified ports.
<i>port-string</i>	Specifies the port or range of ports to be affected.

Defaults

None.

Mode

Switch command, read-write.

Example

This example enables transmitting LLDP-MED traps on ports `ge.1.1` through `ge.1.6`.

```
B2(rw)->set lldp port med-trap enable ge.1.1-6
```

set lldp port location-info

Use this command to configure LLDP-MED location information on a port or range of ports. Currently, only Emergency Call Services (ECS) Emergency Location Identification Number (ELIN) is supported.

Syntax

```
set lldp port location-info elin elin-string port-string
```

Parameters

<b>elin</b>	Specifies that the ECS ELIN data format is to be used.
<i>elin-string</i>	Specifies the location identifier. Value can be from 10 to 25 numerical characters.
<i>port-string</i>	Specifies the port or range of ports to be affected.

Defaults

None.

Mode

Switch command, read-write.

Example

After you configure a location information value, you must also configure the port to send the Location Information TLV with the [set lldp port tx-tlv](#) command. This example configures the ELIN identifier 5551234567 on ports `ge.1.1` through `ge.1.6` and then configures the ports to send the Location Information TLV.

```
B2(rw)->set lldp port location-info 5551234567 ge.1.1-6
B2(rw)->set lldp port tx-tlv med-loc ge.1.1-6
```

set lldp port tx-tlv

Use this command to select the optional LLDP and LLDP-MED TLVs to be transmitted in LLDPDUs by the specified port or ports. Use the [show lldp port local-info](#) command to display the values of these TLVs for the port.

## Syntax

```
set lldp port tx-tlv {[all] | [port-desc] [sys-name] [sys-desc] [sys-cap] [mgmt-addr] [vlan-id] [stp] [lACP] [gvrp] [mac-phy] [poe] [link-aggr] [max-frame] [med-cap] [med-loc] [med-poe]} port-string
```

## Parameters

<b>all</b>	Adds all optional TLVs to transmitted LLDPDUs.
<b>port-desc</b>	Port Description optional basic LLDP TLV. Value sent is ifDescr object defined in RFC 2863.
<b>sys-name</b>	System Name optional basic LLDP TLV. Value sent is the administratively assigned name for the system.
<b>sys-desc</b>	System Description optional basic LLDP TLV. Value sent is sysDescr object defined in RFC 3418.
<b>sys-cap</b>	System Capabilities optional basic LLDP TLV. For a network connectivity device, value sent can be bridge and/or router.
<b>mgmt-addr</b>	Management Address optional basic LLDP TLV. Value sent is IPv4 address of host interface.
<b>vlan-id</b>	Port VLAN ID IEEE 802.1 Extensions TLV. Value sent is port VLAN ID (PVID).
<b>stp</b>	Spanning Tree information defined by Protocol Identity IEEE 802.1 Extensions TLV. If STP is enabled on the port, value sent includes version of protocol being used.
<b>lACP</b>	LACP information defined by Protocol Identity IEEE 802.1 Extensions TLV. If LACP is enabled on the port, value sent includes version of protocol being used.
<b>gvrp</b>	GVRP information defined by Protocol Identity IEEE 802.1 Extensions TLV. If LACP is enabled on the port, value sent includes version of protocol being used.
<b>mac-phy</b>	MAC-PHY Configuration/Status IEEE 802.3 Extensions TLV. Value sent includes the operational MAU type, duplex, and speed of the port.
<b>poe</b>	Power via MDI IEEE 802.3 Extensions TLV. Values sent include whether pair selection can be controlled on port, and the power class supplied by the port. Only valid for PoE-enabled ports.
<b>link-aggr</b>	Link Aggregation IEEE 802.3 Extensions TLV. Values sent indicate whether the link associated with this port can be aggregated, whether it is currently aggregated, and if aggregated, the aggregated port identifier.
<b>max-frame</b>	Maximum Frame Size IEEE 802.3 Extensions TLV. Value sent indicates maximum frame size of the port's MAC and PHY.
<b>med-cap</b>	LLDP-MED Capabilities TLV. Value sent indicates the capabilities (whether the device supports location information, extended power via MDI) and Device Type (network connectivity device) of the sending device.
<b>med-loc</b>	LLDP-MED Location Identification TLV. Value sent is the ECS ELIN value configured on the port. See the <a href="#">set lldp port location-info</a> command for more information.

<b>med-poe</b>	LLDP-MED Extended Power via MDI TLV. Values sent include the Power Limit (total power the port is capable of sourcing over a maximum length cable) and the power priority configured on the port. Only valid for PoE-enabled ports.
<i>port-string</i>	Specifies the port or range of ports to be affected.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example configures the management address, MED capability, and MED location identification TLVs to be sent in LLDPDUs by port `ge.1.1`.

```
B2(rw)->set lldp port tx-tnv mgmt-addr med-cap med-loc ge.1.1
```

# clear lldp

Use this command to return LLDP parameters to their default values.

## Syntax

```
clear lldp {all | tx-interval | hold-multiplier | trap-interval | med-fast-repeat}
```

## Parameters

<b>all</b>	Returns <b>all</b> LLDP configuration parameters to their default values, including port LLDP configuration parameters.
<b>tx-interval</b>	Returns the number of seconds between transmissions of LLDP frames.to the default of 30 seconds.
<b>hold-multiplier</b>	Returns the multiplier to apply to the transmit interval to determine the time-to-live value to the default value of 4.
<b>trap-interval</b>	Returns the minimum time between LLSP trap transmissions to the default value of 5 seconds.
<b>med-fast-repeat</b>	Returns the number of fast start LLDPDUs to be sent when an LLDP-MED endpoint device is detected to the default of 3.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example returns the transmit interval to the default value of 30 seconds.

```
B2(rw)->clear lldp tx-interval
```

## clear lldp port status

Use this command to return the port status to the default value of both (both transmitting and processing received LLDPDUs are enabled).

### Syntax

```
clear lldp port status port-string
```

### Parameters

<i>port-string</i>	Specifies the port or range of ports to be affected.
--------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example returns port ge.1.1 to the default state of enabled for both transmitting and processing received LLDPDUs.

```
B2(rw)->clear lldp port status ge.1.1
```

## clear lldp port trap

Use this command to return the port LLDP trap setting to the default value of disabled.

### Syntax

```
clear lldp port trap port-string
```

### Parameters

<i>port-string</i>	Specifies the port or range of ports to be affected.
--------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example returns port ge.1.1 to the default LLDP trap state of disabled.

```
B2(rw)->clear lldp port trap ge.1.1
```

## clear lldp port med-trap

Use this command to return the port LLDP-MED trap setting to the default value of disabled.

Syntax

`clear lldp port med-trap port-string`

Parameters

<i>port-string</i>	Specifies the port or range of ports to be affected.
--------------------	--

Defaults

None.

Mode

Switch command, read-write.

Example

This example returns port ge.1.1 to the default LLDP-MED trap state of disabled.

B2(rw)->clear lldp port med-trap ge.1.1

clear lldp port location-info

Use this command to return the port ECS ELIN location setting to the default value of null.

Syntax

`clear lldp port location-info elin port-string`

Parameters

<b>elin</b>	Specifies that the ECS ELIN location information value should be cleared.
<i>port-string</i>	Specifies the port or range of ports to be affected.

Defaults

None.

Mode

Switch command, read-write.

Example

This example returns the location information ELIN value on port ge.1.1 to the default value of null.

B2(rw)->clear lldp port location-info elin ge.1.1

clear lldp port tx-tlv

Use this command to clear the optional LLDP and LLDP-MED TLVs to be transmitted in LLDPDUs by the specified port or ports to the default value of disabled.



## Syntax

```
clear lldp port tx-tlv {[all] | [port-desc] [sys-name] [sys-desc] [sys-cap] [mgmt-addr] [vlan-id] [stp] [lACP] [gvrp] [mac-phy] [poe] [link-aggr] [max-frame] [med-cap] [med-loc] [med-poe]} port-string
```

## Parameters

<b>all</b>	Disables all optional TLVs from being transmitted in LLDPDUs.
<b>port-desc</b>	Disables the Port Description optional basic LLDP TLV from being transmitted in LLDPDUs.
<b>sys-name</b>	Disables the System Name optional basic LLDP TLV from being transmitted in LLDPDUs.
<b>sys-desc</b>	Disables the System Description optional basic LLDP TLV from being transmitted in LLDPDUs.
<b>sys-cap</b>	Disables the System Capabilities optional basic LLDP TLV from being transmitted in LLDPDUs.
<b>mgmt-addr</b>	Disables the Management Address optional basic LLDP TLV from being transmitted in LLDPDUs.
<b>vlan-id</b>	Disables the Port VLAN ID IEEE 802.1 Extensions TLV from being transmitted in LLDPDUs.
<b>stp</b>	Disables the Spanning Tree information defined by Protocol Identity IEEE 802.1 Extensions TLV from being transmitted in LLDPDUs.
<b>lACP</b>	Disables the LACP information defined by Protocol Identity IEEE 802.1 Extensions TLV from being transmitted in LLDPDUs.
<b>gvrp</b>	Disables the GVRP information defined by Protocol Identity IEEE 802.1 Extensions TLV from being transmitted in LLDPDUs.
<b>mac-phy</b>	Disables the MAC-PHY Configuration/Status IEEE 802.3 Extensions TLV from being transmitted in LLDPDUs.
<b>poe</b>	Disables the Power via MDI IEEE 802.3 Extensions TLV from being transmitted in LLDPDUs. Only valid for PoE-enabled ports.
<b>link-aggr</b>	Disables the Link Aggregation IEEE 802.3 Extensions TLV from being transmitted in LLDPDUs.
<b>max-frame</b>	Disables the Maximum Frame Size IEEE 802.3 Extensions TLV from being transmitted in LLDPDUs.
<b>med-cap</b>	Disables the LLDP-MED Capabilities TLV from being transmitted in LLDPDUs.
<b>med-loc</b>	Disables the LLDP-MED Location Identification TLV from being transmitted in LLDPDUs.
<b>med-poe</b>	Disables the LLDP-MED Extended Power via MDI TLV from being transmitted in LLDPDUs. Only valid for PoE-enabled ports.
<i>port-string</i>	Specifies the port or range of ports to be affected.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example disables the management address, MED capability, and MED location identification TLVs from being sent in LLDPDUs by port ge.1.1.

```
B2(rw)->clear lldp port tx-tlv mgmt-addr med-cap med-loc ge.1.1
```

# 5

## Port Configuration

This chapter describes the Port Configuration set of commands and how to use them.

For information about...	Refer to page...
<a href="#">Port Configuration Summary</a>	5-1
<a href="#">Reviewing Port Status</a>	5-3
<a href="#">Disabling / Enabling and Naming Ports</a>	5-6
<a href="#">Setting Speed and Duplex Mode</a>	5-9
<a href="#">Enabling / Disabling Jumbo Frame Support</a>	5-11
<a href="#">Setting Auto-Negotiation and Advertised Ability</a>	5-13
<a href="#">Setting Flow Control</a>	5-17
<a href="#">Setting Port Link Traps and Link Flap Detection</a>	5-18
<a href="#">Configuring Broadcast Suppression</a>	5-27
<a href="#">Port Mirroring</a>	5-29
<a href="#">Link Aggregation Control Protocol (LACP)</a>	5-32
<a href="#">Configuring Protected Ports</a>	5-45

## Port Configuration Summary

### B2H124-48 and B2H124-48P Switch Ports

The B2H124-48 and B2H124-48P stackable devices provide the following types of front panel connections:

- 48 fixed RJ45 10/100 Mbps copper Fast Ethernet ports
- 4 SFP slots (labeled ports 49 through 52) that provide the option of installing Small Form Pluggable (SFP) Mini-GBICs for 1000BASE-T compliant copper connections or 1000BASE-SX\LX\ELX fiber-optic connections

### B2G124-24, B2G124-48, and B2G124-48P Switch Ports

The B2G124-24, B2G124-48 and B2G124-48P stackable devices provide the following types of switch port connections:

- 24 or 48 RJ45 10/100/1000 Mbps 1000BASE-T Gigabit Ethernet copper ports

- 4 SFP slots (labeled ports 21 through 24 or ports 45 through 48) that provide the option of installing Small Form Pluggable (SFP) Mini-GBICs for 1000BASE-T compliant copper connections or 1000BASE-SX\ LX\ ELX fiber-optic connections.

---

### Important Notice About B2Gxxx-xx 10/100/100 and SFP Mini-GBIC Ports

SFP Mini-GBIC uplink ports are used in an either / or configuration with their corresponding RJ45 10/100/1000 Mbps 1000BASE-T Gigabit Ethernet copper ports. If all Mini-GBIC ports are used, the four corresponding RJ45 ports will be disabled. The maximum number of active ports can be 24 on the B2G124-24, and 48 on the B2G124-48 and B2G124-48P, in any combination of RJ45s and Mini-GBICs. This does not apply to the B2Hxxx-xx switches.

---

## Port String Syntax Used in the CLI

Commands requiring a *port-string* parameter use the following syntax to designate port type, slot location, and port number:

**port type.unit number.port number**

Where **port type** can be:

**fe** for 100-Mbps Ethernet

**ge** for 1-Gbps Ethernet

**tg** for 10-Gbps Ethernet

**host** for the host port

**vlan** for vlan interfaces

**lag** for IEEE802.3 link aggregation ports

**Unit number** can be:

**1 - 8** for switch units in a SecureStack B2 stack

**Port number** can be:

**1 – 52** for the B2H124-48 and B2H124-48P

**1 – 48** for the B2G124-48 and B2G124-48P

**1 - 24** for the B2G124-24

The highest valid port number is dependent on the number of ports in the device and the port type.

## Port Slot/Unit Parameters Used in the CLI

The “unit” parameter is often used interchangeably with “module” in the SecureStack CLI to indicate a module slot location.

## Examples



**Note:** You can use a wildcard (\*) to indicate all of an item. For example, `ge.3.*` would represent all 1-Gigabit Ethernet (`ge`) ports in slot 3.

This example shows the *port-string* syntax for specifying the 1-Gigabit Ethernet port 14 in slot unit 3.

```
ge.3.14
```

This example shows the *port-string* syntax for specifying all 1-Gigabit Ethernet ports in slot unit 3 in the system.

```
ge.3.*
```

This example shows the *port-string* syntax for specifying all ports (of any interface type) in the system.

```
*.*.*
```

## Reviewing Port Status

### Purpose

To display operating status, duplex mode, speed, port type, and statistical information about traffic received and transmitted through one or all switch ports on the device.

### Commands

The commands used to review port status are listed below.

For information about...	Refer to page...
show port	<a href="#">5-3</a>
show port status	<a href="#">5-4</a>
show port counters	<a href="#">5-5</a>

## show port

Use this command to display whether or not one or more ports are enabled for switching.

### Syntax

```
show port [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays operational status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

If *port-string* is not specified, operational status information for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display operational status information for ge.3.14:

```
B2(su)->show port ge.3.14
Port ge.3.14 enabled
```

# show port status

Use this command to display operating and admin status, speed, duplex mode and port type for one or more ports on the device.

## Syntax

```
show port status [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, status information for all ports will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display status information for ge.3.14:

```
B2(su)->show port status ge.3.14
```

Port	Alias (truncated)	Oper Status	Admin Status	Speed	Duplex	Type
ge.3.14		up	up	N/A	N/A	BaseT RJ45

[Table 5-11](#) provides an explanation of the command output.

Table 5-11 show port status Output Details

Output	What It Displays...
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
Alias (truncated)	Alias configured for the port. For details on using the <b>set port alias</b> command, refer to <a href="#">“set port alias”</a> on page 5-8.
Oper Status	Operating status (up or down).
Admin Status	Whether the specified port is enabled (up) or disabled (down). For details on using the <b>set port disable</b> command to change the default port status of enabled, refer to <a href="#">“set port disable”</a> on page 5-6. For details on using the <b>set port enable</b> command to re-enable ports, refer to <a href="#">“set port enable”</a> on page 5-7.
Speed	Operational speed in Mbps or Kbps of the specified port. For details on using the <b>set port speed</b> command to change defaults, refer to <a href="#">“set port speed”</a> on page 5-10.
Duplex	Duplex mode (half or full) of the specified port. For details on using the <b>set port duplex</b> command to change defaults, refer to <a href="#">“Setting Auto-Negotiation and Advertised Ability”</a> on page 5-13.
Type	Physical port and interface type.

# show port counters

Use this command to display port counter statistics detailing traffic through the device and through all MIB2 network devices.

## Syntax

```
show port counters [port-string] [switch | mib2]
```

## Parameters

<i>port-string</i>	(Optional) Displays counter statistics for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>switch</b>   <b>mib2</b>	(Optional) Displays switch or MIB2 statistics. Switch statistics detail performance of the SecureStack B2 device. MIB2 interface statistics detail performance of all network devices.

## Defaults

If *port-string* is not specified, counter statistics will be displayed for all ports.

If **mib2** or **switch** are not specified, all counter statistics will be displayed for the specified port(s).

## Mode

Switch command, read-only.

## Examples

This example shows how to display all counter statistics, including MIB2 network traffic and traffic through the device for ge.3.1:

```
B2(su)->show port counters ge.3.1
```

```
Port: ge.3.1    MIB2 Interface: 1
```

```
No counter discontinuity time
```

```
-----
```

```
MIB2 Interface Counters
```

```
-----
```

```
In Octets                                0
In Unicast Pkts                          0
In Multicast Pkts                        0
In Broadcast Pkts                        0
In Discards                              0
In Errors                                 0
Out Octets                                0
Out Unicasts Pkts                        0
Out Multicast Pkts                      0
Out Broadcast Pkts                      0
Out Errors                                0
```

```
802.1Q Switch Counters
```

```
-----
```

```
Frames Received                          0
Frames Transmitted                       0
```

```
This example shows how to display all ge.3.1 port counter statistics related to traffic through the device.

B2(su)->show port counters ge.3.1 switch

Port: ge.3.1           Bridge Port: 2

802.1Q Switch Counters
-----
Frames Received          0
Frames Transmitted       0
```

Table 5-12 provides an explanation of the command output.

Table 5-12 show port counters Output Details

Output	What It Displays...
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “Port String Syntax Used in the CLI” on page 5-2.
MIB2 Interface	MIB2 interface designation.
Bridge Port	IEEE 802.1D bridge port designation.
MIB2 Interface Counters	MIB2 network traffic counts
802.1Q Switch Counters	Counts of frames received, transmitted, and filtered.

## Disabling / Enabling and Naming Ports

### Purpose

To disable and re-enable one or more ports, and to assign an alias to a port. By default, all ports are enabled at device startup. You may want to disable ports for security or to troubleshoot network issues. Ports may also be assigned an alias for convenience.

### Commands

For information about...	Refer to page...
set port disable	5-6
set port enable	5-7
show port alias	5-7
set port alias	5-8

### set port disable

Use this command to administratively disable one or more ports. When this command is executed, in addition to disabling the physical Ethernet link, the port will no longer learn entries in the forwarding database.



## Syntax

```
set port disable port-string
```

## Parameters

<i>port-string</i>	Specifies the port(s) to disable. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to disable ge.1.1:

```
B2(su)->set port disable ge.1.1
```

# set port enable

Use this command to administratively enable one or more ports.

## Syntax

```
set port enable port-string
```

## Parameters

<i>port-string</i>	Specifies the port(s) to enable. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable ge.1.3:

```
B2(su)->set port enable ge.1.3
```

# show port alias

Use this command to display the alias name for one or more ports.

## Syntax

```
show port alias [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays alias name(s) for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, aliases for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display alias information for ports 1-3 on slot 3:

```
B2(rw)->show port alias ge.3.1-3
Port  ge.3.1 user
Port  ge.3.2 user
Port  ge.3.3 Admin
```

## set port alias

Use this command to assign an alias name to a port.

### Syntax

```
set port alias port-string [name]
```

### Parameters

<i>port-string</i>	Specifies the port to which an alias will be assigned. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<i>name</i>	(Optional) Assigns an alias name to the port. If the alias name contains spaces, the text string must be surrounded by double quotes. Maximum length is 60 characters.

### Defaults

If *name* is not specified, the alias assigned to the port will be cleared.

### Mode

Switch command, read-write.

### Examples

This example shows how to assign the alias “Admin” to *ge.3.3*:

```
B2(rw)->set port alias ge.3.3 Admin
```

This example shows how to clear the alias for *ge.3.3*:

```
B2(rw)->set port alias ge.3.3
```

# Setting Speed and Duplex Mode

## Purpose

To review and set the operational speed in Mbps and the default duplex mode: **Half**, for half duplex, or **Full**, for full duplex for one or more ports.



**Note:** These settings only take effect on ports that have auto-negotiation disabled.

## Commands

For information about...	Refer to page...
show port speed	<a href="#">5-9</a>
set port speed	<a href="#">5-10</a>
show port duplex	<a href="#">5-10</a>
set port duplex	<a href="#">5-13</a>

## show port speed

Use this command to display the default speed setting on one or more ports.

### Syntax

```
show port speed [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays default speed setting(s) for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

If *port-string* is not specified, default speed settings for all ports will display.

### Mode

Switch command, read-only.

### Example

This example shows how to display the default speed setting for 1-Gigabit Ethernet port 14 in slot 3:

```
B2(su)->show port speed ge.3.14
default speed is 10 on port ge.3.14.
```

# set port speed

Use this command to set the default speed of one or more ports. This setting only takes effect on ports that have auto-negotiation disabled.

## Syntax

```
set port speed port-string {10 | 100 | 1000}
```

## Parameters

<i>port-string</i>	Specifies the port(s) for which to a speed value will be set. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
10   100   1000	Specifies the port speed. Valid values are: 10 Mbps, 100 Mbps, or 1000 Mbps.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set ge.3.3 to a port speed of 10 Mbps:

```
B2(su)->set port speed ge.3.3 10
```

# show port duplex

Use this command to display the default duplex setting (half or full) for one or more ports.

## Syntax

```
show port duplex [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays default duplex setting(s) for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

## Defaults

If *port-string* is not specified, default duplex settings for all ports will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display the default duplex setting for Gigabit Ethernet port 14 in slot 3:

```
B2(su)->show port duplex ge.3.14
```

default duplex mode is full on port ge.3.14.

## set port duplex

Use this command to set the default duplex type for one or more ports. This command will only take effect on ports that have auto-negotiation disabled.

### Syntax

```
set port duplex port-string {full | half}
```

### Parameters

<i>port-string</i>	Specifies the port(s) for which duplex type will be set. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>full</b>   <b>half</b>	Sets the port(s) to full-duplex or half-duplex operation.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set ge.1.17 to full duplex:

```
B2(su)->set port duplex ge.1.17 full
```

## Enabling / Disabling Jumbo Frame Support

### Purpose

To review, enable, and disable jumbo frame support on one or more ports. This allows Gigabit Ethernet ports to transmit frames up to 10 KB in size.

### Commands

For information about...	Refer to page...
show port jumbo	<a href="#">5-11</a>
set port jumbo	<a href="#">5-12</a>
clear port jumbo	<a href="#">5-13</a>

## show port jumbo

Use this command to display the status of jumbo frame support and maximum transmission units (MTU) on one or more ports.

### Syntax

`show port jumbo [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays the status of jumbo frame support for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, jumbo frame support status for all ports will display.

### Mode

Switch command, read-only.

### Example

This example shows how to display the status of jumbo frame support for ge.1.1:

```
B2(su)->show port jumbo ge.1.1
```

Port Number	Jumbo Status	Max Frame Size
-----	-----	-----
ge.1.1	Enable	9216

## set port jumbo

Use this command to enable or disable jumbo frame support on one or more ports.

### Syntax

`set port jumbo {enable | disable} [port-string]`

### Parameters

<b>enable   disable</b>	Enables or disables jumbo frame support.
<i>port-string</i>	(Optional) Specifies the port(s) on which to disable or enable jumbo frame support. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

### Defaults

If *port-string* is not specified, jumbo frame support will be enabled or disabled on all ports.

### Mode

Switch command, read-write.

### Example

This example shows how to enable jumbo frame support for Gigabit Ethernet port 14 in slot 3:

```
B2(su)->set port jumbo enable ge.3.14
```

## clear port jumbo

Use this command to reset jumbo frame support status to enabled on one or more ports.

### Syntax

```
clear port jumbo [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Specifies the port(s) on which to reset jumbo frame support status to enabled. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, jumbo frame support status will be reset on all ports.

### Mode

Switch command, read-write.

### Example

This example shows how to reset jumbo frame support status for Gigabit Ethernet port 14 in slot 3:

```
B2(su)->clear port jumbo ge.3.14
```

## Setting Auto-Negotiation and Advertised Ability

### Purpose

To review, disable or enable auto-negotiation, and to configure port advertisement for speed and duplex.

During auto-negotiation, the port “tells” the device at the other end of the segment what its capabilities and mode of operation are. If auto-negotiation is disabled, the port reverts to the values specified by default speed, default duplex, and the port flow control commands.

In normal operation, with all capabilities enabled, advertised ability enables a port to “advertise” that it has the ability to operate in any mode. The user may choose to configure a port so that only a portion of its capabilities are advertised and the others are disabled.



**Note:** Advertised ability can be activated only on ports that have auto-negotiation enabled.

### Commands

For information about...	Refer to page...
show port negotiation	<a href="#">5-14</a>
set port negotiation	<a href="#">5-14</a>

For information about...	Refer to page...
show port advertise	<a href="#">5-15</a>
set port advertise	<a href="#">5-16</a>
clear port advertise	<a href="#">5-16</a>

## show port negotiation

Use this command to display the status of auto-negotiation for one or more ports.

### Syntax

```
show port negotiation [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays auto-negotiation status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, auto-negotiation status for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display auto-negotiation status for 1-Gigabit Ethernet port 14 in slot 3:

```
B2(su)->show port negotiation ge.3.14
auto-negotiation is enabled on port ge.3.14.
```

## set port negotiation

Use this command to enable or disable auto-negotiation on one or more ports.

### Syntax

```
set port negotiation port-string {enable | disable}
```

### Parameters

<i>port-string</i>	Specifies the port(s) for which to enable or disable auto-negotiation. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>enable</b>   <b>disable</b>	Enables or disables auto-negotiation.

### Defaults

None.



## Mode

Switch command, read-write.

## Example

This example shows how to disable auto-negotiation on 1-Gigabit Ethernet port 3 in slot 14:

```
B2(su)->set port negotiation ge.3.14 disable
```

# show port advertise

Use this command to display port capability and advertisement as far as speed and duplex for auto-negotiation.

## Syntax

```
show port advertise [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays advertised ability for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, advertisement for all ports will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display advertisement status for Gigabit ports 13 and 14:

```
B2(su)->show port advertise ge.1.13-14
```

ge.1.13	capability	advertised	remote
-----			
10BASE-T	yes	yes	yes
10BASE-TFD	yes	yes	yes
100BASE-TX	yes	yes	yes
100BASE-TXFD	yes	yes	yes
1000BASE-T	no	no	no
1000BASE-TFD	yes	yes	yes
pause	yes	yes	no
ge.1.14	capability	advertised	remote
-----			
10BASE-T	yes	yes	yes
10BASE-TFD	yes	yes	yes
100BASE-TX	yes	yes	yes
100BASE-TXFD	yes	yes	yes
1000BASE-T	no	no	no
1000BASE-TFD	yes	yes	yes
pause	yes	yes	no

## set port advertise

Use this command to configure what a port will advertise for speed/duplex capabilities in auto-negotiation.

### Syntax

```
set port advertise {port-string}{10t | 10tfd | 100tx | 100txfd | 1000t | 1000tfd  
| pause}
```

### Parameters

<i>port-string</i>	Select the ports for which to configure advertisements. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>10t</b>	Advertise 10BASE-T half duplex mode.
<b>10tfd</b>	Advertise 10BASE-T full duplex mode.
<b>100tx</b>	Advertise 100BASE-TX half duplex mode.
<b>100txfd</b>	Advertise 100BASE-TX full duplex mode.
<b>1000t</b>	Advertise 1000BASE-T half duplex mode.
<b>1000tfd</b>	Advertise 1000BASE-T full duplex mode.
<b>pause</b>	Advertise PAUSE for full-duplex links.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to configure port 1 to advertise 1000BASE-T full duplex:

```
B2(su)->set port advertise ge.1.1 1000tfd
```

## clear port advertise

Use this command to configure a port to not advertise a specific speed/duplex capability when auto-negotiating with another port.

### Syntax

```
clear port advertise {port-string}{10t | 10tfd | 100tx | 100txfd | 1000t | 1000tfd  
| pause}
```

## Parameters

<i>port-string</i>	Clear advertisements for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>10t</b>	Do not advertise 10BASE-T half duplex mode.
<b>10tfd</b>	Do not advertise 10BASE-T full duplex mode.
<b>100tx</b>	Do not advertise 100BASE-TX half duplex mode.
<b>100txfd</b>	Do not advertise 100BASE-TX full duplex mode.
<b>1000t</b>	Do not advertise 1000BASE-T half duplex mode.
<b>1000tfd</b>	Do not advertise 1000BASE-T full duplex mode.
<b>pause</b>	Do not advertise PAUSE for full-duplex links.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to configure port 1 to not advertise 10 MB capability for auto-negotiation:

```
B2(su)->clear port advertise ge.1.1 10t 10tfd
```

# Setting Flow Control

## Purpose

To review, enable or disable port flow control. Flow control is used to manage the transmission between two devices as specified by IEEE 802.3x to prevent receiving ports from being overwhelmed by frames from transmitting devices.

## Commands

For information about...	Refer to page...
show flowcontrol	<a href="#">5-17</a>
set flowcontrol	<a href="#">5-18</a>

## show flowcontrol

Use this command to display the flow control state.

## Syntax

```
show flowcontrol
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the port flow control state:

```
B2(su)->show flowcontrol
Flow control status: enabled
```

# set flowcontrol

Use this command to enable or disable flow control.

## Syntax

```
set flowcontrol {enable | disable}
```

## Parameters

---

<b>enable   disable</b>	Enables or disables flow control settings.
-------------------------	--

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable flow control:

```
B2(su)->set flowcontrol enable
```

# Setting Port Link Traps and Link Flap Detection

## Purpose

To disable or re-enable link traps, display link trap status, and to configure the link flapping detection function. By default, all ports are enabled to send SNMP trap messages indicating changes to their link status (up or down).

The link flap function detects when a link is going up and down rapidly (also called “link flapping”) on a physical port, and takes the required actions (disable port, and eventually send notification trap) to stop such a condition. If left unresolved, the “link flapping” condition can be

detrimental to network stability because it can trigger Spanning Tree and routing table recalculation.

## Commands

For information about...	Refer to page...
show port trap	<a href="#">5-19</a>
set port trap	<a href="#">5-20</a>
show linkflap	<a href="#">5-20</a>
set linkflap globalstate	<a href="#">5-22</a>
set linkflap portstate	<a href="#">5-23</a>
set linkflap interval	<a href="#">5-23</a>
set linkflap action	<a href="#">5-24</a>
clear linkflap action	<a href="#">5-25</a>
set linkflap threshold	<a href="#">5-25</a>
set linkflap downtime	<a href="#">5-26</a>
clear linkflap down	<a href="#">5-26</a>
clear linkflap	<a href="#">5-27</a>

## show port trap

Use this command to display whether the port is enabled for generating an SNMP trap message if its link state changes.

### Syntax

```
show port trap [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays link trap status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

If *port-string* is not specified, the trap status for all ports will be displayed.

### Mode

Switch command, read-write.

### Example

This example shows how to display link trap status for ge.3.1 through 4:

```
B2(su)->show port trap ge.3.1-4
Link traps enabled on port ge.3.1.
Link traps enabled on port ge.3.2.
```

Link traps enabled on port ge.3.3.  
Link traps enabled on port ge.3.4.

# set port trap

Use this command to enable of disable ports for sending SNMP trap messages when their link status changes.

## Syntax

```
set port trap port-string {enable | disable}
```

## Parameters

port-string	Specifies the port(s) for which to enable or disable port traps. For a detailed description of possible port-string values, refer to “Port String Syntax Used in the CLI” on page 5-2.
enable   disable	Enables or disables sending trap messages when link status changes.

## Defaults

Sending traps when link status changes is enabled by default.

## Mode

Switch command, read-write.

## Example

The following example disables sending trap on ge.3.1.

```
B2(su)->set port trap ge.3.1 disable
```

# show linkflap

Use this command to display link flap detection state and configuration information.

## Syntax

```
show linkflap {globalstate | portstate | parameters | metrics | portsupported |  
actsupported | maximum | downports | action | operstatus | threshold | interval |  
downtime | currentcount | totalcount | timelapsed | violations [port-string]}
```

## Parameters

globalstate	Displays the global enable state of link flap detection.
portstate	Displays the port enable state of link flap detection.
parameters	Displays the current value of settable link flap detection parameters.
metrics	Displays linkflap detection metrics.
portsupported	Displays ports which can support the link flap detection function.
actsupported	Displays link flap detection actions supported by system hardware.
maximum	Displays the maximum allowed linkdowns per 10 seconds supported by system hardware.

<b>downports</b>	Displays ports disabled by link flap detection due to a violation.
<b>action</b>	Displays linkflap actions taken on violating port(s).
<b>operstatus</b>	Displays whether linkflap has deactivated port(s).
<b>threshold</b>	Displays the number of allowed link down transitions before action is taken.
<b>interval</b>	Displays the time period for counting link down transitions.
<b>downtime</b>	Displays how long violating port(s) are deactivated.
<b>currentcount</b>	Displays how many linkdown transitions are in the current interval.
<b>totalcount</b>	Displays how many linkdown transitions have occurred since the last reset.
<b>timelapsed</b>	Displays the time period since the last link down event or reset.
<b>violations</b>	Displays the number of link flap violations since the last reset.
<i>port-string</i>	(Optional) Displays information for specific port(s).

## Defaults

- If not specified, information about all link flap detection settings will be displayed.
- If *port-string* is not specified, information for all ports will be displayed.

## Mode

Switch mode, read-only.

## Usage

The linkflap default conditions are shown in the following table.

Linkflap Parameter	Default Condition
Linkflap global state	Disabled
Linkflap port state	Disabled
Linkflap action	None
Linkflap interval	5
Linkflap maximum allowed link downs per 10 seconds	20
Linkflap threshold (number of allowed link down transitions before action is taken)	10

## Examples

This example shows how to display the global status of the link trap detection function:

```
B2(rw)->show linkflap globalstate
Linkflap feature globally disabled
```

This example shows how to display ports disabled by link flap detection due to a violation:

```
B2(rw)->show linkflap downports
Ports currently held DOWN for Linkflap violations:
None.
```

This example shows how to display the link flap parameters table:

```
B2(rw)->show linkflap parameters
Linkflap Port Settable Parameter Table (X means error occurred)
Port      LF Status  Actions  Threshold  Interval  Downtime
-----
ge.1.1    disabled  .....  10         5         300
ge.1.2    enabled   D..S..T  3          5         300
ge.1.3    disabled  ...S..T  10         5         300
```

Table 5-13 provides an explanation of the **show linkflap parameters** command output.

**Table 5-13 show linkflap parameters Output Details**

Output...	What it displays...
Port	Port designation.
LF Status	Link flap enabled state.
Actions	Actions to be taken if the port violates allowed link flap behavior. D = disabled, S = Syslog entry will be generated, T = SNMP trap will be generated.
Threshold	Number of link down transitions necessary to trigger the link flap action.
Interval	Time interval (in seconds) for accumulating link down transitions.
Downtime	Interval (in seconds) port(s) will be held down after a link flap violation.

This example shows how to display the link flap metrics table:

```
B2(rw)->show linkflap metrics
Port      LinkStatus  CurrentCount  TotalCount  TimeElapsed  Violations
-----
ge.1.1    operational  0             0           241437       0
ge.1.2    disabled    4             15          147          5
ge.1.3    operational  3             3           241402       0
```

Table 5-14 provides an explanation of the **show linkflap metrics** command output.

**Table 5-14 show linkflap metrics Output Details**

Output...	What it displays...
Port	Port designation.
LinkStatus	Link status according to the link flap function.
CurrentCount	Link down count accruing toward the link flap threshold.
TotalCount	Number of link downs since system start,
TimeElapsed	Time (in seconds) since the last link down event.
Violations	Number of link flap violations on listed ports since system start.

## set linkflap globalstate

Use this command to globally enable or disable the link flap detection function.



## Syntax

```
set linkflap globalstate {disable | enable}
```

## Parameters

<b>disable   enable</b>	Globally disables or enables the link flap detection function.
-------------------------	--

## Defaults

By default, the function is disabled globally and on all ports.

## Mode

Switch mode, read-write.

## Usage

By default, the function is disabled globally and on all ports. If disabled globally after per-port settings have been configured using the linkflap commands, per-port settings will be retained.

## Example

This example shows how to globally enable the link trap detection function.

```
B2(rw)->set linkflap globalstate enable
```

# set linkflap portstate

Use this command to enable or disable link flap monitoring on one or more ports.

## Syntax

```
set linkflap portstate {disable | enable} [port-string]
```

## Parameters

<b>disable   enable</b>	Disables or enables the link flap detection function.
<i>port-string</i>	(Optional) Specifies the port or ports on which to disable or enable monitoring.

## Defaults

If *port-string* is not specified, all ports are enabled or disabled.

## Mode

Switch command, read-write.

## Example

This example shows how to enable the link trap monitoring on all ports.

```
B2(rw)->set linkflap portstate enable
```

# set linkflap interval

Use this command to set the time interval (in seconds) for accumulating link down transitions.

## Syntax

```
set linkflap interval port-string interval-value
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to set the link flap interval.
<i>interval-value</i>	Specifies an interval in seconds. A value of 0 will set the interval to forever.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the link flap interval on port `ge.1.4` to 1000 seconds.

```
B2(rw)->set linkflap interval ge.1.4 1000
```

# set linkflap action

Use this command to set reactions to a link flap violation.

## Syntax

```
set linkflap action port-string {disableInterface | gensyslogentry | gentrap | all}
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to set the link flap action.
<b>disableInterface</b>	Sets the reaction as disabling the interface.
<b>gensyslogentry</b>	Sets the reaction as generating a syslog entry.
<b>gentrap</b>	Sets the reaction as generating an SNMP trap.
<b>all</b>	Sets the reaction as all of the above.

## Defaults

None.

## Mode

Switch mode, read-write.

## Example

This example shows how to set the link flap violation action on port `ge.1.4` to generating a Syslog entry.

```
B2(rw)->set linkflap action ge.1.4 gensyslogentry
```

## clear linkflap action

Use this command to clear reactions to a link flap violation.

### Syntax

```
clear linkflap action [port-string] {disableInterface | gensyslogentry | gentrap  
| all}
```

### Parameters

<i>port-string</i>	(Optional) Specifies the port(s) on which to clear the link flap action.
<b>disableInterface</b>	Clears the reaction as disabling the interface.
<b>gensyslogentry</b>	Clears the reaction as generating a syslog entry.
<b>gentrap</b>	Clears the reaction as generating an SNMP trap.
<b>all</b>	Clears the reaction as all of the above.

### Defaults

If *port-string* is not specified, actions will be cleared on all ports.

### Mode

Switch mode, read-write.

### Example

This example shows how to clear the link flap violation action on port ge.1.4 to generating a Syslog entry.

```
B2(rw)->clear linkflap action ge.1.4 gensyslogentry
```

## set linkflap threshold

Use this command to set the link flap action trigger count.

### Syntax

```
set linkflap threshold port-string threshold-value
```

### Parameters

<i>port-string</i>	Specifies the port(s) on which to set the link flap action trigger count.
<i>threshold-value</i>	Specifies the number of link down transitions necessary to trigger the link flap action. A minimum of 1 must be configured.

### Defaults

None.

### Mode

Switch mode, read-write.

### Example

This example shows how to set the link flap threshold on port ge.1.4 to 5.

```
B2(rw)->set linkflap threshold ge.1.4 5
```

# set linkflap downtime

Use this command to set the time interval (in seconds) one or more ports will be held down after a link flap violation.

## Syntax

```
set linkflap downtime port-string downtime-value
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to set the link flap downtime.
<i>downtime-value</i>	Specifies a downtime in seconds. A value of 0 will set the downtime to forever.

## Defaults

None.

## Mode

Switch mode, read-write.

## Example

This example shows how to set the link flap downtime on port `ge.1.4` to 5000 seconds.

```
B2(rw)->set linkflap downtime ge.1.4 5000
```

# clear linkflap down

Use this command to toggle link flap disabled ports to operational.

## Syntax

```
clear linkflap down [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Specifies the ports to make operational.
--------------------	---

## Defaults

If *port-string* is not specified, all ports disabled by a link flap violation will be made operational.

## Mode

Switch mode, read-write.

## Example

This example shows how to make disabled port `ge.1.4` operational.

```
B2(rw)->clear linkflap down ge.1.4
```

## clear linkflap

Use this command to clear all link flap options and / or statistics on one or more ports.

### Syntax

```
clear linkflap {all | stats [port-string] | parameter port-string {threshold | interval | downtime | all}}
```

### Parameters

<b>all   stats</b>	Clears all options and statistics, or clears only statistics.
<b>parameter</b>	Clears link flap parameters.
<b>threshold   interval   downtime   all</b>	Clears link flap threshold, interval, downtime or all parameters.
<i>port-string</i>	(Optional unless parameter is specified) Specifies the port(s) on which to clear settings.

### Defaults

If *port-string* is not specified, settings and/or statistics will be cleared on all ports.

### Mode

Switch mode, read-write.

### Example

This example shows how to clear all link flap options on port ge.1.4.

```
B2(rw)->clear linkflap all ge.1.4
```

## Configuring Broadcast Suppression

### Purpose

To review and set the broadcast suppression threshold for one or more ports. This feature limits the number of received broadcast frames the switch will accept per port. Broadcast suppression thresholds apply only to broadcast traffic—multicast traffic is not affected. By default, a broadcast suppression threshold of 14881 packets per second (pps) will be used, regardless of actual port speed. Broadcast suppression protects against broadcast storms and ARP sweeps.

### Commands

For information about...	Refer to page...
show port broadcast	<a href="#">5-28</a>
set port broadcast	<a href="#">5-28</a>
clear port broadcast	<a href="#">5-29</a>

# show port broadcast

Use this command to display port broadcast suppression thresholds.

## Syntax

`show port broadcast [port-string]`

## Parameters

<i>port-string</i>	(Optional) Select the ports for which to show broadcast suppression thresholds. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

If *port-string* is not specified, broadcast status of all ports will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display the broadcast suppression thresholds for ports 1 through 4:

```
B2(su)->show port broadcast ge.1.1-4
Port          Total BC      Threshold
              Packets      (pkts/s)
-----
ge.1.1        0              50
ge.1.2        0              50
ge.1.3        0              40
ge.1.4        0             14881
```

# set port broadcast

Use this command to set the broadcast suppression threshold, in packets per second, on one or more ports. This sets a threshold on the broadcast traffic that is received and switched out to other ports.

## Syntax

`set port broadcast port-string threshold-val`

## Parameters

<i>port-string</i>	Select the ports for which to configure broadcast suppression thresholds. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>threshold-val</i>	Sets the packets per second threshold on broadcast traffic. Maximum value is 148810 for Fast Ethernet ports and 1488100 for Gigabit ports.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example configures ports 1 through 5 with a broadcast limit of 50 pps:

```
B2(su)->set port broadcast ge.1.1-5 50
```

# clear port broadcast

Use this command to clear the broadcast threshold limit to the default value of 14881 for the selected port.

## Syntax

```
clear port broadcast port-string threshold
```

## Parameters

<i>port-string</i>	Select the ports for which to clear broadcast suppression thresholds. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example clears the broadcast threshold limit to 14881 pps for ports 1 through 5:

```
B2(su)->clear port broadcast ge.1.1-5 threshold
```

# Port Mirroring



**Caution:** Port mirroring configuration should be performed only by personnel who are knowledgeable about the effects of port mirroring and its impact on network operation.

The SecureStack B2 device allows you to mirror (or redirect) the traffic being switched on a port for the purposes of network traffic analysis and connection assurance. When port mirroring is enabled, one port becomes a monitor port for another port within the device.

## Mirroring Features

The SecureStack B2 device supports the following mirroring features:

- Mirroring can be configured in a many-to-one configuration so that one target (destination) port can monitor traffic on up to 8 source ports. Only one mirror destination port can be configured per stack, if applicable.
- Both transmit and receive traffic will be mirrored.

- A mirroring session which is configured to be active (enabled) will be operationally active only if both a destination port and at least one source port have been configured.
- A destination port will only act as a mirroring port when the session is operationally active. If the mirroring session is not operationally active, then the destination port will act as a normal port and participate in all normal operation with respect to transmitting traffic and participating in protocols.

## Purpose

To review and configure port mirroring on the device.

## Commands

For information about...	Refer to page...
show port mirroring	<a href="#">5-30</a>
set port mirroring	<a href="#">5-31</a>
clear port mirroring	<a href="#">5-31</a>

## show port mirroring

Use this command to display the source and target ports for mirroring, and whether mirroring is currently enabled or disabled for those ports.

### Syntax

```
show port mirroring
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display port mirroring information. In this case, `ge.1.4` is configured as a source port and `ge.1.11` is a target and mirroring has been enabled between these ports:

```
B2(su)->show port mirroring
```

```
Port Mirroring
=====
Source Port = ge.1.4
Target Port = ge.1.11
Frames Mirrored = Rx and Tx
Port Mirroring status enabled.
```



## set port mirroring

Use this command to create a new mirroring relationship or to enable or disable an existing mirroring relationship between two ports.

### Syntax

```
set port mirroring {create | disable | enable} source destination
```

### Parameters

<b>create   disable   enable</b>	Creates, disables or enables mirroring settings on the specified ports.
<i>source</i>	Specifies the source port designation. This is the port on which the traffic will be monitored. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>destination</i>	Specifies the target port designation. This is the port that will duplicate or “mirror” all the traffic on the monitored port. Only one destination port can be configured per stack, if applicable.  For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Note that LAG ports and their underlying physical ports, as described in [“Link Aggregation Control Protocol \(LACP\)”](#) on page 5-32, cannot be mirrored.

### Example

This example shows how to create and enable port mirroring with ge.1.4 as the source port, and ge.1.11 as the target port:

```
B2(su)->set port mirroring create ge.1.4 ge.1.11
B2(su)->set port mirroring enable ge.1.4 ge.1.11
```

## clear port mirroring

Use this command to clear a port mirroring relationship.

### Syntax

```
clear port mirroring source destination
```

### Parameters

<i>source</i>	Specifies the source port of the mirroring configuration to be cleared. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>destination</i>	Specifies the target port of the mirroring configuration to be cleared.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear port mirroring between source port `ge.1.4` and target port `ge.1.11`:

```
B2(su)->clear port mirroring ge.1.4 ge.1.11
```

# Link Aggregation Control Protocol (LACP)



**Caution:** Link aggregation configuration should only be performed by personnel who are knowledgeable about Spanning Tree and Link Aggregation, and fully understand the ramifications of modifications beyond device defaults. Otherwise, the proper operation of the network could be at risk.

Using multiple links simultaneously to increase bandwidth is a desirable switch feature, which can be accomplished if both sides agree on a set of ports that are being used as a Link Aggregation Group (LAG). Once a LAG is formed from selected ports, problems with looping can be avoided since the Spanning Tree can treat this LAG as a single port.

Enabled by default, the Link Aggregation Control Protocol (LACP) logically groups interfaces together to create a greater bandwidth uplink, or link aggregation, according to the IEEE 802.3ad standard. This standard allows the switch to determine which ports are in LAGs and configure them dynamically. Since the protocol is based on the IEEE 802.3ad specification, any switch from any vendor that supports this standard can aggregate links automatically.

802.3ad LACP aggregations can also be run to end-users (that is, a server) or to a router.



**Note:** Earlier (proprietary) implementations of port aggregation referred to groups of aggregated ports as “trunks”.

## LACP Operation

For each aggregatable port in the device, LACP:

- Maintains configuration information (reflecting the inherent properties of the individual links as well as those established by management) to control aggregation.
- Exchanges configuration information with other devices to allocate the link to a Link Aggregation Group (LAG).



**Note:** A given link is allocated to, at most, one Link Aggregation Group (LAG) at a time. The allocation mechanism attempts to maximize aggregation, subject to management controls.

- Attaches the port to the aggregator used by the LAG, and detaches the port from the aggregator when it is no longer used by the LAG.
- Uses information from the partner device’s link aggregation control entity to decide whether to aggregate ports.

The operation of LACP involves the following activities:

- Checking that candidate links can actually be aggregated.
- Controlling the addition of a link to a LAG, and the creation of the group if necessary.
- Monitoring the status of aggregated links to ensure that the aggregation is still valid.
- Removing a link from a LAG if its membership is no longer valid, and removing the group if it no longer has any member links.

In order to allow LACP to determine whether a set of links connect to the same device, and to determine whether those links are compatible from the point of view of aggregation, it is necessary to be able to establish


- A globally unique identifier for each device that participates in link aggregation.
- A means of identifying the set of capabilities associated with each port and with each aggregator, as understood by a given device.
- A means of identifying a LAG and its associated aggregator.

## LACP Terminology

Table 5-15 defines key terminology used in LACP configuration.

**Table 5-15 LACP Terms and Definitions**

Term	Definition
Aggregator	Virtual port that controls link aggregation for underlying physical ports. Each SecureStack B2 module provides 6 aggregator ports, which are designated in the CLI as <b>lag.0.1</b> through <b>lag.0.6</b> .
LAG	Link Aggregation Group. Once underlying physical ports (for example, <b>ge.x.x</b> ) are associated with an aggregator port, the resulting aggregation will be represented as one LAG with a <b>lag.x.x</b> port designation.  SecureStack B2 LAGs can have up to 8 associated physical ports.
LACPDU	Link Aggregation Control Protocol Data Unit. The protocol exchanges aggregation state/mode information by way of a port's actor and partner operational states. LACPDU's sent by the first party (the actor) convey to the second party (the actor's protocol partner) what the actor knows, both about its own state and that of its partner.
Actor and Partner	An actor is the local device sending LACPDU's. Its protocol partner is the device on the other end of the link aggregation. Each maintains current status of the other via LACPDU's containing information about their ports' LACP status and operational state.
Admin Key	Value assigned to aggregator ports and physical ports that are candidates for joining a LAG. The LACP implementation on SecureStack B2 devices will use this value to form an oper key and will determine which underlying physical ports are capable of aggregating by comparing oper keys. Aggregator ports allow only underlying ports with oper keys matching theirs to join their LAG. On SecureStack B2 devices, the default admin key value is 32768.
System Priority	Value used to build a LAG ID, which determines aggregation precedence. If there are two partner devices competing for the same aggregator, LACP compares the LAG IDs for each grouping of ports. The LAG with the lower LAG ID is given precedence and will be allowed to use the aggregator.



**Note:** Only one LACP system priority can be set on a SecureStack B2 device, using either the **set lacp asyspri** command (page 5-37), or the **set port lacp** command (page 5-42).

## SecureStack B2 Usage Considerations

In normal usage (and typical implementations) there is no need to modify any of the default LACP parameters on the switch. The default values will result in the maximum number of aggregations possible. If the switch is placed in a configuration with its peers not running the protocol, no dynamic link aggregations will be formed and the switch will function normally (that is, will block redundant paths). For information about building static aggregations, refer to **set lacp static** (page 5-38).

Each SecureStack B2 module provides six virtual link aggregator ports, which are designated in the CLI as **lag.0.1** through **lag.0.6**. Each LAG can have up to eight associated physical ports. Once underlying physical ports (for example, **ge.x.x**, or **ge.x.x**) are associated with an aggregator port, the resulting aggregation will be represented as one LAG with a **lag.x.x** port designation. LACP determines which underlying physical ports are capable of aggregating by comparing operational keys. Aggregator ports allow only underlying ports with keys matching theirs to join their LAG.

LACP uses a system priority value to build a LAG ID, which determines aggregation precedence. If there are two partner devices competing for the same aggregator, LACP compares the LAG IDs for each grouping of ports. The LAG with the lower LAG ID is given precedence and will be allowed to use the aggregator.

There are a few cases in which ports will not aggregate:

- An underlying physical port is attached to another port on this same switch (loopback).
- There is no available aggregator for two or more ports with the same LAG ID. This can happen if there are simply no available aggregators, or if none of the aggregators have a matching admin key and system priority.
- 802.1x authentication is enabled using the **set eapol** command (page 16-17) and ports that would otherwise aggregate are not 802.1X authorized.

The LACP implementation on the SecureStack B2 device will allow up to eight physical ports into a LAG. The device with the lowest LAG ID determines which underlying physical ports are allowed into a LAG based on the ports' LAG port priority. Ports with the lowest LAG port priority values are allowed into the LAG and all other speed groupings go into a standby state.

When an existing dynamically created LAG is reduced to one port, the SecureStack B2 removes the LAG from its VLAN and adds the remaining underlying port to the VLAN. For this reason, you should ensure that the LAG and all the ports in the LAG are assigned to the egress list of the desired VLAN. Otherwise, when the LAG is removed, the remaining port may be assigned to the wrong VLAN. The other option is to enable the **singleportlag** feature as described in “**set lacp singleportlag**” on page 5-40.



**Note:** To aggregate, underlying physical ports must be running in full duplex mode and must be of the same operating speed.

## Commands

For information about...	Refer to page...
show lacp	5-35
set lacp	5-36
set lacp asyspri	5-37
set lacp aadminkey	5-37

For information about...	Refer to page...
clear lacp	<a href="#">5-38</a>
set lacp static	<a href="#">5-38</a>
clear lacp static	<a href="#">5-39</a>
set lacp singleportlag	<a href="#">5-40</a>
clear lacp singleportlag	<a href="#">5-39</a>
show port lacp	<a href="#">5-41</a>
set port lacp	<a href="#">5-42</a>
clear port lacp	<a href="#">5-44</a>

## show lacp

Use this command to display information about one or more aggregator ports.

### Syntax

```
show lacp [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays LACP information for specific LAG port(s). Valid port designations are lag.0.1 - 6.
--------------------	---

### Defaults

If *port-string* is not specified, link aggregation information for all LAGs will be displayed.

### Mode

Switch command, read-only.

### Usage

Each SecureStack B2 module provides 6 virtual link aggregator ports, which are designated in the CLI as **lag.0.1** through **lag.0.6**. Once underlying physical ports (that is, **ge.x.x**) are associated with an aggregator port, the resulting aggregation will be represented as one Link Aggregation Group (LAG) with a **lag.x.x** port designation.

### Example

This example shows how to display lacp information for lag.0.1. The following table describes the output fields.

```
B2(su)->show lacp lag.0.1
Global Link Aggregation state: enabled
Single Port LAGs:                disabled
```

```
Aggregator: lag.0.1
```

	Actor	Partner
System Identifier:	00:01:F4:5F:1E:20	00:11:88:11:74:F9
System Priority:	32768	32768
Admin Key:	32768	
Oper Key:	32768	0

```
Attached Ports:    ge.1.1
                  ge.1.3
```

Table 5-16 provides an explanation of the command output.

Table 5-16 show lacp Output Details

Output	What It Displays...
Global Link Aggregation state	Shows if LACP is enabled or disabled on the switch.
Single Port LAGs	Displays if the single port LAG feature has been enabled on the switch. See “ <a href="#">set lacp singleportlag</a> ” on page 5-40 for more about single port LAG.
Aggregator	LAG port designation. Each SecureStack B2 module provides 6 virtual link aggregator ports, which are designated in the CLI as <b>lag.0.1</b> through <b>lag.0.6</b> . Once underlying physical ports (for example, <b>ge.x.x</b> ) are associated with an aggregator port, the resulting Link Aggregation Group (LAG) is represented with a <b>lag.x.x</b> port designation.
Actor	Local device participating in LACP negotiation.
Partner	Remote device participating in LACP negotiation.
System Identifier	MAC addresses for actor and partner.
System Priority	System priority value which determines aggregation precedence. Only one LACP system priority can be set on a SecureStack B2 device, using either the <b>set lacp asyspri</b> command ( <a href="#">page 5-37</a> ), or the <b>set port lacp</b> command ( <a href="#">page 5-42</a> ).
Admin Key	Port’s assigned key. SecureStack B2 devices provide a default admin key value of 32768 for all LAG ports (lag.0.1 though lag.0.6).
Oper Key	Port’s operational key, derived from the admin key. Only underlying physical ports with oper keys matching the aggregator’s will be allowed to aggregate.
Attached Ports	Underlying physical ports associated with this aggregator.

## set lacp

Use this command to disable or enable the Link Aggregation Control Protocol (LACP) on the device.

### Syntax

```
set lacp {disable | enable}
```

### Parameters

<b>disable   enable</b>	Disables or enables LACP.
-------------------------	---------------------------

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to disable LACP:

```
B2(su)->set lacp disable
```

## set lacp asyspri

Use this command to set the LACP system priority.

### Syntax

```
set lacp asyspri value
```

### Parameters

<b>asyspri</b>	Sets the system priority to be used in creating a LAG (Link Aggregation Group) ID. Valid values are <b>0</b> to <b>65535</b> .
<i>value</i>	Specifies a system priority value. Valid values are <b>0</b> to <b>65535</b> , with precedence given to lower values.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

LACP uses this value to determine aggregation precedence. If there are two partner devices competing for the same aggregator, LACP compares the LAG IDs for each grouping of ports. The LAG with the lower LAG ID is given precedence and will be allowed to use the aggregator.

### Example

This example shows how to set the LACP system priority to 1000:

```
B2(su)->set lacp asyspri 1000
```

## set lacp aadminkey

Use this command to set the administratively assigned key for one or more aggregator ports.

### Syntax

```
set lacp aadminkey port-string value
```

### Parameters

<i>port-string</i>	Specifies the LAG port(s) on which to assign an admin key.
<i>value</i>	Specifies an admin key value to set. Valid values are <b>0</b> to <b>65535</b> . The default admin key value is 32768.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

LACP will use this value to form an oper key. Only underlying physical ports with oper keys matching those of their aggregators will be allowed to aggregate. The default admin key value for all LAG ports is 32768.

### Example

This example shows how to set the LACP admin key to 2000 for LAG port 6:

```
B2(su)->set lacp aadminkey lag.0.6 2000
```

## clear lacp

Use this command to clear LACP system priority or admin key settings.

### Syntax

```
clear lacp {[asyspri] [aadminkey port-string]}
```

### Parameters

<b>asyspri</b>	Clears system priority.
<b>aadminkey</b> <i>port-string</i>	Resets admin keys for one or more ports to the default value of 32768.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the actor admin key for LAG port 6:

```
B2(su)->clear lacp aadminkey lag.0.6
```

## set lacp static


Use this command to disable or enable static link aggregation, or to assign one or more underlying physical ports to a Link Aggregation Group (LAG).

### Syntax

```
set lacp static {disable | enable} | lagportstring [key] port-string
```



## Parameters

<b>disable   enable</b>	Disables or enables static link aggregation.
<i>lagportstring</i>	Specifies the LAG aggregator port to which new ports will be assigned.
<i>key</i>	(Optional) Specifies the new member port and LAG port aggregator admin key value. Only ports with matching keys are allowed to aggregate. Valid values are <b>0 - 65535</b> .
	 <b>Note:</b> This key value must be unique. If ports other than the desired underlying physical ports share the same admin key value, aggregation will fail or undesired aggregations will form.
<i>port-string</i>	Specifies the member port(s) to add to the LAG. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

If not specified, a *key* will be assigned according to the specified aggregator. For example a key of 4 would be assigned to lag.0.4.

## Mode

Switch command, read-write.

## Example

This example shows how to add port `ge.1.6` to the LAG of aggregator port 6:

```
B2(su)->set lacp static lag.0.6 ge.1.6
```

# clear lacp static

Use this command to remove specific ports from a Link Aggregation Group.

## Syntax

```
clear lacp static lagportstring port-string
```

## Parameters

<i>lagportstring</i>	Specifies the LAG aggregator port from which ports will be removed.
<i>port-string</i>	Specifies the port(s) to remove from the LAG. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to remove `ge.1.6` from the LAG of aggregator port 6:

```
B2(su)->clear lacp static lag.0.6 ge.1.6
```

## set lacp singleportlag

Use this command to enable or disable the formation of single port LAGs.

### Syntax

```
set lacp singleportlag {enable | disable}
```

### Parameters

<b>disable   enable</b>	Enables or disables the formation of single port LAGs.
-------------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

When single port LAGs are enabled, Link Aggregation Groups can be formed when only one port is receiving protocol transmissions from a partner. When this setting is disabled, two or more ports are required to form a LAG.

This setting has no effect on existing LAGs created with multiple member ports. It also does not prevent previously formed LAGs from coming up after they have gone down, as long as any previous LAG member ports comes up connected to the same switch as before the LAG went down.

### Example

This example enables the formation of single port LAGs:

```
B2(su)->set lacp singleportlag enable
```

## clear lacp singleportlag

Use this command to reset the single port LAG function back to the default state of disabled.

### Syntax

```
clear lacp singleportlag
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

## Example

This example shows how to reset the single port LAG function back to disabled:

```
B2(su)->clear lacp singleportlag
```

## show port lacp

Use this command to display link aggregation information for one or more underlying physical ports.

### Syntax

```
show port lacp port port-string {[status {detail | summary}] | [counters]}
```

### Parameters

<b>port</b> <i>port-string</i>	Displays LACP information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>status detail</b>   <b>summary</b>	Displays LACP status in detailed or summary information.
<b>counters</b>	Displays LACP counter information.

### Defaults

None.

### Mode

Switch command, read-only.

### Usage

State definitions, such as ActorAdminState and Partner AdminState, are indicated with letter abbreviations. If the **show port lacp** command displays one or more of the following letters, it means the state is true for the associated actor or partner ports:

- **E** = Expired
- **F** = Defaulted
- **D** = Distributing (tx enabled)
- **C** = Collecting (rx enabled)
- **S** = Synchronized (actor and partner agree)
- **G** = Aggregation allowed
- **S/l** = Short/Long LACP timeout
- **A/p** = Active/Passive LACP

For more information about these states, refer to **set port lacp** ([page 5-42](#)) and the IEEE 802.3 2002 specification.

## Examples

This example shows how to display detailed LACP status information for port ge.1.12:

```
B2(su)-> show port lacp port ge.1.12 status detail
Port Instance:                ge.1.12
ActorPort:                    1411    PartnerAdminPort:                1411
ActorSystemPriority:          32768    PartnerOperPort:                1411
ActorPortPriority:            32768    PartnerAdminSystemPriority:      32768
ActorAdminKey:                32768    PartnerOperSystemPriority:      32768
ActorOperKey:                 32768    PartnerAdminPortPriority:       32768
ActorAdminState:              ----G1A    PartnerOperPortPriority:       32768
ActorOperState:               -F----1A    PartnerAdminKey:                1411
ActorSystemID:                00-e0-63-9d-b5-87    PartnerOperKey:                1411
SelectedAggID:                none    PartnerAdminState:              --DCSGlp
AttachedAggID:                none    PartnerOperState:              --DC-Glp
MuxState:                     Detached    PartnerAdminSystemID:          00-00-00-00-00-00
DebugRxState:                 port Disabled    PartnerOperSystemID:          00-00-00-00-00-00
```

This example shows how to display summarized LACP status information for port ge.1.12:

```
B2(su)->show port lacp port ge.1.12 status summary
Port      Aggr      Actor System      Partner System
          Pri:      System ID:  Key:      Pri: System ID:      Key:
ge.1.12   none [(32768,00e0639db587,32768),(32768,000000000000, 1411)]
```

This example shows how to display LACP counters for port ge.1.12:

```
B2(su)->show port lacp port ge.1.12 counters
Port Instance:                ge.1.12
LACPDUsRx:                    11067
LACPDUsTx:                     0
IllegalRx:                     0
UnknownRx:                     0
MarkerPDUsRx:                  0
MarkerPDUsTx:                  0
MarkerResponsePDUsRx:          0
MarkerResponsePDUsTx:          374
```

## set port lacp


Use this command to set link aggregation parameters for one or more ports. These settings will determine the specified underlying physical ports' ability to join a LAG, and their administrative state once aggregated.

### Syntax

```
set port lacp port port-string {[aadminkey aadminkey] [aadminstate {lacpactive |
lacptimeout | lacpagg | lacpsync | lacpcollect | lacpdist | lacpdef | lacpexpire}]}
[aportpri aportpri] [asyspri asyspri] [enable | [disable] [padminkey padminkey]
[padminport padminport] [padminportpri padminportpri] [padminstate {lacpactive |
lacptimeout | lacpagg | lacpsync | lacpcollect | lacpdist | lacpdef | lacpexpire}]}
[padminsysid padminsysid] [padminsyspri padminsyspri]
```

### Parameters

<b>port</b> <i>port-string</i>	Specifies the physical port(s) on which to configure LACP. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------------------	---

<b>aadminkey</b> <i>aadminkey</i>	Sets the port's actor admin key. LACP will use this value to form an oper key and will determine which underlying physical ports are capable of aggregating by comparing oper keys. Aggregator ports allow only underlying ports with oper keys matching theirs to join their LAG. Valid values are <b>1 - 65535</b> . The default key value is 32768.
<b>aadminstate</b> <b>lacpactive</b>   <b>lacptimeout</b>   <b>lacpagg</b>   <b>lacpsync</b>   <b>lacpcollect</b>   <b>lacpdist</b>   <b>lacpdef</b>   <b>lacpexpire</b>	Sets the port's actor LACP administrative state to allow for:  <b>lacpactive</b> - Transmitting LACP PDUs.  <b>lacptimeout</b> - Transmitting LACP PDUs every 1 sec. vs 30 sec. (default).  <b>lacpagg</b> - Aggregation on this port.  <b>lacpsync</b> - Transition to synchronization state.  <b>lacpcollect</b> - Transition to collection state.  <b>lacpdist</b> - Transition to distribution state.  <b>lacpdef</b> - Transition to defaulted state.  <b>lacpexpire</b> - Transition to expired state.
<b>aportpri</b> <i>aportpri</i>	Sets the port's actor port priority. Valid values are <b>0 - 65535</b> , with lower values designating higher priority.
<b>asyspri</b> <i>asyspri</i>	Sets the port's actor system priority. The LACP implementation on the SecureStack B2 device uses this value to determine aggregation precedence when there are two devices competing for the same aggregator. Valid values are <b>0 - 65535</b> , with higher precedence given to lower values.
 <b>Note:</b> Only one LACP system priority can be set on a SecureStack B2 device, using either this command, or the <b>set lacp asyspri</b> command ("set lacp asyspri" on page 5-37).	
<b>enable</b>	(Optional) Enables LACPDU processing on this port.
<b>disable</b>	(Optional) Disables LACPDU processing on this port.
<b>padminkey</b> <i>padminkey</i>	Sets a default value to use as the port's partner admin key. Only ports with matching admin keys are allowed to aggregate. Valid values are <b>1 - 65535</b> .
<b>padminport</b> <i>padminport</i>	Sets a default value to use as the port's partner admin value. Valid values are <b>1 - 65535</b> .
<b>padminportpri</b> <i>padminportpri</i>	Sets a default value to use as the port's partner port priority. Valid values are <b>0 - 65535</b> , with lower values given higher priority.
<b>padminstate</b> <b>lacpactive</b>   <b>lacptimeout</b>   <b>lacpagg</b>   <b>lacpsync</b>   <b>lacpcollect</b>   <b>lacpdist</b>   <b>lacpdef</b>   <b>lacpexpire</b>	Sets a port's partner LACP administrative state. See <b>aadminstate</b> for valid options.
<b>padminsysid</b> <i>padminsysid</i>	Sets a default value to use as the port's partner system ID. This is a MAC address.
<b>padminsyspri</b> <i>padminsyspri</i>	Sets a default value to use as the port's partner priority. Valid values are <b>0 - 65535</b> , with lower values given higher priority.

## Defaults

At least one parameter must be entered per *port-string*.

If **enable** or **disable** are not specified, port(s) will be enabled with the LACP parameters entered.

## Mode

Switch command, read-write.

## Usage

LACP commands and parameters beginning with an “a” (such as **aadminkey**) set actor values. Corresponding commands and parameters beginning with a “p” (such as **padminkey**) set corresponding partner values. Actor refers to the local device participating in LACP negotiation, while partner refers to its remote device partner at the other end of the negotiation. Actors and partners maintain current status of the other via LACPDUs containing information about their ports’ LACP status and operational state.

## Example

This example shows how to set the actor admin key to 3555 for port ge.3.16:

```
B2(su)->set port lacp ge.3.16 aadminkey 3555
```

# clear port lacp

Use this command to clear link aggregation settings for one or more ports.

## Syntax

```
clear port lacp port port-string {[aadminkey] [aportpri] [asyspri] [aadminstate  
{lacpactive | lacptimeout | lacpagg | lacpsync | lacpcollect | lacpdist | lacpdef  
| lacpexpire | all}] [padminsyspri] [padminsysid] [padminkey] [padminportpri]  
[padminport] [padminstate {lacpactive | lacptimeout | lacpagg | lacpsync |  
lacpcollect | lacpdist | lacpdef | lacpexpire | all}]}
```

## Parameters

<b>port</b> <i>port-string</i>	Specifies the physical port(s) on which LACP settings will be cleared. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>aadminkey</b>	Clears a port’s actor admin key.
<b>aportpri</b>	Clears a port’s actor port priority.
<b>asyspri</b>	Clears the port’s actor system priority.
<b>aadminstate</b> <b>lacpactive</b>   <b>lacptimeout</b>   <b>lacpagg</b>   <b>lacpsync</b>   <b>lacpcollect</b>   <b>lacpdist</b>   <b>lacpdef</b>   <b>lacpexpire</b>   <b>all</b>	Clears a port’s specific actor admin state, or all actor admin state(s). For descriptions of specific states, refer to the <b>set port lacp</b> command (“ <a href="#">set port lacp</a> ” on page 5-42).
<b>padminsyspri</b>	Clears the port’s default partner priority value.
<b>padminsysid</b>	Clears the port’s default partner system ID.
<b>padminkey</b>	Clears the port’s default partner admin key.

<b>padminportpri</b>	Clears the port's default partner port priority.
<b>padminport</b>	Deletes a partner port from the LACP configuration.
<b>padminstate</b> <b>lacpactive</b>   <b>lacptimeout</b>   <b>lacpagg</b>   <b>lacpsync</b>   <b>lacpcollect</b>   <b>lacpdist</b>   <b>lacpdef</b>   <b>lacpexpire</b>   <b>all</b>	Clears the port's specific partner admin state, or all partner admin state(s).

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear all link aggregation parameters for port `ge.3.16`:

```
B2(su)->clear port lacp port ge.3.16
```

# Configuring Protected Ports

The Protected Port feature is used to prevent ports from forwarding traffic to each other, even when they are on the same VLAN. Ports may be designated as either protected or unprotected. Ports are unprotected by default. Multiple groups of protected ports are supported.

## Protected Port Operation

Ports that are configured to be protected cannot forward traffic to other protected ports in the same group, regardless of having the same VLAN membership. However, protected ports can forward traffic to ports which are unprotected (not listed in any group). Protected ports can also forward traffic to protected ports in a different group, if they are in the same VLAN. Unprotected ports can forward traffic to both protected and unprotected ports. A port may belong to only one group of protected ports.

This feature only applies to ports within a switch. It does not apply across multiple switches in a network.

## Commands

For information about...	Refer to page...
set port protected	<a href="#">5-46</a>
show port protected	<a href="#">5-46</a>
clear port protected	<a href="#">5-47</a>
set port protected name	<a href="#">5-47</a>
show port protected name	<a href="#">5-48</a>

For information about...	Refer to page...
clear port protected name	<a href="#">5-48</a>

# set port protected

Use this command to specify a port to be protected and assign the port to a group of protected ports. A port can be assigned to only one group.

## Syntax

`set port protected port-string group-id`

## Parameters

<i>port-string</i>	Specifies the port or ports to be protected.
<i>group-id</i>	Specifies the id of the group to which the ports should be assigned. Id can range from 0 to 2.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to assign ports ge.1.1 through ge.1.3 to protected port group 1:

```
B2(rw)->set port protected ge.1.1-3 1
```

# show port protected

Use this command to display information about the ports configured for protected mode.

## Syntax

`show port protected [port-string] | [group-id]`

## Parameters

<i>port-string</i>	(Optional) Specifies the port or ports for which to display information.
<i>group-id</i>	(Optional) Specifies the id of the group for which to display information. Id can range from 0 to 2.

## Defaults

If no parameters are entered, information about all protected ports is displayed.

## Mode

Read-only.



## Example

This example shows how to display information about all protected ports:

```
B2(ro)->show port protected
Group id      Port
-----
1             ge.1.1
1             ge.1.2
1             ge.1.3
```

## clear port protected

Use this command to remove a port or group from protected mode.

### Syntax

```
clear port protected [port-string] | [group-id]
```

### Parameters

<i>port-string</i>	(Optional) Specifies the port or ports to remove from protected mode.
<i>group-id</i>	(Optional) Specifies the id of the group to remove from protected mode. Id can range from 0 to 2.

### Defaults

If no parameters are entered, all protected ports and groups are cleared.

### Mode

Switch command, read-write.

### Example

This example shows how to clear protected ports `ge.1.1` through `ge.1.3`:

```
B2(rw)->clear port protected ge.1.1-3
```

## set port protected name

Use this command to assign a name to a protected port group id.

### Syntax

```
set port protected name group-id name
```

### Parameters

<i>group-id</i>	Specifies the id of this group. Id can range from 0 to 2.
<i>name</i>	Specifies a name for the group. The name can be up to 32 characters in length.

### Defaults

None.

**Mode**

Switch command, read-write.

**Example**

This example shows how to assign the name “group1” to protected port group 1:

```
B2(rw)->set port protected name 1 group1
```

**show port protected name**

Use this command to display the name for the group ids specified.

**Syntax**

```
show port protected name group-id
```

**Parameters**

<i>group-id</i>	Specifies the id of the group to display. Id can range from 0 to 2.
-----------------	---

**Defaults**

None.

**Mode**

Read-only.

**Example**

This example shows how to show the name of protected port group 1:

```
B2(ro)->show port protected name 1
Group ID      Group Name
-----
1             group1
```

**clear port protected name**

Use this command to clear the name of a protected group.

**Syntax**

```
clear port protected name group-id
```

**Parameters**

<i>group-id</i>	Specifies the id of the group for which to clear the name. Id can range from 0 to 2.
-----------------	--

**Defaults**

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the name of protected port group 1:

```
B2(rw)->clear port protected name 1
```



## SNMP Configuration

This chapter describes the Simple Network Management Protocol (SNMP) set of commands and how to use them.

For information about...	Refer to page...
<a href="#">SNMP Configuration Summary</a>	<a href="#">6-1</a>
<a href="#">Reviewing SNMP Statistics</a>	<a href="#">6-3</a>
<a href="#">Configuring SNMP Users, Groups, and Communities</a>	<a href="#">6-7</a>
<a href="#">Configuring SNMP Access Rights</a>	<a href="#">6-15</a>
<a href="#">Configuring SNMP MIB Views</a>	<a href="#">6-18</a>
<a href="#">Configuring SNMP Target Parameters</a>	<a href="#">6-22</a>
<a href="#">Configuring SNMP Target Addresses</a>	<a href="#">6-25</a>
<a href="#">Configuring SNMP Notification Parameters</a>	<a href="#">6-28</a>
<a href="#">Creating a Basic SNMP Trap Configuration</a>	<a href="#">6-36</a>

### SNMP Configuration Summary

SNMP is an application-layer protocol that facilitates the exchange of management information between network devices. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth.

SecureStack B2 devices support three versions of SNMP:

- Version 1 (SNMPv1) — This is the initial implementation of SNMP. Refer to RFC 1157 for a full description of functionality.
- Version 2 (SNMPv2c) — The second release of SNMP, described in RFC 1907, has additions and enhancements to data types, counter size, and protocol operations.
- Version 3 (SNMPv3) — This is the most recent version of SNMP, and includes significant enhancements to administration and security. SNMPv3 is fully described in RFC 2571, RFC 2572, RFC 2573, RFC 2574, and RFC 2575.

### SNMPv1 and SNMPv2c

The components of SNMPv1 and SNMPv2c network management fall into three categories:

- Managed devices (such as a switch).
- SNMP agents and MIBs, including SNMP traps, community strings, and Remote Monitoring (RMON) MIBs, which run on managed devices.

- SNMP network management applications, such as the Enterasys NetSight application, which communicate with agents to get statistics and alerts from the managed devices.

## SNMPv3

SNMPv3 is an interoperable standards-based protocol that provides secure access to devices by authenticating and encrypting frames over the network. The advanced security features provided in SNMPv3 are as follows:

- Message integrity — Collects data securely without being tampered with or corrupted.
- Authentication — Determines the message is from a valid source.
- Encryption — Scrambles the contents of a frame to prevent it from being seen by an unauthorized source.

Unlike SNMPv1 and SNMPv2c, in SNMPv3, the concept of SNMP agents and SNMP managers no longer apply. These concepts have been combined into an SNMP entity. An SNMP entity consists of an SNMP engine and SNMP applications. An SNMP engine consists of the following four components:

- Dispatcher — This component sends and receives messages.
- Message processing subsystem — This component accepts outgoing PDUs from the dispatcher and prepares them for transmission by wrapping them in a message header and returning them to the dispatcher. The message processing subsystem also accepts incoming messages from the dispatcher, processes each message header, and returns the enclosed PDU to the dispatcher.
- Security subsystem — This component authenticates and encrypts messages.
- Access control subsystem — This component determines which users and which operations are allowed access to managed objects.

## About SNMP Security Models and Levels

An SNMP security model is an authentication strategy that is set up for a user and the group in which the user resides. A security level is the permitted level of security within a security model. The three levels of SNMP security are: No authentication required (NoAuthNoPriv); authentication required (AuthNoPriv); and privacy (authPriv). A combination of a security model and a security level determines which security mechanism is employed when handling an SNMP frame. [Table 6-17](#) identifies the levels of SNMP security available on SecureStack B2 devices and authentication required within each model.

**Table 6-17 SNMP Security Levels**

Model	Security Level	Authentication	Encryption	How It Works
v1	NoAuthNoPriv	Community string	None	Uses a community string match for authentication.
v2c	NoAuthNoPriv	Community string	None	Uses a community string match for authentication.

**Table 6-17 SNMP Security Levels (Continued)**

Model	Security Level	Authentication	Encryption	How It Works
v3	NoAuthNoPriv	User name	None	Uses a user name match for authentication.
	AuthNoPriv	MD5 or SHA	None	Provides authentication based on the HMAC-MD5 or HMAC-SHA algorithms.
	authPriv	MD5 or SHA	DES	Provides authentication based on the HMAC-MD5 or HMAC-SHA algorithms. Provides DES 56-bit encryption in addition to authentication based on the CBC-DES (DES-56) standard.

## Using SNMP Contexts to Access Specific MIBs

By default, when operating from the switch CLI, SecureStack B2 devices allow access to all SNMP MIBs or contexts. A context is a collection of MIB objects, often associated with a particular physical or logical device.

If no optional *context* parameters are configured for v1 and v2 “community” names and v3 “user” groups, these groups are able to access all SNMP MIB objects when in switch mode.

Specifying a *context* parameter when setting up SNMP user group would permit or restrict the group’s switch management access to the MIB(s) specified by the *context* (MIB object ID) value.

All SNMP contexts known to the device can be displayed using the **show snmp context** command as described in “[show snmp context](#)” on page 6-20.

### Example

This example permits the “powergroup” to manage all MIBs via SNMPv3:

```
B2(su)->set snmp access powergroup security-model usm
```

## Configuration Considerations

Commands for configuring SNMP on the SecureStack B2 device are independent during the SNMP setup process. For instance, target parameters can be specified when setting up optional notification filters — even though these parameters have not yet been created with the **set snmp targetparams** command.

## Reviewing SNMP Statistics

### Purpose

To review SNMP statistics.

# Commands

For information about...	Refer to page...
show snmp engineid	<a href="#">6-4</a>
show snmp counters	<a href="#">6-5</a>

## show snmp engineid

Use this command to display the SNMP local engine ID. This is the SNMP v3 engine’s administratively unique identifier.

### Syntax

`show snmp engineid`

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display SNMP engine properties:

```
B2(su)->show snmp engineid
EngineId: 80:00:15:f8:03:00:e0:63:9d:b5:87
Engine Boots      = 12
Engine Time       = 162181
Max Msg Size      = 2048
```

[Table 6-18](#) provides an explanation of the command output.

**Table 6-18 show snmp engineid Output Details**

Output	What It Displays...
<b>EngineId</b>	String identifying the SNMP agent on the device.
<b>Engine Boots</b>	Number of times the SNMP engine has been started or reinitialized.
Engine Time	Time in seconds since last reboot.
Max Msg Size	Maximum accepted length, in bytes, of SNMP frame.



# show snmp counters

Use this command to display SNMP traffic counter values.

## Syntax

```
show snmp counters
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display SNMP counter values

```
B2(su)->show snmp counters
```

```
--- mib2 SNMP group counters:
snmpInPkts           = 396601
snmpOutPkts          = 396601
snmpInBadVersions    = 0
snmpInBadCommunityNames = 0
snmpInBadCommunityUses = 0
snmpInASNParseErrs   = 0
snmpInTooBigs        = 0
snmpInNoSuchNames    = 0
snmpInBadValues      = 0
snmpInReadOnlyls     = 0
snmpInGenErrs        = 0
snmpInTotalReqVars   = 403661
snmpInTotalSetVars   = 534
snmpInGetRequests    = 290
snmpInGetNexts       = 396279
snmpInSetRequests    = 32
snmpInGetResponses   = 0
snmpInTraps          = 0
snmpOutTooBigs       = 0
snmpOutNoSuchNames   = 11
snmpOutBadValues     = 0
snmpOutGenErrs       = 0
snmpOutGetRequests   = 0
snmpOutGetNexts      = 0
snmpOutSetRequests   = 0
snmpOutGetResponses  = 396601
snmpOutTraps         = 0
snmpSilentDrops      = 0
snmpProxyDrops       = 0

--- USM Stats counters:
usmStatsUnsupportedSecLevels = 0
usmStatsNotInTimeWindows    = 0
usmStatsUnknownUserNames    = 0
```

```

usmStatsUnknownEngineIDs      = 0
usmStatsWrongDigests          = 0
usmStatsDecryptionErrors      = 0

```

Table 6-19 provides an explanation of the command output.

**Table 6-19 show snmp counters Output Details**

Output	What It Displays...
snmplnPkts	Number of messages delivered to the SNMP entity from the transport service.
snmpOutPkts	Number of SNMP messages passed from the SNMP protocol entity to the transport service.
snmplnBadVersions	Number of SNMP messages delivered to the SNMP entity for an unsupported SNMP version.
snmplnBadCommunityNames	Number of SNMP messages delivered to the SNMP entity that used an SNMP community name not known to the entity.
snmplnBadCommunityUses	Number of SNMP messages delivered to the SNMP entity that represented an SNMP operation not allowed by the SNMP community named in the message.
snmplnASNParseErrs	Number of ASN.1 (Abstract Syntax Notation) or BER (Basic Encoding Rules) errors encountered by the SNMP entity when decoding received SNMP messages.
snmplnTooBig	Number of SNMP PDUs delivered to the SNMP protocol entity with the value of the error-status field as "tooBig."
snmplnNoSuchNames	Number of SNMP PDUs delivered to the SNMP protocol entity with the value of the error-status field as "noSuchName."
snmplnBadValues	Number of SNMP PDUs delivered to the SNMP protocol entity with the value of the error-status field as "badValue."
snmplnReadOnly	Number of valid SNMP PDUs delivered to the SNMP protocol entity with the value of the error-status field as "readOnly."
snmplnGenErrs	Number of SNMP PDUs delivered to the SNMP protocol entity with the value of the error-status field as "genErr."
snmplnTotalReqVars	Number of MIB objects retrieved successfully by the SNMP protocol entity as the result of receiving valid SNMP Get-Request and Get-Next PDUs.
snmplnTotalSetVars	Number of MIB objects altered successfully by the SNMP protocol entity as the result of receiving valid SNMP Set-Request PDUs.
snmplnGetRequests	Number of SNMP Get-Request PDUs accepted and processed by the SNMP protocol entity.
snmplnGetNexts	Number of SNMP Get-Next PDUs accepted and processed by the SNMP protocol entity.
snmplnSetRequests	Number of SNMP Set-Request PDUs accepted and processed by the SNMP protocol entity.
snmplnGetResponses	Number of SNMP Get-Response PDUs accepted and processed by the SNMP protocol entity.
snmplnTraps	Number of SNMP Trap PDUs accepted and processed by the SNMP protocol entity.
snmpOutTooBig	Number of SNMP PDUs generated by the SNMP protocol entity with the value of the error-status field as "tooBig."
snmpOutNoSuchNames	Number of SNMP PDUs generated by the SNMP protocol entity with the value of the error-status as "noSuchName."

**Table 6-19 show snmp counters Output Details (Continued)**

Output	What It Displays...
snmpOutBadValues	Number of SNMP PDUs generated by the SNMP protocol entity with the value of the error-status field as "badValue."
snmpOutGenErrs	Number of SNMP PDUs generated by the SNMP protocol entity with the value of the error-status field as "genErr."
snmpOutGetRequests	Number of SNMP Get-Request PDUs generated by the SNMP protocol entity.
snmpOutGetNexts	Number of SNMP Get-Next PDUs generated by the SNMP protocol entity.
snmpOutSetRequests	Number of SNMP Set-Request PDUs generated by the SNMP protocol entity.
snmpOutGetResponses	Number of SNMP Get-Response PDUs generated by the SNMP protocol entity.
snmpOutTraps	Number of SNMP Trap PDUs generated by the SNMP protocol entity.
snmpSilentDrops	Number of SNMP Get, Set, or Inform request error messages that were dropped because the reply was larger than the requestor's maximum message size.
snmpProxyDrops	Number of SNMP Get, Set, or Inform request error messages that were dropped because the reply was larger than the proxy target's maximum message size.
usmStatsUnsupportedSec Levels	Number of packets received by the SNMP engine that were dropped because they requested a security level that was unknown to the SNMP engine or otherwise unavailable.
usmStatsNotInTimeWindows	Number of packets received by the SNMP engine that were dropped because they appeared outside of the authoritative SNMP engine's window.
usmStatsUnknownUserNames	Number of packets received by the SNMP engine that were dropped because they referenced a user that was not known to the SNMP engine.
usmStatsUnknownEngineIDs	Number of packets received by the SNMP engine that were dropped because they referenced an snmpEngineID that was not known to the SNMP engine.
usmStatsWrongDigests	Number of packets received by the SNMP engine that were dropped because they did not contain the expected digest value.
usmStatsDecryptionErrors	Number of packets received by the SNMP engine that were dropped because they could not be decrypted.

## Configuring SNMP Users, Groups, and Communities

### Purpose

To review and configure SNMP users, groups, and v1 and v2 communities. These are defined as follows:

- User — A person registered in SNMPv3 to access SNMP management.
- Group — A collection of users who share the same SNMP access privileges.
- Community — A name used to authenticate SNMPv1 and v2 users.

## Commands

For information about...	Refer to page...
show snmp user	<a href="#">6-8</a>
set snmp user	<a href="#">6-9</a>
clear snmp user	<a href="#">6-10</a>
show snmp group	<a href="#">6-10</a>
set snmp group	<a href="#">6-12</a>
clear snmp group	<a href="#">6-12</a>
show snmp community	<a href="#">6-13</a>
set snmp community	<a href="#">6-13</a>
clear snmp community	<a href="#">6-14</a>

## show snmp user

Use this command to display information about SNMP users. These are people registered to access SNMP management.

### Syntax

```
show snmp user [list] | [user] | [remote remote] [volatile | nonvolatile | read-only]
```

### Parameters

<b>list</b>	(Optional) Displays a list of registered SNMP user names.
<i>user</i>	(Optional) Displays information about a specific user.
<b>remote</b> <i>remote</i>	(Optional) Displays information about users on a specific remote SNMP engine.
<b>volatile   nonvolatile   read-only</b>	(Optional) Displays user information for a specified storage type.

### Defaults

If **list** is not specified, detailed SNMP information will be displayed.

If *user* is not specified, information about all SNMP users will be displayed.

If **remote** is not specified, user information about the local SNMP engine will be displayed.

If not specified, user information for all storage types will be displayed.

### Mode

Switch command, read-only.

## Examples

This example shows how to display an SNMP user list:

```
B2(su)->show snmp user list
--- SNMP user information ---
--- List of registered users:
Guest
admin1
admin2
netops
```

This example shows how to display information for the SNMP “guest” user:

```
(su)->show snmp user guest
--- SNMP user information ---
EngineId: 00:00:00:63:00:00:00:a1:00:00:00:00
Username = Guest
Auth protocol = usmNoAuthProtocol
Privacy protocol = usmNoPrivProtocol
Storage type = nonVolatile
Row status = active
```

[Table 6-20](#) provides an explanation of the command output.

**Table 6-20 show snmp user Output Details**

Output	What It Displays...
EngineId	SNMP local engine identifier.
Username	SNMPv1 or v2 community name or SNMPv3 user name.
Auth protocol	Type of authentication protocol applied to this user.
Privacy protocol	Whether a privacy protocol is applied when authentication protocol is in use.
Storage type	Whether entry is stored in <b>volatile</b> , <b>nonvolatile</b> or <b>read-only</b> memory.
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

## set snmp user

Use this command to create a new SNMPv3 user.

### Syntax

```
set snmp user user [remote remoteid] [authentication {md5 | sha}] [authpassword]
[privacy privpassword] [volatile | nonvolatile]
```

### Parameters

<i>user</i>	Specifies a name for the SNMPv3 user.
<b>remote</b> <i>remoteid</i>	(Optional) Registers the user on a specific remote SNMP engine.
<b>authentication</b> <b>md5</b>   <b>sha</b>	(Optional) Specifies the authentication type required for this user as MD5 or SHA.
<i>authpassword</i>	(Optional) Specifies a password for this user when authentication is required. Minimum of 8 characters.
<b>privacy</b> <i>privpassword</i>	(Optional) Applies encryption and specifies an encryption password. Minimum of 8 characters.

<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies a storage type for this user entry.
---	--

Defaults

- If **remote** is not specified, the user will be registered for the local SNMP engine.
- If **authentication** is not specified, no authentication will be applied.
- If **privacy** is not specified, no encryption will be applied.
- If storage type is not specified, **nonvolatile** will be applied.

Mode

Switch command, read-write.

Example

This example shows how to create a new SNMP user named “netops”. By default, this user will be registered on the local SNMP engine without authentication and encryption. Entries related to this user will be stored in permanent (nonvolatile) memory:

```
B2(su)->set snmp user netops
```

clear snmp user

Use this command to remove a user from the SNMPv3 security-model list.

Syntax

```
clear snmp user user [remote remote]
```

Parameters

<i>user</i>	Specifies an SNMPv3 user to remove.
<b>remote</b> <i>remote</i>	(Optional) Removes the user from a specific remote SNMP engine.

Defaults

- If **remote** is not specified, the user will be removed from the local SNMP engine.

Mode

Switch command, read-write.

Example

This example shows how to remove the SNMP user named “bill”:

```
B2(su)->clear snmp user bill
```

show snmp group

Use this command to display an SNMP group configuration. An SNMP group is a collection of SNMPv3 users who share the same access privileges.

## Syntax

```
show snmp group [groupname groupname] [user user] [security-model {v1 | v2c | usm}]
[volatile | nonvolatile | read-only]
```

## Parameters

<b>groupname</b> <i>groupname</i>	(Optional) Displays information for a specific SNMP group.
<b>user</b> <i>user</i>	(Optional) Displays information about users within the specified group.
<b>security-model</b> <b>v1</b>   <b>v2c</b>   <b>usm</b>	(Optional) Displays information about groups assigned to a specific security SNMP model.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Displays SNMP group information for a specified storage type.

## Defaults

If *groupname* is not specified, information about all SNMP groups will be displayed.

If *user* is not specified, information about all SNMP users will be displayed.

If **security-model** is not specified, user information about all SNMP versions will be displayed.

If not specified, information for all storage types will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display SNMP group information:

```
B2(su)->show snmp group
--- SNMP group information ---
Security model           = SNMPv1
Security/user name      = public
Group name              = Anyone
Storage type            = nonVolatile
Row status              = active

Security model           = SNMPv1
Security/user name      = public.router1
Group name              = Anyone
Storage type            = nonVolatile
Row status              = active
```

[Table 6-21](#) provides an explanation of the command output.

**Table 6-21 show snmp group Output Details**

Output	What It Displays...
Security model	SNMP version associated with this group.
Security/user name	User belonging to the SNMP group.
Group name	Name of SNMP group.
Storage type	Whether entry is stored in <b>volatile</b> , <b>nonvolatile</b> or <b>read-only</b> memory.
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

# set snmp group

Use this command to create an SNMP group. This associates SNMPv3 users to a group that shares common access privileges.

## Syntax

```
set snmp group groupname user user security-model {v1 | v2c | usm} [volatile | nonvolatile]
```

## Parameters

<i>groupname</i>	Specifies an SNMP group name to create.
user <i>user</i>	Specifies an SNMPv3 user name to assign to the group.
security-model v1   v2c   usm	Specifies an SNMP security model to assign to the group.
volatile   nonvolatile	(Optional) Specifies a storage type for SNMP entries associated with the group.

## Defaults

If storage type is not specified, **nonvolatile** storage will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to create an SNMP group called “anyone”, assign a user named “public” and assign SNMPv3 security to the group:

```
B2(su)->set snmp group anyone user public security-model usm
```

# clear snmp group

Use this command to clear SNMP group settings globally or for a specific SNMP group and user.

## Syntax

```
clear snmp group groupname user [security-model {v1 | v2c | usm}]
```

## Parameters

<i>groupname</i>	Specifies the SNMP group to be cleared.
<i>user</i>	Specifies the SNMP user to be cleared.
security-model v1   v2c   usm	(Optional) Clears the settings associated with a specific security model.

## Defaults

If not specified, settings related to all security models will be cleared.

## Mode

Switch command, read-write.



## Example

This example shows how to clear all settings assigned to the “public” user within the SNMP group “anyone”:

```
B2(su)->clear snmp group anyone public
```

## show snmp community

Use this command to display SNMP community names and status. In SNMPv1 and v2, community names act as passwords to remote management.

### Syntax

```
show snmp community [name]
```

### Parameters

<i>name</i>	(Optional) Displays SNMP information for a specific community name.
-------------	---

### Defaults

If *name* is not specified, information will be displayed for all SNMP communities.

### Mode

Switch command, read-only.

### Example

This example shows how to display information about the SNMP “public” community name. For a description of this output, refer to **set snmp community** (page 6-13).

```
B2(su)->show snmp community public
```

```
--- Configured community strings ---
```

```
Name           = *****
Security name   = public
Context        =
Transport tag   =
Storage type    = nonVolatile
Status         = active
```

## set snmp community

Use this command to configure an SNMP community group.

### Syntax

```
set snmp community community [securityname securityname] [context context]
[transport transport] [volatile | nonvolatile]
```

### Parameters

<i>community</i>	Specifies a community group name.
<b>securityname</b> <i>securityname</i>	(Optional) Specifies an SNMP security name to associate with this community.

<b>context</b> <i>context</i>	(Optional) Specifies a subset of management information this community will be allowed to access. Valid values are full or partial context names. To review all contexts configured for the device, use the <b>show snmp context</b> command as described in “ <a href="#">show snmp context</a> ” on page 6-20.
<b>transport</b> <i>transport</i>	(Optional) Specifies the set of transport endpoints from which SNMP request with this community name will be accepted. Makes a link to a target address table.
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies the storage type for these entries.

### Defaults

- If **securityname** is not specified, the *community* name will be used.
- If **context** is not specified, access will be granted for the default context.
- If **transport** tag is not specified, none will be applied.
- If storage type is not specified, **nonvolatile** will be applied.

### Mode

Switch command, read-write.

### Example

This example shows how to set an SNMP community name called “vip”

```
B2(su)->set snmp community vip
```

## clear snmp community

Use this command to delete an SNMP community name.

### Syntax

```
clear snmp community name
```

### Parameters

<b>name</b>	Specifies the SNMP community name to clear.
-------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to delete the community name “vip.”

```
B2(su)->clear snmp community vip
```

# Configuring SNMP Access Rights

## Purpose

To review and configure SNMP access rights, assigning viewing privileges and security levels to SNMP user groups.

## Commands

For information about...	Refer to page...
show snmp access	<a href="#">6-15</a>
set snmp access	<a href="#">6-17</a>
clear snmp access	<a href="#">6-18</a>

## show snmp access

Use this command to display access rights and security levels configured for SNMP one or more groups.

### Syntax

```
show snmp access [groupname] [security-model {v1 | v2c | usm}] [noauthentication | authentication | privacy] [context context] [volatile | nonvolatile | read-only]
```

### Parameters

<i>groupname</i>	(Optional) Displays access information for a specific SNMPv3 group.
<b>security-model</b> <b>v1</b>   <b>v2c</b>   <b>usm</b>	(Optional) Displays access information for SNMP security model version 1, 2c or 3 (usm).
<b>noauthentication</b>   <b>authentication</b>   <b>privacy</b>	(Optional) Displays access information for a specific security level.
<b>context</b> <i>context</i>	(Optional) Displays access information for a specific context. For a description of how to specify SNMP contexts, refer to “ <a href="#">Using SNMP Contexts to Access Specific MIBs</a> ” on page 6-3.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Displays access entries for a specific storage type.

### Defaults

If *groupname* is not specified, access information for all SNMP groups will be displayed.

If **security-model** is not specified, access information for all SNMP versions will be displayed.

If **noauthentication**, **authentication** or **privacy** are not specified, access information for all security levels will be displayed.

If **context** is not specified, all contexts will be displayed.

If **volatile**, **nonvolatile** or **read-only** are not specified, all entries of all storage types will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display SNMP access information:

```
B2(su)->show snmp access
Group           = SystemAdmin
Security model   = USM
Security level   = noAuthNoPriv
Read View        = All
Write View       =
Notify View      = All
Context match    = exact match
Storage type     = nonVolatile
Row status       = active
```

```
Group           = NightOperator
Security model   = USM
Security level   = noAuthNoPriv
Read View        = All
Write View       =
Notify View      = All
Context match    = exact match
Storage type     = nonVolatile
Row status       = active
```

[Table 6-22](#) provides an explanation of the command output.

**Table 6-22 show snmp access Output Details**

Output	What It Displays...
Group	SNMP group name.
Security model	Security model applied to this group. Valid types are: <b>SNMPv1</b> , <b>SNMPv2c</b> , and SNMPv3 (User based - <b>USM</b> ).
Security level	Security level applied to this group. Valid levels are: <ul style="list-style-type: none"> <li>noAuthNoPrivacy (<b>no authentication</b> required)</li> <li>AuthNoPrivacy (<b>authentication</b> required)</li> <li>authPriv (<b>privacy</b> -- most secure level)</li> </ul>
Read View	Name of the view that allows this group to view SNMP MIB objects.
Write View	Name of the view that allows this group to configure the contents of the SNMP agent.
Notify View	Name of the view that allows this group to send an SNMP trap message.
Context match	Whether or not SNMP context match must be exact (full context name match) or a partial match with a given prefix.
Storage type	Whether access entries for this group are stored in <b>volatile</b> , <b>nonvolatile</b> or <b>read-only</b> memory.
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

## set snmp access

Use this command to set an SNMP access configuration.

### Syntax

```
set snmp access groupname security-model {v1 | v2c | usm} [noauthentication | authentication | privacy] [context context] [exact | prefix] [read read] [write write] [notify notify] [volatile | nonvolatile]
```

### Parameters

<i>groupname</i>	Specifies a name for an SNMPv3 group.
<b>security-model</b> v1   v2c   usm	Specifies SNMP version 1, 2c or 3 (usm).
<b>noauthentication</b>   <b>authentication</b>   <b>privacy</b>	(Optional) Applies SNMP security level as no authentication, authentication (without privacy) or privacy. Privacy specifies that messages sent on behalf of the user are protected from disclosure.
<b>context</b> <i>context</i> <b>exact</b>   <b>prefix</b>	(Optional) Sets the context for this access configuration and specifies that the match must be exact (matching the whole context string) or a prefix match only. Context is a subset of management information this SNMP group will be allowed to access. Valid values are full or partial context names. To review all contexts configured for the device, use the <b>show snmp context</b> command as described in “ <a href="#">show snmp context</a> ” on page 6-20.
<b>read</b> <i>read</i>	(Optional) Specifies a read access view.
<b>write</b> <i>write</i>	(Optional) Specifies a write access view.
<b>notify</b> <i>notify</i>	(Optional) Specifies a notify access view.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Stores associated SNMP entries as temporary or permanent, or read-only.

### Defaults

If security level is not specified, no authentication will be applied.

If **context** is not specified, access will be enabled for the default context. If **context** is specified without a context match, **exact** match will be applied.

If **read** view is not specified none will be applied.

If **write** view is not specified, none will be applied.

If **notify** view is not specified, none will be applied.

If storage type is not specified, entries will be stored as permanent and will be held through device reboot.

### Mode

Switch command, read-write.

### Example

This example permits the “powergroup” to manage all MIBs via SNMPv3:

```
B2(su)->set snmp access powergroup security-model usm
```

# clear snmp access

Use this command to clear the SNMP access entry of a specific group, including its set SNMP security-model, and level of security.

## Syntax

```
clear snmp access groupname security-model {v1 | v2c | usm} [noauthentication | authentication | privacy] [context context]
```

## Parameters

<i>groupname</i>	Specifies the name of the SNMP group for which to clear access.
security-model v1   v2c   usm	Specifies the security model to be cleared for the SNMP access group.
noauthentication   authentication   privacy	(Optional) Clears a specific security level for the SNMP access group.
context <i>context</i>	(Optional) Clears a specific context for the SNMP access group. Enter / - / to clear the default context.

## Defaults

- If security level is not specified, all levels will be cleared.
- If **context** is not specified, none will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to clear SNMP version 3 access for the “mis-group” via the authentication protocol:

```
B2(su)->clear snmp access mis-group security-model usm authentication
```

# Configuring SNMP MIB Views

## Purpose

To review and configure SNMP MIB views. SNMP views map SNMP objects to access rights.

## Commands

For information about...	Refer to page...
show snmp view	<a href="#">6-19</a>
show snmp context	<a href="#">6-20</a>
set snmp view	<a href="#">6-20</a>
clear snmp view	<a href="#">6-21</a>

## show snmp view

Use this command to display the MIB configuration for SNMPv3 view-based access (VACM).

### Syntax

```
show snmp view [viewname] [subtree oid-or-mibobject] [volatile | nonvolatile | read-only]
```

### Parameters

<i>viewname</i>	(Optional) Displays information for a specific MIB view.
<b>subtree</b> <i>oid-or-mibobject</i>	(Optional) Displays information for a specific MIB subtree when <i>viewname</i> is specified.
<b>volatile   nonvolatile   read-only</b>	(Optional) Displays entries for a specific storage type.

### Defaults

If no parameters are specified, all SNMP MIB view configuration information will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display SNMP MIB view configuration information:

```
B2(su)->show snmp view

--- SNMP MIB View information ---
View Name      = All
Subtree OID    = 1
Subtree mask   =
View Type      = included
Storage type   = nonVolatile
Row status     = active

View Name      = All
Subtree OID    = 0.0
Subtree mask   =
View Type      = included
Storage type   = nonVolatile
Row status     = active

View Name      = Network
Subtree OID    = 1.3.6.1.2.1
Subtree mask   =
View Type      = included
Storage type   = nonVolatile
Row status     = active
```

[Table 6-23](#) provides an explanation of the command output. For details on using the **set snmp view** command to assign variables, refer to “[set snmp view](#)” on page 6-20.

Table 6-23 show snmp view Output Details

Output	What It Displays...
View Name	Name assigned to a MIB view.
Subtree OID	Name identifying a MIB subtree.
Subtree mask	Bitmask applied to a MIB subtree.
View Type	Whether or not subtree use must be <b>included</b> or <b>excluded</b> for this view.
Storage type	Whether storage is in <b>nonVolatile</b> or <b>Volatile</b> memory
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

## show snmp context

Use this command to display the context list configuration for SNMP’s view-based access control.

### Syntax

`show snmp context`

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Usage

An SNMP context is a collection of management information that can be accessed by an SNMP agent or entity. The default context allows all SNMP agents to access all management information (MIBs). When created using the `set snmp access` command (“[set snmp access](#)” on page 6-17), other contexts can be applied to limit access to a subset of management information.

### Example

This example shows how to display a list of all SNMP contexts known to the device:

```
B2(su)->show snmp context

--- Configured contexts:
default context (all mibs)
```

## set snmp view

Use this command to set a MIB configuration for SNMPv3 view-based access (VACM).

### Syntax

```
set snmp view viewname viewname subtree subtree [mask mask] [included | excluded]
[volatile | nonvolatile]
```



## Parameters

<b>viewname</b> <i>viewname</i>	Specifies a name for a MIB view.
<b>subtree</b> <i>subtree</i>	Specifies a MIB subtree name.
<b>mask</b> <i>mask</i>	(Optional) Specifies a bitmask for a subtree.
<b>included</b>   <b>excluded</b>	(Optional) Specifies subtree use (default) or no subtree use.
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies the use of temporary or permanent (default) storage.

## Defaults

If not specified, **mask** will be set to **255.255.255.255**

If not specified, subtree use will be **included**.

If storage type is not specified, **nonvolatile** (permanent) will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to set an SNMP MIB view to “public” with a subtree name of 1.3.6.1 included:

```
B2(su)->set snmp view viewname public subtree 1.3.6.1 included
```

# clear snmp view

Use this command to delete an SNMPv3 MIB view.

## Syntax

```
clear snmp view viewname subtree
```

## Parameters

<i>viewname</i>	Specifies the MIB view name to be deleted.
<i>subtree</i>	Specifies the subtree name of the MIB view to be deleted.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to delete SNMP MIB view “public”:

```
B2(su)->clear snmp view public 1.3.6.1
```

# Configuring SNMP Target Parameters

## Purpose

To review and configure SNMP target parameters. This controls where and under what circumstances SNMP notifications will be sent. A target parameter entry can be bound to a target IP address allowed to receive SNMP notification messages with the **set snmp targetaddr** command (“[set snmp targetaddr](#)” on page 6-26).

## Commands

For information about...	Refer to page...
show snmp targetparams	<a href="#">6-22</a>
set snmp targetparams	<a href="#">6-23</a>
clear snmp targetparams	<a href="#">6-24</a>

## show snmp targetparams

Use this command to display SNMP parameters used to generate a message to a target.

### Syntax

**show snmp targetparams** [*targetParams*] [**volatile** | **nonvolatile** | **read-only**]

### Parameters

<i>targetParams</i>	(Optional) Displays entries for a specific target parameter.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Displays target parameter entries for a specific storage type.

### Defaults

If *targetParams* is not specified, entries associated with all target parameters will be displayed.  
If not specified, entries of all storage types will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display SNMP target parameters information:

```
B2(su)->show snmp targetparams

--- SNMP TargetParams information ---
Target Parameter Name   = vlExampleParams
Security Name           = public
Message Proc. Model     = SNMPv1
Security Level          = noAuthNoPriv
Storage type            = nonVolatile
Row status               = active
```

```

Target Parameter Name = v2cExampleParams
Security Name         = public
Message Proc. Model   = SNMPv2c
Security Level        = noAuthNoPriv
Storage type          = nonVolatile
Row status             = active

```

```

Target Parameter Name = v3ExampleParams
Security Name         = CharlieDChief
Message Proc. Model   = USM
Security Level        = authNoPriv
Storage type          = nonVolatile
Row status             = active

```

Table 6-24 provides an explanation of the command output.

**Table 6-24 show snmp targetparams Output Details**

Output	What It Displays...
Target Parameter Name	Unique identifier for the parameter in the SNMP target parameters table. Maximum length is 32 bytes.
Security Name	Security string definition.
Message Proc. Model	SNMP version.
Security Level	Type of security level ( <b>auth</b> : security level is set to use authentication protocol, <b>noauth</b> : security level is not set to use authentication protocol, or <b>privacy</b> ).
Storage type	Whether entry is stored in <b>volatile</b> , <b>nonvolatile</b> or <b>read-only</b> memory.
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

## set snmp targetparams

Use this command to set SNMP target parameters, a named set of security/authorization criteria used to generate a message to a target.

### Syntax

```

set snmp targetparams paramsname user user security-model {v1 | v2c | usm} message-
processing {v1 | v2c | v3} [noauthentication | authentication | privacy] [volatile
| nonvolatile]

```

### Parameters

<i>paramsname</i>	Specifies a name identifying parameters used to generate SNMP messages to a particular target.
<b>user</b> <i>user</i>	Specifies an SNMPv1 or v2 community name or an SNMPv3 user name. Maximum length is 32 bytes.
<b>security-model</b> v1   v2c   usm	Specifies the SNMP security model applied to this target parameter as version 1, 2c or 3 (usm).
<b>message-processing</b> v1   v2c   v3	Specifies the SNMP message processing model applied to this target parameter as version 1, 2c or 3.

<b>noauthentication</b>   <b>authentication</b>   <b>privacy</b>	(Optional) Specifies the SNMP security level applied to this target parameter as no authentication, authentication (without privacy) or privacy. Privacy specifies that messages sent on behalf of the user are protected from disclosure.
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies the storage type applied to this target parameter.

Defaults

None.

If not specified, security level will be set to **noauthentication**.

If not specified, storage type will be set to **nonvolatile**.

Mode

Switch command, read-write.

Example

This example shows how to set SNMP target parameters named “v1ExampleParams” for a user named “fred” using version 3 security model and message processing, and authentication:

```
B2(su)->set snmp targetparams v1ExampleParams user fred security-model usm message-processing v3 authentication
```

clear snmp targetparams

Use this command to clear the SNMP target parameter configuration.

Syntax

```
clear snmp targetparams targetParams
```

Parameters

<i>targetParams</i>	Specifies the name of the parameter in the SNMP target parameters table to be cleared.
---------------------	--

Defaults

None.

Mode

Switch command, read-write.

Example

This example shows how to clear SNMP target parameters named “v1ExampleParams”:

```
B2(su)->clear snmp targetparams v1ExampleParams
```

# Configuring SNMP Target Addresses

## Purpose

To review and configure SNMP target addresses which will receive SNMP notification messages. An address configuration can be linked to optional SNMP transmit, or target, parameters (such as timeout, retry count, and UDP port) set with the **set snmp targetparams** command ((page 6-23)).

## Commands

For information about...	Refer to page...
show snmp targetaddr	<a href="#">6-25</a>
set snmp targetaddr	<a href="#">6-26</a>
clear snmp targetaddr	<a href="#">6-27</a>

## show snmp targetaddr

Use this command to display SNMP target address information.

### Syntax

```
show snmp targetaddr [targetAddr] [volatile | nonvolatile | read-only]
```

### Parameters

<i>targetAddr</i>	(Optional) Displays information for a specific target address name.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) When target address is specified, displays target address information for a specific storage type.

### Defaults

If *targetAddr* is not specified, entries for all target address names will be displayed.

If not specified, entries of all storage types will be displayed for a target address.

### Mode

Switch command, read-only.

### Example

This example shows how to display SNMP target address information:

```
B2(su)->show snmp targetaddr
Target Address Name      = labmachine
Tag List                 = v2cTrap
IP Address               = 10.2.3.116
UDP Port#               = 162
Target Mask              = 255.255.255.255
Timeout                 = 1500
Retry count              = 4
Parameters              = v2cParams
Storage type             = nonVolatile
Row status               = active
```

Table 6-25 provides an explanation of the command output.

**Table 6-25 show snmp targetaddr Output Details**

Output	What It Displays...
Target Address Name	Unique identifier in the snmpTargetAddressTable.
Tag List	Tags a location to the target address as a place to send notifications.
IP Address	Target IP address.
UDP Port#	Number of the UDP port of the target host to use.
Target Mask	Target IP address mask.
Timeout	Timeout setting for the target address.
Retry count	Retry setting for the target address.
Parameters	Entry in the snmpTargetParamsTable.
Storage type	Whether entry is stored in <b>volatile</b> , <b>nonvolatile</b> or <b>read-only</b> memory.
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

## set snmp targetaddr

Use this command to configure an SNMP target address. The target address is a unique identifier and a specific IP address that will receive SNMP notification messages and determine which community strings will be accepted. This address configuration can be linked to optional SNMP transmit parameters (such as timeout, retry count, and UDP port).

### Syntax

```
set snmp targetaddr targetaddr ipaddr param param [udpport udpport] [mask mask]
[timeout timeout] [retries retries] [taglist taglist] [volatile | nonvolatile]
```

### Parameters

<i>targetaddr</i>	Specifies a unique identifier to index the snmpTargetAddrTable. Maximum length is 32 bytes.
<i>ipaddr</i>	Specifies the IP address of the target.
<b>param</b> <i>param</i>	Specifies an entry in the SNMP target parameters table, which is used when generating a message to the target. Maximum length is 32 bytes.
<b>udpport</b> <i>udpport</i>	(Optional) Specifies which UDP port of the target host to use.
<b>mask</b> <i>mask</i>	(Optional) Specifies the IP mask of the target.
<b>timeout</b> <i>timeout</i>	(Optional) Specifies the maximum round trip time allowed to communicate to this target address. This value is in .01 seconds and the default is 1500 (15 seconds.)
<b>retries</b> <i>retries</i>	(Optional) Specifies the number of message retries allowed if a response is not received. Default is 3.
<b>taglist</b> <i>taglist</i>	(Optional) Specifies a list of SNMP notify tag values. This tags a location to the target address as a place to send notifications. List must be enclosed in quotes and tag values must be separated by a space (for example, "tag 1 tag 2").
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies temporary (default), or permanent storage for SNMP entries.

## Defaults

If not specified, *udpport* will be set to **162**.

If not specified, *mask* will be set to **255.255.255.255**

If not specified, *timeout* will be set to **1500**.

If not specified, number of *retries* will be set to **3**.

If **taglist** is not specified, none will be set.

If not specified, storage type will be **nonvolatile**.

## Mode

Switch command, read-write.

## Example

This example shows how to configure a trap notification called “**TrapSink**.” This trap notification will be sent to the workstation 192.168.190.80 (which is target address “tr”). It will use security and authorization criteria contained in a target parameters entry called “v2cExampleParams”. For more information on configuring a basic SNMP trap, refer to “[Creating a Basic SNMP Trap Configuration](#)” on page 6-36:

```
B2(su)->set snmp targetaddr tr 192.168.190.80 param v2cExampleParams taglist
TrapSink
```

# clear snmp targetaddr

Use this command to delete an SNMP target address entry.

## Syntax

```
clear snmp targetaddr targetAddr
```

## Parameters

<i>targetAddr</i>	Specifies the target address entry to delete.
-------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear SNMP target address entry “tr”:

```
B2(su)->clear snmp targetaddr tr
```

# Configuring SNMP Notification Parameters

## About SNMP Notify Filters

Profiles indicating which targets should not receive SNMP notification messages are kept in the NotifyFilter table. If this table is empty, meaning that no filtering is associated with any SNMP target, then no filtering will take place. “Traps” or “informs” notifications will be sent to all destinations in the SNMP targetAddrTable that have tags matching those found in the NotifyTable.

When the NotifyFilter table contains profile entries, the SNMP agent will find any filter profile name that corresponds to the target parameter name contained in an outgoing notification message. It will then apply the appropriate subtree-specific filter when generating notification messages.

## Purpose

To configure SNMP notification parameters and optional filters. Notifications are entities which handle the generation of SNMP v1 and v2 “traps” or SNMP v3 “informs” messages to select management targets. Optional notification filters identify which targets should not receive notifications. For a sample SNMP trap configuration showing how SNMP notification parameters are associated with security and authorization criteria (target parameters) and mapped to a management target address, refer to [“Creating a Basic SNMP Trap Configuration”](#) on page 6-36.

## Commands

For information about...	Refer to page...
show newaddrtrap	<a href="#">6-28</a>
set newaddrtrap	<a href="#">6-29</a>
show snmp notify	<a href="#">6-30</a>
set snmp notify	<a href="#">6-31</a>
clear snmp notify	<a href="#">6-32</a>
show snmp notifyfilter	<a href="#">6-32</a>
set snmp notifyfilter	<a href="#">6-33</a>
clear snmp notifyfilter	<a href="#">6-34</a>
show snmp notifyprofile	<a href="#">6-34</a>
set snmp notifyprofile	<a href="#">6-35</a>
clear snmp notifyprofile	<a href="#">6-35</a>

## show newaddrtrap

Use this command to display the global and port-specific status of the SNMP new MAC addresses trap function.

### Syntax

```
show newaddrtrap [port-string]
```



## Parameters

<i>port-string</i>	(Optional) Displays the status of the new MAC addresses trap function on specific ports.
--------------------	--

## Defaults

If *port-string* is not specified, the status of the new MAC addresses trap function will be displayed for all ports.

## Mode

Switch command, read-only.

## Usage

By default, this function is disabled globally and per port.

## Example

This example displays the status for Gigabit Ethernet ports 1 through 5 in slot 1.

```
B2(ro)->show newaddrtrap ge.1.1-5
New Address Traps Globally disabled
```

```
Port          Enable State
-----
ge.1.1        disabled
ge.1.2        disabled
ge.1.3        disabled
ge.1.4        disabled
ge.1.5        disabled
```

# set newaddrtrap

Use this command to enable or disable SNMP trap messaging, globally or on one or more ports, when new source MAC addresses are detected.

## Syntax

```
set newaddrtrap [port-string] {enable | disable}
```

## Parameters

<i>port-string</i>	(Optional) Enable or disable the new MAC addresses trap function on specific ports.
<b>enable</b>   <b>disable</b>	Enable or disable the new MAC addresses trap function. If entered without the <i>port-string</i> parameter, enables or disables the function globally. When entered with the <i>port-string</i> parameter, enables or disables the function on specific ports.

## Defaults

If *port-string* is not specified, the trap function is set globally.

## Mode

Switch mode, read-write.

## Usage

This command enables and disables sending SNMP trap messages when a new source MAC address is detected by a port. If the port is a CDP port, however, traps for new source MAC addresses will not be sent.

The default mode is disabled globally and per port.

## Example=

This example enables the trap function globally and then on Gigabit Ethernet ports 1 through 5 in slot 1.

```
B2(rw)->set newaddrtrap enable
B2(rw)->set newaddrtrap ge.1.1-5 enable
```

# show snmp notify

Use this command to display the SNMP notify configuration, which determines the management targets that will receive SNMP notifications.

## Syntax

```
show snmp notify [notify] [volatile | nonvolatile | read-only]
```

## Parameters

<i>notify</i>	(Optional) Displays notify entries for a specific notify name.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Displays notify entries for a specific storage type.

## Defaults

- If a *notify* name is not specified, all entries will be displayed.
- If **volatile**, **nonvolatile**, or **read-only** are not specified, all storage type entries will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display the SNMP notify information:

```
B2(su)->show snmp notify

--- SNMP notifyTable information ---
Notify name      = 1
Notify Tag       = Console
Notify Type      = trap
Storage type     = nonVolatile
Row status       = active

Notify name      = 2
Notify Tag       = TrapSink
Notify Type      = trap
Storage type     = nonVolatile
Row status       = active
```

Table 6-26 provides an explanation of the command output.

**Table 6-26 show snmp notify Output Details**

Output	What It Displays...
Notify name	A unique identifier used to index the SNMP notify table.
Notify Tag	Name of the entry in the SNMP notify table.
Notify Type	Type of notification: SNMPv1 or v2 <b>trap</b> or SNMPv3 <b>InformRequest</b> message.
Storage type	Whether access entry is stored in <b>volatile</b> , <b>nonvolatile</b> , or <b>read-only</b> memory.
Row status	Status of this entry: <b>active</b> , <b>notInService</b> , or <b>notReady</b> .

## set snmp notify

Use this command to set the SNMP notify configuration. This creates an entry in the SNMP notify table, which is used to select management targets who should receive notification messages. This command's **tag** parameter can be used to bind each entry to a target address using the **set snmp targetaddr** command ("[set snmp targetaddr](#)" on page 6-26).

### Syntax

```
set snmp notify notify tag tag [trap | inform] [volatile | nonvolatile]
```

### Parameters

<i>notify</i>	Specifies an SNMP notify name.
tag <i>tag</i>	Specifies an SNMP notify tag. This binds the notify name to the SNMP target address table.
<b>trap</b>   <b>inform</b>	(Optional) Specifies SNMPv1 or v2 Trap messages (default) or SNMP v3 InformRequest messages.
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies temporary (default), or permanent storage for SNMP entries.

### Defaults

If not specified, message type will be set to **trap**.

If not specified, storage type will be set to **nonvolatile**.

### Mode

Switch command, read-write.

### Example

This example shows how to set an SNMP notify configuration with a notify name of "hello" and a notify tag of "world". Notifications will be sent as trap messages and storage type will automatically default to permanent:

```
B2(su)->set snmp notify hello tag world trap
```

# clear snmp notify

Use this command to clear an SNMP notify configuration.

## Syntax

```
clear snmp notify notify
```

## Parameters

<i>notify</i>	Specifies an SNMP notify name to clear.
---------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the SNMP notify configuration for “hello”:

```
B2(su)->clear snmp notify hello
```

# show snmp notifyfilter

Use this command to display SNMP notify filter information, identifying which profiles will not receive SNMP notifications.

## Syntax

```
show snmp notifyfilter [profile] [subtree oid-or-mibobject] [volatile |  
nonvolatile | read-only]
```

## Parameters

<i>profile</i>	(Optional) Displays a specific notify filter.
<b>subtree</b> <i>oid-or-mibobject</i>	(Optional) Displays a notify filter within a specific subtree.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Displays notify filter entries of a specific storage type.

## Defaults

If no parameters are specified, all notify filter information will be displayed.

## Mode

Switch command, read-only.

## Usage

See “[About SNMP Notify Filters](#)” on page 6-28 for more information about notify filters.

## Example

This example shows how to display SNMP notify filter information. In this case, the notify profile “pilot1” in subtree 1.3.6 will not receive SNMP notification messages:

```
B2(su)->show snmp notifyfilter

--- SNMP notifyFilter information ---
Profile           = pilot1
Subtree           = 1.3.6
Filter type       = included
Storage type      = nonVolatile
Row status        = active
```

## set snmp notifyfilter

Use this command to create an SNMP notify filter configuration. This identifies which management targets should NOT receive notification messages, which is useful for fine-tuning the amount of SNMP traffic generated.

### Syntax

```
set snmp notifyfilter profile subtree oid-or-mibobject [mask mask] [included | excluded] [volatile | nonvolatile]
```

### Parameters

<i>profile</i>	Specifies an SNMP filter notify name.
<b>subtree</b> <i>oid-or-mibobject</i>	Specifies a MIB subtree ID target for the filter.
<b>mask</b> <i>mask</i>	(Optional) Applies a subtree mask.
<b>included</b>   <b>excluded</b>	(Optional) Specifies that subtree is included or excluded.
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies a storage type.

### Defaults

If not specified, **mask** is not set.

If not specified, subtree will be **included**.

If storage type is not specified, **nonvolatile** (permanent) will be applied.

### Mode

Switch command, read-write.

### Usage

See “[About SNMP Notify Filters](#)” on page 6-28 for more information about notify filters.

## Example

This example shows how to create an SNMP notify filter called “pilot1” with a MIB subtree ID of 1.3.6:

```
B2(su)->set snmp notifyfilter pilot1 subtree 1.3.6
```

# clear snmp notifyfilter

Use this command to delete an SNMP notify filter configuration.

## Syntax

```
clear snmp notifyfilter profile subtree oid-or-mibobject
```

## Parameters

<i>profile</i>	Specifies an SNMP filter notify name to delete.
<b>subtree</b> <i>oid-or-mibobject</i>	Specifies a MIB subtree ID containing the filter to be deleted.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to delete the SNMP notify filter “pilot1”:

```
B2(su)->clear snmp notifyfilter pilot1 subtree 1.3.6
```

# show snmp notifyprofile

Use this command to display SNMP notify profile information. This associates target parameters to an SNMP notify filter to determine who should not receive SNMP notifications.

## Syntax

```
show snmp notifyprofile [profile] [targetparam targetparam] [volatile | nonvolatile | read-only]
```

## Parameters

<i>profile</i>	(Optional) Displays a specific notify profile.
<b>targetparam</b> <i>targetparam</i>	(Optional) Displays entries for a specific target parameter.
<b>volatile</b>   <b>nonvolatile</b>   <b>read-only</b>	(Optional) Displays notify filter entries of a specific storage type.

## Defaults

If no parameters are specified, all notify profile information will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display SNMP notify information for the profile named “area51”:

```
B2(su)->show snmp notifyprofile area51

--- SNMP notifyProfile information ---
Notify Profile   = area51
TargetParam      = v3ExampleParams
Storage type     = nonVolatile
Row status       = active
```

## set snmp notifyprofile

Use this command to create an SNMP notify filter profile configuration. This associates a notification filter, created with the **set snmp notifyfilter** command (“[set snmp notifyfilter](#)” on page 6-33), to a set of SNMP target parameters to determine which management targets should not receive SNMP notifications.

### Syntax

```
set snmp notifyprofile profile targetparam targetparam [volatile | nonvolatile]
```

### Parameters

<i>profile</i>	Specifies an SNMP filter notify name.
<b>targetparam</b> <i>targetparam</i>	Specifies an associated entry in the SNMP Target Params Table.
<b>volatile</b>   <b>nonvolatile</b>	(Optional) Specifies a storage type.

### Defaults

If storage type is not specified, **nonvolatile** (permanent) will be applied.

### Mode

Switch command, read-write.

### Example

This example shows how to create an SNMP notify profile named area51 and associate a target parameters entry.

```
B2(su)->set snmp notifyprofile area51 targetparam v3ExampleParams
```

## clear snmp notifyprofile

Use this command to delete an SNMP notify profile configuration.

### Syntax

```
clear snmp notifyprofile profile targetparam targetparam
```

Parameters

<i>profile</i>	Specifies an SNMP filter notify name to delete.
<b>targetparam</b> <i>targetparam</i>	Specifies an associated entry in the snmpTargetParamsTable.

Defaults

None.

Mode

Switch command, read-write.

Example

This example shows how to delete SNMP notify profile “area51”:

```
B2(su)->clear snmp notifyprofile area51 targetparam v3ExampleParams
```

Creating a Basic SNMP Trap Configuration

Traps are notification messages sent by an SNMPv1 or v2 agent to a network management station, a console, or a terminal to indicate the occurrence of a significant event, such as when a port or device goes up or down, when there are authentication failures, and when power supply errors occur. The following configuration example shows how to use CLI commands to associate SNMP notification parameters with security and authorization criteria (target parameters), and map the parameters to a management target address.



**Note:** This example illustrates how to configure an SNMPv2 trap notification. Creating an SNMPv1 or v3 Trap, or an SNMPv3 Inform notification would require using the same commands with different parameters, where appropriate. Always ensure that v1/v2 communities or v3 users used for generating traps or informs are pre-configured with enough privileges to access corresponding MIBs.

Complete an SNMPv2 trap configuration on a SecureStack B2 device as follows:

1. Create a community name that will act as an SNMP user password.
2. Create an SNMP target parameters entry to associate security and authorization criteria to the users in the community created in Step 1.
3. Verify if any applicable SNMP notification entries exist, or create a new one. You will use this entry to send SNMP notification messages to the appropriate management targets created in Step 2.
4. Create a target address entry to bind a management IP address to:
  - The notification entry and tag name created in Step 3 and
  - The target parameters entry created in Step 2.

Table 6-27 shows the commands used to complete an SNMPv2 trap configuration on a SecureStack B2 device.

Table 6-27 Basic SNMP Trap Configuration

To do this...	Use these commands...
Create a community name.	<a href="#">set snmp community</a>



**Table 6-27 Basic SNMP Trap Configuration (Continued)**

To do this...	Use these commands...
Create an SNMP target parameters entry.	<code>set snmp targetparams</code>
Verify if any applicable SNMP notification entries exist.	<code>show snmp notify</code>
Create a new notification entry.	<code>set snmp notify</code>
Create a target address entry.	<code>set snmp targetaddr</code>

## Example

This example shows how to:

- Create an SNMP community called **mgmt**.
- Configure a trap notification called **TrapSink**.

This trap notification will be sent with the community name **mgmt** to the workstation **192.168.190.80** (which is target address **tr**). It will use security and authorization criteria contained in a target parameters entry called **v2cExampleParams**.

```
B2(su)->set snmp community mgmt
B2(su)->set snmp targetparams v2cExampleParams user mgmt
security-model v2c message-processing v2c
B2(su)->set snmp notify entry1 tag TrapSink
B2(su)->set snmp targetaddr tr 192.168.190.80 param v2cExampleParams taglist
TrapSink
```

## How SNMP Will Use This Configuration

In order to send a trap/notification requested by a MIB code, the SNMP agent requires the equivalent of a trap “door”, a “key” to unlock the door, and a “procedure” for crossing the doorstep. To determine if all these elements are in place, the SNMP agent proceeds as follows:

1. Determines if the “keys” for trap “doors” do exist. In the example configuration above, the key that SNMP is looking for is the notification entry created with the **set snmp notify** command which, in this case, is a key labeled **entry1**.
2. Searches for the doors matching such a key. For example, the parameters set for the **entry1** key shows that it opens only the door **TrapSink**.
3. Verifies that the specified door **TrapSink** is, in fact, available. In this case it was built using the **set snmp targetaddr** command. This command also specifies that this door leads to the management station **192.168.190.80**, and the “procedure” (**targetparams**) to cross the doorstep is called **v2ExampleParams**.
4. Verifies that the **v2ExampleParams** description of how to step through the door is, in fact, there. The agent checks **targetparams** entries and determines this description was made with the **set snmp targetparams** command, which tells exactly which SNMP protocol to use and what community name to provide. In this case, the community name is **mgmt**.
5. Verifies that the **mgmt** community name is available. In this case, it has been configured using the **set snmp community** command.
6. Sends the trap notification message.



## Spanning Tree Configuration

This chapter describes the Spanning Tree Configuration set of commands and how to use them.

For information about...	Refer to page...
<a href="#">Spanning Tree Configuration Summary</a>	<a href="#">7-1</a>
<a href="#">Configuring Spanning Tree Bridge Parameters</a>	<a href="#">7-3</a>
<a href="#">Configuring Spanning Tree Port Parameters</a>	<a href="#">7-31</a>
<a href="#">Configuring Spanning Tree Loop Protect Parameters</a>	<a href="#">7-39</a>



**Caution:** Spanning Tree configuration should be performed only by personnel who are very knowledgeable about Spanning Trees and the configuration of the Spanning Tree Algorithm. Otherwise, the proper operation of the network could be at risk.

## Spanning Tree Configuration Summary

### Overview: Single, Rapid, and Multiple Spanning Tree Protocols

The IEEE 802.1D Spanning Tree Protocol (STP) resolves the problems of physical loops in a network by establishing one primary path between any two devices in a network. Any duplicate paths are barred from use and become standby or blocked paths until the original path fails, at which point they can be brought into service.

#### RSTP

The IEEE 802.1w Rapid Spanning Protocol (RSTP), an evolution of 802.1D, can achieve much faster convergence than legacy STP in a properly configured network. RSTP significantly reduces the time to reconfigure the network's active topology when physical topology or configuration parameter changes occur. It selects one switch as the root of a Spanning Tree-connected active topology and assigns port roles to individual ports on the switch, depending on whether that port is part of the active topology.

RSTP provides rapid connectivity following the failure of a switch, switch port, or a LAN. A new root port and the designated port on the other side of the bridge transition to forwarding through an explicit handshake between them. By default, user ports are configured to rapidly transition to forwarding in RSTP.

#### MSTP

The IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) builds upon 802.1D and RSTP by optimizing utilization of redundant links between switches in a network. When redundant links exist between a pair of switches running single STP, one link is forwarding while the others are

blocking for all traffic flowing between the two switches. The blocking links are effectively used only if the forwarding link goes down. MSTP assigns each VLAN present on the network to a particular Spanning Tree instance, allowing each switch port to be in a distinct state for each such instance: blocking for one Spanning Tree while forwarding for another. Thus, traffic associated with one set of VLANs can traverse a particular inter-switch link, while traffic associated with another set of VLANs can be blocked on that link. If VLANs are assigned to Spanning Trees wisely, no inter-switch link will be completely idle, maximizing network utilization.

For details on creating Spanning Tree instances, refer to “[set spantree msti](#)” on page 7-12.

For details on mapping Spanning Tree instances to VLANs, refer to “[set spantree mstmap](#)” on page 7-14.



**Note:** MSTP and RSTP are fully compatible and interoperable with each other and with legacy STP 802.1D.

## Spanning Tree Features

The SecureStack B2 device meets the requirements of the Spanning Tree Protocols by performing the following functions:

- Creating a single Spanning Tree from any arrangement of switching or bridging elements.
- Compensating automatically for the failure, removal, or addition of any device in an active data path.
- Achieving port changes in short time intervals, which establishes a stable active topology quickly with minimal network disturbance.
- Using a minimum amount of communications bandwidth to accomplish the operation of the Spanning Tree Protocol.
- Reconfiguring the active topology in a manner that is transparent to stations transmitting and receiving data packets.
- Managing the topology in a consistent and reproducible manner through the use of Spanning Tree Protocol parameters.



**Note:** The term “bridge” is used as an equivalent to the term “switch” or “device” in this document.

## Loop Protect

The Loop Protect feature prevents or short circuits loop formation in a network with redundant paths by requiring ports to receive type 2 BPDUs (RSTP/MSTP) on point-to-point inter-switch links (ISLs) before their states are allowed to become forwarding. Further, if a BPDU timeout occurs on a port, its state becomes listening until a BPDU is received.

Both upstream and downstream facing ports are protected. When a root or alternate port loses its path to the root bridge due to a message age expiration it takes on the role of designated port. It will not forward traffic until a BPDU is received. When a port is intended to be the designated port in an ISL it constantly proposes and will not forward until a BPDU is received, and will revert to listening if it fails to get a response. This protects against misconfiguration and protocol failure by the connected bridge.

The Disputed BPDU mechanism protects against looping in situations where there is one way communication. A disputed BPDU is one in which the flags field indicates a designated role and

learning and the priority vector is worse than that already held by the port. If a disputed BPDU is received, the port is forced to the listening state. When an inferior designated BPDU with the learning bit set is received on a designated port, its state is set to discarding to prevent loop formation. Note that the Dispute mechanism is always active regardless of the configuration setting of Loop Protection.

Loop Protect operates as a per port, per MST instance feature. It should be set on inter-switch links. It is comprised of several related functions:

- Control of port forwarding state based on reception of agreement BPDUs
- Control of port forwarding state based on reception of disputed BPDUs
- Communicating port non-forwarding status through traps and syslog messages
- Disabling a port based on frequency of failure events

Port forwarding state in the designated port is gated by a timer that is set upon BPDU reception. It is analogous to the rcvdInfoWhile timer the port uses when receiving root information in the root/alternate/backup role.

There are two operational modes for Loop Protect on a port. If the port is connected to a device known to implement Loop Protect, it uses full functional mode. Otherwise the port operates in limited functional mode.

Connection to a Loop Protect switch guarantees that the alternate agreement mechanism is implemented. This means the designated port can rely on receiving a response to its proposal regardless of the role of the connected port, which has two important implications. First, the designated port connected to a non-root port may transition to forwarding. Second, there is no ambiguity when a timeout happens; a Loop Protect event has occurred.

In full functional mode, when a type 2 BPDU is received and the port is designated and point-to-point, the timer is set to 3 times helloTime. In limited functional mode there is the additional requirement that the flags field indicate a root role. If the port is a boundary port the MSTIs for that port follow the CIST, that is, the MSTI port timers are set according to the CIST port timer. If the port is internal to the region then the MSTI port timers are set independently using the particular MSTI message.

Message age expiration and the expiration of the Loop Protect timer are both Loop Protect events. A notice level syslog message is produced for each such event. Traps may be configured to report these events as well. A syslog message and trap may be configured for disputed BPDUs.

It is also configurable to force the locking of a SID/port for the occurrence of one or more events. When the configured number of events happen within a given window of time, the port is forced into blocking and held there until it is manually unlocked via management.

## Configuring Spanning Tree Bridge Parameters

### Purpose

To display and set Spanning Tree bridge parameters, including device priorities, hello time, maximum wait time, forward delay, path cost, and topology change trap suppression.

## Commands

For information about...	Refer to page...
show spantree stats	<a href="#">7-5</a>
set spantree	<a href="#">7-7</a>
show spantree version	<a href="#">7-7</a>
set spantree version	<a href="#">7-8</a>
clear spantree version	<a href="#">7-8</a>
show spantree bpdu-forwarding	<a href="#">7-9</a>
set spantree bpdu-forwarding	<a href="#">7-9</a>
show spantree bridgeprioritymode	<a href="#">7-10</a>
set spantree bridgeprioritymode	<a href="#">7-10</a>
clear spantree bridgeprioritymode	<a href="#">7-11</a>
show spantree mstlist	<a href="#">7-12</a>
set spantree msti	<a href="#">7-12</a>
clear spantree msti	<a href="#">7-13</a>
show spantree mstmap	<a href="#">7-13</a>
set spantree mstmap	<a href="#">7-14</a>
clear spantree mstmap	<a href="#">7-14</a>
show spantree vlanlist	<a href="#">7-15</a>
show spantree mstcgid	<a href="#">7-15</a>
set spantree mstcgid	<a href="#">7-16</a>
clear spantree mstcgid	<a href="#">7-16</a>
set spantree priority	<a href="#">7-17</a>
clear spantree priority	<a href="#">7-17</a>
set spantree hello	<a href="#">7-18</a>
clear spantree hello	<a href="#">7-18</a>
set spantree maxage	<a href="#">7-19</a>
clear spantree maxage	<a href="#">7-19</a>
set spantree fwddelay	<a href="#">7-20</a>
clear spantree fwddelay	<a href="#">7-20</a>
show spantree backuproot	<a href="#">7-21</a>
set spantree backuproot	<a href="#">7-21</a>
clear spantree backuproot	<a href="#">7-22</a>
show spantree tctrapsuppress	<a href="#">7-22</a>
set spantree tctrapsuppress	<a href="#">7-23</a>
clear spantree tctrapsuppress	<a href="#">7-23</a>

For information about...	Refer to page...
set spantree protomigration	<a href="#">7-24</a>
show spantree spanguard	<a href="#">7-24</a>
set spantree spanguard	<a href="#">7-25</a>
clear spantree spanguard	<a href="#">7-26</a>
show spantree spanguardtimeout	<a href="#">7-26</a>
set spantree spanguardtimeout	<a href="#">7-26</a>
clear spantree spanguardtimeout	<a href="#">7-27</a>
show spantree spanguardlock	<a href="#">7-27</a>
clear/set spantree spanguardlock	<a href="#">7-28</a>
show spantree spanguardtrapenable	<a href="#">7-28</a>
set spantree spanguardtrapenable	<a href="#">7-29</a>
clear spantree spanguardtrapenable	<a href="#">7-29</a>
show spantree legacypathcost	<a href="#">7-30</a>
set spantree legacypathcost	<a href="#">7-30</a>
clear spantree legacypathcost	<a href="#">7-31</a>

## show spantree stats

Use this command to display Spanning Tree information for one or more ports.

### Syntax

```
show spantree stats [port port-string] [sid sid] [active]
```

### Parameters

<b>port</b> <i>port-string</i>	(Optional) Displays information for the specified port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>sid</b> <i>sid</i>	(Optional) Displays information for a specific Spanning Tree identifier. If not specified, SID 0 is assumed.
<b>active</b>	(Optional) Displays information for ports that have received STP BPDUs since boot.

### Defaults

If *port-string* is not specified, Spanning Tree information for all ports will be displayed.

If *sid* is not specified, information for Spanning Tree 0 will be displayed.

If **active** is not specified information for all ports will be displayed regardless of whether or not they have received BPDUs.

### Mode

Switch command, read-only.

## Example

This example shows how to display the device's Spanning Tree configuration:

```
B2(su)->show spantree stats
```

```
Spanning tree status          - enabled
Spanning tree instance        - 0
Designated Root MacAddr      - 00-e0-63-9d-c1-c8
Designated Root Priority      - 0
Designated Root Cost          - 10000
Designated Root Port          - lag.0.1
Root Max Age                  - 20 sec
Root Hello Time               - 2 sec
Root Forward Delay            - 15 sec
Bridge ID MAC Address         - 00-01-f4-da-5e-3d
Bridge ID Priority            - 32768
Bridge Max Age                - 20 sec
Bridge Hello Time             - 2 sec
Bridge Forward Delay          - 15 sec
Topology Change Count        - 7
Time Since Top Change         - 00 days 03:19:15
Max Hops                      - 20
```

[Table 7-28](#) shows a detailed explanation of command output.

**Table 7-28 show spantree Output Details**

Output	What It Displays...
Spanning tree instance	Spanning Tree ID.
Spanning tree status	Whether Spanning Tree is enabled or disabled.
Designated Root MacAddr	MAC address of the designated Spanning Tree root bridge.
Designated Root Port	Port through which the root bridge can be reached.
Designated Root Priority	Priority of the designated root bridge.
Designated Root Cost	Total path cost to reach the root.
Root Max Age	Amount of time (in seconds) a BPDU packet should be considered valid.
Root Hello Time	Interval (in seconds) at which the root device sends BPDU (Bridge Protocol Data Unit) packets.
Root Forward Delay	Amount of time (in seconds) the root device spends in listening or learning mode.
Bridge ID MAC Address	Unique bridge MAC address, recognized by all bridges in the network.
Bridge ID Priority	Bridge priority, which is a default value, or is assigned using the <b>set spantree priority</b> command. For details, refer to <a href="#">“set spantree priority”</a> on page 7-17.
Bridge Max Age	Maximum time (in seconds) the bridge can wait without receiving a configuration message (bridge “hello”) before attempting to reconfigure. This is a default value, or is assigned using the <b>set spantree maxage</b> command. For details, refer to <a href="#">“set spantree maxage”</a> on page 7-19.
Bridge Hello Time	Amount of time (in seconds) the bridge sends BPDUs. This is a default value, or is assigned using the <b>set spantree hello</b> command. For details, refer to <a href="#">“set spantree hello”</a> on page 7-18.



**Table 7-28 show spantree Output Details (Continued)**

Output	What It Displays...
Bridge Forward Delay	Amount of time (in seconds) the bridge spends in listening or learning mode. This is a default value, or is assigned using the <b>set spantree fwddelay</b> command. For details, refer to “ <a href="#">set spantree fwddelay</a> ” on page 7-20.
Topology Change Count	Number of times topology has changed on the bridge.
Time Since Top Change	Amount of time (in days, hours, minutes and seconds) since the last topology change.
Max Hops	Maximum number of hops information for a particular Spanning Tree instance may traverse (via relay of BPDUs within the applicable MST region) before being discarded.

## set spantree

Use this command to globally enable or disable the Spanning Tree protocol on the switch.

### Syntax

```
set spantree {disable | enable}
```

### Parameters

<b>disable   enable</b>	Globally disables or enables Spanning Tree.
-------------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to disable Spanning Tree on the device:

```
B2(su)->set spantree disable
```

## show spantree version

Use this command to display the current version of the Spanning Tree protocol running on the device.

### Syntax

```
show spantree version
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display Spanning Tree version information for the device:

```
B2(su)->show spantree version
Force Version is mstp
```

## set spantree version

Use this command to set the version of the Spanning Tree protocol to MSTP (Multiple Spanning Tree Protocol), RSTP (Rapid Spanning Tree Protocol) or to STP 802.1D-compatible.

### Syntax

```
set spantree version {mstp | stpcompatible | rstp}
```

### Parameters

<b>mstp</b>	Sets the version to STP 802.1s-compatible.
<b>stpcompatible</b>	Sets the version to STP 802.1D-compatible.
<b>rstp</b>	Sets the version to 802.1w-compatible.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

In most networks, Spanning Tree version should not be changed from its default setting of **mstp** (Multiple Spanning Tree Protocol) mode. MSTP mode is fully compatible and interoperable with legacy STP 802.1D and Rapid Spanning Tree (RSTP) bridges. Setting the version to **stpcompatible** mode will cause the bridge to transmit only 802.1D BPDUs, and will prevent non-edge ports from rapidly transitioning to forwarding state.

### Example

This example shows how to globally change the Spanning Tree version from the default of MSTP to RSTP:

```
B2(su)->set spantree version rstp
```

## clear spantree version

Use this command to reset the Spanning Tree version to MSTP mode.

### Syntax

```
clear spantree version
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the Spanning Tree version:

```
B2(su)->clear spantree version
```

# show spantree bpdu-forwarding

Use this command to display the Spanning Tree BPDU forwarding mode.

## Syntax

```
show spantree bpdu-forwarding
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the Spanning Tree BPDU forwarding mode:

```
B2(su)->show spantree bpdu-forwarding
BPDU forwarding is disabled.
```

# set spantree bpdu-forwarding

Use this command to enable or disable Spanning Tree BPDU forwarding. By default BPDU forwarding is disabled.

## Syntax

```
set spantree bpdu-forwarding {disable | enable}
```

## Parameters

---

<b>disable</b>   <b>enable</b>	Disables or enables BPDU forwarding;.
--------------------------------	---------------------------------------

---

## Defaults

By default BPDU forwarding is disabled.

## Mode

Switch command, read-write.

## Usage

The Spanning Tree protocol must be disabled ([set spantree disable](#)) for this feature to take effect.

## Example

This example shows how to enable BPDU forwarding:

```
B2(rw)-> set spantree bpdu-forwarding enable
```

# show spantree bridgeprioritymode

Use this command to display the Spanning Tree bridge priority mode setting.

## Syntax

```
show spantree bridgeprioritymode
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the Spanning Tree bridge priority mode setting:

```
B2(rw)->show spantree bridgeprioritymode
Bridge Priority Mode is set to IEEE802.1t mode.
```

# set spantree bridgeprioritymode

Use this command to set the Spanning Tree bridge priority mode to 802.1D (legacy) or 802.1t.

## Syntax

```
set spantree bridgeprioritymode {8021d | 8021t}
```

## Parameters

<b>8021d</b>	Sets the bridge priority mode to use 802.1D (legacy) values, which are 0 - 65535.
<b>8021t</b>	Sets the bridge priority mode to use 802.1t values, which are 0 to 61440, in increments of 4096. Values will automatically be rounded up or down, depending on the 802.1t value to which the entered value is closest.  This is the default bridge priority mode.

## Defaults

None

## Mode

Switch command, read-write.

## Usage

The mode affects the range of priority values used to determine which device is selected as the Spanning Tree root as described in **set spantree priority** ("[set spantree priority](#)" on page 7-17). The default for the switch is to use 802.1t bridge priority mode.

## Example

This example shows how to set the bridge priority mode to 802.1D:

```
B2(rw)->set spantree bridgeprioritymode 8021d
```

# clear spantree bridgeprioritymode

Use this command to reset the Spanning Tree bridge priority mode to the default setting of 802.1t.

## Syntax

```
clear spantree bridgeprioritymode
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the bridge priority mode to 802.1t:

```
B2(rw)->clear spantree bridgeprioritymode
```

# show spantree mstlist

Use this command to display a list of Multiple Spanning Tree (MST) instances configured on the device.

## Syntax

`show spantree mstlist`

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display a list of MST instances. In this case, SID 2 has been configured:

```
B2(su)->show spantree mstlist
Configured Multiple Spanning Tree instances:
2
```

# set spantree msti

Use this command to create or delete a Multiple Spanning Tree instance.

## Syntax

`set spantree msti sid sid {create | delete}`

## Parameters

<b>sid sid</b>	Sets the Multiple Spanning Tree ID. Valid values are <b>1 - 4094</b> . SecureStack B2 devices will support up to 4 MST instances.
<b>create   delete</b>	Creates or deletes an MST instance.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to create an MST instance 2:

```
B2(su)->set spantree msti sid 2 create
```

## clear spantree msti

Use this command to delete one or more Multiple Spanning Tree instances.

### Syntax

```
clear spantree msti [sid sid]
```

### Parameters

<i>sid sid</i>	(Optional) Deletes a specific multiple Spanning Tree ID.
----------------	--

### Defaults

If *sid* is not specified, all MST instances will be cleared.

### Mode

Switch command, read-write.

### Example

This example shows how to delete all MST instances:

```
B2(su)->clear spantree msti
```

## show spantree mstmap

Use this command to display the mapping of a filtering database ID (FID) to a Spanning Trees. Since VLANs are mapped to FIDs, this shows to which SID a VLAN is mapped.

### Syntax

```
show spantree mstmap [fid fid]
```

### Parameters

<i>fid fid</i>	(Optional) Displays information for specific FIDs.
----------------	--

### Defaults

If *fid* is not specified, information for all assigned FIDs will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display SID to FID mapping information for FID 1. In this case, no new mappings have been configured:

```
B2(su)->show spantree mstmap fid 1
FID:      SID:
1         0
```

## set spantree mstmap

Use this command to map one or more filtering database IDs (FIDs) to a SID. Since VLANs are mapped to FIDs, this essentially maps one or more VLAN IDs to a Spanning Tree (SID).

### Syntax

```
set spantree mstmap fid [sid sid]
```

### Parameters

<i>fid</i>	Specifies one or more FIDs to assign to the MST. Valid values are <b>1 - 4093</b> , and must correspond to a VLAN ID created using the <b>set vlan</b> command.
<b>sid</b> <i>sid</i>	(Optional) Specifies a Multiple Spanning Tree ID. Valid values are <b>1 - 4094</b> , and must correspond to a SID created using the <b>set msti</b> command.

### Defaults

If *sid* is not specified, FID(s) will be mapped to Spanning Tree 0.

### Mode

Switch command, read-write.

### Example

This example shows how to map FID 3 to SID 2:

```
B2(su)->set spantree mstmap 3 sid 2
```

## clear spantree mstmap

Use this command to map a FID back to SID 0.

### Syntax

```
clear spantree mstmap fid
```

### Parameters

<i>fid</i>	Specifies one or more FIDs to reset to 0.
------------	---

### Defaults

If *fid* is not specified, all SID to FID mappings will be reset.

### Mode

Switch command, read-write.

### Example

This example shows how to map FID 2 back to SID 0:

```
B2(su)->clear spantree mstmap 2
```



## show spantree vlanlist

Use this command to display the Spanning Tree ID(s) assigned to one or more VLANs.

### Syntax

```
show spantree vlanlist [vlan-list]
```

### Parameters

<i>vlan-list</i>	(Optional) Displays SIDs assigned to specific VLAN(s).
------------------	--

### Defaults

If not specified, SID assignment will be displayed for all VLANs.

### Mode

Switch command, read-only.

### Example

This example shows how to display the SIDs mapped to VLAN 1. In this case, SIDs 2, 16 and 42 are mapped to VLAN 1. For this information to display, the SID instance must be created using the **set spantree msti** command as described in “[set spantree msti](#)” on page 7-12, and the FIDs must be mapped to SID 1 using the **set spantree mstmap** command as described in “[set spantree mstmap](#)” on page 7-14:

```
B2(su)->show spantree vlanlist 1
The following SIDS are assigned to VLAN 1: 2 16 42
```

## show spantree mstcfgid

Use this command to display the MST configuration identifier elements, including format selector, configuration name, revision level, and configuration digest.

### Syntax

```
show spantree mstcfgid
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the MST configuration identifier elements. In this case, the default revision level of 0, and the default configuration name (a string representing the bridge MAC address) have not been changed. For information on using the **set spantree mstcfgid** command to change these settings, refer to “[set spantree mstcfgid](#)” on page 7-16:

```
B2(su)->show spantree mstcfgid
MST Configuration Identifier:
Format Selector: 0
Configuration Name: 00:01:f4:89:51:94
Revision Level: 0
Configuration Digest: ac:36:17:7f:50:28:3c:d4:b8:38:21:d8:ab:26:de:62
```

## set spantree mstcfgid

Use this command to set the MST configuration name and/or revision level.

### Syntax

```
set spantree mstcfgid {cfgname name | rev level}
```

### Parameters

<b>cfgname</b> <i>name</i>	Specifies an MST configuration name.
<b>rev</b> <i>level</i>	Specifies an MST revision level. Valid values are 0 - 65535.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the MST configuration name to “mstconfig”:

```
B2(su)->set spantree mstconfigid cfgname mstconfig
```

## clear spantree mstcfgid

Use this command to reset the MST revision level to a default value of 0, and the configuration name to a default string representing the bridge MAC address.

### Syntax

```
clear spantree mstcfgid
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the MST configuration identifier elements to default values:

```
B2(su)->clear spantree mstcfgid
```

## set spantree priority

Use this command to set the device's Spanning Tree priority.

### Syntax

```
set spantree priority priority [sid]
```

### Parameters

<i>priority</i>	Specifies the priority of the bridge. Valid values are from <b>0</b> to <b>61440</b> (in increments of 4096), with 0 indicating highest priority and 61440 lowest priority.
<i>sid</i>	(Optional) Sets the priority on a specific Spanning Tree. Valid values are <b>0</b> - <b>4094</b> . If not specified, SID 0 is assumed.

### Defaults

If *sid* is not specified, priority will be set on Spanning Tree 0.

### Mode

Switch command, read-write.

### Usage

The device with the highest priority (lowest numerical value) becomes the Spanning Tree root device. If all devices have the same priority, the device with the lowest MAC address will then become the root device. Depending on the bridge priority mode (set with the **set spantree bridgeprioritymode** command described in "[set spantree bridgeprioritymode](#)" on page 7-10, some priority values may be rounded up or down.

### Example

This example shows how to set the bridge priority to 4096 on SID 1:

```
B2(su)->set spantree priority 4096 1
```

## clear spantree priority

Use this command to reset the Spanning Tree priority to the default value of 32768.

### Syntax

```
clear spantree priority [sid]
```

### Parameters

<i>sid</i>	(Optional) Resets the priority on a specific Spanning Tree. Valid values are <b>0</b> - <b>4094</b> . If not specified, SID 0 is assumed.
------------	---

### Defaults

If *sid* is not specified, priority will be reset on Spanning Tree 0.

### Mode

Switch command, read-write.

## Example

This example shows how to reset the bridge priority on SID 1:

```
B2(su)->clear spantree priority 1
```

## set spantree hello

Use this command to set the device's Spanning Tree hello time, This is the time interval (in seconds) the device will transmit BPDUs indicating it is active.

### Syntax

```
set spantree hello interval
```

### Parameters

<i>interval</i>	Specifies the number of seconds the system waits before broadcasting a bridge hello message (a multicast message indicating that the system is active). Valid values are <b>1 - 10</b> .
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to globally set the Spanning Tree hello time to 10 seconds:

```
B2(su)->set spantree hello 10
```

## clear spantree hello

Use this command to reset the Spanning Tree hello time to the default value of 2 seconds.

### Syntax

```
clear spantree hello
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to globally reset the Spanning Tree hello time:

```
B2(su)->clear spantree hello
```

## set spantree maxage

Use this command to set the bridge maximum aging time.

### Syntax

```
set spantree maxage agingtime
```

### Parameters

<i>agingtime</i>	Specifies the maximum number of seconds that the system retains the information received from other bridges through STP. Valid values are 6 - 40.
------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The bridge maximum aging time is the maximum time (in seconds) a device can wait without receiving a configuration message (bridge “hello”) before attempting to reconfigure. All device ports (except for designated ports) should receive configuration messages at regular intervals. Any port that ages out STP information provided in the last configuration message becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the device ports attached to the network.

### Example

This example shows how to set the maximum aging time to 25 seconds:

```
B2(su)->set spantree maxage 25
```

## clear spantree maxage

Use this command to reset the maximum aging time for a Spanning Tree to the default value of 20 seconds.

### Syntax

```
clear spantree maxage
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

## Example

This example shows how to globally reset the maximum aging time:

```
B2(su)->clear spantree maxage
```

# set spantree fwddelay

Use this command to set the Spanning Tree forward delay.

## Syntax

```
set spantree fwddelay delay
```

## Parameters

<i>delay</i>	Specifies the number of seconds for the bridge forward delay. Valid values are <b>4 - 30</b> .
--------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The forward delay is the maximum time (in seconds) the root device will wait before changing states (i.e., listening to learning to forwarding). This delay is required because every device must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a blocking state; otherwise, temporary data loops might result.

## Example

This example shows how to globally set the bridge forward delay to 16 seconds:

```
B2(su)->set spantree fwddelay 16
```

# clear spantree fwddelay

Use this command to reset the Spanning Tree forward delay to the default setting of 15 seconds.

## Syntax

```
clear spantree fwddelay
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to globally reset the bridge forward delay:

```
B2(su)->clear spantree fwddelay
```

# show spantree backuproot

Use this command to display the backup root status for an MST instance.

## Syntax

```
show spantree backuproot [sid]
```

## Parameters

<i>sid</i>	(Optional) Display backup root status for a specific Spanning Tree identifier. Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.
------------	---

## Defaults

If a SID is not specified, then status will be shown for Spanning Tree instance 0.

## Mode

Switch command, read-only.

## Example

This example shows how to display the status of the backup root function on SID 0:

```
B2(rw)->show spantree backuproot
Backup root is set to disable on sid 0
```

# set spantree backuproot

Use this command to enable or disable the Spanning Tree backup root function on the switch.

## Syntax

```
set spantree backuproot sid {disable | enable}
```

## Parameters

<i>sid</i>	Specifies the Spanning Tree instance on which to enable or disable the backup root function. Valid values are <b>0 - 4094</b> .
disable   enable	Enables or disables the backup root function.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The Spanning Tree backup root function is disabled by default on the SecureStack B2. When this feature is enabled and the switch is directly connected to the root bridge, stale Spanning Tree information is prevented from circulating if the root bridge is lost. If the root bridge is lost, the backup root will dynamically lower its bridge priority so that it will be selected as the new root over the lost root bridge.

## Example

This example shows how to enable the backup root function on SID 2:

```
B2(rw)->set spantree backuproot 2 enable
```

# clear spantree backuproot

Use this command to reset the Spanning Tree backup root function to the default state of disabled.

## Syntax

```
clear spantree backuproot sid
```

## Parameters

<i>sid</i>	Specifies the Spanning Tree on which to clear the backup root function. Valid values are <b>0 - 4094</b> .
------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the backup root function to disabled on SID 2:

```
B2(rw)->clear spantree backuproot 2
```

# show spantree tctrapsuppress

Use this command to display the status of topology change trap suppression on Rapid Spanning Tree edge ports.

## Syntax

```
show spantree tctrapsuppress
```

## Parameters

None.

## Defaults

None.



## Mode

Switch command, read-only.

## Example

This example shows how to display the status of topology change trap suppression:

```
B2(rw)->show spantree tctrapsuppress
```

Topology change Trap Suppression is set to enabled

# set spantree tctrapsuppress

Use this command to disable or enable topology change trap suppression on Rapid Spanning Tree edge ports.

## Syntax

```
set spantree tctrapsuppress {disable | enable}
```

## Parameters

disable   enable	Disables or enables topology change trap suppression.
------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

By default, RSTP non-edge (bridge) ports that transition to forwarding or blocking cause the switch to issue a topology change trap. When topology change trap suppression is enabled, which is the device default, edge ports (such as end station PCs) are prevented from sending topology change traps. This is because there is usually no need for network management to monitor edge port STP transition states, such as when PCs are powered on. When topology change trap suppression is disabled, all ports, including edge and bridge ports, will transmit topology change traps.

## Example

This example shows how to allow Rapid Spanning Tree edge ports to transmit topology change traps:

```
B2(rw)->set spantree tctrapsuppress disable
```

# clear spantree tctrapsuppress

Use this command to clear the status of topology change trap suppression on Rapid Spanning Tree edge ports to the default state of enabled (edge port topology changes do not generate traps).

## Syntax

```
clear spantree tctrapsuppress
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear topology change trap suppression setting:

```
B2(rw)->clear spantree tctrapsuppress
```

## set spantree protomigration

Use this command to reset the protocol state migration machine for one or more Spanning Tree ports. When operating in RSTP mode, this forces a port to transmit MSTP BPDUs.

### Syntax

```
set spantree protomigration <port-string>
```

### Parameters

<i>port-string</i>	Reset the protocol state migration machine for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the protocol state migration machine on port 20:

```
B2(su)->set spantree protomigration ge.1.20
```

## show spantree spanguard

Use this command to display the status of the Spanning Tree SpanGuard function.

### Syntax

```
show spantree spanguard
```

### Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the SpanGuard function status:

```
B2(su)->show spantree spanguard
Spanguard is disabled
```

# set spantree spanguard

Use this command to enable or disable the Spanning Tree SpanGuard function.

## Syntax

```
set spantree spanguard {enable | disable}
```

## Parameters

<b>enable   disable</b>	Enables or disables the SpanGuard function.
-------------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

SpanGuard is designed to disable, or lock out an “edge” port when an unexpected BPDU is received. The port can be configured to be re-enabled after a set time period, or only after manual intervention.

A port can be defined as an edge (user) port using the **set spantree adminedge** command, described in “[set spantree adminedge](#)” on page 7-37. A port designated as an edge port is expected to be connected to a workstation or other end-user type of device, and not to another switch in the network. When Spanguard is enabled, if a non-loopback BPDU is received on an edge port, the Spanning Tree state of that port will be changed to “blocking” and will no longer forward traffic. The port will remain disabled until the amount of time defined by **set spantree spanguardtimeout** (“[set spantree spanguardtimeout](#)” on page 7-26) has passed since the last seen BPDU, the port is manually unlocked (**set** or **clear spantree spanguardlock**, “[clear / set spantree spanguardlock](#)” on page 7-28), the configuration of the port is changed so it is not longer an edge port, or the SpanGuard function is disabled.

SpanGuard is enabled and disabled only on a global basis (across the stack, if applicable). By default, SpanGuard is disabled and SpanGuard traps are enabled.

## Example

This example shows how to enable the SpanGuard function:

```
B2(rw)->set spantree spanguard enable
```

## clear spantree spanguard

Use this command to reset the status of the Spanning Tree SpanGuard function to disabled.

### Syntax

```
clear spantree spanguard
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the status of the SpanGuard function to disabled:

```
B2(rw)->clear spantree spanguard
```

## show spantree spanguardtimeout

Use this command to display the Spanning Tree SpanGuard timeout setting.

### Syntax

```
show spantree spanguardtimeout
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the SpanGuard timeout setting:

```
B2(su)->show spantree spanguardtimeout  
Spanguard timeout: 300
```

## set spantree spanguardtimeout

Use this command to set the amount of time (in seconds) an edge port will remain locked by the SpanGuard function.

## Syntax

```
set spantree spanguardtimeout timeout
```

## Parameters

<i>timeout</i>	Specifies a timeout value in seconds. Valid values are <b>0</b> to <b>65535</b> .  A value of 0 will keep the port locked until manually unlocked. The default value is 300 seconds.
----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the SpanGuard timeout to 600 seconds:

```
B2(su)->set spantree spanguardtimeout 600
```

# clear spantree spanguardtimeout

Use this command to reset the Spanning Tree SpanGuard timeout to the default value of 300 seconds.

## Syntax

```
clear spantree spanguardtimeout
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the SpanGuard timeout to 300 seconds:

```
B2(rw)->clear spantree spanguardtimeout
```

# show spantree spanguardlock

Use this command to display the SpanGuard lock status of one or more ports.

## Syntax

```
show spantree spanguardlock [port-string]
```

## Parameters

---

<i>port-string</i>	(Optional) Specifies the port(s) for which to show SpanGuard lock status. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

---

## Defaults

If no port string is specified, the SpanGuard lock status for all ports is displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display the SpanGuard lock status for ge.1.1:

```
B2(su)->show spantree spanguardlock ge.1.1
Port ge.1.1 is Unlocked
```

# clear / set spantree spanguardlock

Use either of these commands to unlock one or more ports locked by the Spanning Tree SpanGuard function. When SpanGuard is enabled, it locks ports that receive BPDUs when those ports have been defined as edge (user) ports (as described in [“set spantree adminedge”](#) on page 7-37).

## Syntax

```
clear spantree spanguardlock port-string
set spantree spanguardlock port-string
```

## Parameters

---

<i>port-string</i>	Specifies port(s) to unlock. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to unlock port ge.1.16:

```
B2(rw)->clear spantree spanguardlock ge.1.16
```

# show spantree spanguardtrappable

Use this command to display the state of the Spanning Tree SpanGuard trap function.

## Syntax

```
show spantree spanguardtrapenable
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the state of the SpanGuard trap function:

```
B2(ro)->show spantree spanguardtrapenable
Spanguard SNMP traps are enabled
```

# set spantree spanguardtrapenable

Use this command to enable or disable the sending of an SNMP trap message when SpanGuard has locked a port.

## Syntax

```
set spantree spanguardtrapenable {disable | enable}
```

## Parameters

<b>disable   enable</b>	Disables or enables sending SpanGuard traps. By default, sending traps is enabled.
-------------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to disable the SpanGuard trap function:

```
B2(su)->set spantree spanguardtrapenable disable
```

# clear spantree spanguardtrapenable

Use this command to reset the Spanning Tree SpanGuard trap function back to the default state of enabled.

## Syntax

```
clear spantree spanguardtrapenable
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the SpanGuard trap function to enabled:

```
B2(rw)->clear spantree spanguardtrapenable
```

# show spantree legacypathcost

Use this command to display the default Spanning Tree path cost setting.

## Syntax

```
show spantree legacypathcost
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the default Spanning Tree path cost setting.

```
B2(su)->show spantree legacypathcost  
Legacy Path Cost is disabled.
```

# set spantree legacypathcost

Use this command to enable or disable legacy (802.1D) path cost values.

## Syntax

```
set spantree legacypathcost {disable | enable}
```



## Parameters

<b>disable</b>	Use 802.1t2001 values to calculate path cost.
<b>enable</b>	Use 802.1d1998 values to calculate path cost.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

By default, legacy path cost is disabled. Enabling the device to calculate legacy path costs affects the range of valid values that can be entered in the **set spantree adminpathcost** command.

## Example

This example shows how to set the default path cost values to 802.1D.

```
B2(rw)->set spantree legacypathcost enable
```

# clear spantree legacypathcost

Use this command to set the Spanning Tree default value for legacy path cost to 802.1t values.

## Syntax

```
clear spantree legacypathcost
```

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example clears the legacy path cost to 802.1t values.

```
B2(rw)->clear spantree legacypathcost
```

# Configuring Spanning Tree Port Parameters

## Purpose

To display and set Spanning Tree port parameters.

## Commands

For information about...	Refer to page...
set spantree portadmin	<a href="#">7-32</a>
clear spantree portadmin	<a href="#">7-32</a>
show spantree portadmin	<a href="#">7-33</a>
show spantree portpri	<a href="#">7-33</a>
set spantree portpri	<a href="#">7-34</a>
clear spantree portpri	<a href="#">7-35</a>
show spantree adminpathcost	<a href="#">7-35</a>
set spantree adminpathcost	<a href="#">7-36</a>
clear spantree adminpathcost	<a href="#">7-36</a>
show spantree adminedge	<a href="#">7-37</a>
set spantree adminedge	<a href="#">7-37</a>
clear spantree adminedge	<a href="#">7-38</a>

## set spantree portadmin

Use this command to disable or enable the Spanning Tree algorithm on one or more ports.

### Syntax

```
set spantree portadmin port-string {disable | enable}
```

### Parameters

<i>port-string</i>	Specifies the port(s) for which to enable or disable Spanning Tree. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>disable   enable</b>	Disables or enables Spanning Tree.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to disable Spanning Tree on ge.1.5:

```
B2(rw)->set spantree portadmin ge.1.5 disable
```

## clear spantree portadmin

Use this command to reset the default Spanning Tree admin status to enable on one or more ports.

## Syntax

```
clear spantree portadmin port-string
```

## Parameters

<i>port-string</i>	Resets the default admin status on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the default Spanning Tree admin state to enable on ge.1.12:

```
B2(rw)->clear spantree portadmin ge.1.12
```

# show spantree portadmin

Use this command to display the status of the Spanning Tree algorithm on one or more ports.

## Syntax

```
show spantree portadmin [port port-string]
```

## Parameters

<i>port port-string</i>	(Optional) Displays status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
-------------------------	---

## Defaults

If *port-string* is not specified, status will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display port admin status for ge.1.1:

```
B2(ro)->show spantree portadmin port ge.1.1
Port ge.1.1 has portadmin set to enabled
```

# show spantree portpri

Use this command to show the Spanning Tree priority for one or more ports. Port priority is a component of the port ID, which is one element used in determining Spanning Tree port roles.

## Syntax

```
show spantree portpri [port port-string] [sid sid]
```

## Parameters

<b>port</b> <i>port-string</i>	(Optional) Specifies the port(s) for which to display Spanning Tree priority. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>sid</b> <i>sid</i>	(Optional) Displays port priority for a specific Spanning Tree identifier. Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.

## Defaults

If *port-string* is not specified, port priority will be displayed for all Spanning Tree ports.

If *sid* is not specified, port priority will be displayed for Spanning Tree 0.

## Mode

Switch command, read-only.

## Example

This example shows how to display the port priority for ge.2.7:

```
B2(su)->show spantree portpri port ge.2.7
Port ge.2.7 has a Port Priority of 128 on SID 0
```

# set spantree portpri

Use this command to set a port’s Spanning Tree priority.

## Syntax

```
set spantree portpri port-string priority [sid sid]
```

## Parameters

<i>port-string</i>	Specifies the port(s) for which to set Spanning Tree port priority. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<i>priority</i>	Specifies a number that represents the priority of a link in a Spanning Tree bridge. Valid values are from <b>0 to 240 (in increments of 16)</b> with 0 indicating high priority.
<b>sid</b> <i>sid</i>	(Optional) Sets port priority for a specific Spanning Tree identifier. Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.

## Defaults

If *sid* is not specified, port priority will be set for Spanning Tree 0.

## Mode

Switch command, read-write.

## Example

This example shows how to set the priority of ge.1.3 to 240 on SID 1

```
B2(su)->set spantree portpri ge.1.3 240 sid 1
```

## clear spantree portpri

Use this command to reset the bridge priority of a Spanning Tree port to a default value of 128.

### Syntax

```
clear spantree portpri port-string [sid sid]
```

### Parameters

<i>port-string</i>	Specifies the port(s) for which to set Spanning Tree port priority. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>sid</b> <i>sid</i>	(Optional) Resets the port priority for a specific Spanning Tree identifier. Valid values are <b>0 - 4094</b> . If not specified, SID 0 will be assumed.

### Defaults

If *sid* is not specified, port priority will be set for Spanning Tree 0.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the priority of ge.1.3 to 128 on SID 1

```
B2(su)->clear spantree portpri ge.1.3 sid 1
```

## show spantree adminpathcost

Use this command to display the admin path cost for a port on one or more Spanning Trees.

### Syntax

```
show spantree adminpathcost [port port-string] [sid sid]
```

### Parameters

<b>port</b> <i>port-string</i>	(Optional) Displays the admin path cost value for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>sid</b> <i>sid</i>	(Optional) Displays the admin path cost for a specific Spanning Tree identifier. Valid values are <b>0 - 4094</b> . If not specified, SID 0 will be assumed.

### Defaults

If *port-string* is not specified, admin path cost for all Spanning Tree ports will be displayed.

If *sid* is not specified, admin path cost for Spanning Tree 0 will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display the admin path cost for ge.3.4 on SID 1:

```
B2(su)->show spantree adminpathcost port ge.3.4 sid 1
Port ge.3.4 has a Port Admin Path Cost of 0 on SID 1
```

# set spantree adminpathcost

Use this command to set the administrative path cost on a port and one or more Spanning Trees.

## Syntax

```
set spantree adminpathcost port-string cost [sid sid]
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to set an admin path cost. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<i>cost</i>	Specifies the port path cost. Valid values are <b>0 - 200000000</b> .
<b>sid</b> <i>sid</i>	(Optional) Sets the admin path cost for a specific Spanning Tree identifier. Valid values are <b>0 - 4094</b> . If not specified, SID 0 will be assumed.

## Defaults

If *sid* is not specified, admin path cost will be set for Spanning Tree 0.

## Mode

Switch command, read-write.

## Example

This example shows how to set the admin path cost to 200 for ge.3.2 on SID 1:

```
B2(su)->set spantree adminpathcost ge.3.2 200 sid 1
```

# clear spantree adminpathcost

Use this command to reset the Spanning Tree default value for port admin path cost to 0.

## Syntax

```
clear spantree adminpathcost port-string [sid sid]
```

## Parameters

<i>port-string</i>	Specifies the port(s) for which to reset admin path cost. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>sid</b> <i>sid</i>	(Optional) Resets the admin path cost for specific Spanning Tree(s). Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.

## Defaults

If *sid* is not specified, admin path cost will be reset for Spanning Tree 0.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the admin path cost to 0 for ge.3.2 on SID 1:

```
B2(su)->clear spantree adminpathcost ge.3.2 sid 1
```

# show spantree adminedge

Use this command to display the edge port administrative status for a port.

## Syntax

```
show spantree adminedge [port port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays edge port administrative status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

If *port-string* is not specified edge port administrative status will be displayed for all Spanning Tree ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display the edge port status for ge.3.2:

```
B2(su)->show spantree adminedge port ge.3.2
Port ge.3.2 has a Port Admin Edge of Edge-Port
```

# set spantree adminedge

Use this command to set the edge port administrative status on a Spanning Tree port.

## Syntax

```
set spantree adminedge port-string {true | false}
```

## Parameters

<i>port-string</i>	Specifies the edge port. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>true   false</b>	Enables ( <b>true</b> ) or disables ( <b>false</b> ) the specified port as a Spanning Tree edge port.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The default behavior of the edge port administrative status begins with the value set to **false** initially after the device is powered up. If a Spanning Tree BPDU is not received on the port within a few seconds, the status setting changes to **true**.

## Example

This example shows how to set ge.1.11 as an edge port:

```
B2(su)->set spantree adminedge ge.1.11 true
```

# clear spantree adminedge

Use this command to reset a Spanning Tree port to non-edge status.

## Syntax

```
clear spantree adminedge port-string
```

## Parameters

<i>port-string</i>	Specifies port(s) on which to reset edge port status. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset ge.1.11 as a non-edge port:

```
B2(su)->clear spantree adminedge ge.1.11
```



# Configuring Spanning Tree Loop Protect Parameters

## Purpose

To display and set Spanning Tree Loop Protect parameters, including the global parameters of Loop Protect threshold, window, enabling traps, and disputed BPDU threshold, as well as per port and port/SID parameters. See “[Loop Protect](#)” on page 7-2 for more information about the Loop Protect feature.

## Commands

For information about...	Refer to page...
set spantree lp	<a href="#">7-40</a>
show spantree lp	<a href="#">7-40</a>
clear spantree lp	<a href="#">7-41</a>
show spantree lpblood	<a href="#">7-42</a>
clear spantree lpblood	<a href="#">7-42</a>
set spantree lpcapablepartner	<a href="#">7-43</a>
show spantree lpcapablepartner	<a href="#">7-44</a>
clear spantree lpcapablepartner	<a href="#">7-44</a>
set spantree lpthreshold	<a href="#">7-45</a>
show spantree lpthreshold	<a href="#">7-45</a>
clear spantree lpthreshold	<a href="#">7-46</a>
set spantree lpwindow	<a href="#">7-46</a>
show spantree lpwindow	<a href="#">7-47</a>
clear spantree lpwindow	<a href="#">7-47</a>
set spantree lptrapenable	<a href="#">7-48</a>
show spantree lptrapenable	<a href="#">7-48</a>
clear spantree lptrapenable	<a href="#">7-49</a>
set spantree disputedbpduthreshold	<a href="#">7-49</a>
show spantree disputedbpduthreshold	<a href="#">7-50</a>
clear spantree disputedbpduthreshold	<a href="#">7-50</a>
show spantree nonforwardingreason	<a href="#">7-51</a>

## set spantree lp

Use this command to enable or disable the Loop Protect feature per port and optionally, per SID. The Loop Protect feature is disabled by default. See “Loop Protect” on page 2. for more information.

### Syntax

```
set spantree lp port-string {enable / disable} [sid sid]
```

### Parameters

<i>port-string</i>	Specifies port(s) on which to enable or disable the Loop Protect feature.
<b>enable</b>   <b>disable</b>	Enables or disables the feature on the specified port.
<b>sid</b> <i>sid</i>	(Optional) Enables or disables the feature for specific Spanning Tree(s). Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.

### Defaults

If no SID is specified, SID 0 is assumed.

### Mode

Switch command, read-write.

### Usage

Loop Protect takes precedence over per port STP enable/disable (portAdmin). Normally portAdmin disabled would cause a port to go immediately to forwarding. If Loop Protect is enabled, that port should go to listening and remain there.



**Note:** The Loop Protect enable/disable settings for an MSTI port should match those for the CIST port.

### Example

This example shows how to enable Loop Protect on ge.2.3:

```
B2(su)->set spantree lp ge.1.11 enable
```

## show spantree lp

Use this command to display the Loop Protect status per port and/or per SID.

### Syntax

```
show spantree lp [port port-string] [sid sid]
```

## Parameters

<i>port-string</i>	(Optional) Specifies port(s) for which to display the Loop Protect feature status.
<b>sid</b> <i>sid</i>	(Optional) Specifies the specific Spanning Tree(s) for which to display the Loop Protect feature status. Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.

## Defaults

If no *port-string* is specified, status is displayed for all ports.

If no SID is specified, SID 0 is assumed.

## Mode

Switch command, read-only.

## Example

This example shows how to display Loop Protect status on ge.2.3:

```
B2(su)->show spantree lp port ge.2.3
LoopProtect is disabled on port ge.2.3      , SI
```

# clear spantree lp

Use this command to return the Loop Protect status per port and optionally, per SID, to its default state of disabled.

## Syntax

```
clear spantree lp port-string [sid sid]
```

## Parameters

<i>port-string</i>	Specifies port(s) for which to clear the Loop Protect feature status.
<b>sid</b> <i>sid</i>	(Optional) Specifies the specific Spanning Tree(s) for which to clear the Loop Protect feature status. Valid values are <b>0 - 4094</b> . If not specified, SID 0 is assumed.

## Defaults

If no SID is specified, SID 0 is assumed.

## Mode

Switch command, read-write.

## Example

This example shows how to return the Loop Protect state on ge.2.3 to disabled:

```
B2(rw)->clear spantree lp port ge.2.3
```

# show spantree lblock

Use this command to display the Loop Protect lock status per port and/or per SID. A port can become locked if a configured number of Loop Protect events occur during the configured window of time. See the [set spantree lpthreshold](#) and [set spantree lpwindow](#) commands. Once a port is forced into blocking (locked), it remains locked until manually unlocked with the [clear spantree lblock](#) command.

## Syntax

```
show spantree lblock [port port-string] [sid sid]
```

## Parameters

<i>port-string</i>	(Optional) Specifies port(s) for which to display the Loop Protect lock status.
<b>sid</b> <i>sid</i>	(Optional) Specifies the specific Spanning Tree(s) for which to display the Loop Protect lock status. Valid values are 0 - 4094. If not specified, SID 0 is assumed.

## Defaults

- If no *port-string* is specified, status is displayed for all ports.
- If no SID is specified, SID 0 is assumed.

## Mode

Switch command, read-only.

## Example

```
This example shows how to display Loop Protect lock status on ge.1.1:
B2(rw)->show spantree lblock port ge.1.1
The LoopProtect lock status for port ge.1.1      , SID 0 is UNLOCKED
```

# clear spantree lblock

Use this command to manually unlock a blocked port and optionally, per SID. The default state is unlocked.

## Syntax

```
clear spantree lblock port-string [sid sid]
```

## Parameters

<i>port-string</i>	Specifies port(s) for which to clear the Loop Protect lock.
<b>sid</b> <i>sid</i>	(Optional) Specifies the specific Spanning Tree(s) for which to clear the Loop Protect lock. Valid values are 0 - 4094. If not specified, SID 0 is assumed.

## Defaults

- If no SID is specified, SID 0 is assumed.

## Mode

Switch command, read-only.

## Example

This example shows how to clear Loop Protect lock from ge.1.1:

```
B2(rw)->show spantree lprotect port ge.1.1
The LoopProtect lock status for port ge.1.1      , SID 0 is LOCKED
B2(rw)->clear spantree lprotect ge.1.1
B2(rw)->show spantree lprotect port ge.1.1
The LoopProtect lock status for port ge.1.1      , SID 0 is UNLOCKED
```

# set spantree lpcapablepartner

Use this command to specify per port whether the link partner is Loop Protect capable. See “Loop Protect” on page 2. for more information.

## Syntax

```
set spantree lpcapablepartner port-string {true | false}
```

## Parameters

<i>port-string</i>	Specifies port(s) for which to configure a Loop Protect capable link partner.
<b>true</b>   <b>false</b>	Specifies whether the link partner is capable (true) or not (false).

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The default value for Loop Protect capable partner is false. If the port is configured with a Loop Protect capable partner (true), then the full functionality of the Loop Protect feature is used. If the value is false, then there is some ambiguity as to whether an Active Partner timeout is due to a loop protection event or is a normal situation due to the fact that the partner port does not transmit Alternate Agreement BPDUs. Therefore, a conservative approach is taken in that designated ports will not be allowed to forward unless receiving agreements from a port with root role.

This type of timeout will not be considered a loop protection event. Loop protection is maintained by keeping the port from forwarding but since this is not considered a loop event it will not be factored into locking the port.

## Example

This example shows how to set the Loop Protect capable partner to true for ge.1.1:

```
B2(rw)->set spantree lpcapablepartner ge.1.1 true
```

## show spantree lpcapablepartner

Use this command to the Loop Protect capability of a link partner for one or more ports.

### Syntax

```
show spantree lpcapablepartner [port port-string]
```

### Parameters

<i>port-string</i>	(Optional) Specifies port(s) for which to display Loop Protect capability for its link partner.
--------------------	---

### Defaults

If no *port-string* is specified, Loop Protect capability for link partners is displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display the Loop Protect partner capability for ge.1.1:

```
B2(rw)->show spantree lpcapablepartner port ge.1.1
Link partner of port ge.1.1 is not LoopProtect-capable
```

## clear spantree lpcapablepartner

Use this command to reset the Loop Protect capability of port link partners to the default state of false.

### Syntax

```
clear spantree lpcapablepartner port-string
```

### Parameters

<i>port-string</i>	Specifies port(s) for which to clear their link partners' Loop Protect capability (reset to false).
--------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the Loop Protect partner capability for ge.1.1:

```
B2(rw)->clear spantree lpcapablepartner ge.1.1
```

## set spantree lpthreshold

Use this command to set the Loop Protect event threshold.

### Syntax

```
set spantree lpthreshold value
```

### Parameters

<i>value</i>	Specifies the number of events that must occur during the event window in order to lock a port/SID. The default value is 3 events. A threshold of 0 specifies that ports will never be locked.
--------------	--

### Defaults

None. The default event threshold is 3.

### Mode

Switch command, read-write.

### Usage

The LoopProtect event threshold is a global integer variable that provides protection in the case of intermittent failures. The default value is 3. If the event counter reaches the threshold within a given period (the event window), then the port, for the given SID, becomes locked (that is, held indefinitely in the blocking state). If the threshold is 0, the ports are never locked.

### Example

This example shows how to set the Loop Protect threshold value to 4:

```
B2(rw)->set spantree lpthreshold 4
```

## show spantree lpthreshold

Use this command to display the current value of the Loop Protect event threshold.

### Syntax

```
show spantree lpthreshold
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

## Example

This example shows how to display the current Loop Protect threshold value:

```
B2(rw)->show spantree lpthreshold
The Loop Protect event threshold value is 4
```

## clear spantree lpthreshold

Use this command to return the Loop Protect event threshold to its default value of 3.

### Syntax

```
clear spantree lpthreshold
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the Loop Protect event threshold to the default of 3:

```
B2(rw)->clear spantree lpthreshold
```

## set spantree lpwindow

Use this command to set the Loop Protect event window value in seconds.

### Syntax

```
set spantree lpwindow value
```

### Parameters

<i>value</i>	Specifies the number of seconds that comprise the period during which Loop Protect events are counted. The default event window is 180 seconds.
--------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The Loop Protect Window is a timer value, in seconds, that defines a period during which Loop Protect events are counted. The default value is 180 seconds. If the timer is set to 0, the event



counter is not reset until the Loop Protect event threshold is reached. If the threshold is reached, that constitutes a loop protection event.

### Example

This example shows how to set the Loop Protect event window to 120 seconds:

```
B2(rw)->set spantree lpwindow 120
```

## show spantree lpwindow

Use this command to display the current Loop Protect event window value.

### Syntax

```
show spantree lpwindow
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the current Loop Protect window value:

```
B2(rw)->show spantree lpwindow
The Loop Protect event window is set to 120 seconds
```

## clear spantree lpwindow

Use this command to reset the Loop Protect event window to the default value of 180 seconds.

### Syntax

```
clear spantree lpwindow
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the Loop Protect event window to the default of 180 seconds:

```
B2(rw)->clear spantree lpwindow
```

## set spantree lptrapenable

Use this command to enable or disable Loop Protect event notification.

### Syntax

```
set spantree lptrapenable {enable | disable}
```

### Parameters

enable   disable	Enables or disables the sending of Loop Protect traps. Default is disabled.
------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Loop Protect traps are sent when a Loop Protect event occurs, that is, when a port goes to listening due to not receiving BPDUs. The trap indicates port, SID and loop protection status.

### Example

This example shows how to enable sending of Loop Protect traps:

```
B2(rw)->set spantree lptrapenable enable
```

## show spantree lptrapenable

Use this command to display the current status of Loop Protect event notification.

### Syntax

```
show spantree lptrapenable
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the current Loop Protect event notification status:

```
B2(rw)->show spantree lptrapenable
The Loop Protect event notification status is enable
```

## clear spantree lptrapenable

Use this command to return the Loop Protect event notification state to its default state of disabled.

### Syntax

```
clear spantree lptrapenable
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the Loop Protect event notification state to the default of disabled.

```
B2(rw)->clear spantree lptrapenable
```

## set spantree disputedbpduthreshold

Use this command to set the disputed BPDU threshold, which is the number of disputed BPDUs that must be received on a given port/SID until a disputed BPDU trap is sent.

### Syntax

```
set spantree disputedbpduthreshold value
```

### Parameters

<i>value</i>	Specifies the number of disputed BPDUs that must be received on a given port/SID to cause a disputed BPDU trap to be sent.  A threshold of 0 indicates that traps should not be sent. The default value is 0.
--------------	---

### Defaults

None.

### Mode

Switch command, read-write.

## Usage

A disputed BPDU is one in which the flags field indicates a designated role and learning, and the priority vector is worse than that already held by the port. If a disputed BPDU is received the port is forced to the listening state. Refer to the 802.1Q-2005 standard, *IEEE Standard for Local and Metropolitan Area Networks – Virtual Bridged Local Area Networks*, for a full description of the dispute mechanism, which prevents looping in cases of one-way communication.

The disputed BPDU threshold is an integer variable that represents the number of disputed BPDUs that must be received on a given port/SID until a disputed BPDU trap is sent and a syslog message is issued. For example, if the threshold is 10, then a trap is issued when 10, 20, 30, and so on, disputed BPDUs have been received.

If the value is 0, traps are not sent. The trap indicates port, SID and total Disputed BPDU count. The default is 0.

## Example

This example shows how to set the disputed BPDU threshold value to 5:

```
B2(rw)->set spantree disputedbpduthreshold 5
```

## show spantree disputedbpduthreshold

Use this command to display the current value of the disputed BPDU threshold.

### Syntax

```
show spantree disputedbpduthreshold
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

## Example

This example shows how to display the current disputed BPDU threshold:

```
B2(rw)->show spantree disputedbpduthreshold
The disputed BPDU threshold value is 0
```

## clear spantree disputedbpduthreshold

Use this command to return the disputed BPDU threshold to its default value of 0, meaning that disputed BPDU traps should not be sent.

### Syntax

```
clear spantree disputedbpduthreshold
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the disputed BPDU threshold to the default of 0:

```
B2(rw)->clear spantree disputedbpduthreshold
```

# show spantree nonforwardingreason

Use this command to display the reason for placing a port in a non-forwarding state due to an exceptional condition.

## Syntax

```
show spantree nonforwardingreason port-string [sid sid]
```

## Parameters

<i>port-string</i>	Specifies port(s) for which to display the non-forwarding reason.
<b>sid</b> <i>sid</i>	(Optional) Specifies the specific Spanning Tree(s) for which to display the non-forwarding reason. Valid values are <b>0</b> - <b>4094</b> . If not specified, SID 0 is assumed.

## Defaults

If no *port-string* is specified, non-forwarding reason is displayed for all ports.

If no SID is specified, SID 0 is assumed.

## Mode

Switch command, read-only.

## Usage

Exceptional conditions causing a port to be placed in listening or blocking state include a Loop Protect event, receipt of disputed BPDUs, and loopback detection.

## Example

This example shows how to display the non-forwarding reason on ge.1.1:

```
B2(rw)->show spantree nonforwardingreason port ge.1.1
The non-forwarding reason for port ge.1.1 on SID 0 is None
```



## 802.1Q VLAN Configuration

This chapter describes the SecureStack B2 system's capabilities to implement 802.1Q virtual LANs (VLANs).

For information about...	Refer to page...
<a href="#">VLAN Configuration Summary</a>	<a href="#">8-1</a>
<a href="#">Viewing VLANs</a>	<a href="#">8-2</a>
<a href="#">Creating and Naming Static VLANs</a>	<a href="#">8-4</a>
<a href="#">Assigning Port VLAN IDs (PVIDs) and Ingress Filtering</a>	<a href="#">8-6</a>
<a href="#">Configuring the VLAN Egress List</a>	<a href="#">8-12</a>
<a href="#">Setting the Host VLAN</a>	<a href="#">8-16</a>
<a href="#">Enabling/Disabling GVRP (GARP VLAN Registration Protocol)</a>	<a href="#">8-18</a>

### VLAN Configuration Summary

Virtual LANs allow the network administrator to partition network traffic into logical groups and control the flow of that traffic through the network. Once the traffic and, in effect, the users creating the traffic, are assigned to a VLAN, then broadcast and multicast traffic is contained within the VLAN and users can be allowed or denied access to any of the network's resources. Also, some or all of the ports on the device can be configured as GVRP ports, which enable frames received with a particular VLAN ID and protocol to be transmitted on a limited number of ports. This keeps the traffic associated with a particular VLAN and protocol isolated from the other parts of the network.



**Note:** The device can support up to 1024 802.1Q VLANs. The allowable range for VLAN IDs is 1 to 4093. As a default, all ports on the device are assigned to VLAN ID 1, untagged.

### Port String Syntax Used in the CLI

For information on how to designate VLANs and port numbers in the CLI syntax, refer to "[Port String Syntax Used in the CLI](#)" on page 5-2.

### Creating a Secure Management VLAN

By default at startup, there is one VLAN configured on the SecureStack B2 device. It is VLAN ID 1, the DEFAULT VLAN. The default community name, which determines remote access for SNMP management, is set to "public" with read-write access.

If the SecureStack B2 device is to be configured for multiple VLANs, it may be desirable to configure a management-only VLAN. This allows a station connected to the management VLAN to manage the device. It also makes management secure by preventing configuration via ports assigned to other VLANs.

To create a secure management VLAN, you must:

Step	Task	Refer to page...
1.	Create a new VLAN.	<a href="#">8-4</a>
2.	Set the PVID for the desired switch port to the VLAN created in Step 1.	<a href="#">8-7</a>
3.	Add the desired switch port to the egress list for the VLAN created in Step 1.	<a href="#">8-13</a>
4.	Assign host status to the VLAN.	<a href="#">8-17</a>
5.	Set a private community name and access policy.	<a href="#">6-13</a>

The commands used to create a secure management VLAN are listed in [Table 8-29](#). This example assumes the management station is attached to `ge.1.1` and wants untagged frames.

The process described here would be repeated on every device that is connected in the network to ensure that each device has a secure management VLAN.

**Table 8-29 Command Set for Creating a Secure Management VLAN**

To do this...	Use these commands...
Create a new VLAN and confirm settings.	<b>set vlan create 2</b> (" <a href="#">set vlan</a> " on page 8-4) (Optional) <b>show vlan 2</b> (" <a href="#">show vlan</a> " on page 8-3)
Set the PVID to the new VLAN.	<b>set port vlan ge.1.1 2</b> (" <a href="#">set port vlan</a> " on page 8-7)
Add the port to the new VLAN's egress list.	<b>set vlan egress 2 ge.1.1 untagged</b> (" <a href="#">set vlan egress</a> " on page 8-13)
Remove the port from the default VLAN's egress list.	<b>clear vlan egress 1 ge.1.1</b> (" <a href="#">clear vlan egress</a> " on page 8-14)
Assign host status to the VLAN.	<b>set host vlan 2</b> (" <a href="#">set host vlan</a> " on page 8-17)
Set a private community name and access policy and confirm settings.	<b>set snmp community private</b> (" <a href="#">set snmp community</a> " on page 6-13) (Optional) <b>show snmp community</b> (" <a href="#">show snmp community</a> " on page 6-13)

## Viewing VLANs

### Purpose

To display a list of VLANs currently configured on the device, to determine how one or more VLANs were created, the ports allowed and disallowed to transmit traffic belonging to VLAN(s), and if those ports will transmit the traffic with a VLAN tag included.



## Command

For information about...	Refer to page...
show vlan	<a href="#">8-3</a>

## show vlan

Use this command to display all information related to one or more VLANs.

### Syntax

```
show vlan [static] [vlan-list] [portinfo [vlan vlan-list | vlan-name] [port port-string]]
```

### Parameters

<b>static</b>	(Optional) Displays information related to static VLANs. Static VLANs are manually created using the <b>set vlan</b> command (“ <a href="#">set vlan</a> ” on page 8-4), SNMP MIBs, or the WebView management application. The default VLAN, VLAN 1, is always statically configured and can’t be deleted. Only ports that use a specified VLAN as their default VLAN (PVID) will be displayed.
<i>vlan-list</i>	(Optional) Displays information for a specific VLAN or range of VLANs.
<b>portinfo</b>	(Optional) Displays VLAN attributes related to one or more ports.
<b>vlan</b> <i>vlan-list</i>   <i>vlan-name</i>	(Optional) Displays port information for one or more VLANs.
<b>port</b> <i>port-string</i>	(Optional) Displays port information for one or more ports.

### Defaults

If no options are specified, all information related to static and dynamic VLANs will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display information for VLAN 1. In this case, VLAN 1 is named “DEFAULT VLAN”. Ports allowed to transmit frames belonging to VLAN 1 are listed as egress ports. Ports that won’t include a VLAN tag in their transmitted frames are listed as untagged ports. There are no forbidden ports (prevented from transmitted frames) on VLAN 1:

```
B2(su)->show vlan 1
VLAN: 1          NAME: DEFAULT VLAN
VLAN Type: Default
Egress Ports
ge.1.1-10, ge.2.1-4, ge.3.1-7,
Forbidden Egress Ports
None.
Untagged Ports
ge.1.1-10, ge.2.1-4, ge.3.1-7,
```

[Table 8-30](#) provides an explanation of the command output.

Table 8-30 show vlan Output Details

Output	What It Displays...
VLAN	VLAN ID.
NAME	Name assigned to the VLAN.
Status	Whether it is <b>enabled</b> or <b>disabled</b> .
VLAN Type	Whether it is <b>permanent</b> (static) or <b>dynamic</b> .
Egress Ports	Ports configured to transmit frames for this VLAN.
Forbidden Egress Ports	Ports prevented from transmitted frames for this VLAN.
Untagged Ports	Ports configured to transmit untagged frames for this VLAN.

## Creating and Naming Static VLANs

### Purpose

To create a new static VLAN, or to enable or disable existing VLAN(s).

### Commands

For information about...	Refer to page...
set vlan	<a href="#">8-4</a>
set vlan name	<a href="#">8-5</a>
clear vlan	<a href="#">8-5</a>
clear vlan name	<a href="#">8-6</a>

### set vlan

Use this command to create a new static IEEE 802.1Q VLAN, or to enable or disable an existing VLAN.

#### Syntax

```
set vlan {create | enable | disable} vlan-list
```

#### Parameters

<b>create   enable   disable</b>	Creates, enables or disables VLAN(s).
<i>vlan-list</i>	Specifies one or more VLAN IDs to be created, enabled or disabled.

#### Defaults

None.

## Mode

Switch command, read-write.

## Usage

Once a VLAN is created, you can assign it a name using the **set vlan name** command described in “[set vlan name](#)” on page 8-5.

Each VLAN ID must be unique. If a duplicate VLAN ID is entered, the device assumes that the Administrator intends to modify the existing VLAN.

Enter the VLAN ID using a unique number between 1 and 4093. The VLAN IDs of 0 and 4094 and higher may not be used for user-defined VLANs.

## Examples

This example shows how to create VLAN 3:

```
B2(su)->set vlan create 3
```

This example shows how to disable VLAN 3:

```
B2(su)->set vlan disable 3
```

# set vlan name

Use this command to set or change the ASCII name for a new or existing VLAN.

## Syntax

```
set vlan name vlan-list vlan-name
```

## Parameters

<i>vlan-list</i>	Specifies the VLAN ID of the VLAN(s) to be named.
<i>vlan-name</i>	Specifies the string used as the name of the VLAN (1 to 32 characters).

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the name for VLAN 7 to green:

```
B2(su)->set vlan name 7 green
```

# clear vlan

Use this command to remove a static VLAN from the list of VLANs recognized by the device.

## Syntax

```
clear vlan vlan-list
```

## Parameters

---

<i>vlan-list</i>	Specifies the VLAN ID of the VLAN(s) to be removed.
------------------	---

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to remove a static VLAN 9 from the device's VLAN list:

```
B2(su)->clear vlan 9
```

# clear vlan name

Use this command to remove the name of a VLAN from the VLAN list.

## Syntax

```
clear vlan name vlan-list
```

## Parameters

---

<i>vlan-list</i>	Specifies the VLAN ID of the VLAN(s) for which the name will be cleared.
------------------	--

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the name for VLAN 9:

```
B2(su)->clear vlan name 9
```

# Assigning Port VLAN IDs (PVIDs) and Ingress Filtering

## Purpose

To assign default VLAN IDs to untagged frames on one or more ports, to configure VLAN ingress filtering and constraints, and to set the frame discard mode.

## Commands

For information about...	Refer to page...
show port vlan	<a href="#">8-7</a>
set port vlan	<a href="#">8-7</a>
clear port vlan	<a href="#">8-8</a>
show port ingress filter	<a href="#">8-9</a>
set port ingress filter	<a href="#">8-9</a>
show port discard	<a href="#">8-10</a>
set port discard	<a href="#">8-11</a>

## show port vlan

Use this command to display port VLAN identifier (PVID) information. PVID determines the VLAN to which all untagged frames received on one or more ports will be classified.

### Syntax

```
show port vlan [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays PVID information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

### Defaults

If *port -string* is not specified, port VLAN information for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display PVIDs assigned to ge.2.1 through 6. In this case, untagged frames received on these ports will be classified to VLAN 1:

```
B2(su)->show port vlan ge.2.1-6
ge.2.1 is set to 1
ge.2.2 is set to 1
ge.2.3 is set to 1
ge.2.4 is set to 1
ge.2.5 is set to 1
ge.2.6 is set to 1
```

## set port vlan

Use this command to configure the PVID (port VLAN identifier) for one or more ports.

### Syntax

`set port vlan port-string pvid [modify-egress | no-modify-egress]`

### Parameters

<i>port-string</i>	Specifies the port(s) for which to configure a VLAN identifier. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>pvid</i>	Specifies the VLAN ID of the VLAN to which port(s) will be added.
<b>modify-egress</b>	(Optional) Adds port(s) to VLAN's untagged egress list and removes them from other untagged egress lists.
<b>no-modify-egress</b>	(Optional) Does not prompt for or make egress list changes.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The PVID is used to classify untagged frames as they ingress into a given port. If the specified VLAN has not already been created, this command will create it. It will prompt the user to add the VLAN to the port's egress list as untagged, and to remove the default VLAN from the port's egress list.

### Example

This example shows how to add ge.1.10 to the port VLAN list of VLAN 4 (PVID 4). Since VLAN 4 is a new VLAN, it is created. Then port ge.1.10 is added to VLAN 4's untagged egress list. The port must then be cleared from the egress list of VLAN 1 (the default VLAN) as shown:

```
B2(su)->set port vlan ge.1.10 4
B2(su)->set vlan 4 create
B2(su)->set vlan egress 4 ge.1.10 untagged
B2(su)->clear vlan egress 1 ge.1.10
```

## clear port vlan

Use this command to reset a port's 802.1Q port VLAN ID (PVID) to the host VLAN ID 1.

### Syntax

`clear port vlan port-string`

### Parameters

<i>port-string</i>	Specifies the port(s) to be reset to the host VLAN ID 1. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset ports ge.1.3 through 11 to a VLAN ID of 1 (Host VLAN):

```
B2(su)->clear port vlan ge.1.3-11
```

# show port ingress filter

Use this command to show all ports that are enabled for port ingress filtering, which limits incoming VLAN ID frames according to a port VLAN egress list. If the VLAN ID specified in the received frame is not on the port's VLAN egress list, then that frame is dropped and not forwarded.

## Syntax

```
show port ingress-filter [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Specifies the port(s) for which to display ingress filtering status. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

If *port-string* is not specified, ingress filtering status for all ports will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display the port ingress filter status for ports 10 through 15 in slot 1. In this case, the ports are disabled for ingress filtering:

```
B2(su)->show port ingress-filter ge.1.10-15
```

```

Port      State
-----
ge.1.10   disabled
ge.1.11   disabled
ge.1.12   disabled
ge.1.13   disabled
ge.1.14   disabled
ge.1.15   disabled
```

# set port ingress filter

Use this command to discard all frames received with a VLAN ID that don't match the port's VLAN egress list.

## Syntax

```
set port ingress-filter port-string {disable | enable}
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to enable or disable ingress filtering. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>disable</b>   <b>enable</b>	Disables or enables ingress filtering.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

When ingress filtering is enabled on a port, the VLAN IDs of incoming frames are compared to the port's egress list. If the received VLAN ID does not match a VLAN ID on the port's egress list, then the frame is dropped.

Ingress filtering is implemented according to the IEEE 802.1Q standard.

## Example

This example shows how to enable port ingress filtering on ge.1.3:

```
B2(su)->set port ingress-filter ge.1.3 enable
```

# show port discard

Use this command to display the frame discard mode for one or more ports. Ports can be set to discard frames based on whether or not the frame contains a VLAN tag. They can also be set to discard both tagged and untagged frames, or neither.

## Syntax

```
show port discard [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays the frame discard mode for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, frame discard mode will be displayed for all ports.

## Mode

Switch command, read-only.



## Example

This example shows how to display the frame discard mode for ge.2.7. In this case, the port has been set to discard all tagged frames:

```
B2(su)->show port discard ge.2.7
Port          Discard Mode
-----
ge.2.7        tagged
```

## set port discard

Use this command to set the frame discard mode on one or more ports.

### Syntax

```
set port discard port-string {tagged | untagged | both | none}
```

### Parameters

<i>port-string</i>	Specifies the port(s) for which to set frame discard mode. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>tagged   untagged   both   none</b>	<ul style="list-style-type: none"> <li>Tagged - Discard all incoming (received) tagged packets on the defined port(s).</li> <li>Untagged - Discard all incoming untagged packets.</li> <li>Both - All traffic will be discarded (tagged and untagged).</li> <li>None - No packets will be discarded.</li> </ul>

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The options are to discard all incoming tagged frames, all incoming untagged frames, neither (essentially allow all traffic), or both (essentially discarding all traffic).

A common practice is to discard all tagged packet on user ports. Typically an Administrator does not want the end users defining what VLAN they use for communication.

## Example

This example shows how to discard all tagged frames received on port ge.3.3:

```
B2(su)->set port discard ge.3.3 tagged
```

# Configuring the VLAN Egress List

## Purpose

To assign or remove ports on the egress list of a particular VLAN. This determines which ports on the switch will be eligible to transmit frames for a particular VLAN. For example, ports 1, 5, 7, 8 could be allowed to transmit frames belonging to VLAN 20 and ports 7,8, 9, 10 could be allowed to transmit frames tagged with VLAN 30 (a port can belong to multiple VLAN Egress lists). Note that the Port Egress list for ports 7 and 8 would contain both VLAN 20 and 30.

The port egress type for all ports can be set to tagged, forbidden, or untagged. In general, VLANs have no egress (except for VLAN 1) until they are configured by static administration, or through dynamic mechanisms such as GVRP.

Setting a port to forbidden prevents it from participating in the specified VLAN and ensures that any dynamic requests (either through GVRP or dynamic egress) for the port to join the VLAN will be ignored. Setting a port to untagged allows it to transmit frames without a tag header. This setting is usually used to configure a port connected to an end user device. Frames sent between VLAN aware switches are typically tagged.

The default VLAN defaults its egress to untagged for all ports.

## Commands

For information about...	Refer to page...
show port egress	<a href="#">8-12</a>
set vlan forbidden	<a href="#">8-13</a>
set vlan egress	<a href="#">8-13</a>
clear vlan egress	<a href="#">8-14</a>
show vlan dynamic	<a href="#">8-15</a>
set vlan dynamic	<a href="#">8-16</a>

## show port egress

Use this command to display the VLAN membership for one or more ports.

### Syntax

`show port egress [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays VLAN membership for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, VLAN membership will be displayed for all ports.

## Mode

Switch command, read-write.

## Example

This example shows you how to show VLAN egress information for ge.1.1 through 3. In this case, all three ports are allowed to transmit VLAN 1 frames as tagged and VLAN 10 frames as untagged. Both are static VLANs:

```
B2(su)->show port egress ge.1.1-3
Port      Vlan      Egress      Registration
Number    Id        Status      Status
-----
ge.1.1     1         tagged      static
ge.1.1     10        untagged     static
ge.1.2     1         tagged      static
ge.1.2     10        untagged     static
ge.1.3     1         tagged      static
ge.1.3     10        untagged     static
```

## set vlan forbidden

Use this command to prevent one or more ports from participating in a VLAN. This setting instructs the device to ignore dynamic requests (either through GVRP or dynamic egress) for the port to join the VLAN.

## Syntax

```
set vlan forbidden vlan-id port-string
```

## Parameters

<i>vlan-id</i>	Specifies the VLAN for which to set forbidden port(s).
<i>port-string</i>	Specifies the port(s) to set as forbidden for the specified <i>vlan-id</i> .

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows you how to set ge.1.3 to forbidden for VLAN 6:

```
B2(su)->set vlan forbidden 6 ge.1.3
```

## set vlan egress

Use this command to add ports to the VLAN egress list for the device, or to prevent one or more ports from participating in a VLAN. This determines which ports will transmit frames for a particular VLAN.

## Syntax

```
set vlan egress vlan-list port-string [untagged | forbidden | tagged]
```

## Parameters

<i>vlan-list</i>	Specifies the VLAN where a port(s) will be added to the egress list.
<i>port-string</i>	Specifies one or more ports to add to the VLAN egress list of the specified <i>vlan-list</i> . For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>untagged</b>   <b>forbidden</b>   <b>tagged</b>	(Optional) Adds the specified ports as: <ul style="list-style-type: none"><li>• <b>untagged</b> — Causes the port(s) to transmit frames without an IEEE 802.1Q header tag.</li><li>• <b>forbidden</b> — Instructs the device to ignore dynamic requests (either through GVRP or dynamic egress) from the port(s) to join the VLAN and disallows egress on that port.</li><li>• <b>tagged</b> — Causes the port(s) to transmit 802.1Q tagged frames.</li></ul>

## Defaults

If **untagged**, **forbidden** or **tagged** is not specified, the port will be added to the VLAN egress list as tagged.

## Mode

Switch command, read-write.

## Examples

This example shows how to add ge.1.5 through 10 to the egress list of VLAN 7. This means that these ports will transmit VLAN 7 frames as tagged:

```
B2(su)->set vlan egress 7 ge.1.5-10
```

This example shows how to forbid ports 13 through 15 in slot 1 from joining VLAN 7 and disallow egress on those ports:

```
B2(su)->set vlan egress 7 ge.1.13-15 forbidden
```

This example shows how to allow port 2 in slot 1 to transmit VLAN 7 frames as untagged:

```
B2(su)->set vlan egress 7 ge.1.2 untagged
```

# clear vlan egress

Use this command to remove ports from a VLAN's egress list.

## Syntax

```
clear vlan egress vlan-list port-string [forbidden]
```

## Parameters

<i>vlan-list</i>	Specifies the number of the VLAN from which a port(s) will be removed from the egress list.
<i>port-string</i>	Specifies one or more ports to be removed from the VLAN egress list of the specified <i>vlan-list</i> . For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>forbidden</b>	(Optional) Clears the forbidden setting from the specified port(s) and resets the port(s) as able to egress frames if so configured by either static or dynamic means.

## Defaults

If **forbidden** is not specified, tagged and untagged settings will be cleared.

## Mode

Switch command, read-write.

## Examples

This example shows how to remove ge.3.14 from the egress list of VLAN 9:

```
B2(su)->clear vlan egress 9 ge.3.14
```

This example shows how to remove all Gigabit Ethernet ports in slot 2 from the egress list of VLAN 4:

```
B2(su)->clear vlan egress 4 ge.2.*
```

# show vlan dynamicegress

Use this command to display the status of dynamic egress (enabled or disabled) for one or more VLANs.

## Syntax

```
show vlan dynamicegress [vlan-list]
```

## Parameters

<i>vlan-list</i>	(Optional) Displays dynamic egress status for specific VLAN(s).
------------------	---

## Defaults

If *vlan-list* is not specified, the dynamic egress status for all VLANs will be displayed.

## Mode

Switch command, read-write.

## Example

This example shows how to display the dynamic egress status for VLANs 50-55:

```
B2(rw)->show vlan dynamicegress 50-55
VLAN 50 is disabled
```

```
VLAN 51 is disabled
VLAN 52 is disabled
VLAN 53 is enabled
VLAN 54 is enabled
VLAN 55 is enabled
```

# set vlan dynamicegress

Use this command to administratively set the dynamic egress status for one or more VLANs.

## Syntax

```
set vlan dynamicegress vlan-list {enable | disable}
```

## Parameters

<i>vlan-list</i>	Specifies the VLANs by ID to enable or disable dynamic egress.
<b>enable</b>   <b>disable</b>	Enables or disables dynamic egress.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

If dynamic egress is enabled for a particular VLAN, when a port receives a frame tagged with that VLAN’s ID, the switch will add the receiving port to that VLAN’s egress list. Dynamic egress is disabled on the SecureStack B2 by default.

For example, assume you have 20 AppleTalk users on your network who are mobile users (that is, use different ports every day), but you want to keep the AppleTalk traffic isolated in its own VLAN. You can create an AppleTalk VLAN with a VLAN ID of 55 with a classification rule that all AppleTalk traffic gets tagged with VLAN ID 55. Then, you enable dynamic egress for VLAN 55. Now, when an AppleTalk user plugs into port ge.3.5 and sends an AppleTalk packet, the switch will tag the packet to VLAN 55 and also add port ge.3.5 to VLAN 55’s egress list, which allows the AppleTalk user to receive AppleTalk traffic.

## Example

This example shows how to enable dynamic egress on VLAN 55:

```
B2(rw)->set vlan dynamicegress 55 enable
```

# Setting the Host VLAN

## Purpose

To configure a host VLAN that only select devices are allowed to access. This secures the host port for management-only tasks.



**Note:** The host port is the management entity of the device. Refer to “[Creating a Secure Management VLAN](#)” on page 8-1 for more information.

## Commands.

For information about...	Refer to page...
show host vlan	<a href="#">8-17</a>
set host vlan	<a href="#">8-17</a>
clear host vlan	<a href="#">8-18</a>

## show host vlan

Use this command to display the current host VLAN.

### Syntax

```
show host vlan
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the host VLAN:

```
B2(su)->show host vlan
Host vlan is 7.
```

## set host vlan

Use this command to assign host status to a VLAN.

### Syntax

```
set host vlan vlan-id
```

### Parameters

<i>vlan-id</i>	Specifies the number of the VLAN to set as the host VLAN.
----------------	---

### Defaults

None.

## Mode

Switch command, read-write.

## Usage

The host VLAN should be a secure VLAN where only designated users are allowed access. For example, a host VLAN could be specifically created for device management. This would allow a management station connected to the management VLAN to manage all ports on the device and make management secure by preventing management via ports assigned to other VLANs.



**Note:** Before you can designate a VLAN as the host VLAN, you must create a VLAN using the set of commands described in [“Creating and Naming Static VLANs”](#) on page 8-4.

## Example

This example shows how to set VLAN 7 as the host VLAN:

```
B2(su)->set host vlan 7
```

# clear host vlan

Use this command to reset the host VLAN to the default setting of 1.

## Syntax

```
clear host vlan
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the host VLAN to the default setting:

```
B2(su)->clear host vlan
```

# Enabling/Disabling GVRP (GARP VLAN Registration Protocol)

## About GARP VLAN Registration Protocol (GVRP)

The following sections describe the device operation when its ports are operating under the Generic Attribute Registration Protocol (GARP) application – GARP VLAN Registration Protocol (GVRP).



## Overview

The purpose of GVRP is to dynamically create VLANs across a switched network. When a VLAN is declared, the information is transmitted out GVRP configured ports on the device in a GARP formatted frame using the GVRP multicast MAC address. A switch that receives this frame, examines the frame, and extracts the VLAN IDs. GVRP then creates the VLANs and adds the receiving port to its tagged member list for the extracted VLAN ID (s). The information is then transmitted out the other GVRP configured ports of the device. [Figure 8-7](#) shows an example of how VLAN blue from end station A would be propagated across a switch network.

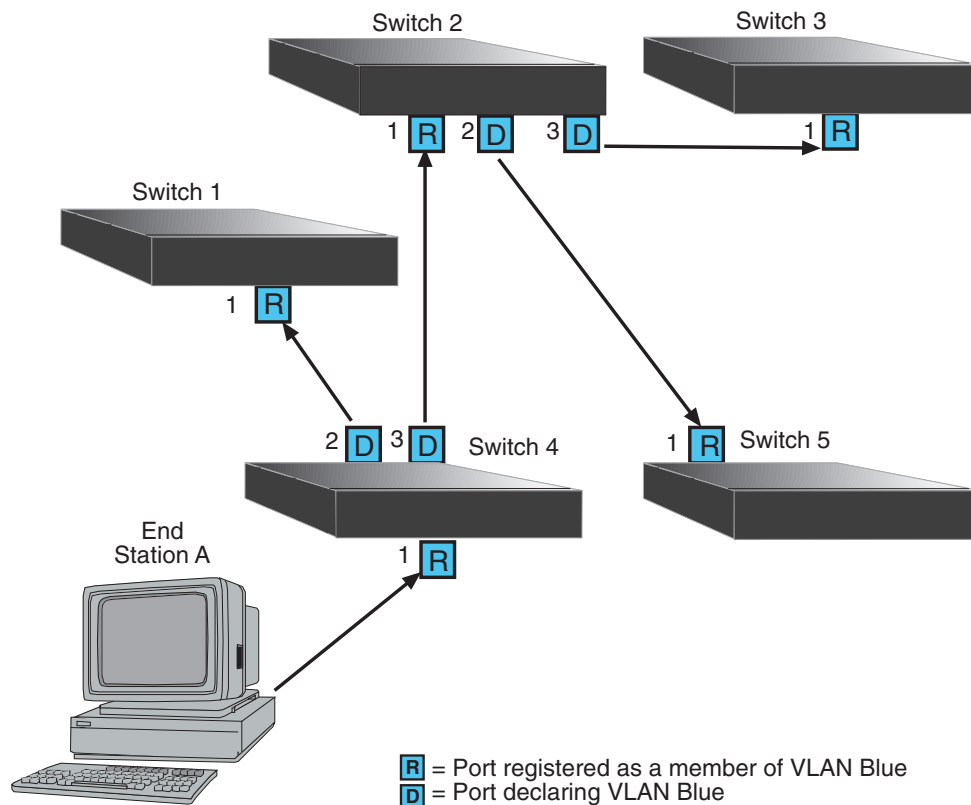
## How It Works

In [Figure 8-7](#) on page 8-19, Switch 4, port 1 is registered as being a member of VLAN Blue and then declares this fact out all its ports (2 and 3) to Switch 1 and Switch 2. These two devices register this in the port egress lists of the ports (Switch 1, port 1 and Switch 2, port 1) that received the frames with the information. Switch 2, which is connected to Switch 3 and Switch 5 declares the same information to those two devices and the port egress list of each port is updated with the new information, accordingly.

Configuring a VLAN on an 802.1Q switch creates a static VLAN entry. The entry will always remain registered and will not time-out. However, dynamic entries will time-out and their registrations will be removed from the member list if the end station A is removed. This ensures that, if switches are disconnected or if end stations are removed, the registered information remains accurate.

The end result is that the port egress list of a port is updated with information about VLANs that reside on that port, even if the actual station on the VLAN is several hops away.

**Figure 8-7 Example of VLAN Propagation via GVRP**



## Purpose

To dynamically create VLANs across a switched network. The GVRP command set is used to display GVRP configuration information, the current global GVRP state setting, individual port settings (enable or disable) and timer settings. By default, GVRP is enabled globally on the device, but disabled on all ports.

## Commands

For information about...	Refer to page...
show gvrp	<a href="#">8-20</a>
show garp timer	<a href="#">8-21</a>
set gvrp	<a href="#">8-22</a>
clear gvrp	<a href="#">8-22</a>
set garp timer	<a href="#">8-23</a>

## show gvrp

Use this command to display GVRP configuration information.

### Syntax

**show gvrp** [*port-string*]

### Parameters

<i>port-string</i>	(Optional) Displays GVRP configuration information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

### Defaults

If *port-string* is not specified, GVRP configuration information will be displayed for all ports and the device.

### Mode

Switch command, read-only.

### Example

This example shows how to display GVRP status for the device and for fw.2.1:

```
B2(su)->show gvrp ge.2.1
Global GVRP status is enabled.
```

Port Number	GVRP status
-----	-----
ge.2.1	disabled

# show garp timer

Use this command to display GARP timer values for one or more ports.

## Syntax

```
show garp timer [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays GARP timer information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, GARP timer information will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display GARP timer information on ports 1 through 10 in slot 1:



**Note:** For a functional description of the terms **join**, **leave**, and **leaveall timers**, refer to the standard IEEE 802.1Q documentation, which is not supplied with this device.

```
B2(su)->show garp timer ge.1.1-10
Port based GARP Configuration: (Timer units are centiseconds)
Port Number      Join          Leave          Leaveall
-----
ge.1.1           20            60            1000
ge.1.2           20            60            1000
ge.1.3           20            60            1000
ge.1.4           20            60            1000
ge.1.5           20            60            1000
ge.1.6           20            60            1000
ge.1.7           20            60            1000
ge.1.8           20            60            1000
ge.1.9           20            60            1000
ge.1.10          20            60            1000
```

[Table 8-31](#) provides an explanation of the command output. For details on using the **set gvrp** command to enable or disable GVRP, refer to “[set gvrp](#)” on page 8-22. For details on using the **set garp timer** command to change default timer values, refer to “[set garp timer](#)” on page 8-23.

**Table 8-31 show gvrp configuration Output Details**

Output	What It Displays...
Port Number	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
Join	Join timer setting.
Leave	Leave timer setting.
Leaveall	Leavall timer setting.

# set gvrp

Use this command to enable or disable GVRP globally on the device or on one or more ports.

## Syntax

```
set gvrp {enable | disable} [port-string]
```

## Parameters

<b>disable   enable</b>	Disables or enables GVRP on the device.
<i>port-string</i>	(Optional) Disables or enables GVRP on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

If *port-string* is not specified, GVRP will be disabled or enabled for all ports.

## Mode

Switch command, read-write.

## Examples

This example shows how to enable GVRP globally on the device:

```
B2(su)->set gvrp enable
```

This example shows how to disable GVRP globally on the device:

```
B2(su)->set gvrp disable
```

This example shows how to enable GVRP on ge.1.3:

```
B2(su)->set gvrp enable ge.1.3
```

# clear gvrp

Use this command to clear GVRP status or on one or more ports.

## Syntax

```
clear gvrp [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Clears GVRP status on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, GVRP status will be cleared for all ports.

## Mode

Switch command, read-write.

## Example

This example shows how to clear GVRP status globally on the device:

```
B2(su)->clear gvrp
```

## set garp timer

Use this command to adjust the values of the join, leave, and leaveall timers.

### Syntax

```
set garp timer {[join timer-value] [leave timer-value] [leaveall timer-value]}  
port-string
```

### Parameters

<b>join</b> <i>timer-value</i>	Sets the GARP join timer in centiseconds (Refer to 802.1Q standard.)
<b>leave</b> <i>timer-value</i>	Sets the GARP leave timer in centiseconds (Refer to 802.1Q standard.)
<b>leaveall</b> <i>timer-value</i>	Sets the GARP leaveall timer in centiseconds (Refer to 802.1Q standard.)
<i>port-string</i>	Specifies the port(s) on which to configure GARP timer settings. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The setting of these timers is critical and should only be changed by personnel familiar with the 802.1Q standards documentation, which is not supplied with this device.

### Examples

This example shows how to set the GARP join timer value to 100 centiseconds for all ports:

```
B2(su)->set garp timer join 100 *.*.*
```

This example shows how to set the leave timer value to 300 centiseconds for all ports:

```
B2(su)->set garp timer leave 300 *.*.*
```

This example shows how to set the leaveall timer value to 20000 centiseconds for all ports:

```
B2(su)->set garp timer leaveall 20000 *.*.*
```



## Differentiated Services Configuration

This chapter describes the Differentiated Services (Diffserv) set of commands and how to use them.



**Note:** Diffserv will not be available if a Policy License is activated on the SecureStack B2. When a Policy License is activated, it enables Policy that takes the place of Diffserv. Refer to [“Activating Licensed Features”](#) on page 3-26 for more information on Licensing.

SecureStack B2 devices support Diffserv policy-based provisioning of network resources by allowing IT administrators to:

- Create, change or remove Diffserv policies based on business-specific use of network services.
- Prioritize and police traffic according to assigned policies and conditions.
- Assign or unassign ports to Diffserv policies so that only ports activated for a policy will be allowed to transmit frames accordingly.

For information about ...	Refer to page ...
<a href="#">Globally Enabling or Disabling Diffserv</a>	<a href="#">9-1</a>
<a href="#">Creating Diffserv Classes and Matching Conditions</a>	<a href="#">9-2</a>
<a href="#">Configuring Diffserv Policies and Assigning Classes</a>	<a href="#">9-9</a>
<a href="#">Assigning Policies to Service Ports</a>	<a href="#">9-15</a>
<a href="#">DiffServ Configuration Examples</a>	<a href="#">9-17</a>

### Globally Enabling or Disabling Diffserv

#### Purpose

To globally enable or disable Diffserv on the device.

#### Command

The command used to globally enable or disable Diffserv on the device is listed below and described in the associated section as shown.

For information about...	Refer to page...
<code>set diffserv adminmode</code>	<a href="#">9-1</a>

# set diffserv adminmode

Use this command to globally enable or disable Diffserv on the device. By default, this function is disabled at device startup.

## Syntax

```
set diffserv adminmode {enable | disable}
```

## Parameters

enable   disable	Enables or disables Diffserv.
------------------	-------------------------------

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable Diffserv:

```
B2(rw)->set diffserv adminmode enable
```

# Creating Diffserv Classes and Matching Conditions

## Purpose

To review, create, and configure Diffserv classes and matching conditions.

## Commands

The commands used to review, create, and configure Diffserv classes and matching conditions are listed below and described in the associated section as shown.

For information about...	Refer to page...
show diffserv info	<a href="#">9-2</a>
show diffserv class	<a href="#">9-3</a>
set diffserv class create	<a href="#">9-4</a>
set diffserv class delete	<a href="#">9-4</a>
set diffserv class match	<a href="#">9-5</a>
set diffserv class rename	<a href="#">9-8</a>

# show diffserv info

Use this command to display general Diffserv status information.



### Syntax

`show diffserv info`

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display general Diffserv status information:

```
B2(rw)->show diffserv info

DiffServ Admin Mode..... Enable
Class Table Size Current/Max..... 0 / 25
Class Rule Table Size Current/Max..... 0 / 150
Policy Table Size Current/Max..... 0 / 12
Policy Instance Table Size Current/Max..... 0 / 120
Policy Attribute Table Size Current/Max..... 0 / 120
Service Table Size Current/Max..... 0 / 48
```

## show diffserv class

Use this command to display information about Diffserv classes.

### Syntax

`show diffserv class {summary | detailed classname}`

### Parameters

<b>summary</b>	Displays a summary of Diffserv class information.
<b>detailed</b> <i>classname</i>	Displays detailed Diffserv information for a specific class.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display a summary of Diffserv class information. In this case, there are two classes configured, named “guest” and “admin”:

```
B2(rw)->show diffserv class summary
```

Class Name	Class Type	Ref Class Name
-----	-----	-----
guest	All	
admin	All	

## set class create

Use this command to create a new Diffserv class.

### Syntax

```
set diffserv class create {all classname}
```

### Parameters

all	Specifies that all match conditions must be met before the associated policy is executed.
classname	Specifies a class name for this new Diffserv class.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to create a Diffserv class called “admin”:

```
B2(rw)->set diffserv class create all admin
```

## set diffserv class delete

Use this command to delete a Diffserv class and remove any match assigned to the class.

### Syntax

```
set diffserv class delete classname
```

### Parameters

classname	Specifies the class name to be deleted.
-----------	---

### Defaults

None.

## Mode

Switch command, read-write.

## Usage

You cannot use this command to delete a class that has been assigned to a policy. Before deleting a class with an assigned policy and service port(s), you must first:

- Remove the service port(s) assigned to the policy using the **set diffserv service remove** command ([page 9-16](#)), then
- Remove the specified class using the **set diffserv policy class remove** command ([page 9-11](#)).

## Example

This example shows how to delete the Diffserv “admin” class:

```
B2(rw)->set diffserv class delete admin
```

# set diffserv class match

Use this command to match a Diffserv class to a service condition based on layer 2, 3, and 4 packet parameters.

```
set diffserv class match {[every classname] [dstmac | srcmac classname macaddr
macmask] [dstip | srcip classname ipaddr ipmask] [dstl4port | src14port{keyword
classname keyword / number classname portnumber}]} [ipdscp classname dscpval]
[ipprecedence classname precedencenumber] [iptos classname tosbits tosmask]
[protocol {keyword classname protocol-name / number classname protocol-number}]}
[refclass {add | remove}{classname refclassname}] [vlan classname vlanid]}
```

## Parameters

<b>every</b> <i>classname</i>	Matches all packets to a specific class.
<b>dstmac</b>   <b>srcmac</b> <i>classname macaddr macmask</i>	Matches to a specific class based on destination or source MAC address.
<b>dstip</b>   <b>srcip</b> <i>classname ipaddr ipmask</i>	Matches to a specific class based on destination or source IP address.

<b>dstl4port   srcl4port</b> <b>keyword</b> <i>classname</i> <i>keyword</i>   <b>number</b> <i>classname</i> <i>portnumber</i>	<p>Matches to a specific class based on destination or source layer 4 port number or keyword. Valid <i>keyword</i> values are:</p> <ul style="list-style-type: none"> <li>• <b>domain</b></li> <li>• <b>echo</b></li> <li>• <b>ftp</b></li> <li>• <b>ftpdata</b></li> <li>• <b>http</b></li> <li>• <b>smtp</b></li> <li>• <b>snmp</b></li> <li>• <b>telnet</b></li> <li>• <b>tftp</b></li> <li>• <b>www</b></li> </ul> <p>Valid <i>portnumber</i> values are <b>0 - 65535</b>.</p>
<b>ipdscp</b> <i>classname dscpval</i>	Matches to a specific class based on the value of the IP Diffserv Code Point. Valid numeric or keyword values can be entered as listed in <a href="#">Table 9-32</a> below.
<b>ipprecedence</b> <i>classname precedencenumber</i>	Matches to a specific class based on the value of the IP precedence field. Valid <i>precedencenumber</i> values are: <b>0 - 7</b> .
<b>iptos</b> <i>classname tosbits tosmask</i>	Matches to a specific class based on the value of the IP type of service (TOS) field. Valid <i>tosbits</i> values are <b>0 - 255</b> . Valid <i>tosmask</i> values are <b>1 - 8</b> .
<b>protocol keyword</b> <i>classname protocol-name</i>   <b>number</b> <i>classname protocol-number</i>	<p>Matches to a specific class based on number or keyword in the IP protocol field. Valid <i>protocol-name</i> keyword are:</p> <ul style="list-style-type: none"> <li>• <b>icmp</b></li> <li>• <b>igmp</b></li> <li>• <b>ip</b></li> <li>• <b>tcp</b></li> <li>• <b>udp</b></li> </ul> <p>Valid <i>protocol-number</i> values are <b>0 - 255</b>.</p>
<b>refclass add   remove</b> <i>classname refclassname</i>	Adds or removes a set of already defined match conditions to a specific class.
<b>vlan</b> <i>classname vlanid</i>	Matches to a specific class based on VLAN ID. Valid values are <b>1-4094</b> .

**Table 9-32 Valid IP DSCP Numeric and Keyword Values**

Code Point Map	Numeric Value	Keyword (Usage)
b'000000	<b>0</b>	<b>be</b> (best effort)
b'xxx000	<b>0,8,16,24,32,40,48,56</b>	<b>cs0 - cs7</b> (Class Selector PHB)
b'001xx0	<b>10,12,14</b>	<b>af11, af12, af13</b> (Assured Forwarding)

**Table 9-32 Valid IP DSCP Numeric and Keyword Values (Continued)**

Code Point Map	Numeric Value	Keyword (Usage)
b'010xx0	<b>18,20,22</b>	<b>af21, af22, af23</b> (Assured Forwarding)
b'011xx0	<b>26,28,30</b>	<b>af31, af32, af33</b> (Assured Forwarding)
b'100xx0	<b>34,36,38</b>	<b>af41, af42, af43</b> (Assured Forwarding)
b'101110	<b>46</b>	<b>ef</b> (Expedited Forwarding)

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Any policy that is applied must be composed of rules that come from only one of the following four groups.

- Layer 3:
  - Destination IP address (**dstip**)
  - Destination Layer 4 port (**dstl4port**)
  - IP Diffserv Code Point (**ipdscp**)
  - IP precedence field (**ipprecedence**)
  - IP type of service (TOS) field (**iptos**)
  - IP protocol field (**protocol**)
  - Source IP address (**srcip**)
  - Source Layer 4 port (**srcl4port**)
- Layer 2:
  - Destination MAC address (**dstmac**)
  - Source MAC address (**srcmac**)
  - VLAN ID (**vlan**)
- Layer 2 Layer 3 source:
  - Source MAC address (**srcmac**)
  - Source IP address (**srcip**)
  - VLAN ID (**vlan**)
- Layer 2 Layer 3 destination:
  - Destination MAC address (**dstmac**)
  - Destination IP address (**dstip**)
  - VLAN ID (**vlan**)



**Note:** The match type **every** will work with any group.

You cannot create and add a class to a policy before adding any rules (match conditions) to the class. Once a class is added to a policy, you cannot add any more rules (match conditions) to the class. You cannot create outbound policies.

You can only add rules that fit into the same category (shown in the groupings above) to a class. For example, if you create a class and add the match conditions **dstip** and **dstl4port**, you will only be able to add other rules from the L3 group.

Class matches of layer 4 destination or source must be sequenced before the corresponding protocol match, as illustrated in the third example below.

You can only add classes of the same category to a policy.

**Examples**

This example shows how to match the “admin” class to source IP address 130.10.0.32 and only that IP address type:

```
B2(rw)->set diffserv class match srcip admin 130.10.0.32 255.255.255.255
```

This example shows how to match the “admin” class to VLAN 10:

```
B2(rw)->set diffserv class match vlan admin 10
```

This example shows how to match the “http” class to TCP packets with a destination port of 80 (HTTP). The layer 4 port match must precede the protocol type.

```
B2(rw)->set diffserv class match dstl4port keyword http http
B2(rw)->set diffserv class match protocol keyword http tcp
```

**set diffserv class rename**

Use this command to change the name of a Diffserv class.

**Syntax**

```
set diffserv class rename classname newclassname
```

**Parameters**

<i>classname</i>	Specifies the class name previously set for this new Diffserv class.
<i>newclassname</i>	Specifies a new class name.

**Defaults**

None.

**Mode**

Switch command, Read-Write.

**Example**

This example shows how to rename the Diffserv “admin” class to “system”:

```
B2(rw)->set diffserv class rename admin system
```

# Configuring Diffserv Policies and Assigning Classes

## Purpose

To review, create, and configure Diffserv policies and assign classes.

## Commands

The commands used to review, create, and configure Diffserv policies and assign classes are listed below and described in the associated section as shown.

For information about...	Refer to page...
show diffserv policy	<a href="#">9-9</a>
set diffserv policy create	<a href="#">9-10</a>
set diffserv policy delete	<a href="#">9-10</a>
set diffserv policy class	<a href="#">9-11</a>
set diffserv policy mark	<a href="#">9-11</a>
set diffserv policy police style simple	<a href="#">9-12</a>
set diffserv policy police action conform	<a href="#">9-13</a>
set diffserv policy police action nonconform	<a href="#">9-13</a>
set diffserv policy rename	<a href="#">9-14</a>

## show diffserv policy

Use this command to display information about Diffserv policies.

### Syntax

```
show diffserv policy {summary | detailed policyname}
```

### Parameters

<b>summary</b>	Displays Diffserv policy summary information.
<b>detailed</b> <i>policyname</i>	Displays detailed Diffserv information for a specific policy.

### Defaults

None.

### Mode

Switch command. Read-Only.

### Example

This example shows how to display a summary of Diffserv policy information. In this case, there is one policy named “admin”, to which members of the “admin” class have been assigned. This policy is applied to incoming traffic on its assigned service ports:

```
B2(rw)->show diffserv policy summary
```

Policy Name	Policy Type	Class Members
-----	-----	-----
admin	In	admin

## set diffserv policy create

Use this command to create a new Diffserv policy.

### Syntax

```
set diffserv policy create polycyname {in}
```

### Parameters

<i>polycyname</i>	Specifies a policy name.
in	Applies this policy to incoming packets.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to create a Diffserv policy called “admin” and apply it to incoming packets:

```
B2(rw)->set diffserv policy create admin in
```

## set diffserv policy delete

Use this command to delete a Diffserv policy.

### Syntax

```
set diffserv policy delete polycyname
```

### Parameters

<i>polycyname</i>	Specifies a policy name to be deleted.
-------------------	--

### Defaults

None.



## Mode

Switch command, read-write.

## Usage

In order to delete a policy you must first remove the service port(s) assigned to the policy using the **set diffserv service remove** command as described in “[set diffserv service](#)” on page 9-16.

## Example

This example shows how to delete the Diffserv “admin” policy:

```
B2(rw)->set diffserv policy delete admin
```

# set diffserv policy class

Use this command to add or remove a Diffserv class to a specified policy. Once added, policies will be active for the specified class.

## Syntax

```
set diffserv policy class {add | remove} policyname classname
```

## Parameters

<b>add   remove</b>	Adds or removes the specified class.
<i>policyname</i>	Specifies the policy name to be associated with the class.
<i>classname</i>	Specifies a class name to add or remove.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Class must be added to a policy using this command before policy parameters, such as bandwidth, marking, and policing, can be configured.

## Example

This example shows how to add the “system” class to the “admin” policy:

```
B2(rw)->set diffserv policy class add admin system
```

# set diffserv policy mark

Use this command to mark all packets for the associated Diffserv traffic stream with a specific IP DSCP or IP precedence value.

## Syntax

```
set diffserv policy mark {ipdscp | ipprecedence} policyname classname value
```

## Parameters

<b>ipdscp   ipprecedence</b>	Specifies that packets will be marked with either an IP DSCP or precedence value.
<i>policyname</i>	Specifies the policy name being configured.
<i>classname</i>	Specifies a Diffserv class to associate to this policy.
<i>value</i>	Specifies an IP DSCP or precedence value. Valid numeric or keyword DCSP values can be entered as listed in <a href="#">Section 9-32</a> . Valid precedence values are: <b>0 - 7</b> .

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to mark packets matching the “admin” policy in the “system” class for DSCP expedited forwarding precedence:

```
B2(rw)->set diffserv policy mark ipdscp admin system ef
```

# set diffserv policy police style simple

Use this command to establish the policing style for a Diffserv policy based only on bandwidth for the specified class.

## Syntax

```
set diffserv policy police style simple policyname classname bandwidth burstsize
```

## Parameters

<i>policyname</i>	Specifies the policy name being configured.
<i>classname</i>	Specifies a Diffserv class to associate to this policy.
<i>bandwidth</i>	Specifies a bandwidth value in Kbps. Valid values are <b>1 - 4294967295</b> .
<i>burstsize</i>	Specifies a burst size value in Kbytes. Valid values are <b>1 - 128</b> .

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to configure a bandwidth-based policing style for the “admin” Diffserv policy:

```
B2(rw)->set diffserv policy police style simple admin system 1000 128
```

## set diffserv policy police action conform

Use this command to configure traffic policing actions for packets that conform to associated Diffserv classifications.

### Syntax

```
set diffserv policy police action conform {drop | send policyname classname} /
{markdscp | markprec policyname classname value}
```

### Parameters

<b>drop   send</b>	Specifies whether the policing action for packets conforming to the classification parameters will be to drop or send packets.
<i>policyname</i>	Specifies the policy name being configured.
<i>classname</i>	Specifies a Diffserv class to associate to this policing action.
<b>markdscp   markprec</b>	Specifies a policing action based on IP DHCP or precedence.
<i>value</i>	Specifies an IP DHCP or precedence value set with the <b>set diffserv policy mark</b> command ( <a href="#">page 9-11</a> ).

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the policing action to `send` for packets conforming to Diffserv policy “admin,” class “system.”

```
B2(rw)->set diffserv policy police action conform send admin system
```

## set diffserv policy police action nonconform

Use this command to configure traffic policing actions for packets that do not conform to associated Diffserv classifications.

### Syntax

```
set diffserv policy police action nonconform {drop | send policyname classname} /
{markdscp | markprec policyname classname value}
```

### Parameters

<b>drop   send</b>	Specifies whether the policing action for packets not conforming to the classification parameters will be to drop or send packets.
<i>policyname</i>	Specifies the policy name being configured.
<i>classname</i>	Specifies a Diffserv class to associate to this policing action.
<b>markdscp   markprec</b>	Specifies a policing action based on IP DHCP or precedence.
<i>value</i>	Specifies an IP DHCP or precedence value set with the <b>set diffserv policy mark</b> command ( <a href="#">page 9-11</a> ).

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the policing action to drop for packets not conforming to the Diffserv policy “admin,” class “system.”

```
B2(rw)->set diffserv policy police action nonconform drop admin system
```

# set diffserv policy rename

Use this command to change the name of a Diffserv policy.

## Syntax

```
set diffserv policy rename polycyname newpolycyname
```

## Parameters

<i>polycyname</i>	Specifies the policy name previously set for this new Diffserv class.
<i>newpolycyname</i>	Specifies a new policy name.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to rename the “admin” Diffserv policy to “system”:

```
B2(rw)->set diffserv policy rename admin system
```

# Assigning Policies to Service Ports

## Purpose

To review and assign Diffserv policies and their associated classes to service ports.

## Commands

The commands used to review and assign Diffserv policies to service ports are listed below and described in the associated section as shown.

For information about...	Refer to page...
show diffserv service info	<a href="#">9-15</a>
show diffserv service stats	<a href="#">9-16</a>
set diffserv service	<a href="#">9-16</a>

## show diffserv service info

Use this command to display information about Diffserv service ports.

### Syntax

```
show diffserv service info {summary | detailed port-string} {in}
```

### Parameters

<b>summary</b>	Displays Diffserv service port summary information.
<b>detailed</b> <i>port-string</i>	Displays detailed information for a specific port(s).
<b>in</b>	Displays information about incoming traffic.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display a summary of incoming Diffserv service port traffic:

```
B2(rw)->show diffserv service info summary in
```

```
DiffServ Admin Mode..... Enable
```

Interface	Direction	OperStatus	Policy Name
ge.1.1	In	Up	admin
ge.1.2	In	Up	admin
ge.1.3	In	Up	admin

# show diffserv service stats

Use this command to display Diffserv policy service statistics.

## Syntax

```
show diffserv service stats {summary | detailed port-string} {in}
```

## Parameters

summary	Displays Diffserv a summary of service statistics.
detailed port-string	Displays detailed statistics for a specific port.
in	Displays information about incoming traffic.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display a detailed incoming traffic statistics about service port ge.1.1:

```
B2(rw)->show diffserv service stats detailed ge.1.1 in
Interface..... ge.1.1

Direction..... In
Operational Status..... Up
Policy Name..... admin

Class Name..... system
In Discarded Packets..... 0
```

# set diffserv service

Use this command to add or remove a Diffserv policy to incoming traffic on one or more ports.

## Syntax

```
set diffserv service {add | remove} {in} port-string policyname
```

## Parameters

add   remove	Adds or removes the specified policy.
in	Adds or removes the specified policy to incoming traffic.
port-string	Specifies the port(s) to which this policy configuration will be applied.
policyname	Specifies the policy name to be added to or removed from port traffic.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to apply the Diffserv policy named “admin” to incoming traffic on ports ge1.1-10:

```
B2(rw)->set diffserv service add in ge.1.5 admin
```

# DiffServ Configuration Examples

Typically, you would use the Diffserv command set to complete configuration tasks in the following order:

1. Enable DiffServ.
2. Create a Class.
3. Create one or more classification rules within the Class.
4. Create a Policy.
5. Add one or more Classes to the Policy.
6. Add Policing (Conforming/Non-conforming, Drop/Forward, Rate Limit, Precedence/DSCP Rewrite) actions or just Marking (Precedence/DSCP Rewrite) actions to the Policy.
7. Assign the Policy to one or more ports.

The following examples show how to proceed through these tasks to create DiffServ policies.

This example creates two separate policies:

- a. **policyef** — rate-limits ingress traffic on port fe.1.1 to a maximum of 100Mb/s, and on the same traffic, also rewrites the six DSCP bits to a decimal value of 46 for Express Forwarding on layer 3.
- b. **policyaf31** — rate-limits ingress traffic on port fe.1.2 to a maximum of 100Mb/s, and on the same traffic, also rewrites the six DSCP bits to a decimal value of 26 for Flash forwarding on layer 3.

```
B2(rw)->set diffserv adminmode enable
B2(rw)->set diffserv class create all classevery
B2(rw)->set diffserv class match every classevery
B2(rw)->set diffserv policy create policyef in
B2(rw)->set diffserv policy class add policyef classevery
B2(rw)->set diffserv policy police style simple policyef classevery 100000 128
B2(rw)->set diffserv policy police action conform markdscp policyef classevery ef
B2(rw)->set diffserv policy create policyaf31 in
B2(rw)->set diffserv policy class add policyaf31 classevery
B2(rw)->set diffserv policy police style simple policyaf31 classevery 100000 128
B2(rw)->set diffserv policy police action conform markdscp policyaf31 classevery
af31
B2(rw)->set diffserv service add in fe.1.1 policyef
B2(rw)->set diffserv service add in fe.1.2 policyaf31
```

This example creates one policy which identifies VOIP traffic (DSCP value 46 or 32) on ports ge.1.1 through ge.1.10, and drops all other traffic.

```
B2(rw)->set diffserv adminmode enable
B2(rw)->set diffserv class create all classVOIP
B2(rw)->set diffserv class match ipdscp classVOIP ef
B2(rw)->set diffserv class match ipdscp classVOIP cs4
B2(rw)-> set diffserv policy create policyQOS in
B2(rw)-> set diffserv policy class add policyQOS classVOIP
B2(rw)->set diffserv policy police style simple policyQOS classVOIP 1000000 128
B2(rw)->set diffserv policy police action nonconform drop policyQOS classVOIP
B2(rw)-> set diffserv service add in ge.1.1-10 policyQOS
```



## Policy Classification Configuration

This chapter describes the Policy Classification set of commands and how to use them.



**Note:** A license is required to enable Policy on the SecureStack B2 and B3. Refer to “[Activating Licensed Features](#)” on page 3-26 for more information.

For information about...	Refer to page...
<a href="#">Policy Classification Configuration Summary</a>	10-1
<a href="#">Configuring Policy Profiles</a>	10-1
<a href="#">Configuring Classification Rules</a>	10-5
<a href="#">Assigning Ports to Policy Profiles</a>	10-14
<a href="#">Configuring Policy Class of Service (CoS)</a>	10-15

### Policy Classification Configuration Summary

SecureStack B2 devices support policy profile-based provisioning of network resources by allowing IT administrators to:

- Create, change or remove policy profiles based on business-specific use of network services.
- Permit or deny access to specific services by creating and assigning classification rules which map user profiles to protocol-based frame filtering policies configured for a particular VLAN or Class of Service (CoS).
- Assign or unassign ports to policy profiles so that only ports activated for a profile will be allowed to transmit frames accordingly.



**Note:** It is recommended that you use Enterasys Networks NetSight Policy Manager as an alternative to CLI for configuring policy classification on the SecureStack B2 devices.

### Configuring Policy Profiles

#### Purpose

To review, create, change and remove user profiles that relate to business-driven policies for managing network resources.



**Note:** B3, C3, and G3 devices support profile-based CoS traffic rate limiting only. Policy rules specifying CoS will only rate limit on C2 and B2 devices, including when they are configured on mixed stacks containing B3 and C3 devices.

## Commands

For information about...	Refer to page...
show policy profile	<a href="#">10-2</a>
set policy profile	<a href="#">10-3</a>
clear policy profile	<a href="#">10-5</a>

## show policy profile

Use this command to display policy profile information.

### Syntax

```
show policy profile {all | profile-index [consecutive-pids] [-verbose]}
```

### Parameters

<b>all</b>   <i>profile-index</i>	Displays policy information for all profile indexes or a specific profile index.
<i>consecutive-pids</i>	(Optional) Displays information for specified consecutive profile indexes.
<b>-verbose</b>	(Optional) Displays detailed information.

### Defaults

If optional parameters are not specified, summary information will be displayed for the specified index or all indices.

### Mode

Switch command, read-only.

### Example

This example shows how to display policy information for profile 11:

```
B2(su)->show policy profile 11
Profile Index           : 11
Profile Name            : MacAuth1
Row Status              : active
Port VID Status         : Enable
Port VID Override       : 11
CoS                     : 0
CoS Status              : Disable
Egress Vlans            : none
Forbidden Vlans         : none
Untagged Vlans          : none
Rule Precedence         : 1-31
                        : MACSource(1), MACDest(2), Unknown(3),
                        : Unknown(4), Unknown(5), Unknown(6),
                        : Unknown(7), Unknown(8), Unknown(9),
                        : Unknown(10), Unknown(11), IPSource(12),
```

```

:IPDest(13),IPFrag(14),UDPSrcPort(15),
:UDPDestPort(16),TCPSrcPort(17),TCPDestPort(18),
:ICMPType(19),Unknown(20),IPTOS(21),
:IPProto(22),Unknown(23),Unknown(24),
:Ether(25),Unknown(26),VLANTag(27),
:Unknown(28),Unknown(29),Unknown(30),
:port(31)
Admin Profile Usage      : none
Oper Profile Usage       : none
Dynamic Profile Usage    : none

```

Table 10-33 provides an explanation of the command output.

**Table 10-33 show policy profile Output Details**

Output	What It Displays...
Profile Index	Number of the profile.
Profile Name	User-supplied name assigned to this policy profile.
Row Status	Whether or not the policy profile is enabled ( <b>active</b> ) or disabled.
Port VID Status	Whether or not PVID override is <b>enabled</b> or <b>disabled</b> for this profile. If all classification rules associated with this profile are missed, then this parameter, if specified, determines default behavior.
Port VID Override	The PVID assigned to packets, if PVID override is enabled.
CoS	CoS priority value to assign to packets, if CoS override is enabled.
CoS Status	Whether or not Class of Service override is <b>enabled</b> or <b>disabled</b> for this profile. If all classification rules associated with this profile are missed, then this parameter, if specified, determines default behavior.
Egress VLANs	VLAN(s) that ports to which the policy profile is assigned can use for tagged egress.
Forbidden VLANs	VLAN(s) forbidden to ports to which the policy profile is assigned.
Untagged VLANs	VLAN(s) that ports to which the policy profile is assigned can use for untagged egress.
Rule Precedence	Displays the precedence of types of rules.
Admin Profile Usage	Ports administratively assigned to use this policy profile.
Oper Profile Usage	Ports currently assigned to use this policy profile.
Dynamic Profile Usage	Port dynamically assigned to use this policy profile.

## set policy profile

Use this command to create a policy profile entry.

### Syntax

```

set policy profile profile-index [name name] [pvid-status {enable | disable}]
[pvid pvid] [cos-status {enable | disable}] [cos cos] [egress-vlans egress-vlans]
[forbidden-vlans forbidden-vlans] [untagged-vlans untagged-vlans] [precedence
precedence-list] [append] [clear]

```

## Parameters

<i>profile-index</i>	Specifies an index number for the policy profile. Valid values are <b>1 - 255</b> .
<b>name</b> <i>name</i>	(Optional) Specifies a name for the policy profile. This is a string from 1 to 64 characters.
<b>pvid-status</b> <b>enable</b>   <b>disable</b>	(Optional) Enables or disables PVID override for this profile. If all classification rules associated with this profile are missed, then this parameter, if specified, determines default behavior.
<b>pvid</b> <i>pvid</i>	(Optional) Specifies the PVID to packets, if PVID override is enabled and invoked as default behavior.
<b>cos-status</b> <b>enable</b>   <b>disable</b>	(Optional) Enables or disables Class of Service override for this profile. If all classification rules associated with this profile are missed, then this parameter, if specified, determines default behavior.
<b>cos</b> <i>cos</i>	(Optional) Specifies a CoS value to assign to packets, if CoS override is enabled and invoked as default behavior. Valid values are <b>0 to 7</b> .
<b>egress-vlans</b> <i>egress-vlans</i>	(Optional) Specifies that the port to which this policy profile is applied should be added to the egress list of the VLANs defined by <i>egress-vlans</i> . Packets will be formatted as tagged.
<b>forbidden-vlans</b> <i>forbidden-vlans</i>	(Optional) Specifies that the port to which this policy profile is applied should be added as forbidden to the egress list of the VLANs defined by <i>forbidden-vlans</i> . Packets from this port will not be allowed to participate in the listed VLANs.
<b>untagged-vlans</b> <i>untagged-vlans</i>	(Optional) Specifies that the port to which this policy profile is applied should be added to the egress list of the VLANs defined by <i>untagged-vlans</i> . Packets will be formatted as untagged.
<b>append</b>	(Optional) Appends this policy profile setting to settings previously specified for this policy profile by the <b>egress-vlans</b> , <b>forbidden-vlans</b> , or <b>untagged-vlans</b> parameters.  If <b>append</b> is not used, previous VLAN settings are replaced.
<b>clear</b>	(Optional) Appends this policy profile setting from settings previously specified for this policy profile by the <b>egress-vlans</b> , <b>forbidden-vlans</b> , or <b>untagged-vlans</b> parameters.
<b>precedence</b> <i>precedence-list</i>	(Optional) Assigns a rule precedence to this profile. Lower values will be given higher precedence. For a list of values, refer to the <b>show policy profile</b> command output.

If optional parameters are not specified, none will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to create a policy profile 1 named “netadmin” with PVID override enabled for PVID 10, and Class-of-Service override enabled for CoS 5. This profile can use VLAN 10 for untagged egress:

```
B2(su)->set policy profile 1 name netadmin pvid-status enable pvid 10 cos-status
enable cos 5 untagged-vlans 10
```

## clear policy profile

Use this command to delete a policy profile entry.

### Syntax

```
clear policy profile profile-index
```

### Parameters

<i>profile-index</i>	Specifies the index number of the profile entry to be deleted. Valid values are <b>1</b> to <b>255</b> .
----------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to delete policy profile 8:

```
B2(su)->clear policy profile 8
```

## Configuring Classification Rules

### Purpose

To review, create, assign, and unassign classification rules to policy profiles. This maps user profiles to protocol-based frame filtering policies.



**Note:** B3, C3, and G3 devices support profile-based CoS traffic rate limiting only. Policy rules specifying CoS will not rate limit on these devices, or on mixed stacks including B3 or C3 devices.

### Commands

For information about...	Refer to page...
show policy rule	<a href="#">10-6</a>
show policy capability	<a href="#">10-8</a>
set policy rule	<a href="#">10-9</a>

For information about...	Refer to page...
clear policy rule	<a href="#">10-12</a>
clear policy all-rules	<a href="#">10-13</a>

## show policy rule

Use this command to display policy classification rule information.

### Syntax

```
show policy rule [all | admin-profile | profile-index] [ether | icmp-type | ipproto
| ipdest-socket | ipsource-socket | iptos | macdest | macsource | tcpdest-port |
tcp-source-port | udpdest-port | udp-source-port] [data] [mask mask] [port-string port-
string] [rule-status {active | not-in-service | not-ready}] [storage-type {non-
volatile | volatile}] [vlan vlan] | [drop | forward] [dynamic-pid dynamic-pid]
[cos cos] [admin-pid admin-pid] [-verbose] [usage-list] [display-if-used]
```

### Parameters

<b>all</b>   <b>admin-profile</b>   <i>profile-index</i>	Displays policy classification rules for <b>all</b> profiles, profile ID 0 ( <b>admin-profile</b> ), or for a specific profile index number. Valid values are 1 - 1023.
<b>ether</b>	Displays Ethernet type II rules.
<b>icmp-type</b>	Displays ICMP type rules.
<b>ipproto</b>	Displays IP protocol field in IP packet rules.
<b>ipdest-socket</b>	Displays IP destination address rules.
<b>ipsource-socket</b>	Displays IP source address rules.
<b>iptos</b>	Displays Type of Service rules.
<b>macdest</b>	Displays MAC destination address rules.
<b>macsource</b>	Displays MAC source address rules.
<b>tcpdest-port</b>	Displays TCP destination port rules.
<b>tcp-source-port</b>	Displays TCP source port rules.
<b>udpdest-port</b>	Displays UDP destination port rules.
<b>udp-source-port</b>	Displays UDP source port rules.
<i>data</i>	Displays rules for a predefined classifier. This value is dependent on the classification type entered. Refer to <a href="#">Table 10-35</a> for valid values for each classification type.
<b>mask</b> <i>mask</i>	(Optional) Displays rules for a specific data mask. Refer to <a href="#">Table 10-35</a> for valid values for each classification type and data value.
<b>port-string</b> <i>port-string</i>	(Optional) Displays rules related to a specific ingress port.
<b>rule-status</b> <b>active</b>   <b>not-in-service</b>   <b>not-ready</b>	(Optional) Displays rules related to a specific rules status.
<b>storage-type</b> <b>non-volatile</b>   <b>volatile</b>	(Optional) Displays rules configured for either non-volatile or volatile storage.

<b>vlan</b> <i>vlan</i>	(Optional) Displays rules for a specific VLAN ID.
<b>drop   forward</b>	Displays rules based on whether matching packets will be dropped or forwarded.
<b>dynamic-pid</b> <i>dynamic-pid</i>	Displays rules associated with a specific dynamic policy ID.
<b>cos</b> <i>cos</i>	(Optional) Displays rules for a Class-of-Service value. (Not supported on B3, C3 devices.)
<b>admin-pid</b> <i>admin-pid</i>	Displays rules associated with a specific administrative policy ID [1..1023].
<b>-verbose</b>	(Optional) Displays detailed information.
<b>usage-list</b>	(Optional) If selected, each rule's usage-list shall be checked and shall display only those ports which have applied this rule.
<b>display-if-used</b>	(Optional) Displays rule(s) only if they are applied to at least one port.

## Defaults

If **verbose** is not specified, summary information will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display policy classification information for Ethernet type 2 rules

```
B2(su)->show policy rule ether
|PID|Rule Type|Rule Data|Mk|PortStr|RS|ST|VLAN|CoS|U|
|02|Ether|2048 (0x0800)|16|All|A|NV|fwr|?|
|02|Ether|2049 (0x0801)|16|All|A|NV|drop|?|
|02|Ether|2989 (0x0bad)|16|All|A|NV|drop|?|
|02|Ether|33079 (0x8137)|16|All|A|NV|drop|?|
```

This example shows how to display policy classification information for administrative rule 1

```
B2(su)->show policy rule admin-pid 1
|Admin|Rule Type|Rule Data|Mk|PortStr|RS|ST|dPID|aPID|U|
|admin|Port|ge.1.1|16|ge.1.1|A|NV||1|?|
|admin|Port|ge.1.2|16|ge.1.2|A|NV||1|?|
|admin|Port|ge.1.3|16|ge.1.3|A|NV||1|?|
|admin|Port|ge.1.4|16|ge.1.4|A|NV||1|?|
|admin|Port|ge.1.5|16|ge.1.5|A|NV||1|?|
|admin|Port|ge.1.6|16|ge.1.6|A|NV||1|?|
|admin|Port|ge.1.7|16|ge.1.7|A|NV||1|?|
|admin|Port|ge.1.8|16|ge.1.8|A|NV||1|?|
|admin|Port|ge.1.9|16|ge.1.9|A|NV||1|?|
|admin|Port|ge.1.10|16|ge.1.10|A|NV||1|?|
|admin|Port|ge.1.11|16|ge.1.11|A|NV||1|?|
|admin|Port|ge.1.12|16|ge.1.12|A|NV||1|?|
```

[Table 10-34](#) provides an explanation of the command output.

**Table 10-34 show policy rule Output Details**

Output	What It Displays...
PID	Profile index number. Assigned to this classification rule with the <b>set policy profile</b> command (" <a href="#">set policy profile</a> " on page 10-3).

**Table 10-34 show policy rule Output Details (Continued)**

Output	What It Displays...
Rule Type	Type of classification rule. Refer to <a href="#">Table 10-35</a> for valid types.
Rule Data	Rule data value. Refer to <a href="#">Table 10-35</a> for valid values for each classification type.
Mk	Rule data mask. Refer to <a href="#">Table 10-35</a> for valid values for each classification data value.
PortStr	Ingress port(s) to which this rule applies.
RS	Whether or not the status of this rule is active (A), not in service or not ready.
ST	Whether or not this rule's storage type is non-volatile (NV) or volatile (V).
VLAN	VLAN ID to which this rule applies and whether or not matching packets will be dropped or forwarded.
CoS	If applicable, Class of Service value to which this rule applies. (Not supported on B3, C3, and G3 devices.)
U	Whether or not this rule has been used.
dPID	Whether or not this is a dynamic profile ID.
aPID	Whether or not this is an administrative profile ID.

## show policy capability

Use this command to display detailed policy classification capabilities supported by your SecureStack B2 device.

### Syntax

```
show policy capability
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Usage

Use this command to display detailed policy classification capabilities supported by your SecureStack B2 device. The output of this command shows a table listing classifiable traffic attributes and the type of actions, by rule type, that can be executed relative to each attribute. Above the table is a list of all the actions possible on this device.

The left-most column of the table lists all possible classifiable traffic attributes. The next two columns from the left indicate how policy profiles may be assigned, either administratively or dynamically. The next four columns from the left indicate the actions that may be performed. The last three columns indicate auditing options.

An x in an action column for a traffic attribute row indicates that your system has the capability to perform that action for traffic classified by that attribute.



## Example

This example shows how to display the device's policy classification capabilities. Refer to [“set policy rule”](#) on page 10-9 for a description of the parameters displayed:

```
B2(su)->show policy capability
```

The following supports related to policy are supported in this device:

VLAN Forwarding	Priority	Permit
Deny	Precedence Reordering	Rules Table
Rule-Use Notification	Longest Prefix Rules	

=====									
	D					F			D
	Y					O	S		I
	N	A				R	Y		S
	A	D	V		D	W	S	T	A
	M	M	L	C	R	A	L	R	B
	I	I	A	O	O	R	O	A	L
SUPPORTED RULE TYPES	C	N	N	S	P	D	G	P	E
=====									
MAC source address				X	X	X			
MAC destination address				X	X	X			
IPX source address									
IPX destination address									
IPX source socket									
IPX destination socket									
IPX transmission control									
IPX type field									
IPv6 source address									
IPv6 destination address									
IPv6 flow label									
IP source address				X	X	X			
IP destination address				X	X	X			
IP fragmentation									
UDP port source				X	X	X			
UDP port destination				X	X	X			
TCP port source				X	X	X			
TCP port destination				X	X	X			
ICMP packet type				X	X	X			
TTL									
IP type of service				X	X	X			
IP proto				X	X	X			
Ether II packet type			X	X	X	X			
LLC DSAP/SSAP/CTRL									
VLAN tag									
Replace tci									
Port string	X	X	X	X	X	X			
=====									

## set policy rule

Use this command to assign incoming untagged frames to a specific policy profile and to VLAN or Class-of-Service classification rules.

### Syntax

This command has two forms of syntax—one to create an admin rule (for policy ID 0), and the other to create a classification rule and attach it to a policy profile.

```
set policy rule admin-profile {vlantag data [mask mask] admin-pid profile-index}
[port-string port-string]

set policy rule profile-index {ether | icmp type | ip proto | ip dest socket |
ip source socket | ip tos | mac dest | mac source | tcp dest port | tcp source port |
udp dest port | udp source port} data [mask mask] [vlan vlan] [cos cos] | [drop |
forward]
```



**Note:** Classification rules are automatically enabled when created.

## Parameters

The following parameters apply to creating an admin rule.

<b>admin-profile</b>	Specifies that this is an admin rule for policy ID 0.
<b>vlantag data</b>	Classifies based on VLAN tag specified by <i>data</i> . Value of <i>data</i> can range from 1 to 4094 or 0xFFFF.
<b>mask mask</b>	(Optional) Specifies the number of significant bits to match, dependent on the <i>data</i> value entered. Value of <i>mask</i> can range from 1 to 12.  Refer to <a href="#">Table 10-35</a> for valid values for each classification type and data value.
<b>admin-pid profile-index</b>	Associates this admin rule with a policy profile, identified by its index number. Policy profiles are configured with the <b>set policy profile</b> command as described in “ <a href="#">set policy profile</a> ” on page 10-3.  Valid <i>profile-index</i> values are 1- 255.
<b>port-string port-string</b>	(Optional) Assigns this rule to the specified policy profile on specific ingress port(s). Rule would not be used until policy is assigned to the specified port(s) using the <b>set policy port</b> command as described in “ <a href="#">set policy port</a> ” on page 10-14.

The following parameters apply to creating a classification rule.

<i>profile-index</i>	Specifies a policy profile number to which this rule will be assigned. Policy profiles are configured with the <b>set policy profile</b> command as described in “ <a href="#">set policy profile</a> ” on page 10-3. Valid <i>profile-index</i> values are 1- 255.
<b>ether</b>	Classifies based on type field in Ethernet II packet.
<b>icmp type</b>	Classifies based on ICMP type.
<b>ip proto</b>	Classifies based on Protocol field in IP packet.
<b>ip dest socket</b>	Classifies based on destination IP address with optional post-fixed port.
<b>ip source socket</b>	Classifies based on source IP address, with optional post-fixed port.
<b>ip tos</b>	Classifies based on Type of Service field in IP packet.
<b>mac dest</b>	Classifies based on MAC destination address.
<b>mac source</b>	Classifies based on MAC source address.
<b>tcp dest port</b>	Classifies based on TCP destination port.
<b>tcp source port</b>	Classifies based on TCP source port.

<b>udpdestport</b>	Classifies based on UDP destination port.
<b>udpsourceport</b>	Classifies based on UDP source port.
<i>data</i>	Specifies the code for a predefined classifier. This value is dependent on the classification type entered. Refer to <a href="#">Table 10-35</a> for valid values for each classification type.
<b>mask</b> <i>mask</i>	(Optional) Specifies the number of significant bits to match, dependent on the <i>data</i> value entered. Refer to <a href="#">Table 10-35</a> for valid values for each classification type and data value.
<b>vlan</b> <i>vlan</i>	Classifies to a VLAN ID.
<b>cos</b> <i>cos</i>	Specifies that this rule will classify to a Class-of-Service ID. Valid values are <b>0 - 4095</b> . A value of -1 indicates that no CoS forwarding behavior modification is desired. (Not supported on B3, C3, and G3.)
<b>drop</b>   <b>forward</b>	Specifies that packets within this classification will be dropped or forwarded.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

[Table 10-35](#) provides the **set policy rule** *data* values that can be entered for a particular classification type, and the *mask* bits that can be entered for each classifier associated with that parameter.

**Table 10-35 Valid Values for Policy Classification Rules**

Classification Rule Parameter	<i>data</i> value	<i>mask</i> bits
ether	Type field in Ethernet II packet: <b>1536 - 65535</b> or <b>0x600 - 0xFFFF</b>	<b>1 - 16</b>
icmptype	ICMP Type: <b>a.b</b>	<b>1 - 16</b>
ipproto	Protocol field in IP packet: <b>0 - 255</b> or <b>0 - 0xFF</b>	<b>1 - 8</b>
Destination or Source IP Address: ipdestsocket ipsourcesocket	IP Address in dotted decimal format: <b>000.000.000.000</b> and (Optional) post-fixed port: <b>0 - 65535</b>	<b>1 - 48</b>
iptos	Type of Service field in IP packet: <b>0 - 255</b> or <b>0 - 0xFF</b>	<b>1 - 8</b>
Destination or Source MAC: macdest macsource	MAC Address: <b>00-00-00-00-00-00</b>	<b>1 - 48</b>
Destination or Source TCP port: tcpdestport tcpsourceport	TCP Port Number: <b>0 - 65535</b> or <b>0 - 0xFFFF</b>	<b>1 - 16</b>

**Table 10-35 Valid Values for Policy Classification Rules (Continued)**

Classification Rule Parameter	<i>data</i> value	<i>mask</i> bits
Destination or Source UDP port: udpsourceport udpdestport	UDP Port Number: <b>0 - 65535</b> or <b>0 - 0xFFFF</b>	<b>1 - 16</b>
viantag	VLAN tag: <b>1- 4094</b>	<b>1 -12</b>

## Examples

This example shows how to use [Table 10-35](#) to assign a rule to policy profile 3 that will filter Ethernet II Type 1526 frames to VLAN 7:

```
B2(su)->set policy rule 3 ether 1526 vlan 7
```

This example shows how to use [Table 10-35](#) to assign a rule to policy profile 5 that will forward UDP frames from source port 45:

```
B2(su)->set policy rule 5 udpportsource 45 forward
```

This example shows how to use [Table 10-35](#) to assign a rule to policy profile 1 that will drop IP source traffic from IP address 1.2.3.4. If mask 32 is not specified as shown, a default mask of 48 bits (IP address + port) would be applied:

```
B2(su)->set policy rule 1 ipsourcesocket 1.2.3.4 mask 32 drop
```

## clear policy rule

Use this command to delete policy classification rule entries.

### Syntax

This command has two forms of syntax—one to clear an admin rule (for policy ID 0), and the other to clear a classification rule.

```
clear policy rule admin-profile {viantag data [mask mask]
```

```
clear policy rule profile-index {all-pid-entries | {ether | icmptype | ipproto |  
ipdestsocket | ipsourcesocket | iptos | macdest | macsource | tcpdestport |  
tcpsourceport | udpdestport | udpsourceport}}
```

### Parameters

The following parameters apply to deleting an admin rule.

<b>admin-profile</b>	Specifies that the rule to be deleted is an admin rule for policy ID 0.
<b>viantag data</b>	Deletes the rule based on VLAN tag specified by <i>data</i> . Value of <i>data</i> can range from 1 to 4094 or 0xFFFF.
<b>mask mask</b>	(Optional) Specifies the number of significant bits to match, dependent on the <i>data</i> value entered. Value of <i>mask</i> can range from 1 to 12.  Refer to <a href="#">Table 10-35</a> for valid values for each classification type and data value.

The following parameters apply to deleting a classification rule.

<i>profile-index</i>	Specifies a policy profile for which to delete classification rules. Valid <i>profile-index</i> values are <b>1 - 255</b> .
<b>all-pid-entries</b>	Deletes all entries associated with the specified policy profile.
<b>ether</b>	Deletes associated Ethernet II classification rule.
<b>icmptype</b>	Deletes associated ICMP classification rule.
<b>ipproto</b>	Deletes associated IP protocol classification rule.
<b>ipdestsocket</b>	Deletes associated IP destination classification rule.
<b>ipsourcesocket</b>	Deletes associated IP source classification rule.
<b>iptos</b>	Deletes associated IP Type of Service classification rule.
<b>macdest</b>	Deletes associated MAC destination address classification rule.
<b>macsource</b>	Deletes associated MAC source address classification rule.
<b>tcpdestport</b>	Deletes associated TCP destination port classification rule.
<b>tcpsourceport</b>	Deletes associated TCP source port classification rule.
<b>udpdestport</b>	Deletes associated UDP destination port classification rule.
<b>udpsourceport</b>	Deletes associated UDP source port classification rule.

## Defaults

When applicable, *data* and *mask* must be specified for individual rules to be cleared.

## Mode

Switch command, read-write.

## Examples

This example shows how to delete Ethernet II Type 1526 classification rule entries associated with policy profile 1 from all ports

```
B2(su)->clear policy rule 1 ether 1526
```

This example shows how to remove a rule from policy profile 5 that will forward UDP frames from source port 45:

```
B2(su)->clear policy rule 5 udpportsource 45 forward
```

# clear policy all-rules

Use this command to remove all policy classification rules.

## Syntax

```
clear policy all-rules
```

## Parameters

None.

## Defaults

None.

Mode

Switch command, read-write.

Example

This example shows how to remove all administrative and policy index rules:

```
B2(su)->clear policy all-rules
```

Assigning Ports to Policy Profiles



**Note:** The B2 switch supports up to eight user policies per port.

Purpose

To assign and unassign ports to policy profiles.

Commands

For information about...	Refer to page...
set policy port	<a href="#">10-14</a>
clear policy port	<a href="#">10-15</a>

set policy port

Use this command to assign ports to a policy profile.

Syntax

```
set policy port port-string profile-index
```

Parameters

<i>port-string</i>	Specifies the port(s) to add to the policy profile. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<i>profile-index</i>	Specifies the ID of the policy profile (role) to which the port(s) will be added. This value must match the <i>profile-index</i> value assigned using the <b>set policy profile</b> command (“ <a href="#">set policy profile</a> ” on page 10-3) in order for a policy profile to be active on the specified port.

Defaults

None.

Mode

Switch command, read-write.

## Example

This example shows how to allow Gigabit Ethernet ports 5 through 15 in slot 1 to transmit frames according to policy profile 1:

```
B2(su)->set policy port ge.1.5-15 1
```

## clear policy port

Use this command to remove a policy profile from one or more ports.

### Syntax

```
clear policy port port-string profile-index
```

### Parameters

<i>port-string</i>	Specifies the port(s) from which to remove the policy profile. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>profile-index</i>	Specifies the ID of the policy profile (role) to which the port(s) will be added. This value must match the <i>profile-index</i> value assigned using the <b>set policy profile</b> command ( <a href="#">“set policy profile”</a> on page 10-3) in order for a policy profile to be active on the specified port.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to remove policy profile 10 from port 21 in slot 1:

```
B2(rw)->clear policy port ge.1.21 10
```

## Configuring Policy Class of Service (CoS)

### Using Port-Based or Policy-Based CoS Settings



**Note:** It is recommended that you use Enterasys Networks NetSight Policy Manager as an alternative to CLI for configuring policy-based CoS on the switches.

The SecureStack B2 supports Class of Service (CoS), which allows you to assign mission-critical data to a higher priority through the device by delaying less critical traffic during periods of congestion. The higher priority traffic going through the device is serviced first (before lower priority traffic). The Class of Service capability of the device is implemented by a priority queueing mechanism. Class of Service is based on the IEEE 802.1D (802.1p) standard specification, and allows you to define eight priorities (0-7, with 7 granted highest priority) and up to 8 transmit queues (0-7) for each port.

Enterasys Networks' enhanced CoS implementation allows you to use the following methods to configure Class of Service on the SecureStack B2:

- Allowing the switch to automatically assign policy-based inbound rate limiters as described in this section.
- Configuring transmit queueing and rate limiting on a per-port basis as described in [Chapter 11](#).

By default, policy-based CoS is disabled on the device, and default or user-assigned port-based 802.1D (802.1p) settings are used to determine traffic rate limiting. When policy-based CoS is enabled, the default and user-assigned policy-based settings will override port-based settings described in [Chapter 11](#).

## About Policy-Based CoS Configurations

Once enabled using the **set cos state** command as described in “[set cos state](#)” on page 10-18, you can add to the policy-based CoS function by defining new port groupings, and assigning inbound rate limiters. The process for user-defined CoS configuration involves the following steps and associated commands listed in [Procedure 10-1](#). An example follows the procedure.

### Procedure 10-1 User-Defined CoS Configuration

Step	Task	Command(s)
1.	Enable CoS	<b>set cos state</b>
2.	Create CoS port groups	<b>set cos port-config</b>
3.	Define physical rate limiters for groups	<b>set cos port-resource</b>
4.	Create virtual reference for the IRL resource (physical reference) for each port group	<b>set cos reference</b>
5.	Add IRL reference to CoS settings table	<b>set cos settings</b>

### Example

This example creates different inbound rate limiters for two port groups and then assigns them to traffic with a CoS setting of 0.

1. Configure two port groups, one for user ports and one for uplink ports and assign ports to the groups. Port group 1.0 will represent user ports, group 2.0 will represent uplink ports.

```
B2(su)->set cos port-config irl 1.0 name Users ports ge.1.1-46
B2(su)->set cos port-config irl 2.0 name Uplink ports ge.1.47-48
```

```
B2(su)->show cos port-config
Inbound Rate Limiting Port Configuration Entries
```

```
-----
Port Group Name  :Default
Port Group      :0
Port Type       :0
Assigned Ports  :none
-----
Port Group Name  :Users
Port Group      :1
Port Type       :0
Assigned Ports  :ge.1.1-46
-----
Port Group Name  :Uplink
Port Group      :2
```



```
Port Type      :0
Assigned Ports :ge.1.47-48
-----
```

2. Configure physical inbound rate limiters for each port group. For the user port group (1.0), create an IRL (irl-index of 1) for 512 kbps. For the uplink port group (2.0), create an IRL (irl-index of 1) for 10 megabits per second (10,000 kbps).

```
B2(su)->set cos port-resource irl 1.0 1 unit kbps rate 512
B2(su)->set cos port-resource irl 2.0 1 unit kbps rate 10000
```

```
B2(su)->show cos port-resource irl 1.0 1
Group Index Resource Type Unit      Rate      Rate Limit Type Action
-----
```

Group	Index	Resource	Type	Unit	Rate	Rate Limit	Type	Action
1.0	1	irl	kbps	512		drop		none

```
B2(su)->show cos port-resource irl 2.0 1
Group Index Resource Type Unit      Rate      Rate Limit Type Action
-----
```

Group	Index	Resource	Type	Unit	Rate	Rate Limit	Type	Action
2.0	1	irl	kbps	10000		drop		none

3. In the CoS IRL reference mapping table for each port group, create a reference for each IRL resource created in the previous step. We will use reference number 1.

```
B2(su)->set cos reference irl 1.0 1 rate-limit 1
B2(su)->set cos reference irl 2.0 1 rate-limit 1
```

```
B2(su)->show cos reference irl 1.0
```

```
Group Index Reference Type Rate Limiter
-----
```

Group	Index	Reference	Type	Rate Limiter
1.0	0	irl	none	
1.0	1	irl	1	
1.0	2	irl	none	
1.0	3	irl	none	
...				
1.0	97	irl	none	
1.0	98	irl	none	
1.0	99	irl	none	

```
B2(su)->show cos reference irl 2.0
```

```
Group Index Reference Type Rate Limiter
-----
```

Group	Index	Reference	Type	Rate Limiter
2.0	0	irl	none	
2.0	1	irl	1	
2.0	2	irl	none	
2.0	3	irl	none	
...				
2.0	97	irl	none	
2.0	98	irl	none	
2.0	99	irl	none	

4. In the CoS settings table, configure a CoS setting for CoS index 1, which has a priority of 0. We enter the IRL reference, created in the previous step.

```
B2(su)->set cos settings 0 irl-reference 1
B2(su)->show cos settings
```

```
CoS Index Priority ToS      IRL
-----
```

CoS Index	Priority	ToS	IRL
0	0	*	1
1	1	*	*
2	2	*	*

3	3	*	*
4	4	*	*
5	5	*	*
6	6	*	*
7	7	*	*

## Commands

For information about...	Refer to page...
set cos state	<a href="#">10-18</a>
show cos state	<a href="#">10-19</a>
clear cos state	<a href="#">10-19</a>
set cos settings	<a href="#">10-20</a>
clear cos settings	<a href="#">10-21</a>
show cos settings	<a href="#">10-21</a>
set cos port-config	<a href="#">10-22</a>
show cos port-config	<a href="#">10-23</a>
clear cos port-config	<a href="#">10-24</a>
set cos port-resource	<a href="#">10-25</a>
show cos port-resource	<a href="#">10-26</a>
clear cos port-resource	<a href="#">10-26</a>
set cos reference	<a href="#">10-27</a>
show cos reference	<a href="#">10-28</a>
clear cos reference	<a href="#">10-29</a>
show cos unit	<a href="#">10-30</a>
clear cos all-entries	<a href="#">10-30</a>
show cos port-type	<a href="#">10-31</a>

## set cos state

Use this command to enable or disable Class of Service.

### Syntax

```
set cos state {enable | disable}
```

### Parameters

<b>enable   disable</b>	Enables or disables Class of Service on the switch. Default state is disabled.
-------------------------	--

### Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable Class of Service:

```
B2(rw)->set cos state enable
```

# show cos state

Use this command to display the Class of Service enable state.

## Syntax

```
show cos state
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to show the Class of Service enable state:

```
B2(rw)->show cos state  
Class-of-Service application is enabled
```

# clear cos state

Use this command to set CoS state back to its default setting of disabled.

## Syntax

```
clear cos state
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the CoS state back to its default setting of disabled:

```
B2(su)->clear cos state
```

## set cos settings

Use this command to configure a Class of Service entry in the CoS settings table.

### Syntax

```
set cos settings cos-index priority priority [tos-value tos-value] [irl-reference irl-reference]
```

### Parameters

<i>cos-index</i>	Specifies a Class of Service entry. Valid values are <b>0</b> to <b>255</b> .
<b>priority</b> <i>priority</i>	Specifies an 802.1d priority value. Valid values are <b>0</b> to <b>7</b> , with 0 being the lowest priority. See Usage section below for more information.
<b>tos-value</b> <i>tos-value</i>	(Optional) Specifies a Type of Service value. Valid values are <b>0</b> to <b>255</b> . See Usage section below for more information.
<b>irl-reference</b> <i>irl-reference</i>	(Optional) Set the inbound rate limiter associated with this entry. Valid values are 0 to 99. See Usage section below for more information.

### Defaults

If no optional parameters are specified, none will be applied.

### Mode

Switch command, read-write.

### Usage

The CoS settings table takes individual class of service features and displays them as belonging to a CoS entry. Essentially, it is used for CoS feature assignment. Each class of service entry consists of an index, 802.1p priority, an optional ToS value, and an IRL reference.

- **CoS Index**

Indexes are unique identifiers for each CoS setting. CoS indexes 0 through 7 are created by default and mapped directly to 802.1p priority for backwards compatibility. These entries cannot be removed, and 802.1p priority values cannot be changed. When CoS is enabled, indexes are assigned. Up to 256 CoS indexes or entries can be configured.

- **Priority**

802.1p priority can be applied per CoS index. For each new CoS index created, the user has the option to assign an 802.1p priority value 0 to 7 for the class of service. CoS indexes 0 through 7 map directly to 802.1p priorities and cannot be changed as they exist for backward compatibility.

- **ToS**

This value can be set per class of service, but is not required. When a frame is assigned to a class of service for which this value is configured, the ToS field of the incoming IP packet will be overwritten to the user-defined value. ToS bits 0-255 can be set, making the entire ToS field rewritable. ToS can be set for CoS indexes 0 through 7.

- **IRL Reference**

The CoS IRL reference field is optional, as rate limits are not required. The IRL reference does not assign an inbound rate limit but points to the CoS IRL Reference Mapping Table. This reference may be thought of as the virtual rate limiter that will assign the physical rate limiter defined by the IRL Reference Mapping Table, described in “[set cos reference](#)” on page 10-27.

## Example

This example shows how to create CoS entry 8 with a priority value of 3:

```
B2(rw)->set cos settings 8 priority 3
```

# clear cos settings

Use this command to clear Class of Service entry settings.

## Syntax

```
clear cos settings cos-list {[all] | [priority] [tos-value] [irl-reference]}
```

## Parameters

<i>cos-list</i>	Specifies a Class of Service entry to clear.
<b>all</b>	Clears all settings associated with this entry.
<b>priority</b>	Clears the priority value associated with this entry.
<b>tos-value</b>	Clears the Type of Service value associated with this entry.
<b>irl-reference</b>	Clear the IRL reference associated with this entry.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the priority for CoS entry 8:

```
B2(rw)->clear cos settings 8 priority
```

# show cos settings

Use this command to display Class of Service parameters.

## Syntax

```
show cos settings [cos-list]
```

## Parameters

<i>cos-list</i>	(Optional) Specifies a Class of Service entry to display.
-----------------	---

## Defaults

If not specified, all CoS entries will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to show all CoS settings:

```
B2(su)->show cos settings
CoS Index Priority ToS IRL
-----
0          0      *   *
1          1      *   *
2          2      *   *
3          3      *   *
4          4      *   *
5          5      *   *
6          6      *   *
7          7      *   *
```

## set cos port-config

Use this command to create a port group for inbound rate limiting and add or remove ports from the group.

### Syntax

```
set cos port-config irl group-type-index [name name] [ports port-list] [append] |
[clear]
```

### Parameters

<b>irl</b>	Specifies that this is an inbound rate limiting (IRL) port group.
<i>group-type-index</i>	Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<b>name name</b>	(Optional) User defined name for the <b>group</b> .
<b>ports port-list</b>	(Optional) Ports assigned to the <b>group</b> . All ports must be of the same port <b>type</b> (Fast Ethernet, Gigabit Ethernet).
<b>append</b>	(Optional) Append (add) the ports to the ports that are already in the <b>group</b> .
<b>clear</b>	(Optional) Clear the given ports from those assigned to the <b>group</b> .

### Defaults

None.

### Mode

Switch command, read-write.

## Usage

CoS IRL port groups are identified by group number and the type of ports in the group, in the form of **group#.port-type**. The IRL port group 0.0 exists by default. This default port group cannot be removed and all physical ports in the system are assigned to it. Up to seven additional port groups (1 through 7) can be configured. Currently, only one port type (type 0) is supported. This port type supports 100 limiters.

Additional port groups may be created for flexibility. Ports assigned to a new port group must be mutually exclusive from the other port group entries—ports are automatically removed from the default port group—and must be comprised of the same port type as defined by the port group.

The creation of additional port groups could be used to combine similar ports by their function for flexibility. For instance, ports associated to users can be added to a port group called “Users” and ports associated to uplink ports can be added to a port group called “Uplink.” Using these port groups, a single class of service can assign different rate limits to each port group. “User” ports can be assigned one rate limit, while “Uplink” ports can be assigned another. DFE supports a maximum of 8 port groups per CoS function (IRL).

The command [show cos port-config](#) displays each IRL port group configured by group and type, with the group name and associated (assigned) ports. The command [show cos port-type](#) displays the available inbound rate limiting resources for the port type.

## Example

This example configures two port groups, one for user ports and one for uplink ports and assign ports to the groups. Port group 1.0 will represent user ports, group 2.0 will represent uplink ports.

```
B2(su)->set cos port-config irl 1.0 name Users ports ge.1.1-46
B2(su)->set cos port-config irl 2.0 name Uplink ports ge.1.47-48
```

## show cos port-config

Use this command to show inbound rate limiting groups and the assigned ports.

## Syntax

```
show cos port-config [irl group-type-index]
```

## Parameters

<b>irl</b>	(Optional) Specifies that inbound rate limiting configuration information should be displayed.
<i>group-type-index</i>	<p>(Optional) Show assigned ports for a specific port group. Valid entries are in the form of <b>group#.port-type</b>.</p> <p>Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b>.</p>

## Defaults

The **show cos port-config** command by itself will show all Port Groups.

## Mode

Switch command, read-only.

### Example

This example shows all inbound rate limiting port groups. Note that ports ge.1.1 through ge.1.48 were removed from the default port group 0.0 when they were added to port groups 1.0 and 2.0.

```
B2(su)->show cos port-config

Inbound Rate Limiting Port Configuration Entries
-----
Port Group Name :Default
Port Group      :0
Port Type       :0
Assigned Ports  :none
-----
Port Group Name :Users
Port Group      :1
Port Type       :0
Assigned Ports  :ge.1.1-46
-----
Port Group Name :Uplink
Port Group      :2
Port Type       :0
Assigned Ports  :ge.1.47-48
-----
```

## clear cos port-config

Use this command to clear inbound rate limiting groups or assigned ports.

### Syntax

```
clear cos port-config irl {all | group-type-index {[entry] | [name] [ports]}}
```

### Parameters

<b>irl</b>	Clear an IRL port group configuration.
<b>all</b>	Clear all inbound rate limiting port-config non-default entries.
<i>group-type-index</i>	Delete a specific port group or group name, or clear the ports from that group. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<b>entry</b>	Delete this non-default inbound rate limiter entry.
<b>name</b>	Clear the administratively assigned textual description of this port group entry to its default.
<b>ports</b>	Clear the ports assigned to this group to its default.

### Defaults

None.

### Mode

Switch command, read-write.



## Usage

The default port group 0.0 cannot be deleted.

## Example

This example deletes all Port Groups except for the Default group 0.0:

```
B2(su)->clear cos port-config irl all
```

# set cos port-resource

Use this command to set the inbound rate limit parameters for a specific IRL resource for a specific port group.

## Syntax

```
set cos port-resource irl group-type-index irl-index {[unit {kbps}]} [rate rate]
[type {drop}]}
```

## Parameters

<b>irl</b>	Set an IRL port resource.
<i>group-type-index</i>	Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<i>irl-index</i>	Index number of the inbound rate limiter resource associated with this entry. Valid values range from 0 to 99.
<b>unit</b>	Unit of measure for the inbound rate limiter (only option is Kbps).
<b>kbps</b>	Kilobits per second.
<b>rate rate</b>	Data rate for this inbound rate limiter. This is the actual rate limit. Valid values range from 512 to 1,000,000 Kbps for a Gigabit port.
<b>type drop</b>	Action for the rate limiter. The only action option is drop the frame if all limiters are exceeded.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

CoS port resources are where actual physical rate limiters are configured. Resources map directly to the number of rate limiters supported by the port type. (Port type 0 supports 100 IRL resources.) Resources exist for each port group and are indexed as **group#.port-type.irl-index**. Port resources are not initially configured as rate limiting.

Inbound rate limiting, or rate policing, simply drops or clips traffic inbound if a configured rate is exceeded. CoS inbound rate limiting allows the user to configure rate limits based on kilobits per second.

The `show cos port-resource` command displays the resources available for each port group. By default, no IRL resources are configured. The default Rate Limiting algorithm is drop and cannot be configured otherwise.

## Example

This example sets the inbound rate limit resource index number 1 for port group 2.0 to 10000 Kbps or 1 MB:

```
B2(su)->set cos port-resource irl 2.0 1 unit kbps rate 10000 type drop
```

# show cos port-resource

Use this command to display the IRL port resources.

## Syntax

```
show cos port-resource [irl [group-type-index [irl-index]]]
```

## Parameters

<b>irl</b>	(Optional) Specifies that inbound rate limiting port resources should be displayed.
<i>group-type-index</i>	(Optional) Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<i>irl-index</i>	(Optional) Inbound rate limiter resource index configured for the specified port group. Valid values range from 0 to 99.

## Defaults

If a port group and IRL index are not specified, the IRL configuration for all resources (0-99) for all configured port groups will be shown.

## Mode

Switch command, read-only.

## Example

This example displays the IRL resource index number 1 configuration for group 2.0.

```
B2(su)->show cos port-resource irl 2.0 1
```

'?' after the rate value indicates an invalid rate value

Group	Index	Resource	Type	Unit	Rate	Rate Limit	Type	Action
-----	-----	-----	----	-----	-----	-----	-----	-----
2.0	1	irl	kbps	10000	?	drop		none

# clear cos port-resource

Use this command to set the inbound rate limit in Kbps.

## Syntax

```
clear cos port-resource irl {all | group-type-index [irl-index [unit] [rate]
[type]]}
```

## Parameters

<b>irl</b>	Specifies that an IRL resource is to be cleared.
<b>all</b>	Clear all IRL resources for all port groups.
<i>group-type-index</i>	Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<i>irl-index</i>	(Optional) Inbound rate limiter resource index associated with the specified port group. Valid values range from 0 to 99.
<b>unit</b>	Clear the unit of measure for the inbound rate limiter.
<b>rate</b>	Clear the data rate for this inbound rate limiter.
<b>type</b>	Clear the action for the rate limiter.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example clears the data rate to 0 for IRL resource index 1 for group 2.0.

```
B2(su)->clear cos port-resource irl 2.0 1 rate
```

# set cos reference

Use this command to set the Class of Service inbound rate limiting reference configuration.

## Syntax

```
set cos reference irl group-type-index reference rate-limit irl-index
```

## Parameters

<b>irl</b>	Specifies that an IRL reference is being configured.
<i>group-type-index</i>	Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<i>reference</i>	IRL reference number associated with this entry.

<b>rate-limit</b> <i>irl-index</i>	Rate limiter (IRL resource index) to bind this reference to. Valid values range from 0 to 99.
------------------------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The CoS reference table maps the user-defined IRL references found in the CoS settings table (see “[set cos settings](#)” on page 10-20) to rate limiters created in the port resource table (see “[set cos port-resource](#)” on page 10-25). The CoS reference table indexes can be thought of as virtual rate limiters. The table accounts for the maximum number of rate limiters supported by the device. The virtual limiters then map to the physical rate limiters. The CoS IRL Reference Table is not configured by default.

The CoS IRL reference table uses 100 indexes or virtual rate limiters, and maps each virtual limiter to a physical limiter or resource. An IRL reference table exists for each port group configured, and is indexed similarly to port resources, as port group#, port-type, reference. IRL references are not populated with limiters (resources), but can be configured by the user. The IRL reference table can be displayed using the [show cos reference](#) command.

### Example

In the CoS IRL reference mapping table for port groups 1.0 and 2.0, create a reference for the IRL resource number 1 created for each group. The reference number 1 is used.

```
B2(su)->set cos reference irl 1.0 1 rate-limit 1
B2(su)->set cos reference irl 2.0 1 rate-limit 1
```

## show cos reference

Use this command to show the Class of Service inbound rate limiting reference configuration.

### Syntax

```
show cos reference [irl [group-type-index]]
```

### Parameters

<b>irl</b>	(Optional) Specifies that inbound rate limiting reference information should be displayed.
<i>group-type-index</i>	(Optional) Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .

### Defaults

If **irl** is not specified, all CoS reference information is displayed.

If a specific port group is not specified, information for all port groups is displayed.

## Mode

Switch command, read-only.

## Example

This example shows the Class of Service IRL references for port group 1.0. Note that not all of the 100 possible references are displayed in this output example.

```
B2(su)->show cos reference irl 1.0
```

Group	Index	Reference	Type	Rate	Limiter
1.0	0		irl	none	
1.0	1		irl	1	
1.0	2		irl	none	
1.0	3		irl	none	
...					
1.0	97		irl	none	
1.0	98		irl	none	
1.0	99		irl	none	

## clear cos reference

Use this command to clear the Class of Service inbound rate limiting reference configuration.

## Syntax

```
clear cos reference irl {all / group-type-index reference}
```

## Parameters

<b>irl</b>	Specifies that IRL references are being cleared.
<b>all</b>	Clear all groups indexes and references.
<i>group-type-index</i>	Specifies an inbound rate limiting port group/type index. Valid entries are in the form of <b>group#.port-type</b> .  Valid values for group# can range from 0 to 7. Valid values for port-type can range from 0 to 1, although only port type 0 is currently supported. For example, port group 3 would be specified as <b>3.0</b> .
<i>reference</i>	Clear a specific reference for the specified port group.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the CoS inbound rate limiting reference configuration for all groups:

```
B2(su)->clear cos reference irl all
```

## show cos unit

Use this command to show possible CoS unit entries.

### Syntax

```
show cos unit
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows possible unit entries for inbound rate limiting:

```
B2(su)->show cos unit
```

```
Type:                               Unit:
irl = inbound rate limiting         Kbps  = Kilobits per second

Port Type  Type  Unit  Maximum Rate  Minimum Rate  Granularity
-----
0          irl  Kbps  1000000      512           1
```

## clear cos all-entries

Use this command to clear all Class of Service entries except entries 0-7.

### Syntax

```
clear cos all-entries
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the CoS configuration for all entries except entries 0-7:

```
B2(su)->clear cos all-entries
```

# show cos port-type

Use this command to display Class of Service port type configurations.

## Syntax

```
show cos port-type [irl [port-type]]
```

## Parameters

<b>irl</b>	(Optional) Displays inbound rate limiting information.
<i>port-type</i>	(Optional) Displays information for a specific port type.

## Defaults

If no parameters are specified, inbound rate limiting information for all port types is displayed.

## Mode

Switch command, read-only.

## Usage

The B2 implementation provides one default port type (0) for designating available inbound rate limiting resources. Port type 0 includes all ports.

The port type 0 description is "B2100 IRL," which indicates that this port type provides a maximum of 100 inbound rate limiting resources per port group.

## Example

This example shows inbound rate limiting information for port type 0.

```
B2(su)->show cos port-type irl 0
```

```
Number of resources:      Supported rate types:
irl = inbound rate limiter(s)  Kbps = kilobits per second
```

Index	Port type description	Number of limiters	Supported rate type	Eligible ports	Unselected ports
0	B2 100 IRL	100	kbps	ge.1.1-48	ge.1.1-48





## Port Priority and Rate Limiting Configuration

This chapter describes the Port Priority and Rate Limiting set of commands and how to use them.

For information about...	Refer to page...
<a href="#">Port Priority Configuration Summary</a>	11-1
<a href="#">Configuring Port Priority</a>	11-1
<a href="#">Configuring Priority to Transmit Queue Mapping</a>	11-4
<a href="#">Configuring Quality of Service (QoS)</a>	11-6
<a href="#">Configuring Port Traffic Rate Limiting</a>	11-9

### Port Priority Configuration Summary

The SecureStack B2 device supports Class of Service (CoS), which allows you to assign mission-critical data to higher priority through the device by delaying less critical traffic during periods of congestion. The higher priority traffic through the device is serviced first before lower priority traffic. The Class of Service capability of the device is implemented by a priority queueing mechanism. Class of Service is based on the IEEE 802.1D (802.1p) standard specification, and allows you to define eight priorities (0 through 7) and assign them to transmit queues for each port.

A priority 0 through 7 can be set on each port, with 0 being the lowest priority. A port receiving a frame without priority information in its tag header is assigned a priority according to the default priority setting on the port. For example, if the priority of a port is set to 4, the frames received through that port without a priority indicated in their tag header are classified as a priority 4 and transmitted according to that priority.

In addition, the device's rate limiting capabilities allow you to further prioritize traffic by limiting the rate of inbound traffic on a per port/priority basis.



**Note:** When CoS override is enabled using the **set policy profile** command as described in “[set policy profile](#)” on page 10-3, CoS-based classification rules will take precedence over priority settings configured with the **set port priority** command described in this section.

### Configuring Port Priority

#### Purpose

To view or configure port priority characteristics as follows:

- Display or change the port default Class-of Service (CoS) transmit priority (0 through 7) of each port for frames that are received (ingress) without priority information in their tag header.
- Display the current traffic class mapping-to-priority of each port.
- Set each port to transmit frames according to 802.1D (802.1p) priority set in the frame header.

## Commands

For information about...	Refer to page...
show port priority	<a href="#">11-4</a>
set port priority	<a href="#">11-2</a>
clear port priority	<a href="#">11-3</a>

## show port priority

Use this command to display the 802.1D priority for one or more ports.

### Syntax

`show port priority [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays priority information for a specific port. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, priority for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display the port priority for the ge.2.1 through 5.

```
B2(su)->show port priority ge.2.1-5
ge.2.1 is set to 0
ge.2.2 is set to 0
ge.2.3 is set to 0
ge.2.4 is set to 0
ge.2.5 is set to 0
```

## set port priority

Use this command to set the 802.1D (802.1p) Class-of-Service transmit priority (0 through 7) on each port. A port receiving a frame without priority information in its tag header is assigned a priority according to the priority setting on the port. For example, if the priority of a port is set to

5, the frames received through that port without a priority indicated in their tag header are classified as a priority 5.

A frame with priority information in its tag header is transmitted according to that priority.

## Syntax

```
set port priority port-string priority
```

## Parameters

<i>port-string</i>	Specifies the port for which to set priority. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>priority</i>	Specifies a value of <b>0 to 7</b> to set the CoS priority for the port entered in the <i>port-string</i> . Priority value of 0 is the lowest priority.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set a default priority of 6 on ge.1.3. Frames received by this port without priority information in their frame header are set to the default setting of 6:

```
B2(su)->set port priority ge.1.3 6
```

# clear port priority

Use this command to reset the current CoS port priority setting to 0. This will cause all frames received without a priority value in its header to be set to priority 0.

## Syntax

```
clear port priority port-string
```

## Parameters

<i>port-string</i>	Specifies the port for which to clear priority. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset ge.1.11 to the default priority:

```
B2(rw)->clear port priority ge.1.11
```

# Configuring Priority to Transmit Queue Mapping

## Purpose

To perform the following:

- View the current priority to transmit queue mapping of each physical port.
- Configure each port to either transmit frames according to the port priority, set using the **set port priority** command described in “[set port priority](#)” on page 11-2, or according to a priority based on a percentage of port transmission capacity, assigned to transmit queues using the **set port txq** command described in “[set port txq](#)” on page 11-7.
- Clear current port priority queue settings for one or more ports.

## Commands

For information about...	Refer to page...
show port priority-queue	<a href="#">11-4</a>
set port priority-queue	<a href="#">11-5</a>
clear port priority-queue	<a href="#">11-6</a>

## show port priority-queue

Use this command to display the port priority levels (0 through 7, with 0 as the lowest level) associated with the current transmit queues (0 being the lowest priority) for each selected port. A frame with a certain port priority is transmitted according to the settings entered using the **set port priority-queue** command described in “[set port priority-queue](#)” on page 11-5.

### Syntax

```
show port priority-queue [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays the mapping of priorities to transmit queues for one or more ports.
--------------------	---

### Defaults

If *port-string* is not specified, priority queue information for all ports will be displayed.

### Mode

Switch command, read-only.

## Example

This example shows how to display priority queue information for ge.1.1. In this case, frames with a priority of 0 are associated with transmit queue 1; frames with 1 or 2 priority, are associated with transmit queue 0; and so forth:

```
B2(su)->show port priority-queue ge.1.1
Port      P0 P1 P2 P3 P4 P5 P6 P7
-----
ge.1.1    1  0  0  2  3  4  5  5
```

## set port priority-queue

Use this command to map 802.1D (802.1p) priorities to transmit queues. This enables you to change the transmit queue (0 to 5, with 0 being the lowest priority queue) for each port priority of the selected port. You can apply the new settings to one or more ports.

### Syntax

```
set port priority-queue port-string priority queue
```

### Parameters

<i>port-string</i>	Specifies the port(s) for which to set priority-to-queue mappings. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>priority</i>	Specifies a value of <b>0</b> through <b>7</b> (0 is the lowest level) that determines what priority frames will be transmitted on the transmit queue entered in this command.
<i>queue</i>	Specifies a value of <b>0</b> through <b>5</b> (0 is the lowest level) that determines the queue on which to transmit the frames with the port priority entered in this command.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Although there are eight queues implemented in the switch hardware, only six are available for use in prioritizing various data and control traffic. The 7th and 8th queues are reserved for stacking (if applicable) and network control-related communications. Refer to [“Configuring Quality of Service \(QoS\)”](#) on page 11-6 for more information about configuring the priority mode and weight for these queues.

Priority to transmit queue mapping on an individual port basis can only be configured on Gigabit Ethernet ports (ge.x.x). When you use the set port priority-queue command to configure a Fast Ethernet port (fe.x.x), the mapping values are applied globally to all Fast Ethernet ports on the system.

Example

This example shows how to set priority 5 frames received on ge.2.12 to transmit on queue 0.

```
B2(su)->set port priority-queue ge.2.12 5 0
```

clear port priority-queue

Use this command to reset port priority queue settings back to defaults for one or more ports.

Syntax

```
clear port priority-queue port-string
```

Parameters

<i>port-string</i>	Specifies the port for which to clear priority-to-queue mappings. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

Defaults

None.

Mode

Switch command, read-write.

Example

This example shows how to clear the priority queue settings on ge.2.12:

```
B2(su)->clear port priority-queue ge.2.12
```

Configuring Quality of Service (QoS)

Purpose

Eight transmit queues are implemented in the switch hardware for each port, but only six are available for use in prioritizing various data and control traffic. The seventh and eighth queues are reserved for stacking (if applicable) and network control related communications.

The commands in this section allow you to set the priority mode and weight for each of the available six queues (queues 0 through 5) for each physical port on the switch. Priority mode and weight cannot be configured on LAGs, only on the physical ports that make up the LAG.

Commands

For information about...	Refer to page...
show port txq	<a href="#">11-7</a>
set port txq	<a href="#">11-7</a>
clear port txq	<a href="#">11-8</a>

## show port txq

Use this command to display QoS transmit queue information for one or more physical ports.

### Syntax

```
show port txq [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Specifies port(s) for which to display QoS settings. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.  Only physical ports will be displayed. LAG ports have no transmit queue information.
--------------------	--

### Defaults

If the *port-string* is not specified, the QoS setting of all physical ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display the current algorithm and transmit queue weights configured on ports `ge.1.10` through `24`:

```
B2(su)->show port txq ge.1.10-24
Port      Alg  Q0  Q1  Q2  Q3  Q4  Q5  Q6  Q7
-----
ge.1.10 WRR 2   10  15  20  24  29  SP  SP
ge.1.11 WRR 2   10  15  20  24  29  SP  SP
ge.1.12 WRR 2   10  15  20  24  29  SP  SP
ge.1.13 WRR 2   10  15  20  24  29  SP  SP
ge.1.14 WRR 2   10  15  20  24  29  SP  SP
ge.1.15 WRR 2   10  15  20  24  29  SP  SP
ge.1.16 WRR 2   10  15  20  24  29  SP  SP
ge.1.17 WRR 2   10  15  20  24  29  SP  SP
ge.1.18 WRR 2   10  15  20  24  29  SP  SP
ge.1.19 WRR 2   10  15  20  24  29  SP  SP
ge.1.20 WRR 2   10  15  20  24  29  SP  SP
ge.1.21 WRR 2   10  15  20  24  29  SP  SP
ge.1.22 WRR 2   10  15  20  24  29  SP  SP
ge.1.23 WRR 2   10  15  20  24  29  SP  SP
ge.1.24 WRR 2   10  15  20  24  29  SP  SP
```

## set port txq

Use this command to set QoS transmit queue arbitration values for physical ports.

### Syntax

```
set port txq port-string value0 value1 value2 value3 value4 value5
```

## Parameters

<i>port-string</i>	Specifies port(s) on which to set queue arbitration values. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.  Only physical ports can be configured with this command. LAG ports cannot be configured.
<i>value0 - value5</i>	Specifies percentage to allocate to a specific transmit queue. The values must total 100 percent.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Eight transmit queues are implemented in the switch hardware for each physical port, but only six are available for use in prioritizing various data and control traffic. The seventh and eighth queues are reserved for stacking (if applicable) and network control related communications and cannot be configured.

Queues can be set for strict priority (SP) or weighted round-robin (WRR). If set for WRR mode, weights may be assigned to those queues with this command. Weights are specified in the range of 0 to 100 percent. Weights specified for queues 0 through 5 on any port must total 100 percent.

Queues 0 through 5 can be changed to strict priority by configuring queues 0 through 4 at 0 percent and queue 5 at 100 percent. Queues can be changed back to WRR by changing the weight of queues 0 through 5, or by issuing the **clear port txq** command.

## Examples

This example shows how to change the arbitration values for the six transmit queues belonging to ge.1.1:

```
B2(su)->set port txq ge.1.1 17 17 17 17 16 16
```

This example shows how to change the algorithm to strict priority for the six transmit queues belonging to ge.1.1:

```
B2(su)->set port txq ge.1.1 0 0 0 0 0 100
B2(su)->show port txq ge.1.1
Port    Alg  Q0  Q1  Q2  Q3  Q4  Q5  Q6  Q7
-----
ge.1.1  STR  SP  SP  SP  SP  SP  SP  SP  SP
```

## clear port txq

Use this command to clear port transmit queue values back to their default values.

## Syntax

```
clear port txq port-string
```



## Parameters

<i>port-string</i>	<p>Clears transmit queue values on specific port(s) back to their default values. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.</p> <p>Only physical ports can be configured with this command. LAG ports cannot be configured.</p>
--------------------	--

## Defaults

By default, transmit queues are defined as follows:

Queue	Mode	Weight	Queue	Mode	Weight
0	WRR	1	4	WRR	5
1	WRR	2	5	WRR	6
2	WRR	3	6	Strict (not configurable)	–
3	WRR	4	7	Strict (not configurable)	–

## Mode

Switch command, read-write.

## Example

This example shows how to clear transmit queue values on ge.1.1:

```
B2(su)->clear port txq ge.1.1
```

```
B2(su)->show port txq ge.1.1
```

```
Port   Alg  Q0  Q1  Q2  Q3  Q4  Q5  Q6  Q7
-----
ge.1.1 WRR  2   10  15  20  24  29  SP  SP
```

# Configuring Port Traffic Rate Limiting

## Purpose

To limit the rate of inbound traffic on the SecureStack B2 device on a per port/priority basis. The allowable range for the rate limiting is 64 kilobytes per second minimum up to the maximum transmission rate allowable on the interface type.

Rate limit is configured for a given port and list of priorities. The list of priorities can include one, some, or all of the eight 802.1p priority levels. Once configured, the rate of all traffic entering the port with the priorities configured to that port is not allowed to exceed the programmed limit. If the rate exceeds the programmed limit, frames are dropped until the rate falls below the limit.



**Note:** Port traffic rate limiting is not supported on mixed stacks containing B3 or C3 devices.

# Commands

For information about...	Refer to page...
show port ratelimit	<a href="#">11-10</a>
set port ratelimit	<a href="#">11-11</a>
clear port ratelimit	<a href="#">11-12</a>

## show port ratelimit

Use this command to show the traffic rate limiting configuration on one or more ports.

### Syntax

`show port ratelimit [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays rate limiting information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, rate limiting information will be displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display the current rate limiting information for ge.2.1:

```
B2(su)->show port ratelimit ge.2.1
Global Ratelimiting status is disabled.
```

Port Number	Index	Threshold (kB/s)	Action	Direction	Priority List	Status
ge.2.1	1	64	discard	inbound	0	disabled
ge.2.1	2	64	discard	inbound	0	disabled
ge.2.1	3	64	discard	inbound	0	disabled
ge.2.1	4	64	discard	inbound	0	disabled
ge.2.1	5	64	discard	inbound	0	disabled
ge.2.1	6	64	discard	inbound	0	disabled
ge.2.1	7	64	discard	inbound	0	disabled
ge.2.1	8	64	discard	inbound	0	disabled

[Table 11-36](#) provides an explanation of the command output.

**Table 11-36 show port ratelimit Output Details**

Output	What It Displays...
Port Number	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

**Table 11-36 show port ratelimit Output Details (Continued)**

Output	What It Displays...
Index	Resource index for this port.
Threshold (kB/s)	Port rate limiting threshold in kilobytes per second.
Action	Whether or not frames not conforming to rate limiting will be discarded.
Direction	Currently rules can only be applied to inbound traffic.
Priority List	802.1D (802.1p) port priority level.
Status	Whether or not this rule is active or disabled.

## set port ratelimit

Use this command to configure the traffic rate limiting status and threshold (in kilobytes per second) for one or more ports.

### Syntax

```
set port ratelimit {disable | enable} | port-string priority threshold
{disable | enable} [inbound] [index]
```

### Parameters

<b>disable   enable</b>	When entered without a <i>port-string</i> , globally disables or enables the port rate limiting function. When entered with a <i>port-string</i> , disables or enables rate limiting on specific port(s) when the global function is enabled.
<i>port-string</i>	Specifies a port on which to set the rate limiting threshold and other parameters. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>priority</i>	Specifies the 802.1D (802.1p) port priority level associated with the <i>port-string</i> . The value can be 0 to 7, with 0 specifying the lowest priority.
<i>threshold</i>	Specifies a port rate limiting threshold in kilobytes per second. Range is 64 up to a maximum of 2,147,483,647 kilobytes per second.
<b>inbound</b>	(Optional) Applies this rate policing rule to inbound traffic.
<i>index</i>	(Optional) Assigns a resource index for this port.

### Defaults

Threshold will be applied to inbound traffic on the port/priority.

If *index* is not specified, settings will be applied to index 1, and will overwrite index 1 for any subsequent rate limits configured.

### Mode

Switch command, read-write.

### Example

This example shows how to:

- globally enable rate limiting
- configure rate limiting for inbound traffic on port ge.2.1, index 1, priority 5, to a threshold of 125 Kbps:

```
B2(rw)->set port ratelimit enable
B2(rw)->set port ratelimit ge.2.1 5 125 enable inbound
```

## clear port ratelimit

Use this command to clear rate limiting parameters for one or more ports.

### Syntax

```
clear port ratelimit port-string [index]
```

### Parameters

<i>port-string</i>	Specifies the port(s) on which to clear rate limiting. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<i>index</i>	(Optional) Specifies the associated resource index to be reset.

### Defaults

If not specified, all *index* entries will be reset.

### Mode

Switch command, read-write.

### Example

This example shows how to clear all rate limiting parameters on port ge.2.1.

```
B2(su)->clear port ratelimit ge.2.1
```

## IGMP Configuration

This chapter describes the IGMP Configuration set of commands and how to use them.

For information about...	Refer to page...
<a href="#">IGMP Overview</a>	<a href="#">12-1</a>
<a href="#">Configuring IGMP at Layer 2</a>	<a href="#">12-2</a>

### IGMP Overview

#### About IP Multicast Group Management

The Internet Group Management Protocol (IGMP) runs between hosts and their immediately neighboring multicast device. The protocol's mechanisms allow a host to inform its local device that it wants to receive transmissions addressed to a specific multicast group.

A multicast-enabled device can periodically ask its hosts if they want to receive multicast traffic. If there is more than one device on the LAN performing IP multicasting, one of these devices is elected "querier" and assumes the responsibility of querying the LAN for group members.

Based on the group membership information learned from IGMP, a device can determine which (if any) multicast traffic needs to be forwarded to each of its ports. At Layer-3, multicast devices use this information, along with a multicast routing protocol, to support IP multicasting across the Internet.

IGMP provides the final step in an IP multicast packet delivery service, since it is only concerned with forwarding multicast traffic from the local device to group members on a directly attached subnetwork or LAN segment.

This device supports IP multicast group management by passively snooping on the IGMP query and IGMP report packets transferred between IP multicast devices and IP multicast host groups to learn IP multicast group members.

The purpose of IP multicast group management is to optimize a switched network's performance so multicast packets will only be forwarded to those ports containing multicast group hosts or multicast devices instead of flooding to all ports in the subnet (VLAN).

#### About Multicasting

Multicasting is used to support real-time applications such as video conferences or streaming audio. A multicast server does not have to establish a separate connection with each client. It merely broadcasts its service to the network, and any hosts that want to receive the multicast register with their local multicast switch/router. Although this approach reduces the network overhead required by a multicast server, the broadcast traffic must be carefully pruned at every

multicast switch/router it passes through to ensure that traffic is only passed to the hosts that subscribed to this service.

## Configuring IGMP at Layer 2

### Purpose

To configure IGMP snooping from the switch CLI.

### Commands

For information about...	Refer to page...
show igmpsnooping	<a href="#">12-2</a>
set igmpsnooping adminmode	<a href="#">12-3</a>
set igmpsnooping interfacemode	<a href="#">12-3</a>
set igmpsnooping groupmembershipinterval	<a href="#">12-4</a>
set igmpsnooping maxresponse	<a href="#">12-5</a>
set igmpsnooping mcrtrexpiretime	<a href="#">12-5</a>
set igmpsnooping add-static	<a href="#">12-6</a>
set igmpsnooping remove-static	<a href="#">12-7</a>
show igmpsnooping static	<a href="#">12-7</a>
show igmpsnooping mfdb	<a href="#">12-8</a>
clear igmpsnooping	<a href="#">12-8</a>

## show igmpsnooping

Use this command to display IGMP snooping information.

### Syntax

`show igmpsnooping`

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Usage

Configured information is displayed whether or not IGMP snooping is enabled. Status information is displayed only when the function is enabled. For information on enabling IGMP on

the system, refer to “[set igmpsnooping adminmode](#)” on page 12-3. For information on enabling IGMP on one or more ports, refer to “[set igmpsnooping interfacemode](#)” on page 12-3.

## Example

This example shows how to display IGMP snooping information:

```
B2(su)->show igmpsnooping
Admin Mode..... Enable
Group Membership Interval..... 260
Max Response Time..... 100
Multicast Router Present Expiration Time..... 0
Interfaces Enabled for IGMP Snooping..... ge.1.1,ge.1.2,ge.1.3
Multicast Control Frame Count.....0
Data Frames Forwarded by the CPU.....0
```

## set igmpsnooping adminmode

Use this command to enable or disable IGMP on the system.

### Syntax

```
set igmpsnooping adminmode {enable | disable}
```

### Parameters

<b>enable   disable</b>	Enables or disables IGMP snooping on the system.
-------------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

In order for IGMP snooping to be enabled on one or all ports, it must be globally enabled on the device with this command, and then enabled on a port(s) using the **set igmpsnooping interface mode** command as described in “[set igmpsnooping interfacemode](#)” on page 12-3.

## Example

This example shows how to enable IGMP on the system:

```
B2(su)->set igmpsnooping adminmode enable
```

## set igmpsnooping interfacemode

Use this command to enable or disable IGMP on one or all ports.

### Syntax

```
set igmpsnooping interfacemode port-string {enable | disable}
```

### Parameters

<i>port-string</i>	Specifies one or more ports on which to enable or disable IGMP.
<b>enable</b>   <b>disable</b>	Enables or disables IGMP.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

In order for IGMP snooping to be enabled on one or all ports, it must be globally enabled on the device using the **set igmpsnooping adminmode** command as described in “[set igmpsnooping adminmode](#)” on page 12-3, and then enabled on a port(s) using this command.

### Example

This example shows how to enable IGMP on ports ge.1-10:

```
B2(su)->set igmpsnooping interfacemode ge.1-10 enable
```

## set igmpsnooping groupmembershipinterval

Use this command to configure the IGMP group membership interval time for the system.

### Syntax

```
set igmpsnooping groupmembershipinterval time
```

### Parameters

<i>time</i>	Specifies the IGMP group membership interval. Valid values are <b>2 - 3600</b> seconds.  This value works together with the <b>set igmpsnooping maxresponsetime</b> command to remove ports from an IGMP group and must be greater than the max response time value.
-------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

The IGMP group membership interval time sets the frequency of host-query frame transmissions and must be greater than the IGMP maximum response time as described in “[set igmpsnooping maxresponse](#)” on page 12-5.



## Example

This example shows how to set the IGMP group membership interval to 250 seconds:

```
B2(su)->set igmpsnooping groupmembershipinterval 250
```

## set igmpsnooping maxresponse

Use this command to configure the IGMP query maximum response time for the system.

### Syntax

```
set igmpsnooping maxresponse time
```

### Parameters

<i>time</i>	Specifies the IGMP maximum query response time. Valid values are <b>100 - 255</b> seconds. The default value is 100 seconds.  This value works together with the <b>set igmpsnooping groupmembershipinterval</b> command to remove ports from an IGMP group and must be lesser than the group membership interval value.
-------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

This value must be less than the IGMP maximum response time described in “[set igmpsnooping groupmembershipinterval](#)” on page 12-4.

### Example

This example shows how to set the IGMP maximum response time to 100 seconds:

```
B2(su)->set igmpsnooping maxresponse 100
```

## set igmpsnooping mcrtrexpiretime

Use this command to configure the IGMP multicast router expiration time for the system.

### Syntax

```
set igmpsnooping mcrtrexpire time
```

### Parameters

<i>time</i>	Specifies the IGMP multicast router expiration time. Valid values are <b>0 - 3600</b> seconds. A value of 0 will configure the system with an infinite expiration time. The default value is 0.
-------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

This timer is for expiring the switch from the multicast database. If the timer expires, and the only address left is the multicast switch, then the entry will be removed.

## Example

This example shows how to set the IGMP multicast router expiration time to infinity:

```
B2(su)->set igmpsnooping mcrtrexpiretime 0
```

# set igmpsnooping add-static

This command creates a new static IGMP entry or adds one or more new ports to an existing entry.

## Syntax

```
set igmpsnooping add-static group vlan-list [modify] [port-string]
```

## Parameters

<i>group</i>	Specifies the multicast group IP address for the entry.
<i>vlan-list</i>	Specifies the VLANs on which to configure the entry.
<b>modify</b>	(Optional) Adds the specified port or ports to an existing entry.
<i>port-string</i>	(Optional) Specifies the port or ports to add to the entry.

## Defaults

If no ports are specified, all ports are added to the entry.

If **modify** is not specified, a new entry is created.

## Mode

Switch command, read-write.

## Usage

Use this command to create and configure Layer 2 IGMP entries.

## Example

This example creates an IGMP entry for the multicast group with IP address of 233.11.22.33 configured on VLAN 20 configured with the port ge.1.1.

```
B2(su)->set igmpsnooping add-static 233.11.22.33 20 ge.1.1
```

## set igmpsnooping remove-static

This command deletes a static IGMP entry or removes one or more new ports from an existing entry.

### Syntax

```
set igmpsnooping remove-static group vlan-list [modify] [port-string]
```

### Parameters

<i>group</i>	Specifies the multicast group IP address of the entry.
<i>vlan-list</i>	Specifies the VLANs on which the entry is configured.
<b>modify</b>	(Optional) Removes the specified port or ports from an existing entry.
<i>port-string</i>	(Optional) Specifies the port or ports to remove from the entry.

### Defaults

If no ports are specified, all ports are removed from the entry.

### Mode

Switch command, read-write.

### Example

This example removes port ge.1.1 from the entry for the multicast group with IP address of 233.11.22.33 configured on VLAN 20.

```
B2(su)->set igmpsnooping remove-static 233.11.22.33 20 ge.1.1
```

## show igmpsnooping static

This command displays static IGMP ports for one or more VLANs or IGMP groups.

### Syntax

```
show igmpsnooping static vlan-list [group group]
```

### Parameters

<i>vlan-list</i>	Specifies the VLAN for which to display static IGMP ports.
<b>group</b> <i>group</i>	(Optional) Specifies the IGMP group for which to display static IGMP ports.

### Defaults

If no group is specified, information for all groups is displayed.

### Mode

Switch command, read-only.

## Example

This example displays the static IGMP ports for VLAN 20.

```
B2(su)->show igmpsnooping static 20
```

```
-----
Vlan Id      = 20      Static Multicast Group Address = 233.11.22.33      Type = IGMP
IGMP Port List = ge.1.1
```

## show igmpsnooping mfdb

Use this command to display multicast forwarding database (MFDB) information.

### Syntax

```
show igmpsnooping mfdb [stats]
```

### Parameters

<b>stats</b>	(Optional) Displays MFDB statistics.
--------------	--------------------------------------

### Defaults

If **stats** is not specified, all MFDB table entries will be displayed.

### Mode

Switch command, read-only.

### Examples

This example shows how to display multicast forwarding database entries:

```
B2(su)->show igmpsnooping mfdb
MAC Address      Type      Description      Interfaces
-----
00:14:01:00:5E:02:CD:B0  Dynamic  Network Assist  Fwd: ge.1.1,ge.3.1,ge.4.1
00:32:01:00:5E:37:96:D0  Dynamic  Network Assist  Fwd: ge.4.7
00:32:01:00:5E:7F:FF:FA  Dynamic  Network Assist  Fwd: ge.4.7
```

This example shows how to display multicast forwarding database statistics:

```
B2(su)->show igmpsnooping mfdb stats
Max MFDB Table Entries..... 256
Most MFDB Entries Since Last Reset..... 1
Current Entries..... 0
```

## clear igmpsnooping

Use this command to clear all IGMP snooping entries.

### Syntax

```
clear igmpsnooping
```

### Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear all IGMP snooping entries:

```
B2(su)->clear igmpsnooping
Are you sure you want to clear all IGMP snooping entries? (y/n) y

IGMP Snooping Entries Cleared.
```



## Logging and Network Management

This chapter describes switch-related logging and network management commands and how to use them.



**Note:** The commands in this chapter pertain to network management of the SecureStack B2 device from the **switch CLI** only. For information on router-related network management tasks, including reviewing router ARP tables and IP traffic, refer to [Chapter 17](#).

For information about...	Refer to page...
<a href="#">Configuring System Logging</a>	<a href="#">13-1</a>
<a href="#">Monitoring Network Events and Status</a>	<a href="#">13-11</a>
<a href="#">Managing Switch Network Addresses and Routes</a>	<a href="#">13-15</a>
<a href="#">Configuring Simple Network Time Protocol (SNTP)</a>	<a href="#">13-25</a>
<a href="#">Configuring Node Aliases</a>	<a href="#">13-32</a>

### Configuring System Logging

#### Purpose

To display and configure system logging, including Syslog server settings, Syslog default settings, and the logging buffer.

#### Commands

For information about...	Refer to page...
show logging server	<a href="#">13-2</a>
set logging server	<a href="#">13-3</a>
clear logging server	<a href="#">13-4</a>
show logging default	<a href="#">13-4</a>
set logging default	<a href="#">13-5</a>
clear logging default	<a href="#">13-5</a>
show logging application	<a href="#">13-6</a>
set logging application	<a href="#">13-7</a>

For information about...	Refer to page...
clear logging application	<a href="#">13-8</a>
show logging local	<a href="#">13-9</a>
set logging local	<a href="#">13-9</a>
clear logging local	<a href="#">13-10</a>
show logging buffer	<a href="#">13-10</a>

# show logging server

Use this command to display the Syslog configuration for a particular server.

## Syntax

```
show logging server [index]
```

## Parameters

<i>index</i>	(Optional) Displays Syslog information pertaining to a specific server table entry. Valid values are <b>1-8</b> .
--------------	---

## Defaults

If *index* is not specified, all Syslog server information will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display Syslog server configuration information:

```
B2(ro)->show logging server
```

IP Address	Facility	Severity	Description	Port	Status
1 132.140.82.111	local4	warning(5)	default	514	enabled
2 132.140.90.84	local4	warning(5)	default	514	enabled

[Table 13-37](#) provides an explanation of the command output.

**Table 13-37 show logging server Output Details**

Output	What It Displays...
IP Address	Syslog server's IP address. For details on setting this using the <b>set logging server</b> command, refer to " <a href="#">set logging server</a> " on page 13-3.
Facility	Syslog facility that will be encoded in messages sent to this server. Valid values are: <b>local0</b> to <b>local7</b> .
Severity	Severity level at which the server is logging messages.
Description	Text string description of this facility/server.
Port	UDP port the client uses to send to the server.
Status	Whether or not this Syslog configuration is currently enabled or disabled.



# set logging server

Use this command to configure a Syslog server.

## Syntax

```
set logging server index [ip-addr ip-addr] [facility facility] [severity severity]
[descr descr] [port port] [state {enable | disable}]
```

## Parameters

<i>index</i>	Specifies the server table index number for this server. Valid values are <b>1 - 8</b> .
<b>ip-addr</b> <i>ip-addr</i>	(Optional) Specifies the Syslog message server's IP address.
<b>facility</b> <i>facility</i>	(Optional) Specifies the server's facility name. Valid values are: <b>local0</b> to <b>local7</b> .
<b>severity</b> <i>severity</i>	(Optional) Specifies the severity level at which the server will log messages. Valid values and corresponding levels are: <b>1</b> — emergencies (system is unusable) <b>2</b> — alerts (immediate action required) <b>3</b> — critical conditions <b>4</b> — error conditions <b>5</b> — warning conditions <b>6</b> — notifications (significant conditions) <b>7</b> — informational messages <b>8</b> — debugging messages
<b>descr</b> <i>descr</i>	(Optional) Specifies a textual string description of this facility/server.
<b>port</b> <i>port</i>	(Optional) Specifies the default UDP port the client uses to send to the server.
<b>state</b> <b>enable</b>   <b>disable</b>	(Optional) Enables or disables this facility/server configuration.

## Defaults

If **ip-addr** is not specified, an entry in the Syslog server table will be created with the specified *index* number and a message will display indicating that no IP address has been assigned.

If not specified, **facility**, severity and port will be set to defaults configured with the **set logging default** command ("[set logging default](#)" on page 13-5).

If **state** is not specified, the server will not be enabled or disabled.

## Mode

Switch command, read-write.

## Example

This command shows how to enable a Syslog server configuration for index 1, IP address 134.141.89.113, facility local4, severity level 3 on port 514:

```
B2(su)->set logging server 1 ip-addr 134.141.89.113 facility local4 severity 3
port 514 state enable
```

# clear logging server

Use this command to remove a server from the Syslog server table.

## Syntax

```
clear logging server index
```

## Parameters

<i>index</i>	Specifies the server table index number for the server to be removed. Valid values are 1 - 8.
--------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This command shows how to remove the Syslog server with index 1 from the server table:

```
B2(su)->clear logging server 1
```

# show logging default

Use this command to display the Syslog server default values.

## Syntax

```
show logging default
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This command shows how to display the Syslog server default values. For an explanation of the command output, refer back to [Table 13-37](#) on page 13-2.

```
B2(su)->show logging default
```

	Facility	Severity	Port
	-----		
Defaults:	local4	warning(5)	514

## set logging default

Use this command to set logging default values.

### Syntax

```
set logging default {[facility facility] [severity severity] port port]}
```

### Parameters

<b>facility</b> <i>facility</i>	Specifies the default facility name. Valid values are: <b>local0</b> to <b>local7</b> .
<b>severity</b> <i>severity</i>	Specifies the default logging severity level. Valid values and corresponding levels are:  1 — emergencies (system is unusable) 2 — alerts (immediate action required) 3 — critical conditions 4 — error conditions 5 — warning conditions 6 — notifications (significant conditions) 7 — informational messages 8 — debugging messages
<b>port</b> <i>port</i>	Specifies the default UDP port the client uses to send to the server.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the Syslog default facility name to local2 and the severity level to 4 (error logging):

```
B2(su)->set logging default facility local2 severity 4
```

## clear logging default

Use this command to reset logging default values.

### Syntax

```
clear logging default {[facility] [severity] [port]}
```

### Parameters

<b>facility</b>	(Optional) Resets the default facility name to <b>local4</b> .
<b>severity</b>	(Optional) Resets the default logging severity level to <b>6</b> (notifications of significant conditions).
<b>port</b>	(Optional) Resets the default UDP port the client uses to send to the server to <b>514</b> .

### Defaults

At least one optional parameter must be entered.  
All three optional keywords must be entered to reset all logging values to defaults.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the Syslog default severity level to 6:  
B2(su)->clear logging default severity

## show logging application

Use this command to display the severity level of Syslog messages for one or all applications configured for logging on your system.

### Syntax

**show logging application** [*mnemonic* | **all**]

### Parameters

<i>mnemonic</i>	(Optional) Displays severity level for one application configured for logging. Mnemonics will vary depending on the number and types of applications running on your system. Sample mnemonics and their corresponding applications are listed in <a href="#">Table 13-39</a> on page 13-8.  <b>Note:</b> Mnemonic values are case sensitive and must be typed as they appear in <a href="#">Table 13-39</a> .
<b>all</b>	(Optional) Displays severity level for all applications configured for logging.

### Defaults

If no parameter is specified, information for all applications will be displayed.

### Mode

Switch command, read-only.

## Example

This example shows how to display system logging information pertaining to the SNMP application.

```
B2(ro)->show logging application SNMP
```

```
Application      Current Severity Level
-----
90      SNMP                      6

1(emergencies)  2(alerts)          3(critical)
4(errors)       5(warnings)        6(notifications)
7(information)  8(debugging)
```

[Table 13-38](#) provides an explanation of the command output.

**Table 13-38 show logging application Output Details**

Output...	What it displays...
Application	A mnemonic abbreviation of the textual description for applications being logged.
Current Severity Level	Severity level at which the server is logging messages for the listed application. This range (from 1 to 8) and its associated severity list is shown in the CLI output. For a description of these entries, which are set using the <b>set logging application</b> command, refer to “ <a href="#">set logging application</a> ” on page 13-7.

## set logging application

Use this command to set the severity level of log messages for one or all applications.

### Syntax

```
set logging application {[mnemonic | all]} [level level]
```

### Parameters

<i>mnemonic</i>	Specifies a case sensitive mnemonic abbreviation of an application to be logged. This parameter will vary depending on the number and types of applications running on your system. To display a complete list, use the <b>show logging application</b> command as described in “ <a href="#">show logging application</a> ” on page 13-6. Sample mnemonics and their corresponding applications are listed in <a href="#">Table 13-39</a> on page 13-8.  <b>Note:</b> Mnemonic values are case sensitive and must be typed as they appear in <a href="#">Table 13-39</a> .
<b>all</b>	Sets the logging severity level for all applications.

<b>level</b> <i>level</i>	(Optional) Specifies the severity level at which the server will log messages for applications. Valid values and corresponding levels are:  1 — emergencies (system is unusable) 2 — alerts (immediate action required) 3 — critical conditions 4 — error conditions 5 — warning conditions 6 — notifications (significant conditions) 7 — informational messages 8 — debugging messages
---------------------------	---

**Table 13-39 Mnemonic Values for Logging Applications**

Mnemonic	Application
CLIWEB	Command Line Interface and Webview management
SNMP	Simple Network Management Protocol
STP	Spanning Tree Protocol
Driver	Hardware drivers
System	Non-application items such as general chassis management
Stacking	Stacking management (if applicable)
UPN	User Personalized Networking
Router	Router

## Defaults

If **level** is not specified, none will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to set the severity level for SNMP to 4 so that error conditions will be logged for that application.

```
B2(rw)->set logging application SNMP level 4
```

# clear logging application

Use this command to reset the logging severity level for one or all applications to the default value of 6 (notifications of significant conditions).

## Syntax

```
clear logging application {mnemonic | all}
```

### Parameters

<i>mnemonic</i>	Resets the severity level for a specific application to 6. Valid mnemonic values and their corresponding applications are listed in <a href="#">Table 13-39</a> on page 13-8.
<b>all</b>	Resets the severity level for all applications to 6.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the logging severity level to 6 for SNMP.

```
B2(rw)->clear logging application SNMP
```

## show logging local

Use this command to display the state of message logging to the console and a persistent file.

### Syntax

```
show logging local
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the state of message logging. In this case, logging to the console is enabled and logging to a persistent file is disabled.

```
B2(su)->show logging local
Syslog Console Logging enabled
Syslog File Logging disabled
```

## set logging local

Use this command to configure log messages to the console and a persistent file.

### Syntax

```
set logging local console {enable | disable} file {enable | disable}
```

## Parameters

<b>console enable   disable</b>	Enables or disables logging to the console.
<b>file enable   disable</b>	Enables or disables logging to a persistent file.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This command shows how to enable logging to the console and disable logging to a persistent file:

```
B2(su)->set logging local console enable file disable
```

# clear logging local

Use this command to clear the console and persistent store logging for the local session.

## Syntax

```
clear logging local
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear local logging:

```
B2(su)->clear logging local
```

# show logging buffer

Use this command to display the last 256 messages logged.

## Syntax

```
show logging buffer
```

## Parameters

None.



## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows a portion of the information displayed with the **show logging buffer** command:

```
B2(su)->show logging buffer
<165>Sep  4 07:43:09 10.42.71.13 CLI[5]User:rw logged in from 10.2.1.122 (telnet)
<165>Sep  4 07:43:24 10.42.71.13 CLI[5]User: debug failed login from 10.4.1.100
(telnet)
```

# Monitoring Network Events and Status

## Purpose

To display switch events and command history, to set the size of the history buffer, and to display and disconnect current user sessions.

## Commands

For information about...	Refer to page...
history	<a href="#">13-11</a>
show history	<a href="#">13-12</a>
set history	<a href="#">13-12</a>
ping	<a href="#">13-13</a>
show users	<a href="#">13-13</a>
disconnect	<a href="#">13-14</a>

## history

Use this command to display the contents of the command history buffer. The command history buffer includes all the switch commands entered up to a maximum of 100, as specified in the **set history** command ("[set history](#)" on page 13-12).

## Syntax

**history**

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the contents of the command history buffer. It shows there are five commands in the buffer:

```
B2(su)->history
1 hist
2 show gvrp
3 show vlan
4 show igmp
5 show ip address
```

# show history

Use this command to display the size (in lines) of the history buffer.

## Syntax

```
show history
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the size of the history buffer:

```
B2(su)->show history
History buffer size: 20
```

# set history

Use this command to set the size of the history buffer.

## Syntax

```
set history size [default]
```

## Parameters

<i>size</i>	Specifies the size of the history buffer in lines. Valid values are <b>1</b> to <b>100</b> .
<b>default</b>	(Optional) Makes this setting persistent for all future sessions.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the size of the command history buffer to 30 lines:

```
B2(su)->set history 30
```

# ping

Use this command to send ICMP echo-request packets to another node on the network from the switch CLI.

## Syntax

```
ping host
```

## Parameters

<i>host</i>	Specifies the IP address of the device to which the <b>ping</b> will be sent.
-------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Examples

This example shows how to ping IP address 134.141.89.29. In this case, this host is alive:

```
B2(su)->ping 134.141.89.29
134.141.89.29 is alive
```

In this example, the host at IP address is not responding:

```
B2(su)->ping 134.141.89.255
no answer from 134.141.89.255
```

# show users

Use this command to display information about the active console port or Telnet session(s) logged in to the switch.

### Syntax

**show users**

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to use the **show users** command. In this output, there are two Telnet users logged in with Read-Write access privileges from IP addresses 134.141.192.119 and 134.141.192.18:

```
B2(su)->show users
  Session  User  Location
  -----
* telnet   rw    134.141.192.119
  telnet   rw    134.141.192.18
```

## disconnect

Use this command to close an active console port or Telnet session from the switch CLI.

### Syntax

**disconnect** {*ip-addr* | **console**}

### Parameters

<i>ip-addr</i>	Specifies the IP address of the Telnet session to be disconnected. This address is displayed in the output shown in “ <a href="#">show users</a> ” on page 12-15.
<b>console</b>	Closes an active console port.

### Defaults

None.

### Mode

Switch command, read-write.

### Examples

This example shows how to close a Telnet session to host 134.141.192.119:

```
B2(su)->disconnect 134.141.192.119
```

This example shows how to close the current console session:

```
B2(su)->disconnect console
```

# Managing Switch Network Addresses and Routes

## Purpose

To display or delete switch ARP table entries, and to display MAC address information.

## Commands

For information about...	Refer to page...
show arp	<a href="#">13-15</a>
set arp	<a href="#">13-16</a>
clear arp	<a href="#">13-17</a>
tracert	<a href="#">13-17</a>
show mac	<a href="#">13-18</a>
show mac agetime	<a href="#">13-19</a>
set mac agetime	<a href="#">13-20</a>
clear mac agetime	<a href="#">13-20</a>
set mac algorithm	<a href="#">13-21</a>
show mac algorithm	<a href="#">13-21</a>
clear mac algorithm	<a href="#">13-22</a>
set mac multicast	<a href="#">13-22</a>
clear mac address	<a href="#">13-23</a>
show mac unreserved-flood	<a href="#">13-24</a>
set mac unreserved-flood	<a href="#">13-24</a>

## show arp

Use this command to display the switch's ARP table.

### Syntax

```
show arp
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the ARP table:

```
B2(su)->show arp

LINK LEVEL ARP TABLE
IP Address          Phys Address      Flags  Interface
-----
10.20.1.1           00-00-5e-00-01-1   S      host
134.142.21.194      00-00-5e-00-01-1   S      host
134.142.191.192     00-00-5e-00-01-1   S      host
134.142.192.18      00-00-5e-00-01-1   S      host
134.142.192.119     00-00-5e-00-01-1   S      host
-----
```

[Table 13-40](#) provides an explanation of the command output.

**Table 13-40** show arp Output Details

Output	What It Displays...
IP Address	IP address mapped to MAC address.
Phys Address	MAC address mapped to IP address.
Flags	Route status. Possible values and their definitions include: <b>S</b> - manually configured entry (static) <b>P</b> - respond to ARP requests for this entry

## set arp

Use this command to add mapping entries to the switch’s ARP table.

### Syntax

```
set arp ip-address mac-address
```

### Parameters

<i>ip-address</i>	Specifies the IP address to map to the MAC address and add to the ARP table.
<i>mac-address</i>	Specifies the MAC address to map to the IP address and add to the ARP table. The MAC address can be formatted as xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to map IP address 192.168.219.232 to MAC address 00-00-0c-40-0f-bc:

```
B2(su)->set arp 192.168.219.232 00-00-0c-40-0f-bc
```

## clear arp

Use this command to delete a specific entry or all entries from the switch's ARP table.

### Syntax

```
clear arp {ip-address / all}
```

### Parameters

<i>ip-address</i>   <b>all</b>	Specifies the IP address in the ARP table to be cleared, or clears all ARP entries.
--------------------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to delete entry 10.1.10.10 from the ARP table:

```
B2(su)->clear arp 10.1.10.10
```

## traceroute

Use this command to display a hop-by-hop path through an IP network from the device to a specific destination host. Three UDP or ICMP probes will be transmitted for each hop between the source and the traceroute destination.

### Syntax

```
traceroute [-w waittime] [-f first-ttl] [-m max-ttl] [-p port] [-q nqueries] [-r] [-d] [-n] [-v] host
```

### Parameters

<b>-w</b> <i>waittime</i>	(Optional) Specifies time in seconds to wait for a response to a probe.
<b>-f</b> <i>first-ttl</i>	(Optional) Specifies the time to live (TTL) of the first outgoing probe packet.
<b>-m</b> <i>max-ttl</i>	(Optional) Specifies the maximum time to live (TTL) used in outgoing probe packets.
<b>-p</b> <i>port</i>	(Optional) Specifies the base UDP port number used in probes.
<b>-q</b> <i>nqueries</i>	(Optional) Specifies the number of probe inquiries.
<b>-r</b>	(Optional) Bypasses the normal host routing tables.
<b>-d</b>	(Optional) Sets the debug socket option.
<b>-n</b>	(Optional) Displays hop addresses numerically. (Supported in a future release.)
<b>-v</b>	(Optional) Displays verbose output, including the size and destination of each response.

<i>host</i>	Specifies the host to which the route of an IP packet will be traced.
-------------	---

Defaults

- If not specified, *waittime* will be set to **5** seconds.
- If not specified, *first-ttl* will be set to **1** second.
- If not specified, *max-ttl* will be set to **30** seconds.
- If not specified, *port* will be set to **33434**.
- If not specified, *nqueries* will be set to **3**.
- If **-r** is not specified, normal host routing tables will be used.
- If **-d** is not specified, the debug socket option will not be used.
- If **-v** is not specified, summary output will be displayed.

Mode

Switch command, read-only.

Example

This example shows how to use traceroute to display a round trip path to host 192.167.252.17. In this case, hop 1 is the SecureStack B2 switch, hop 2 is 14.1.0.45, and hop 3 is back to the host IP address. Round trip times for each of the three UDP probes are displayed next to each hop:

```
B2(su)->traceroute 192.167.252.17
traceroute to 192.167.252.17 (192.167.252.17), 30 hops max, 40 byte packets
 1  matrix.enterasys.com (192.167.201.40)  20.000 ms  20.000 ms  20.000 ms
 2  14.1.0.45 (14.1.0.45)  40.000 ms  10.000 ms  20.000 ms
 3  192.167.252.17 (192.167.252.17)  50.000 ms  0.000 ms  20.000 ms
```

show mac

Use this command to display MAC addresses in the switch’s filtering database. These are addresses learned on a port through the switching process.

Syntax

```
show mac [address mac-address] [fid fid] [port port-string] [type {other | learned
| self | mgmt}]
```

Parameters

<b>address</b> <i>mac-address</i>	(Optional) Displays a specific MAC address (if it is known by the device).
<b>fid</b> <i>fid</i>	(Optional) Displays MAC addresses for a specific filter database identifier.
<b>port</b> <i>port-string</i>	(Optional) Displays MAC addresses for specific port(s).
<b>type</b> <b>other</b>   <b>learned</b>   <b>self</b>   <b>mgmt</b>	(Optional) Displays information related to <b>other</b> , <b>learned</b> , <b>self</b> or <b>mgmt</b> (management) address type.

Defaults

If no parameters are specified, all MAC addresses for the device will be displayed.



## Mode

Switch command, read-only.

## Example

This example shows how to display MAC address information for ge.3.1:

```
B2(su)->show mac port ge.3.1
```

MAC Address	FID	Port	Type
00-09-6B-0F-13-E6	15	ge.3.1	Learned

MAC Address	VLAN	Port	Type	Status	Egress Ports
01-01-23-34-45-56	20	any	mcast	perm	ge.3.1

[Table 13-41](#) provides an explanation of the command output.

**Table 13-41 show mac Output Details**

Output	What It Displays...
MAC Address	MAC addresses mapped to the port(s) shown.
FID	Filter database identifier.
Port	Port designation.
Type	Address type. Valid types are: <ul style="list-style-type: none"> <li>• Learned</li> <li>• Self</li> <li>• Management</li> <li>• Other</li> <li>• mcast (multicast)</li> </ul>
VLAN	The VLAN ID configured for the multicast MAC address.
Status	The status of the multicast address.
Egress Ports	The ports which have been added to the egress ports list.

## show mac agetime

Use this command to display the timeout period for aging learned MAC entries.

## Syntax

```
show mac agetime
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the MAC timeout period:

```
B2(su)->show mac agetime
Aging time: 300 seconds
```

# set mac agetime

Use This command to set the timeout period for aging learned MAC entries.

## Syntax

```
set mac agetime time
```

## Parameters

<i>time</i>	Specifies the timeout period in seconds for aging learned MAC addresses. Valid values are 10 to 1,000,000 seconds. Default value is 300 seconds.
-------------	--

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to set the MAC timeout period:

```
B2(su)->set mac agetime 250
```

# clear mac agetime

Use this command to reset the timeout period for aging learned MAC entries to the default value of 300 seconds.

## Syntax

```
clear mac agetime
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to reset the MAC timeout period to the default value of 300 seconds.

```
B2(su)->clear mac agetime
```

## set mac algorithm

Use this command to set the MAC algorithm mode, which determines the has mechanism used by the device when performing Layer 2 lookups on received frames.

### Syntax

```
set mac algorithm {mac-crc16-lowerbits | mac-crc16-upperbits |  
mac-crc32-lowerbits | mac-crc32-upperbits}
```

### Parameters

<b>mac-crc16-lowerbits</b>	Select the MAC CRC 16 lower bits algorithm for hashing.
<b>mac-crc16-upperbits</b>	Select the MAC CRC 16 upper bits algorithm for hashing.
<b>mac-crc32-lowerbits</b>	Select the MAC CRC 32 lower bits algorithm for hashing.
<b>mac-crc32-upperbits</b>	Select the MAC CRC 32 upper bits algorithm for hashing.

### Defaults

The default MAC algorithm is **mac-crc16-upperbits**.

### Mode

Switch command, read-write.

### Usage

Each algorithm is optimized for a different spread of MAC addresses. When changing this mode, the switch will display a warning message and prompt you to restart the device.

The default MAC algorithm is mac-crc16-upperbits.

## Example

This example sets the hashing algorithm to mac-crc32-upperbits.

```
B2(rw)->set mac algorithm mac-crc32-upperbits
```

## show mac algorithm

This command displays the currently selected MAC algorithm mode.

### Syntax

```
show mac algorithm
```

### Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows the output of this command.

```
B2(su)->show mac algorithm
Mac hashing algorithm is mac-crc16-upperbits.
```

# clear mac algorithm

Use this command to return the MAC hashing algorithm to the default value of **mac-crc16-upperbits**.

## Syntax

```
clear mac algorithm
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example resets the MAC hashing algorithm to the default value.

```
B2(su)->clear mac algorithm
```

# set mac multicast

Use this command to define on what ports within a VLAN a multicast address can be dynamically learned on, or on what ports a frame with the specified MAC address can be flooded. Also, use this command to append ports to or clear ports from the egress ports list.

## Syntax

```
set mac multicast mac-address vlan-id [port-string] [{append | clear} port-string]
```

## Parameters

<i>mac-address</i>	Specifies the multicast MAC address. The MAC address can be formatted as xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx.
<i>vlan-id</i>	Specifies the VLAN ID containing the ports.
<i>port-string</i>	Specifies the port or range of ports the multicast MAC address can be learned on or flooded to.
<b>append</b>   <b>clear</b>	Appends or clears the port or range of ports from the egress port list.

## Defaults

If no *port-string* is defined, the command will apply to all ports.

## Mode

Switch command, read-write.

## Example

This example configures multicast MAC address 01-01-22-33-44-55 for VLAN 24.

```
B2(su)->set mac multicast 01-01-22-33-44-55 24
```

# clear mac address

Use this command to remove a multicast MAC address.

## Syntax

```
clear mac address mac-address [vlan-id]
```

## Parameters

<i>mac-address</i>	Specifies the multicast MAC address to be cleared. The MAC address can be formatted as xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx.
<i>vlan-id</i>	(Optional) Specifies the VLAN ID from which to clear the static multicast MAC address.

## Defaults

If no *vlan-id* is specified, the multicast MAC address is cleared from all VLANs.

## Mode

Switch command, read-write.

## Example

This example clears multicast MAC address 01-01-22-33-44-55 from VLAN 24.

```
B2(su)->clear mac multicast 01-01-22-33-44-55 24
```

# show mac unreserved-flood

Use this command to display the state of multicast flood protection.

## Syntax

`show mac unreserved-flood`

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example displays the status of multicast flood protection.

```
B2(su)->show mac unreserved-flood
mac unreserved flood is disabled.
```

# set mac unreserved-flood

Use this command to enable or disable multicast flood protection. When enabled, this prevents policy profiles requiring a full 10 masks from being loaded.

## Syntax

`set mac unreserved-flood {disable | enable}`

## Parameters

<code>disable</code>   <code>enable</code>	Disables or enables multicast flood protection.
--	---

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The following addresses will be forwarded when this function is enabled:

- 01:80:C2:00:00:11
- 01:80:C2:00:00:14
- 01:80:C2:00:00:15

The default state is disabled, and these addresses will not be forwarded.

## Example

This example enables multicast flood protection.

```
B2(su)->set mac unreserved-flood enable
```

# Configuring Simple Network Time Protocol (SNTP)

## Purpose

To configure the Simple Network Time Protocol (SNTP), which synchronizes device clocks in a network.

## Commands

For information about...	Refer to page...
show sntp	<a href="#">13-25</a>
set sntp client	<a href="#">13-27</a>
clear sntp client	<a href="#">13-27</a>
set sntp server	<a href="#">13-28</a>
clear sntp server	<a href="#">13-28</a>
set sntp poll-interval	<a href="#">13-29</a>
clear sntp poll-interval	<a href="#">13-29</a>
set sntp poll-retry	<a href="#">13-30</a>
clear sntp poll-retry	<a href="#">13-30</a>
set sntp poll-timeout	<a href="#">13-31</a>
clear sntp poll-timeout	<a href="#">13-31</a>

## show sntp

Use this command to display SNTP client settings.

## Syntax

```
show sntp
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display SNTP client settings:

```
B2(su)->show sntp
SNTP Version: 3
Current Time: TUE SEP 09 16:13:33 2003
Timezone: 'EST', offset from UTC is -4 hours and 0 minutes
Client Mode: unicast
Broadcast Count: 0
Poll Interval: 512 seconds
Poll Retry: 1
Poll Timeout: 5 seconds
SNTP Poll Requests: 1175
Last SNTP Update: TUE SEP 09 16:05:24 2003
Last SNTP Request: TUE SEP 09 16:05:24 2003
Last SNTP Status: Success
```

SNTP-Server	Precedence	Status
10.2.8.6	2	Active
144.111.29.19	1	Active

[Table 13-42](#) provides an explanation of the command output.

**Table 13-42 show sntp Output Details**

Output	What It Displays...
SNTP Version	SNTP version number.
Current Time	Current time on the system clock.
Timezone	Time zone name and amount it is offset from UTC (Universal Time).
Client Mode	Whether SNTP client is operating in unicast or broadcast mode. Set using <b>set sntp client</b> command (" <a href="#">set sntp client</a> " on page 13-27).
Broadcast Count	Number of SNTP broadcast frames received.
Poll Interval	Interval between SNTP unicast requests. Default of 512 seconds can be reset using the <b>set sntp poll-interval</b> command (" <a href="#">set sntp poll-interval</a> " on page 13-29).
Poll Retry	Number of poll retries to a unicast SNTP server. Default of 1 can be reset using the <b>set sntp poll-retry</b> command (" <a href="#">set sntp poll-retry</a> " on page 13-30).
Poll Timeout	Timeout for a response to a unicast SNTP request. Default of 5 seconds can be reset using <b>set sntp poll-timeout</b> command (" <a href="#">set sntp poll-timeout</a> " on page 13-31).
SNTP Poll Requests	Total number of SNTP poll requests.
Last SNTP Update	Date and time of most recent SNTP update.
Last SNTP Request	Date and time of most recent SNTP request.
Last SNTP Status	Whether or not broadcast reception or unicast transmission and reception was successful.
SNTP-Server	IP address(es) of SNTP server(s).
Precedence	Precedence level of SNTP server in relation to its peers. Highest precedence is 1 and lowest is 10. Default of 1 can be reset using the <b>set sntp server</b> command (" <a href="#">set sntp server</a> " on page 13-28).
Status	Whether or not the SNTP server is active.



## set sntp client

Use this command to set the SNTP operation mode.

### Syntax

```
set sntp client {broadcast | unicast | disable}
```

### Parameters

<b>broadcast</b>	Enables SNTP in broadcast client mode.
<b>unicast</b>	Enables SNTP in unicast (point-to-point) client mode. In this mode, the client must supply the IP address from which to retrieve the current time.
<b>disable</b>	Disables SNTP.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to enable SNTP in broadcast mode:

```
B2(su)->set sntp client broadcast
```

## clear sntp client

Use this command to clear the SNTP client's operational mode.

### Syntax

```
clear sntp client
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the SNTP client's operational mode:

```
B2(su)->clear sntp client
```

## set sntp server

Use this command to add a server from which the SNTP client will retrieve the current time when operating in unicast mode. Up to 10 servers can be set as SNTP servers.

### Syntax

```
set sntp server ip-address [precedence]
```

### Parameters

<i>ip-address</i>	Specifies the SNTP server's IP address.
<i>precedence</i>	(Optional) Specifies this SNTP server's precedence in relation to its peers. Valid values are <b>1</b> (highest) to <b>10</b> (lowest).

### Defaults

If *precedence* is not specified, 1 will be applied.

### Mode

Switch command, read-write.

### Example

This example shows how to set the server at IP address 10.21.1.100 as an SNTP server:

```
B2(su)->set sntp server 10.21.1.100
```

## clear sntp server

Use this command to remove one or all servers from the SNTP server list.

### Syntax

```
clear sntp server {ip-address | all}
```

### Parameters

<i>ip-address</i>	Specifies the IP address of a server to remove from the SNTP server list.
<b>all</b>	Removes all servers from the SNTP server list.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to remove the server at IP address 10.21.1.100 from the SNTP server list:

```
B2(su)->clear sntp server 10.21.1.100
```

## set sntp poll-interval

Use this command to set the poll interval between SNTP unicast requests.

### Syntax

```
set sntp poll-interval interval
```

### Parameters

<i>interval</i>	Specifies the poll interval in seconds. Valid values are <b>16</b> to <b>16284</b> .
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the SNTP poll interval to 30 seconds:

```
B2(su)->set sntp poll-interval 30
```

## clear sntp poll-interval

Use this command to clear the poll interval between unicast SNTP requests.

### Syntax

```
clear sntp poll-interval
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the SNTP poll interval:

```
B2(su)->clear sntp poll-interval
```

## set sntp poll-retry

Use this command to set the number of poll retries to a unicast SNTP server.

### Syntax

```
set sntp poll-retry retry
```

### Parameters

---

<i>retry</i>	Specifies the number of retries. Valid values are <b>0</b> to <b>10</b> .
--------------	---

---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the number of SNTP poll retries to 5:

```
B2(su)->set sntp poll-retry 5
```

## clear sntp poll-retry

Use this command to clear the number of poll retries to a unicast SNTP server.

### Syntax

```
clear sntp poll-retry
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the number of SNTP poll retries:

```
B2(su)->clear sntp poll-retry
```

## set sntp poll-timeout

Use this command to set the poll timeout (in seconds) for a response to a unicast SNTP request.

### Syntax

```
set sntp poll-timeout timeout
```

### Parameters

<i>timeout</i>	Specifies the poll timeout in seconds. Valid values are <b>1</b> to <b>30</b> .
----------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the SNTP poll timeout to 10 seconds:

```
B2(su)->set sntp poll-timeout 10
```

## clear sntp poll-timeout

Use this command to clear the SNTP poll timeout.

### Syntax

```
clear sntp poll-timeout
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the SNTP poll timeout:

```
B2(su)->clear sntp poll-timeout
```

# Configuring Node Aliases

## Purpose

To review, disable, and re-enable node (port) alias functionality, which determines what network protocols are running on one or more ports.

## Commands

For information about...	Refer to page...
show nodealias config	<a href="#">13-32</a>
set nodealias	<a href="#">13-33</a>
clear nodealias config	<a href="#">13-34</a>

## show nodealias config

Use this command to display node alias configuration settings on one or more ports.

### Syntax

`show nodealias config [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays node alias configuration settings for specific port(s).
--------------------	---

### Defaults

If *port-string* is not specified, node alias configurations will be displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display node alias configuration settings for ports ge.2.1 through 9:

```
B2(rw)->show nodealias config ge.2.1-9
Port Number      Max Entries      Used Entries      Status
-----
ge.2.1           16                0                Enable
ge.2.2           47                0                Enable
ge.2.3           47                2                Enable
ge.2.4           47                0                Enable
ge.2.5           47                0                Enable
ge.2.6           47                2                Enable
ge.2.7           47                0                Enable
ge.2.8           47                0                Enable
ge.2.9           4000              1                Enable
```

[Table 13-43](#) provides an explanation of the command output.

**Table 13-43 show nodealias config Output Details**

Output	What It Displays...
Port Number	Port designation.
Max Entries	Maximum number of alias entries configured for this port.
Used Entries	Number of alias entries (out of the maximum amount configured) already used by this port.
Status	Whether or not a node alias agent is enabled (default) or disabled on this port.

## set nodealias

Use this command to enable or disable a node alias agent on one or more ports, or set the maximum number of alias entries per port.

### Syntax

```
set nodealias {enable | disable | maxentries maxentries} port-string
```

### Parameters

<b>enable   disable</b>	Enables or disables a node alias agent.
<b>maxentries</b> <i>maxentries</i>	Set the maximum number of alias entries per ports. Valid range is 0 to 4096. The default value is 32.
<i>port-string</i>	Specifies the port(s) on which to enable/disable node alias agent or set a maximum number of entries.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Upon packet reception, node aliases are dynamically assigned to ports enabled with an alias agent, which is the default setting on SecureStack B2 devices. Node aliases cannot be statically created, but can be deleted using the **clear node alias** command as described in “[clear nodealias config](#)” on page 13-34.

### Example

This example shows how to disable the node alias agent on ge.1.3:

```
B2(su)->set nodealias disable ge.1.3
```

## clear nodealias config

Use this command to reset node alias state to enabled and clear the maximum entries value.

### Syntax

```
clear nodealias config port-string
```

### Parameters

---

<i>port-string</i>	Specifies the port(s) on which to reset the node alias configuration.
--------------------	---

---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to reset the node alias configuration on ge.1.3:

```
B2(su)->clear nodealias config ge.1.3
```



## RMON Configuration

This chapter describes the commands used to configure RMON on a SecureStack B2 switch.

For information about...	Refer to page...
<a href="#">RMON Monitoring Group Functions</a>	<a href="#">14-1</a>
<a href="#">Statistics Group Commands</a>	<a href="#">14-3</a>
<a href="#">History Group Commands</a>	<a href="#">14-6</a>
<a href="#">Alarm Group Commands</a>	<a href="#">14-9</a>
<a href="#">Event Group Commands</a>	<a href="#">14-13</a>
<a href="#">Filter Group Commands</a>	<a href="#">14-16</a>
<a href="#">Packet Capture Commands</a>	<a href="#">14-20</a>

### RMON Monitoring Group Functions

RMON (Remote Network Monitoring) provides comprehensive network fault diagnosis, planning, and performance tuning information and allows for interoperability between SNMP management stations and monitoring agents. RMON extends the SNMP MIB capability by defining additional MIBs that generate a much richer set of data about network usage. These MIB “groups” each gather specific sets of data to meet common network monitoring requirements.

[Table 14-44](#) lists the RMON monitoring groups supported on SecureStack B2 devices, each group’s function and the elements it monitors, and the associated configuration commands needed.

**Table 14-44 RMON Monitoring Group Functions and Commands**

<b>RMON Group</b>	<b>What It Does...</b>	<b>What It Monitors...</b>	<b>CLI Command(s)</b>
Statistics	Records statistics measured by the RMON probe for each monitored interface on the device.	Packets dropped, packets sent, bytes sent (octets), broadcast and multicast packets, CRC errors, oversized and undersized packets, fragments, jabbers, and counters for packets.	<a href="#">“show rmon stats”</a> on page 14-3 <a href="#">“set rmon stats”</a> on page 14-5 <a href="#">“clear rmon stats”</a> on page 14-6
History	Records periodic statistical samples from a network.	Sample period, number of samples and item(s) sampled.	<a href="#">“show rmon history”</a> on page 14-7 <a href="#">“set rmon history”</a> on page 14-7 <a href="#">“clear rmon history”</a> on page 14-8
Alarm	Periodically gathers statistical samples from variables in the probe and compares them with previously configured thresholds. If the monitored variable crosses a threshold, an event is generated.	Alarm type, interval, starting threshold, stop threshold.	<a href="#">“show rmon alarm”</a> on page 14-9 <a href="#">“set rmon alarm properties”</a> on page 14-10 <a href="#">“set rmon alarm status”</a> on page 14-11 <a href="#">“clear rmon alarm”</a> on page 14-12
Event	Controls the generation and notification of events from the device.	Event type, description, last time event was sent.	<a href="#">“show rmon event”</a> on page 14-13 <a href="#">“set rmon event properties”</a> on page 14-14 <a href="#">“set rmon event status”</a> on page 14-15 <a href="#">“clear rmon event”</a> on page 14-15

**Table 14-44 RMON Monitoring Group Functions and Commands (Continued)**

RMON Group	What It Does...	What It Monitors...	CLI Command(s)
Filter	Allows packets to be matched by a filter equation. These matched packets form a data stream or “channel” that may be captured.	Packets matching the filter configuration.	<a href="#">“show rmon channel”</a> on page 14-16 <a href="#">“set rmon channel”</a> on page 14-17 <a href="#">“clear rmon channel”</a> on page 14-18 <a href="#">“show rmon filter”</a> on page 14-18 <a href="#">“set rmon filter”</a> on page 14-19 <a href="#">“clear rmon filter”</a> on page 14-20
Packet Capture	Allows packets to be captured upon a filter match.	Packets matching the filter configuration.	<a href="#">“show rmon capture”</a> on page 14-21 <a href="#">“set rmon capture”</a> on page 14-22 <a href="#">“clear rmon capture”</a> on page 14-22

## Statistics Group Commands

### Purpose

To display, configure, and clear RMON statistics.



**Note:** Due to hardware limitations, the only frame error counted is oversized frames.

### Commands

For information about...	Refer to page...
show rmon stats	<a href="#">14-3</a>
set rmon stats	<a href="#">14-5</a>
clear rmon stats	<a href="#">14-6</a>

### show rmon stats

Use this command to display RMON statistics measured for one or more ports.

#### Syntax

```
show rmon stats [port-string]
```

Parameters

<i>port-string</i>	(Optional) Displays RMON statistics for specific port(s).
--------------------	---

Defaults

If *port-string* is not specified, RMON stats will be displayed for all ports.

Mode

Switch command, read-only.

Example

This example shows how to display RMON statistics for Gigabit Ethernet port 1 in switch 1.

```
B2(su)->show rmon stats ge.1.1

Port: ge.1.1
-----
Index          = 1
Owner          = monitor
Data Source    = ifIndex.1

Drop Events    = 0      Packets          = 0
Collisions    = 0      Octets          = 0
Jabbers       = 0      0 - 64 Octets = 0
Broadcast Pkts = 0      65 - 127 Octets = 0
Multicast Pkts = 0      128 - 255 Octets = 0
CRC Errors    = 0      256 - 511 Octets = 0
Undersize Pkts = 0      512 - 1023 Octets = 0
Oversize Pkts = 0      1024 - 1518 Octets = 0
Fragments     = 0
```

[Table 14-45](#) provides an explanation of the command output.

**Table 14-45 show rmon stats Output Details**

Output	What It Displays...
Port	Port designation.
Owner	Name of the entity that configured this entry. Monitor is default.
Data Source	Data source of the statistics being displayed.
Drop Events	Total number of times that the switch was forced to discard frames due to lack of available switch device resources. This does not display the number of frames dropped, only the number of times the switch was forced to discard frames.
Collisions	Total number of collisions that have occurred on this interface.
Jabbers	Total number of frames that were greater than 1518 bytes and had either a bad FCS or a bad CRC.
Packets	Total number of frames (including bad frames, broadcast frames, and multicast frames) received on this interface.
Broadcast Pkts	Total number of good frames that were directed to the broadcast address. This value does not include multicast frames.
Multicast Pkts	Total number of good frames that were directed to the multicast address. This value does not include broadcast frames.

**Table 14-45 show rmon stats Output Details (Continued)**

Output	What It Displays...
CRC Errors	Number of frames with bad Cyclic Redundancy Checks (CRC) received from the network. The CRC is a 4-byte field in the data frame that ensures that the data received is the same as the data that was originally sent.
Undersize Pkts	Number of frames received containing less than the minimum Ethernet frame size of 64 bytes (not including the preamble) but having a valid CRC.
Oversize Pkts	Number of frames received that exceeded 1518 data bytes (not including the preamble) but had a valid CRC.
Fragments	Number of received frames that are not the minimum number of bytes in length, or received frames that had a bad or missing Frame Check Sequence (FCS), were less than 64 bytes in length (excluding framing bits, but including FCS bytes) and had an invalid CRC. It is normal for this value to increment since fragments are a normal result of collisions in a half-duplex network.
Packets	Total number of packets, including bad, broadcast and multicast.
Octets	Total number of octets (bytes) of data, including those in bad frames, received on this interface.
0 – 64 Octets	Total number of frames, including bad frames, received that were 64 bytes in length (excluding framing bits, but including FCS bytes).
65 – 127 Octets	Total number of frames, including bad frames, received that were between 65 and 127 bytes in length (excluding framing bits, but including FCS bytes).
128 – 255 Octets	Total number of frames, including bad frames, received that were between 128 and 255 bytes in length (excluding framing bits, but including FCS bytes).
256 – 511 Octets	Total number of frames, including bad frames, received that were between 256 and 511 bytes in length (excluding framing bits, but including FCS bytes).
512 – 1023 Octets	Total number of frames, including bad frames, received that were between 512 and 1023 bytes in length (excluding framing bits, but including FCS bytes).
1024 – 1518 Octets	Total number of frames, including bad frames, received that were between 1024 and 1518 bytes in length (excluding framing bits, but including FCS bytes).

## set rmon stats

Use this command to configure an RMON statistics entry.

### Syntax

```
set rmon stats index port-string [owner]
```

### Parameters

<i>index</i>	Specifies an index for this statistics entry.
<i>port-string</i>	Specifies port(s) to which this entry will be assigned.
<i>owner</i>	(Optional) Assigns an owner for this entry.

### Defaults

If *owner* is not specified, **monitor** will be applied.

Mode

Switch command, read-write.

Example

This example shows how to configure RMON statistics entry 2 for ge.1.20:

```
B2(rw)->set rmon stats 2 ge.1.20
```

clear rmon stats

Use this command to delete one or more RMON statistics entries.

Syntax

```
clear rmon stats {index-list / to-defaults}
```

Parameters

<i>index-list</i>	Specifies one or more stats entries to be deleted, causing them to disappear from any future RMON queries.
<b>to-defaults</b>	Resets all history entries to default values. This will cause entries to reappear in RMON queries.

Defaults

None.

Mode

Switch command, read-write.

Example

This example shows how to delete RMON statistics entry 2:

```
B2(rw)->clear rmon stats 2
```

History Group Commands

Purpose

To display, configure, and clear RMON history properties and statistics.

Commands

For information about...	Refer to page...
show rmon history	<a href="#">14-7</a>
set rmon history	<a href="#">14-7</a>
clear rmon history	<a href="#">14-8</a>

## show rmon history

Use this command to display RMON history properties and statistics. The RMON history group records periodic statistical samples from a network.

### Syntax

```
show rmon history [port-string]
```

### Parameters

---

<i>port-string</i>	(Optional) Displays RMON history entries for specific port(s).
--------------------	--

---

### Defaults

If *port-string* is not specified, information about all RMON history entries will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display RMON history entries for Gigabit Ethernet port 1 in switch 1. A control entry displays first, followed by actual entries corresponding to the control entry. In this case, the default settings for entry owner, sampling interval, and maximum number of entries (buckets) have not been changed from their default values. For a description of the types of statistics shown, refer to [Table 14-45](#).

```
B2(su)->show rmon history ge.1.1

Port: ge.1.1
-----
Index 1
Owner          = monitor
Status         = valid
Data Source    = ifIndex.1
Interval       = 30
Buckets Requested = 50
Buckets Granted  = 10
Sample 2779      Interval Start: 1 days 0 hours 2 minutes 22 seconds
Drop Events     = 0      Undersize Pkts    = 0
Octets          = 0      Oversize Pkts    = 0
Packets         = 0      Fragments        = 0
Broadcast Pkts  = 0      Jabbers          = 0
Multicast Pkts  = 0      Collisions        = 0
CRC Align Errors = 0      Utilization(%)    = 0
```

## set rmon history

Use this command to configure an RMON history entry.

### Syntax

```
set rmon history index [port-string] [buckets buckets] [interval interval] [owner owner]
```

## Parameters

<i>index-list</i>	Specifies an index number for this entry.
<i>port-string</i>	(Optional) Assigns this entry to a specific port.
<b>buckets</b> <i>buckets</i>	(Optional) Specifies the maximum number of entries to maintain.
<b>interval</b> <i>interval</i>	(Optional) Specifies the sampling interval in seconds.
<b>owner</b> <i>owner</i>	(Optional) Specifies an owner for this entry.

## Defaults

If *buckets* is not specified, the maximum number of entries maintained will be 50.

If not specified, *interval* will be set to 30 seconds.

If *owner* is not specified, **monitor** will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how configure RMON history entry 1 on port `ge.2.1` to sample every 20 seconds:

```
B2(rw)->set rmon history 1 ge.2.1 interval 20
```

# clear rmon history

Use this command to delete one or more RMON history entries or reset one or more entries to default values. For specific values, refer to “[set rmon history](#)” on page 14-7.

## Syntax

```
clear rmon history {index-list | to-defaults}
```

## Parameters

<i>index-list</i>	Specifies one or more history entries to be deleted, causing them to disappear from any future RMON queries.
<b>to-defaults</b>	Resets all history entries to default values. This will cause entries to reappear in RMON queries.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to delete RMON history entry 1:

```
B2(rw)->clear rmon history 1
```



# Alarm Group Commands

## Purpose

To display, configure, and clear RMON alarm entries and properties.

## Commands

For information about...	Refer to page...
show rmon alarm	<a href="#">14-9</a>
set rmon alarm properties	<a href="#">14-10</a>
set rmon alarm status	<a href="#">14-11</a>
clear rmon alarm	<a href="#">14-12</a>

## show rmon alarm

Use this command to display RMON alarm entries. The RMON alarm group periodically takes statistical samples from RMON variables and compares them with previously configured thresholds. If the monitored variable crosses a threshold an RMON event is generated.

### Syntax

```
show rmon alarm [index]
```

### Parameters

<i>index</i>	(Optional) Displays RMON alarm entries for a specific entry index ID.
--------------	---

### Defaults

If *index* is not specified, information about all RMON alarm entries will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display RMON alarm entry 3:

```
B2(rw)->show rmon alarm 3
```

```
Index 3
```

```
-----
```

```
Owner           = Manager
Status          = valid
Variable        = 1.3.6.1.4.1.5624.1.2.29.1.2.1.0
Sample Type     = delta      Startup Alarm      = rising
Interval       = 30          Value          = 0
Rising Threshold = 1          Falling Threshold = 0
Rising Event Index = 2       Falling Event Index = 0
```

[Table 14-46](#) provides an explanation of the command output.

**Table 14-46 show rmon alarm Output Details**

Output	What It Displays...
Index	Index number for this alarm entry.
Owner	Text string identifying who configured this entry.
Status	Whether this event entry is enabled (valid) or disabled.
Variable	MIB object to be monitored.
Sample Type	Whether the monitoring method is an absolute or a delta sampling.
Startup Alarm	Whether alarm generated when this entry is first enabled is rising, falling, or either.
Interval	Interval in seconds at which RMON will conduct sample monitoring.
Rising Threshold	Minimum threshold for causing a rising alarm.
Falling Threshold	Maximum threshold for causing a falling alarm.
Rising Event Index	Index number of the RMON event to be triggered when the rising threshold is crossed.
Falling Event Index	Index number of the RMON event to be triggered when the falling threshold is crossed.


## set rmon alarm properties

Use this command to configure an RMON alarm entry, or to create a new alarm entry with an unused alarm index number.

### Syntax

```
set rmon alarm properties index [interval interval] [object object] [type
{absolute | delta}] [startup {rising | falling | either}] [rthresh rthresh]
[fthresh fthresh] [revent revent] [fevent fevent] [owner owner]
```

### Parameters

<i>index</i>	Specifies an index number for this entry. Maximum number of entries is 50. Maximum value is 65535.
<b>interval</b> <i>interval</i>	(Optional) Specifies an interval (in seconds) for RMON to conduct sample monitoring.
<b>object</b> <i>object</i>	(Optional) Specifies a MIB object to be monitored.
	 <b>Note:</b> This parameter is not mandatory for executing the command, but must be specified in order to enable the alarm entry configuration.
<b>type</b> <i>absolute</i>   <i>delta</i>	(Optional) Specifies the monitoring method as: sampling the absolute value of the object, or the difference (delta) between object samples.

<b>startup</b> <b>rising</b>   <b>falling</b>   <b>either</b>	(Optional) Specifies the type of alarm generated when this event is first enabled as: <ul style="list-style-type: none"> <li>• Rising - Sends alarm when an RMON event reaches a maximum threshold condition is reached, for example, more than 30 collisions per second.</li> <li>• Falling - Sends alarm when RMON event falls below a minimum threshold condition, for example when the network is behaving normally again.</li> <li>• Either - Sends alarm when either a rising or falling threshold is reached.</li> </ul>
<b>rthresh</b> <i>rthresh</i>	(Optional) Specifies a minimum threshold for causing a rising alarm.
<b>fthresh</b> <i>fthresh</i>	Specifies a maximum threshold for causing a falling alarm.
<b>revent</b> <i>revent</i>	Specifies the index number of the RMON event to be triggered when the rising threshold is crossed.
<b>fevent</b> <i>fevent</i>	Specifies the index number of the RMON event to be triggered when the falling threshold is crossed.
<b>owner</b> <i>owner</i>	(Optional) Specifies the name of the entity that configured this alarm entry.

## Defaults

interval - **3600** seconds

type - **absolute**

startup - **rising**

rthresh - **0**

fthresh - **0**

revent - **0**

fevent - **0**

owner - **monitor**

## Mode

Switch command, read-write.

## Example

This example shows how to configure a rising RMON alarm. This entry will conduct monitoring of the delta between samples every 30 seconds:

```
B2(rw)->set rmon alarm properties 3 interval 30 object
1.3.6.1.4.1.5624.1.2.29.1.2.1.0 type delta rthresh 1 revent 2 owner Manager
```

# set rmon alarm status

Use this command to enable an RMON alarm entry. An alarm is a notification that a statistical sample of a monitored variable has crossed a configured threshold.

## Syntax

```
set rmon alarm status index enable
```

## Parameters

<i>index</i>	Specifies an index number for this entry. Maximum number of entries is 50. Maximum value is <b>65535</b> .
<b>enable</b>	Enables this alarm entry.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

An RMON alarm entry can be created using this command, configured using the **set rmon alarm properties** command ("[set rmon alarm properties](#)" on page 14-10), then enabled using this command. An RMON alarm entry can be created and configured at the same time by specifying an unused index with the **set rmon alarm properties** command.

## Example

This example shows how to enable RMON alarm entry 3:

```
B2(rw)->set rmon alarm status 3 enable
```

# clear rmon alarm

Use this command to delete an RMON alarm entry.

## Syntax

```
clear rmon alarm index
```

## Parameters

<i>index</i>	Specifies the index number of entry to be cleared.
--------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear RMON alarm entry 1:

```
B2(rw)->clear rmon alarm 1
```

# Event Group Commands

## Purpose

To display and clear RMON events, and to configure RMON event properties.

## Commands

For information about...	Refer to page...
show rmon event	<a href="#">14-13</a>
set rmon event properties	<a href="#">14-14</a>
set rmon event status	<a href="#">14-15</a>
clear rmon event	<a href="#">14-15</a>

## show rmon event

Use this command to display RMON event entry properties.

### Syntax

```
show rmon event [index]
```

### Parameters

<i>index</i>	(Optional) Displays RMON properties and log entries for a specific entry index ID.
--------------	--

### Defaults

If *index* is not specified, information about all RMON entries will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display RMON event entry 3:

```
B2(rw)->show rmon event 3
Index 3
-----
Owner          = Manager
Status         = valid
Description    = STP Topology change
Type          = log-and-trap
Community     = public
Last Time Sent = 0 days 0 hours 0 minutes 37 seconds
```

[Table 14-47](#) provides an explanation of the command output.

**Table 14-47 show rmon event Output Details**

Output	What It Displays...
Index	Index number for this event entry.
Owner	Text string identifying who configured this entry.
Status	Whether this event entry is enabled (valid) or disabled.
Description	Text string description of this event.
Type	Whether the event notification will be a log entry, and SNMP trap, both, or none.
Community	SNMP community name if message type is set to trap.
Last Time Sent	When an event notification matching this entry was sent.

## set rmon event properties

Use this command to configure an RMON event entry, or to create a new event entry with an unused event index number.

### Syntax

```
set rmon event properties index [description description] [type {none | log | trap
| both}] [community community] [owner owner]
```

### Parameters

<i>index</i>	Specifies an index number for this entry. Maximum number of entries is 100. Maximum value is <b>65535</b> .
<b>description</b> <i>description</i>	(Optional) Specifies a text string description of this event.
<b>type none   log   trap   both</b>	(Optional) Specifies the type of RMON event notification as: none, a log table entry, an SNMP trap, or both a log entry and a trap message.
<b>community</b> <i>community</i>	(Optional) Specifies an SNMP community name to use if the message type is set to <b>trap</b> . For details on setting SNMP traps and community names, refer to <a href="#">“Creating a Basic SNMP Trap Configuration”</a> on page 6-36.
<b>owner</b> <i>owner</i>	(Optional) Specifies the name of the entity that configured this entry.

### Defaults

If **description** is not specified, none will be applied.

If not specified, **type none** will be applied.

If *owner* is not specified, **monitor** will be applied.

### Mode

Switch command, read-write.

### Example

This example shows how to create and enable an RMON event entry called “STP topology change” that will send both a log entry and an SNMP trap message to the “public” community:

```
B2(rw)->set rmon event properties 2 description "STP topology change" type both
community public owner Manager
```

## set rmon event status

Use this command to enable an RMON event entry. An event entry describes the parameters of an RMON event that can be triggered. Events can be fired by RMON alarms and can be configured to create a log entry, generate a trap, or both.

### Syntax

```
set rmon event status index enable
```

### Parameters

<i>index</i>	Specifies an index number for this entry. Maximum number of entries is 100. Maximum value is <b>65535</b> .
<b>enable</b>	Enables this event entry.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

An RMON event entry can be created using this command, configured using the **set rmon event properties** command ("[set rmon event properties](#)" on page 14-14), then enabled using this command. An RMON event entry can be created and configured at the same time by specifying an unused index with the **set rmon event properties** command.

### Example

This example shows how to enable RMON event entry 1:

```
B2(rw)->set rmon event status 1 enable
```

## clear rmon event

Use this command to delete an RMON event entry and any associated log entries.

### Syntax

```
clear rmon event index
```

### Parameters

<i>index</i>	Specifies the index number of the entry to be cleared.
--------------	--

### Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear RMON event 1:

```
B2(rw)->clear rmon event 1
```

# Filter Group Commands

The packet capture and filter function is disabled by default. Only one interface can be configured for capturing and filtering at a time.

When packet capture is enabled on an interface, the SecureStack B2 switch will capture 100 frames as close to sequentially as possible. These 100 frames will be placed into a buffer for inspection. If there is data in the buffer when the function is started, the buffer will be overwritten. Once 100 frames have been captured, the capture will stop. Filtering will be performed on the frames captured in the buffer. Therefore, only a subset of the frames captured will be available for display.



**Note:** Packet capture is sampling only and does not guarantee receipt of back to back packets.

One channel at a time can be supported, with up to three filters. Configured channel, filter, and buffer control information will be saved across resets, but captured frames within the buffer will not be saved.

This function cannot be used concurrently with port mirroring. The system will check to prevent concurrently enabling both functions, and a warning will be generated in the CLI if attempted.

## Commands

For information about...	Refer to page...
show rmon channel	<a href="#">14-16</a>
set rmon channel	<a href="#">14-17</a>
clear rmon channel	<a href="#">14-18</a>
show rmon filter	<a href="#">14-18</a>
set rmon filter	<a href="#">14-19</a>
clear rmon filter	<a href="#">14-20</a>

## show rmon channel

Use this command to display RMON channel entries for one or more ports.

## Syntax

```
show rmon channel [port-string]
```



## Parameters

<i>port-string</i>	(Optional) Displays RMON channel entries for a specific port(s).
--------------------	--

## Defaults

If *port-string* is not specified, information about all channels will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display RMON channel information for ge.2.12:

```
B2(rw)->show rmon channel ge.2.12
Port ge.2.12      Channel index= 628      EntryStatus= valid
-----
Control           off           AcceptType       matched
OnEventIndex      0           OffEventIndex    0
EventIndex        0           Status          ready
Matches           4498
Description       Thu Dec 16 12:57:32 EST 2004
Owner             NetSight smith
```

# set rmon channel

Use this command to configure an RMON channel entry.

## Syntax

```
set rmon channel index port-string [accept {matched | failed}] [control {on | off}]
[description description] [owner owner]
```

## Parameters

<i>index</i>	Specifies an index number for this entry. An entry will automatically be created if an unused index number is chosen. Maximum number of entries is 2. Maximum value is <b>65535</b> .
<i>port-string</i>	Specifies the port on which traffic will be monitored.
<b>accept matched</b>   <b>failed</b>	(Optional) Specifies the action of the filters on this channel as: <ul style="list-style-type: none"> <li><b>matched</b> - Packets will be accepted on filter matches</li> <li><b>failed</b> - Packets will be accepted if they fail a match</li> </ul>
<b>control on</b>   <b>off</b>	(Optional) Enables or disables control of the flow of data through the channel.
<b>description</b> <i>description</i>	(Optional) Specifies a description for this channel.
<b>owner</b> <i>owner</i>	(Optional) Specifies the name of the entity that configured this entry.

## Defaults

If an action is not specified, packets will be accepted on filter matches.

If not specified, **control** will be set to **off**.

If a **description** is not specified, none will be applied.

If *owner* is not specified, it will be set to **monitor**.

### Mode

Switch command, read-write.

### Example

This example shows how to create an RMON channel entry:

```
B2(rw)->set rmon channel 54313 ge.2.12 accept failed control on description
"capture all"
```

## clear rmon channel

Use this command to clear an RMON channel entry.

### Syntax

```
clear rmon channel index
```

### Parameters

<i>index</i>	Specifies the channel entry to be cleared.
--------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear RMON channel entry 2:

```
B2(rw)->clear rmon channel 2
```

## show rmon filter

Use this command to display one or more RMON filter entries.

### Syntax

```
show rmon filter [index index | channel channel]
```

### Parameters

<b>index</b> <i>index</i>   <b>channel</b> <i>channel</i>	(Optional) Displays information about a specific filter entry, or about all filters which belong to a specific channel.
--	---

### Defaults

If no options are specified, information for all filter entries will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display all RMON filter entries and channel information:

```
B2(rw)->show rmon filter
Index= 55508      Channel Index= 628      EntryStatus= valid
-----
Data Offset      0          PktStatus      0
PktStatusMask    0          PktStatusNotMask  0
Owner            ETS,NAC-D
-----
Data
ff ff ff ff ff ff
-----
DataMask
ff ff ff ff ff ff
-----
DataNotMask
00 00 00 00 00 00
```

## set rmon filter

Use this command to configure an RMON filter entry.

## Syntax

```
set rmon filter index channel-index [offset offset] [status status] [smask smask]
[snotmask snotmask] [data data] [dmask dmask] [dnotmask dnotmask] [owner owner]
```

## Parameters

<i>index</i>	Specifies an index number for this entry. An entry will automatically be created if an unused index number is chosen. Maximum number of entries is 10. Maximum value is <b>65535</b> .
<i>channel-index</i>	Specifies the channel to which this filter will be applied.
<b>offset</b> <i>offset</i>	(Optional) Specifies an offset from the beginning of the packet to look for matches.
<b>status</b> <i>status</i>	(Optional) Specifies packet status bits that are to be matched.
<b>smask</b> <i>smask</i>	(Optional) Specifies the mask applied to status to indicate which bits are significant.
<b>snotmask</b> <i>snotmask</i>	(Optional) Specifies the inversion mask that indicates which bits should be set or not set
<b>data</b> <i>data</i>	(Optional) Specifies the data to be matched.
<b>dmask</b> <i>dmask</i>	(Optional) Specifies the mask applied to data to indicate which bits are significant.
<b>dnotmask</b> <i>dnotmask</i>	(Optional) Specifies the inversion mask that indicates which bits should be set or not set.
<i>owner</i>	(Optional) Specifies the name of the entity that configured this entry.

## Defaults

If *owner* is not specified, it will be set to **monitor**.

If no other options are specified, none (0) will be applied.

## Mode

Switch command, read-write.

## Example

This example shows how to create RMON filter 1 and apply it to channel 9:

```
B2(rw)->set rmon filter 1 9 offset 30 data 0a154305 dmask ffffffff
```

# clear rmon filter

Use this command to clear an RMON filter entry.

## Syntax

```
clear rmon filter {index index | channel channel}
```

## Parameters

---

<b>index</b> <i>index</i>	Clears a specific filter entry, or all entries belonging to a specific channel.
<b>channel</b> <i>channel</i>	

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear RMON filter entry 1:

```
B2(rw)->clear rmon filter index 1
```

# Packet Capture Commands

Note that packet capture filter is sampling only and does not guarantee receipt of back-to-back packets.

## Purpose

To display RMON capture entries, configure, enable, or disable capture entries, and clear capture entries.

## Commands

For information about...	Refer to page...
show rmon capture	<a href="#">14-21</a>
set rmon capture	<a href="#">14-22</a>
clear rmon capture	<a href="#">14-22</a>

## show rmon capture

Use this command to display RMON capture entries and associated buffer control entries.

### Syntax

```
show rmon capture [index [nodata]]
```

### Parameters

<i>index</i>	(Optional) Displays the specified buffer control entry and all captured packets associated with that entry.
<b>nodata</b>	(Optional) Displays only the buffer control entry specified by index.

### Defaults

If no options are specified, all buffer control entries and associated captured packets will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display RMON capture entries and associated buffer entries:

```
B2(rw)->show rmon capture
Buf.control= 28062  Channel= 38283      EntryStatus= valid
-----
FullStatus      avail      FullAction      lock
Captured packets 251      Capture slice   1518
Download size    100      Download offset  0
Max Octet Requested 50000    Max Octet Granted 50000
Start time       1 days 0 hours 51 minutes 15 seconds
Owner            monitor

captureEntry= 1      Buff.control= 28062
-----
Pkt ID          9      Pkt time        1 days 0 hours 51 minutes 15 seconds
Pkt Length      93      Pkt status      0
Data:
00 00 5e 00 01 01 00 01 f4 00 7d ce 08 00 45 00
00 4b b4 b9 00 00 40 11 32 5c 0a 15 43 05 86 8d
bf e5 00 a1 0e 2b 00 37 cf ca 30 2d 02 01 00 04
06 70 75 62 6c 69 63 a2 20 02 02 0c 92 02 01 00
02 01 00 30 14 30 12 06 0d 2b 06 01 02 01 10 07
```

```
01 01 0b 81 fd 1c 02 01 01 00 11 0b 00
```

## set rmon capture

Use this command to configure an RMON capture entry.

### Syntax

```
set rmon capture index {channel [action {lock}] [slice slice] [loadsize loadsize]
[offset offset] [asksize asksize] [owner owner]}
```

### Parameters

<i>index</i>	Specifies a buffer control entry.
<i>channel</i>	Specifies the channel to which this capture entry will be applied.
<b>action lock</b>	(Optional) Specifies the action of the buffer when it is full as: <ul style="list-style-type: none"><li>• <b>lock</b> - Packets will cease to be accepted</li></ul>
<b>slice slice</b>	(Optional) Specifies the maximum octets from each packet to be saved in a buffer. Currently, the only value allowed is 1518.
<b>loadsize loadsize</b>	(Optional) Specifies the maximum octets from each packet to be downloaded from the buffer. The default is 100.
<b>offset offset</b>	(Optional) Specifies the first octet from each packet that will be retrieved.
<b>asksize asksize</b>	(Optional) Specifies the requested maximum octets to be saved in this buffer. Currently, the only value accepted is -1, which requests as many octets as possible.
<i>owner</i>	(Optional) Specifies the name of the entity that configured this entry.

### Defaults

If not specified, **action** defaults to **lock**.

If not specified, **offset** defaults to 0.

If not specified, **asksize** defaults to -1 (which will request as many octets as possible).

If **slice** is not specified, **1518** will be applied.

If **loadsize** is not specified, **100** will be applied.

If *owner* is not specified, it will be set to **monitor**.

### Mode

Switch command, read-write.

### Example

This example shows how to create RMON capture entry 1 to “listen” on channel 628:

```
B2(rw)->set rmon capture 1 628
```

## clear rmon capture

Use this command to clears an RMON capture entry.

## Syntax

```
clear rmon capture index
```

## Parameters

---

<i>index</i>	Specifies the capture entry to be cleared.
--------------	--

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear RMON capture entry 1:

```
B2(rw)->clear rmon capture 1
```





## DHCP Server Configuration

This chapter describes the commands to configure the IPv4 DHCP server functionality on a SecureStack B2 switch.

For information about...	Refer to page...
<a href="#">DHCP Overview</a>	<a href="#">15-1</a>
<a href="#">Configuring General DHCP Server Parameters</a>	<a href="#">15-3</a>
<a href="#">Configuring IP Address Pools</a>	<a href="#">15-10</a>

### DHCP Overview

Dynamic Host Configuration Protocol (DHCP) for IPv4 is a network layer protocol that implements automatic or manual assignment of IP addresses and other configuration information to client devices by servers. A DHCP server manages a user-configured pool of IP addresses from which it can make assignments upon client requests. A relay agent passes DHCP messages between clients and servers which are on different physical subnets.

### DHCP Server

DHCP server functionality allows the SecureStack B2 switch to provide basic IP configuration information to a client on the network who requests such information using the DHCP protocol.

DHCP provides the following mechanisms for IP address allocation by a DHCP server:

- Automatic—DHCP server assigns an IP address to a client for a limited period of time (or until the client explicitly relinquishes the address) from a defined pool of IP addresses configured on the server.
- Manual—A client's IP address is assigned by the network administrator, and DHCP is used simply to convey the assigned address to the client. This is managed by means of "static" address pools configured on the server.

The amount of time that a particular IP address is valid for a system is called a lease. The SecureStack B2 maintains a lease database which contains information about each assigned IP address, the MAC address to which it is assigned, the lease expiration, and whether the address assignment is dynamic (automatic) or static (manual). The DHCP lease database is stored in flash memory.

In addition to assigning IP addresses, the DHCP server can also be configured to assign the following to requesting clients:

- Default router(s)
- DNS server(s) and domain name

- NetBIOS WINS server(s) and node name
- Boot file
- DHCP options as defined by RFC 2132



**Note:** A total of 16 address pools, dynamic and/or static, can be configured on the SecureStack B2.

## Configuring a DHCP Server

For DHCP to function on SecureStack B2 systems, the system has to “know about” the IP network for which the DHCP pool is to be created. This is done by associating the DHCP address pool with the switch’s host port IP address.

The following tasks provide basic DHCP server functionality when the DHCP pool is associated with the system’s host IP address.

1. Configure the system (stack) host port IP address with the **set ip address** command. Once the system’s IP address is configured, the system then “knows” about the configured subnet. For example:

```
set ip address 192.0.0.50 mask 255.255.255.0
```

2. Enable DHCP server functionality on the system with the **set dhcp enable** command.
3. Configure an IP address pool for dynamic IP address assignment. The only *required* steps are to name the pool and define the network number and mask for the pool. Note that the pool has to be in the same subnet and use the same mask as the system host port IP address. For example:

```
set dhcp pool auto-pool network 192.0.0.0 255.255.255.0
```

All DHCP clients served by this switch must be in the same VLAN as the system’s host port.

Optional DHCP server tasks include:

- You can limit the scope of addresses assigned to a pool for dynamic address assignment with the **set dhcp exclude** command. Up to 128 non-overlapping address ranges can be excluded on the SecureStack B2. For example:

```
set dhcp exclude 192.0.0.1 192.0.0.10
```



**Note:** The IP address of the system’s host port is automatically excluded.

- Configure static address pools for manual address assignment. The only *required* steps are to name the pool, configure either the hardware address of the client or the client identifier, and configure the IP address and mask for the manual binding. For example:

```
set dhcp pool static-pool hardware-address 0011.2233.4455  
set dhcp pool static-pool host 192.0.0.200 255.255.255.0
```

- Set other DHCP server parameters such as the number of ping packets to be sent before assigning an IP address, or enabling conflict logging.

# Configuring General DHCP Server Parameters

## Purpose

To configure DHCP server parameters, and to display and clear address binding information, server statistics, and conflict information.

## Commands

For information about...	Refer to page...
set dhcp	<a href="#">15-3</a>
set dhcp bootp	<a href="#">15-4</a>
set dhcp conflict logging	<a href="#">15-4</a>
show dhcp conflict	<a href="#">15-5</a>
clear dhcp conflict	<a href="#">15-5</a>
set dhcp exclude	<a href="#">15-6</a>
clear dhcp exclude	<a href="#">15-6</a>
set dhcp ping	<a href="#">15-7</a>
clear dhcp ping	<a href="#">15-7</a>
show dhcp binding	<a href="#">15-8</a>
clear dhcp binding	<a href="#">15-9</a>
show dhcp server statistics	<a href="#">15-9</a>
clear dhcp server statistics	<a href="#">15-10</a>

## set dhcp

Use this command to enable or disable the DHCP server functionality on the SecureStack B2.

### Syntax

```
set dhcp {enable | disable}
```

### Parameters

<b>enable   disable</b>	Enables or disables DHCP server functionality. By default, DHCP server is disabled.
-------------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

## Example

This example enables DHCP server functionality.

```
B2(rw)->set dhcp enable
```

## set dhcp bootp

Use this command to enable or disable automatic address allocation for BOOTP clients. By default, address allocation for BOOTP clients is disabled. Refer to RFC 1534, "Interoperation Between DHCP and BOOTP," for more information.

### Syntax

```
set dhcp bootp {enable | disable}
```

### Parameters

<b>enable   disable</b>	Enables or disables address allocation for BOOTP clients.
-------------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example enables address allocation for BOOTP clients.

```
B2(rw)->set dhcp bootp enable
```

## set dhcp conflict logging

Use this command to enable conflict logging. By default, conflict logging is enabled. Use the **clear dhcp conflict logging** command to disable conflict logging.

### Syntax

```
set dhcp conflict logging
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example enables DHCP conflict logging.

```
B2(rw)->set dhcp conflict logging
```

## show dhcp conflict

Use this command to display conflict information, for one address or all addresses.

### Syntax

```
show dhcp conflict [address]
```

### Parameters

<i>address</i>	[Optional] Specifies the address for which to display conflict information.
----------------	---

### Defaults

If no address is specified, conflict information for all addresses is displayed.

### Mode

Read-only.

### Example

This example displays conflict information for all addresses. Note that ping is the only detection method used.

```
B2(ro)->show dhcp conflict
```

IP address	Detection Method	Detection Time
-----	-----	-----
192.0.0.2	Ping	0 days 19h:01m:23s
192.0.0.3	Ping	0 days 19h:00m:46s
192.0.0.4	Ping	0 days 19h:01m:25s
192.0.0.12	Ping	0 days 19h:01m:26s

## clear dhcp conflict

Use this command to clear conflict information for one or all addresses, or to disable conflict logging.

### Syntax

```
clear dhcp conflict {logging | ip-address/ *}
```

### Parameters

logging	Disables conflict logging.
<i>ip-address</i>	Clears the conflict information for the specified IP address.
*	Clears the conflict information for all IP addresses.

### Defaults

None.

### Mode

Switch command, read-write.

## Examples

This example disables DHCP conflict logging.

```
B2(rw)->clear dhcp conflict logging
```

This example clears the conflict information for the IP address 192.0.0.2.

```
B2(rw)->clear dhcp conflict 192.0.0.2
```

## set dhcp exclude

Use this command to configure the IP addresses that the DHCP server should not assign to DHCP clients. Multiple address ranges can be configured but the ranges cannot overlap. Up to 128 non-overlapping address ranges can be excluded.

### Syntax

```
set dhcp exclude low-ipaddr [high-ipaddr]
```

### Parameters

<i>low-ipaddr</i>	Specifies the first IP address in the address range to be excluded from assignment.
<i>high-ipaddr</i>	(Optional) Specifies the last IP address in the address range to be excluded.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example first configures the address pool named “auto1” with 255 addresses for the Class C network 172.20.28.0, with the **set dhcp pool network** command. Then, the example limits the scope of the addresses that can be assigned by a DHCP server by excluding addresses 172.20.28.80 – 100, with the **set dhcp exclude** command.

```
B2(rw)->set dhcp pool auto1 network 172.20.28.0 24  
B2(rw)->set dhcp exclude 172.20.28.80 172.20.28.100
```

## clear dhcp exclude

Use this command to clear the configured IP addresses that the DHCP server should not assign to DHCP clients.

### Syntax

```
clear dhcp exclude low-ipaddr [high-ipaddr]
```

## Parameters

<i>low-ipaddr</i>	Specifies the first IP address in the address range to be cleared.
<i>high-ipaddr</i>	(Optional) Specifies the last IP address in the address range to be cleared.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example clears the previously excluded range of IP addresses between 192.168.1.88 through 192.168.1.100.

```
B2(rw)->clear dhcp exclude 192.168.1.88 192.168.1.100
```

# set dhcp ping

Use this command to configure the number of ping packets the DHCP server sends to an IP address before assigning the address to a requesting client.

## Syntax

```
set dhcp ping packets number
```

## Parameters

<b>packets</b> <i>number</i>	Specifies the number of ping packets to be sent. The value of number can be 0, or range from 2 to 10. Entering 0 disables this function. The default value is 2 packets.
------------------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example sets the number of ping packets sent to 3.

```
B2(rw)->set dhcp ping packets 3
```

# clear dhcp ping

Use this command to reset the number of ping packets sent by the DHCP server back to the default value of 2.

## Syntax

```
clear dhcp ping packets
```

Parameters

None.

Defaults

None.

Mode

Switch command, read-write.

Example

This example resets the number of ping packets sent back to the default value.

```
B2(rw)->clear dhcp ping packets
```

show dhcp binding

Use this command to display binding information for one or all IP addresses.

Syntax

```
show dhcp binding [ip-address]
```

Parameters

<i>ip-address</i>	(Optional) Specifies the IP address for which to display binding information.
-------------------	---

Defaults

If no IP address is specified, binding information for all addresses is displayed.

Mode

Read-only.

Example

This example displays binding information about all addresses.

```
B2(rw)->show dhcp binding
IP address      Hardware Address      Lease Expiration      Type
-----
192.0.0.6       00:33:44:56:22:39     00:11:02              Automatic
192.0.0.8       00:33:44:56:22:33     00:10:22              Automatic
192.0.0.10      00:33:44:56:22:34     00:09:11              Automatic
192.0.0.11      00:33:44:56:22:35     00:10:05              Automatic
192.0.0.12      00:33:44:56:22:36     00:10:30              Automatic
192.0.0.13      00:33:44:56:22:37     infinite              Manual
192.0.0.14      00:33:44:56:22:38     infinite              Manual
```



## clear dhcp binding

Use this command to clear (delete) one or all DHCP address bindings.

### Syntax

```
clear dhcp binding {ip-addr | *}
```

### Parameters

<i>ip-addr</i>	Specifies the IP address for which to clear/delete the DHCP binding.
<i>*</i>	Deletes all address bindings.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example deletes the DHCP address binding for IP address 192.168.1.1.

```
B2(rw)->clear dhcp binding 192.168.1.1
```

## show dhcp server statistics

Use this command to display DHCP server statistics.

### Syntax

```
show dhcp server statistics
```

### Parameters

None.

### Defaults

None.

### Mode

Read-only.

## Example

This example displays server statistics.

```
B2(ro)->show dhcp server statistics
```

Automatic Bindings	36
Expired Bindings	6
Malformed Bindings	0
Messages	Received
-----	-----
DHCP DISCOVER	382
DHCP REQUEST	3855
DHCP DECLINE	0
DHCP RELEASE	67
DHCP INFORM	1
Messages	Sent
-----	-----
DHCP OFFER	381
DHCP ACK	727
DHCP NACK	2

## clear dhcp server statistics

Use this command to clear all DHCP server counters.

### Syntax

```
clear dhcp server statistics
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example clears all DHCP server counters.

```
B2(rw)->clear dhcp server statistics
```

## Configuring IP Address Pools

### Manual Pool Configuration Considerations

- The subnet of the IP address being issued should be on the same subnet as the ingress interface (that is, the subnet of the host IP address of the switch, or if routing interfaces are configured, the subnet of the routing interface).

- A manual pool can be configured using either the client's hardware address (**set dhcp pool hardware-address**) or the client's client-identifier (**set dhcp pool client-identifier**), but using both is not recommended.
- If the incoming DHCP request packet contains a client-identifier, then a manual pool configured with that client-identifier must exist on the switch in order for the request to be processed. The hardware address is not checked.
- If a manual pool is configured with a client-identifier, then the incoming DHCP request packet from that client must include that client-identifier in order for the request to be processed. The hardware address is not checked.
- A hardware address and type (Ethernet or IEEE 802) configured in a manual pool is checked only when a client-identifier is not also configured for the pool and the incoming DHCP request packet does not include a client-identifier option.

## Purpose

To configure and clear DHCP address pool parameters, and to display address pool configuration information.



**Note:** A total of 16 address pools, dynamic and/or static, can be configured on the SecureStack B2.

## Commands

For information about...	Refer to page...
set dhcp pool	<a href="#">15-12</a>
clear dhcp pool	<a href="#">15-12</a>
set dhcp pool network	<a href="#">15-13</a>
clear dhcp pool network	<a href="#">15-14</a>
set dhcp pool hardware-address	<a href="#">15-14</a>
clear dhcp pool hardware-address	<a href="#">15-15</a>
set dhcp pool host	<a href="#">15-15</a>
clear dhcp pool host	<a href="#">15-16</a>
set dhcp pool client-identifier	<a href="#">15-16</a>
clear dhcp pool client-identifier	<a href="#">15-17</a>
set dhcp pool client-name	<a href="#">15-18</a>
clear dhcp pool client-name	<a href="#">15-18</a>
set dhcp pool bootfile	<a href="#">15-19</a>
clear dhcp pool bootfile	<a href="#">15-19</a>
set dhcp pool next-server	<a href="#">15-20</a>
clear dhcp pool next-server	<a href="#">15-20</a>
set dhcp pool lease	<a href="#">15-21</a>
clear dhcp pool lease	<a href="#">15-21</a>

For information about...	Refer to page...
set dhcp pool default-router	<a href="#">15-22</a>
clear dhcp pool default-router	<a href="#">15-22</a>
set dhcp pool dns-server	<a href="#">15-23</a>
clear dhcp pool dns-server	<a href="#">15-23</a>
set dhcp pool domain-name	<a href="#">15-24</a>
clear dhcp pool domain-name	<a href="#">15-24</a>
set dhcp pool netbios-name-server	<a href="#">15-25</a>
clear dhcp pool netbios-name-server	<a href="#">15-25</a>
set dhcp pool netbios-node-type	<a href="#">15-26</a>
clear dhcp pool netbios-node-type	<a href="#">15-26</a>
set dhcp pool option	<a href="#">15-27</a>
clear dhcp pool option	<a href="#">15-28</a>
show dhcp pool configuration	<a href="#">15-28</a>

## set dhcp pool

Use this command to create and assign a name to a DHCP server pool of addresses. Up to 16 address pools may be configured on a SecureStack B2. Note that entering this command is not required to create an address pool before configuring other address pool parameters.

### Syntax

```
set dhcp pool poolname
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example creates an address pool named "auto1."

```
B2(rw)->set dhcp pool auto1
```

## clear dhcp pool

Use this command to delete a DHCP server pool of addresses.

## Syntax

```
clear dhcp pool poolname
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example deletes the address pool named "auto1."

```
B2(rw)->clear dhcp pool auto1
```

# set dhcp pool network

Use this command to configure the subnet number and mask for an automatic DHCP address pool.

## Syntax

```
set dhcp pool poolname network number {mask | prefix-length}
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>number</i>	Specifies an IP subnet for the address pool.
<i>mask</i>	Specifies the subnet mask in dotted quad notation.
<i>prefix-length</i>	Specifies the subnet mask as an integer.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Use this command to configure a set of IP addresses to be assigned by the DHCP server using the specified address pool. In order to limit the scope of the addresses configured with this command, use the [set dhcp exclude](#) command on page [15-6](#).

## Examples

This example configures the IP subnet 172.20.28.0 with a prefix length of 24 for the automatic DHCP pool named "auto1." Alternatively, the mask could have been specified as 255.255.255.0.

```
B2(rw)->set dhcp pool auto1 network 172.20.28.0 24
```

This example limits the scope of 255 addresses created for the Class C network 172.20.28.0 by the previous example, by excluding addresses 172.20.28.80 – 100.

```
B2(rw)->set dhcp exclude 172.20.28.80 172.20.28.100
```

## clear dhcp pool network

Use this command to remove the network number and mask of a DHCP server pool of addresses.

### Syntax

```
clear dhcp pool poolname network
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example deletes the network and mask from the address pool named “auto1.”

```
B2(rw)->clear dhcp pool auto1 network
```

## set dhcp pool hardware-address

Use this command to configure the MAC address of the DHCP client and create an address pool for manual binding. You can use either this command or the **set dhcp pool client-identifier** command to create a manual binding pool, but using both is not recommended.

### Syntax

```
set dhcp pool poolname hardware-address hw-addr [type]
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>hw-addr</i>	Specifies the MAC address of the client’s hardware platform. This value can be entered using dotted hexadecimal notation or colons.
<i>type</i>	(Optional) Specifies the protocol of the hardware platform. Valid values are 1 for Ethernet or 6 for IEEE 802. Default value is 1, Ethernet.

### Defaults

If no *type* is specified, Ethernet is assumed.

## Mode

Switch command, read-write.

## Example

This example specifies 0001.f401.2710 as the Ethernet MAC address for the manual address pool named “manual1.” Alternatively, the MAC address could have been entered as 00:01:f4:01:27:10.

```
B2(rw)->set dhcp pool manual1 hardware-address 0001.f401.2710
```

# clear dhcp pool hardware-address

Use this command to remove the hardware address of a DHCP client from a manual binding address pool.

## Syntax

```
clear dhcp pool poolname hardware-address
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example deletes the client hardware address from the address pool named “manual1.”

```
B2(rw)->clear dhcp pool manual1 hardware-address
```

# set dhcp pool host

Use this command to configure an IP address and network mask for a manual DHCP binding.

## Syntax

```
set dhcp pool poolname host ip-address [mask | prefix-length]
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>ip-address</i>	Specifies the IP address for manual binding.
<i>mask</i>	(Optional) Specifies the subnet mask in dotted quad notation.
<i>prefix-length</i>	(Optional) Specifies the subnet mask as an integer.

## Defaults

If a mask or prefix is not specified, the class A, B, or C natural mask will be used.

## Mode

Switch command, read-write.

## Example

This example shows how to configure the minimum requirements for a manual binding address pool. First, the hardware address of the client's hardware platform is configured, followed by configuration of the address to be assigned to that client manually.

```
B2(rw)->set dhcp pool manual1 hardware-address 0001.f401.2710
B2(rw)->set dhcp pool manual1 host 15.12.1.99 255.255.248.0
```

# clear dhcp pool host

Use this command to remove the host IP address from a manual binding address pool.

## Syntax

```
clear dhcp pool poolname host
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example deletes the host IP address from the address pool named "manual1."

```
B2(rw)->clear dhcp pool manual1 host
```

# set dhcp pool client-identifier

Use this command to configure the client identifier of the DHCP client and create an address pool for manual binding. You can use either this command or the **set dhcp pool hardware-address** command to create a manual binding pool, but using both is not recommended.

## Syntax

```
set dhcp pool poolname client-identifier id
```



## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>id</i>	Specifies the unique client identifier for this client. The value must be entered in xx:xx:xx:xx:xx:xx format.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The client identifier is formed by concatenating the media type and the MAC address. For example, if the client hardware type is Ethernet and the client MAC address is 00:01:22:33:44:55, then the client identifier configured with this command must be 01:00:01:22:33:44:55.

## Example

This example shows how to configure the minimum requirements for a manual binding address pool, using a client identifier rather than the hardware address of the client's hardware platform.

```
B2(rw)->set dhcp pool manual2 client-identifier 01:00:01:22:33:44:55
B2(rw)->set dhcp pool manual2 host 10.12.1.10 255.255.255.0
```

# clear dhcp pool client-identifier

Use this command to remove the unique identifier of a DHCP client from a manual binding address pool.

## Syntax

```
clear dhcp pool poolname client-identifier
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example deletes the client identifier from the address pool named "manual1."

```
B2(rw)->clear dhcp pool manual1 client-identifier
```

## set dhcp pool client-name

Use this command to assign a name to a DHCP client when creating an address pool for manual binding.

### Syntax

```
set dhcp pool poolname client-name name
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>name</i>	Specifies the name to be assigned to this client. Client names may be up to 31 characters in length.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example configures the client name “appsvr1” to the manual binding pool “manual2.”

```
B2(rw)->set dhcp pool manual2 client-identifier 01:22:33:44:55:66
B2(rw)->set dhcp pool manual2 host 10.12.1.10 255.255.255.0
B2(rw)->set dhcp pool manual2 client-name appsvr1
```

## clear dhcp pool client-name

Use this command to delete a DHCP client name from an address pool for manual binding.

### Syntax

```
clear dhcp pool poolname client-name
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example deletes the client name from the manual binding pool “manual2.”

```
B2(rw)->clear dhcp pool manual2 client-name
```

## set dhcp pool bootfile

Use this command to specify a default boot image for the DHCP clients who will be served by the address pool being configured.

### Syntax

```
set dhcp pool poolname bootfile filename
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>filename</i>	Specifies the boot image file name.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example sets the boot image filename for address pool named "auto1."

```
B2(rw)->set dhcp pool auto1 bootfile image1.img
```

## clear dhcp pool bootfile

Use this command to remove a default boot image from the address pool being configured.

### Syntax

```
clear dhcp pool poolname bootfile
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example removes the boot image filename from address pool named "auto1."

```
B2(rw)->clear dhcp pool auto1 bootfile
```

## set dhcp pool next-server

Use this command to specify the file server from which the default boot image is to be loaded by the client.

### Syntax

```
set dhcp pool poolname next-server ip-address
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>ip-address</i>	Specifies the IP address of the file server the DHCP client should contact to load the default boot image.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example specifies the file server from which clients being served by address pool “auto1” should download the boot image file “image1.img.”

```
B2(rw)->set dhcp pool auto1 bootfile image1.img
B2(rw)->set dhcp pool auto1 next-server 10.1.1.10
```

## clear dhcp pool next-server

Use this command to remove the boot image file server from the address pool being configured.

### Syntax

```
clear dhcp pool poolname next-server
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example removes the file server from address pool “auto1.”

```
B2(rw)->clear dhcp pool auto1 next-server
```

## set dhcp pool lease

Use this command to specify the duration of the lease for an IP address assigned by the DHCP server from the address pool being configured.

### Syntax

```
set dhcp pool poolname lease {days [hours [minutes]] | infinite}
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>days</i>	Specifies the number of days an address lease will remain valid. Value can range from 0 to 59.
<i>hours</i>	(Optional) When a <i>days</i> value has been assigned, specifies the number of hours an address lease will remain valid. Value can range from 0 to 1439.
<i>minutes</i>	(Optional) When a <i>days</i> value and an <i>hours</i> value have been assigned, specifies the number of minute an address lease will remain valid. Value can range from 0 to 86399.
<b>infinite</b>	Specifies that the duration of the lease will be unlimited.

### Defaults

If no lease time is specified, a lease duration of 1 day is configured.

### Mode

Switch command, read-write.

### Example

This example configures a lease duration of 12 hours for the address pool being configured. Note that to configure a lease time less than one day, enter 0 for days, then the number of hours and minutes.

```
B2(rw)->set dhcp pool auto1 lease 0 12
```

## clear dhcp pool lease

Use this command to restore the default lease time value of one day for the address pool being configured.

### Syntax

```
clear dhcp pool poolname lease
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

Clears the lease time for this address pool to the default value of one day.

## Mode

Switch command, read-write.

## Example

This example restores the default lease duration of one day for address pool “auto1.”

```
B2(rw)->clear dhcp pool auto1 lease
```

# set dhcp pool default-router

Use this command to specify a default router list for the DHCP clients served by the address pool being configured. Up to 8 default routers can be configured.

## Syntax

```
set dhcp pool poolname default-router address [address2 ... address8]
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>address</i>	Specifies the IP address of a default router.
<i>address2</i> ... <i>address8</i>	(Optional) Specifies, in order of preference, up to 7 additional default router addresses.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example assigns a default router at 10.10.10.1 to the address pool named “auto1.”

```
B2(rw)->set dhcp pool auto1 default-router 10.10.10.1
```

# clear dhcp pool default-router

Use this command to delete the default routers configured for this address pool.

## Syntax

```
clear dhcp pool poolname default-router
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example removes the default router from the address pool "auto1."

```
B2(rw)->clear dhcp pool auto1 default-router
```

# set dhcp pool dns-server

Use this command to specify one or more DNS servers for the DHCP clients served by the address pool being configured. Up to 8 DNS servers can be configured.

## Syntax

```
set dhcp pool poolname dns-server address [address2 ... address8]
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>address</i>	Specifies the IP address of a DNS server.
<i>address2</i> ... <i>address8</i>	(Optional) Specifies, in order of preference, up to 7 additional DNS server addresses.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example assigns a DNS server at 10.14.10.1 to the address pool "auto1."

```
B2(rw)->set dhcp pool auto1 dns-server 10.14.10.1
```

# clear dhcp pool dns-server

Use this command to remove the DNS server list from the address pool being configured.

## Syntax

```
clear dhcp pool poolname dns-server
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example removes the DNS server list from the address pool “auto1.”

```
B2(rw)->clear dhcp pool auto1 dns-server
```

# set dhcp pool domain-name

Use this command to specify a domain name to be assigned to DHCP clients served by the address pool being configured.

## Syntax

```
set dhcp pool poolname domain-name domain
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>domain</i>	Specifies the domain name string. The domain name can be up to 255 characters in length.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example assigns the “mycompany.com” domain name to the address pool “auto1.”

```
B2(rw)->set dhcp pool auto1 domain-name mycompany.com
```

# clear dhcp pool domain-name

Use this command to remove the domain name from the address pool being configured.

## Syntax

```
clear dhcp pool poolname domain-name
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.



## Mode

Switch command, read-write.

## Example

This example removes the domain name from the address pool "auto1."

```
B2(rw)->clear dhcp pool auto1 domain-name
```

# set dhcp pool netbios-name-server

Use this command to assign one or more NetBIOS name servers for the DHCP clients served by the address pool being configured. Up to 8 NetBIOS name servers can be configured.

## Syntax

```
set dhcp pool poolname netbios-name-server address [address2 ... address8]
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>address</i>	Specifies the IP address of a NetBIOS name server.
<i>address2</i> ... <i>address8</i>	(Optional) Specifies, in order of preference, up to 7 additional NetBIOS name server addresses.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example assigns a NetBIOS name server at 10.15.10.1 to the address pool being configured.

```
B2(rw)->set dhcp pool auto1 netbios-name-server 10.15.10.1
```

# clear dhcp pool netbios-name-server

Use this command to remove the NetBIOS name server list from the address pool being configured.

```
clear dhcp pool poolname netbios-name-server
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example removes the NetBIOS name server list from the address pool auto1.

```
B2(rw)->clear dhcp pool auto1 netbios-name-server
```

# set dhcp pool netbios-node-type

Use this command to specify a NetBIOS node (server) type for the DHCP clients served by the address pool being configured.

## Syntax

```
set dhcp pool poolname netbios-node-type {b-node | h-node | p-node | m-node}
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<b>b-node</b>	Specifies the NetBIOS node type to be broadcast (no WINS).
<b>h-node</b>	Specifies the NetBIOS node type to be hybrid (WINS, then broadcast).
<b>p-node</b>	Specifies the NetBIOS node type to be peer (WINS only).
<b>m-node</b>	Specifies the NetBIOS node type to be mixed (broadcast, then WINS).

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example specifies hybrid as the NetBIOS node type for the address pool “auto1.”

```
B2(rw)->set dhcp pool auto1 netbios-node-type h-node
```

# clear dhcp pool netbios-node-type

Use this command to remove the NetBIOS node type from the address pool being configured.

## Syntax

```
clear dhcp pool poolname netbios-node-type
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example removes the NetBIOS node type from the address pool “auto1.”

```
B2(rw)->clear dhcp pool auto1 netbios-node-type
```

# set dhcp pool option

Use this command to configure DHCP options, described in RFC 2132.

## Syntax

```
set dhcp pool poolname option code {ascii string | hex string-list | ip address-list}
```

## Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>code</i>	Specifies the DHCP option code, as defined in RFC 2132. Value can range from 1 to 254.
<b>ascii string</b>	Specifies the data in ASCII format. An ASCII character string containing a space must be enclosed in quotations.
<b>hex string-list</b>	Specifies the data in HEX format. Up to 8 HEX strings can be entered.
<b>ip address-list</b>	Specifies the data in IP address format. Up to 8 IP addresses can be entered.

## Defaults

None.

## Mode

Switch command, read-write.

## Examples

This example configures DHCP option 19, which specifies whether the client should configure its IP layer for packet forwarding. In this case, IP forwarding is enabled with the 01 value.

```
B2(rw)->set dhcp pool auto1 option 19 hex 01
```

This example configures DHCP option 72, which assigns one or more Web servers for DHCP clients. In this case, two Web server addresses are configured.

```
B2(rw)->set dhcp pool auto1 option 72 ip 168.24.3.252 168.24.3.253
```

## clear dhcp pool option

Use this command to remove a DHCP option from the address pool being configured.

### Syntax

```
clear dhcp pool poolname option code
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
<i>code</i>	Specifies the DHCP option code, as defined in RFC 2132. Value can range from 1 to 254.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example removes option 19 from address pool “auto1.”

```
B2(rw)->clear dhcp pool auto1 option 19
```

## show dhcp pool configuration

Use this command to display configuration information for one or all address pools.

### Syntax

```
show dhcp pool configuration [poolname / all]
```

### Parameters

<i>poolname</i>	Specifies the name of the address pool. Pool names may be up to 31 characters in length.
-----------------	--

### Defaults

None.

### Mode

Read-only.

### Example

This example displays configuration information for all address pools.

```
B2(rw)->show dhcp pool configuration all
```

```
Pool: Atg_Pool
Pool Type                               Dynamic
```

---

Network	192.0.0.0 255.255.255.0
Lease Time	1 days 0 hrs 0 mins
Default Routers	192.0.0.1
Pool: static1	
Pool Type	Manual
Client Name	appsvr1
Client Identifier	01:00:01:f4:01:27:10
Host	10.1.1.1 255.0.0.0
Lease Time	infinite
Option	19 hex 01
Pool: static2	
Pool Type	Manual
Hardware Address	00:01:f4:01:27:10
Hardware Address Type	ieee802
Host	192.168.10.1 255.255.255.0
Lease Time	infinite



## Security Configuration

This chapter describes the Security Configuration set of commands and how to use them.

For information about...	Refer to page...
<a href="#">Overview of Security Methods</a>	<a href="#">16-1</a>
<a href="#">Configuring RADIUS</a>	<a href="#">16-3</a>
<a href="#">Configuring 802.1X Authentication</a>	<a href="#">16-9</a>
<a href="#">Configuring MAC Authentication</a>	<a href="#">16-19</a>
<a href="#">Configuring Multiple Authentication Methods</a>	<a href="#">16-30</a>
<a href="#">Configuring VLAN Authorization (RFC 3580)</a>	<a href="#">16-41</a>
<a href="#">Configuring MAC Locking</a>	<a href="#">16-46</a>
<a href="#">Configuring Port Web Authentication (PWA)</a>	<a href="#">16-57</a>
<a href="#">Configuring Secure Shell (SSH)</a>	<a href="#">16-69</a>

### Overview of Security Methods

The following security methods are available for controlling which users are allowed to access, monitor, and manage the switch.

- Login user accounts and passwords – used to log in to the CLI via a Telnet connection or local COM port connection. For details, refer to [“Setting User Accounts and Passwords”](#) on page 3-1.
- Host Access Control Authentication (HACA) – authenticates user access of Telnet management, console local management and WebView via a central RADIUS Client/Server application. When RADIUS is enabled, this essentially overrides login user accounts. When HACA is active per a valid RADIUS configuration, the user names and passwords used to access the switch via Telnet, SSH, WebView, and COM ports will be validated against the configured RADIUS server. Only in the case of a RADIUS timeout will those credentials be compared against credentials locally configured on the switch. For details, refer to [“Configuring RADIUS”](#) on page 16-3.
- SNMP user or community names – allows access to the SecureStack B2 switch via a network SNMP management application. To access the switch, you must enter an SNMP user or community name sting. The level of management access is dependent on the associated access policy. For details, refer to [Chapter 6](#).
- 802.1X Port Based Network Access Control using EAPOL (Extensible Authentication Protocol) – provides a mechanism via a RADIUS server for administrators to securely authenticate and grant appropriate access to end user devices communicating with

SecureStack B2 ports. For details on using CLI commands to configure 802.1X, refer to [“Configuring 802.1X Authentication”](#) on page 16-9.

**Note:** To configure EAP pass-through, which allows client authentication packets to be forwarded through the switch to an upstream device, 802.1X authentication must be globally disabled with the **set dot1x** command.



- MAC Authentication – provides a mechanism for administrators to securely authenticate source MAC addresses and grant appropriate access to end user devices communicating with SecureStack B2 ports. For details, refer to [“Configuring MAC Authentication”](#) on page 16-19.
- Multiple Authentication Methods – allows users to authenticate using multiple methods of authentication on the same port. For details, refer to [“Configuring Multiple Authentication Methods”](#) on page 16-30.
- Multi-User Authentication – On the SecureStack B2, the only type of multiple user authentication supported is “User + IP Phone”. The User + IP Phone authentication feature supports authentication and authorization of two devices, specifically a PC cascaded with an IP phone, on a single port on the B2. The IP phone must authenticate using MAC or 802.1X authentication, but the user may authenticate by any method. This feature allows both the user’s PC and IP phone to simultaneously authenticate on a single port and each receive a unique level of network access. For details, refer to [“Configuring Multi-User Authentication \(User + IP phone\)”](#) on page 16-30.

**Note:** B2 devices support up to eight authenticated users per port.



- RFC 3580 Tunnel Attributes provide a mechanism to contain an 802.1X authenticated user to a VLAN regardless of the PVID. Up to three users can be configured per Gigabit port. Refer to [“Configuring VLAN Authorization \(RFC 3580\)”](#) on page 16-41.
- MAC Locking – locks a port to one or more MAC addresses, preventing the use of unauthorized devices and MAC spoofing on the port. For details, refer to [“Configuring MAC Locking”](#) on page 16-46.
- Port Web Authentication (PWA) – locks down a port a user is attached to until after the user logs in using a web browser to access the switch. The switch will pass all login information from the end station to a RADIUS server for authentication before turning the port on. PWA is an alternative to 802.1X and MAC authentication. For details, refer to [“Configuring Port Web Authentication \(PWA\)”](#) on page 16-57.
- Secure Shell (SSH) – provides secure Telnet. For details, refer to [“Configuring Secure Shell \(SSH\)”](#) on page 16-69.

## RADIUS Filter-ID Attribute and Dynamic Policy Profile Assignment

If you configure an authentication method that requires communication with a RADIUS server, you can use the RADIUS Filter-ID attribute to dynamically assign a policy profile and/or management level to authenticating users and/or devices.

The RADIUS Filter-ID attribute is simply a string that is formatted in the RADIUS Access-Accept packet sent back from the RADIUS server to the switch during the authentication process.

Each user can be configured in the RADIUS server database with a RADIUS Filter-ID attribute that specifies the name of the policy profile and/or management level the user should be assigned upon successful authentication. During the authentication process, when the RADIUS server returns a RADIUS Access-Accept message that includes a Filter-ID matching a policy profile name



configured on the switch, the switch then dynamically applies the policy profile to the physical port the user/device is authenticating on.

## Filter-ID Attribute Formats

Enterasys Networks supports two Filter-ID formats — “decorated” and “undecorated.” The decorated format has three forms:

- To specify the policy profile to assign to the authenticating user (network access authentication):

`Enterasys:version=1:policy=string`

where *string* specifies the policy profile name. Policy profile names are case-sensitive.

- To specify a management level (management access authentication):

`Enterasys:version=1:mgmt=level`

where *level* indicates the management level, either **ro**, **rw**, or **su**.

- To specify both management level and policy profile:

`Enterasys:version=1:mgmt=level:policy=string`

The undecorated format is simply a string that specifies a policy profile name. The undecorated format cannot be used for management access authentication.

Decorated Filter-IDs are processed first by the switch. If no decorated Filter-IDs are found, then undecorated Filter-IDs are processed. If multiple Filter-IDs are found that contain conflicting values, a Syslog message is generated.

# Configuring RADIUS

## Purpose

To perform the following:

- Review the RADIUS client/server configuration on the switch.
- Enable or disable the RADIUS client.
- Set local and remote login options.
- Set primary and secondary server parameters, including IP address, timeout period, authentication realm, and number of user login attempts allowed.
- Reset RADIUS server settings to default values.
- Configure a RADIUS accounting server.

## Commands

For information about...	Refer to page...
<code>show radius</code>	<a href="#">16-4</a>
<code>set radius</code>	<a href="#">16-5</a>
<code>clear radius</code>	<a href="#">16-7</a>
<code>show radius accounting</code>	<a href="#">16-7</a>

For information about...	Refer to page...
set radius accounting	<a href="#">16-8</a>
clear radius accounting	<a href="#">16-9</a>

# show radius

Use this command to display the current RADIUS client/server configuration.

## Syntax

`show radius [status | retries | timeout | server [index | all]]`

## Parameters

<b>status</b>	(Optional) Displays the RADIUS server's enable status.
<b>retries</b>	(Optional) Displays the number of retry attempts before the RADIUS server times out.
<b>timeout</b>	(Optional) Displays the maximum amount of time (in seconds) to establish contact with the RADIUS server before retry attempts begin.
<b>server</b>	(Optional) Displays RADIUS server configuration information.
<i>index</i>   <b>all</b>	For use with the <b>server</b> parameter to show server configuration for all servers or a specific RADIUS server as defined by an index.

## Defaults

If no parameters are specified, all RADIUS configuration information will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display RADIUS configuration information:

```
B2(rw)->show radius
RADIUS status:      Enabled
RADIUS retries:      3
RADIUS timeout:      20 seconds
RADIUS Server        IP Address      Auth-Port  Realm-Type
-----
10                   172.16.20.10  1812       management-access
```

[Table 16-48](#) provides an explanation of the command output.

**Table 16-48 show radius Output Details**

Output	What It Displays...
RADIUS status	Whether RADIUS is <b>enabled</b> or <b>disabled</b> .
RADIUS retries	Number of retry attempts before the RADIUS server times out. The default value of <b>3</b> can be reset using the <b>set radius</b> command as described in " <a href="#">set radius</a> " on page 16-5.

**Table 16-48 show radius Output Details (Continued)**

Output	What It Displays...
RADIUS timeout	Maximum amount of time (in seconds) to establish contact with the RADIUS server before retry attempts begin. The default value of <b>20</b> can be reset using the <b>set radius</b> command as described in “ <a href="#">set radius</a> ” on page 16-5.
RADIUS Server	RADIUS server's index number, IP address, and UDP authentication port.
Realm-Type	<p>Realm defines who has to go through the RADIUS server for authentication.</p> <ul style="list-style-type: none"> <li>• Management-access: This means that anyone trying to access the switch (Telnet, SSH, Local Management) has to authenticate through the RADIUS server.</li> <li>• Network-access: This means that all the users have to authenticate to a RADIUS server before they are allowed access to the network.</li> <li>• Any-access: Means that both Management-access and Network-access have been enabled.</li> </ul>

## set radius

Use this command to enable, disable, or configure RADIUS authentication.

### Syntax

```
set radius {enable | disable} | {retries number-of-retries} | {timeout timeout} |
{server index ip-address port [secret-value] [realm {management-access | any |
network-access}]} | {realm {management-access | any | network-access} {index| all}}
```

### Parameters

<b>enable</b>   <b>disable</b>	Enables or disables the RADIUS client.
<b>retries</b> <i>number-of-retries</i>	Specifies the number of retry attempts before the RADIUS server times out. Valid values are from <b>0</b> to <b>10</b> . Default is <b>3</b> .
<b>timeout</b> <i>timeout</i>	Specifies the maximum amount of time (in seconds) to establish contact with the RADIUS server before retry attempts begin. Valid values are from <b>1</b> to <b>30</b> . Default is <b>20</b> seconds.
<b>server</b> <i>index ip_address port</i>	Specifies the index number, IP address and the UDP authentication port for the RADIUS server.
<i>secret-value</i>	(Optional) Specifies an encryption key to be used for authentication between the RADIUS client and server.

<b>realm</b> <b>management-</b> <b>access   any  </b> <b>network-access</b>	<p>Realm allows you to define who has to go through the RADIUS server for authentication.</p> <ul style="list-style-type: none"> <li>• <b>management-access</b>: This means that anyone trying to access the switch (Telnet, SSH, Local Management) has to authenticate through the RADIUS server.</li> <li>• <b>network-access</b>: This means that all the users have to authenticate to a RADIUS server before they are allowed access to the network.</li> <li>• <b>any</b>: Means that both management-access and network-access have been enabled.</li> </ul> <p><b>Note:</b> If the <b>management-access</b> or <b>any</b> access realm has been configured, the local “admin” account is disabled for access to the switch using the console, Telnet, or Local Management. Only the <b>network-access</b> realm allows access to the local “admin” account.</p>
<i>index</i>   <b>all</b>	Applies the realm setting to a specific server or to all servers.

## Defaults

If *secret-value* is not specified, none will be applied.

If **realm** is not specified, the **any** access realm will be used.

## Mode

Switch command, read-write.

## Usage

The SecureStack B2 device allows up to 10 RADIUS accounting servers to be configured, with up to two servers active at any given time.

The RADIUS client can only be enabled on the switch once a RADIUS server is online, and its IP address(es) has been configured with the same password the RADIUS client will use.



**Note:** If RADIUS is configured with no host IP address on the device, it will use the loopback interface 0 IP address (if it has been configured) as its source for the NAS-IP attribute. For information about configuring loopback interfaces, refer to “[interface](#)” on page 17-2.

## Examples

This example shows how to enable the RADIUS client for authenticating with RADIUS server 1 at IP address 192.168.6.203, UDP authentication port 1812, and an authentication password of “pwsecret.” As previously noted, the “server secret” password entered here must match that already configured as the Read-Write (rw) password on the RADIUS server:

```
B2(su)->set radius server 1 192.168.6.203 1812 pwsecret
```

This example shows how to set the RADIUS timeout to 5 seconds:

```
B2(su)->set radius timeout 5
```

This example shows how to set RADIUS retries to 10:

```
B2(su)->set radius retries 10
```

This example shows how to force any management-access to the switch (Telnet, web, SSH) to authenticate through a RADIUS server. The **all** parameter at the end of the command means that any of the defined RADIUS servers can be used for this Authentication.

```
B2(rw)->set radius realm management-access all
```

## clear radius

Use this command to clear RADIUS server settings.

### Syntax

```
clear radius [retries] | [timeout] | [server {index | all | realm {index / all}}]
```

### Parameters

<b>retries</b>	Resets the maximum number of attempts a user can contact the RADIUS server before timing out to <b>3</b> .
<b>timeout</b>	Resets the maximum amount of time to establish contact with the RADIUS server before timing out to <b>20</b> seconds.
<b>server</b>	Deletes server settings.
<i>index</i>   <b>all</b>	For use with the <b>server</b> parameter to clear the server configuration for all servers or a specific RADIUS server as defined by an index.
<b>realm</b>	Resets the realm setting for all servers or a specific RADIUS server as defined by an index.

### Mode

Switch command, read-write.

### Defaults

None.

### Examples

This example shows how to clear all settings on all RADIUS servers:

```
B2(su)->clear radius server all
```

This example shows how to reset the RADIUS timeout to the default value of 20 seconds:

```
B2(su)->clear radius timeout
```

## show radius accounting

Use this command to display the RADIUS accounting configuration. This transmits accounting information between a network access server and a shared accounting server.

### Syntax

```
show radius accounting [server] | [counter ip-address] | [retries] | [timeout]
```

### Parameters

<b>server</b>	(Optional) Displays one or all RADIUS accounting server configurations.
<b>counter</b> <i>ip-address</i>	(Optional) Displays counters for a RADIUS accounting server.
<b>retries</b>	(Optional) Displays the maximum number of attempts to contact the RADIUS accounting server before timing out.
<b>timeout</b>	(Optional) Displays the maximum amount of time before timing out.

Mode

Switch command, read-only.

Defaults

If no parameters are specified, all RADIUS accounting configuration information will be displayed.

Example

This example shows how to display RADIUS accounting configuration information. In this case, RADIUS accounting is not currently enabled and global default settings have not been changed. One server has been configured.

For details on enabling and configuring RADIUS accounting, refer to “set radius accounting” on page 16-8:

```
B2(ro)->show radius accounting

RADIUS accounting status:          Disabled
RADIUS Acct Server  IP Address  Acct-Port  Retries  Timeout  Status
-----
1                   172.16.2.10  1856       3        20       Disabled
```

set radius accounting

Use this command to configure RADIUS accounting.

Syntax

```
set radius accounting {[enable | disable] [retries retries] [timeout timeout]
[server ip_address port [server-secret]]}
```

Parameters

<b>enable   disable</b>	Enables or disables the RADIUS accounting client.
<b>retries</b> <i>retries</i>	Sets the maximum number of attempts to contact a specified RADIUS accounting server before timing out. Valid retry values are <b>0 - 10</b> .
<b>timeout</b> <i>timeout</i>	Sets the maximum amount of time (in seconds) to establish contact with a specified RADIUS accounting server before timing out. Valid timeout values are <b>1 - 30</b> .
<b>server</b> <i>ip_address</i> <i>port server-secret</i>	Specifies the accounting server's: <ul style="list-style-type: none"><li>• IP address</li><li>• UDP authentication port (<b>0 - 65535</b>)</li><li>• <i>server-secret</i> (Read-Write password to access this accounting server. Device will prompt for this entry upon creating a server instance, as shown in the example below.)</li></ul>

Mode

Switch command, read-write.

Defaults

None.

## Examples

This example shows how to enable the RADIUS accounting client for authenticating with the accounting server at IP address 10.2.4.12, UDP authentication port 1800. As previously noted, the “server secret” password entered here must match that already configured as the Read-Write (rw) password on the RADIUS accounting server:

```
B2(su)->set radius accounting server 10.2.4.12 1800
Enter secret:
Re-enter secret:
```

This example shows how to set the RADIUS accounting timeout to 30 seconds:

```
B2(su)->set radius accounting timeout 30
```

This example shows how to set RADIUS accounting retries to 10:

```
B2(su)->set radius accounting retries 10
```

## clear radius accounting

Use this command to clear RADIUS accounting configuration settings.

### Syntax

```
clear radius accounting {server ip-address | retries | timeout | counter}
```

### Parameters

<b>server</b> <i>ip-address</i>	Clears the configuration on one or more accounting servers.
<b>retries</b>	Resets the retries to the default value of 3.
<b>timeout</b>	Resets the timeout to 5 seconds.
<b>counter</b>	Clears counters.

### Mode

Switch command, read-write.

### Defaults

None.

### Example

This example shows how to reset the RADIUS accounting timeout to 5 seconds.

```
B2(su)->clear radius accounting timeout
```

## Configuring 802.1X Authentication

### Purpose

To review and configure 802.1X authentication for one or more ports using EAPOL (Extensible Authentication Protocol). 802.1X controls network access by enforcing user authorization on selected ports, which results in allowing or denying network access according to RADIUS server configuration.



**Note:** To configure EAP pass-through, which allows client authentication packets to be forwarded through the switch to an upstream device, 802.1X authentication must be globally disabled with the **set dot1x** command (“[set dot1x](#)” on page 16-13).

## Commands

For information about...	Refer to page...
show dot1x	<a href="#">16-10</a>
show dot1x auth-config	<a href="#">16-11</a>
set dot1x	<a href="#">16-13</a>
set dot1x auth-config	<a href="#">16-13</a>
clear dot1x auth-config	<a href="#">16-15</a>
show eapol	<a href="#">16-15</a>
set eapol	<a href="#">16-17</a>
clear eapol	<a href="#">16-18</a>

## show dot1x

Use this command to display 802.1X status, diagnostics, statistics, and reauthentication or initialization control information for one or more ports.

### Syntax

```
show dot1x [auth-diag] [auth-stats] [port [init | reauth]] [port-string]
```

### Parameters

<b>auth-diag</b>	(Optional) Displays authentication diagnostics information.
<b>auth-stats</b>	(Optional) Displays authentication statistics.
<b>port init   reauth</b>	(Optional) Displays the status of port initialization and reauthentication control for the port.
<i>port-string</i>	(Optional) Displays information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

### Defaults

If no parameters are specified, 802.1X status will be displayed.

If *port-string* is not specified, information for all ports will be displayed.

### Mode

Switch command, read-only.



## Examples

This example shows how to display 802.1X status:

```
B2(su)->show dot1x
DOT1X is disabled.
```

This example shows how to display authentication diagnostics information for ge.1.1:

```
B2(su)->show dot1x auth-diag ge.1.1
```

```
Port : 1   Auth-Diag
Enter Connecting:                                0
EAP Logoffs While Connecting:                   0
Enter Authenticating:                            0
Success While Authenticating                    0
Timeouts While Authenticating:                   0
Fails While Authenticating:                      0
ReAuths While Authenticating:                   0
EAP Starts While Authenticating:                 0
EAP logoff While Authenticating:                 0
Backend Responses:                              0
Backend Access Challenges:                      0
Backend Others Requests To Supp:                 0
Backend NonNak Responses From:                  0
Backend Auth Successes:                         0
Backend Auth Fails:                             0
```

This example shows how to display authentication statistics for ge.1.1:

```
B2(su)->show dot1x auth-stats ge.1.1
Port: 1   Auth-Stats
EAPOL Frames Rx:                                0
EAPOL Frames Tx:                                0
EAPOL Start Frames Rx:                         0
EAPOL Logoff Frames Rx:                        0
EAPOL RespId Frames Rx:                        0
EAPOL Resp Frames Rx:                          0
EAPOL Req Frames Tx:                           0
EAP Length Error Frames Rx:                     0
Last EAPOL Frame Version:                       0
Last EAPOL Frame Source:                        00:00:00:00:00:00
```

This example shows how to display the status of port reauthentication control for ge.1.1 through ge.1.6:

```
B2(su)->show dot1x port reauth ge.1.1-6
Port 1: Port reauthenticate:                     FALSE
Port 2: Port reauthenticate:                     FALSE
Port 3: Port reauthenticate:                     FALSE
Port 4: Port reauthenticate:                     FALSE
Port 5: Port reauthenticate:                     FALSE
Port 6: Port reauthenticate:                     FALSE
```

## show dot1x auth-config

Use this command to display 802.1X authentication configuration settings for one or more ports.

### Syntax

```
show dot1x auth-config [authcontrolled-portcontrol] [maxreq] [quietperiod]
[reauthenabled] [reauthperiod] [servertimeout] [supptimeout] [txperiod]
[port-string]
```

## Parameters

<b>authcontrolled-portcontrol</b>	(Optional) Displays the current value of the controlled Port control parameter for the port.
<b>maxreq</b>	(Optional) Displays the value set for maximum requests currently in use by the backend authentication state machine.
<b>quietperiod</b>	(Optional) Displays the value set for quiet period currently in use by the authenticator PAE state machine.
<b>reauthenabled</b>	(Optional) Displays the state of reauthentication control used by the Reauthentication Timer state machine.
<b>reauthperiod</b>	(Optional) Displays the value, in seconds, set for the reauthentication period used by the reauthentication timer state machine.
<b>servertimeout</b>	(Optional) Displays the server timeout value, in seconds, currently in use by the backend authentication state machine.
<b>supptimeout</b>	(Optional) Displays the authentication supplicant timeout value, in seconds, currently in use by the backend authentication state machine.
<b>txperiod</b>	(Optional) Displays the transmission period value, in seconds, currently in use by the authenticator PAE state machine.
<i>port-string</i>	(Optional) Limits the display of desired information information to specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

If no parameters are specified, all 802.1X settings will be displayed.

If *port-string* is not specified, information for all ports will be displayed.

## Mode

Switch command, read-only.

## Examples

This example shows how to display the EAPOL port control mode for ge.1.1:

```
B2(su)->show dot1x auth-config authcontrolled-portcontrol ge.1.1
Port 1: Auth controlled port control:           Auto
```

This example shows how to display the 802.1X quiet period settings for ge.1.1:

```
B2(su)->show dot1x auth-config quietperiod ge.1.1
Port 1: Quiet period:           30
```

This example shows how to display all 802.1X authentication configuration settings for ge.1.1:

```
B2(ro)->show dot1x auth-config ge.1.1
Port : 1    Auth-Config
PAE state:                                Initialize
Backend auth state:                      Initialize
Admin controlled directions:             Both
Oper controlled directions:              Both
Auth controlled port status:              Authorized
Auth controlled port control:             Auto
Quiet period:                            60
Transmission period:                     30
Supplicant timeout:                      30
```

```

Server timeout:          30
Maximum requests:        2
Reauthentication period: 3600
Reauthentication control: Disabled

```

## set dot1x

Use this command to enable or disable 802.1X authentication, to reauthenticate one or more access entities, or to reinitialize one or more supplicants.

### Syntax

```
set dot1x {enable | disable | port {init | reauth} {true | false} [port-string]}
```

### Parameters

<b>enable   disable</b>	Enables or disables 802.1X.
<b>port</b>	Enable or disable 802.1X reauthentication or initialization control on one or more ports.
<b>init   reauth</b>	Configure initialization or reauthentication control.
<b>true   false</b>	Enable (true) or disable (false) reinitialization/reauthentication.
<i>port-string</i>	(Optional) Specifies the port(s) to reinitialize or reauthenticate.

### Defaults

If no ports are specified, the reinitialization or reauthentication setting will be applied to all ports.

### Mode

Switch command, read-write.

### Usage

Disabling 802.1X authentication globally, by not entering a specific *port-string* value, will enable the EAP pass-through feature. EAP pass-through allows client authentication packets to be forwarded unmodified through the switch to an upstream device.

### Examples

This example shows how to enable 802.1X:

```
B2(su)->set dot1x enable
```

This example shows how to reinitialize ge.1.2:

```
B2(rw)->set dot1x port init true ge.1.2
```

## set dot1x auth-config

Use this command to configure 802.1X authentication.

### Syntax

```
set dot1x auth-config {[authcontrolled-portcontrol {auto | forced-auth | forced-unauth}] [maxreq value] [quietperiod value] [reauthenabled {false | true}]}
```

```
[reauthperiod value] [servertimeout timeout] [supptimeout timeout] [txperiod
value]} [port-string]
```

## Parameters

<b>authcontrolled-portcontrol</b> <b>auto</b>   <b>forced-auth</b>   <b>forced-unauth</b>	Specifies the 802.1X port control mode. <ul style="list-style-type: none"> <li><b>auto</b> – Set port control mode to auto controlled port control. This is the default value.</li> <li><b>forced-auth</b> – Set port control mode to ForcedAuthorized controlled port control.</li> <li><b>forced-unauth</b> – Set port control mode to ForcedUnauthorized controlled port control.</li> </ul>
<b>maxreq</b> <i>value</i>	Specifies the maximum number of authentication requests allowed by the backend authentication state machine. Valid values are <b>1 – 10</b> . Default value is 2.
<b>quietperiod</b> <i>value</i>	Specifies the time (in seconds) following a failed authentication before another attempt can be made by the authenticator PAE state machine. Valid values are <b>0 – 65535</b> . Default value is 60 seconds.
<b>reauthenabled</b> <b>false</b>   <b>true</b>	Enables ( <b>true</b> ) or disables ( <b>false</b> ) reauthentication control of the reauthentication timer state machine. Default value is false.
<b>reauthperiod</b> <i>value</i>	Specifies the time lapse (in seconds) between attempts by the reauthentication timer state machine to reauthenticate a port. Valid values are <b>0 – 65535</b> . Default value is 3600 seconds.
<b>servertimeout</b> <i>timeout</i>	Specifies a timeout period (in seconds) for the authentication server, used by the backend authentication state machine. Valid values are <b>1 – 300</b> . Default value is 30 seconds.
<b>supptimeout</b> <i>timeout</i>	Specifies a timeout period (in seconds) for the authentication supplicant used by the backend authentication state machine. Valid values are <b>1 – 300</b> . Default value is 30 seconds.
<b>txperiod</b> <i>value</i>	Specifies the period (in seconds) which passes between authenticator PAE state machine EAP transmissions. Valid values are <b>0 – 65535</b> . Default value is 30 seconds.
<i>port-string</i>	(Optional) Limits the configuration of desired settings to specified port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

If *port-string* is not specified, authentication parameters will be set on all ports.

## Mode

Switch command, read-write.

## Examples

This example shows how to enable reauthentication control on ports ge.1.1-3:

```
B2(su)->set dot1x auth-config reauthenabled true ge.1.1-3
```

This example shows how to set the 802.1X quiet period to 120 seconds on ports ge.1.1-3:

```
B2(su)->set dot1x auth-config quietperiod 120 ge.1.1-3
```

## clear dot1x auth-config

Use this command to reset 802.1X authentication parameters to default values on one or more ports.

### Syntax

```
clear dot1x auth-config [authcontrolled-portcontrol] [maxreq] [quietperiod]
[reauthenabled] [reauthperiod] [servertimeout] [supptimeout] [txperiod] [port-
string]
```

### Parameters

<b>authcontrolled-portcontrol</b>	(Optional) Resets the 802.1X port control mode to <b>auto</b> .
<b>maxreq</b>	(Optional) Resets the maximum requests value to <b>2</b> .
<b>quietperiod</b>	(Optional) Resets the quiet period value to <b>60</b> seconds.
<b>reauthenabled</b>	(Optional) Resets the reauthentication control state to disabled ( <b>false</b> ).
<b>reauthperiod</b>	(Optional) Resets the reauthentication period value to <b>3600</b> seconds.
<b>servertimeout</b>	(Optional) Resets the server timeout value to <b>30</b> seconds.
<b>supptimeout</b>	(Optional) Resets the authentication supplicant timeout value to <b>30</b> seconds.
<b>txperiod</b>	(Optional) Resets the transmission period value to <b>30</b> seconds.
<i>port-string</i>	(Optional) Resets settings on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

### Defaults

If no parameters are specified, all authentication parameters will be reset.

If *port-string* is not specified, parameters will be set on all ports.

### Mode

Switch command, read-write.

### Examples

This example shows how to reset the 802.1X port control mode to auto on all ports:

```
B2(su)->clear dot1x auth-config authcontrolled-portcontrol
```

This example shows how to reset reauthentication control to disabled on ports ge.1.1-3:

```
B2(su)->clear dot1x auth-config reauthenabled ge.1.1-3
```

This example shows how to reset the 802.1X quiet period to 60 seconds on ports ge.1.1-3:

```
B2(su)->clear dot1x auth-config quietperiod ge.1.1-3
```

## show eapol

Use this command to display EAPOL status or settings for one or more ports.

## Syntax

`show eapol [port-string]`

## Parameters

<i>port-string</i>	(Optional) Displays EAPOL status for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, only EAPOL enable status will be displayed.

## Mode

Switch command, read-only.

## Example

This example shows how to display EAPOL status for ports ge.1.1-3:

```
B2(su)->show eapol ge.1.1-3
EAPOL is disabled.
```

Port	Authentication State	Authentication Mode
-----	-----	-----
ge.1.1	Initialize	Auto
ge.1.2	Initialize	Auto
ge.1.3	Initialize	Auto

[Table 16-49](#) provides an explanation of the command output. For details on using the `set eapol` command to enable the protocol and assign an authentication mode, refer to [“set eapol”](#) on page 16-17.

**Table 16-49 show eapol Output Details**

Output	What It Displays...
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

**Table 16-49 show eapol Output Details (Continued)**

Output	What It Displays...
Authentication State	<p>Current EAPOL authentication state for each port. Possible internal states for the authenticator (switch) are:</p> <ul style="list-style-type: none"> <li>• <b>initialize</b>: A port is in the initialize state when: <ul style="list-style-type: none"> <li>– authentication is disabled,</li> <li>– authentication is enabled and the port is not linked, or</li> <li>– authentication is enabled and the port is linked. (In this case very little time is spent in this state, it immediately transitions to the connecting state, via disconnected.</li> </ul> </li> <li>• <b>disconnected</b>: The port passes through this state on its way to connected whenever the port is reinitialized, via link state change, reauthentication failure, or management intervention.</li> <li>• <b>connecting</b>: While in this state, the authenticator sends request/ID messages to the end user.</li> <li>• <b>authenticating</b>: The port enters this state from connecting after receiving a response/ID from the end user. It remains in this state until the entire authentication exchange between the end user and the authentication server completes.</li> <li>• <b>authenticated</b>: The port enters this state from authenticating state after the exchange completes with a favorable result. It remains in this state until linkdown, logoff, or until a reauthentication begins.</li> <li>• <b>aborting</b>: The port enters this state from authenticating when any event occurs that interrupts the login exchange.</li> <li>• <b>held</b>: After any login failure the port remains in this state for the number of seconds equal to quietPeriod (can be set using MIB).</li> <li>• <b>forceAuth</b>: Management is allowing normal, unsecured switching on this port.</li> <li>• <b>forceUnauth</b>: Management is preventing any frames from being forwarded to or from this port.</li> </ul>
Authentication Mode	<p>Mode enabling network access for each port. Modes include:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>: Frames are forwarded according to the authentication state of each port.</li> <li>• <b>Forced Authorized Mode</b>: Meant to disable authentication on a port. It is intended for ports that support ISLs and devices that cannot authenticate, such as printers and file servers. If a default policy is applied to the port via the policy profile MIB, then frames are forwarded according to the configuration set by that policy, otherwise frames are forwarded according to the current configuration for that port. Authentication using 802.1X is not possible on a port in this mode.</li> <li>• <b>Forced Unauthorized Mode</b>: All frames received on the port are discarded by a filter. Authentication using 802.1X is not possible on a port in this mode.</li> </ul>

## set eapol

Use this command to enable or disable EAPOL port-based user authentication with the RADIUS server and to set the authentication mode for one or more ports.

### Syntax

```
set eapol [enable | disable] [auth-mode {auto | forced-auth | forced-unauth}]
port-string
```

## Parameters

<b>enable   disable</b>	Enables or disables EAPOL.
<b>auth-mode</b>	Specifies the authentication mode as:
<b>auto   forced-auth   forced-unauth</b>	<ul style="list-style-type: none"> <li>• <b>auto</b> - Auto authorization mode. This is the default mode and will forward frames according to the authentication state of the port. For details on this mode, refer to <a href="#">Table 16-49</a>.</li> <li>• <b>forced-auth</b> - Forced authorized mode, which disables authentication on the port.</li> <li>• <b>forced-unauth</b> - Forced unauthorized mode, which filters and discards all frames received on the port.</li> </ul>
<i>port-string</i>	Specifies the port(s) on which to set EAPOL parameters. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

None.

## Mode

Switch command, read-write.

## Examples

This example shows how to enable EAPOL:

```
B2(su)->set eapol enable
```

This example shows how to enable EAPOL with forced authorized mode on port ge.1.1:

```
B2(su)->set eapol auth-mode forced-auth ge.1.1
```

# clear eapol

Use this command to globally clear the EAPOL authentication mode, or to clear settings for one or more ports.

## Syntax

```
clear eapol [auth-mode] [port-string]
```

## Parameters

<b>auth-mode</b>	(Optional) Globally clears the EAPOL authentication mode.
<i>port-string</i>	Specifies the port(s) on which to clear EAPOL parameters. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

If **auth-mode** is not specified, all EAPOL settings will be cleared.

If *port-string* is not specified, settings will be cleared for all ports.



## Mode

Switch command, read-write.

## Example

This example shows how to clear the EAPOL authentication mode for port ge.1.3:

```
B2(su)->clear eapol auth-mode ge.1.3
```

# Configuring MAC Authentication

## Purpose

To review, disable, enable and configure MAC authentication. This authentication method allows the device to authenticate source MAC addresses in an exchange with an authentication server. The authenticator (switch) selects a source MAC seen on a MAC-authentication enabled port and submits it to a backend client for authentication. The backend client uses the MAC address stored password, if required, as credentials for an authentication attempt. If accepted, a string representing an access policy may be returned. If present, the switch applies the associated policy rules.

You can specify a mask to apply to MAC addresses when authenticating users through a RADIUS server (see “[set macauthentication significant-bits](#)” on page 16-29). The most common use of significant bit masks is for authentication of all MAC addresses for a specific vendor.

## Commands

For information about...	Refer to page...
show macauthentication	<a href="#">16-20</a>
show macauthentication session	<a href="#">16-21</a>
set macauthentication	<a href="#">16-22</a>
set macauthentication password	<a href="#">16-22</a>
clear macauthentication password	<a href="#">16-23</a>
set macauthentication port	<a href="#">16-23</a>
set macauthentication portinitialize	<a href="#">16-24</a>
set macauthentication portquietperiod	<a href="#">16-25</a>
clear macauthentication portquietperiod	<a href="#">16-25</a>
set macauthentication macinitialize	<a href="#">16-26</a>
set macauthentication reauthentication	<a href="#">16-26</a>
set macauthentication portreauthenticate	<a href="#">16-27</a>
set macauthentication macreauthenticate	<a href="#">16-27</a>
set macauthentication reauthperiod	<a href="#">16-28</a>
clear macauthentication reauthperiod	<a href="#">16-28</a>
set macauthentication significant-bits	<a href="#">16-29</a>

For information about...	Refer to page...
clear macauthentication significant-bits	<a href="#">16-29</a>

# show macauthentication

Use this command to display MAC authentication information for one or more ports.

## Syntax

**show macauthentication** [*port-string*]

## Parameters

<i>port-string</i>	(Optional) Displays MAC authentication information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, MAC authentication information will be displayed for all ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display MAC authentication information for ge.2.1 through 8:

```
B2(su)->show macauthentication ge.2.1-8
MAC authentication:          - enabled
MAC user password:          - NOPASSWORD
Port username significant bits - 48
```

Port	Port State	Reauth Period	Auth Allowed	Auth Allocated	Reauthentications
-----	-----	-----	-----	-----	-----
ge.2.1	disabled	3600	1	1	disabled
ge.2.2	disabled	3600	1	1	disabled
ge.2.3	disabled	3600	1	1	disabled
ge.2.4	disabled	3600	1	1	disabled
ge.2.5	disabled	3600	1	1	disabled
ge.2.6	disabled	3600	1	1	disabled
ge.2.7	disabled	3600	1	1	disabled
ge.2.8	disabled	3600	1	1	disabled

[Table 16-50](#) provides an explanation of the command output.

**Table 16-50 show macauthentication Output Details**

Output	What It Displays...
MAC authentication	Whether MAC authentication is globally enabled or disabled. Set using the <b>set macauthentication</b> command as described in “ <a href="#">set macauthentication</a> ” on page 16-22.
MAC user password	User password associated with MAC authentication on the device. Set using the <b>set macauthentication password</b> command as described in “ <a href="#">set macauthentication password</a> ” on page 16-22.

**Table 16-50 show macauthentication Output Details (Continued)**

Output	What It Displays...
Port username significant bits	Number of significant bits in the MAC addresses to be used starting with the left-most bit of the vendor portion of the MAC address. The significant portion of the MAC address is sent as a user-name credential when the primary attempt to authenticate the full MAC address fails. Any other failure to authenticate the full address, (i.e., authentication server timeout) causes the next attempt to start once again with a full MAC authentication. Default value of 48 can be changed with the <b>set macauthentication significant-bits</b> command.
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
Port State	Whether or not MAC authentication is enabled or disabled on this port.
Reauth Period	Reauthentication period for this port. Default value of <b>30</b> can be changed using the <b>set macauthentication reauthperiod</b> command (page 16-28).
Auth Allowed	Number of concurrent authentications supported on this port. Default is 1 and cannot be reset.
Auth Allocated	Maximum number of MAC authentications permitted on this port. Default is 1 and cannot be reset
Reauthentications	Whether or not reauthentication is enabled or disabled on this port. Set using the <b>set macauthentication reauthentication</b> command (page 16-26).

## show macauthentication session

Use this command to display the active MAC authenticated sessions.

### Syntax

```
show macauthentication session
```

### Parameters

None.

### Defaults

If *port-string* is not specified, MAC session information will be displayed for all MAC authentication ports.

### Mode

Switch command, read-only.

### Usage

Changing the Reauth Period with the [set macauthentication reauthperiod](#) command does not affect current sessions. New sessions display the correct period.

### Example

This example shows how to display MAC session information:

```
B2(su)->show macauthentication session
Port          MAC Address      Duration  Reauth Period  Reauthentications
-----
ge.1.2        00:60:97:b5:4c:07  0,00:52:31  3600           disabled
```

Table 16-51 provides an explanation of the command output.

Table 16-51 show macauthentication session Output Details

Output	What It Displays...
Port	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “Port String Syntax Used in the CLI” on page 5-2.
MAC Address	MAC address associated with the session.
Duration	Time this session has been active.
Reauth Period	Reauthentication period for this port, set using the <b>set macauthentication reauthperiod</b> command described in “set macauthentication reauthperiod” on page 16-28.
Reauthentications	Whether or not reauthentication is enabled or disabled on this port. Set using the <b>set macauthentication reauthentication</b> command described in “set macauthentication reauthentication” on page 16-26.

## set macauthentication

Use this command to globally enable or disable MAC authentication.

### Syntax

```
set macauthentication {enable | disable}
```

### Parameters

enable   disable	Globally enables or disables MAC authentication.
------------------	--

### Mode

Switch command, read-write.

### Defaults

None.

### Example

This example shows how to globally enable MAC authentication:

```
B2(su)->set macauthentication enable
```

## set macauthentication password

Use this command to set a MAC authentication password.

## Syntax

```
set macauthentication password password
```

## Parameters

<i>password</i>	Specifies a text string MAC authentication password.
-----------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the MAC authentication password to “macauth”:

```
B2(su)->set macauthentication password macauth
```

# clear macauthentication password

Use this command to clear the MAC authentication password.

## Syntax

```
clear macauthentication password
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the MAC authentication password:

```
B2(su)->clear macauthentication password
```

# set macauthentication port

Use this command to enable or disable one or more ports for MAC authentication.

## Syntax

```
set macauthentication port {enable | disable} port-string
```

## Parameters

<b>enable   disable</b>	Enables or disables MAC authentication.
<i>port-string</i>	Specifies port(s) on which to enable or disable MAC authentication. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Enabling port(s) for MAC authentication requires globally enabling MAC authentication on the switch as described in “[set macauthentication](#)” on page 16-22, and then enabling it on a port-by-port basis. By default, MAC authentication is globally disabled and disabled on all ports.

## Example

This example shows how to enable MAC authentication on ge.2.1 through 5:

```
B2(su)->set macauthentication port enable ge.2.1-5
```

# set macauthentication portinitialize

Use this command to force one or more MAC authentication ports to re-initialize and remove any currently active sessions on those ports.

## Syntax

```
set macauthentication portinitialize port-string
```

## Parameters

<i>port-string</i>	Specifies the MAC authentication port(s) to re-initialize. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to force ge.2.1 through 5 to initialize:

```
B2(su)->set macauthentication portinitialize ge.2.1-5
```

## set macauthentication portquietperiod

This sets the number of seconds following a failed authentication before another attempt may be made on the port.

### Syntax

```
set macauthentication portquietperiod time port-string
```

### Parameters

<i>time</i>	Period in seconds to wait after a failed authentication
<i>port-string</i>	Specifies the ports for which the quit period is to be applied. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example sets port 1 to wait 5 seconds after a failed authentication attempt before a new attempt can be made:

```
B2(su)->set macauthentication portquietperiod 5 ge.1.1
```

## clear macauthentication portquietperiod

This sets the quiet period back to the default value.

### Syntax

```
clear macauthentication portquietperiod [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Specifies the ports for which the quiet period is to be reset. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

### Defaults

If a *port-string* is not specified then all ports will be set to the default port quiet period.

### Mode

Switch command, read-write.

### Example

This example resets the default quit period on port 1:

```
B2(su)->clear macauthentication portquietperiod ge.1.1
```

# set macauthentication macinitialize

Use this command to force a current MAC authentication session to re-initialize and remove the session.

## Syntax

```
set macauthentication macinitialize mac-addr
```

## Parameters

mac-addr	Specifies the MAC address of the session to re-initialize.
----------	--

## Mode

Switch command, read-write.

## Defaults

None.

## Example

This example shows how to force the MAC authentication session for address 00-60-97-b5-4c-07 to re-initialize:

```
B2(su)->set macauthentication macinitialize 00-60-97-b5-4c-07
```

# set macauthentication reauthentication

Use this command to enable or disable reauthentication of all currently authenticated MAC addresses on one or more ports.

## Syntax

```
set macauthentication reauthentication {enable | disable} port-string
```

## Parameters

enable   disable	Enables or disables MAC reauthentication.
port-string	Specifies port(s) on which to enable or disable MAC reauthentication. For a detailed description of possible port-string values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable MAC reauthentication on ge.4.1 through 5:

```
B2(su)->set macauthentication reauthentication enable ge.4.1-5
```



## set macauthentication portreauthenticate

Use this command to force an immediate reauthentication of the currently active sessions on one or more MAC authentication ports.

### Syntax

```
set macauthentication portreauthenticate port-string
```

### Parameters

<i>port-string</i>	Specifies MAC authentication port(s) to be reauthenticated. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to force ge.2.1 through 5 to reauthenticate:

```
B2(su)->set macauthentication portreauthentication ge.2.1-5
```

## set macauthentication macreauthenticate

Use this command to force an immediate reauthentication of a MAC address.

### Syntax

```
set macauthentication macreauthenticate mac-addr
```

### Parameters

<i>mac-addr</i>	Specifies the MAC address of the session to reauthenticate.
-----------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to force the MAC authentication session for address 00-60-97-b5-4c-07 to reauthenticate:

```
B2(su)->set macauthentication macreauthenticate 00-60-97-b5-4c-07
```

## set macauthentication reauthperiod

Use this command to set the MAC reauthentication period (in seconds). This is the time lapse between attempts to reauthenticate any current MAC address authenticated to a port.

### Syntax

```
set macauthentication reauthperiod time port-string
```

### Parameters

<i>time</i>	Specifies the number of seconds between reauthentication attempts. Valid values are 1 - 4294967295.
<i>port-string</i>	Specifies the port(s) on which to set the MAC reauthentication period. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Changing the Reauth Period with the **set macauthentication reauthperiod** command does not affect current sessions. New sessions will use the correct period.

### Example

This example shows how to set the MAC reauthentication period to 7200 seconds (2 hours) on ge.2.1 through 5:

```
B2(su)->set macauthentication reauthperiod 7200 ge.2.1-5
```

## clear macauthentication reauthperiod

Use this command to clear the MAC reauthentication period on one or more ports.

### Syntax

```
clear macauthentication reauthperiod [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Clears the MAC reauthentication period on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

### Defaults

If *port-string* is not specified, the reauthentication period will be cleared on all ports.

### Mode

Switch command, read-write.

## Example

This example shows how to globally clear the MAC reauthentication period:

```
B2(su)->clear macauthentication reauthperiod
```

## set macauthentication significant-bits

Use this command to set the number of significant bits of the MAC address to use for authentication.

### Syntax

```
set macauthentication significant-bits number
```

### Parameters

<i>number</i>	Specifies the number of significant bits to be used for authentication.
---------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

This command allows you to specify a mask to apply to MAC addresses when authenticating users through a RADIUS server. The most common use of significant bit masks is for authentication of all MAC addresses for a specific vendor.

On switches using MAC authentication, the MAC address of a user attempting to log in is sent to the RADIUS server as the user name. If access is denied, and if a significant bit mask has been configured (other than 48) with this command, the switch will apply the mask and resend the masked address to the RADIUS server. For example, if a user with MAC address of 00-16-CF-12-34-56 is denied access, and a 32 bit mask has been configured, the switch will apply the mask and resend a MAC address of 00-16-CF-12-00-00 to the RADIUS server.

To use a significant bits mask for authentication of devices by a particular vendor, specify a 24-bit mask, to mask out everything except the vendor portion of the MAC address.

## Example

This example sets the MAC authentication significant bits mask to 24.

```
B2(su)->set macauthentication significant-bits 24
```

## clear macauthentication significant-bits

Use this command to reset the number of significant bits of the MAC address to use for authentication to the default of 48.

### Syntax

```
clear macauthentication significant-bits
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example resets the MAC authentication significant bits to 48.

```
B2(su)->clear macauthentication significant-bits
```

# Configuring Multiple Authentication Methods



**Note:** B2 devices support up to eight authenticated users per port.

## About Multiple Authentication Types

When enabled, multiple authentication types allow users to authenticate using up to two methods on the same port. In order for multiple authentication to function on the device, each possible method of authentication (MAC authentication, 802.1X, PWA) must be enabled globally and configured appropriately on the desired ports with its corresponding command set described in this chapter.

Multiple authentication mode must be globally enabled on the device using the [set multiauth mode](#) command.

## Configuring Multi-User Authentication (User + IP phone)

The User + IP phone multi-user authentication feature allows a user and their IP phone to both use a single port on the B2 but to have separate policy roles.



**Note:** The only Multi-User Authentication supported on the B2 is User + IP phone. The IP phone and the user may authenticate using 802.1x or MAC authentication.

"User + IP Phone" Authentication on the SecureStack B2 is implemented by assigning an ingress packet received on a port to a policy role based on the VLAN the packet was assigned to, and not the packet's source MAC address. Therefore, on a port configured for User + IP Phone Authentication, there exists two different VLAN-to-policy role mappings.

The policy role for the IP phone is statically mapped using the VLAN-to-policy mapping feature which assigns any packets received with a VLAN tag set to a specific VID (for example, Voice VLAN) to an indicated policy role (for example, IP Phone policy role). Therefore, it is required that IP phone is configured to send VLAN tagged packets to the "Voice" VLAN.

The second policy role, for the user, can either be statically configured with the default policy role on the port or dynamically assigned through authentication to the network. When the default policy role is assigned on a port, the VLAN set as the port's PVID is mapped to the default policy

role. When a policy role is dynamically applied to a port as the result of a successfully authenticated session, the “authenticated VLAN” is mapped to the policy role set in the Filter-ID returned from the RADIUS server. The “authenticated VLAN” may either be the PVID of the port, if the PVID Override for the policy profile is disabled, or the VLAN specified in the PVID Override if the PVID Override is enabled.

## Commands

For information about...	Refer to page...
show multiauth	<a href="#">16-31</a>
set multiauth mode	<a href="#">16-32</a>
clear multiauth mode	<a href="#">16-32</a>
set multiauth precedence	<a href="#">16-33</a>
clear multiauth precedence	<a href="#">16-34</a>
show multiauth port	<a href="#">16-34</a>
set multiauth port	<a href="#">16-35</a>
clear multiauth port	<a href="#">16-35</a>
show multiauth station	<a href="#">16-36</a>
show multiauth session	<a href="#">16-36</a>
show multiauth idle-timeout	<a href="#">16-37</a>
set multiauth idle-timeout	<a href="#">16-38</a>
clear multiauth idle-timeout	<a href="#">16-39</a>
show multiauth session-timeout	<a href="#">16-39</a>
set multiauth session-timeout	<a href="#">16-40</a>
clear multiauth session-timeout	<a href="#">16-41</a>

## show multiauth

Use this command to display multiple authentication system configuration.

### Syntax

```
show multiauth
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display multiple authentication system configuration:

```
B2(rw)->show multiauth

Multiple authentication system configuration
-----
Supported types           : dot1x, pwa mac
Maximum number of users   :
Current number of users   : 0
System mode               : multi
Default precedence        : dot1x, pwa, mac
Admin precedence          :
Operational precedence    : dot1x, pwa, mac
```

## set multiauth mode

Use this command to set the system authentication mode to allow multiple authenticators simultaneously (802.1xPWA, and MAC Authentication) on a single port, or to strictly adhere to 802.1x authentication.

### Syntax

```
set multiauth mode {multi | strict}
```

### Parameters

<b>multi</b>	Allows the system to use multiple authenticators simultaneously (802.1x, PWA, and MAC Authentication) on a port. This is the default mode.
<b>strict</b>	User must authenticate using 802.1x authentication before normal traffic (anything other than authentication traffic) can be forwarded.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

Multiauth **multi** mode requires that MAC, PWA, and 802.1X authentication be enabled globally, and configured appropriately on the desired ports according to their corresponding command sets described in this chapter. Refer to “[Configuring 802.1X Authentication](#)” on page 16-9 and “[Configuring MAC Authentication](#)” on page 16-19 and “[Configuring Port Web Authentication \(PWA\)](#)” on page 16-57.

### Example

This example shows how to enable simultaneous multiple authentications:

```
B2(rw)->set multiauth mode multi
```

## clear multiauth mode

Use this command to clear the system authentication mode.

## Syntax

```
clear multiauth mode
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the system authentication mode:

```
B2(rw)->clear multiauth mode
```

# set multiauth precedence

Use this command to set the system's multiple authentication administrative precedence.

## Syntax

```
set multiauth precedence {[dot1x] [mac] }
```

## Parameters

<b>dot1x</b>	Sets precedence for 802.1X authentication.
<b>mac</b>	Sets precedence for MAC authentication.
<b>pwa</b>	Sets precedence for port web authentication

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

When a user is successfully authenticated by more than one method at the same time, the precedence of the authentication methods will determine which RADIUS-returned filter ID will be processed and result in an applied traffic policy profile.

## Example

This example shows how to set precedence for MAC authentication:

```
B2(rw)->set multiauth precedence mac dot1x
```

## clear multiauth precedence

Use this command to clear the system's multiple authentication administrative precedence.

### Syntax

```
clear multiauth precedence
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to clear the multiple authentication precedence:

```
B2(rw)->clear multiauth precedence
```

## show multiauth port

Use this command to display multiple authentication properties for one or more ports.

### Syntax

```
show multiauth port [port-string]
```

### Parameters

---

<i>port-string</i>	(Optional) Displays multiple authentication information for specific port(s).
--------------------	---

---

### Defaults

If port-string is not specified, multiple authentication information will be displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display multiple authentication information for ports ge.3.1-4:

```
B2(rw)->show multiauth port ge.3.1-4
```

Port	Mode	Max users	Allowed users	Current users
-----	-----	-----	-----	-----
ge.3.1	auth-opt	2	8	0
ge.3.2	auth-opt	2	8	0
ge.3.3	auth-opt	2	8	0
ge.3.4	auth-opt	2	8	0



## set multiauth port

Use this command to set multiple authentication properties for one or more ports.

### Syntax

```
set multiauth port mode {auth-opt | auth-reqd | force-auth | force-unauth} |
numusers numusers port-string
```

### Parameters

<b>mode</b> <b>auth-opt</b>   <b>auth-reqd</b>   <b>force-auth</b>   <b>force-unauth</b>	Specifies the port(s)' multiple authentication mode as: <ul style="list-style-type: none"> <li>• <b>auth-opt</b> — Authentication optional ("non-strict" behavior). If a user does not attempt to authenticate using 802.1x, or if 802.1x authentication fails, the port will allow traffic to be forwarded according to the defined default VLAN.</li> <li>• <b>auth-reqd</b> — Authentication is required.</li> <li>• <b>force-auth</b> — Authentication considered.</li> <li>• <b>force-unauth</b> — Authentication disabled.</li> </ul>
<b>numusers</b> <i>numusers</i>	Specifies the number of users allowed authentication on port(s). Valid values are 0 to 8.
<i>port-string</i>	Specifies the port(s) on which to set multiple authentication properties.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the port multiple authentication mode to required on ge.3.14:

```
B2(rw)->set multiauth port mode auth-reqd ge.3.14
```

## clear multiauth port

Use this command to clear multiple authentication properties for one or more ports.

### Syntax

```
clear multiauth port {mode | numusers} port-string
```

### Parameters

<b>mode</b>	Clears the specified port's multiple authentication mode.
<b>numusers</b>	Clears the value set for the number of users allowed authentication on the specified port.
<i>port-string</i>	Specifies the port or ports on which to clear multiple authentication properties.

Defaults

None.

Mode

Switch command, read-write.

Examples

This example shows how to clear the port multiple authentication mode on port ge.3.14:

```
B2(rw)->clear multiauth port mode ge.3.14
```

This example shows how to clear the number of users on port ge.3.14:

```
B2(rw)->clear multiauth port numusers ge.3.14
```

show multiauth station

Use this command to display multiple authentication station (end user) entries.

Syntax

```
show multiauth station [mac address] [port port-string]
```

Parameters

<b>mac</b> address	(Optional) Displays multiple authentication station entries for specific MAC address(es).
<b>port</b> port-string	(Optional) Displays multiple authentication station entries for specific port(s).

Mode

Switch command, read-only.

Defaults

If no options are specified, multiple authentication station entries will be displayed for all MAC addresses and ports.

Example

This example shows how to display multiple authentication station entries. In this case, two end user MAC addresses are shown:

```
B2(rw)->show multiauth station
Port           Address type  Address
-----
ge.1.20        mac          00-10-a4-9e-24-87
ge.2.16        mac          00-b0-d0-e5-0c-d0
```

show multiauth session

Use this command to display multiple authentication session entries.

Syntax

```
show multiauth session [all] [agent {dot1x | mac | pwa}] [mac address]
[port port-string]
```

## Parameters

<b>all</b>	(Optional) Displays information about all sessions, including those with terminated status.
<b>agent dot1x   mac   pwa</b>	(Optional) Displays 802.1X, or MAC, or port web authentication session information.
<b>mac address</b>	(Optional) Displays multiple authentication session entries for specific MAC address(es).
<b>port port-string</b>	(Optional) Displays multiple authentication session entries for the specified port or ports.

## Defaults

If no options are specified, multiple authentication session entries will be displayed for all sessions, authentication types, MAC addresses, and ports.

## Mode

Switch command, read-only.

## Example

This example shows how to display multiple authentication session information for port ge.1.1.

```
B2(su)->show multiauth session port ge.1.1
```

Port	ge.1.1	Station address	00-01-03-86-0A-87
Auth status	success	Last attempt	FRI MAY 18 11:16:36 2007
Agent type	dot1x	Session applied	true
Server type	radius	VLAN-Tunnel-Attr	none
Policy index	0	Policy name	Administrator
Session timeout	0	Session duration	0,00:00:25
Idle timeout	5	Idle time	0,00:00:00
Termination time	Not Terminated		

# show multiauth idle-timeout

Use this command to display the timeout value, in seconds, for an idle session for all authentication methods.

## Syntax

```
show multiauth idle-timeout
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display timeout values for an idle session for all authentication types.

```
B2(su)->show multiauth idle-timeout
Authentication type  Timeout (sec)
-----
dot1x                0
pwa                  0
mac                  0
```

## set multiauth idle-timeout

Use this command to set the maximum number of consecutive seconds an authenticated session may be idle before termination of the session.

### Syntax

```
set multiauth idle-timeout [dot1x | mac | pwa] timeout
```

### Parameters

<b>dot1x</b>	(Optional) Specifies the IEEE 802.1X port-based network access control authentication method for which to set the timeout value.
<b>mac</b>	(Optional) Specifies the Enterasys MAC authentication method for which to set the timeout value.
<b>pwa</b>	(Optional) Specifies the Enterasys Port Web Authentication method for which to set the timeout value.
<i>timeout</i>	Specifies the timeout value in seconds. The value can range from 0 to 65535. A value of 0 means that no idle timeout will be applied unless an idle timeout value is provided by the authenticating server.

### Defaults

If no authentication method is specified, the idle timeout value is set for all authentication methods.

### Mode

Switch mode, read-write.

### Usage

If you set an idle timeout value, a MAC user whose MAC address has aged out of the forwarding database will be unauthenticated if no traffic has been seen from that address for the specified idle timeout period.

A value of zero indicates that no idle timeout will be applied unless an idle timeout value is provided by the authenticating server. For example, if a session is authenticated by a RADIUS server, that server may encode a Idle-Timeout Attribute in its authentication response.

## Example

This example sets the idle timeout value for all authentication methods to 300 seconds.

```
B2(su)->set multiauth idle-timeout 300
```

## clear multiauth idle-timeout

Use this command to reset the maximum number of consecutive seconds an authenticated session may be idle before termination of the session to its default value of 0.

### Syntax

```
clear multiauth idle-timeout [dot1x | mac | pwa]
```

### Parameters

<b>dot1x</b>	(Optional) Specifies the IEEE 802.1X port-based network access control authentication method for which to reset the timeout value to its default.
<b>mac</b>	(Optional) Specifies the Enterasys MAC authentication method for which to reset the timeout value to its default.
<b>pwa</b>	(Optional) Specifies the Enterasys Port Web Authentication method for which to reset the timeout value to its default.

### Defaults

If no authentication method is specified, the idle timeout value is reset to its default value of 0 for all authentication methods.

### Mode

Switch mode, read-write.

### Example

This example resets the idle timeout value for all authentication methods to 0 seconds.

```
B2(su)->clear multiauth idle-timeout
```

## show multiauth session-timeout

Use this command to display the session timeout value, in seconds, for all authentication methods.

### Syntax

```
show multiauth session-timeout
```

### Parameters

None.

### Defaults

None.

### Mode

Switch mode, read-only.

## Example

This example displays the session timeout values for all authentication methods.

```
B2(su)->show multiauth session-timeout
Authentication type  Timeout (sec)
-----
dot1x                0
pwa                  0
mac                  0
```

## set multiauth session-timeout

Use this command to set the maximum number of seconds an authenticated session may last before termination of the session.

### Syntax

```
set multiauth session-timeout [dot1x | mac | pwa] timeout
```

### Parameters

<b>dot1x</b>	(Optional) Specifies the IEEE 802.1X port-based network access control authentication method for which to set the session timeout value.
<b>mac</b>	(Optional) Specifies the Enterasys MAC authentication method for which to set the session timeout value.
<b>pwa</b>	(Optional) Specifies the Enterasys Port Web Authentication method for which to set the session timeout value.
<i>timeout</i>	Specifies the timeout value in seconds. The value can range from 0 to 65535. A value of 0 means that no session timeout will be applied unless a session timeout value is provided by the authenticating server.

### Defaults

If no authentication method is specified, the session timeout value is set for all authentication methods.

### Mode

Switch mode, read-write.

### Usage

A value of zero may be superseded by a session timeout value provided by the authenticating server. For example, if a session is authenticated by a RADIUS server, that server may encode a Session-Timeout Attribute in its authentication response.

## Example

This example sets the session timeout value for the IEEE 802.1X authentication method to 300 seconds.

```
B2(su)->set multiauth session-timeout dot1x 300
```

## clear multiauth session-timeout

Use this command to reset the maximum number of consecutive seconds an authenticated session may last before termination of the session to its default value of 0.

### Syntax

```
clear multiauth session-timeout [dot1x | mac | pwa]
```

### Parameters

<b>dot1x</b>	(Optional) Specifies the IEEE 802.1X port-based network access control authentication method for which to reset the timeout value to its default.
<b>mac</b>	(Optional) Specifies the Enterasys MAC authentication method for which to reset the timeout value to its default.
<b>pwa</b>	(Optional) Specifies the Enterasys Port Web Authentication method for which to reset the timeout value to its default.

### Defaults

If no authentication method is specified, the session timeout value is reset to its default value of 0 for all authentication methods.

### Mode

Switch mode, read-write.

### Example

This example resets the session timeout value for the IEEE 802.1X authentication method to 0 seconds.

```
B2(su)->clear multiauth session-timeout dot1x
```

## Configuring VLAN Authorization (RFC 3580)

### Purpose

RFC 3580 Tunnel Attributes provide a mechanism to contain an 802.1X authenticated user to a VLAN regardless of the PVID. Up to three users can be configured per Gigabit port.

Please see section 3-31 of RFC 3580 for details on configuring a RADIUS server to return the desired tunnel attributes. As stated in RFC 3580, "... it may be desirable to allow a port to be placed into a particular Virtual LAN (VLAN), defined in [IEEE8021Q], based on the result of the authentication."

The RADIUS server typically indicates the desired VLAN by including tunnel attributes within its Access-Accept parameters. However, the IEEE 802.1X authenticator can also be configured to instruct the VLAN to be assigned to the supplicant by including tunnel attributes within Access-Request parameters.

The following tunnel attributes are used in VLAN authorization assignment, :

- Tunnel-Type - VLAN (13)
- Tunnel-Medium-Type - 802
- Tunnel-Private-Group-ID - VLANID

In order to authenticate multiple RFC 3580 users, policy mactable response must be set to **tunnel** as described in this section.

## Commands

For information about...	Refer to page...
show policy mactable response	<a href="#">16-42</a>
set policy mactable response	<a href="#">16-42</a>
set vlanauthorization	<a href="#">16-43</a>
set vlanauthorization egress	<a href="#">16-44</a>
clear vlanauthorization	<a href="#">16-44</a>
show vlanauthorization	<a href="#">16-45</a>

## show policy mactable response

Displays the current policy mactable response setting. When mactable response is set to **policy** (the default setting) the maximum number of multiauth users allowed per port is 2. When the mactable response is set to **tunnel** the maximum number of multiauth users allowed per port is 3. When VLAN authorization is enabled (as described in this section) and the policy mactable response is tunnel, you can use the “[set multiauth port](#)” on page 16-35 command to set the number of RFC 3580 users (numusers) allowed per Gigabit port to a value between 1 and 3.

### Syntax

```
show policy mactable response
```

### Parameters

None.

### Defaults

None.

### Mode

Switch command, read-only.

### Example

This example shows how to display the current policy mactable response setting:

```
B2(rw)->show policy mactable response
```

```
policy
```

## set policy mactable response

Sets the mactable response from the default of policy to tunnel to allow up to 3 VLAN authorized users to be configured per Gigabit port.



## Syntax

```
set policy mactable response {policy | tunnel}
```

## Parameters

<b>policy</b>	Sets the mactable response to policy. This is the default setting, which allows authentication of up to 2 multiauth users per port.
<b>tunnel</b>	Sets the mactable response to tunnel, which allows authentication of up to 3 multiauth users per port. This setting is required to configure VLAN authorization for multiple users per Gigabit port.

## Defaults

Set to policy.

## Mode

Switch command, read-write.

## Examples

This example shows how to set the policy mactable response to tunnel:

```
B2(rw)-> set policy mactable response tunnel
```

# set vlanauthorization

Enable or disable the use of the RADIUS VLAN tunnel attribute to put a port into a particular VLAN based on the result of authentication.

## Syntax

```
set vlanauthorization {enable | disable} [port-string]
```

## Parameters

<b>enable   disable</b>	Enables or disables vlan authorization/tunnel attributes.
<i>port-string</i>	(Optional) Specifies which ports to enable or disable the use of VLAN tunnel attributes/authorization. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

VLAN authentication is disabled by default.

## Mode

Switch command, read-write.

## Examples

This example shows how to enable VLAN authentication for all Gigabit Ethernet ports:

```
B2(rw)-> set vlanauthorization enable ge.*.*
```

This example shows how to disable VLAN authentication for all Gigabit Ethernet ports on switch unit/module 3:

```
B2(rw)-> set vlanauthorization disable ge.3.*
```

# set vlanauthorization egress

Controls the modification of the current VLAN egress list of 802.1x authenticated ports for the VLANs returned in the RADIUS authorization filter id string.

## Syntax

```
set vlanauthorization egress {none | tagged | untagged} port-string
```

## Parameters

<b>none</b>	Specifies that no egress manipulation will be made.
<b>tagged</b>	Specifies that the authenticating port will be added to the current tagged egress for the VLAN-ID returned.
<b>untagged</b>	Specifies that the authenticating port will be added to the current untagged egress for the VLAN-ID returned (default).
<i>port-string</i>	Specifies that the port or list of ports. to which this command will apply. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

By default, administrative egress is set to untagged.

## Mode

Switch command, read-write.

## Example

This example shows how to enable the insertion of the RADIUS assigned VLAN to an 802.1q tag for all outbound frames for ports 10 through 15 on unit/module number 3.

```
B2(rw)->set vlanauthorization egress tagged ge.3.10-15
```

# clear vlanauthorization

Use this command to return port(s) to the default configuration of VLAN authorization disabled, egress untagged.

## Syntax

```
clear vlanauthorization [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Specifies which ports are to be restored to default configuration. If no port string is entered, the action will be a global setting. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

If no port string is entered, all ports will be reset to default configuration with VLAN authorization disabled and egress frames untagged.

## Mode

Switch command, read-write.

## Example

This example shows how to clear VLAN authorization for all ports on slots 3, 4, and 5:

```
B2(rw)->clear vlanauthorization ge.3-5.*
```

# show vlanauthorization

Displays the VLAN authentication status and configuration information for the specified ports.

## Syntax

```
show vlanauthorization [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Displays VLAN authentication status for the specified ports. If no port string is entered, then the global status of the setting is displayed. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

If no port string is entered, the status for all ports will be displayed.

## Mode

Switch command, read-only.

## Example

This command shows how to display VLAN authorization status for ge.1.1:

```
B2(rw)-> show vlanauthorization ge.1.1
```

port	status	administrative egress	operational egress	vlan id
-----	-----	-----	-----	-----
ge.1.1	enabled	untagged	none	0

[Table 16-52](#) provides an explanation of command output. For details on enabling and assigning protocol and egress attributes, refer to [“set vlanauthorization”](#) on page 16-43 and [“set vlanauthorization egress”](#) on page 16-44.

**Table 16-52** show vlanauthorization Output Details

Output	What It Displays...
port	Port identification
status	Port status as assigned by set vlanauthorization command
administrative egress	Port status as assigned by the set vlanauthorization egress command
operational egress	If authentication has succeeded, displays the VLAN id assigned for egress.
vlan id	If authentication has succeeded, displays the assigned VLAN id for ingress.

## Configuring MAC Locking

This feature locks a MAC address to one or more ports, preventing connection of unauthorized devices through the port(s). When source MAC addresses are received on specified ports, the switch discards all subsequent frames not containing the configured source addresses. The only frames forwarded on a “locked” port are those with the “locked” MAC address(es) for that port.

There are two methods of locking a MAC to a port: first arrival and static. The first arrival method is defined to be locking the first *n* number of MACs which arrive on a port configured with MAC locking enabled. The value *n* is configured with the **set maclock firstarrival** command.

The static method is defined to be statically provisioning a MAC-port lock using the **set maclock** command. The maximum number of static MAC addresses allowed for MAC locking on a port can be configured with the **set maclock static** command.

You can configure the switch to issue a violation trap if a packet arrives with a source MAC address different from any of the currently locked MAC addresses for that port.

MACs are unlocked as a result of:

- A link down event
- When MAC locking is disabled on a port
- When a MAC is aged out of the forwarding database when FirstArrival aging is enabled

When properly configured, MAC locking is an excellent security tool as it prevents MAC spoofing on configured ports. Also if a MAC were to be secured by something like Dragon Dynamic Intrusion Detection, MAC locking would make it more difficult for a hacker to send packets into the network because the hacker would have to change their MAC address and move to another port. In the meantime the system administrator would be receiving a maclock trap notification.

## Purpose

To review, disable, enable, and configure MAC locking.

## Commands

For information about...	Refer to page...
show maclock	<a href="#">16-47</a>
show maclock stations	<a href="#">16-48</a>
set maclock enable	<a href="#">16-49</a>

For information about...	Refer to page...
set maclock disable	<a href="#">16-50</a>
set maclock	<a href="#">16-50</a>
clear maclock	<a href="#">16-51</a>
set maclock static	<a href="#">16-52</a>
clear maclock static	<a href="#">16-52</a>
set maclock firstarrival	<a href="#">16-53</a>
clear maclock firstarrival	<a href="#">16-54</a>
set maclock agefirstarrival	<a href="#">16-54</a>
clear maclock agefirstarrival	<a href="#">16-55</a>
set maclock move	<a href="#">16-55</a>
set maclock trap	<a href="#">16-56</a>

## show maclock

Use this command to display the status of MAC locking on one or more ports.

### Syntax

```
show maclock [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays MAC locking status for specified port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, MAC locking status will be displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display MAC locking information for ge.1.1.

```
B2(su)->show maclock ge.1.1
MAC locking is globally enabled
```

Port Number	Port Status	Trap Status	Aging Status	Max Static Allocated	Max FirstArrival Allocated	Last Violating MAC Address
ge.1.1	enabled	disabled	enabled	20	1	00:a0:c9:39:5c:b4

[Table 16-53](#) provides an explanation of the command output.

**Table 16-53 show maclock Output Details**

Output	What It Displays...
Port Number	Port designation. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
Port Status	Whether MAC locking is <b>enabled</b> or <b>disabled</b> on the port. MAC locking is globally disabled by default. For details on enabling MAC locking on the switch and on one or more ports, refer to “ <a href="#">set maclock enable</a> ” on page 16-49 and “ <a href="#">set maclock</a> ” on page 16-50.
Trap Status	Whether MAC lock trap messaging is <b>enabled</b> or <b>disabled</b> on the port. For details on setting this status, refer to “ <a href="#">set maclock trap</a> ” on page 16-56.
Aging Status	Whether aging of FirstArrival MAC addresses is <b>enabled</b> or <b>disabled</b> on the port. Refer to “ <a href="#">set maclock agefirstarrival</a> ” on page 16-54.
Max Static Allocated	The maximum static MAC addresses allowed locked to the port. For details on setting this value, refer to “ <a href="#">set maclock static</a> ” on page 16-52.
Max FirstArrival Allocated	The maximum end station MAC addresses allowed locked to the port. For details on setting this value, refer to “ <a href="#">set maclock firstarrival</a> ” on page 16-53.
Last Violating MAC Address	Most recent MAC address(es) violating the maximum static and first arrival value(s) set for the port.

## show maclock stations

Use this command to display MAC locking information about end stations connected to the switch.

### Syntax

```
show maclock stations [firstarrival | static] [port-string]
```

### Parameters

<b>firstarrival</b>	(Optional) Displays MAC locking information about end stations first connected to MAC locked ports.
<b>static</b>	(Optional) Displays MAC locking information about static (management defined) end stations connected to MAC locked ports.
<i>port-string</i>	(Optional) Displays end station information for specified port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

### Defaults

If no parameters are specified, MAC locking information will be displayed for all end stations.

### Mode

Switch command, read-only.

## Example

This example shows how to display MAC locking information for the end stations connected to all Gigabit Ethernet ports in unit/module 2:

```
B2(su)->show maclock stations ge.2.*
```

Port Number	MAC Address	Status	State	Aging
ge.2.1	00:a0:c9:39:5c:b4	active	first arrival	true
ge.2.7	00:a0:c9:39:1f:11	active	static	false

[Table 16-54](#) provides an explanation of the command output.

**Table 16-54 show maclock stations Output Details**

Output	What It Displays...
Port Number	Port designation. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
MAC address	MAC address of the end station(s) locked to the port.
Status	Whether the end stations are <b>active</b> or <b>inactive</b> .
State	Whether the end station locked to the port is a <b>first arrival</b> or <b>static</b> connection.
Aging	When true, FirstArrival MACs that have aged out of the forwarding database will be removed for the associated port lock.

## set maclock enable

Use this command to enable MAC locking globally or on one or more ports.



**Note:** MAC locking needs to be enabled globally and on appropriate ports for it to function.

## Syntax

```
set maclock enable [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Enables MAC locking on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	--

## Defaults

If *port-string* is not specified, MAC locking will be enabled globally.

## Mode

Switch command, read-write.

## Usage

When enabled and configured, MAC locking defines which MAC addresses, as well as how many MAC addresses are permitted to use specific port(s).

MAC locking is disabled by default at device startup. Configuring one or more ports for MAC locking requires globally enabling it on the device and then enabling it on the desired ports.

### Example

This example shows how to enable MAC locking on ge.2.3:

```
B2(su)->set maclock enable ge.2.3
```

## set maclock disable

Use this command to disable MAC locking globally or on one or more ports.

### Syntax

```
set maclock disable [port-string]
```

### Parameters

---

<i>port-string</i>	(Optional) Disables MAC locking on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	---

---

### Defaults

If *port-string* is not specified, MAC locking will be disabled globally on the stack or standalone device.

### Mode

Switch command, read-write.

### Example

This example shows how to disable MAC locking on ge.2.3:

```
B2(su)->set maclock disable ge.2.3
```

## set maclock

Use this command to create a static MAC address-to-port locking, and to enable or disable MAC locking for the specified MAC address and port.

### Syntax

```
set maclock mac-address port-string {create | enable | disable}
```



## Parameters

<i>mac-address</i>	Specifies the MAC address for which MAC locking will be created, enabled or disabled.
<i>port-string</i>	Specifies the port on which to create, enable or disable MAC locking for the specified MAC. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>create</b>	Establishes a MAC locking association between the specified MAC address and port. Create automatically enables MAC locking between the specified MAC address and port.
<b>enable   disable</b>	Enables or disables MAC locking between the specified MAC address and port.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

Configuring one or more ports for MAC locking requires globally enabling it on the switch first using the **set maclock enable** command as described in [“set maclock enable”](#) on page 16-49.

## Example

This example shows how to create a MAC locking association between MAC address 0e-03-ef-d8-44-55 and port ge.3.2:

```
B2(rw)->set maclock 0e-03-ef-d8-44-55 ge.3.2 create
```

# clear maclock

Use this command to remove a static MAC address to port locking entry.

## Syntax

```
clear maclock mac-address port-string
```

## Parameters

<i>mac-address</i>	Specifies the MAC address that will be removed from the list of static MACs allowed to communicate on the port.
<i>port-string</i>	Specifies the port on which to clear the MAC address. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.

## Defaults

None.

## Mode

Switch command, read-write.

### Usage

The MAC address that is cleared will no longer be able to communicate on the port unless the first arrival limit has been set to a value greater than 0 and this limit has not yet been met.

For example, if user B's MAC is removed from the static MAC address list and the first arrival limit has been set to 0, then user B will not be able to communicate on the port. If user A's MAC is removed from the static MAC address list and the first arrival limit has been set to 10, but only has 7 entries, user A will become the 8th entry and allowed to communicate on the port.

### Example

This example shows how to remove a MAC from the list of static MACs allowed to communicate on port ge.3.2:

```
B2(rw)->clear maclock 0e-03-ef-d8-44-55 ge.3.2
```

## set maclock static

Use this command to set the maximum number of static MAC addresses allowed per port. Static MACs are administratively defined.

### Syntax

```
set maclock static port-string value
```

### Parameters

<i>port-string</i>	Specifies the port on which to set the maximum number of static MACs allowed. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>value</i>	Specifies the maximum number of static MAC addresses allowed per port. Valid values are 0 to 20.

### Defaults

None.

### Mode

Switch command, read-write.

### Example

This example shows how to set the maximum number of allowable static MACs to 2 on ge.3.1:

```
B2(rw)->set maclock static ge.3.1 2
```

## clear maclock static

Use this command to reset the number of static MAC addresses allowed per port to the default value of 20.

### Syntax

```
clear maclock static port-string
```

## Parameters

<i>port-string</i>	Specifies the port on which to reset number of static MAC addresses allowed. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the number of allowable static MACs on ge.2.3:

```
B2(rw)->clear maclock static ge.2.3
```

# set maclock firstarrival

Use this command to restrict MAC locking on a port to a maximum number of end station addresses first connected to that port.

## Syntax

```
set maclock firstarrival port-string value
```

## Parameters

<i>port-string</i>	Specifies the port on which to limit MAC locking. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<i>value</i>	Specifies the number of first arrival end station MAC addresses to be allowed connections to the port. Valid values are <b>0</b> to <b>600</b> .

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

The maclock first arrival count resets when the link goes down. This feature is beneficial if you have roaming users—the first arrival count will be reset every time a user moves to another port, but will still protect against connecting multiple devices on a single port and will protect against MAC address spoofing.

If you wish to have only statically set MACs, set a port’s first arrival limit to 0.

## Example

This example shows how to restrict MAC locking to 6 MAC addresses on ge.2.3:

```
B2(su)->set maclock firstarrival ge.2.3 6
```

# clear maclock firstarrival

Use this command to reset the number of first arrival MAC addresses allowed per port to the default value of 600.

## Syntax

```
clear maclock firstarrival port-string
```

## Parameters

<i>port-string</i>	Specifies the port on which to reset the first arrival value. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset MAC first arrivals on ge.2.3:

```
B2(su)->clear maclock firstarrival ge.2.3
```

# set maclock agefirstarrival

Use this command to enable or disable the aging of first arrival MAC addresses. When enabled, first arrival MAC addresses that are aged out of the forwarding database will be removed from the associated port MAC lock.

## Syntax

```
set maclock agefirstarrival port-string {enable | disable}
```

## Parameters

<i>port-string</i>	Specifies the port(s) on which to enable or disable first arrival aging. For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
<b>enable   disable</b>	Enable or disable first arrival aging. By default, first arrival aging is disabled.

## Defaults

None.

## Mode

Switch mode, read-write.

## Example

This example enables first arrival aging on port ge.1.1.

```
B2(su)-> set maclock agefirstarrival ge.1.1 enable
```

## clear maclock agefirstarrival

Use this command to reset first arrival aging on one or more ports to its default state of disabled.

### Syntax

```
clear maclock agefirstarrival port-string
```

### Parameters

<i>port-string</i>	Specifies the port(s) on which to disable first arrival aging. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

None.

### Mode

Switch mode, read-write.

### Example

This example disables first arrival aging on port ge.1.1.

```
B2(su)-> clear maclock agefirstarrival ge.1.1 enable
```

## set maclock move

Use this command to move all current first arrival MACs to static entries.

### Syntax

```
set maclock move port-string
```

### Parameters

<i>port-string</i>	Specifies the port on which MAC will be moved from first arrival MACs to static entries. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

If there are more first arrival MACs than the allowed maximum static MACs, then only the latest first arrival MACs will be moved to static entries. For example, if you set the maximum number of static MACs to 2 with the **set maclock static** command, and then executed the **set maclock move** command, even though there were five MACs in the first arrival table, only the two most recent MAC entries would be moved to static entries.

### Example

This example shows how to move all current first arrival MACs to static entries on ports ge.3.1-40:

```
B2(rw)->set maclock move ge.3.1-40
```

## set maclock trap

Use this command to enable or disable MAC lock trap messaging.

### Syntax

```
set maclock trap port-string {enable | disable}
```

### Parameters

<i>port-string</i>	Specifies the port on which MAC lock trap messaging will be enabled or disabled. For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
<b>enable</b>   <b>disable</b>	Enables or disables MAC lock trap messaging.

### Defaults

None.

### Mode

Switch command, read-write.

### Usage

When enabled, this feature authorizes the switch to send an SNMP trap message if an end station is connected that exceeds the maximum values configured using the **set maclock firstarrival** and **set maclock static** commands. Violating MAC addresses are dropped from the device’s (or stack’s) filtering database.

### Example

This example shows how to enable MAC lock trap messaging on ge.2.3:

```
B2(su)->set maclock trap ge.2.3 enable
```

# Configuring Port Web Authentication (PWA)



**Note:** A license is required to enable PWA on the SecureStack B2 and B3. Refer to “[Activating Licensed Features](#)” on page 3-26 for more information.

## About PWA

PWA provides a way of authenticating users before allowing general access to the network. A PWA user’s access to the network is restricted until after the user successfully logs in via a web browser using the Enterasys Networks’ web-based security interface. The SecureStack B2 device will validate all login credentials from the user with a RADIUS server before allowing network access.

PWA is an alternative to 802.1X and MAC authentication. It allows only the essential protocols and services required by the authentication process between the end-station and the network. All other traffic is discarded. When a user is in the unauthenticated state, any user traffic requesting network resources will not be allowed.

To log on using PWA, the user makes a request via a web browser for the PWA web page or is automatically redirected to this login page after requesting a URL in a browser.

Depending upon the authenticated state of the user, a login page or a logout page will display. When a user submits username and password, the switch then authenticates the user via a preconfigured RADIUS server. If the login is successful, then the user will be granted full network access according to the user’s policy configuration on the switch.



**Note:** One user per PWA-configured port can be authenticated on SecureStack B2 devices. Only one method of authentication can be deployed per port.

## Purpose

To review, enable, disable, and configure Port Web Authentication (PWA).

## Commands

For information about...	Refer to page...
show pwa	<a href="#">16-58</a>
set pwa	<a href="#">16-59</a>
show pwa banner	<a href="#">16-60</a>
set pwa banner	<a href="#">16-60</a>
clear pwa banner	<a href="#">16-61</a>
set pwa displaylogo	<a href="#">16-61</a>
set pwa ipaddress	<a href="#">16-62</a>
set pwa protocol	<a href="#">16-62</a>
set pwa guestname	<a href="#">16-63</a>
clear pwa guestname	<a href="#">16-63</a>
set pwa guestpassword	<a href="#">16-64</a>

For information about...	Refer to page...
set pwa gueststatus	<a href="#">16-64</a>
set pwa initialize	<a href="#">16-65</a>
set pwa quietperiod	<a href="#">16-66</a>
set pwa maxrequest	<a href="#">16-66</a>
set pwa portcontrol	<a href="#">16-67</a>
show pwa session	<a href="#">16-67</a>
set pwa enhancedmode	<a href="#">16-68</a>

## show pwa

Use this command to display port web authentication information for one or more ports.

### Syntax

`show pwa [port-string]`

### Parameters

<i>port-string</i>	(Optional) Displays PWA information for specific port(s).
--------------------	---

### Defaults

If *port-string* is not specified, PWA information will be displayed for all ports.

### Mode

Switch command, read-only.

### Example

This example shows how to display PWA information for ge.2.1:

```
B2(su)->show pwa ge.2.1
PWA Status          - enabled
PWA IP Address      - 192.168.62.99
PWA Protocol        - PAP
PWA Enhanced Mode   - N/A
PWA Logo            - enabled
PWA Guest Networking Status - disabled
PWA Guest Name      - guest
PWA Redirect Time   - N/A
```

Port	Mode	AuthStatus	QuietPeriod	MaxReq
-----	-----	-----	-----	-----
ge.2.1	disabled	disconnected	60	16

[Table 16-55](#) provides an explanation of the command output.



**Table 16-55 show pwa Output Details**

Output	What It Displays...
PWA Status	Whether or not port web authentication is enabled or disabled. Default state of disabled can be changed using the <b>set pwa</b> command as described in “ <a href="#">set pwa</a> ” on page 16-59.
PWA IP Address	IP address of the end station from which PWA will prevent network access until the user is authenticated. Set using the <b>set pwa ipaddress</b> command as described in “ <a href="#">set pwa ipaddress</a> ” on page 16-62.
PWA Protocol	Whether PWA protocol is CHAP or PAP. Default setting of PAP can be changed using the <b>set pwa protocol</b> command as described in “ <a href="#">set pwa protocol</a> ” on page 16-62.
PWA Enhanced Mode	Whether PWA enhanced mode is enabled or disabled. Default state of disabled can be changed using the <a href="#">set pwa enhancedmode</a> command as described in “ <a href="#">set pwa enhancedmode</a> ” on page 16-68.
PWA Logo	Whether the Enterasys Networks logo will be displayed or hidden at user login. Default state of enabled (displayed) can be changed using the <b>set pwa displaylogo</b> command as described in “ <a href="#">set pwa displaylogo</a> ” on page 16-61.
PWA Guest Networking Status	Whether PWA guest user status is disabled or enabled with RADIUS or no authentication. Default state of disabled can be changed using the <b>set pwa gueststatus</b> command as described in “ <a href="#">set pwa gueststatus</a> ” on page 16-64.
PWA Guest Name	Guest user name for PWA enhanced mode networking. Default value of “guest” can be changed using the <b>set pwa guestname</b> command as described in “ <a href="#">set pwa guestname</a> ” on page 16-63.
PWA Guest Password	Guest user’s password. Default value of an empty string can be changed using the <b>set pwa guestpassword</b> command as described in “ <a href="#">set pwa guestpassword</a> ” on page 16-64.
PWA Redirect Time	Time in seconds after login success before the user is redirected to the PWA home page.
Port	PWA port designation.
Mode	Whether PWA is enabled or disabled on his port.
Auth Status	Whether or not the port state is disconnected, authenticating, authenticated, or held (authentication has failed).
Quiet Period	Amount of time a port will be in the held state after a user unsuccessfully attempts to log on to the network. Default value of 60 can be changed using the <b>set pwa quietperiod</b> command as described in “ <a href="#">set pwa quietperiod</a> ” on page 16-66.
MaxReq	Maximum number of log on attempts allowed before transitioning the port to a held state. Default value of 2 can be changed using the <b>set pwa maxrequests</b> command as described in “ <a href="#">set pwa maxrequest</a> ” on page 16-66.

## set pwa

Use this command to enable or disable port web authentication.

### Syntax

```
set pwa {enable | disable}
```

## Parameters

---

<b>enable</b>   <b>disable</b>	Enables or disables port web authentication.
--------------------------------	--

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to enable port web authentication:

```
B2(su)->set pwa enable
```

# show pwa banner

Use this command to display the port web authentication login banner string.

## Syntax

```
show pwa banner
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-only.

## Example

This example shows how to display the PWA login banner:

```
B2(su)->show pwa banner
Welcome to Enterasys Networks
```

# set pwa banner

Use this command to configure a string to be displayed as the PWA login banner.

## Syntax

```
set pwa banner string
```

## Parameters

---

<i>string</i>	Specifies the PWA login banner.
---------------	---------------------------------

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the PWA login banner to “Welcome to Enterasys Networks”:

```
B2(su)->set pwa banner "Welcome to Enterasys Networks"
```

# clear pwa banner

Use this command to reset the PWA login banner to a blank string.

## Syntax

```
clear pwa banner
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to reset the PWA login banner to a blank string

```
B2(su)->clear pwa banner
```

# set pwa displaylogo

Use this command to set the display options for the Enterasys Networks logo.

## Syntax

```
set pwa displaylogo {display | hide}
```

## Parameters

<b>display   hide</b>	Displays or hides the Enterasys Networks logo when the PWA website displays.
-----------------------	--

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to hide the Enterasys Networks logo:

```
B2(su)->set pwa displaylogo hide
```

# set pwa ipaddress

Use this command to set the PWA IP address. This is the IP address of the end station from which PWA will prevent network access until the user is authenticated.

## Syntax

```
set pwa ipaddress ip-address
```

## Parameters

---

<i>ip-address</i>	Specifies a globally unique IP address. This same value must be configured into every authenticating switch in the domain.
-------------------	--

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set a PWA IP address of 1.2.3.4:

```
B2(su)->set pwa ipaddress 1.2.3.4
```

# set pwa protocol

Use this command to set the port web authentication protocol.

## Syntax

```
set pwa protocol {chap | pap}
```

## Parameters

---

<b>chap   pap</b>	Sets the PWA protocol to: <ul style="list-style-type: none"><li>• CHAP (PPP Challenge Handshake Protocol) - encrypts the username and password between the end-station and the switch port.</li><li>• PAP (Password Authentication Protocol- does not provide any encryption between the end-station the switch port.</li></ul>
-------------------	---

---

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set a the PWA protocol to CHAP:

```
B2(su)->set pwa protocol chap
```

# set pwa guestname

Use this command to set a guest user name for PWA networking. PWA will use this name to grant network access to guests without established login names and passwords.

## Syntax

```
set pwa guestname name
```

## Parameters

<i>name</i>	Specifies a guest user name.
-------------	------------------------------

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to set the PWA guest user name to “guestuser”:

```
B2(su)->set pwa guestname guestuser
```

# clear pwa guestname

Use this command to clear the PWA guest user name.

## Syntax

```
clear pwa guestname
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to clear the PWA guest user name

```
B2(su)->clear pwa guestname
```

# set pwa guestpassword

Use this command to set the guest user password for PWA networking.

## Syntax

```
set pwa guestpassword
```

## Parameters

None.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

PWA will use this password and the guest user name to grant network access to guests without established login names and passwords.

## Example

This example shows how to set the PWA guest user password name:

```
B2(su)->set pwa guestpassword
Guest Password: *****
Retype Guest Password: *****
```

# set pwa gueststatus

Use this command to enable or disable guest networking for port web authentication.

## Syntax

```
set pwa gueststatus {authnone | authradius | disable}
```

## Parameters

<b>authnone</b>	Enables guest networking with no authentication method.
<b>authradius</b>	Enables guest networking with RADIUS authentication. Upon successful authentication from RADIUS, PWA will apply the policy returned from RADIUS to the PWA port.
<b>disable</b>	Disables guest networking.

## Defaults

None.

## Mode

Switch command, read-write.

## Usage

PWA will use a guest password and guest user name to grant network access with default policy privileges to users without established login names and passwords.

## Example

This example shows how to enable PWA guest networking with RADIUS authentication:

```
B2(su)->set pwa guestnetworking authradius
```

# set pwa initialize

Use this command to initialize a PWA port to its default unauthenticated state.

## Syntax

```
set pwa initialize [port-string]
```

## Parameters

<i>port-string</i>	(Optional) Initializes specific port(s). For a detailed description of possible <i>port-string</i> values, refer to <a href="#">“Port String Syntax Used in the CLI”</a> on page 5-2.
--------------------	---

## Defaults

If *port-string* is not specified, all ports will be initialized.

## Mode

Switch command, read-write.

## Example

This example shows how to initialize ports ge.1.5-7:

```
B2(su)->set pwa initialize ge.1.5-7
```

# set pwa quietperiod

Use this command to set the amount of time a port will remain in the held state after a user unsuccessfully attempts to log on to the network.

## Syntax

```
set pwa quietperiod time [port-string]
```

## Parameters

<i>time</i>	Specifies quiet time in seconds.
<i>port-string</i>	(Optional) Sets the quiet period for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

If *port-string* is not specified, quiet period will be set for all ports.

## Mode

Switch command, read-write.

## Example

This example shows how to set the PWA quiet period to 30 seconds for ports ge.1.5-7:

```
B2(su)->set pwa quietperiod 30 ge.1.5-7
```

# set pwa maxrequest

Use this command to set the maximum number of log on attempts allowed before transitioning the PWA port to a held state.

## Syntax

```
set pwa maxrequests requests [port-string]
```

## Parameters

<i>maxrequests</i>	Specifies the maximum number of log on attempts.
<i>port-string</i>	(Optional) Sets the maximum requests for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

## Defaults

If *port-string* is not specified, maximum requests will be set for all ports.

## Mode

Switch command, read-write.



## Example

This example shows how to set the PWA maximum requests to 3 for all ports:

```
B2(su)->set pwa maxrequests 3
```

## set pwa portcontrol

This command enables or disables PWA authentication on select ports.

### Syntax

```
set pwa portcontrol {enable | disable} [port-string]
```

### Parameters

<b>enable   disable</b>	Enables or disables PWA on specified ports.
<i>port-string</i>	(Optional) Sets the control mode on specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.

### Defaults

If *port-string* is not specified, PWA will enabled on all ports.

### Mode

Switch command, read-write.

### Example

This example shows how to enable PWA on ports 1-22:

```
B2(su)->set pwa portcontrol enable ge.1.1-22
```

## show pwa session

Use this command to display information about current PWA sessions.

### Syntax

```
show pwa session [port-string]
```

### Parameters

<i>port-string</i>	(Optional) Displays PWA session information for specific port(s). For a detailed description of possible <i>port-string</i> values, refer to “ <a href="#">Port String Syntax Used in the CLI</a> ” on page 5-2.
--------------------	--

### Defaults

If *port-string* is not specified, session information for all ports will be displayed.

### Mode

Switch command, read-only.

### Example

This example shows how to display PWA session information:

```
B2(su)->show pwa session
```

Port	MAC	IP	User	Duration	Status
ge.2.19	00-c0-4f-20-05-4b	172.50.15.121	pwachap10	0,14:46:55	active
ge.2.19	00-c0-4f-24-51-70	172.50.15.120	pwachap1	0,15:43:30	active
ge.2.19	00-00-f8-78-9c-a7	172.50.15.61	pwachap11	0,14:47:58	active

## set pwa enhancedmode

This command enables PWA URL redirection. The switch intercepts all HTTP packets on port 80 from the end user, and sends the end user a refresh page destined for the PWA IP Address configured.

### Syntax

```
set pwa enhancedmode {enable | disable}
```

### Parameters

<b>enable   disable</b>	Enables or disables PWA <b>enhancedmode</b> .
-------------------------	---

### Defaults

None.

### Mode

Switch command, read-write.

Example

This example shows how to enable PWA **enhancedmode**:

```
B2(su)->set pwa enhancedmode enable
```

Configuring Secure Shell (SSH)

Purpose

To review, enable, disable, and configure the Secure Shell (SSH) protocol, which provides secure Telnet.

Commands

For information about...	Refer to page...
show ssh status	<a href="#">16-69</a>
set ssh	<a href="#">16-69</a>
set ssh hostkey	<a href="#">16-70</a>

show ssh status

Use this command to display the current status of SSH on the switch.

Syntax

```
show ssh status
```

Parameters

None.

Defaults

None.

Mode

Switch command, read-only.

Example

This example shows how to display SSH status on the switch:

```
B2(su)->show ssh status
SSH Server status: Disabled
```

set ssh

Use this command to enable, disable or reinitialize SSH server on the switch. By default, the SSH server is disabled.

## Syntax

```
set ssh {enable | disable | reinitialize}
```

## Parameters

<b>enable   disable</b>	Enables or disables SSH, or reinitializes the SSH server.
<b>reinitialize</b>	Reinitializes the SSH server.

## Defaults

None.

## Mode

Switch command, read-write.

## Example

This example shows how to disable SSH:

```
B2(su)->set ssh disable
```

# set ssh hostkey

Use this command to set or reinitialize new SSH authentication keys.

## Syntax

```
set ssh hostkey [reinitialize]
```

## Parameters

<b>reinitialize</b>	(Optional) Reinitializes the server host authentication keys.
---------------------	---

## Defaults

If **reinitialize** is not specified, the user must supply SSH authentication key values.

## Mode

Switch command, read-write.

## Example

This example shows how to regenerate SSH keys:

```
B2(su)->set ssh hostkey reinitialize
```

## Numerics

802.1D 7-1  
802.1p 10-15, 11-1  
802.1Q 8-1  
802.1s 7-1  
802.1w 7-1  
802.1x 16-5, 16-17

## A

Advertised Ability 5-13  
Alias  
  node 13-32  
Authentication  
  EAPOL 16-17  
  MAC 16-19  
  Port web 16-57  
  RADIUS server 16-5, 16-8  
  SSH 16-70  
Auto-negotiation 5-13

## B

banner motd 3-20  
Baud Rate 3-26  
Broadcast  
  suppression, enabling on ports 5-27

## C

CDP Discovery Protocol 4-1  
Cisco Discovery Protocol 4-6  
Class of Service 10-7, 10-11,  
  10-15 to 10-21, 11-1  
Classification Policies 10-1  
Clearing NVRAM 3-51  
CLI  
  closing 3-49  
  scrolling screens 1-8  
  starting 1-5  
Command History Buffer 13-11, 13-12  
Command Line Interface. See also CLI  
Configuration  
  clearing switch parameters 3-51  
Configuration Files  
  copying 3-45  
  deleting 3-46  
  displaying 3-44  
  executing 3-45  
  show running config 3-46  
Contexts (SNMP) 6-3  
Copying Configuration or Image  
  Files 3-45  
Cost  
  Spanning Tree port 7-37

## D

Defaults  
  CLI behavior, described 1-6  
  factory installed 1-2

DHCP server, configuring 15-1  
Differentiated Services  
  adding classes to policies 9-11  
  assigning policies to service  
    ports 9-15  
  configuring policies 9-9  
  creating classes and matching  
    conditions 9-2  
  deleting classes 9-4  
  deleting policies 9-10  
  displaying class information 9-3  
  displaying status information 9-2  
  globally enabling or disabling 9-1  
  marking packets 9-11  
  matching classes to conditions 9-5  
  setting policing styles for  
    policies 9-12  
Diffserv, see Differentiated Services  
Dynamic policy profile  
  assignment 16-2

## E

EAP pass-through 16-2, 16-13  
EAPOL 16-17

## F

Flow Control 5-17  
Forbidden VLAN port 8-13

## G

Getting Help xxi  
GVRP  
  enabling and disabling 8-22  
  purpose of 8-19  
  timer 8-23

## H

Hardware  
  show system 3-12, 3-21  
Help  
  keyword lookups 1-7  
Host VLAN 8-16

## I

ICMP 13-13  
IGMP 12-1  
  enabling and disabling 12-2  
Image File  
  copying 3-45  
  downloading 3-34  
Ingress Filtering 8-6, 8-9  
IP  
  routes, managing in switch  
    mode 13-15

## J

Jumbo Frame Support 5-11

## K

Keyword Lookups 1-7

## L

licenses  
  activating 3-26  
  license key field descriptions 3-26  
  procedure for stack  
    environment 3-27  
Line Editing Commands 1-9  
Link Layer Discovery Protocol (LLDP)  
  configuring 4-13  
LLDP  
  configuring 4-13  
LLDP-MED  
  configuring 4-14  
Lockout  
  set system 3-6  
Logging 13-1  
Login  
  administratively configured 1-6  
  default 1-6  
  setting accounts 3-1  
  via Telnet 1-5

## M

MAC Addresses  
  displaying 13-18  
MAC Authentication 16-19  
MAC Locking 16-46  
  maximum static entries 16-52  
  static 16-52  
Management VLAN 8-1  
motd 3-20  
Multicast Filtering 12-1  
Multiple Spanning Tree Protocol  
  (MSTP) 7-1

## N

Name  
  setting for a VLAN 8-5  
  setting for the system 3-22  
Network Management  
  addresses and routes 13-15  
  monitoring switch events and  
    status 13-11  
Node Alias 13-32  
NVRAM  
  clearing 3-51

## P

Password  
  aging 3-5  
  history 3-5, 3-6  
  set new 3-4  
  setting the login 3-4  
Ping 13-13

- Policy Management
  - assigning ports [10-14](#)
  - classifying to a VLAN or Class of Service [10-7](#), [10-11](#)
  - dynamic assignment of profiles [16-2](#)
  - profiles [10-1](#), [10-15](#)
- Port Mirroring [5-29](#)
- Port Priority
  - configuring [11-1](#)
- Port String
  - syntax used in the CLI [5-2](#)
- Port Trunking [5-32](#)
- Port web authentication
  - configuring [16-57](#)
- Port(s)
  - alias [5-8](#)
  - assignment scheme [5-2](#)
  - auto-negotiation and advertised ability [5-13](#)
  - broadcast suppression [5-27](#)
  - counters, reviewing statistics [5-5](#)
  - duplex mode, setting [5-9](#)
  - flow control [5-17](#)
  - link flap
    - about [5-19](#)
    - configuration defaults [5-21](#)
    - configuring [5-20](#)
  - link traps, configuring [5-18](#)
  - MAC lock [16-49](#)
  - priority, configuring [11-1](#)
  - speed, setting [5-9](#)
  - status, reviewing [5-3](#)
- Power over Ethernet (PoE),
  - configuring [3-31](#)
- Priority to Transmit Queue Mapping [11-4](#)
- Prompt
  - set [3-19](#)
- PWA [16-57](#)

## R

- RADIUS [16-3](#)
  - realm [16-6](#)
- RADIUS Filter-ID [16-2](#)
  - attribute formats [16-3](#)
- RADIUS server [16-5](#), [16-8](#)
- Rapid Spanning Tree Protocol (RSTP) [7-1](#)
- Rate Limiting [11-9](#)
- Related Manuals [xx](#)
- Reset [3-51](#)
- RFC 3580 [16-41](#)

## S

- Scrolling Screens [1-8](#)
- Secure Shell (SSH) [16-69](#)
  - enabling [16-69](#)
  - regenerating new keys [16-70](#)
- Security
  - methods, overview of [16-1](#)
- Serial Port

- downloading upgrades via [3-34](#)
- show system utilization cpu [3-13](#)
- SNMP
  - access rights [6-15](#)
  - accessing in router mode [6-3](#)
  - enabling on the switch [6-17](#)
  - MIB views [6-18](#)
  - notification parameters [6-28](#)
  - notify filters [6-28](#)
  - security models and levels [6-2](#)
  - statistics [6-3](#)
  - target addresses [6-25](#)
  - target parameters [6-22](#)
  - trap configuration example [6-36](#)
  - users, groups and communities [6-7](#)
- SNTP [13-25](#)
- Spanning Tree [7-1](#)
  - backup root [7-21](#)
  - bridge parameters [7-3](#)
  - features [7-2](#)
  - port parameters [7-31](#)
  - Rapid Spanning Tree Protocol (RSTP) [7-1](#)
- SSL WebView [3-54](#)
- stacks
  - installing units [2-2](#)
  - operation [2-1](#)
  - virtual switch configuration [2-4](#)
- Syslog [13-1](#)
- System Information
  - displaying basic [3-11](#)
  - setting basic [3-8](#)

## T

- Technical Support [xxi](#)
- Telnet
  - disconnecting [13-14](#)
  - enabling in switch mode [3-38](#)
- Terminal Settings [3-23](#)
- TFTP
  - downloading firmware upgrades via [3-34](#)
- Timeout
  - CLI, system [3-25](#)
  - RADIUS [16-5](#)
- Trap
  - SNMP configuration example [6-36](#)
- Tunnel Attributes
  - RFC 3580 RADIUS attributes [16-41](#)

## U

- User Accounts
  - default [1-6](#)
  - setting [3-1](#)

## V

- Version Information [3-21](#)
- virtual switch, configuring [2-4](#)
- VLANs
  - assigning ingress filtering [8-9](#)
  - assigning port VLAN IDs [8-6](#)

- authentication [16-41](#), [16-45](#)
- classifying to [10-7](#), [10-11](#)
- creating static [8-4](#)
- dynamic egress [8-16](#)
- egress lists [8-12](#), [16-44](#)
- enabling GVRP [8-18](#)
- forbidden ports [8-13](#)
- host, setting [8-16](#)
- ingress filtering [8-6](#)
- naming [8-5](#)
- RADIUS [16-41](#)
- secure management, creating [8-1](#)

## W

- WebView [1-2](#), [3-52](#)
- WebView SSL [3-54](#)