



EMC[®] Smarts[®]

Network Configuration Manager Device Services Support (DSr)

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Support Matrix

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PREFACE

As part of an effort to improve its product lines, EMC periodically releases revisions of its software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact your EMC technical support professional if a product does not function properly or does not function as described in this document.

NOTICE

This document was accurate at publication time. Go to EMC Online Support (<https://support.emc.com>) to ensure that you are using the latest version of this document.

Revision history

[Table 1 on page 31](#) lists the revision history of this document.

Table 1 Revision history

Date	Revision	Description of change
July, 2018	01	GA release

Purpose

This document lists the device driver information for EMC Smarts Network Configuration Manager Device Services Support (DSr) release.

Audience

This document is part of the *EMC Smarts Network Configuration Manager Device Services Support (DSr)* documentation set, and is intended for use by individuals who have the responsibility of installing and deploying devices and device drivers.

Readers of this document are expected to be familiar with the following topics:

- ◆ *Windows® and Linux® operating systems*
- ◆ *Database architecture and concepts*
- ◆ *Security management*
- ◆ *Internet protocols, including HTTP, TCP/IP, File Transfer Protocol (FTP), and Telnet*
- ◆ *Lightweight Directory Access Protocol (LDAP) and directory services*
- ◆ *Authentication and authorization*

Related documentation

Related documents include:

- ◆ *EMC Smarts Network Configuration Manager Device Services Support (DSr) Version 24.0 Hotfix 2 Read Me*

Conventions used in this document

EMC uses the following conventions for special notices:

NOTICE

NOTICE is used to address practices not related to personal injury.

Typographical conventions

EMC uses the following type style conventions in this document:

Bold	Use for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
<i>Italic</i>	Use for full titles of publications referenced in text
Monospace	Use for: <ul style="list-style-type: none"> • System output, such as an error message or script • System code • Pathnames, filenames, prompts, and syntax • Commands and options
<i>Monospace italic</i>	Use for variables.
Monospace bold	Use for user input.
[]	Square brackets enclose optional values
	Vertical bar indicates alternate selections — the bar means “or”
{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information omitted from the example

Where to get help

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Product information — For documentation, release notes, software updates, or information about EMC products, go to EMC Online Support at:

<https://support.emc.com>

Technical support — Go to EMC Online Support and click Service Center. You will see several options for contacting EMC Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to:

techpubcomments@emc.com

CHAPTER 1

Introduction

This chapter contains the following topics:

- ◆ [Overview.....](#) 34

Overview

The following information is included in this Support Matrix document.

- ◆ Device Driver Features and Information
- ◆ Additions to Existing Device Drivers
- ◆ Known Device Driver Issues
- ◆ Additional Device Driver Support Information

What is Network Configuration Manager?

- ◆ An automated compliance, change and configuration management solution that delivers industry-recognized best practices.
- ◆ A collaborative network infrastructure design, controlled change processes, network device and service configuration transparency, and compliance with corporate and regulatory requirements—to enable you to ensure the security, availability, and operational efficiency of your network.
- ◆ An automated support for all facets of the network infrastructure lifecycle, seamlessly integrating critical design, change, and compliance management requirements.

Compatibility

This release is certified to work with Network Configuration Manager 9.5.1 or below (lowest supported version is 9.3), on the following environments:

- ◆ Red Hat Enterprise Linux 6.x
- ◆ Red Hat Enterprise Linux 7.x
- ◆ Microsoft Windows Server 2012
- ◆ Microsoft Windows Server 2016

NOTICE

The *EMC Smarts Network Configuration Manager Support Matrix* document provides operating system versions and system requirements.

CHAPTER 2

Device Driver Information

This chapter contains the following topics:

- ◆ [New device drivers](#) 36
- ◆ [Modified Driver](#) 36
- ◆ [Enabling inactive device classes](#) 37
- ◆ [Viewing installed device driver packages](#) 37
- ◆ [Configuring FTP Transfer Service](#)..... 38

New device drivers

The following are device driver that have been added with this release:

- ◆ Cisco FirePower TD
 - Added support for Cisco FirePOWER FPR-2130 Security Appliance, Cisco FirePOWER FPR-2110 Security Appliance.
- ◆ Cisco FirePower K9
 - Added support for FPR-4120-SUP, FPR-4110-SUP.

Modified Driver

The following driver that has been modified in this release:

- ◆ Allot Devices
 - Added support for model netexplorer 15.1.10-14.
- ◆ Cisco FirePower SM
 - Added support for model Cisco FirePower SM-12 Mod.
- ◆ Cisco IOS Switch
 - Added support for model C9300, C9300-48P, C9300-48T-E, C9300-24T-E, C9300-48P-A, C9300-48P-E, C9300-24P-E, C3560CX-8PC-S.
- ◆ Cisco IOS Router
 - Added serial number support for model ISR4351.
- ◆ Cisco Wireless LAN Controller
 - Added support for model AIR-CT5520-K9.

Enabling inactive device classes

To enable a device class that is not enabled by default, follow these steps.

Step	Action
1	Select Tools > System Administration from the Network Configuration Manager menu bar.
2	Select Global > Device Classes to open the Global Managed Device Classes window.
3	Click the Manage List button.
4	Highlight the <i>Supported Device Class</i> you want to enable, and click the Add button. Repeat this step for <i>all</i> device classes you are enabling.
5	Click Ok .
6	Click Apply . Notice: Changes to device classes may affect the underlying Auto Discovery device classes' configuration.
7	Click Yes to confirm the changes.
8	Click Ok .
9	Click Close .

Viewing installed device driver packages

To view a list of installed device driver packages, follow these steps.

Step	Action
1	Log into the server as a user with administrator privileges .
2	Navigate to the [Product Home]/bin directory.
3	Run the perl versiondb.pl --query command. Notice: This command can be run on either the Application Server or the Device Server. The versiondb.pl tool reports information based on the server where it is run.

Configuring FTP Transfer Service

To support FTP transfers for configuration management on some devices, an FTP service must be configured on the device server(s). Refer to the individual driver documentation to determine if this service must be configured for your device.

As a minimum, the following characteristics must be present; any additional security precautions are the responsibility of the end-user.

- ◆ An anonymous FTP user (typically user **anonymous**) *must* be enabled.
- ◆ The anonymous FTP user's home directory must be set to **\$FTPHOMEDIR/ftp**, and *cannot* be world-writeable.
- ◆ The path **\$FTPHOMEDIR/ftp/backup** *must* exist and the backup directory *must* be world-writeable.
- ◆ The FTP user must be able to create subdirectories under **\$FTPHOMEDIR/ftp/backup**. This may require additional settings for the FTP service employed.

CHAPTER 3

3COM Devices

This chapter contains the following topics:

- ◆ 3Com Netbuilder II Router 40
- ◆ 3Com Switch 5500..... 43

3Com Netbuilder II Router

Device Type	Router
Specific Model(s)	nb2, 2 port nbtr NBTR Remote Access, 4 port nb1 NB Remote, 2 port nb1 NB Remote Access, 2 port boundary rtr NB Remote Control, 4 port tok.ring nb1 NBTR Remote, tok.ring boundary rtr NBTR Remote Control, nb2 4-slot, nb2 8-slot, netbuilder Rem. Office (spectre), 2 Lan nb1 NB Local, 2 Lan nbtr NBTR Local, NB Rem Ctl w/2 wan ports, NBTR Rem Ctl w/2 wan ports, Spectre Large (SuperStackII 22x), Spectre Huge (SuperStackII 22x), Spectre ISDN (SuperStackII 42x), 8 slot nb2, 8 slot nb2, fw versions, sw versions, Spectre ISDN, SpectreTR4x8 (superStackII 32x TR), SpectreTrIsdn4x8 (SSII 52x TR/ISDN), SpectreTrxxx (SSII 32x TR), Spectre2Eth (SSII 22x Eth sw ver>9.1), Spectre2EthIsdn (SSII 42x Eth/ISDN sw ver > 9.1), officeConnect, Intrepid (SuperStackII NBSI 2xWan:intrepid, 4xWan:blueridge), Score (PB S5xx tunnel switch), Copper (PB S4xx WAN convergence switch), Easter (SuperStack II Router 400)
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP, OOB
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes

Features Available	Support
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains “SW/NBII”
 - sysObjectID contains at least one of the following 1.3.6.1.4.1.43.1.4. (2 | 11 | 12 | 22 | 23)

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - Get the boot directory using the sf 4 command
 - Get a list of files in the boot directory excluding the BOOT.??K file
 - Copy <fileName> <serverIPAddress>:<filename>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - Copy <fileName> <serverIPAddress>:<filename>

Credential management

- ◆ Account
 - Syspassword <oldPassword> <newPassword>
- ◆ SNMP
 - system (community | writecommunity) <newCommunity>

Device monitoring

- ◆ Ping

- ◆ Reboot
- ◆ DF

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP, OOB

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

3Com Switch 5500

Device Type	Switch
Specific Model(s)	5500
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/FTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, View Routes, View Arp, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr value contains “Switch 5500” (case-insensitive)
- sysObjectID contains 1.3.6.1.4.1.43.1.16.4.3

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - display current-configuration
 - display saved-configuration
- ◆ Terminal/TFTP
 - backup fabric current-configuration to <SERVERIPADDR> <destFile>
 - display startup
 - tftp <SERVERIPADDR> put <xferFilename> <destFile>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - tftp <SERVERIPADDR> get <configFilename> <tempFilename>
 - copy <tempFilename> <SavedCfgFilename>

Credential management

- ◆ Account
 - local-user <thisUser>
 - level <level>
 - service-type terminal telnet ssh
 - password (simple | cipher) <password>
 - undo local-user <oldUser>
- ◆ Privilege Account
 - super password (simple | cipher) <newPrivPass>
- ◆ SNMP
 - snmp-agent community (read | write) <newCommunityString>
 - undo snmp-agent community <oldString>

Device monitoring

- ◆ display current-configuration
- ◆ display saved-configuration
- ◆ display startup
- ◆ tftp <deviceServerAddress> (get | put) <localFilename> <remoteFilename>
- ◆ copy sourceFilename destFilename
- ◆ save filename
- ◆ delete filename
- ◆ ping ipAddress
- ◆ tracert ipAddress
- ◆ display ip interface
- ◆ display ip routing-table
- ◆ display arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/TFTP, SSH/FTP
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

3Com Switch 5500

- ◆ Editing comments generated by the device when capturing the configuration causes device warnings during push operations.
- ◆ Inconsistencies in command behavior for configuration and credential management appear in software version 3.01, but not later versions.
 - Startup configurations are the only file types retrieved.
 - User credentials cannot be removed during password rolls, due to the session use count. The error message *User access number not 0* is displayed. Manual removal of the user credentials is untested but might be successful.

CHAPTER 4

ACCEDIAN Devices

This chapter contains the following topics:

- ◆ [Accedian AEN-1000-GE-H.....](#) 48

Accedian AEN-1000-GE-H

Device Type	Switch
Specific Model(s)	AEN-1000-GE-H, AMO-10000-NE, AEN-1000-GE, AMN-1000-TE-R
Operating System and Firmware Versions	AEN_4.9.2.1_22919, AMO_10GE_5.4.1.5_30715, AEN_4.9.3.2_30737
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, View Routes, View Interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.22420.1.1
- ◆ Terminal
 - Output of "board show info" contains model name and serial number.
 - Output of "board show info" contains hostname of the device.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Startup configuration
 - Export configuration

Configuration deploy

- ◆ Terminal
 - The text config, as captured, cannot be pushed to the device. Configlets must use the text config for the destination.
- ◆ Terminal/TFTP
 - A stored startup or running config is pushed to the system by transferring it to the system using FTP and issuing the command-line interface command `restore-backup-config <filename>`.

Credential Management

- ◆ Account
 - `user add <username> password`
 - `user delete <oldUser>`
 - `user edit <oldUser> password`
- ◆ SNMP
 - `snmp edit <type> newString`

Device monitoring

- ◆ Board show info
- ◆ ping
- ◆ traceroute
- ◆ export configuration
- ◆ route show active

- ◆ interface show

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Startup configuration	No	Yes	NA	Text	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 5

ACME Devices

This chapter contains the following topics:

- ◆ [ACME NetNet SBC](#) 52

ACME NetNet SBC

Device Type	Switch
Specific Model(s)	4250
Operating System and Firmware Versions	6.1
Communication Protocols	TELNET, SSH, TELNET/FTP, SSH/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, Privilege Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, View Routes, View ARP, View Interfaces, Save Config, Activate Config, Reboot Activate, Reboot Force

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains “Acme Packet Net-Net”
 - sysObjectID contains 1.3.6.1.4.1.9148
- ◆ Terminal
 - Get the model via terminal
 - Get the serial number via terminal
 - Check if there is an OID corresponding to the model found via terminal
 - Get the package ID from the OID
 - Check if the found package Id is matching the packed id of the current driver

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - From a command line interface session, the output of show running-config is captured as the text config.
- ◆ Terminal/TFTP
 - From a command line interface session, the command backup-config <filename> is issued. That file is then transferred from the SBC using FTP and stored in binary form as the startup config.
 - From a command line interface session, the command backup-config <filename> running is issued. That file is then transferred from the SBC using FTP and stored in binary form as the running config.

Configuration deploy

- ◆ Terminal
 - The text config, as captured, cannot be pushed to the device. Configlets must use the text config for the destination.
- ◆ Terminal/TFTP
 - A stored startup or running config is pushed to the system by transferring it to the system using FTP and issuing the command-line interface command restore-backup-config <filename>.

Credential management

- ◆ Account
 - ssh-password
- ◆ Privilege Account
 - secret enable

Device monitoring

- ◆ cli terminal-height
- ◆ enable
- ◆ exit
- ◆ configure terminal
- ◆ reboot activate
- ◆ save-config
- ◆ activate-config
- ◆ reboot force
- ◆ show routes
- ◆ show arp
- ◆ show interfaces
- ◆ show running-config authentication
- ◆ delete-backup-config
- ◆ backup-config
- ◆ show running-config
- ◆ restore backup-config
- ◆ ping
- ◆ show health
- ◆ save config
- ◆ show memory usage
- ◆ check-space-remaining boot
- ◆ check-space-remaining code
- ◆ check-space-remaining ramdrv

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
startup-config	Yes	Yes	Save Config Only, Save Config and Activate, Save Config and Reboot Activate	Binary	TELNET/FTP, SSH/FTP
text-config	Yes	Yes	Save Config Only, Save Config and Activate, Save Config and Reboot Activate	ASCII	TELNET, SSH
running-config	No	Yes	NA	Binary	TELNET/FTP, SSH/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

ACME NetNet SBC

- ◆ The ACME NetNet SBC driver is known not to work with pre-v6.1 systems, due to substantial differences in the way that configuration backups work.
- ◆ Models other than the 4250 may need to be manually added to the driver's models file, due to ACME Packet not supplying a comprehensive list of SNMP Model OIDs.
- ◆ Pushing configlets to these systems may be problematic due to the way ACME's configuration editing works. In order to edit many configuration items, such as SNMP communities, the user must *select* an existing item to edit, which this driver cannot do. If you have advance knowledge of the system's configuration you may be able to create a configlet that works, but the concept of *selecting* a configuration item to edit is not supported.
- ◆ Configlets always use the text config for the destination.
- ◆ A configlet is processed in the device's configuration mode. Ensure *not* to exit completely out of config mode, as this causes the job to fail.
- ◆ Selection prompts are considered valid config prompts. The following configlet is now valid:

```
system
snmp-community
sel
public
1
ip-addresses (1.1.1.1 2.2.2.2)
done
exit
exit
```


CHAPTER 6

Adtran Devices

This chapter contains the following topics:

◆ Adtran NetVanta	58
◆ Adtran NetVanta Switch	63
◆ Adtran MX.....	68
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Adtran NetVanta

Device Type	Router
Specific Model(s)	Atlas 800, Atlas Generic, Atlas 800 Plus, Atlas 550, Atlas 810, NetVanta 3200, NetVanta 3205, NetVanta 3305, NetVanta 5305, NetVanta 4305, Netvanta 3430, NetVanta 3120, NetVanta 1335, Netvanta 4430,5660
Operating System and Firmware Versions	04.02.00, 05.02.00, 05.03.00, 06.01.00, R10.5.0.E
Communication Protocols	TELNET/TFTP, SSH, TELNET, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	TFTP
Quick Commands	Standard quick commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - SysObjectID contains 1.3.6.1.4.1.664
- ◆ Terminal
 - If there is a string matching “Netvanta” (case -insensitive) in the output of show version command then
 - Get serial number from **show version** output
 - Get host name from **show running-config** output
 - Get object id from **show version** output

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show startup
 - show running
 - copy running-config startup-config
- ◆ Terminal/TFTP
 - copy startup-config tftp
 - copy running-config tftp

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp startup-config <SERVERIPADDR> <filename>
 - copy tftp running-config <SERVERIPADDR> <filename>

Credential management

- ◆ Account
 - If AAA is enabled do the following
 - no username <oldUserName>
 - username <username> password <password>
 - line (telnet 0 | console 0)
 - no password

- no login
- login local-userlist
- Else
 - line (telnet 0 | console 0)
 - no login local-userlist
 - login
 - password <password>
- ◆ Privilege Account
 - no enable password <oldPrivPas>
 - enable password [md5] <newPrivPass>
- ◆ SNMP
 - no snmp-server community <oldCommunity>
 - snmp-server community <newCommunity> RO|RW

Operating System management

- ◆ copy tftp flash
- ◆ boot system flash <newLoad> <currentLoad>
- ◆ erase

Device monitoring

- ◆ show memory heap
- ◆ show flash
- ◆ show version
- ◆ exit
- ◆ copy startup-config tftp
- ◆ copy running-config tftp
- ◆ show startup
- ◆ show running
- ◆ copy tftp running-config
- ◆ copy tftp startup-config
- ◆ copy tftp flash
- ◆ copy flash tftp
- ◆ erase
- ◆ boot system flash
- ◆ enable
- ◆ disable

- ◆ configuration terminal
- ◆ end
- ◆ reload

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET/TFTP, SSH, TELNET, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET/TFTP, SSH, TELNET, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Adtran NetVanta drivers

- ◆ Adtran NetVanta and Adtran NetVanta Switch drivers may experience problems if configured with the **message of the day banner**.

Adtran NetVanta Router - Serial Numbers not Displaying

- ◆ The Adtran NetVanta Router does *not* show the serial number when using SNMP.

Adtran NetVanta Switch

Device Type	Switch
Specific Model(s)	NetVanta 1224, NetVanta 1224R, NetVanta 1224 STR, NetVanta 1224 STR, Total Access 916e, Total Access 924e, Total Access 908e, Total Access 908e(3rd Gen), Total Access 900e, NetVanta 644
Operating System and Firmware Versions	06.01.03, A4.05.00.E, R10.9.0, R10.9.4.E
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	TFTP
Quick Commands	NA

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	No
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.664
 - Get the number of interfaces with 1.3.6.1.2.1.2.1.0 OID and it should be greater than 4
- ◆ Terminal
 - If there is a string matching “Netvanta” (case -insensitive) in the output of **show version** command then
 - Get serial number from **show version** output
 - Get host name from **show running-config** output
 - Get object id from **show version** output
 - There should be more than four interfaces listed in the command **show interfaces**.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show startup
 - show running
 - copy running-config startup-config
- ◆ Terminal/TFTP
 - copy startup-config tftp
 - copy running-config tftp

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp startup-config <SERVERIPADDR> <filename>
 - copy tftp running-config <SERVERIPADDR> <filename>

Credential management

- ◆ Account

- If AAA is enabled do the following
 - no username <oldUserName>
 - username <username> password <password>
 - line (telnet 0 | console 0)
 - no password
 - no login
 - login local-userlist
- Else
 - line (telnet 0 | console 0)
 - no login local-userlist
 - login
 - password <password>
- ◆ Privilege Account
 - no enable password <oldPrivPas>
 - enable password [md5] <newPrivPass>
- ◆ SNMP
 - no snmp-server community <oldCommunity>
 - snmp-server community <newCommunity> (RO|RW)

Operating System management

- ◆ copy tftp flash
- ◆ boot system flash <newLoad> <currentLoad>
- ◆ erase

Device monitoring

- ◆ show memory heap
- ◆ show flash
- ◆ show version
- ◆ exit
- ◆ copy startup-config tftp
- ◆ copy running-config tftp
- ◆ show startup
- ◆ show running
- ◆ copy tftp running-config
- ◆ copy tftp startup-config
- ◆ copy tftp flash

- ◆ copy flash tftp
- ◆ erase
- ◆ boot system flash
- ◆ enable
- ◆ disable
- ◆ configuration terminal
- ◆ end
- ◆ reload

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET/TFTP, SSH, TELNET, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET/TFTP, SSH, TELNET, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Adtran NetVanta Switch drivers

- ◆ Adtran NetVanta and Adtran NetVanta Switch drivers may experience problems if configured with the **message of the day banner**.

Adtran MX

Device Type	Router
Specific Model(s)	MX 2820
Operating System and Firmware Versions	E04
Communication Protocols	TELNET, TELNET/TFTP, SSH, SSH/TFTP
Configuration Files Content	Binary
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP
Credential Management	SNMPv1/v2, Account
Operating System Management Protocols	NA
Quick Commands	NA

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	No
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains 1.3.6.1.4.1.664.1.484
- Serial number is retrieved from .1.3.6.1.4.1.664.3.1.4.0
- System name is retrieved from 1.3.6.1.2.1.1.5
- ◆ Terminal
 - NA

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - Navigate through Menu system to "System Configuration Archive" menu.
 - Select 3 to go to "SCA Operations" menu
 - Select 1 to set TFTP server
 - Select 2 to set Config Filename
 - Select 4 to Perform "TFTP SCA Save"
 - Check "SCA Save Status" for completion

Configuration deploy

- ◆ Terminal/TFTP
 - Navigate through Menu system to "System Configuration Archive".
 - Select 3 to go to "SCA Operations" menu.
 - Select 1 to set TFTP server
 - Select 2 to set Config Filename
 - Select 5 to Perform "TFTP SCA Restore"
 - Check "SCA Restore status" for completion

Credential management

- ◆ SNMP
 - Navigate through Menu system to "SNMP" menu
 - Select 11 to set the "Read Community"
 - Select 12 to set the "Write Community"
- ◆ Account
 - New account creation
 - Navigate through Menu system to "Security Administration" menu
 - Select 3 to go to "Create New User Account"

- Select 1 to set "User-ID"
- Select 2 to set "Password"
- Select 3 to go to "Account Properties/Access Privilege" menu
- Select 1 to go to "Access Rights" menu
- Select 4 to set as "ADMIN"
- Select 2 to enable the user account.
- Password change
 - Navigate through menu system to "Change <current user> password"
 - Enter new password

Operating System management

- ◆ NA

Device monitoring

- ◆ NA

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	Binary	TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No

Attributed data	Terminal	SNMP
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ Being a menu-based device, only discovery via SNMP is supported.
- ◆ Interfaces are pulled via SNMP only. Due to current library code logic, only interfaces with a distinct name are shown as separate interfaces.

Adtran Ethernet NTU

Device Type	Switch
Specific Model(s)	NetVanta 873, Total Access 1424S-CE, NetVanta 818, NetVanta 838, NetVanta 838T, NetVanta 8044M
Operating System and Firmware Versions	G01.05, G03.07
Communication Protocols	SSH/Telnet,SNMP
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, View Routes,View Interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - sysObjectID value contains .1.3.6.1.4.1.664.1
- ◆ Terminal
 - Output of "show version" contains model name, host name and serial number.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ SNMP
 - snmp-server community read-only <newCommunity>
 - snmp-server community read-write <newCommunity>
 - no snmp-server community read-only <oldSnmpCommunity>
 - no snmp-server community read-write <oldSnmpCommunity>
- ◆ Account
 - security
 - username <username>
 - password
 - privilege admin
 - no username <username>

Operating System management

- ◆ NA

Device monitoring

- ◆ show version
- ◆ write
- ◆ ping

- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ show interfaces
- ◆ reload

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copy to start	TEXT	SSH, Telnet
startup	No	Yes	NA	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ SNMP credential roll is supported but was not qualified in house due to device restrictions.

CHAPTER 7

Adva Devices

This chapter contains the following topics:

- ◆ [Adva FSP150CC](#) 78
- ◆ [Adva FSP150CCGE201](#) 82

Adva FSP150CC

Device Type	Switch
Specific Model(s)	FSP150CCD-410, FSP150CC-825
Operating System and Firmware Versions	2.1, 7.0
Communication Protocols	TELNET, SSH, TELNET/FTP, SSH/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Routes, View ARP, View Interfaces, Resync, Set FTP Credentials

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains “FSP150CC”
 - sysObjectID contains 1.3.6.1.4.1.18022.1
- ◆ Terminal
 - Model found from show system should be found in the *Models* file

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
- ◆ Terminal/FTP
 - database backup
 - database copy ftp put <serverip> <username> <password> <filename>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
 - database save
- ◆ Terminal/FTP
 - database copy ftp get <serverip> <username> <password> <filename>
 - show database copy
 - database restore active none

Credential management

- ◆ Account
 - configure system
 - no user <username>
 - add user <userName> <password>
- ◆ SNMP
 - configure snmp
 - communityname <newSnmpCommunity> (read-only | read-write)
 - no communityname <oldSnmpCommunity>

Device monitoring

- ◆ show system
- ◆ show ip routes static
- ◆ show arp
- ◆ show interface
- ◆ show ip
- ◆ show mgmttnl
- ◆ database backup
- ◆ show database copy
- ◆ database restore active none
- ◆ ping
- ◆ show ip route dynamic
- ◆ tracet
- ◆ reboot
- ◆ database save

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	TELNET, SSH
startup	Yes	Yes	Reboot	Binary	TELNET/FTP, SSH/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No

Attributed data	Terminal	SNMP
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Adva FSP150CC

- ◆ This device can only transfer binary files using an external FTP server located on the device server. It is the customer's responsibility to setup and maintain a correctly configured FTP daemon on the appropriate device server.
- ◆ The driver will default to using the FTP credentials: *anonymous / ionixncm@emc.com*. The defaults can be changed on a device by device basis using the quick command named *Set_FTP_Credentials*.
- ◆ Some lines in the text (running) config cannot be sent back to the device using terminal input.

Adva FSP150CCGE201

Device Type	Switch
Specific Model(s)	FSP150CC-GE201
Operating System and Firmware Versions	4.3.2-27
Communication Protocols	SNMP, Telnet, SSH, SSH/FTP, Telnet/FTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Trap, Syslog
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains 1.3.6.1.4.1.2544. 1.12.1.1.4.
- Model number should be retrievable.
- Chassis Serial number or Sysname will be used for discovery.
- ◆ Terminal
 - Should be able to retrieve Model number via term and that should resolve to Package ID.
 - Chassis Serial Number or Sysname will be used for discovery.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - admin config-file
 - show configfile <saved-configfile name> -- for saved configuration file which is delta between running config and default database
 - show running-config current -- for running configuration
- ◆ Terminal/FTP
 - admin config-file
 - save <configFile>
 - transfer-file ftp put <userid> [password | no-password] <password> <ip-address> <filename>
 - show file-services-status

Configuration deploy

- ◆ Terminal/FTP
 - admin config-file
 - transfer-file ftp get <userid> [password | no-password] <password> <ip-address> <filename>
 - show file-services-status
 - restart-with-configfile <configfile name> yes
- ◆ Terminal
 - Configuration can be deployed as running configuration by sending as command line

Credential management

- ◆ Account
 - config user-security

- add <username> <password> <password> superuser
- show local-user <username>
- config-user <username>
- config-user <username> password <password> <password>
- delete <username>
- ◆ SNMP
 - configure snmp
 - add community <newSnmpCommunity> readonly
 - add community <newSnmpCommunity> readwrite
 - delete community <oldSnmpCommunity>
 - show all-communities
 - show community <community string>

Operating System management

- ◆ NA

Device monitoring

- ◆ show system
- ◆ home
- ◆ show interface
- ◆ show arp-entries
- ◆ show ip-routes
- ◆ configure communication
- ◆ ping <ip addr>
- ◆ trace-route <ip-addr>
- ◆ show ping-result
- ◆ show trace-route-result

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running-config	Yes	Yes	copyToSaved	ASCII	SSH, Telnet
running-config-ftp	Yes	Yes	Reboot	ASCII	Telnet/FTP, SSH/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases.

- ◆ Pull/Push via FTP is not supported due to issues with FTP connection.
- ◆ Interfaces are not supported via Term as the command returns only a single interface data instead of three returned by SNMP.
- ◆ While pushing the config file, there should be no '#end' in the configuration file as this interferes with GUI-based elements and causes a failure.

CHAPTER 8

Airspace Devices

This chapter contains the following topics:

- ◆ [Airspace Switch](#) 88

Airespace Switch

Device Type	Switch
Specific Model(s)	AS-4012
Operating System and Firmware Versions	2.0.152.3
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, View Interfaces, View Routes Summary, View Arp Switch, Save Config

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.14179
 - sysDescr contains “Airespace Switch”
 - Model number .1.3.6.1.4.1.14179.1.1.1.3.0
- ◆ Terminal
 - **show sysinfo** contains “Airespace Switch”
 - Model number using **show inventory**

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show run-config
- ◆ Terminal/TFTP
 - transfer upload datatype config
 - transfer upload mode tftp
 - transfer upload serverip <SERVERIPADDR>
 - transfer upload path /
 - transfer upload filename <fileName>
 - transfer upload start

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - transfer download datatype config
 - transfer download mode tftp
 - transfer download serverip <SERVERIPADDR>
 - transfer download path /
 - transfer download filename <fileName>
 - transfer download start

Credential management

- ◆ Account
 - config mgmtuser delete <username>

- config mgmtuser add <username> <password> read-write
- config mgmtuser password <oldUser> p <TIME>
- config mgmtuser password <username> <password>
- ◆ SNMP
 - config snmp community delete <newSnmpCommunity>
 - config snmp community create <newSnmpCommunity>
 - config snmp community accessmode (ro|rw) <newSnmpCommunity>
 - config snmp community mode enable <newSnmpCommunity>
 - config snmp community delete <oldSnmpCommunity>

Device monitoring

- ◆ show sysinfo
- ◆ show inventory
- ◆ show tech-support
- ◆ show route-summary

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	Binary	SSH/TFTP, Telnet/TFTP
readable_run-config	Yes	Yes	Save Config, Reboot	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No

Attributed data	Terminal	SNMP
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Airespace 4400

- ◆ **Issue:** Airespace devices drop the connection if the current user is deleted.
Resolution: When rolling credentials on Airespace devices, the old user is not deleted but instead the password is set to a random value.

CHAPTER 9

Allot Devices

This chapter contains the following topics:

- ◆ [Allot Devices](#) 94

Allot Devices

Device Type	Linux Server
Specific Model(s)	SSG600; netxplorer 15.1.10-14
Operating System and Firmware Versions	Allot Kickstart 17.4.3 CentOS 7.1, Version AOS.SGVE.14.5.50 Build 46
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	N.A.
Discovery/Identify Methods	Terminal
Credential Management	Account
Operating System Management Protocols	Not Available
Quick Commands	Standard Unix Quick Commands. Example : Finger, ps, Ping, Traceroute, View Arp, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ Terminal
 - `etc/sysconfig/allot.conf` this file should contain the model number containing SSG
 - `Uname -a` should have the Linux keyword

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - `go config view`
 - `/etc/sysconfig/allot.conf`

Credential management

- ◆ Account
 - Account role is supported only for non root users
 - For root user only password can be changed, following are the commands used:
 - `"passwd username"`

Operating System management

- Not supported

Device monitoring

- ◆ `Go config view`
- ◆ `/etc/sysconfig/allot.conf`
- ◆ `allotype`
- ◆ `Actype`
- ◆ Basic unix commands (`df`, `hostname`, `ifconfig`, `uname` etc.)

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
<code>/etc/sysconfig/allot.conf</code>	No	Yes	NA	ASCII	TELNET, SSH
<code>Go config view</code>	No	Yes	NA	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 10

Alcatel Devices

This chapter contains the following topics:

◆ Alcatel OmniAccess	98
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◆ Alcatel Omnistack.....	106
◆ Alcatel Omniswitch	110
◆ Alcatel Service Router and Ethernet Service Switch	115
◆ Alcatel EFM	120
◆ Alcatel EFM 1531	124

Alcatel OmniAccess

Device Type	Wireless AP
Specific Model(s)	OAW-4324-US, OAW-4306GW-US, OAW-4604-US
Operating System and Firmware Versions	AOS-W 3.4, AOS-W 3.3.2.10, 3.4.2.5 (24358), 5.0.2.1
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not Available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- SysObjectID should be 1.3.6.1.4.1.6486.800.1.1.2.2.1.1.2
- ◆ Terminal
 - **show version** includes manufacturer and model information
 - **show running-config | include hostname** includes hostname information

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running
 - show startup
- ◆ Terminal/TFTP
 - copy startup-config tftp <serverIPAddress> <filename>
 - copy running-config tftp <serverIPAddress> <filename>

Configuration deploy

- ◆ Terminal
 - A command-line interface session is started in config mode.
 - The configuration is pushed line by line while checking responses for error codes.
- ◆ Terminal/TFTP
 - A command-line interface session is started in config mode.
 - copy tftp <serverIPAddress> <filename>
 - copy flash

Credential management

- ◆ Account
 - mgmt-user <username> root
- ◆ Privilege Account
 - enable secret
- ◆ SNMP
 - no snmp-server community <oldSnmpROCommunity>
 - snmp-server community <newSnmpROCommunity>

Operating System

- ◆ copy tftp:<serverLocation> <srcFilename> system partition <bootPartitionNumber>
- ◆ reload

Device monitoring

- ◆ show interface
- ◆ show version
- ◆ show running-config
- ◆ exit
- ◆ show inventory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Alcatel OmniAccess

- ◆ The configuration information obtained from a running config pull cannot be pushed back to the device. The running config push is done on a line by line basis through the command-line interface in config mode, due to there being no way to push an entire config file to running.
- ◆ Some commands are not accepted and must be removed from the configuration before pushing a full configuration. A few examples of lines that must be removed are:
 - version 3.3
 - enable secret "*****"
 - end
- ◆ Some commands are not valid and should be removed or replaced with valid commands before pushing a full configuration. A few examples of lines that must be removed or replaced are:
 - mms config 0
 - controller config 0
 - ip access-list eth validuserethacl
 - permit any
 - ip access-list session validuser
 - any any any permit
 - vpn-dialer default-dialer
 - ike authentication PRE-SHARE *****
 - user-role ap-role
 - user-role denyall
 - session-acl denyall
 - user-role cpbase
 - session-acl cpbase
 - user-role guest-logon
 - user-role guest
 - user-role stateful-dot1x
 - user-role logon
 - aaa pubcookie-authentication
 - no crypto isakmp psk-caching
 - no crypto-local isakmp permit-invalid-cert

- `crypto isakmp groupname changeme`
 - `crypto-local isakmp dpd idle-timeout 22 retry-timeout 2 retry-attempts 3`
 - `crypto-local isakmp xauth`
 - `vpdn group l2tp`
 - `ppp authentication PAP`
 - `vpdn group pptp`
 - `ppp authentication MSCHAPv2`
 - `mgmt-user admin root`
 - `9bf216ef01dc8a58fdecefd48e9482a5ef57ed326a34ffd75`
 - `country US`
- ◆ Some commands can only be pushed to the master switch and are not valid for a local switch. These commands are displayed in the configs pulled from the device, but must be removed from the configs before pushing. See the AOS-W User Guide for more information.

Alcatel OmniCore

Device Type	Switch
Specific Model(s)	OmniCore 5022, OmniCore 5010, OmniSwitch 5, OmniSwitch 9, OmniCell 5, OmniCell 9, OmniStack 1024, OmniStack 6024, OmniCore 13, OmniAccess 408, OmniAccess 512, OmniStack 8008
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains “Switch”
 - sysObjectID contains 1.3.6.1.3.3003 or 1.3.6.1.4.1.3003

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - write-config
- ◆ Terminal/TFTP
 - write-config tftp:// <SERVERIPADDR> / <filename>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp:// <SERVERIPADDR> / <configFile> <voyence.conf>
 - load-config <voyence.conf>
 - del <voyence.conf>
 - save startup.config

Credential management

- ◆ Account
 - password
- ◆ SNMP
 - ip snmp (read-community | write-community) <snmpCommunity>

Device monitoring

- ◆ write mem
- ◆ utils
- ◆ file
- ◆ exit
- ◆ del
- ◆ save

- ◆ write-config

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Alcatel Omnistack

Device Type	Switch
Specific Model(s)	6624, 6246, 8008, LS6224U
Operating System and Firmware Versions	1.0.0.47, 1.7.0.13 For LS6224U Models: 1.5.1.7
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	TFTP
Quick Commands	Ping, Traceroute, View Arp, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID contains 1.3.6.1.4.1.6486.800.1.1.2.2.4.1
- Serial Number retrieved successfully from ENTITY-MIB for row with class chassis (3)

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
- ◆ Terminal/TFTP
 - copy running-config tftp <SERVERIPADDR> <fileName>
 - copy startup-config tftp <SERVERIPADDR> <fileName>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp <SERVERIPADDR> <fileName> running-config
 - copy tftp <SERVERIPADDR> <fileName> startup-config

Credential management

- ◆ Account
 - username <username> password <password>
 - no username <oldUser>
- ◆ Privilege Account
 - enable password level <level> <newPrivPass>
- ◆ SNMP
 - snmp-server community <newString> (ro | rw) view default
 - no snmp-server community <oldString>

Operating System

- ◆ show bootvar
- ◆ boot system <name>
- ◆ copy <fromPath> <toPath>
- ◆ show version

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ show arp
- ◆ show ip interface
- ◆ enable
- ◆ disable
- ◆ config
- ◆ end
- ◆ no terminal datadump
- ◆ copy running-config startup-config
- ◆ dir

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	No	Yes
Interfaces	Yes	No
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No

Attributed data	Terminal	SNMP
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Alcatel Omnistack

- ◆ Push-to-Start using Telnet/SSH not supported.
- ◆ No volatile memory support using SNMP or command line interface
 - Blank values are displayed in the client.
- ◆ Image files are listed in the file system information. Image files cannot be selected and backed up by name due to a limitation of the device. The active image can be backed up as an upgrade option.
- ◆ Boot file upgrades are not supported.

Alcatel Omniswitch

Device Type	Switch
Specific Model(s)	6602-48, 6624, 6850, OS6850-P48, 7700, 9700, OS9616/OS9716-CFM2, Alcatel-Lucent OS6450-P10, Alcatel-Lucent OS6450-P24, Alcatel-Lucent OS6450-P48, Alcatel-Lucent OS6900-X72
Operating System and Firmware Versions	Operating systems for 6602-48 models: 5.1.6.243.R02 GA, 5.1.6.393.R01 GA Operating systems for 6850 models: 6.3.1.999.R01 Operating systems for 7700 and 9700 models: 6.3.1.1023.R01 Operating systems for other models: 5.1.5.83.R04, 6.3.4.378.R01 GA, 6.4.1.394.S01 GA
Communication Protocols	TELNET, SSH, TELNET/FTP, SSH/FTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP, SCP
Quick Commands	Ping, Traceroute, View Routes, View Arp, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID value contains 1.3.6.1.4.1.6486.800.1.1.2.1
 - Serial number is found in row (chassis class) of entPhysicalTable in ENTITY-MIB
- ◆ Terminal
 - sysObjectID is present in **show system output**
 - Value contains 1.3.6.1.4.1.6486.800.1.1.2.1

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration snapshot
- ◆ Terminal/FTP
 - Configuration is pulled using FTP

Configuration deploy

- ◆ Terminal
 - Device commands are issued interactively from the stored configuration (configlet only); each command is sent line-by-line as long as the device returns to a prompt afterwards. The results are scanned for warnings and errors.
- ◆ Terminal/FTP
 - Configuration is pushed using FTP

Credential management

- ◆ Account
 - show user password-size
 - password
 - user <username> password <password> <cmdFrag>
 - no user <oldUser>
 - snmp community map <snmpCred> user <username>
- ◆ SNMP
 - no snmp community map <oldCommString>
 - snmp community map <newCommString> user <username> enable

Operating System

- ◆ ls
- ◆ delete
- ◆ ftp
- ◆ binary
- ◆ hash
- ◆ lcd
- ◆ cd
- ◆ show system
- ◆ reload working no rollback-timeout

Device monitoring

- ◆ show system
- ◆ show running-directory
- ◆ no more
- ◆ ping
- ◆ reload working no rollback-timeout
- ◆ show arp
- ◆ show chassis
- ◆ show cmm
- ◆ show configuration snapshot
- ◆ show hardware info
- ◆ show health
- ◆ show interfaces
- ◆ show ip interface
- ◆ show ip protocols
- ◆ show ip route
- ◆ show module long
- ◆ show running-directory
- ◆ show system
- ◆ traceroute
- ◆ copy running-config working
- ◆ copy working certified [flash-synchro]
- ◆ copy certffied working
- ◆ free space

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy Running to Working	ASCII	TELNET, SSH
working	Yes	Yes	Copy Working to Certified, Reboot from Working	ASCII	TELNET/FTP, SSH/FTP
certified	Yes	Yes	Copy Certified to Working, Reboot	ASCII	TELNET/FTP, SSH/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Alcatel Omniswitch

- ◆ Full configuration pushes for the working and certified files require FTP to be enabled. Configlets and the running configuration use terminal mode only.
- ◆ Cold booting the device will use the configuration stored in `/flash/certified/boot.cfg` unless it is identical to `/flash/working/boot.cfg`. If these files differ, the **reload working no-rollback timeout** command must be issued or configuration changes will fail. This can be done using cut-through.
- ◆ The Reboot from Working post-operation on configuration pushes does not warn the user about service interruption.
- ◆ Post operations on working and certified configurations may potentially change the operating system version of the device if it is rebooted afterwards. This is due to the use of “copy working certified” and “copy certified working” commands for these operations. It is the user’s responsibility to ensure that configuration content is compatible if the software images in the working and certified directories differ.
- ◆ SNMP credential rolls are not written to the certified (startup) configuration, which is a device limitation in the copy command syntax (as detailed in the previous bullet). The commit operation used after account and SNMP rolls uses “copy running working” to avoid copying software images as part of SNMP credential changes.
- ◆ The model name is reported differently through SNMP than through terminal: SNMP uses the chassis entry of ENTITY-MIB, while the terminal query uses the “Model Name:” field in the “show system” response, which corresponds to the CMM model.
- ◆ No restrictions are enforced on password length.

Alcatel Service Router and Ethernet Service Switch

Device Type	Router
Specific Model(s)	7450 ESS-1, 7450 ESS-6, 7450 ESS-7, 7450 ESS-12, 7750 SR-1, 7750 SR-12, 7750 SR-7, 7705 SAR-8, 7705 SAR-F, 7210 SAS-M-1, 7705 SAR-H
Operating System and Firmware Versions	SR OS Release 5 (B-5.0.R8, C-5.0.R8), TiMOS-6.1.R9 Untested: 7.0.R9
Communication Protocols	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP, TFTP
Quick Commands	Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - Model found via SNMP should be found in models file.
 - Get host name
 - Get the interfaces from standard Interface MIB table
- ◆ Terminal
 - Model found from **show sys info** should be found in models file.
 - Get host name from **show sys info**
 - Get the interfaces from **show router interface**

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - The admin display-config command is issued in the command line interface, and the file captured directly from the command line interface output.
- ◆ Terminal/FTP
 - The startup-config (config.cfg) or boot-options-file (bof.cg) is copied using FTP.
- ◆ Terminal/SCP
 - The startup-config (config.cfg) or boot-options-file (bof.cg) is copied using SCP

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/FTP
 - The startup-config (config.cfg) or boot-options-file (bof.cg) is copied to the device using FTP.
- ◆ Terminal/SCP
 - The startup-config (config.cfg) or boot-options-file (bof.cg) is copied to the device using SCP

Credential management

- ◆ Account
 - system security no user <oldUser>
 - system security user <username>
 - password
 - access console ftp snmp

- console member administrative
- ◆ SNMP
 - system security snmp no community <oldSnmpCommunity>
 - system security snmp community <newSnmpCommunity> (r | rw) version both

Operating System

- ◆ file dir <filepath>
- ◆ file md <dirName>
- ◆ file copy <fromPath> <toPath>
- ◆ file delete <filename>
- ◆ bof primary-image <newImgPath>
- ◆ bof save
- ◆ admin reboot upgrade

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ environment no more
- ◆ environment more
- ◆ exit all
- ◆ configure
- ◆ admin save
- ◆ exec
- ◆ show system memory-pools
- ◆ show port
- ◆ show system info
- ◆ show chassis
- ◆ show router interface

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running-config	Yes	Yes	Save	ASCII	TELNET, SSH
startup-config	Yes	Yes	Reboot, Load	ASCII	TELNET/FTP, SSH/FTP, SSH/SCP
boot-options	Yes	Yes	Reboot, Load	ASCII	TELNET/FTP, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Alcatel Service Router and Ethernet Service Switch

- ◆ The serial number can *not* be obtained using SNMP. A serial number of *Unknown* will be displayed if the correct account credentials are not supplied.
- ◆ A user *cannot* delete their own account due to device limitations.
- ◆ Any attempt to roll credentials to a new user account will leave the existing account in place. The account must be deleted using a configlet or cut-through to the device. Attempts to roll user names may result in a warning with the message: *CLI Users cannot delete themselves. Old user name must be removed manually.*
- ◆ OS upgrade:
 - Standard upgrade is supported
 - In-Service upgrade and AA Signature upgrades are not supported.
 - Service Router upgrade capability is unverified.
 - The operating system repository must use a path for the images, since the files themselves do not have versioning information in the names. The path must be only one level deep. Support for creating nested directories on the supported devices has not been implemented.
 - It is advisable that the operating system version be used for the directory in which the images reside, since this is used for the device image directory and the *primary-image* boot option setting.
 - If only one set of images is present in the repository, and no path is specified, the name *SW_UPGRADE* will be used.
 - The upgrade fails in the scheduler if the following conditions are not present:
 - The *boot.ldr* file must be part of the selected images.
 - For a one-slot chassis, the *both.tim* file must be included along with the boot loader.
 - For a redundant SFM/CPM device, both CPM and IOM image files must be included along with the boot loader.

Alcatel EFM

Device Type	Switch
Specific Model(s)	Alcatel EFM
Operating System and Firmware Versions	1.7.456
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic,Route,ARP, Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID value contains .8550.1.1.1.3
- ◆ Terminal
 - Output of “show system” contains model name and serial number.
 - Output of “show system” contains hostname of the device.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - Create user <username> privilege <level>
 - delete user <oldUser>
- ◆ SNMP
 - config snmp community<oldSNMPcommunity> communityString <newSnmpCommunity>
 - config snmp community <newSnmpCommunity> privilege readOnly

Operating System Management

- ◆ dir swImage *
- ◆ clear swImage < filename>
- ◆ show memory
- ◆ copy swImage protocol ftp server <upgradeLoc> imageFile <imageFilename> loginId <upgradeUser>

Device monitoring

- ◆ show system
- ◆ ping
- ◆ traceroute
- ◆ show running-config

- ◆ show startup-config
- ◆ show arp
- ◆ show route
- ◆ saveRunning
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running-config	Yes	Yes	Copy to Startup	TEXT	TELNET, SSH
startup-config	No	Yes	Reboot, Load	TEXT	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

Alcatel EFM does not support PUSH operation to push existing configurations changes through Config mode.

Alcatel EFM 1531

Device Type	Switch
Specific Model(s)	1531 CLAS, 1532 CLAS
Operating System and Firmware Versions	1.7.447
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID value contains .8550.1.1.1.5
- ◆ Terminal
 - Output of “show system” contains model name and serial number.
 - Output of “show system” contains hostname of the device.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - Create user <username> privilege <level>
 - delete user <oldUser>
- ◆ SNMP
 - config snmp community<oldSNMPcommunity> communityString <newSnmCommunity>
 - config snmp community <newSnmCommunity> privilege readOnly

Device monitoring

- ◆ show system
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ show arp
- ◆ saveRunning
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running-config	Yes	Yes	Copy to Startup	TEXT	TELNET, SSH
startup-config	Yes	Yes	Reboot	TEXT	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 11

Alvarion Devices

This chapter contains the following topic:

- ◆ [Alvarion Breeze AP](#)..... 128

Alvarion Breeze AP

Device Type	Wireless AP
Specific Model(s)	BreezeACCESS SU-A/E-BD
Operating System and Firmware Versions	4.5.17
Communication Protocols	TELNET
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account
Operating System Management Protocols	Not available
Quick Commands	Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysName OID
- sysServices: bit 3 set
- brzAccUnitType (from Breeze-Access-MIB)

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Selecting menu option (Main > Info > Advanced Configuration)

Configuration deploy

- ◆ Terminal
 - Not Supported

Credential management

- ◆ Account
 - Selecting menu option (2->4->3)

Device monitoring

- ◆ ping
- ◆ traceroute

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	ASCII	TELNET

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes

Attributed data	Terminal	SNMP
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Alvarion Wireless Access Point

- ◆ Incorrect password specification leaves the login screen in an unusable state. If this occurs, the user must manually login to the device and clear the prompt.
- ◆ SNMP credentials are mapped to user accounts; the corresponding read/write SNMP community change must be saved (not pushed) in the UI prior to initiating the corresponding admin credential roll.
- ◆ Device settings are distributed among several menus. The driver displays their contents, but the results cannot be pushed.

CHAPTER 12

APC Devices

This chapter contains the following topic:

- ◆ [APC Power Strips.....](#) 132

APC Power Strips

Device Type	Power Strips
Specific Model(s)	AP7866A, AP7941
Operating System and Firmware Versions	V3.7.3
Communication Protocols	SSH/Telnet, SNMP
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not available
Quick Commands	Not available

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	No
Quick Commands	No
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains . 1.3.6.1.4.1.318.1.3.4.5
- Chassis serial Number .1.3.6.1.4.1.318.1.1.4.1.5.0
- ◆ Terminal
 - For Model and chassis serial number through term, go to **System Menu** and then move to **About System Menu**.
 - Host name is present when first logged in to the device.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ FTP
 - Running Configuration
 - Pull running config via ftp . Credentials of ftp should be same as user creds for device.
- ◆ TFTP
 - Using CLI, tftp config can be pulled.

Configuration deploy

- ◆ FTP
 - Push running config through FTP. Credentials of FTP should be same as user credentials for device.

Credential management

- ◆ Account
 - Device has two users – admin and local. Account credential roll will always change the local user account details as admin credentials cannot be rolled into.
 1. Go to **System Menu** > **User Manager Menu** > **Device Manager User**.
 2. Type the admin password, change the device manager user details and then commit.
- ◆ SNMP Credential
 - In the menu, go to **Network** > **SNMP** > **SNMP V1** specific settings. Then change the **SNMP V1 Access control** status to **Committed**.

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	No	TEXT	SSH/FTP,Telnet/FTP,SSH/TFTP(Pull),Telnet/TFTP(Pull).

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Account credential roll will always change the local user account details as admin creds cannot be rolled into. So for these devices, rolling of account credential will be from admin to a new device user credential. Implicitly, this will roll the old device user to new device user. These devices always require admin credentials for rolling device credentials.
- ◆ TFTP has not been tested.

CHAPTER 13

Arista Devices

This chapter contains the following topic:

- ◆ [Arista 7000.....](#) 136

Arista 7000

Device Type	Switch
Specific Model(s)	DCS-7050Q-16-R, DCS-7050T-36-F, DCS-7050T-52-F, DCS-7048T-A-R, DCS-7050T-64-R, DCS-7050S-52-F, DCS-7050S-64-R, DCS-7150S-52-CL, DCS-7150S-64-CL, DCS-7150S-64-CL-F
Operating System and Firmware Versions	4.9.5, 4.10.2, 4.11.3, 4.12.0
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Trace route, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .30065.1.3011, .1.3.6.1.4.1.30065.1.3011.7050.427.52, .1.3.6.1.4.1.30065.1.3011.7048.427.3648, .1.3.6.1.4.1.30065.1.3011.7050.427.64, .1.3.6.1.4.1.30065.1.3011.7050.3282.52, .1.3.6.1.4.1.30065.1.3011.7050.3282.64, .1.3.6.1.4.1.30065.1.3011.7150.3282.52.2745, .1.3.6.1.4.1.30065.1.3011.7050.2512.16
- ◆ Terminal:
 - Output of "show version" contains model name and serial number.
 - Output of "show version" contains hostname of the device.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show startup-config
 - show running-config
- ◆ Terminal/TFTP
 - copy startup-config tftp <serverIPAddress> <filename>
 - copy running-config tftp <serverIPAddress> <filename>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - username <user> privilege 15 secret <password>
 - no username <user> privilege 15 secret <password>
- ◆ SNMP
 - snmp-server community <newCommunity> ro
 - snmp-server community <newCommunity> rw
 - no snmp-server community <oldCommunity>

Device monitoring

- ◆ show version
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ copy running-config startup-config
- ◆ reload now

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	TEXT	SSH, Telnet
startup	Yes	Yes	Reboot	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 14

Aruba Devices

This chapter contains the following topic:

- ◆ [Aruba Wireless Switch](#) 142

Aruba Wireless Switch

Device Type	Wireless AP
Specific Model(s)	a52, a50, a800, a2400, a5000, a6000, a620, a650, a3200, a3400, a7030, a105, a115, a7210, a7220, a7005, a7010, a335
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not Available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.14823 or 1.3.6.1.4.1.6486.800.1.1.2.2.2.1.1.4

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show startup
 - show run
- ◆ Terminal/TFTP
 - copy startup-config tftp <serverIPAddress> <filename>
 - copy running-config tftp <serverIPAddress> <filename>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp <serverIPAddress> <filename> startup-config
 - copy tftp <serverIPAddress> <filename> running-config

Credential management

- ◆ Account
 - mgmt-user <username> root
- ◆ Privilege Account
 - enable secret
- ◆ SNMP
 - no snmp-server community <oldSnmpROCommunity>
 - snmp-server community <newSnmpROCommunity>

Device monitoring

- ◆ no paging
- ◆ exit
- ◆ write mem
- ◆ show memory
- ◆ show version

- ◆ show inventory
- ◆ show storage

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 15

AudioCodes Devices

This chapter contains the following topics:

- ◆ [AudioCodes MediaPack](#) 146

AudioCodes MediaPack

Device Type	Content Cache
Specific Model(s)	MP-118FXS
Operating System and Firmware Versions	5.6
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, View Routes, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID contains 1.3.6.1.4.1.5003.8.1.1
- ◆ Terminal
 - Model found from `/conf/cf get` should be found in the Models file

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - `/conf/cf get` command is issued in the command-line interface.
 - The file is captured directly from the command-line interface output.

Configuration deploy

- ◆ Terminal/TFTP
 - Full Configuration
 - A command-line interface session is started and the command `/conf/cf set` is entered.
 - The system waits for the Type a . on an empty line prompt.
 - The config is sent to the command-line interface session all at once followed by a period on an empty line.
 - The system waits for the INI file replaced message.
 - By default, following a successful push, the command `/conf/sar` is sent to the device to save the changes and reload the system. This can be disabled when the job is scheduled.
 - Configlet
 - A command-line interface session is started. Each line of the configlet is sent, one by one, preceded by the text `conf/scp`.
 - The responses are monitored for any error messages, and the job is stopped if an error is encountered.
 - Following a successful push, the command `/conf/sar` is sent to the device to save the changes and reload the system. This default setting can be disabled when the job is scheduled

Credential management

- ◆ Account
 - `/conf/chun " <username>`
 - `/conf/chpw <oldPass> <newPass>`
- ◆ SNMP

- /conf/scp (SNMPREADWRITECOMMUNITYSTRING_1 | SNMPREADONLYCOMMUNITYSTRING_1) <newSnmpCommunity>

Device monitoring

- ◆ /conf/cf get
- ◆ show ip conf
- ◆ show ip route
- ◆ /conf/cf get
- ◆ ping
- ◆ show arp
- ◆ traceroute
- ◆ show ip interface detail 5

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Save and Reboot	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	No
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

AudioCodes MediaPack

- ◆ Full configs MUST use the INI file format.
- ◆ Configlets may be in either INI file format (parameter=value) or SetConfigParam format (parameter value). Do not include the `/conf/scp` command in configlet lines.
- ◆ If credential roll is used to add or change community strings, the new string will always be stored in string one.

CHAPTER 16

Avocent Devices

This chapter contains the following topics:

- ◆ [Avocent ACS](#) 152

Avocent ACS

Device Type	Switch
Specific Model(s)	ACS6032, Cyclades ACS 6000
Operating System and Firmware Versions	3.3.0.10
Communication Protocols	TELNET, SSH,SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	Terminal, SNMP
Credential Management	Account, Privilege Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectId contains 1.3.6.1.4.1.10418
- ◆ Terminal
 - show system/information/ command output should have "type:"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - list_configuration

Device monitoring

- ◆ show system/usage/memory/
- ◆ show system/usage/flash_usage/
- ◆ show system/information/
- ◆ show network/settings/
- ◆ show network/ipv4_static_routes/

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 17

Bigswitch Devices

This chapter contains the following topics:

- ◆ [Bigswitch Controller.....](#) 156
- ◆ [Bigswitch Switch.....](#) 159

Bigswitch Controller

Device Type	Switch
Specific Model(s)	BIGTAPCONTROLLER
Operating System and Firmware Versions	Big Tap Controller 5.0.0(0006-b.bsc.bt-5.0.0)
Communication Protocols	TELNET, SSH,TELNET/FTP,SSH/FTP,SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP/Term
Credential Management	Not Available
Operating System Management Protocols	Not available
Quick Commands	Ping, Interfaces ,Routes, Traceroute,Arp

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectId contains 1.3.6.1.4.1.37538
- sysDescr contains "Big Tap Controller" or "Big Switch Controller"
- ◆ Terminal
 - show controller-node includes hostname
 - show version includes model and OS version
 - show environment includes serial number of device

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
- ◆ Terminal/TFTP
 - copy running-config tftp://\$SERVERIPADDRESS\$/\$LOCALFILE\$"
 - copy startup-config tftp://\$SERVERIPADDRESS\$/\$LOCALFILE\$"

Configuration deploys

- ◆ Terminal/FTP
 - copy ftp://\$SERVERIPADDR\$/\$REMOTEFILE\$ running-config
 - copy ftp://\$SERVERIPADDR\$/\$REMOTEFILE\$ startup-config
 - copy running-config startup-config

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ show interfaces

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	SSH, SSH/FTP, TELNET, TELNET/FTP
startup	Yes	Yes	copyToStart	ASCII	SSH, SSH/FTP, TELNET, TELNET/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Bigswitch Switch

Device Type	Switch
Specific Model(s)	AS5710-54X
Operating System and Firmware Versions	Switch Light OS SWL-BT-5.0.0
Communication Protocols	SSH, SSH/TFTP, SSH/FTP,SSH/SCP,TELNET, TELNET/TFTP,TELNET/FTP,SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP/Term
Credential Management	SNMP v1/v2,TERMINAL
Operating System Management Protocols	Not Available
Quick Commands	Ping, Interfaces ,Routes,Traceroute,Arp

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.37538
 - sysDescr contains "Switch Light OS"
- ◆ Terminal
 - show tech-support includes hostname
 - show version includes model, OS version and serial number

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
- ◆ Terminal/TFTP
 - copy running-config tftp://\$SERVERIPADDRESS\$/\$LOCALFILE\$"
 - copy startup-config tftp://\$SERVERIPADDRESS\$/\$LOCALFILE\$"

Configuration deploy

- ◆ Terminal/FTP
 - copy ftp://\$SERVERIPADDR\$/\$REMOTEFILE\$ running-config
 - copy ftp://\$SERVERIPADDR\$/\$REMOTEFILE\$ startup-config
 - copy running-config startup-config

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ show interfaces

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	SSH, SSH/TFTP, TELNET, TELNET/TFTP, FTP
startup	Yes	Yes	copyToStart	ASCII	SSH, SSH/TFTP, TELNET, TELNET/TFTP, FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 18

Blade Networks Devices

This chapter contains the following topic:

- ◆ [Blade Networks G8000 Switch](#) 164

Blade Networks G8000 Switch

Device Type	Switch
Specific Model(s)	G8000
Operating System and Firmware Versions	5.1.1.0
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, View Routes, View Interfaces, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr value contains “RackSwitch G8000” (case-insensitive)
- sysObjectID contains 1.3.6.1.4.1.26543.1.7.1
- ◆ Terminal
 - Model found from **show sys-info** should be found in the Models file

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - The command `show (running|active|backup)-config` is issued in the command-line interface and the output is captured.
- ◆ Terminal/TFTP
 - The command `copy (running|active|backup)-config tftp://<serverip>/<filename>` is issued in the command-line interface to transfer the file to the device server.

Configuration deploy

- ◆ Terminal
 - A command-line interface session is started and brought to configuration mode.
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - The command `copy tftp://<serverip>/<filename> (running|active|backup)-config` is issued in the command-line interface, to transfer the config from the device server directly to the selected configuration.
 - `copy running-config startup-config`

Credential management

- ◆ Account
 - `access user (user-password | operator-password | administrator-password)`
 - `no access user <oldUserNum> enable`
 - `access user <enableUser> name <username>`
 - `access user <enableUser> level admin`
 - `access user <enableUser> password <password>`
 - `access user <enableUser> enable`
 - `no access user <disableUser> enable`
- ◆ SNMP
 - `snmp-server (write-community | read-community) <newSnmpCommunity>`

Device monitoring

- ◆ terminal length <value>
- ◆ enable
- ◆ disable
- ◆ configure terminal
- ◆ show snmp
- ◆ show sys-info
- ◆ show ip route
- ◆ show system memory
- ◆ show boot
- ◆ console-log
- ◆ ping
- ◆ traceroute
- ◆ show interface info
- ◆ show interface link
- ◆ show interface portchan info
- ◆ show interface portchan link

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
active	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
backup	Yes	Yes	N.A	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Blade Networks G8000 Switch

- ◆ When sending a config line by line using Telnet or SSH, sending an *ip-mgmt interface address* command causes the immediate dropping of the terminal session. Therefore ,the driver will intentionally filter out any configuration line that starts with *ip-mgmt interface address* when sending in line by line mode.
- ◆ The Blade Networks G8000 Switch only supports a total of ten user accounts. When rolling usernames and passwords, if the new user does not already exist, the driver will attempt to re-use the old user account if it exists. If the old user account does not exist, the driver will look for one available user account out of the possible ten. If there are no available user accounts, no changes will be made and the job will fail.
- ◆ The Blade Networks G8000 Switch has console logging enabled by default and will send console messages during the login procedure, which is not a best practice. It is advisable to permanently turn off console logging on any Blade Networks G8000 Switches that will be managed by this application. During testing of this driver, the

driver always managed to login despite these messages, but the messages slow down the login procedure dramatically. For best performance, turn off console logging permanently using the following commands:

```
configure terminal
no logging console
end
save running-config startup-config
```


CHAPTER 19

BlueCoat Devices

This chapter contains the following topic:

- ◆ BlueCoat SG..... 170
- ◆ BlueCoat PacketShaper 174

BlueCoat SG

Device Type	Content Cache
Specific Model(s)	SG 100, SG 1000, SG 500, SG 2000, SG 5000, SG 500A, SG 3000, SG 5X5, SG 110, SG 600, SG 6000, SG 610, SG 6X5, SG 3000S, SG 5000S, SG 7X5, SG 710, SG 7000, SG 611, SG 800, SG 400, SG 8000, SG 200, SG 810, SG 210, SG 510, SG 8100
Operating System and Firmware Versions	6.0.0
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, View Arp, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectId contains 1.3.6.1.4.1.3417.1.1
 - sysDesc contains “Blue Coat SG”
 - Map the sysObjectId to model in BlueCoatSGModels.xml

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration expanded noprompts
- ◆ Terminal/TFTP
 - archive-configuration protocol tftp
 - archive-configuration host <SERVERIPADDR>
 - archive-configuration path
 - archive-configuration filename-prefix <fileName>
 - upload configuration

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - configure network tftp <SERVERIPADDR> <fileName>

Credential management

- ◆ Account
 - security user <username>
 - security password <password>
- ◆ Privilege Account
 - security enable-password <newPrivPass>
- ◆ SNMP
 - snmp
 - enable
 - read-community <newString>

- write-community <newString>

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ disable
- ◆ configure terminal
- ◆ exit
- ◆ show interface all
- ◆ show ip-route-table
- ◆ show arp-table

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

BlueCoat SG

- ◆ No volatile or non-volatile storage information is available using SNMP for this device class.
- ◆ Account password rolls are performed on a device-wide account. Content is the responsibility of the user.
- ◆ Configuration pushes using terminal protocols (Telnet/SSH) may experience timeout problems when content includes nested inline commands. The first occurrence of **end-*-inline** causes the driver to expect a command prompt. This does not occur when TFTP is used for configuration management.

For example:

```
inline exceptions end-383770416-inline
additional content...
    inline exceptions end-383770416-inline
        additional content...
    )
end-383770416-inline
additional content...
)
end-383770416-inline
```

BlueCoat PacketShaper

Device Type	PacketShaper
Specific Model(s)	12000/ISP, S400,S200
Operating System and Firmware Versions	v9.2.11g1
Communication Protocols	TELNET, SSH, SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP,SSH
Credential Management	SNMP v1/v2, Terminal
Operating System Management Protocols	Not available
Quick Commands	Ping, Arp, Interfaces, Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectId contains 1.3.6.1.4.1.2334.1.1

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
- ◆ setup capture complete config.cmd
- ◆ cat cmd/config.cmd

Device monitoring

- ◆ ping
- ◆ show interface status

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 20

Brocade Devices

This chapter contains the following topics:

◆ Brocade 7500	178
◆ Brocade McData	181
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◆ Brocade FCX.....	189
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◆ Brocade VDX.....	196
◆ Brocade Turbolron	199

Brocade 7500

Device Type	Switch
Specific Model(s)	7500
Operating System and Firmware Versions	6.0.0
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectId contains 1.3.6.1.4.1.1588.2.1.1.1

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - configShow

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.

Credential management

- ◆ Account
 - passwd
 - passwd admin
 - userConfig --add <username> -r Admin -h 0 -a 0-255
 - userConfig --delete <oldUser>
- ◆ SNMP
 - snmpConfig --show snmpv1
 - snmpConfig --set snmpv1

Device monitoring

- ◆ switchShow
- ◆ configShow

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Brocade 7500 Router

- ◆ Configurations *cannot* be pushed in this version of the driver. The configuration displayed in response to *showConfig* from the command line interface does *not* have the same form as the commands used to configure the device.
- ◆ Although configuration files can be pushed and pulled by the device acting as a client using FTP/SCP, the necessary credential and server support is not implemented.
- ◆ No volatile or non-volatile storage information is available using SNMP for this device class.

Brocade McData

Device Type	Switch
Specific Model(s)	ED-10000M, 010000, ED-6140, ED-6064, SAN140M, 006140, 006064, 004500
Operating System and Firmware Versions	9.6.1.5, 9.2.0.8, 09.02.01, 05.01.00
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Not Available
Operating System Management Protocols	Not Available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.289.2.1.1.2 or 1.3.6.1.4.1.289.2.2.1.2.2
 - sysDescr contains “Fibre Channel”
- ◆ Terminal
 - sysDescr and sysObjectID is found via terminal
 - sysObjectID contains 1.3.6.1.4.1.289.2.1.1.2 or 1.3.6.1.4.1.289.2.2.1.2.2
 - sysDescr contains “Fibre Channel”

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - This device class uses a set of configurable commands in the [Product Home]/package/pkgxml/McData/McDataDeviceCommands.xml file for displaying various settings in a user-defined order.
 - The comments in the above file include directions on changing this order, adding future model command support as software versions, and new supported products in the family.

Configuration deploy

- ◆ Terminal
 - Termllet push is supported

Credential management

- ◆ Not supported

Device monitoring

- ◆ show ip Ethernet
- ◆ show system
- ◆ show switch
- ◆ show opensysm config
- ◆ show port config
- ◆ show snmp config
- ◆ show port status
- ◆ show port info
- ◆ show port technology
- ◆ show loginserver

- ◆ show features
- ◆ show security portbinding
- ◆ show security switchbinding
- ◆ show security fabricbinding
- ◆ show opentrunking config
- ◆ show thresholdalerts alerts
- ◆ show fabric topology
- ◆ show security switchacl
- ◆ show fencing policies
- ◆ show activealias
- ◆ system show
- ◆ show all
- ◆ system ip
- ◆ show frus
- ◆ system fru

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No

Attributed data	Terminal	SNMP
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases.

Brocade McData

- ◆ Memory and flash are not available from SNMP or command line interface access.
- ◆ The device **type number** is used in place of the model for both SNMP and Terminal access, as some models only report "-" for the model number in the results of **show system**.
- ◆ Some hardware detail lines show partial part numbers in the command line interface which are reported verbatim.
- ◆ A test using 10000 devices and running OS version 9.2.0.8 has exhibited the following behavior:
 - The device does not appear to support **system show** at operator level access. In this case, no configuration will be shown.
 - IP-related details do not appear to be available from SNMP.

Brocade MLX

Device Type	Router
Specific Model(s)	NetIronMLX
Operating System and Firmware Versions	5.0.0T165
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not available
Quick Commands	Ping

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr value contains “MLX”
- sysObjectID contains 1.3.6.1.4.1.1991
- ◆ Terminal
 - **show version** should contain "Brocade Communications" and “MLX”

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration
 - show run
- ◆ Terminal/TFTP
 - copy start tftp <SERVERIPADDR> <fileName>
 - copy run tftp <SERVERIPADDR> <fileName>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp running-config <SERVERIPADDR> <fileName>
 - copy tftp startup-config <SERVERIPADDR> <fileName>

Credential management

- ◆ Account
 - show run
 - enable telnet password <password>
 - no aaa authentication login default
 - username <username> password <password>
 - enable telnet authentication
 - no username <oldUser>
 - aaa authentication login default local
- ◆ Privilege Account
 - show run
 - enable super-user-password <newPrivPass>
 - no enable super-user-password <newPrivPass>

- ◆ SNMP
 - snmp-server community <newCommunity> (RO | RW)
 - no snmp-server community <oldCommunity> (RO | RW)

Device Monitoring

- ◆ write mem
- ◆ enable
- ◆ disable
- ◆ exit
- ◆ terminal length 0
- ◆ show version
- ◆ show module
- ◆ show chassis
- ◆ show snmp server
- ◆ show memory
- ◆ show flash
- ◆ ping
- ◆ show ip route
- ◆ show arp
- ◆ show interfaces
- ◆ reload
- ◆ show run
- ◆ skip-page

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases.

- ◆ During push, the process should not be interrupted as the device may be permanently damaged.
- ◆ In SNMP credential operation, the RO/RW credential validation may fail due to a timing issue; this cannot be addressed at driver level.
- ◆ The password credential roll is dependent on the device configuration. If a username is supplied in an account credential roll job, the local account is changed, otherwise the line credential is changed.
- ◆ In non-volatile memory, only total memory is reported.
- ◆ If there is no data in a specific OID, then reading of this object will report an error.
- ◆ Configuration pushes may fail due to the absence of appropriate exit commands from configuration sub-modes in the content, which is a device limitation. It is the user's responsibility to edit the configuration to include these before scheduling the job.

Brocade FCX

Device Type	Switch
Specific Model(s)	FCX, FCX 648
Operating System and Firmware Versions	07.0.01bT7f1
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	NA
Quick Commands	Ping

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr value contains “FCX”
- sysObjectID contains 1.3.6.1.4.1.1991
- ◆ Terminal
 - **show version** should contain "Brocade Communications" and “FCX”

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration
 - show run
- ◆ Terminal/TFTP
 - copy start tftp <SERVERIPADDR> <fileName>
 - copy run tftp <SERVERIPADDR> <fileName>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - copy tftp running-config <SERVERIPADDR> <fileName>
 - copy tftp startup-config <SERVERIPADDR> <fileName>

Credential management

- ◆ Account
 - show run
 - enable telnet password <password>
 - no aaa authentication login default
 - username <username> password <password>
 - enable telnet authentication
 - no username <oldUser>
 - aaa authentication login default local
- ◆ Privilege Account
 - show run
 - enable super-user-password <newPrivPass>
 - no enable super-user-password <newPrivPass>

- ◆ SNMP
 - snmp-server community <newCommunity> (RO | RW)
 - no snmp-server community <oldCommunity> (RO | RW)

Device monitoring

- ◆ write mem
- ◆ enable
- ◆ disable
- ◆ exit
- ◆ terminal length 0
- ◆ show version
- ◆ show module
- ◆ show chassis
- ◆ show snmp server
- ◆ show memory
- ◆ show flash
- ◆ ping
- ◆ show ip route
- ◆ show arp
- ◆ show interfaces
- ◆ reload
- ◆ show run
- ◆ skip-page

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ During push, the process should not be interrupted as the device may be permanently damaged.
- ◆ In SNMP credential operation, the RO/RW credential validation may fail due to a timing issue; this cannot be addressed at driver level.
- ◆ The password credential roll is dependent on the device configuration.
- ◆ In non-volatile memory, only total memory is reported.
- ◆ If there is no data in a specific OID, then reading of this object will report an error.
- ◆ Based on the configuration data and the configuration level at which the command is issued, the device may signal an error while trying to push configuration to the device. On such an occurrence, the driver detects the failure and aborts pushing of configuration any further.

Brocade FOS

Device Type	Switch
Specific Model(s)	8000, BROCADE VA-40FC, BROCADE 200E
Operating System and Firmware Versions	v7.0.1, v6.2.1_vfc, v6.2.2c
Communication Protocols	SSH/Telnet, TELNET/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, Routes, Interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .1588.2.1.1
- ◆ Terminal
 - Output of "switchShow" contains model name and serial number.
 - Output of "wnn -sn" contains hostname of the device.
 - Output of "version" contains the software version.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - configShow -all
- ◆ SCP
 - configUpload -all -p scp <SERVERIPADDR>,<USER>,<LOCALFILE>
- ◆ FTP
 - configUpload -all -p ftp <SERVERIPADDR>,<USER>,<LOCALFILE>,<PASSWORD>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
- ◆ SCP
 - configDownload -all -p scp <SERVERIPADDR>,<USER>,<REMOTEFILE>
- ◆ FTP
 - configDownload -all -p ftp <SERVERIPADDR>,<USER>,<REMOTEFILE>,<PASSWORD>

Credential management

- ◆ Account
 - userConfig --add <user> -r admin <password>
 - userConfig --delete <user>

Device monitoring

- ◆ switchShow
- ◆ version
- ◆ wnn -sn
- ◆ ping
- ◆ traceroute

- ◆ configShow -all
- ◆ interfaceShow
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	No	TEXT	SSH, Telnet,FTP,SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Brocade VDX

Device Type	Switch
Specific Model(s)	Brocade VDX Switch(switchType 96),BROCADEVDX8770-4,BROCADEVDX8770-8,BROCADEVDX6740,BROCADEVDX6740T,BROCADEVDX6940,BROCADEVDX6940144S
Operating System and Firmware Versions	VDX Switch Model -NOS 3.0.0b 8770,6740,6940 Models - Version 6.0.2b
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, Interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .1588.2.2.1.1.1.3
- ◆ Terminal
 - Output of "show chassis" contains model name and serial number.
 - Output of "show system" contains hostname of the device.
 - Output of "show version" contains the software version.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - username <user> password <password> enable true role admin
 - no username <user>
- ◆ SNMP
 - snmp-server community <newCommunity> ro
 - snmp-server community <newCommunity> rw
 - no snmp-server community <oldCommunity>

Device monitoring

- ◆ Show system
- ◆ Show version
- ◆ Show chassis
- ◆ ping
- ◆ traceroute
- ◆ show running-config

- ◆ show startup-config
- ◆ show interface
- ◆ show arp
- ◆ copy running-config startup-config
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	TEXT	SSH, Telnet
startup	Yes	Yes	Reboot	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Brocade Turbolron

Device Type	Switch
Specific Model(s)	Stackable Turbolron-X24, FCX 648
Operating System and Firmware Versions	04.1.00c, 06.0.00T7f1
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, Interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .1991.1.3.53.1.1 or 1.3.54.2.1.1.1
- ◆ Terminal
 - Output of "show version" contains model name, serial number, version and hostname of the device.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show configuration

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - username <user> privilege 0 password <password> +username <user> enable
 - no username <user>
 - username <user> password <password>
- ◆ SNMP
 - snmp-server community <newCommunity> ro
 - snmp-server community <newCommunity> rw
 - no snmp-server community <oldCommunity> ro
 - no snmp-server community <oldCommunity> rw

Device monitoring

- ◆ Show version
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show configuration
- ◆ show interfaces
- ◆ show arp

- ◆ write memory
- ◆ reload

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	TEXT	SSH, Telnet
startup	Yes	Yes	Reboot	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 21

Cambium Devices

This chapter contains the following topics:

- ◆ [Cambium Canopy](#)..... 204

Cambium Canopy

Device Type	Wireless Device
Specific Model(s)	Canopy PMP450
Operating System and Firmware Versions	13.3
Communication Protocols	SNMP, SNMP/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP
Credential Management	NA
Operating System Management Protocols	NA
Quick Commands	Route, Ping, Arp

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - sysDescr(1.3.6.1.2.1.1.1) should have “CANOPY” string.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP/TFTP
 - Snmp oid “1.3.6.1.4.1.161.19.3.3.8” will be set with tftp url
 - Device will transfer the file to Device server(Configured as TFTP server).

Configuration deploy

- ◆ SNMP/TFTP
 - Snmp oid “1.3.6.1.4.1.161.19.3.3.7” will be set with tftp url
 - Device will transfer the file from Device server(Configured as TFTP server).

Credential management

- ◆ Not supported

Operating System management

- ◆ Not supported

Device monitoring

- ◆ SNMP based

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	N/A	ASCII	SNMP/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
File System Information	No	No
Identity	No	Yes

Attributed data	Terminal	SNMP
Interfaces	No	Yes
Memory	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes

Known issues

The following device issues have been discovered with this releases. A resolution is included to address the issue, if available.

- ◆ Device server should be configured as TFTP server.
- ◆ Reboot of device is by default enabled upon any push operation

CHAPTER 22

Carrier Access Devices

This chapter contains the following topic:

- ◆ [Adit 600](#)..... 208

Adit 600

Device Type	Other
Specific Model(s)	Adit 600
Operating System and Firmware Versions	9.7.0.4
Communication Protocols	SSH/Telnet,SNMP
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, View Routes,ARP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID value contains .1.3.6.1.4.1.964
- ◆ Terminal
 - Output of "show id" contains host name.
 - Output of "show image" contains os version.
 - Output of "print config" contains model name.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - Running Configuration
 - print config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - add user <user>
 - set user <user> password
 - delete user <user>
- ◆ SNMP
 - set snmp getcom <newCommunity>
 - set snmp setcom <newCommunity>

Operating System Management

- ◆ NA

Device monitoring

- ◆ show image
- ◆ show id
- ◆ ping
- ◆ tracet
- ◆ print config
- ◆ reset

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support:

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running configuration	Yes	Yes	No	TEXT	SSH, Telnet

Device data

The following data represents device data per device class:

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 23

Checkpoint Devices

This chapter contains the following topic:

- ◆ [Checkpoint Firewall-1](#) 212

Checkpoint Firewall-1

Device Type	Firewall
Specific Model(s)	FireWall-1
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, View Routes, View Arp, View Interfaces, View Processor CPU, View Network Management Events, View Interface Counters

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - OID 1.3.6.1.4.1.2620.1.1.10.0 contains “FireWall-1”
 - sysDesc should not contain “IP530”
- ◆ Terminal
 - **fw ver** should contain “FireWall-1”
 - **clish -c "show image current"** should not contain “IPSONOKIA” (case insensitive)

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/SCP
 - Use the expert command to get to a Unix prompt. Requires the super user password. All files are transferred using SCP.
 - The files listed in the Multi-Config Files section for this device are retrieved using a combination of SSH and SCP commands.

Configuration deploy

- ◆ Terminal
 - Use the expert command to get to a Unix prompt. Requires the super user password. All files are transferred back using SCP.
 - Use the Unix file commands to put the files back into place.
 - The files listed in the Multi-Config Files section for this device are pushed using a combination of SSH and SCP commands.

Credential management

- ◆ Account
 - adduser <username>
 - deluser <username>
 - passwd
- ◆ Privilege Account
 - passwd
- ◆ SNMP
 - cat /etc/snmp/snmpd.users.conf | grep -v '^ ro | rw .* <oldSnmpCommunity>
 - echo ro | rw user <snmpCommunity>
 - echo ro | rw community <snmpCommunity>
 - cp -f /tmp/snmpd.users.conf /etc/snmp/snmpd.users.conf
 - service snmpd restart

Device monitoring

- ◆ fw ver
- ◆ clish -c
- ◆ cat /proc/meminfo
- ◆ cpinfo | head -20 | grep FireWall"
- ◆ cpstat -f policy fw
- ◆ hostid
- ◆ hostname
- ◆ uname -a
- ◆ egrep -i '^[/s]*syslocation' /etc/snmp/snmpd.conf
- ◆ egrep -i '^[/s]*syscontact' /etc/snmp/snmpd.conf
- ◆ lspci
- ◆ ifconfig -a
- ◆ fw ctl pstat
- ◆ cpinfo
- ◆ cat /proc/cpuinfo
- ◆ fw log
- ◆ cprestart
- ◆ expert
- ◆ exit
- ◆ echo

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
\$base_dir/conf/netso.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/objects.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/InternalCA.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/snmp.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/SDS_objects.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/classes.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/lea_server_unification_scheme.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
\$base_dir/conf/log_unification_scheme.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/newobjects.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/refs.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/tables.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/userdef.C	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cpha.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cphaprob.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cpmap_config.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cpmap_operation.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cpmap_rulebase.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cp.lf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/product.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/fwauthd.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/fwopsec.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/slapd.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/smtp.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/omi.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/thresholds.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/fwmusers	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/gui-clients	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/external.if	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/cp.license	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/masters	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/*.W	Yes	Yes	NA	ASCII	SSH, SSH/SCP
/config/active	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/state/*	Yes	Yes	NA	Binary	SSH, SSH/SCP
\$base_dir/conf/serverkeys.*	Yes	Yes	NA	Binary	SSH, SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
\$base_dir/database/*	Yes	Yes	NA	Binary	SSH, SSH/SCP
\$base_dir/conf/fwauth.NDB	Yes	Yes	NA	Binary	SSH, SSH/SCP
\$base_dir/conf/fwauth.keys	Yes	Yes	NA	Binary	SSH, SSH/SCP
\$base_dir/conf/rulebases.fws	Yes	Yes	NA	Binary	SSH, SSH/SCP
\$base_dir/conf/inst.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/conf/sic_policy.conf	Yes	Yes	NA	ASCII	SSH, SSH/SCP
\$base_dir/database/cprid/cprid_keys/*	Yes	Yes	NA	Binary	SSH, SSH/SCP
\$base_dir/database/cprid/cprid_util_keys/*	Yes	Yes	NA	Binary	SSH, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

3.6 Regression - Credentials (Account, Privilege and SNMP) change failed

- ◆ When changing Checkpoint Credentials do *not* change the enable password from the device communications settings. This may result in the login password being modified and subsequently, you will be denied access to the system.

Changing Checkpoint Credentials

- ◆ When changing Checkpoint credentials do *not* schedule a change of the enable password from the device communications settings. This may result in the login password being modified and subsequent denial of access to the system.

CHAPTER 24

Ciena Devices

This chapter contains the following topic:

- ◆ Ciena Router 220
- ◆ Ciena Switch 224

Ciena Router

Device Type	Router
Specific Model(s)	CN4200,4200
Operating System and Firmware Versions	6.2.0,8.1.3
Communication Protocols	TELNET, SSH, TELNET/FTP, SSH/FTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	Terminal
Credential Management	SNMP v1/v2
Operating System Management Protocols	Not available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ Terminal

- Vendor is Ciena in response to **show system**
- Serial number is retrievable
- SysObjectId
 - Maps to model using CienaRouter/CienaRouterModels.xml
 - Contains 1.3.6.1.4.1.7737.5.2.2.6 or 1.3.6.1.4.1.7737.5.2.2.8

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Change Log
 - show log dbchg
- ◆ Terminal/FTP
 - Running
 - configure terminal
 - maint-state enter
 - save
 - maint-state exit
 - copy configuration to address <SERVERIPADDR> <remoteFilename> user <FtpAccount_> overwrite yes

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/FTP
 - copy configuration from address <SERVERIPADDR> <remoteFilename> user <FtpAccount_>

Credential management

- ◆ SNMP
 - system
 - snmp-server community <newString> (ro | rw)
 - no snmp-server community <oldString>

Device monitoring

- ◆ exit

- ◆ enable priv
- ◆ configure terminal
- ◆ terminal more on
- ◆ terminal more off
- ◆ show system
- ◆ show version
- ◆ show hardware
- ◆ show snmp
- ◆ show interface all

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET/FTP, SSH/FTP
change log	No	Yes	NA	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Ciena Router

- ◆ The enable priv and enable admin passwords must be set to the same value to manage the device.
- ◆ Only SNMP credential rolls are supported.
- ◆ On configuration pushes (restore), the push may fail to get a verification message due to the device responding with (*Destination already exists*). The cause for this is not yet identified.
- ◆ Change logs show a revision on every pull due to entering configuration mode in order to put the device into maintenance mode to save prior to transfer.
- ◆ In order to generate a configuration backup, the device is briefly placed into maintenance mode; the effects of this on the managed device have not been investigated.
- ◆ An FTP transfer service must be configured for this device. See [“Configuring FTP Transfer Service” on page 38](#) for more information.

Ciena Switch

Device Type	Switch
Specific Model(s)	CN 3920
Operating System and Firmware Versions	06-07-01-0024
Communication Protocols	TELNET, TELNET/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	TFTP, FTP
Quick Commands	Ping, Traceroute, Reboot

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains 1.3.6.1.4.1.6141
- sysDescription value contains "CN"
- ◆ Terminal
 - Model name, Package ID, Serial Number/Hostname will be used to identify the device
 - Serial number is available through **chassis show**. If not, Hostname is used.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - configuration show
- ◆ Terminal/TFTP
 - file tput <SERVERIPADDR> <startupFile> /flash0/config/startup-config
 - configuration save filename <runningFile>
 - file tput <SERVERIPADDR> <runningFile> /flash0/config/ <locaFile>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - file tget <SERVERIPADDR> <remoteFile> /flash0/config/ <startupName>

Credential management

- ◆ Account
 - user create user <username> password <password> access-level super
 - user delete user <oldUser>
 - user set user <username> password <password>
- ◆ SNMP
 - snmp remove(DEPRECATED) community <oldSnmpCommunity> ip 0.0.0.0
 - snmp add(DEPRECATED) community <newSnmpCommunity> ip 0.0.0.0 permission (read-only | read-write)

Operating System

- ◆ OS upgrade is supported via TFTP and FTP. Before transferring the OS image, running configuration is saved using command "configuration save filename "+FILENAME.Ciena Switch 133 Ciena Devices

- ◆ Via TFTP
 - software download package <IMAGENAME> server <SERVERIPADDRESS>
 - Device reboots if configured
- ◆ Via FTP
 - software upgrade package <IMAGENAME> server <SERVERIPADDRESS> user <USERNAME> password <PASSWORD> service-disruption allow
 - Device reboots automatically

Device Monitoring

- ◆ ping
- ◆ traceroute
- ◆ configuration list
- ◆ file vols
- ◆ software show
- ◆ chassis show
- ◆ file cat /mnt/apps/version
- ◆ snmp show
- ◆ system show
- ◆ system shell set more on
- ◆ system shell set more off
- ◆ arp show
- ◆ interface route show
- ◆ interface show
- ◆ port show
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running Configuration	Yes	Yes	Copy To Startup	ASCII	TELNET, TELNET/TFTP
startup configuration	Yes	Yes	Reboot	ASCII	TELNET/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases.

- ◆ Serial Number and OS Version are not available via SNMP.
- ◆ Physical Hardware is not available via SNMP.
- ◆ Memory and Filesystem information are not available via SNMP.
- ◆ In case of interfaces via terminal, the iftype of all the interfaces is shown as Ethernet, as this information is not available.
- ◆ Cut thru to the device is not working.

CHAPTER 25

Cisco Devices

This chapter contains the following topics:

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Cisco Aironet AP VXWorks

Device Type	Wireless AP
Specific Model(s)	CAP340, AIRAP1200
Operating System and Firmware Versions	Not Available
Communication Protocols	Telnet, TFTP/HTTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	Not Available
Operating System Management Protocols	Not Available
Quick Commands	Standard quick commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	No
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains “Cisco AP340” or “Cisco 1200 Series AP”

- sysObjectId contains “.9.1.379” or “.9.1.474”
- ◆ Term
 - Not Available

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture:

- ◆ SNMP : Not Available
- ◆ Terminal
 - GET /cgi-bin/cgiConfigDownloadAll?detailLevel=40 HTTP/1.1"

Configuration Deploy

Not Available

Credential Management

Not Available

Device Monitoring

Not Applicable

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	ASCII	TFTP/HTTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	No
Interfaces	No	Yes

Attributed data	Terminal	SNMP
Keys	No	Yes
Memory	No	No
Access Control Lists Match Counts	No	Yes
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

Cisco Aironet AP VXWorks device does not support PUSH.

Cisco PIX Firewall

Device Type	Firewall
Specific Model(s)	501, 506, 506E, 515, 515E, 520, 525, 515Esc, 515Esy, 515sc, 515sy, 525sc, 525sy, 535, 535sc, 535sy, FWSM-6000, ASA5510, ASA5510-K8, ASA5520, ASA5520sc, ASA5520sy, ASA5540, ASA5540sc, ASA5540sy, CiscoASASm1sc, ASA515, ASA5515-X, CiscoASA5515sc, ASA5585-10, ASA5585-20, ASA5525, ASA5555, ASA5516, ASA5525-X
Operating System and Firmware Versions	Operating systems for 501 models: 6.11, 6.22, 6.24, 6.35 Operating systems for all other models: 6.3, 7.0, 7.2, 8.0, Cisco Adaptive Security Appliance Version 9.1(1), Cisco Adaptive Security Appliance Version 9.1(2)
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP/Term
Credential Management	SNMP v1/v2, Account, Privilege
Operating System Management Protocols	TFTP
Quick Commands	Standard quick commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	No
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP (not available for FWSM and ASA models):
 - sysObjectID value contains 1.3.6.1.4.1.9, 1.3.6.1.4.1.9. 1.1421
 - sysDescr value contains PIX
- ◆ Term
 - show version response contains PIX, FWSM, or Adaptive Security Appliance

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP : Not Available
- ◆ For Telnet and SSH
 - running: show run (show config if show run fails)
 - startup: show config (show start if show config fails)
- ◆ For Telnet/TFTP and SSH/TFTP
 - running: write net ipAddress filename
 - startup: same approach as startup for Telnet and SSH above

Configuration deploy

- ◆ via Term
 - Send configuration lines one by one as device commands.
 - "write mem"

Credential management

- ◆ SNMP
 - snmp-server community <newROCString>
 - snmp-server host inside <ip-addr> community <newROCString>
- ◆ Account
 - aaa authentication telnet console LOCAL
 - aaa authentication ssh console LOCAL
 - aaa authentication serial console LOCAL
 - no username "oldName"
 - username "userName" password "password"

- no aaa authentication telnet console LOCAL
- no aaa authentication ssh console LOCAL
- no aaa authentication serial console LOCAL
- passwd "password"
- no enable password "newPrivPass" level "level"
- enable password "newPrivPass" level
- disable
- enable "level"

Device monitoring

- ◆ show checksum
- ◆ show version
- ◆ show pager
- ◆ show config
- ◆ show start
- ◆ show run
- ◆ show snmp
- ◆ show snmp location
- ◆ show interface | include is
- ◆ show interface ifName
- ◆ show memory
- ◆ show memory summary
- ◆ show flash
- ◆ show ip
- ◆ show arp
- ◆ show priv
- ◆ enable
- ◆ conf term
- ◆ write mem
- ◆ write net ip-addr ...
- ◆ no pager
- ◆ page 0
- ◆ term length 0
- ◆ exit
- ◆ snmp-server enable traps

- ◆ snmp-server host ip-addr
- ◆ logging history notifications
- ◆ logging on
- ◆ enable
- ◆ disable

FWSM Commands (Pix 7.0)

- ◆ show host
- ◆ show mode
- ◆ show context
- ◆ change context system
- ◆ change context "contextName"

Operating System management

- copy tftp flash

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
runningAdmin	Yes	Yes	copyToStart	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
runningAdmin	Yes	Yes	copyToStart	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
startupAdmin	Yes	Yes	copyToStart	ASCII	Telnet, SSH
startupSystem	Yes	Yes	copyToStart	ASCII	Telnet, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	Yes

Attributed data	Terminal	SNMP
Keys	Yes	Yes
Memory	No	No
Access Control Lists Match Counts	Yes	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

SNMP Credential Change for PIX 515 (version 7.0)

- ◆ When rolling Credentials (for example, using the application's System Administration -> Networks -> Roll feature), only the credential entry relating to the application's IP address changes.

Operating System Management

- ◆ This device class does not currently support listing flash contents; the user must ensure sufficient space exists before scheduling the upgrade. Upgrading from version 6.x to later versions is not supported by this device class because memory and flash requirements cannot be verified by the driver.

Physical Hardware

- ◆ Inventory is displayed for supported devices discovered using Non-SNMP protocols. Non-admin contexts do not have access to the processor information, so "N/A" is listed for those values.
- ◆ The system context does not support hardware inventory.

Autodiscovery of spared units

- ◆ When discovering non-admin contexts operating in a spared configuration, the newly discovered non-admin context will replace the previous version. This is due to the non-unique combination of hostname/context, IP address, and serial number for this equipment.
- ◆ To avoid duplicate devices in the UI, devices in multi-context mode currently use hostname for the serial number to maintain backward-compatibility with previously discovered units for upgrade scenarios.

Autodiscovery of Multiple Context

- ◆ Devices configured to contain multiple virtual firewall context, such as an ASA or PIX 7, must be discovered using terminal credentials. There is not enough unique information from the SNMP agent to accurately determine a unique chassis on these devices.

Cisco PIX - SNMP Discovery

- ◆ SNMP discovery is not available for FWSM and ASA models.

Device Naming

- ◆ For devices operating in multiple context mode, the device name is constructed as hostname/context.
 - Hostname is initially taken from the **show host** response.
 - Context is taken from the **show context** response, active context detail is listed on the line ending in *.
 - When these values are identical, the hardware name shown in the **show version** response is used for the hostname. For example, **ciscoasa up 4 days 3 hours**.

Configuration Management

- ◆ runningSystem and startupSystem configuration files can only be pulled for the admin-equivalent context. All other contexts will pull only runningAdmin and startupAdmin configurations.

Cisco VPN 3000

Device Type	VPN concentrator
Specific Model(s)	3000
Operating System and Firmware Versions	4.1.7.G, 4.7.2.L , 4.7.2.N
Communication Protocols	Telnet/FTP, SSH/FTP, Telnet, SSH, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps, Syslog
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	TFTP
Quick Commands	OSUpgrade

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following items are used to provide information about your device (Host Name, Type, Vendor, Model, Operating System, and Serial Number).

- ◆ SNMP

- sysObjectID contains 1.3.6.1.4.1.1.3076 or 1.3.6.1.4.1.3076
- sysDescr contains VPN
- Sys Services Layer contains 3, 4, or 7
- ◆ Term
 - Not Available

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Navigate the following menu
- ◆ Administration
- ◆ File Management
- ◆ Export XML file
- ◆ Use FTP or SCP to get the exported config file

Configuration deploy

- ◆ Use FTP or SCP to push the config file
- ◆ Navigate the following menu
- ◆ Administration
- ◆ File Management
- ◆ Import XML file
- ◆ Save changes to the configuration file

Credential management

- ◆ Account
 - Access the following menu
 - Administration
 - Access Rights
 - Administrators
 - Modify Administrators
 - Set Username/Password
 - Back
 - Save changes to Config file
- ◆ SNMP
 - Access the following menu

- Configuration
- System Management
- Management Protocols
- Configure SNMP Community Strings
- Delete a Community String
- Add a Community String
- Back
- Save changes to Config file

Operating System management

- Access the following menu
- Administration
- Software Update
- Concentrator
- Reboot the device

Device Monitoring

- Not Available

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	Telnet/FTP, SSH/FTP, Telnet, SSH, SSH/SCP
startup	Yes	Yes	Reboot	ASCII	Telnet/FTP, SSH/FTP, Telnet, SSH, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No

Attributed data	Terminal	SNMP
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Cisco VPN 3000

- ◆ For the listed software versions, the VPN Concentrator can fail pulls and pushes if an FTP session to the device is changed to a different directory than the default / directory.
 - Push/pull failures due to the above problem can be verified with manual FTP sessions to the device being unable to list or transfer files. The **pwd** command reports the correct directory.
 - The above failures will show up as failed pull or push jobs in the Scheduler, with a **failed credentials** error. The credentials will succeed for a Test Credentials job.
 - To correct this condition, access the device with an FTP client, login, and issue **cd /**. After logging out, retry the failed operation.

Cisco Aironet AP

Device Type	Wireless AP
Specific Model(s)	1100, 1130, 1200, 1210, 1240, 1310, 350IOS, AIR-AP1230A-A-K9, AP1200
Operating System and Firmware Versions	12.2(13)JA, 12.3(8)JEC3
Communication Protocols	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Trap and Syslog
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2,v3, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	View ARP View Interfaces View Vlans View Logs View CDP Neighbors Resync Backup OS Via TFTP Update OS Via TFTP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/Identify Methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectId should be either
 - 1.3.6.1.4.1.9.1.507
 - 1.3.6.1.4.1.9.1.565
 - 1.3.6.1.4.1.9.1.525
 - 1.3.6.1.4.1.9.1.474
 - 1.3.6.1.4.1.9.1.685
 - 1.3.6.1.4.1.9.1.618
 - sysDescr should contain “IOS”
 - sysServices Layer should only be 2
- ◆ Term
 - **Show version** result should have “IOS” or “Internetwork Operating System”
 - **show vtp counter** must be successfully executed
 - Cisco Enterprise ID must match models list and not be in the list of 164, 107, 533

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Startup config: show start
 - Running config: show run
- ◆ SNMP/TFTP
 - Devices using OLD-CISCO-SYSTEM-MIB (running configuration only):
.1.3.6.1.4.1.9.2.1.55.ipAdress -> remoteFilename
 - Devices using CISCO-CONFIG-COPY-MIB (idx is a unique integer):
.1.3.6.1.4.1.9.9.96.1.1.1.1.2.idx -> 1 (TFTP)
.1.3.6.1.4.1.9.9.96.1.1.1.1.3.idx -> 1 (network file)
.1.3.6.1.4.1.9.9.96.1.1.1.1.4.idx -> type (4: running, 3: startup)
.1.3.6.1.4.1.9.9.96.1.1.1.1.5.idx -> serverIpAddress
.1.3.6.1.4.1.9.9.96.1.1.1.114.idx -> 1 (start transfer)
- ◆ Terminal/TFTP
 - copy running-config tftp
 - copy startup-config tftp

Configuration Deploy

- ◆ Terminal
 - From the console prompts, the device is put into configuration mode using enable 15 and configure terminal, and if successful, the configuration is issued line-by-line with checks for banner content and invalid input messages.
 - If a banner is entered using banner motd X, the termination banner character X is stored, and there are no prompt checks until the final banner line is entered or a new prompt is detected.
- ◆ SNMP/TFTP
 - Devices supporting OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.50.ipAddress -> remoteFilename
 - Devices supporting CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.2.id -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.3.id -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.4.id -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.5.id -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.14.id -> 1 (start transfer)

Commit config

- ◆ SNMP
 - .1.3.6.1.4.1.9.2.1.54.0 -> 1
- ◆ Terminal
 - copy running-config startup-config

Credential management

- ◆ Check for RADIUS or TACAS, if true fail the operation
 - term length 0
 - sh run
- ◆ If not RADIUS or TACAS,
 - term length 0
 - sh run
- ◆ For non AAA user account password
 - conf t
 - no aaa new-model
 - For type 0: line console 0
 - For type 1: line aux 0
 - login

- password
- exit
- ◆ For AAA user account password
 - conf t
 - aaa new-model
 - no username <oldUser>
 - username <username> privilege <userLevel> password <password>
 - username <username> password <password>
 - exit
- ◆ For Privilege password
 - conf t
 - no enable secret level
 - no enable password level
 - enable secret level < level> <newPrivPass>
 - enable password level <level> <newPrivPass>
 - exit
- ◆ SNMP (v1v2)
 - term length 0
 - show run | include community
 - conf t
 - snmp-server community <newSnmpCommunity> <view> <type> acl
 - no snmp-server community <oldSnmpCommunity>
 - exit

Operating System management

- ◆ NA

Device Monitoring

- ◆ show version
- ◆ show module
- ◆ show diag
- ◆ term length
- ◆ term width
- ◆ show run
- ◆ show snmp user
- ◆ show snmp group

- ◆ show hosts
- ◆ access-list
- ◆ archive

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	SNMP, Telnet, SSH, Telnet/TFTP, SSH/TFTP
startup	Yes	Yes	copyToStart	ASCII	SNMP, Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	Yes
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	Yes	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Cisco Aironet AP

- ◆ If the device supports CISCO-CONFIG-COPY-MIB, then SNMP/TFTP can be used to pull and push both the running and startup configurations, otherwise only running configurations are supported.

Cisco Aironet Bridge

Device Type	Wireless Bridge
Specific Model(s)	1300,1410
Operating System and Firmware Versions	Tested : 4200 Untested : 3600
Communication Protocols	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	SNMP Traps, Syslog
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2,v3, Account, Privilege
Operating System Management Protocols	FTP, SCP, TFTP
Quick Commands	Standard

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	No
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- ciscoROMId should be valid
- sysObjectId should contain “1.3.6.1.4.1.9.1.533”
- sysDescr should contain “IOS”
- sysServices Layer should only be 2

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Startup config: show start
 - Running config: show run
- ◆ SNMP/TFTP
 - Devices using OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.55.ipAddress -> remoteFilename
 - Devices using CISCO-CONFIG-COPY-MIB (idx is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.2.idx -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.3.idx -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.4.idx -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.5.idx -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.14.idx -> 1 (start transfer)
- ◆ Terminal/TFTP
 - copy running-config tftp
 - copy startup-config tftp

Configuration deploy

- ◆ Terminal
 - From the console prompts, the device is put into configuration mode using enable 15 and configure terminal, and if successful, the configuration is issued line-by-line with checks for banner content and invalid input messages.
 - If a banner is entered using banner motd X, the termination banner character X is stored, and there are no prompt checks until the final banner line is entered or a new prompt is detected.
- ◆ SNMP/TFTP
 - Devices supporting OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.50.ipAddress -> remoteFilename
 - Devices supporting CISCO-CONFIG-COPY-MIB (id is a unique integer):

- .1.3.6.1.4.1.9.9.96.1.1.1.1.2.id -> 1 (TFTP)
- .1.3.6.1.4.1.9.9.96.1.1.1.1.3.id -> type (4: running, 3: startup)
- .1.3.6.1.4.1.9.9.96.1.1.1.1.4.id -> 1 (network file)
- .1.3.6.1.4.1.9.9.96.1.1.1.1.5.id -> serverIpAdress
- .1.3.6.1.4.1.9.9.96.1.1.1.114.id -> 1 (start transfer)

Commit Config

- ◆ SNMP
 - .1.3.6.1.4.1.9.2.1.54.0 -> 1
- ◆ Terminal
 - copy running-config startup-config

Credential management

- ◆ Check for RADIUS or TACAS, if true fail the operation
 - term length 0
 - sh run
- ◆ If not RADIUS or TACAS
 - term length 0
 - sh run
- ◆ For non AAA user account password
 - conf t
 - no aaa new-model
 - For type 0
 - line console 0
 - For type 1
 - line aux 0
 - login
 - password
 - exit
- ◆ For AAA user account password
 - conf t
 - aaa new-model
 - no username <oldUser>
 - username <username> privilege <userLevel> password <password>
 - username <username> password <password>
 - exit

- ◆ For Privilege password
 - conf t
 - no enable secret level
 - no enable password level
 - enable secret level < level> <newPrivPass>
 - enable password level <level> <newPrivPass>
 - exit
- ◆ SNMP (v1v2)
 - term length 0
 - show run | include community
 - conf t
 - snmp-server community <newSnmpCommunity> <view> <type> acl
 - no snmp-server community <oldSnmpCommunity>
 - exit

Operating System management

- ◆ Not Available

Device monitoring

- ◆ show version
- ◆ show module
- ◆ show diag
- ◆ term length
- ◆ term width
- ◆ show run
- ◆ show snmp user
- ◆ show snmp group
- ◆ show hosts
- ◆ access-list
- ◆ archive

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	SNMP,Telnet, SSH, Telnet/TFTP, SSH/TFTP
startup	Yes	Yes	copyToStart	ASCII	SNMP,Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	Yes
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	Yes	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco Application Control Engine

Device Type	Content Cache
Specific Model(s)	ACE20-MOD-K9,ACE4710K9
Operating System and Firmware Versions	3.0
Communication Protocols	Telnet, SSH,Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog and Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	View ARP View Interfaces View Vlans View Logs View CDP Neighbors Resync Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescription should have “Application Control Engine”
- ◆ Term
 - term length 0
 - **show version** should have “Cisco Application Control Software”
 - **show hardware** for model no, cisco system id

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - term length 0
 - show start
 - show run
- ◆ Term/TFTP
 - copy startup-config tftp://<SERVERIPADDR>/<localFile.filename>
 - copy running-config tftp://<SERVERIPADDR>/<localFile.filename>

Configuration deploy

- ◆ Term
 - Send configuration as commands line by line.
- ◆ Term/TFTP
 - copy tftp://<SERVERIPADDR>/<configfile> running-config
 - copy tftp://<SERVERIPADDR>/<configfile> startup-config
- ◆ copyRunToStart
 - copy running-config startup-config

Credential management

- ◆ Account
 - Configure
 - username <username> password 0 <password> role Admin
 - no username <oldUser>

- exit
- ◆ SNMP (v1/v2)
 - term length 0
 - config
 - snmp-server community <newSnmpCommunity>
 - no snmp-server community <oldSnmpCommunity>
 - exit

Operating System management

- ◆ NA

Device monitoring

- ◆ show context
- ◆ term length
- ◆ show version
- ◆ show hardware
- ◆ show interface
- ◆ show inventory
- ◆ show snmp
- ◆ show arp
- ◆ show ip interface brief
- ◆ show vlan

Multi-config files

For this device, only contexts that have their own unique management IP address are managed, and each context is managed as a separate device. Each of those devices will store and revision the following configuration files.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyRunToStart	ASCII	Telnet,SSH,Telnet/TFTP,SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	Telnet,SSH,Telnet/TFTP,SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco BPX

Device Type	Switch
Specific Model(s)	BPX 8620
Operating System and Firmware Versions	NA
Communication Protocols	SNMP, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP
Credential Management	NA
Operating System Management Protocols	NA
Quick Commands	Enable Automatic Backups Disable Automatic Backups Display Cards Display Card Display Ports Display Port Display Connection Display Connections Display Lines

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No

Features Available	Support
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - Model name must be mapped with the sysObjectId
 - Get the serial number or sysName
- ◆ Terminal
 - NA

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - savecnf <backupId> <nodeName> * <serverIP> <nodeName>
 - dspcnf
 - clrscrn
 - A saved configuration file set is saved in the /tftpboot directory of the device server. This configuration set contains three files needed to restore the device configuration state. The ID of the save determines the name of the subdirectory containing the saved files. The ID is VC<DDD><YY> where DDD represents the 3 digit day of the year and YY is the two digit year. For example the ID for a backup on March 2nd 2008 would be VC06208. The subdirectory containing the configuration files for restoration is named <ID>_Cfgdir as in /tftpboot/VC06208_Cfgdir for a backup on March 2nd 2008. For example:
 - -bash-3.00# ls -l /tftpboot/
 - drwxr-x--- 2 nobody root 4096 Mar 3 22:59 VC06308_Cfgdir
 - -bash-3.00# ls -l /tftpboot/VC06308_Cfgdir/
 - total 4984
 - -rw-rw-rw- 1 root root 256 Mar 3 20:14 D1.ALX1_BPX.000
 - -rw-rw-rw- 1 root root 2536663 Mar 3 20:35 D1.ALX1_BPX.001
 - -rw-rw-rw- 1 root root 800 Mar 3 20:14 D1.ALX1_BPX.cfg

- -rw-rw-rw- 1 root root 256 Mar 3 22:59 D1.Madi_BPX.000
- -rw-rw-rw- 1 root root 2536663 Mar 3 23:21 D1.Madi_BPX.001
- -rw-rw-rw- 1 root root 800 Mar 3 22:59 D1.Madi_BPX.cfg

NOTICE

Automatic backups will be disabled after every configuration capture.

- You can save a configuration if both of the following are true:
 - No save or restore process is currently running.
 - No configuration changes are in progress.
- Configuration captures for the device have an enable and disable feature. The quick commands Disable Automatic Backups and Enable Automatic Backups are provided to prevent the server from automatically issuing the saveallcnf after every device change. It is advisable to disable automatic backups unless the device is currently not provisioned.

- ◆ SNMP
 - NA

Configuration deploy

- ◆ Terminal
 - Configuration lines can be pushed as commands one by one
- ◆ SNMP
 - NA

Credential management

- ◆ NA

Operating System management

- ◆ NA

Device monitoring

- ◆ dspcd
- ◆ dspcds
- ◆ savecnf
- ◆ clrscrn
- ◆ dspcd

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Cisco BPX - Restore Causes Device Reset and Loss of Service

- ◆ **Issue:** Restoring the device may cause a device reset and loss of service.
- ◆ **Resolution:** This feature has not been implemented and should not be done until tested against a non-production system. The device server contains the necessary files to manually restore the device.

Cisco BPX - SNMP MIB-II shows only two interfaces

- ◆ **Issue:** BPX SNMP MIB-II shows only two interfaces.

- ◆ **Resolution:** The device SNMP agent only reports two interfaces. This is a limitation of the network device.

Cisco BPX - No SSH support

- ◆ **Issue:** No SSH support for Cisco BPX.
- ◆ **Resolution:** The Cisco BPX does not support SSH.

Cisco BPX - Screen Painting and Re-drawing Issues occur when using Cut-Through

- ◆ **Issue:** The BPX in a split screen VT100 interface. Screen painting and redrawing issues may occur when using Cut-Through.
- ◆ **Resolution:** The `clrscrn` command can be used to re-draw and refresh any screen issues. In addition, terminal commands will show multiple snapshots of the screen progression. This information is shown with dividers to aid in distinguishing the screen updates and associated commands.

Cisco CatOS Switch

Device Type	Switch
Specific Model(s)	CAT2900XL-ATM, CAT2940, CAT2950, CAT2950LRE, CAT2955, CAT2960, CAT2970, CAT2970, CAT3550, CAT3550, CAT3560, CAT3560E, CAT3750, CAT3750, CAT3750E, CAT3750-METRO, CAT4000-AGM, CAT4000-SUP4, CAT4224, CAT4500-AGM, CAT4500-AGM, CAT4500E-SUP6E, CAT4500-SUP2-PLUS, CAT4500-SUP2-PLUS, CAT4500-SUP2-PLUS-10GE, CAT4500-SUP2-PLUS-TS, CAT4500-SUP3, CAT4500-SUP3, CAT4500-SUP4, CAT4500-SUP4, CAT4500-SUP5, CAT4500-SUP5-10GE, CAT4900M, CAT4948, CAT4948-10GE, CAT5000-ATM, CAT5000-RSFC, CAT5000-RSM, CAT5000-RSM, CAT6000-ATM, CAT6000-CMM, CAT6000-MSFC, CAT6000-MSFC2, CAT6000-MSFC2, CAT6000-MSFC2A, CAT6000-MSFC3, CAT6000-MWAM, CAT6000-SUP1/MSFC1, CAT6000-SUP1/MSFC2, CAT6000-SUP2/MSFC2, CAT6000-SUP2/MSFC2, CAT6000-SUP32/MSFC2A, CAT6000-SUP32/PISA, CAT6000-SUP720/MSFC3, CAT6000-VS-S720-10G/MSFC3, CATEXPRESS500, CATEXPRESS520, WS-C2948G-GE-TX, WS-C2948G, WS-C4507RPlusE, CAT-OS 6506
Operating System and Firmware Versions	
Communication Protocols	SNMP/TFTP, Telnet,SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs and Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2,V3, Account, Privilege
Operating System Management Protocols	TFTP, FTP, SCP
Quick Commands	View Trunk View CDP Neighbors View Vlans Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes

Features Available	Support
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysDescr should have “Catalyst” or “Cisco Systems WS-C5”
 - sysServices should be layer 2 and not Layer 3.
- ◆ Term
 - **Show version** should have “Cisco Systems” and not have “Internetwork Operating System” or “Cisco IOS”
 - **show version** also should have model number which should match to the models file.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP/TFTP
 - .1.3.6.1.4.1.9.5.1.5.1.0 -> serverIpAddress
 - .1.3.6.1.4.1.9.5.1.5.2.0 -> remoteFilename for configuration file
 - .1.3.6.1.4.1.9.5.1.5.3.0 -> id (integer representing Supervisor module)
 - .1.3.6.1.4.1.9.5.1.5.4.0 -> 3 (pull config from device)
- ◆ Term
 - “set length 0”
 - “show config”
- ◆ Term/TFTP
 - Only for startup configuration, write <SERVERIPADDR> <local config file>

Configuration deploy

- ◆ SNMP/TFTP
 - .1.3.6.1.4.1.9.5.1.5.1.0 -> serverIpAddress
 - .1.3.6.1.4.1.9.5.1.5.2.0 -> remoteFilename for configuration file
 - .1.3.6.1.4.1.9.5.1.5.3.0 -> id (integer representing Supervisor module)
 - .1.3.6.1.4.1.9.5.1.5.4.0 -> 2 (push config from device)
- ◆ Term
 - From the console prompts, the device is brought to the enable mode using enable then to the configure mode using conf t after which the configuration is entered line-by-line with checks for banners and for invalid input.
 - If a banner is entered using banner motd X, the termination banner character X is stored, and there are no prompt checks until the final banner line is entered or a new prompt is detected.
- ◆ Term/TFTP
 - Push to running config
copy tftp config
<ServerIpAddress>
<local configuration file>
 - Push to Start
copy tftp flash"
<ServerIpAddress>
<Local configuration file>
"bootflash"
<Local configuration file>
clear boot auto-config
"set boot auto-config bootflash:" <configFileName>

Credential management

- ◆ SNMP
 - CatOS 1900
"no snmp-server community <oldSnmpRO/RWCommunity> \r\n"
"snmp-server community <newSnmpROCommunity> ro\r\n"
"snmp-server community <newSnmpRWCommunity> rw \r\n"
 - CatOS
"set snmp community read-only <newSnmpROCommunity> \n"
"set snmp community read-write <newSnmpRWCommunity> \n"
- ◆ Account
 - "set password"
 - <old password>
 - <new password>
 - Confirm <new password>

- ◆ Privilege
 - CatOS1900
 - "conf t\r\n"
 - "no enable password level 15\r\n"
 - "enable secret 0 <newPrivPassword>\r\n"
 - "no enable secret\r\n"
 - "enable password level 15 <newPrivPassword> \r\n"
 - CatOS
 - "set enablepass\r\n"
 - <old Privilege password>
 - <new Privilege password>
 - Confirm new password

Operating System management

- ◆ "term length 0"
- ◆ "set length 0"
- ◆ "show module"
- ◆ "delete <partition> <image filename>"
- ◆ "dir"
- ◆ "squeeze <partition>"
- ◆ "copy <partition><srcFilename> tftp"
- ◆ "copy <protocol>://<user>:<password>@<serverLocation>/<srcFilename> <partition> <destFilename>"
- ◆ "copy <partition> <srcFilename> <protocol>://<user>:<password>@<serverLocation>/<destFilename>"
- ◆ <server Location>
- ◆ <source Filename>
- ◆ <destination Filename>
- ◆ "Y"
- ◆ "dir <partition>"
- ◆ "verify <partition> <filename>"
- ◆ "verify ?"
- ◆ "verify <slot> <name>"
- ◆ "clear boot system all"
- ◆ "set boot system flash <partition> <image>"
- ◆ set boot config-register 0x2102"
- ◆ "copy <partition> <image> <slaveModuleNum>/<partition> BTSYNC_<image>"
- ◆ "reset < slaveModuleNum >"
- ◆ "show module < slaveModuleNum >"

- ◆ "show run"
- ◆ "no boot bootldr <partition> <old imageName>"
- ◆ "no boot system flash <partition> <old imageName>"
- ◆ "boot bootldr <partition> <new imageName>"
- ◆ "boot system flash <partition> <new imageName>"
- ◆ "exit"
- ◆ "copy running-config startup-config"

Device Monitoring

- ◆ "show version"
- ◆ "show ip"
- ◆ "show module "
- ◆ "ping "
- ◆ "traceroute "
- ◆ "show trunk"
- ◆ "show CDP neighbors detail"
- ◆ "show vlan"
- ◆ "show cam <mac>"
- ◆ "write memory"
- ◆ "bootflash"
- ◆ "clear boot auto-config"
- ◆ "set boot auto-config bootflash:< configFileName >"
- ◆ "show snmp hostname"
- ◆ "show snmp contact"
- ◆ "show snmp location"
- ◆ "show interfaces"
- ◆ "show vlan"
- ◆ "show snmp ifalias"
- ◆ "show port status"
- ◆ "show cam dynamic"
- ◆ "show arp"
- ◆ "show port"
- ◆ "show port trunk"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes		ASCII	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	Yes	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	Yes	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Cisco Catalyst OS Switches - Auto Discovery SNMP

- ◆ **Issue:** Auto Discovery with SNMP Credentials and Accounts, and Privilege Passwords may *hang* if the devices *do not have names*. For example: no name set on CAT OS Switches. Note that this may be prevalent in the CAT OS devices, due to the *no name* default setting on CAT OS Switches.

- ◆ **Resolution:** Set the Name on the device. On CAT OS, use the **set system name** command in Enable mode.

Cisco Catalyst 1900 - Serial Numbers not Displayed

- ◆ Serial numbers for the CAT OS 1900 devices are *not* being displayed.

Catalyst OS Switch 1900

- ◆ After a hardware pull, using either SNMP or non-SNMP mechanisms, the Non-Volatile Memory information will *not* display. The device does *not* support the display of Non-Volatile Memory. This is a device limitation. Other memory information can be accessed using the SNMP mechanism.

Cisco Catalyst 4000 Series

- ◆ The OS version for 12.2(18)EW4 for the CAT 4000 series switch displays UNKNOWN for the feature set in the application.

The device responds with UNKNOWN during an SNMP-GET.

- For example:

```
SNMP-GET(1.3.6.1.4.1.9.9.25.1.1.1.2.4)->CW_FEATURE$UNKNOWN$
```

Cisco Content Appliance

Device Type	Content Cache
Specific Model(s)	507, 511, 512, 560, 565, 566, 590, 611, 612, 674, 7305, 7320, 7341
Operating System and Firmware Versions	5.4.3.17
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps and Syslogs
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces View CDP Neighbors Resync Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following items are used to provide information about your device (Host Name, Type, Vendor, Model, Operating System, and Serial Number).

- ◆ SNMP
 - SysDescription must have “Application Content Network”
 - Model name is obtained from the following OIDs (in order):
 - 1.3.6.1.4.1.9.9.368.1.34.3.0
 - 1.3.6.1.4.1.2467.1.34.3.0
 - Part number column of the CISCO-ENTITY-ASSET-MIB for the chassis entry
- ◆ Term
 - Should be able to enter enable mode
 - **getModel** result should be able to mapped to a valid sysObjectID.
 - **show version** should have “Application Content Network”

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show startup-config"
 - "show running-config"
- ◆ Term/TFTP
 - "copy startup-config tftp <SERVERIPADDR> <local configFile name>"
 - "copy running-config tftp <SERVERIPADDR> <local configFile name>"

Configuration deploy

- ◆ Term
 - “conf t”
 - Configuration is entered line by line
 - “exit”
 - To copy run to start, “copy running-config startup-config”
- ◆ Term/TFTP
 - "copy tftp <SERVERIPADDR> <local configfilename> startup-config"
 - "copy tftp <SERVERIPADDR> <local configfilename> startup-config"

Credential management

- ◆ SNMP v1/v2
 - “snmp-server community <newString>”
 - “snmp-server community <newString> rw”
 - "no snmp-server community <oldString>”
 - "no snmp-server community <oldString> rw”
- ◆ Account
 - Enter enable mode
 - “conf t”
 - "username <username> password <password>”
 - "username <username> privilege <user Privilege Level>”
 - "no username <oldUser>”
- ◆ Privilege
 - Enter enable mode
 - “conf t”
 - "username admin password <newPrivPass>”

Operating System management

- ◆ NA

Device monitoring

- ◆ “show disk”
- ◆ “show disk current”
- ◆ “show hardware”
- ◆ “reboot”
- ◆ “show interface”
- ◆ “ping”
- ◆ “traceroute”
- ◆ “show arp”
- ◆ “no terminal more”
- ◆ “terminal length 0”
- ◆ "show cdp"
- ◆ "show ip interface"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Cisco Content Appliance

- ◆ Privilege level access is controlled by the administrator account password. The administrator account *cannot* be rolled since it is used for the privilege password.

- ◆ Although users of level 0 or 15 can be created, use of a level 15 account will not prompt for an enable password even when dropping back to user level.

Cisco Content Services Switch

Device Type	ContentCache
Specific Model(s)	11050, 11501, 11503, 11506
Operating System and Firmware Versions	Not Tested
Communication Protocols	Telnet, Telnet/TFTP, SSH/TFTP, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs and Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA (Telnet/FTP, SSH/FTP)
Quick Commands	View Arp View Interfaces View CDP Neighbors Resync Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/Identify Methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescription must have either “Content Switch” or "Application and Content Networking"
- ◆ Term
 - Not supported

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show startup-config"
 - "show running-config"
- ◆ Term/TFTP
 - "copy startup-config tftp <SERVERIPADDR> <local configFile name>"
 - "copy running-config tftp <SERVERIPADDR> <local configFile name>"

Configuration deploy

- ◆ Term
 - “conf t”
 - Configuration is entered line by line
 - “exit”
 - To copy run to start, “copy running-config startup-config”
- ◆ Term/TFTP
 - "copy tftp <SERVERIPADDR> <local configfilename> startup-config"
 - "copy tftp <SERVERIPADDR> <local configfilename> startup-config"

Credential management

- ◆ Account
 - “conf t”
 - "username <username> password <password> superuser"
 - "no username <oldUser>"
- ◆ SNMP v1/v2
 - "snmp community <newSnmpROCommunity> read-only"
 - "snmp community <newSnmpRWCommunity> read-write"

- "no snmp community <oldSnmpROCommunity> "

Operating System management

- ◆ Following commands should be supported for OS management
 - "show version"
 - "show disk"
 - "terminal timeout 120"
 - "save_config"
 - "save_profile"
 - "archive log sys.log"
 - "archive script default-profile"
 - "conf t"
 - "no ftp-record DEFAULT_FTP"
 - "ftp-record DEFAULT_FTP <serverIp> <ftpUser> <ftpPwd> <filePath>
 - "exit"
 - "upgrade"

Device monitoring

- ◆ "show interface"
- ◆ "show ip interface"
- ◆ "reboot"
- ◆ "show version"
- ◆ "show boot-config"
- ◆ "show disk"
- ◆ "ping"
- ◆ "traceroute"
- ◆ "no terminal more"
- ◆ "show cdp"
- ◆ "show disk current"
- ◆ "show hardware"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	Telnet,Telnet/TFTP,SSH/TFTP, SSH
startup	Yes	Yes	Reboot	ASCII	Telnet,Telnet/TFTP,SSH/TFTP, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco IOS Router

Device Type	Router
Specific Model(s)	<p>1700, 1711, 1801, 1801W, 1811, 1841, 1861, 1000, 1003, 1020, 1004, 1005, 1601, 1602, 1603, 1604, 1605, 12012, 12004, 12008, 1710, 1720, 1401, 1750, 1407, 1417, 12416, 12406, 12410, 1760,12404, 1721, 1751, 12010, 10400, 12016, 10720, 1701, 1720VPN, 1941/K9, 1941W-A/K9, 2000, 2500, 2102, 2202, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2801, 2821, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2516, 2610, 2611, 2612, 2613, 2620, 2621, 2501FRADFX, 2501LANFRADFX, 2502LANFRADFX, 2610M, 2611M, 2610XM, 2611XM, 2620XM, 2621XM, 2650XM, 2651XM, 2691, 2650, 2651, 2811, 2851, 2901/K9, 2911/K9, 2921/K9, 2951, 2951/K9, 3000, 3825, 3101, 3102, 3103, 3104, 3202, 3204, 3220, 3845, 3620, 3640, 3251, 3660, 3661Ac, 3661Dc, 3662Ac, 3662Dc, 3662AcCo, 3662DcCo, 3631, 3745, 3725, 3825, 3845, 3925, 3945, 4000, 4500, 6000, 6100, 6130, 6260, 6400, 6400Nrp, 677i, 674, 6400UAC, 761, 762, 765, 766, 771, 772, 775, 776, 751, 752, 753, 7000, 7010, 7507, 7513, 7505, 4700, 7206, 7576, 7204, 7202, 7206VXR, 7204VXR, 7507z, 7513z, 7507mx, 7513mx, 7120At3, 7120Ae3, 7120Smi3, 7140Dualt3, 7140Duale3, 7140Dualat3, 7140Dualae3, 7140Dualmm3, 7750Mrp200, 7120Quadt1, 7120T3, 7120E3, 7140Ocutt1, 7140Dualfe, 7750Ssp80, 7609OSR, 7750, 7603, 7606, 7606-S, 7304, 7609, 7613, 801, 802, 803, 804, 805, 828, 806, 811, 8110, 813, 8510, 8515, 826QuadV, 826, 827QuadV, 811, 827, 831837,827H, 836, AS5200, AS2509RJ, AS2511RJ, AS5300, AS5800, AS5400, AS5350, ASR 1000, ASR1002-X,ASR 1004 AIR-AP1120B-A-K95, ASR 1006, ASR 9000, Cat6000, CS500, Catalyst6kMsfc2, Catalyst5kRsfc, Catalyst6kMsfc, Catalyst295024GDC, Catalyst3200, Catalyst3100, Catalyst1800, Catalyst1601, Catalyst3001, CE7305, CE510, DPA7630, IAD2430, IAD2431, IAD2432, IAD2431-8FXS, IAD2431-16FXS, IAD2431-1T1E1, IAD2432-24FXS, MC3810, Mc3810V3, ONS15540ESPx, Pro1003, Pro1004, Pro1005, Pro2500PCE, Pro2501, Pro2503, Pro2505, Pro2507, Pro2509, Pro2511, Pro2514, Pro2516, Pro2519, Pro4500, Pro751, Pro752, Pro753, Pro765, Pro766, Pro2520, Pro2522, Pro2524, Pro1601, Pro1602, Pro1603, Pro1604, Pro2502, Pro2504, Pro2506, Pro2508, Pro2510, Pro2512, Pro2513, Pro2515, Pro2517, Pro2518, Pro2523, Pro2525, Pro4700, SOHO77, SOHO76, SOHO97, SOHO91, SOHO96, UBR7246, UBR904, UBR7223, UBR924, UBR7246VXR, UBR912C, UBR912S, UBR914, UBR925, UBR10012, UBR7111, UBR7111E, UBR7114, UBR7114E, UBR905, WSX5302, WS-C6506-E, ASR 1002-F, VG 202, SOHO 78, VG 204, C3900-SPE200, CISCO3945-CHASSIS, C819G-4G-A-K9(CISCO 891), ASR1001, WS-C3560X-24T-S, WS-C3560X-48T-L, WS-C2960C-8TC-L, WS-C2960C-8PC-L, WS-C3560C-8PC-S, WS-C2960+48PST-L, WS-C2960+24PC-L,ASR1002-X,ISR4300,ISR4321,ISR4321 /K9,ISR4451,ISR4331,Catalyst 6807-XL, ISR4351</p>
Operating System and Firmware Versions	<p>Boot Upgrade, OS Upgrade For 1801W Models: 12.4(4)XC3, 12.4(24)T1 For 1941/K9, 941W-A/K9, 2901/K9, 2911/K9, 2921/K9, 2951/K9, 3925, and 3945 Models: 12.4(24.6) For 2951 Models: 12.4(23.15.8), 12.4(24.6) For 1841 Models: 15.x For WS-C3560, WS-C2960 Models: 15.1(3)S2, 15.0(2)SE4, 15.0(2)SE7</p>

Communication Protocols	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2v3, Account, Privilege
Operating System Management Protocols	FTP, TFTP
Quick Commands	View Routes View ARP View FrameRelay Map View Interfaces Clear Interface Counters View Diagnostic View Processor CPU View Network Management Events Resync Append ACL Rule Delete ACL

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:
 - sysObjectID value contains 1.3.6.1.4.1.9
 - sysDescription value contains IOS or Internetwork Operating System
 - sysServices value indicates a Layer 3 device
 - Cisco Rom ID (.1.3.6.1.4.1.9.2.1.1.0) is retrievable
- ◆ Terminal:
 - Device responds with an error to **show vtp counters**
 - **show version** response contains “Internetwork Operating System” or “Cisco IOS”
 - **show version** response should not contain "AIR-AP"
 - CiscoSysID should not contain either of "9.1.164" or "9.1.107" or "9.1.533" or "9.1.507" or "9.1.525" Cisco IOS

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - startup configuration : show start
 - running configuration: show run
 - VTP Configuration: show VTP
 - SDM Configuration: show SDM
- ◆ SNMP/TFTP
 - Devices using OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.55.ipAdress -> remoteFilename
 - Devices using CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.2.id -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.3.id -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.4.id -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.5.id -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.14.id -> 1 (start transfer)
- ◆ Terminal/TFTP
 - copy running-config tftp
 - copy startup-config tftp

Configuration Deploy

- ◆ Terminal

- From the console prompts, the device is put into configuration mode using enable 15 and configure terminal, and if successful, the configuration is issued line-by-line with checks for banner content and invalid input messages.
- If a banner is entered using banner motd X, the termination banner character X is stored, and there are no prompt checks until the final banner line is entered or a new prompt is detected.
- ◆ SNMP/TFTP
 - Devices supporting OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.50.ipAddress -> remoteFilename
 - Devices supporting CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.2.id -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.3.id -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.4.id -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.5.id -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.114.id -> 1 (start transfer)

Commit config

- ◆ SNMP:
 - .1.3.6.1.4.1.9.2.1.54.0 -> 1
- ◆ Terminal:
 - copy running-config startup-config

Credential management

- ◆ For non AAA user account password
 - conf t
 - no aaa new-model
 - For type 0
 - line console 0
 - For type 1
 - line aux 0
 - login
 - password
 - exit
- ◆ For AAA user account password
 - "conf t"
 - "aaa new-model"
 - "no username <oldUser>"
 - "username <username> privilege <userLevel> password <password>"

- "username <username> password <password>"
- "exit"
- ◆ For Privilege password
 - Check for RADIUS or TACAS
 - "conf t"
 - "sh run"
 - "no enable secret level"
 - "no enable password level"
 - "enable secret level <level> <newPrivPass>"
 - "enable password level <level> <newPrivPass>"
 - "exit"
- ◆ SNMP (v1v2)
 - term length 0"
 - show run | include community"
 - "show run"
 - "conf t"
 - "snmp-server community <newSnmpCommunity> <view> <type> acl"
 - "no snmp-server community <oldSnmpCommunity>"
 - "exit"
- ◆ SNMP v3
 - "conf t"
 - "term length 0"
 - "snmp-server user"
 - "show snmp user"
 - "show snmp group"
 - "no snmp-server engineID local "
 - "snmp-server engineID local"
 - "snmp-server context <context name>"
 - "snmp-server view <view name>"
 - "snmp-server group <group name>"
 - "snmp-server user <user name> <group name> v3 encrypted auth (md5|sha) <password> (priv des|des56|aes 128|aes 192|aes 192) <password>"
 - "no snmp-server user <user name> <group name> v3"

Operating System management

- ◆ "term length 0"
- ◆ "config-register 0x2102"
- ◆ "show file systems"
- ◆ "reload"
- ◆ "hw-module module <module Number> reset"
- ◆ "hw-module standby reload"
- ◆ "archive download-sw /overwrite tftp://<server IP Address>/<image name>"
- ◆ "archive download-sw /safe tftp://<server IP Address>/<image name>"
- ◆ "write memory"
- ◆ archive download-sw /overwrite ftp:<username>:<password>@//<server IP Address>/<image name>
- ◆ archive download-sw /safe ftp:<username>:<password>@//<server IP Address>/<image name>

Device monitoring

- ◆ show run
- ◆ show start
- ◆ show version
- ◆ show config
- ◆ show interfaces
- ◆ configure term
- ◆ terminal length 0
- ◆ exit
- ◆ write memory
- ◆ reload
- ◆ copy running-config tftp
- ◆ copy startup-config tftp
- ◆ copy running-config startup-config
- ◆ copy tftp running-config
- ◆ show file systems
- ◆ show module
- ◆ show vtp counters
- ◆ show memory summary
- ◆ dir
- ◆ dir nvram:

- ◆ dir flash:
- ◆ squeeze flash:
- ◆ show priv
- ◆ show bootvar
- ◆ show snmp contact
- ◆ show snmp location
- ◆ show interface | include is
- ◆ show sdm prefer

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	CopyToStart , Reboot	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP, SSH/SCP
startup	Yes	Yes	CopyToStart , Reboot	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	Yes	No
OSPF Settings	Yes	No
Physical Hardware	Yes	Yes

Attributed data	Terminal	SNMP
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No
VTP	Yes	No
SDM	Yes	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Cisco IOS - Out-of-Sync

- ◆ When a SNMP/TFTP mechanism is used with only a Community String credential, the Running against Startup Configuration Out-of-Sync icon is not displayed. A valid Account and/or Privilege Password credential is needed to pull the Startup configuration on Cisco IOS devices.

Cisco IOS Update

- ◆ **Issue:** An issue exists where the OS image resided in bootflash, but was not the boot loader image. Additionally, the system image file was not in the show version command. In this case, the application could not free space in the target location. Manual intervention is needed to free space.

When there is insufficient space in the target location for an OS update on Cisco IOS devices with Class A file systems, the system attempts to free up additional space by deleting and squeezing the system image name displayed in the show version command.

For example:

```
r2621-vpn uptime is 6 weeks, 5 days, 1 hour, 0 minutes
```

```
System returned to ROM by reload
```

```
System image file is "flash:c2600-ik9o3s3-mz.122-15.T9.bin"
```

- ◆ **Resolution:** Manually, complete a delete and squeeze on that filename before beginning the OS update.

Cisco 3845

- ◆ Memory is not currently supported for the Cisco 3845.

Cisco 7206

- ◆ **Issue:** Cisco Model 7206 does *not* correctly display the Hardware Controller I/O Controller version. It incorrectly displays the version as 0.0. This issue is present with IOS Version 12.0(4)XE2, and not in Version 12.2(25)S2.
- ◆ **Resolution:** Cisco Model 7206 should be upgraded to a **new IOS version**.

TFTP Pushes May Fail Silently

- ◆ Silent configuration command failures may occur when using any of the TFTP transfer methods (snmp/tftp, ssh/tftp, or telnet/tftp). Error status, if any, is being missed from the device following the transfer.

TACACS+ Implementation

- ◆ **Issue:** Some versions of IOS have a TACACS+ implementation issue that causes additional characters to be added to the login User Name. When this occurs, it may cause occasional login failures.
- ◆ **Resolution:** Modify a custom version of the stdlib/stdterm.inc file to issue a backspace character before the username as shown below.
 1. Make a directory named \$VOYENCE_HOME/custompackage/stdlib
 2. Copy the file \$VOYENCE_HOME/package/stdlib/stdterm.inc to \$VOYENCE_HOME/custompackage/stdlib/stdterm.inc
 3. Change the termLogin() function in this new file:
 4. Search for: send(session,userId+stdEOL,true);
 5. Change to: send(session,asc(0x08)+userId+stdEOL,true);
 6. After making the change, restart the device server services.

Cisco IOS Router - Running Configuration Contents

- ◆ Running configuration contents of the following form must be removed prior to pushing, or the resulting job will fail based on “Invalid input” messages from the device when the data values following the “certificate self-signed” line are processed:

```
crypto pki certificate chain TP-self-signed-2725887360
```

```
certificate self-signed 01
```

```
3082024C 308201B5 A0030201 02020101 300D0609 2A864886 F70D0101  
04050030
```

```
31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D  
43657274
```


Cisco IOS Switch

Device Type	Switch
	<p>Catalyst Models: 1000, 1100, 1116, 116C, 116T, 1200, 1220, 1220c, 1220i, 1400, 1420, 1600, 1601, 1800, 1900, 1900c, 1900i, 1900 Lite Fx, 1912C, 2200, 2820, 2900, 2980ga, 2908xl, 2912MfXL, 2912XL, 2916, 2924CXL, 2924CXLv, 2924MXL, 2924XL, 2924XLv, 2926, 2940 8TF, 2940 8TT, 2948g, 2950-12, 2950-24, 2950-24C, 2950 24GDC, 295024LREG, 295048T, 2950 St24LRE997, 2950 t24, 2955C12, 2955T12, 297024, 297024TS, 2980g, 3000, 3001, 3100, 3200, 3201 WMIC, 3500, 3508GXL, 3512XL, 3524XL, 3550-12T, 3550-24, 3550-48, 3560-24PS, 3560-24TS, 3560-48PS, 3560-48TS, 3560G-24PS, 3560G-24TS, 3560G-48TS, 375024, 375024ME, 375024T, 375024TS, 375048, 3750G16TD, 3750Ge12Sfp, 37xxStack, 3900, 3920, 4000NAM, 4003, 4006, 4503, 4506, 4507, 4510, 4912g, 4948, 4948-10G, 4k Gateway, 5000, 5002, 5500, 5505, 5509, 5k Rsfc, 6006, 6009, 6506, 6509, 6509neb, 6513, 6k Msfc, 6k Msfc2, 6knam, 8510 msr, 8515 msr, 8540csr, 8540msr, 9006, 9009, 3560V2-48TS, 3560V2-24TS, 2350-48TD</p> <p>IE3000, IE-3000-4TC, ME3400, ME-C3750-24TE, WS-CBS3020-HPQ, WS-CBS3032-DEL, WS-CBS3120G-S, WS-CBS3110, WS-C2960G-24TC-L, WS-C2960-48TT-S, WS-C3750-24ME, WS-C3750-48TS, WS-C6509, WS-C3560V2-48TS, WS-C3560V2-24TS, WS-C3750-24TS, WS-C2350-48TD, WS-C4948-10GE, WS-C2960-24LT-L, WS-C3560-12PC-S, WS-C2960-8TC-S, WS-C3560V2-48PS, SM-ES3G-16-P, WS-C3560X-48P, WS-C3560X-24P, WS-C3560V2-24PS, WS-C4006, WS-C4948, WS-C3560E-48PD, WS-C2960-8TC-L, WS-C2960G-8TC-L, WS-CBS3130X-S-F, WS-CBS3012-IBM-I, WS-C2960-24PC-S, WS-C2960-48PST-S, WS-C2960S-24PS-L, ME-3600X-24FS-M, WS-C4510RPlusE, CiscoSmXd3k48Ge2SFPPoe, WS-C4500X-32, WS-C4500X-16, CAT38xxStack, WS-C3850-48P, WS-C3850-24T, WS-C3850-48T, WS-C3850-24P, WS-C3850-48F, WS-C3850-12S, WS-C3850-24S, WS-C3850-24U, WS-C3850-48U, WS-C3850-24XU, WS-C3850-12X48U, WS-C3850-12XS, WS-C3850-16XS, WS-C3850-24XS, WS-C3850-48XS, CAT36xxStack, WS-C3650-24TS, WS-C3650-48TS, WS-C3650-24PS, WS-C3650-48PS, WS-C3650-24TD, WS-C3650-48TD, WS-C3650-24PD, WS-C3650-48PD, WS-C2960X-48FPS-L, WS-C2960X-48FPD-L, WS-C3560-24PS-S, WS-C2960XR-24PS-I, WS-C3750X-12S, WS-C3750X-24, WS-C3750X-48P, WS-C3750X-48T, WS-C3560V2-24PS, WS-C3560V2-48PS, WS-C3750V2-24PS, WS-C3750V2-48PS, WS-C4507RPlusE, WS-C6503-E, C9300, C9300-48P, C9300-48T-E, C9300-24T-E, C9300-48P-A, C9300-48P-E, C9300-24P-E, C3560CX-8PC-S</p>
Specific Model(s)	
Operating System and Firmware Versions	<p>Boot Upgrade, OS Upgrade For IE-3000-4TC Models: 12.2(0.0.109)EX For WS-C2960G-24TC-L Models: 12.2(44)SE LAYER_2, For WS-C4500X-XX Models: 03.04.05.SG</p>
Communication Protocols	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap

Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2, v3, Account, Privilege
Operating System Management Protocols	FTP, TFTP
Quick Commands	View ARP View Interfaces View Vlans View Logs View CDP Neighbors Resync Clear_Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following items are used to provide information about your device (Host Name, Type, Vendor, Model, Operating System, and Serial Number).

- ◆ SNMP
 - sysObjectID value contains "1.3.6.1.4.1.9" or "1.3.6.1.4.1.11"
 - sysDescription value contains "IOS" or "Internetwork Operating System"
 - sysServices value should not indicate a Layer 3 device but a Layer 2 device
 - Cisco Rom ID (.1.3.6.1.4.1.9.2.1.1.0) is retrievable
- ◆ Terminal

- Device responds positively to **show vtp counters**
- "term length 0" should get to standard enable or disable prompt
- **show version** response contains "Internetwork Operating System" or "Cisco IOS"
- **show version** response should not be IOSXR.
- CiscoSysID should not contain either of "9.1.164" or "9.1.107" or "9.1.533" or "9.1.507" or "9.1.525"
- **show interfaces** should respond positively

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - startup configuration : show start
 - running configuration: show run
 - VTP Configuration: show VTP
 - SDM Configuration: show SDM
- ◆ SNMP/TFTP
 - Devices using OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.55.ipAdress -> remoteFilename
 - Devices using CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.2.id -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.3.id -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.4.id -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.5.id -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.14.id -> 1 (start transfer)
- ◆ Terminal/TFTP
 - copy running-config tftp
 - copy startup-config tftp
- ◆ For VLAN Database
 - Via Term
 - VLAN Text
 - "vlan database
 - show current
 - Via Term/TFTP - Get the partition name using the following:

- "dir flash:"
- "dir const_nvram:"
- "dir cat4000_flash:"
- "dir nvram:"
- "copy <partitionName>:/vlan.dat tftp://<Server IP Address>/<local filename>"
- Term/SCP
 - SCPget vlan.dat

Configuration Deploy

- ◆ Terminal
 - From the console prompts, the device is put into configuration mode using enable 15 and configure terminal, and if successful, the configuration is issued line-by-line with checks for banner content and invalid input messages.
 - If a banner is entered using banner motd X, the termination banner character X is stored, and there are no prompt checks until the final banner line is entered or a new prompt is detected.
- ◆ SNMP/TFTP
 - Devices supporting OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.50.ipAddress -> remoteFilename
 - Devices supporting CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.2.id -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.3.id -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.4.id -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.5.id -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.114.id -> 1 (start transfer)

Commit config

- ◆ SNMP
 - .1.3.6.1.4.1.9.2.1.54.0 -> 1
- ◆ Terminal
 - copy running-config startup-config
 - For Binary vlan database:
 - copy tftp://<server IP Address>/<vlan filename> <vlan partition>:vlan.dat

Credential management

- ◆ Check for RADIUS or TACAS, if true fail the operation.
 - term length 0
 - sh run

- ◆ For non AAA user account password
 - conf t
 - no aaa new-model
 - For type 0
 - line console 0
 - For type 1
 - line aux 0
 - login
 - password
 - exit
- ◆ For AAA user account password
 - "conf t"
 - "aaa new-model"
 - "no username <oldUser>"
 - "username <username> privilege <userLevel> password <password>"
 - "username <username> password <password>"
 - "exit"
- ◆ For Privilege password
 - Check for RADIUS or TACAS
 - "conf t"
 - "sh run"
 - "no enable secret level"
 - "no enable password level"
 - "enable secret level <level> <newPrivPass>"
 - "enable password level <level> <newPrivPass>"
 - "exit"
- ◆ SNMP (v1v2)
 - term length 0"
 - show run | include community"
 - "show run"
 - "conf t"
 - "snmp-server community <newSnmpCommunity> <view> <type> acl"
 - "no snmp-server community <oldSnmpCommunity>"
 - "exit"

- ◆ SNMP v3
 - "conf t"
 - "term length 0"
 - "snmp-server user"
 - "show snmp user"
 - "show snmp group"
 - "no snmp-server engineID local "
 - "snmp-server engineID local"
 - "snmp-server context <context name>"
 - "snmp-server view <view name>"
 - "snmp-server group <group name>"
 - "snmp-server user <user name> <group name> v3 encrypted auth (md5|sha) <password> (priv des|des56|aes 128|aes 192|aes 192) <password>"
 - "no snmp-server user <user name> <group name> v3"

Operating System management

- ◆ "term length 0"
- ◆ "config-register 0x2102"
- ◆ "show file systems"
- ◆ "reload"
- ◆ "hw-module module <module Number> reset"
- ◆ "hw-module standby reload"
- ◆ "archive download-sw /overwrite tftp://<server IP Address>/<image name>"
- ◆ "archive download-sw /safe tftp://<server IP Address>/<image name>"
- ◆ "write memory"
- ◆ archive download-sw /overwrite ftp:<username>:<password>@//<server IP Address>/<image name>
- ◆ archive download-sw /safe ftp:<username>:<password>@//<server IP Address>/<image name>

Device monitoring

- ◆ show run
- ◆ show start
- ◆ show version
- ◆ show config
- ◆ show interfaces
- ◆ configure term

- ◆ terminal length 0
- ◆ exit
- ◆ write memory
- ◆ reload
- ◆ copy running-config tftp
- ◆ copy startup-config tftp
- ◆ copy running-config startup-config
- ◆ copy tftp running-config
- ◆ show file systems
- ◆ show module
- ◆ show vtp counters
- ◆ show memory summary
- ◆ dir
- ◆ dir nvram:
- ◆ dir flash:
- ◆ squeeze flash:
- ◆ show priv
- ◆ show bootvar
- ◆ show snmp contact
- ◆ show snmp location
- ◆ show interface | include is
- ◆ ping
- ◆ view ip route
- ◆ view arp
- ◆ view ip interface brief
- ◆ clear counters
- ◆ view process cpu
- ◆ view management event
- ◆ copy run start
- ◆ traceroute "ip-addr"
- ◆ view vlan
- ◆ view logging
- ◆ view cdp neighbors detail
- ◆ view frame-relay map

- ◆ view diag

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	CopyToStart , Reboot	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP, SSH/SCP
startup	Yes	Yes	CopyToStart , Reboot	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP, SSH/SCP
vlan.dat	Yes	Yes	Reboot	Binary	TELNET/TFTP, SSH/TFTP, SSH/SCP
vlan text	No	Yes	NA	ASCII	Telnet, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	Yes	No
OSPF Settings	Yes	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

ME-C3750-24TE and WS-C3750-24ME - Display Error

- ◆ The ME-C3750-24TE and WS-C3750-24ME do not display identically, depending on SNMP or Terminal pull of SystemProperties using the sysObjectID to get the model.

Cisco IOS Switches - Missing VLAN Database Command

- ◆ The ME3400 does not return VLAN text, due to lack of support for the **vlan database** command. This will appear in the scheduler with a message of the form: *Dialog getVLANs failed: Warning, can not resolve input value (ConfigFile:vlan text.Content)*

Cisco IOS Switches - VLAN Databases

- ◆ To pull VLAN Databases successfully, the device must be discovered as a Cisco IOS Switch.
- ◆ If it is not discovered as a Cisco IOS switch, you must edit the IOSModels.XML in **\$VOYENCE_HOME/custompackage /pkgxml**, and then **re-discover the device**.

Cisco IOS Switches - Missing Hardware Information

- ◆ **Issue:** Cisco IOS Switches with OS version 12.0 (5.2) XU do not display device OS information correctly in the Device Hardware tab.
- ◆ **Resolution:** Disable all SNMP Credentials, and then Pull the Hardware using Non-SNMP. Doing this ensures the memory size is pulled correctly, and is then populated using the terminal commands. This must be completed before beginning an OS Upgrade.

Cisco IOS - Out-of-Sync

- ◆ When a SNMP/TFTP mechanism is used with only a Community String credential, the Running against Startup Configuration Out-of-Sync icon is not displayed. A valid Account and/or Privilege Password credential is needed to pull the Startup configuration on Cisco IOS devices.

Cisco IOS Upgrade - SNMP Information

- ◆ There is no available OS install target for the 3524 Switch.
 - **Issue:** SNMP information is not present for this model. The information must be retrieved from the IOS CLI.
 - **Resolution:** Remove all SNMP community strings from the communication settings of the device, and re-pull the hardware specification. This provides the needed memory information to allow for an OS upgrade.

Cisco IOS Update

- ◆ **Issue:** An issue exists where the OS image resided in bootflash, but was not the boot loader image. Additionally, the system image file was not in the show version command. In this case, the application could not free space in the target location. Manual intervention is needed to free space.

When there is insufficient space in the target location for an OS update on Cisco IOS devices with Class A file systems, the system attempts to free up additional space by deleting and squeezing the system image name displayed in the show version command.

- ◆ For example:

```
r2621-vpn uptime is 6 weeks, 5 days, 1 hour, 0 minutes
```

```
System returned to ROM by reload
```

```
System image file is "flash:c2600-ik9o3s3-mz.122-15.T9.bin"
```

- ◆ **Resolution:** Manually, complete a delete and squeeze on the filename before beginning the OS update.

TFTP Pushes May Fail Silently

- ◆ Silent configuration command failures may occur when using any of the TFTP transfer methods (SNMP/TFTP, SSH/TFTP, or Telnet/TFTP). Error status, if any, is being missed from the device following the transfer.

TACACS+ Implementation

- ◆ **Issue:** Some versions of IOS have a TACACS+ implementation issue that causes additional characters to be added to the login User Name. When this occurs, it may cause occasional login failures.

- ◆ **Resolution:** Modify a custom version of the stdlib/stdterm.inc file to issue a backspace character before the username as shown below.

1. Make a directory named \$VOYENCE_HOME/custompackage/stdlib
2. Copy the file \$VOYENCE_HOME/package/stdlib/stdterm.inc to \$VOYENCE_HOME/custompackage/stdlib/stdterm.inc
3. Change the termLogin() function in this new file:
 - Search for: send(session,userId+stdEOL,true);
 - Change to: send(session,asc(0x08)+userId+stdEOL,true);
 - After making the change, restart the device server services.

Cisco IOS Switch — Running Configuration Contents

- ◆ Running configuration contents of the following form must be removed prior to pushing, or the resulting job will fail based on invalid input messages from the device when the data values following the *certificate self-signed* line are processed:

```
crypto pki certificate chain TP-self-signed-2725887360
```

```
certificate self-signed 01
```

```
3082024C 308201B5 A0030201 02020101 300D0609 2A864886 F70D0101  
04050030
```

```
31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D  
43657274
```

Cisco IOS XR

Device Type	Router
Specific Model(s)	CRS-1, 12000XR Series,NCS-5500
Operating System and Firmware Versions	Version 3.4 and higher
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	SSH/TFTP, Telnet/TFTP, SSH/FTP, Telnet/FTP (FTP protocols require external FTP server)
Quick Commands	View Routes View ARP View Interfaces Clear Interface Counters

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - Should have a valid Cisco ROM Id ("1.3.6.1.4.1.9.2.1.1.0") OR SysObjectID should contain "1.3.6.1.4.1.9"
 - SysDescription should contain "IOS XR"
- ◆ Term
 - **show version** output should contain "isco IOS XR "
 - Model No and Version can be retrieved from **show version** output.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show run"
 - "show install active summary"
- ◆ Term/TFTP
 - "copy running-config tftp:/<Server IP Address>/<Local filename>"

Configuration deploy

- ◆ Term
 - conf t\
"
 - Send configuration line by line to the device as device commands
 - "commit"
 - In case of "commit" failure
"show configuration failed"
"exit"
- ◆ Term/TFTP
 - "copy tftp://<SERVERIPADDR>/<configFile> running-config"
 - In case of failure
"show configuration failed"

Credential management

- ◆ SNMP v1/v2
 - "config"
 - "snmp-server community <newSnmpCommunity> RO SystemOwner"
 - "snmp-server community <newSnmpCommunity> RW SystemOwner"

- "no snmp-server community < oldSnmpCommunity >"
- "commit"
- "exit"
- ◆ Account
 - "show tacacs server-groups"
 - "show radius server-groups"
 - "show aaa userdb"
 - "conf"
 - "username < userName>"
 - "password 0 < password >"
 - "group root-system"
 - "group <retrieved group info>"
 - "commit"
 - "exit"
 - "no username < oldUser >"

Operating System management

- ◆ Following commands are being used for OS Upgrade of IOS XR devices via transfer protocol FTP or TFTP
 - "install remove inactive sync"
 - "install add <protocol>://<server IP Address>/<image Name> sync"
 - "install activate <package list> sync "
 - "y"
 - "install commit"

Device monitoring

- ◆ "term length"
- ◆ "show version"
- ◆ "show inventory chassis"
- ◆ "show memory summary"
- ◆ "show filesystem"
- ◆ "show version"
- ◆ "dir"
- ◆ "show diag"
- ◆ "ping "
- ◆ "show ip route"

- ◆ "show arp"
- ◆ "traceroute "
- ◆ "show ip interface brief"
- ◆ "clear counters"
- ◆ "conf t"
- ◆ "admin"
- ◆ "show hosts"
- ◆ "show cdp neighbors detail"
- ◆ "show interface "
- ◆ "show mac-address-table"
- ◆ "show run router static"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
admin	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
packages	No	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	Yes	No
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Cisco IOS XR Network Operating System

- ◆ The Cisco IOS XR - Secure Domain Router functionality is not supported.
- ◆ This device driver does *not* interface with the Cisco IOS XR's configuration store and commit lists.

Cisco IOS XR - Login Credentials

- ◆ It is advisable to use login credentials that belong to the **root-system** group, for this driver. All credentials created by this driver will belong to the root-system group.
- ◆ When rolling a login credential, an attempt to place the new user in the same user groups with the old user is made.
- ◆ Login credentials cannot be rolled if TACACS or Radius authentication is in use.
 - To identify if TACACS/Radius is in use, the **show [tacacs|radius] server-groups** command is used.
 - Login credentials will not be rolled if the output of the **show [tacacs|radius] server-groups** command has a global list of servers indicating external authentication is in use.

Cisco IOS XR - SNMP Communities

- ◆ It is advisable to use SNMP communities that belong to the **SystemOwner** attribute set, with this driver. All communities created by this driver will belong to the SystemOwner attribute set.

Cisco IOS XR - Configuration Changes

- ◆ When pushing config changes, If a commit fails when pushing configuration changes to the device, the **show configuration failed** command is issued. The results for the **show configuration failed** command is included in the output of the jobs result text.
- ◆ Push to the user mode config is currently the only capture command supported.

Cisco Intrusion Prevention System (IPS)

Device Type	Firewall
Specific Model(s)	IPS-4255-K9
Operating System and Firmware Versions	6.1
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP, SCP
Quick Commands	Ping, Traceroute, View Interfaces, View Logs

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	No
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains “1.3.6.1.4.1.9.”
- Serial Number should be available from “.1.3.6.1.2.1.47.1.1.1.1.11.1” OID
- ◆ Terminal
 - The output of **show version** command contains “Cisco Intrusion Detection System” or “Cisco Intrusion Prevention System”
 - Model name and Serial Number should be available from the output of **show version** command
 - Hostname is available from the output of **show conf | include host-name** command.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration

Configuration dDeploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.

Credential management

- ◆ Account
 - username <username> password <password> privilege administrator
 - no username <userName>
- ◆ SNMP
 - service notification
 - (read-only | read-write) –community <newSnmpCommunity>

Operating System

- ◆ upgrade ftp|scp://<username>@<serverIpAddress>/<imageName>

Device Monitoring

- ◆ term length
- ◆ show privilege
- ◆ show version
- ◆ show diag
- ◆ show configuration

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy Config to Backup	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Cisco Intrusion Prevention System (IPS)

- ◆ Banner input is error prone. Do *not* put the word **exit** on a line by itself in a banner.
- ◆ This driver was built on an IPS-4255 but should manage any Cisco IPS/IDS 42xx system.

Cisco IronPort

Device Type	Server
Specific Model(s)	S360
Operating System and Firmware Versions	5.6.0-626
Communication Protocols	SSH, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Ping Traceroute Reboot

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - Model name should be retrievable and should resolve to pkgID.
 - sysObjectID should have "1.3.6.1.4.1.8072"
 - sysDecription should have "IronPort"
- ◆ Term
 - **version** command should have "IronPort" in the output.
 - Should be able to get the hostname using command **showconfig**
 - Should be able to get the model number using command **version**

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "showconfig"
- ◆ SSH/FTP or SSH/SCP
 - "saveconfig"
 - Use FTP or SCP to get the configuration file

Configuration deploy

- ◆ SSH/FTP or SSH/SCP
 - FTP or SCP the configuration file to the device
 - "loadconfig"
 - Send "2" and then "voyence.cfg" to select the uploaded configuration file.

Credential management

- ◆ SNMP v1/v2
 - "snmpconfig"
 - "SETUP"
 - "Y"
 - "⟨new SNMP Community⟩"
- ◆ Account
 - "userconfig"
 - "NEW"
 - "⟨user name⟩"

- “1”
- “<password>”
- "commit" with "Added new user"
- "userconfig"
- "DELETE"
- <Old username>
- Send “1” and “Y”
- “commit” with "Deleted the old user"

Operating System management

- ◆ NA

Device monitoring

- "ping "
- "traceroute "
- “reboot”
- "version"
- "showconfig"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
current	Yes	Yes	NA	ASCII	SSH, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No

Attributed data	Terminal	SNMP
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Cisco IronPort

- ◆ Only Total Memory is available.
- ◆ Non-volatile memory is not available.
- ◆ If a user is logged in, the account credential cannot be deleted. To enable the deletion of the account credentials, the session must be disconnected and re-connected using new credentials.
- ◆ adminStatus and operationalStatus of the interfaces are not available when using terminal. The default value is UP.

Cisco Lightstream

Device Type	ATM Switch
Specific Model(s)	LS 1010, LS 1015
Operating System and Firmware Versions	NA
Communication Protocols	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, v3, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	No
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID value contains "9.1.164" or "9.1.107"
 - sysServices value should indicate a Layer 3 device

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - startup configuration : show start
 - running configuration: show run
- ◆ SNMP/TFTP
 - Devices using OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.55.ipAddress -> remoteFilename
 - Devices using CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.2.id -> 1 (TFTP)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.3.id -> 1 (network file)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.4.id -> type (4: running, 3: startup)
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.5.id -> serverIpAddress
 - .1.3.6.1.4.1.9.9.96.1.1.1.114.id -> 1 (start transfer)
- ◆ Terminal/TFTP
 - copy running-config tftp
 - copy startup-config tftp

Configuration deploy

- ◆ Terminal
 - From the console prompts, the device is put into configuration mode using enable 15 and configure terminal, and if successful, the configuration is issued line-by-line with checks for banner content and invalid input messages.
 - If a banner is entered using banner motd X, the termination banner character X is stored, and there are no prompt checks until the final banner line is entered or a new prompt is detected.
- ◆ SNMP/TFTP
 - Devices supporting OLD-CISCO-SYSTEM-MIB (running configuration only):
 - .1.3.6.1.4.1.9.2.1.50.ipAddress -> remoteFilename
 - Devices supporting CISCO-CONFIG-COPY-MIB (id is a unique integer):
 - .1.3.6.1.4.1.9.9.96.1.1.1.1.2.id -> 1 (TFTP)

- .1.3.6.1.4.1.9.9.96.1.1.1.1.3.id -> type (4: running, 3: startup)
- .1.3.6.1.4.1.9.9.96.1.1.1.1.4.id -> 1 (network file)
- .1.3.6.1.4.1.9.9.96.1.1.1.1.5.id -> serverIpAddress
- .1.3.6.1.4.1.9.9.96.1.1.1.1.14.id -> 1 (start transfer)

Commit config

- ◆ SNMP
 - .1.3.6.1.4.1.9.2.1.54.0 -> 1
- ◆ Terminal
 - copy running-config startup-config

Credential management

- ◆ Check for RADIUS or TACAS, if true fail the operation.
 - term length 0
 - sh run
- ◆ For non AAA user account password
 - conf t
 - no aaa new-model
 - For type 0
 - line console 0
 - For type 1
 - line aux 0
 - login
 - password
 - exit
- ◆ For AAA user account password
 - "conf t"
 - "aaa new-model"
 - "no username <oldUser>"
 - "username <username> privilege <userLevel> password <password>"
 - "username <username> password <password>"
 - "exit"
- ◆ For Privilege password
 - Check for RADIUS or TACAS
 - "conf t"
 - "sh run"

- "no enable secret level"
- "no enable password level"
- "enable secret level < level> <newPrivPass>"
- "enable password level <level> <newPrivPass>"
- "exit"
- ◆ SNMP (v1v2)
 - term length 0"
 - show run | include community"
 - "show run"
 - "conf t"
 - "snmp-server community <newSnmpCommunity> <view> <type> acl"
 - "no snmp-server community <oldSnmpCommunity>"
 - "exit"
- ◆ SNMP v3
 - "conf t"
 - "term length 0"
 - "snmp-server user"
 - "show snmp user"
 - "show snmp group"
 - "no snmp-server engineID local "
 - "snmp-server engineID local"
 - "snmp-server context <context name>"
 - "snmp-server view <view name>"
 - "snmp-server group <group name>"
 - "snmp-server user <user name> <group name> v3 encrypted auth (md5|sha) <password> (priv des|des56|aes 128|aes 192|aes 192) <password>"
 - "no snmp-server user <user name> <group name> v3"

Operating System management

- ◆ NA

Device monitoring

- ◆ show run
- ◆ show start
- ◆ show version
- ◆ show config

- ◆ show interfaces
- ◆ configure term
- ◆ terminal length 0
- ◆ exit
- ◆ show arp
- ◆ show access-lists

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP, SSH/SCP
startup	Yes	Yes	Reboot	ASCII	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	Yes	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco Nexus

Device Type	Switch
Specific Model(s)	1000V, 1010, 5010, 5020, 5672UP, C7010, C7018, MDS 9222i, 5548, 5596, 7009, 7210, 3064, 9508, 56128P, 6004, 9396, 9332, 9372PX, 7706, 3172, C9372, 9000, 3548, N3K-C3548P-10G, C7710, 9504, Nexus 3064-X, Nexus 3048, Nexus 3132, Nexus7718, C93108TC-EX, C93180LC-EX
Operating System and Firmware Versions	4.0(1a)N1(1a) For MDS 9222i Models: 4.1(3a) For 1000V Models: 4.0(4)SV1(1) For 7010 Models: 5.1(3) and 5.1(4) For 9508 Model: 6.1(2)I2(2) For 1010 Model: 4.2(1)SP1(5.1a) For 5672UP Model : 6.2(10) For 7210 Model : 7.0(5) For 9396 Model: 6.1(2)I3(2)
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs and Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	SCP, FTP
Quick Commands	View Routes View ARP View Interfaces Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes

Features Available	Support
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Cisco Nexus OS"
 - Serial number should be obtainable from ".1.3.6.1.2.1.47.1.1.1.1.11"
 - Get the sysObjectId
- ◆ Term
 - The software banner through command **show inventory** should have "Cisco Nexus" or "Cisco NX-OS"
 - Commands **show version**, **show inventory** and **show snmp** should be able to return system properties information.
 - **show interface** command should return interface information.
 - sysObjectID value must be mapped by the retrieved model name from CiscoModels.xml.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show startup-config"
 - "show running-config"
- ◆ Term/TFTP
 - "copy startup-config tftp://<Server IP Address>/<local filename>"
 - "copy running-config tftp://<Server IP Address>/<local filename>"

Configuration deploy

- ◆ Term
 - "configure terminal"

- Send configuration lines one by one as device commands.
- ◆ Term/TFTP
 - "copy tftp://<Server IP Address>/<local filename> running-config "

Credential management

- ◆ SNMP v1/v2
 - "snmp-server community <new Community String> ro "
 - "snmp-server community <new Community String> rw "
 - "no snmp-server community <old Community String> ro"
 - "no snmp-server community <old Community String> ro"
- ◆ Account
 - "show aaa authentication"
 - "username <username> password <password> role network-admin"
 - "no username < old Username>"

Operating System management

- ◆ copy running-config startup-config
- ◆ copy [ftp|scp]://<user>@<server>//<imageName> bootflash:/// vrf management
- ◆ show install all status

Device monitoring

- ◆ "configure terminal"
- ◆ "terminal length 0"
- ◆ "end"
- ◆ "copy running startup"
- ◆ "show inventory"
- ◆ "show version"
- ◆ "show snmp"
- ◆ "dir ?"
- ◆ "reload"
- ◆ "show users"
- ◆ "show module "
- ◆ "copy ?"
- ◆ "delete ?"
- ◆ "format ?"
- ◆ "ping "
- ◆ "traceroute "

- ◆ "show ip interface vrf all"
- ◆ "show ip static-route vrf "
- ◆ "show ip arp vrf all"
- ◆ "show ip route vrf all"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
startup	No	Yes	NA	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Cisco Nexus

- ◆ The driver supports the MDS series running NX-OS if **Nexus** or **NX-OS** appears in the **show version** response, and the driver is successful in determining the identity, system properties, and interfaces for the device.
- ◆ The management VRF must have a default route configured or file transfers will fail.
- ◆ If the command **“system default switchport”** appears literally in the configuration, it must be removed or commented out before pushing with terminal, or the resulting **% Incomplete command** message will be treated as a failure, although the push content will be accepted. Same is the case with commands "switchport", "switchport mode fex-fabric" and "spanning-tree port type edge" in case of Cisco Nexus 7010 with 5.1(4) version.
- ◆ Privilege account rolls are not supported because accounts are role based, and credentials are give network-admin privileges. Any attempt to execute a job including privilege credential changes will fail.
- ◆ IP addresses and ARP table entries are not reported using SNMP.
- ◆ Config Change Detection is only supported using syslog monitoring.
- ◆ Switches running 4.0(4)SV1(1) have been observed to intermittently fail account credential rolls when both the account and password are changed.
 - A failsafe in the device prevents deletion of the original account, if the account is logged in.
 - The driver executes a *show users* command if this message is detected, but the account does not appear in the response.
 - Currently, only the account password can be successfully changed. This behavior is not observed on the hardware products.
- ◆ Push to start is not supported.
 - The **copy tftp startup** command is deprecated.
 - The config content is silently ignored, although the job shows as successful in the scheduler.
 - The recommended Cisco procedure of **write erase, reload, copy tftp running** cannot be implemented due to a high probability of the application and managed device being located on different subnets.
- ◆ Delete and Backup options are not available for OS Upgrade.
- ◆ In the case of SCP, copy of images takes about 10-15 minutes whereas via FTP, it takes only 1 to 2 minutes.
- ◆ The driver will attempt to reconnect once during upgrade when the session is lost due to switchover:

- The "show install all status" command is run if the session is successfully re-established. This command does not return to a command prompt on its own; Ctrl+C is required and is issued if the success message is encountered.
- In the event that it is not, the session will timeout after 15 minutes with no significant progress messages. The upgrade itself may in fact succeed, but NCM will mark the job as failed.
- The upgrade output is not currently analyzed to automate reboot of the CMP modules in the event that this is needed to complete the upgrade. This step must be performed manually (i.e., via cut-thru or by an external login).

Cisco Nexus 1000V

- ◆ The Nexus 1000v may not report IP addresses in the Interfaces tab, due to a limitation in the SNMP agent of the device.
- ◆ The Nexus 1000V virtual switch running 4.0(4)SV1(1) has been found to include commands that cannot be pushed back to the device from the command-line interface. Such content *must* be commented out or removed prior to scheduling a full configuration push or the job will fail (though other changes will effectively succeed). This behavior has *not* been observed for pushes using TFTP.

An example of these commands is included below; other forms may occur as well.

- limit-resource u4route-mem minimum 32 maximum 80
- limit-resource u6route-mem minimum 16 maximum 48

Cisco MGX

Device Type	Router
Specific Model(s)	8850 Wide Area Switch - MGX 8850 PXM-45 and MGX 8250 PXM-1
Operating System and Firmware Versions	5.2
Communication Protocols	Telnet, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Enable Automatic Backups Disable Automatic Backups Display Cards Display Card Display IMA Groups Display IMA Group Counters Display IMA Link Counters Display Alarms Display Hardware Alarms Display Software Alarms Display Port Counters Display Port Display Ports Display Connection Display Lines Display PNNI Node List Display PNNI Neighbor Display PNNI Link Display PNNI Routing Policy

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No

Features Available	Support
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - Matched model number for MGX devices must be retrieved from models file using sysObjectID
- ◆ Terminal
 - **dsplcnodeid** to get the chassis serial number
 - **dspcds** to get the node name
 - Determine the model number from models file.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "sesntimeout 2360"
 - "saveallcnf -v"
 - "ll CNF"
 - "dsplcnodeid"
 - "shellConn"
 - "setLogin"
 - FTP the image

Configuration deploy

- ◆ Term

- Send the configuration line by line to the device as device commands
- ◆ Term/FTP
 - "ll CNF"
 - "sesntimeout 1360"
 - "restoreallcnf -f < backupFile.filename>"
 - This command is issued after a backup capture is transferred to the machine using FTP. This backup is named in the revision history as "FILE: <BackupName> SAVED: <Date>" Sending the string as described will initiate the transfer and restoreallcnf command.
 - If these files are needed for manual restore procedures they can be found in the /tftpboot directory of the device server.
 - "y"

Credential management

- ◆ SNMP
 - "cnfsntp community <new Snmp Community> ro"
 - "cnfsntp community <new Snmp Community> rw"
- ◆ Account
 - "cnfpasswd"
 - <Old Password>
 - <New Password>

Operating System management

- ◆ NA

Device monitoring

- ◆ "dspifip"
- ◆ "cc"
- ◆ "dspcd"
- ◆ "dspcds"
- ◆ "version"
- ◆ "dsplicnodeid"
- ◆ "dspalms"
- ◆ "dspimagrps"
- ◆ "dspimagrpcnt "
- ◆ "dspimalncnt "
- ◆ "dsphwalm"
- ◆ "dspportcnt "

- ◆ "dspport "
- ◆ "dsports"
- ◆ "dspcon"
- ◆ " dspcons -port "
- ◆ " dspcons -vpi "
- ◆ " dspcons -vci "
- ◆ "dspls "
- ◆ "dsppnni-node"
- ◆ "dsppnni-node-list"
- ◆ "dsppnni-neighbor"
- ◆ "dsppnni-link"
- ◆ "dsppnni-routing-policy"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Cisco MGX - Restore Causes Device Reset and Loss of Service

- ◆ **Issue:** Restoring the device capture causes a device reset and loss of service.
- ◆ **Resolution:** Testing shows the loss of service is in the range of 2 to 5 minutes.

Cisco MGX - PXM-1 Card Shows Only Two Interfaces

- ◆ **Issue:** PXM-1 cards show only two interfaces.
- ◆ **Resolution:** The device SNMP agent only reports two interfaces. This is a limitation of the network device.

Cisco PXM-1 Cards - MIB not entirely Supported

- ◆ **Issue:** PXM-1 cards do not support the Entity MIB and hardware information is displayed differently than a PXM-45 card.
- ◆ **Resolution:** The models having PXM-1 cards require terminal access to collect hardware information.

Cisco PXM-1 Cards - No SSH support

- ◆ **Issue:** No SSH support for Cisco PXM-1 cards.
- ◆ **Resolution:** The Cisco PXM-1 cards does not support SSH.

Cisco PXM-1 Cards - Not Responding After saveallcnf Command

- ◆ **Issue:** PXM-1 cards can sometimes not respond after a saveallcnf command.
- ◆ **Resolution:** Device capture operations will not succeed if the device does not respond with the success status of the command.

Cisco RPM Cards - Cards not Reported in Hardware Output

- ◆ **Issue:** RPM Cards are not fully reported in the MGX hardware output.
- ◆ **Resolution:** RPM cards are reported under the RPM IOS hardware inventory and do not provide dspcd information at the terminal.

Cisco MDS

Device Type	Switch
Specific Model(s)	9124, 9134, 9216, 9216A, 9216i, 9509, 9513,9148,9506
Operating System and Firmware Versions	San-OS 3.0, 3.2, 3.3
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	View NAT Setup View ARP View Interfaces View VSANs View Logs View CDP Neighbors Resync Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID should have “1.3.6.1.4.1.9” (cisco enterprise id)
 - sysDescription should have “SAN-OS”
 - sysServices should be 0x06 (layer 2 and 3 flag)

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - “term length 0”
 - “show start”
 - “show run”
- ◆ SNMP/TFTP
 - Set “.1.3.6.1.4.1.9.2.1.55.<Server IP address>” to TFTP the config file

Configuration deploy

- ◆ SNMP/TFTP
 - Try to push vlan config separately if tagged
 - Set “.1.3.6.1.4.1.9.2.1.50.<SERVERIPADDR>” to start TFTP of the local config file
 - For copyToStart set “.1.3.6.1.4.1.9.2.1.54.0” to 1.
- ◆ Term
 - Send configuration one by one using command line.

Credential management

- ◆ SNMP v1/v2
 - To get the view and ACL information
 - “term length 0”
 - “show run | include community”
 - “show run”
 - “conf t”
 - “snmp-server community <newSnmpCommunity> <view> <community string type> <acl>”
 - “no snmp-server community <oldSnmpCommunity>”

- “exit”
- ◆ Account
 - "term length 0"
 - “show run”
 - "config term"
 - "username <username> password <password> role <userLevel>”
 - "username <username> password <password>
 - "no username <oldUser>”
 - “exit”
- ◆ Privilege
 - "term length 0"
 - "sh run"
 - "conf t"
 - "no enable secret level <level>”
 - "no enable password level <level>”
 - "enable secret level < level> <newPrivPass>”
 - "enable password level <level> <newPrivPass>”
 - “exit”
- ◆ SNMP V3
 - "config terminal"
 - "snmp-server user <securityName> network-admin <authProtPart+privPassPart>”
 - "no snmp-server user <oldsn>”

Operating System management

- ◆ NA

Device monitoring

- ◆ "show interface"
- ◆ "term length 0”
- ◆ "show system resources"
- ◆ "show arp"
- ◆ "show interface brief"
- ◆ "show vsan"
- ◆ "show logging"
- ◆ "show cdp neighbors detail"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP, SSH/SCP
startup	Yes	Yes	Reboot	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Cisco MDS

- ◆ If the device is upgraded to run NX-OS, it will **not** appear as a Cisco Nexus device class until it is re-discovered. It is not necessary to drop the device, but pre-Nexus config pushes may fail, depending on the content.

Cisco Wide Area Application Services (WAAS)

Device Type	Content Cache
Specific Model(s)	512, 612, 674, 7371
Operating System and Firmware Versions	4.8.0-12
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps and Syslogs
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces View CDP Neighbors Resync Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysDescription must have “Wide Area Application Services”
 - Model name is obtained from the following OIDs (in order):
 - 1.3.6.1.4.1.9.9.368.1.34.3.0
 - 1.3.6.1.4.1.2467.1.34.3.0
 - Part number column of the CISCO-ENTITY-ASSET-MIB for the chassis entry
- ◆ Term
 - Should be able to enter enable mode
 - **getModel** result should be able to mapped to a valid sysObjectID.
 - **show version** should have “Wide Area Application Services”

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show startup-config"
 - "show running-config"
- ◆ Term/TFTP
 - "copy startup-config tftp <SERVERIPADDR> <local configFile name>"
 - "copy running-config tftp <SERVERIPADDR> <local configFile name>"

Configuration deploy

- ◆ Term
 - “conf t”
 - Configuration is entered line by line
 - “exit”
 - To copy run to start, “copy running-config startup-config”
- ◆ Term/TFTP
 - "copy tftp <SERVERIPADDR> <local configfilename> startup-config"
 - "copy tftp <SERVERIPADDR> <local configfilename> startup-config"

Credential management

- ◆ SNMP v1/v2
 - “snmp-server community <newString>"

- "snmp-server community <newString> rw"
- "no snmp-server community <oldString>"
- "no snmp-server community <oldString> rw"

- ◆ Account
 - Enter enable mode
 - "conf t"
 - "username <username> password <password>"
 - "username <username> privilege <user Privilege Level>"
 - "no username <oldUser>"
- ◆ Privilege
 - Enter enable mode
 - "conf t"
 - "username admin password <newPrivPass>"

Operating System management

- ◆ NA

Device monitoring

- ◆ "show disk"
- ◆ "show disk current"
- ◆ "show hardware"
- ◆ "reboot"
- ◆ "show interface"
- ◆ "ping"
- ◆ "traceroute"
- ◆ "show arp"
- ◆ "no terminal more"
- ◆ "terminal length 0"
- ◆ "show cdp"
- ◆ "show ip interface"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco Wireless LAN Controller

Device Type	Switch
Specific Model(s)	2100 series, 4400 series. AIR-CT5508-K9, AIR-CT2504-K9, WS-SVC-WISM-1-K9, WS-SVC-WISM2-K9, AIR-CT5520-K9, AIR-CT8540-K9.
Operating System and Firmware Versions	4.0, 6.0.128.0, 7.6.130.0
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs and Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	View Routes Summary View Arp Switch View Interfaces Save Config

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP - Either of the following has to be found:
 - SysDescription should have “Cisco Controller”
 - SysObjID should be either:
 - 1.3.6.1.4.1.9.1.828
 - 1.3.6.1.4.1.14179.1.1.4.3
 - 1.3.6.1.4.1.14179.1.1.4.4
 - 1.3.6.1.4.1.9.1.1069
 - 1.3.6.1.4.1.9.1.1279
 - 1.3.6.1.4.1.9.1.1293
- ◆ Term
 - **show sysinfo** contains “Cisco Controller”
 - **show inventory** to get the Model number

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term/TFTP
 - "transfer upload datatype config"
 - "transfer upload mode tftp"
 - "transfer upload serverip <SERVERIPADDR>"
 - "transfer upload path /"
 - "transfer upload filename <local File name>"
 - "transfer upload start"
- ◆ Term
 - “show run-config”
 - “show running-config or show run-config commands”

Configuration deploy

- ◆ Term/TFTP
 - "transfer download datatype config"
 - "transfer download mode tftp"
 - "transfer download serverip <SERVERIPADDR>"

- "transfer download path /"
- "transfer download filename <local file name>"
- "transfer download start"
- ◆ Term
 - Configuration is sent line by line through command line.

Credential management

- ◆ Account
 - For creation of new account
 - "config mgmtuser delete <username>"
 - "config mgmtuser add <username> <password> read-write"
 - "config mgmtuser delete <oldUser>"
 - "config mgmtuser password <oldUser> p <TIME>"
 - For Password change only,
 - "config mgmtuser password <username> <password>"
- ◆ SNMP v1/v2
 - "config snmp community delete <newSnmpCommunity>"
 - "config snmp community create <newSnmpCommunity>"
 - "config snmp community accessmode <community string type> <newSnmpCommunity>"
 - "config snmp community mode enable <newSnmpCommunity>"
 - "config snmp community delete <oldSnmpCommunity>"

Operating System management

- ◆ NA

Device monitoring

- ◆ "show interface summary"
- ◆ "show interface detailed "
- ◆ "show sysinfo"
- ◆ "exit"
- ◆ "show udi"
- ◆ "show boot"
- ◆ "show inventory"
- ◆ "show memory statistics"
- ◆ "show route"
- ◆ "show arp switch"

- ◆ "show stats switch summary"
- ◆ "term len 0"
- ◆ "show route summary"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP
readable_run-config	Yes	Yes	Save and Reboot	ASCII	Telnet, SSH
readable_running-config	Yes	Yes	Save and Reboot	ASCII	Telnet, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ For WLC 5508:
 - Interface via term is not working due to mismatch in the output format.
 - Readable-run-config cannot be pushed although there is support in the package file.
 - A warning appears that time is not set while pushing the running config, even after successful transfer of the config file.
 - System Location and System Contact values must be present in the device if they have to be pulled via Term correctly. Empty fields for System Location and System Contact might show incorrect values in the GUI if pulled via Term.

Cisco GSS

Device Type	Load Balancer
Specific Model(s)	GSS-4490-K9
Operating System and Firmware Versions	3.1(2)
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	Ping, Traceroute

Features available

Features available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- sysObjectID value contains 1.3.6.1.4.1.9
- sysDescr value contains "Global site Selector"
- ◆ Terminal
 - Output of "show version" contains "Global site Selector"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - Running configuration
 - show running-config
 - Startup configuration
 - show startup-config
- ◆ Terminal/FTP and Terminal/SCP
 - Running configuration properties
 - copy running-config disk <filename>
 - FTP/SCP configuration file to NCM
 - Startup configuration properties
 - copy startup-config disk <filename>
 - FTP/SCP startup configuration file to NCM

Configuration Deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP and Terminal/SCP

Configuration files can be pushed to the device as startup-configuration-properties file.

 - FTP/SCP the configuration file from the NCM to the device
 - copy disk startup-config <Filename>

Credential Management

- ◆ Account
 - username <username> password <password> privilege admin
 - username <oldUser> delete

- ◆ SNMP
 - snmp-server community-string <community> ro|rw
 - no snmp-server community-string <oldSnmpCommunity>

Operating System Management

NA

Device Monitoring

- ◆ show version
- ◆ show inventory
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ show arp
- ◆ show ip routes
- ◆ show interface eth0|eth1
- ◆ show disk
- ◆ show memory
- ◆ reload

Multi-Config Files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running configuration	Yes	Yes	Copy to Startup	ASCII	SSH, Telnet
Startup configuration	No	Yes	NA	ASCII	SSH, Telnet
Running-configuration-properties	No	Yes	NA	ASCII	Telnet/FTP, SSH/FTP, SSH/SCP
Startup-configuration-properties	Yes	Yes	Reboot	ASCII	Telnet/FTP, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue:

- ◆ Syslogs and Traps are not supported.

Cisco UCS

Device Type	Switch
Specific Model(s)	UCS 6100, UCS 6120, UCS 6130, UCS 5100
Operating System and Firmware Versions	5.0(3)N2(2.1t)
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic

Features available

Features available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID value contains 1.3.6.1.4.1.9
 - sysDescr value contains "Ucs" or "ucs"
- ◆ Terminal
 - Output of "show version" contains model name.
 - Output of "show hostname" contains hostname of the device.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - Running configuration
 - show running-config

Device Monitoring

- ◆ show system
- ◆ show configuration

Multi-Config Files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running configuration	No	Yes	No	Text	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No

Attributed data	Terminal	SNMP
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco SG

Device Type	Switch
Specific Model(s)	SG300-10MP
Operating System and Firmware Versions	1.2.5.70
Communication Protocols	SSH/TFTP, Telnet/TFTP
Configuration Files Content	Ascii
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	Ping, View Interfaces, View VLANs, View ARP, View Routes, View Password Rules

Features available

Features available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ Identity, device properties, and interfaces must be successfully retrieved from the device via the following oids:
 - identity: sysName.0
 - sysObjectID: sysObjectID.0
 - interfaces: IF- and IP-MIB tables
 - serial number: entPhysicalSerialNum row for chassis entry in ENTITY-MIB, or MAC address for the management interface
- ◆ Identity, device properties, and interfaces must be successfully retrieved from the device via the following commands:
 - hostname: successfully parsed from show system
 - properties: successfully parsed from show system, show system id, and show version
 - interfaces: successfully parsed from show interfaces configuration, show interfaces status, show vlan, and show ip interface
- ◆ sysObjectID must map to a model and the driver package ID in CiscoModels.xml

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ copy [running-config | startup-configuration]
tftp://<serverIpAddress>/<remoteFilename>

Configuration Deploy

- ◆ copy tftp://<serverIpAddress>/<remoteFilename> [running-config | startup-configuration]
- ◆ copy running-config startup-config

Credential Management

- ◆ SNMP:
 - show snmp
 - snmp-server community <newString> { serverIpAddress }
 - no snmp-server community <oldString> { serverIpAddress }
- ◆ Account:
 - show authentication methods
 - show user accounts
 - username <newUserId> password <newSecret> privilege <level>
 - no username <oldUserId>
- ◆ Privilege password:

- enable password level <level> <newSecret>

Multi-Config Files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running configuration	Yes	Yes	copyToStart	Ascii	SSH/TFTP, Telnet/TFTP
Startup configuration	Yes	Yes	reboot	Ascii	SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered during development or with other releases. A resolution is included to address the issue, if available.

- ◆ The device tested did not display any information regarding software family, so the success of terminal discovery relies completely with successful parsing of information from the commands listed above. It may be necessary to limit the number of device drivers in use if SNMP is not used.
- ◆ It is strongly recommended to disable console logging to avoid confusing the pattern recognition expressions in the driver.
- ◆ Key data is only present in the running configuration, which would cause problems with determining synced configurations, so it is programmatically removed from the result during a pull.
- ◆ The running configuration has a number of non-pushable lines involving software/CLI version and the like. Although configuration management via Telnet and SSH is presently disabled, this content is presently removed by use of regular expressions in the package XML.
- ◆ Since it does not appear explicitly in any device command output, model information is cross-referenced using the sysObjectID from **show system**, using the CiscoModels.xml file.
- ◆ Management ACL lines in the running configuration must be commented out, as the device will fail the push since they are bound to an interface (even if no changes are being made). This is not an issue for pushes to the startup configuration.
- ◆ Commands of the form **permit ip-source** with the same parameters may repeat multiple times in the configuration as a result of pushing the running configuration. This appears to be device behavior in the present firmware version. This will likely show as an out-of-sync condition in the NCM product.
- ◆ Volatile memory information is not presently available from SNMP or CLI, even in the **show tech-support** output, so only non-volatile (flash) information is displayed.
- ◆ Hardware information via terminal consists primarily of interfaces and chassis properties. SNMP is more detailed in showing a motherboard and switch processor, but several entry descriptions may be terse or missing (such as the ports); this appears to be agent behavior.
- ◆ Account and privilege password rolls will fail if external authentication is active, or if the password rules of the device would be violated.

Cisco 300 Series

Device Type	Switch
Specific Model(s)	SF300-24P
Operating System and Firmware Versions	1.1.2.0
Communication Protocols	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, v3, Account, Privilege
Operating System Management Protocols	TFTP
Quick Commands	Ping, Traceroute, View ARP, View Interfaces, View Vlans, Clear Interface Counters, View_Processor_CPU, View Logs, View CDP Neighbors, Resync, Clear_Cache

Features available

Features Available	Support
Auto-Discovery	No
Pull configuration	No
Push configuration	No
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectId contains "1.3.6.1.4.1.9"
- ◆ Term
 - "terminal datadump" should get to standard enable or disable prompt.
 - "show system" command should contain the Cisco SF300 device OID 1.3.6.1.4.1.9.6.1.82.24.2.
 - "show ip interface" command should respond positively.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture:

- ◆ Terminal
 - show start
 - show run
- ◆ SNMP : Not Available

Device using CISCOSB-COPY-MIB (id is a unique integer) :

 - .1.3.6.1.4.1.9.6.1.101.87.2.1.3.id -> 1 (local)
 - .1.3.6.1.4.1.9.6.1.101.87.2.1.7.id -> 2 (running-config) or 3 (startup-config)
 - .1.3.6.1.4.1.9.6.1.101.87.2.1.8.id -> 3 (tftp)
 - .1.3.6.1.4.1.9.6.1.101.87.2.1.9.id -> Device Server IP
 - .1.3.6.1.4.1.9.6.1.101.87.2.1.11.id -> local file name
 - .1.3.6.1.4.1.9.6.1.101.87.2.1.14.id -> 1 (operational state)
 - .1.3.6.1.4.1.9.6.1.101.87.2.1.17.id -> 4 (create and go)
- ◆ Terminal / TFTP
 - copy running-config tftp://ipaddress/file
 - copy startup-config tftp://ipaddress/file
- ◆ For VLAN Database
 - VLAN Text - "show vlan" command

Configuration Deploy

- ◆ Terminal
 - From the console prompts, the device is put into configuration mode using enable 15 and configure terminal, and if successful, the configuration is issued line-by-line with checks for invalid input messages.
- ◆ SNMP

Device using CISCOSB-COPY-MIB (id is a unique integer):

- .1.3.6.1.4.1.9.6.1.101.87.2.1.3.id -> 3(tftp)
- .1.3.6.1.4.1.9.6.1.101.87.2.1.4.id -> Device Server IP Address
- .1.3.6.1.4.1.9.6.1.101.87.2.1.6.id -> local file name.
- .1.3.6.1.4.1.9.6.1.101.87.2.1.7.id -> 1 (other)
- .1.3.6.1.4.1.9.6.1.101.87.2.1.8.id -> 1 (local)
- .1.3.6.1.4.1.9.6.1.101.87.2.1.12.id -> 3 (startup-config)
- .1.3.6.1.4.1.9.6.1.101.87.2.1.14.id -> 2(operational state)
- .1.3.6.1.4.1.9.6.1.101.87.2.1.17.id -> 4 (create and go)

Commit config

- ◆ Terminal
 - copy running-config startup-config
 - reboot
- ◆ SNMP
 - 1.3.6.1.4.1.9.6.1.101.1.2.0 -> 1

Credential Management

- ◆ Check for RADIUS or TACACS, if true fail the operation.
 - terminal datadump
 - show run
- ◆ For non AAA user account password
 - configure terminal
 - no aaa new-model
 - For type 0
 - line console
 - For type 1
 - line aux 0
 - login
 - password
 - exit
- ◆ For AAA user account password
 - "configure terminal
 - "aaa new-model"
 - "no username <oldUser>"
 - "username <username> privilege <userLevel> password <password>"

- "username <username> password <password>
- "exit"
- ◆ For Privilege password
 - Check for RADIUS or TACACS
 - "configure terminal"
 - "show run"
 - "no enable password level"
 - "enable password level <level> <newPrivPass>
 - "exit"
- ◆ SNMP(V1/V2)
 - "terminal datadump"
 - "show run"
 - "configure terminal"
 - "snmp-server community <newSnmpCommunity> <view> <type> acl"
 - "no snmp-server community <oldSnmpCommunity>
 - "exit"
- ◆ SNMP v3
 - "configure terminal"
 - "terminal datadump"
 - "snmp-server user"
 - "show snmp user"
 - "show snmp group"
 - "no snmp-server engineID local"
 - "snmp-server engineID local"
 - "snmp-server context <context name>"
 - "snmp-server view <view name>"
 - "snmp-server group <group name>"
 - "snmp-server user <user name> <group name> v3 encrypted auth (md5|sha) <password> (priv des | des56 | aes128 | aes 192 | aes 192) <password>
 - "no snmp-server user <user name> <group name> v3"

Operating System Management

- ""terminal datadump"
- "dir"
- "copy flash://image tftp://<device server ip>/backupImageFileName"

- "copy tftp://<device server ip>/imageFileName flash://image"
- "boot system image-1 | image-2"
- "copy running-config startup-config"

Device Monitoring

- show run
- show start
- show version
- show interface status | configuration
- configure terminal
- terminal datadump
- exit
- write memory
- reload
- copy running-config tftp://destination URL
- copy startup-config tftp://destination URL
- copy running-config startup-config
- copy tftp://source URL running-config
- dir
- show privilege
- show bootvar
- ping
- view arp
- view interfaces
- clear counters
- view process cpu
- copy run start
- traceroute "ip-addr"
- view vlan
- view logging
- view cdp neighbors detail

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP, SSH, SSH/TFTP
vlan text	No	Yes	Not Available	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	Yes	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	Yes	No

Cisco FirePower

Device Type	Firewall
Specific Model(s)	Cisco Firepower 9300 Security Appliance;
Operating System and Firmware Versions	3.1(4.69)
Communication Protocols	SNMP/TFTP, TELNET, TELNET/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2, Terminal, Privilege
Operating System Management Protocols	Not Available
Quick Commands	View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:

- sysObjectID value contains 1.3.6.1.4.1.9.1
- ◆ Terminal:
 - **show version** response contains “System Version” or “Package Version”
 - show tech-support fprm-mgmt response contains “Cisco Firepower 9300 Security Appliance” and interface information

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - startup configuration : show configuration all no-pending no-diff-markers
 - running configuration: show configuration all no-pending no-diff-markers

Configuration Deploy

- ◆ Terminal
 - Configlets must use the text config for the destination

Device monitoring

- ◆ show configuration all no-pending no-diff-markers
- ◆ show export-config detail
- ◆ show tech-support fprm-mgmt
- ◆ show version brief
- ◆ terminal length 0
- ◆ enable
- ◆ disable
- ◆ commit-buffer

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Not Applicable	ASCII	SNMP/TFTP, TELNET, TELNET/TFTP
startup	Yes	Yes	Not Applicable	ASCII	TELNET, TELNET/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco FirePower SM

Device Type	Firewall
Specific Model(s)	FPR9K-SM-36; Cisco FirePower SM-12 Mod
Operating System and Firmware Versions	9.6(1)
Communication Protocols	SNMP/TFTP, TELNET, TELNET/TFTP , SSH ,SSH/TFTP , SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2, Terminal, Privilege
Operating System Management Protocols	Not Available
Quick Commands	ping , traceroute , Routes , ARP and View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:
 - sysObjectID value contains 1.3.6.1.4.1.9.1
- ◆ Terminal:
 - show version response contains "Software Version"
 - show version response contains "Hardware: FPR9K-SM-36" Hostname information .
 - show configuration response contains "Serial Number" information.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - startup configuration : show startup-config
 - running configuration: show running-config

Configuration Deploy

- ◆ Terminal
 - Configlets must use the text config for the destination

Device monitoring

- ◆ show running-config
- ◆ show running-config
- ◆ show version
- ◆ show hostname
- ◆ show configuration
- ◆ terminal pager 0
- ◆ terminal pager 24
- ◆ enable
- ◆ disable

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Not Applicable	ASCII	TELNET,SSH,SSH/TFTP,TELNET/TFTP
startup	Yes	Yes	Not Applicable	ASCII	TELNET,SSH,SSH/TFTP,TELNET/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco FirePower TD

Device Type	Firewall
Specific Model(s)	Cisco FirePOWER FPR-2130 Security Appliance, Cisco FirePOWER FPR-2110 Security Appliance
Operating System and Firmware Versions	v6.2.2
Communication Protocols	Telnet, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2, Terminal, Privilege
Operating System Management Protocols	Not Available
Quick Commands	ping , traceroute , Routes , ARP and View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:
 - sysObjectID value contains 1.3.6.1.4.1.9.1
- ◆ Terminal:
 - show version response contains "Version"
 - show inventory response contains "Serial Number" information.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - startup configuration : show startup-config
 - running configuration: show running-config

Device monitoring

- ◆ show running-config
- ◆ show startup-config
- ◆ show version
- ◆ show configuration all no-pending no-diff-markers
- ◆ show model
- ◆ show inventory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Not Applicable	ASCII	TELNET,SSH
startup	Yes	Yes	Not Applicable	ASCII	TELNET,SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco FirePower K9

Device Type	Firewall
Specific Model(s)	FPR-4120-SUP, FPR-4110-SUP
Operating System and Firmware Versions	v6.2.2
Communication Protocols	Telnet, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2, v3, Terminal, Privilege
Operating System Management Protocols	Not Available
Quick Commands	ping , traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:

- sysObjectID value contains 1.3.6.1.4.1.9.1

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - configuration : show configuration

Device monitoring

- ◆ show configuration
- ◆ show version

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Not Applicable	ASCII	TELNET,SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Cisco WSA

Device Type	Firewall
Specific Model(s)	S100V
Operating System and Firmware Versions	9.1.1-074
Communication Protocols	TELNET, SSH, SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, Privilege Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	ping , traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:

- sysObjectId contains 1.3.6.1.4.1.15497
- ◆ Terminal:
 - version command output should have "Model"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - show configuration

Device monitoring

- ◆ Version

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	Not Applicable	ASCII	TELNET,SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 26

Citrix Devices

This chapter contains the following topic:

- ◆ Citrix Netscaler LoadBalancer 370

Citrix Netscaler LoadBalancer

Device Type	Content Cache
Specific Model(s)	7000, 9000, 10000, 12000
Operating System and Firmware Versions	6.0 or greater
Communication Protocols	SSH, Telnet, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Interfaces, View Routes, View Arp, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains "1.3.6.1.4.1.5951.1"
 - sysDescr contains "(?i)NetScaler\\s+NS[0-9\\.]+:\\s+Build"
- ◆ Terminal
 - Get the model Number from the output of **show version** command
 - Get the Hostname from the output of **show mib** command
 - Get the Chassis Serial Number from the output of **show hardware** command

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show ns runningconfig
 - show ns ns.conf
- ◆ SSH/SCP
 - Scp /flash/nsconfig/ns.conf to device server
 - Scp is used only for the startup configuration

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ SSH/SCP:
 - SCP config file to /tmp/ns.conf
 - cp /tmp/ns.conf /flash/nsconfig/ns.conf
 - chmod 0644 /flash/nsconfig/ns.confcopy

Credential management

- ◆ Account
 - add system user <userName> <password>
 - bind system user <userName> superuser 0
 - set system user <userName> <password>
 - rm system user <oldUser>
- ◆ SNMP
 - add snmp community <newSnmpCommunity> ALL

- `rm snmp community <oldSnmpCommunity>`

Device monitoring

- ◆ `shell`
- ◆ `show interfaces`
- ◆ `stat ns`
- ◆ `reboot`
- ◆ `ping`
- ◆ `traceroute`
- ◆ `show route`
- ◆ `show arp`
- ◆ `exit`

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/SCP
startup	Yes	Yes	Reboot	ASCII	SSH, Telnet, SSH/SCP
/flash/nsconfig	Yes	Yes	Reboot	ASCII	SSH/SCP
/var/customizations	Yes	Yes	Reboot	ASCII	SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No

Attributed data	Terminal	SNMP
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

- ◆ The non-standard configuration mode included in newer versions of the NetScaler operating system, is not supported.
- ◆ The filesystem restore functionality requires VoyenceControl 4.1.0 HF6 or higher. update. A filesystem restore on more than one file at a time causes data loss if VoyenceControl 4.1.0 HF6 or higher is not installed.

CHAPTER 27

Covaro Devices

This chapter contains the following topic:

- ◆ [Covaro switch](#) 376

Covaro switch

Device Type	Switch
Specific Model(s)	CC-814, CC-410, CC-512
Operating System and Firmware Versions	6.0.348
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .18022
- ◆ Terminal:
 - Output of "show system" contains model name,serial number,hostname and software version.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - add user <user> <password> superuser
 - no user <user>
 - user password
- ◆ SNMP
 - communityname <newCommunity> read-only
 - communityname <newCommunity> read-write
 - no communityname <oldCommunity>

Device monitoring

- ◆ Show system
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	No	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 28

D-Link Devices

This chapter contains the following topic:

- ◆ [D-Link xStack..... 380](#)

D-Link xStack

Device Type	Switch
Specific Model(s)	3550
Operating System and Firmware Versions	4.01
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege Account
Operating System Management Protocols	Not available
Quick Commands	Ping, View Arp, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID contains 1.3.6.1.4.1.171.10.64.2

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show config current_config
 - show config config_in_nvram
- ◆ Terminal/TFTP
 - upload configuration <SERVERIPADDR> <fileName>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.

Credential management

- ◆ Account
 - config account <oldUser>
 - create account admin <newUser>
 - delete account <oldUser>
- ◆ Privilege Account
 - config admin local_enable
- ◆ SNMP
 - show snmp community <oldString>
 - create snmp community <newString> view <mibView> read_only | read_write
 - delete snmp community <oldString>

Device monitoring

- ◆ enable admin
- ◆ enable clipaging
- ◆ disable clipaging
- ◆ ping
- ◆ show ipif
- ◆ show iproute
- ◆ show arpentry

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

D-Link xStack

- ◆ No volatile or non-volatile storage information is available using SNMP, for this device class.
- ◆ User accounts are defined at administrator level.

CHAPTER 29

Digi Devices

This chapter contains the following topic:

- ◆ [Digi ConnectPort](#) 384
- ◆ [Digi TransPort](#) 387

Digi ConnectPort

Device Type	VPN Router
Specific Model(s)	ConnectPort WAN VPN
Operating System and Firmware Versions	2.5
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	XML, Text
Configuration Change Notification (Events)	Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Ping, View_Routes, View_Arp, View_Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Not applicable
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- SysDescr contains "ConnectPort WAN VPN"
- SysObjectID contains "1.3.6.1.4.1.332.11.6"
- ◆ Terminal
 - 'display device" command output contains "ConnectPort WAN VPN"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SSH or Telnet
 - 'backup print' command is issued in the CLI, and the file captured directly from the CLI output.
- ◆ SSH/TFTP or Telnet/TFTP
 - The command 'backup to=[serverip]:[filename]' is issued in the CLI to transfer the file to the Voyence device server.

Configuration deploy

- ◆ SSH/TFTP or Telnet/TFTP
 - The command 'backup from=[serverip]:[filename]' is issued in the CLI to transfer the file to the device from the Voyence device server.

Credential management

- ◆ SNMP v1/v2
 - set snmp [publiccommunity|privatecommunity] = "[communityName]"
- ◆ Account
 - newpass
 - [oldPassword]
 - [newPassword]
 - [newPassword]

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Reboot	XML	TFTP
running-text	No	Yes	none	Text	Term

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes (some)
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

- ◆ The device config is XML. It can be pulled either via Term or TFTP but can only be pushed via TFTP.
- ◆ The XML text of the Running config exceeds the UI editor's line length limit and therefore cannot be edited in the UI.
- ◆ The Running-Text config is generated from the running config by replacing all < > sequences in the XML config with >|< sequences.
- ◆ The Running-Text config cannot be pushed back to the device. Trying to do so results in job failure.

Digi TransPort

Device Type	Router
Specific Model(s)	WR44-HXA3-DE1-XX, WR44-CXA3-DE1-XX
Operating System and Firmware Versions	5115
Communication Protocols	Telnet, Telnet/FTP, SSH, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/2c, Account
Operating System Management Protocols	NA
Quick Commands	Ping, Traceroute, ARP, Routes

Features available

Features available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- The sysDescr OID must be accessible with the model following “Digi TransPort”. This value must be found in the models XML file.
- The sysDescr OID must be accessible with the serial number following “SER#:”.
- ◆ Terminal
 - The “hw” command must list the model after the “Part#:” label. This value must be found in the models XML file.
 - The “hw” command must list the serial number after the "Serial Number:" label.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration Capture

- ◆ config c show
- ◆ FTP or SSH server enabled

Configuration Deploy

- ◆ super roles for issuing configuration command from the prompt
- ◆ FTP or SSH server enabled

Credential Management

- ◆ snmpuser 0 community token
- ◆ radcli 0 ?
- ◆ tacplus 0 ?
- ◆ user n name token
- ◆ user n access super
- ◆ user n password token

Device Monitoring

- ◆ ati5
- ◆ hw
- ◆ ping
- ◆ traceroute
- ◆ route print
- ◆ arp -a

Multi-Config Files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy	ASCII	Telnet, SSH
config.da0	Yes	Yes	Reboot	ASCII	Telnet/FTP, SSH/FTP, SSH/SCP
pwd.s.da0	Yes	Yes	Reboot	ASCII ^a	Telnet/FTP, SSH/FTP
fw.txt	Yes	Yes	Reboot	ASCII	Telnet/FTP, SSH/FTP, SSH/SCP
sregs.dat	Yes	Yes	Reboot	Binary	Telnet/FTP, SSH/FTP, SSH/SCP

a. Not shown in configuration editor for security reasons.

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Passwords cannot be pulled with the SCP protocol due to the device behavior. The FTP management for this file is currently working, but could fail in the future firmware releases. So, the file is listed as optional for a complete Device Configuration State.
- ◆ SNMP community information is encrypted in both the configuration and command output, so instance 0 must be used for management.
- ◆ The device telnet server only permits one connection. So, the device operations will fail if another session is already established to the device. Unless SSH is enabled on the device and "ssh 0 nb_listen 1" is present in the running configuration, SSH access does not exhibit this behavior.
- ◆ The device supports private key files on flash, but they are not retrievable.
- ◆ Alternate configuration or password files are not supported, as NCM architecture does not have the ability to conditionally specify the non-volatile configuration for comparison purposes. Power-up profile 0 must be used.

CHAPTER 30

Dell Devices

This chapter contains the following topic:

- ◆ [Dell PowerConnect.....](#) 392

Dell PowerConnect

Device Type	Switch
Specific Model(s)	PCT6224P, PCT6224, PCT6224F, PCT6248, PCT6248P, M6248, M5424, PCM8024, PCM6348, M8024F, PCT7024, M8024-F, W-AP105, N3024, N2024, N30485,N3048
Operating System and Firmware Versions	3.2.1.3
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	SysLog
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	SCP, FTP, TFTP
Quick Commands	Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	No
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID value contains 1.3.6.1.4.1.674.10895
 - sysDescr value contains "Powerconnect"
- ◆ Terminal
 - Output of "show system" contains "Powerconnect"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - Running Configuration
 - show running-config
 - Startup Configuration
 - show startup-config
- ◆ Terminal/TFTP
 - Running Configuration
 - copy running-config tftp://<server_IP>/<file_path>/<file_name>
 - Startup Configuration
 - copy startup-config tftp://<server_IP>/<file_path>/<file_name>
- ◆ Terminal/FTP
 - Running Configuration
 - copy running-config sftp://<username>@<server_IP>/<file_path>/<file_name>
 - Startup Configuration
 - copy startup-config sftp://<username>@<server_IP>/<file_path>/<file_name>
- ◆ Terminal/SCP
 - Running Configuration
 - copy running-config scp://<username>@<server_IP>/<file_path>/<file_name>
 - Startup Configuration
 - copy startup-config scp://<username>@<server_IP>/<file_path>/<file_name>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

- Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - Running Configuration
 - copy tftp://<server_IP>/<file_path>/<file_name> running-config
 - Startup Configuration
 - copy tftp://<server_IP>/<file_path>/<file_name> startup-config
- ◆ Terminal/FTP
 - Running Configuration
 - copy sftp://<username>@<server_IP>/<file_path>/<file_name> running-config
 - Startup Configuration
 - copy sftp://<username>@<server_IP>/<file_path>/<file_name> startup-config
- ◆ Terminal/SCP
 - Running Configuration
 - copy scp://<username>@<server_IP>/<file_path>/<file_name> running-config
 - Startup Configuration
 - copy scp://<username>@<server_IP>/<file_path>/<file_name> startup-config

Credential management

- ◆ Account
 - username <user_name> password <password> level 15
 - no username <user_name>
- ◆ SNMP
 - snmp-server community <community> ro|rw
 - no snmp-server community <oldSnmpCommunity>

Operating System Management

- ◆ copy running-config startup-config
- ◆ copy tftp://<server_address>/<image> image
- ◆ copy scp|sftp://<user>@<server_address>/<image> image
- ◆ boot system image1|image2

Device monitoring

- ◆ show system
- ◆ show system id
- ◆ show switch
- ◆ ping

- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ show arp
- ◆ show arp switch
- ◆ show ip route static
- ◆ show tech-support
- ◆ show memory cpu
- ◆ reload
- ◆ show Ip route

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support:

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running configuration	Yes	Yes	Copy to Start	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, Telnet/TFTP, SSH/TFTP, SSH/SCP
Startup configuration	Yes	Yes	Reboot	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, Telnet/TFTP, SSH/TFTP, SSH/SCP

Device data

The following data represents device data per device class:

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Dell PowerConnect

- ◆ Cut-through is not working.
- ◆ Pull, Push, and OS upgrade using TFTP are not tested, since TFTP from the Dell device to device server is failing.
- ◆ Non-volatile memory information is not available.
- ◆ Static routes using SNMP display all the other routes along with static routes, whereas using terminal only static routes are being displayed.
- ◆ IP address and Subnet Mask information of the interfaces are not available using terminal.
- ◆ For Push and Pull using FTP/SCP to work, an FTP login "ftpuser" with password "forFTP" must exist on the NCM device server.
- ◆ SNMP location and contact has to be configured to display the correct values.
- ◆ In "Update OS Image" window, "Projected Free Space" is shown as negative value since "Total Space" value is not available.

CHAPTER 31

Edgewater Devices

This chapter contains the following topic.

- ◆ [Edgewater EdgeMarc Router.....](#) 398

Edgewater EdgeMarc Router

Device Type	Router
Specific Model(s)	4200, 4300T, 4500, 5300, 6400
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, View Interfaces, View Routes, View Arp, Reboot Unit

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectIDs: 1.3.6.1.4.1.8072.3.2.10.* or 1.3.6.1.4.1.19139.*
 - Compiler Options at OID .1.3.6.1.4.1.2021.100.6.0
 - Interface table from MIB-2

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - `ewn save <remoteFile>`
 - `cat /etc/config/ <remoteFile>`
- ◆ Terminal/TFTP
 - `ewn save <remoteFile>`
 - `tftp -p -l /etc/config/ <remoteFile> -r <fileName> <SERVERIPADDR>`

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP
 - `tftp -g -l /etc/config/<remoteFile> -r <fileName> <SERVERIPADDR>`
 - `ewn load <remoteFile>`

Credential management

- ◆ Account
 - `passwd <username>`
- ◆ SNMP
 - `cat /etc/config/snmpd_defs.conf | sed 's/^SNMP_RO|RW_COMM=<oldSnmpCommunity> /SNMP_ RO|RW_COMM=<snmpCommunity>/'`
 - `cp -f /tmp/snmpd_defs.conf /etc/config/snmpd_defs.conf`
 - `echo (SNMP_ RO|RW_COMM)=<snmpCommunity>`
 - `ewn save <IDXNUMBER>-comm.conf2`
 - `ewn load <IDXNUMBER>-comm.conf2`

Device monitoring

- ◆ `cat /var/ewn_model`
- ◆ `cat /etc/platform`

- ◆ cat /etc/version
- ◆ reboot
- ◆ ping
- ◆ netstat
- ◆ arp
- ◆ traceroute
- ◆ ifconfig

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 32

Enterasys Devices

This chapter contains the following topic:

- ◆ [Enterasys SSR](#)..... 404

Enterasys SSR

Device Type	Router
Specific Model(s)	XP 2400
Operating System and Firmware Versions	E10.0.0.3A
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	Not Available
Operating System Management Protocols	Not Available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr value contains “Enterasys”
- sysObjectID contains 1.3.6.1.4.1.5624

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - system show startup-config
 - system show active-config
- ◆ Terminal/TFTP
 - copy (active | startup) to tftp://<SERVERIPADDR>/<fileName>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
 - copy scratchpad to (active | startup)
- ◆ Terminal/TFTP
 - copy tftp://<SERVERIPADDR>/<fileName> to (scratchpad | startup)
 - copy scratchpad to active

Credential management

- ◆ Not supported

Device monitoring

- ◆ reboot
- ◆ system show
- ◆ enable
- ◆ exit
- ◆ configure
- ◆ cli set command completion off
- ◆ cli terminal monitor off
- ◆ cli set terminal rows 0
- ◆ copy active to startup
- ◆ exit

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Enterasys SSR

- ◆ Credential management is not supported.

- ◆ Comment characters are not ignored by the device class and are skipped when the configuration is pushed using Telnet or SSH.
- ◆ The presence of the **last modified** comment is used to distinguish full configurations from configlets.

CHAPTER 33

Ericsson Devices

This chapter contains the following topics:

- ◆ Ericsson ECN Switch 410
- ◆ Ericsson MSED 414

Ericsson ECN Switch

Device Type	Switch
Specific Model(s)	ECN320, ECN330
Operating System and Firmware Versions	1.2
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Not Available
Operating System Management Protocols	Not Available
Quick Commands	Standard quick commands, view routes, view ARP, Resync, view Interfaces, clear cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysOID contains 1.3.6.1.4.1.193
- ◆ Terminal
 - **show system** cli command issued to get the sys oid. Driver is identified if the obtained sysoid exists in model file.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal: Telnet , SSH
 - running-config : show running-config.
 - Startup-config : show startup-config.

Configuration deploy

- ◆ Terminal : Telnet, SSH
 - A stored configuration is pushed to the systems running config by opening a command line interface session, entering configuration mode, and sending the config line-by-line to the command line interface session

Commit config

- ◆ Terminal : Telnet, SSH
 - copy running-config startup-config

Credential management

- ◆ Not Available

Device monitoring

- ◆ configure
- ◆ end
- ◆ show running-config
- ◆ show startup-config
- ◆ reload
- ◆ show system
- ◆ show arp
- ◆ show ip-route config
- ◆ show interfaces status
- ◆ show ip route

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	CopyTo Start	ASCII	TELNET, SSH
startup	Yes	Yes	Reboot	ASCII	TELNET, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	Yes	Yes
Memory	No	No
Access Control Lists Match Counts	Yes	Yes
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Ericsson ECN Switch

- ◆ Ericsson ECN configs *cannot* be re-entered at a config prompt, because they do not properly exit from sub-config modes. This driver will attempt to send an **exit** command anytime the config parser receives a comment line in the configuration while the system is at a sub-config prompt.

- ◆ On some Ericsson ECN models, the output of **show running-config** or **show startup-config** is not a valid config, in that it *cannot* be re-entered at a config prompt without causing **%invalid input** errors. Invalid configurations will cause push jobs to fail, and the offending lines must be edited out before sending the configuration to the device.

Ericsson MSED

Device Type	Router/Edge Device
Specific Model(s)	MSED/HL950
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1/V2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr contains Ericsson MSED

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - ascii running-config :
 - config export <filename>
 - tftp -i <TFTP server IP> put <filename>
 - binary running-config
 - config backup <filename>
 - tftp -i <TFTP server IP> put <filename>

Configuration deploy

- ◆ Terminal/TFTP:
 - running-config :
 - tftp -i <TFTP server IP> get <filename>
 - config restore <filename>

Credential management

- ◆ SNMP
 - snmp getc <community string>
 - snmp setc <community string>

Device monitoring

- ◆ configure
- ◆ end
- ◆ reload
- ◆ show system info
- ◆ config export
- ◆ config backup
- ◆ config restore

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 34

Extreme Devices

This chapter contains the following topics:

- ◆ Extreme Switch 418
- ◆ ExtremeWare XOS 423

Extreme Switch

Device Type	Switch
Specific Model(s)	Summit 2, Summit 3, Summit 4, Summit 4fx, Summit 48, Summit 24, Black Diamond 6800, Black Diamond 6808, Summit 7iSX, Summit 7iTX, Summit 1iTX, Summit 5i, Summit 48i, Alpine 3808, Summit 1iSX, Alpine 3804, Summit 5iLX, Summit 5iTX, Enet Switch 24 Port, Black Diamond 6816, Summit 24E3, Alpine 3802, Black Diamond 6804, Summit 48SI, Summit PX1, Summit 24E2TX, Summit 24E2SX
Operating System and Firmware Versions	Not Available
Communication Protocols	SNMP/TFTP, TELNET, SSH, TELNET/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Trap
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP, SCP, TFTP
Quick Commands	Ping, Traceroute, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.1916.2

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration
- ◆ Terminal/TFTP
 - upload configuration <SERVERIPADDR> <localFile>
- ◆ SNMP/TFTP
 - Set the following values to the OID .1.3.6.1.4.1.1916.1.10.1.2.1.10.999
 - 6 : destroy the existing row
 - 5 : create the new row
 - 1 : activate the row
 - Set .1.3.6.1.4.1.1916.1.10.1.2.1.2.999 to < SERVERIPADDR>
 - Set .1.3.6.1.4.1.1916.1.10.1.2.1.3.999 to <tftpFileName>
 - Set .1.3.6.1.4.1.1916.1.10.1.2.1.4.999 to
 - 4 : uploadConfigImmediate
 - Set .1.3.6.1.4.1.1916.1.10.1.2.1.9.999 to "Voyence Control!"
 - Set .1.3.6.1.4.1.1916.1.10.1.2.1.6.999 to value 1 which started the file transfer.

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ SNMP/TFTP
 - Set the following values to the OID .1.3.6.1.4.1.1916.1.10.1.2.1.10.999
 - 6 : destroy the existing row
 - 5 : create the new row
 - 1 : activate the row
 - Set .1.3.6.1.4.1.1916.1.10.1.2.1.2.999 to < SERVERIPADDR>

- Set .1.3.6.1.4.1.1916.1.10.1.2.1.3.999 to <tftpFileName>
- Set .1.3.6.1.4.1.1916.1.10.1.2.1.4.999 to
 - 3 – downloadConfigImmediate
- Set .1.3.6.1.4.1.1916.1.10.1.2.1.9.999 to "Voyence Control!"
- Set .1.3.6.1.4.1.1916.1.10.1.2.1.6.999 to value 1 which started the file transfer

Credential management

- ◆ Account
 - delete account <oldUser>
 - create account admin <username> <password>
- ◆ SNMP
 - configure snmp community (readonly | readwrite) <newSnmpCommunity>

Operating System

- ◆ Use image <fileName>
- ◆ reboot

Device monitoring

- ◆ show memory
- ◆ ping
- ◆ traceroute
- ◆ show ip route
- ◆ extreme
- ◆ show configuration
- ◆ download image <serverLocation> [all-image] <srcFileName> <dstImage>

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Extreme Summit (Model Summit iTx)

- ◆ When working with the Extreme Summit device switch, the configuration text lines containing "delete" may cause connectivity loss if used in a Configuration Roll Back. Remove the "delete lines" *before* the Push to avoid loss of connectivity with the device during a **Roll Back**, or when using **Restore** to restore an old revision.

Extreme Device - Configuration not changing after Push

- ◆ **Issue:** For Extreme Summit Software Version 6.1.5, configuration changes (pushes) will *not* take on the device using the SNMP/TFTP mechanism.
- ◆ **Resolution:** Ensure you use the **Telnet or Telnet/TFTP** mechanisms for Extreme Summit configuration pushes.

Config Push using Telnet to Extreme Switch - Unsuccessful

- ◆ **Issue:** Pushing an entire configuration to the Extreme Switch should not be executed using Telnet unless **disable commands** (which can potentially stop the management interface) are removed before pushing the config.

- For example, for a configuration entry such as, **disable ipforwarding vlan Default**.
 - A disable command in the device configuration takes the form *disable string* (where *string* may be an interface).
 - All disable commands can easily be removed from the device configuration using a text editor.

You can *push a full configuration* using the SNMP/TFTP mechanism as a work around. Additionally, you can push configlets to the device.

- ◆ **Resolution:** Use configlets when making changes to the Extreme Summit with Telnet or SSH.

NOTICE

SNMP/TFTP can be used for configuration pulls; however, changes cannot be the configuration using this mechanism.

ExtremeWare XOS

Device Type	Switch
Specific Model(s)	BlackDiamond 10808, 12804, Summit X460-24x, Summit X450a-24x, Summit X480-24x-10G4X
Operating System and Firmware Versions	11.3.4.5, 12.6.2.10
Communication Protocols	TELNET/TFTP, SSH/TFTP, TELNET, SSH
Configuration Files Content	Single XML
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.1916.2, .1.3.6.1.4.1.1916.2.154, .1.3.6.1.4.1.1916.2.84, .1.3.6.1.4.1.1916.2.139
 - sysDesc contains “ExtremeWare XOS”

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - tftp <SERVERIPADDR> -p -l <deviceFilename> -r <filename>

Configuration deploy

- ◆ Terminal
 - The configuration is sent to the command-line interface session, line by line, and each response is checked for error responses.
- ◆ Terminal/TFTP:
 - tftp <SERVERIPADDR> -g -l <deviceFilename> -r <fileName>
 - use configuration <deviceFilename>

Credential management

- ◆ Account
 - create account admin <username>
 - configure account <oldUser>
 - delete account <oldUser>
- ◆ SNMP
 - configure snmp add community (readonly | readwrite) <newSnmpCommunity>
 - configure snmp delete community (readonly | readwrite) <newSnmpCommunity>

Device monitoring

- ◆ enable clipaging
- ◆ disable clipaging
- ◆ show switch
- ◆ save configuration <confifFile>
- ◆ show account
- ◆ show memory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	Single XML	TELNET, SSH, TELNET/TFTP, SSH/TFTP
startup	Yes	Yes	NA	Single XML	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

ExtremeWare XOS

- ◆ Configuration management is not supported if TFTP is not enabled for the device class.
- ◆ Configuration pushes have *not* been certified.

CHAPTER 35

F5 Devices

This chapter contains the following topics:

- ◆ F5 Load Balancer Rev 3 428
- ◆ F5 Load Balancer Rev 4 433
- ◆ F5 Load Balancer Rev 9 438
- ◆ F5 Load Balancer Rev 11 444

F5 Load Balancer Rev 3

Device Type	Load Balancer
Specific Model(s)	Big-IP-HA, Big-IP-LB, Big-IP-3-DNS, Big-IP-FLB, Big-IP-CLB, Big-IP-XLB, Big-IP-SSL
Operating System and Firmware Versions	3.x
Communication Protocols	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Trap
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceoute, View Routes, View Arp, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.3375.1.1

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP/SCP
 - The configuration file units in the package/pkgxml/F5_30/F5_R9.xml file are retrieved using a combination of SSH and SCP commands.
 - The files listed in the Multi-Config Files section for this device are retrieved using a combination of SSH and SCP commands.

Configuration deploy

- ◆ Terminal/TFTP/SCP
 - The configuration file units in the package/pkgxml/F5_9x/F5_R9.xml file are transferred using a combination of SSH and SCP commands.
 - The files listed in the Multi-Config Files section for this device are pushed using a combination of SSH and SCP commands.

Credential management

- ◆ Account
 - passwd <username>
- ◆ SNMP
 - cat /etc/snmpd.conf | sed 's/^ (ro | rw)community <oldSnmpCommunity>/ (ro | rw)community <snmpCommunity>/' > /tmp/snmpd.conf
 - cat /etc/snmpd.conf | sed 's/^ (ro | rw)community [[:alnum:]]\\ / (ro | rw)community <snmpCommunity>/' > /tmp/snmpd.conf
 - grep -q '^ (ro | rw)community' /tmp/snmpd.conf || echo '(ro | rw)community <snmpCommunity> default .1' >> /tmp/snmpd.conf
 - cp -f /tmp/snmpd.conf /etc/snmpd.conf
 - /etc/bigstart/scripts/bigsnmpd-ctrl reinit

Device monitoring

- ◆ bigstart reinit
- ◆ df
- ◆ mount
- ◆ ls
- ◆ ifconfig

- ◆ ping
- ◆ traceroute
- ◆ arp
- ◆ netstat

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/bigip.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/bigd.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ipfw.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/bigip.license	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/routes	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/bigconfig/openssl.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/bigconfig/users	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/bigconf.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/passwd	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/hosts	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/hosts.allow	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/rateclass.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ipfwrate.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/snmpd.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/snmptrap.conf	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/sshd_config	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ssh_config	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ssh_host_dsa_key	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ssh_host_dsa_key.pub	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ssh_host_key.pub	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ssh_host_key	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/user.db	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP
/etc/ipfw.filt	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/FTP, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

F5 Load Balancer Rev 4

Device Type	Load Balancer
Specific Model(s)	BigIP HA, BigIP LB, BigIP 3-DNS, BigIP FLB, BigIP CLB, BigIP XLB, BigIP SSL
Operating System and Firmware Versions	Rev 4
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog & Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Ping Traceroute View Routes View Arp View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
- ◆ ProductCode Oid ".1.3.6.1.4.1.3375.1.1.1.1.5.0" should contain values >1 and <8

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

The files listed in the Multi-Config Files section for this device are pulled using a combination of SSH and SCP commands.

Configuration deploy

The files listed in the Multi-Config Files section for this device are pushed using a combination of SSH and SCP commands.

Credential management

- ◆ SNMP v1/v2
 - "cat /etc/snmpd.conf | sed 's/^ rocommunity <oldSnmpCommunity>/rocommunity <snmpCommunity>/' > /tmp/snmpd.conf\n"
 - "cat /etc/snmpd.conf | sed 's/^ rwcommunity <oldSnmpCommunity>/rwcommunity <snmpCommunity>/' > /tmp/snmpd.conf\n"
 - "cat /etc/snmpd.conf | sed 'rocommunity [[:alnum:]]\+/ rocommunity <snmpCommunity>/' > /tmp/snmpd.conf\n"
 - "cat /etc/snmpd.conf | sed 'rwcommunity [[:alnum:]]\+/ rwcommunity <snmpCommunity>/' > /tmp/snmpd.conf\n"
 - "grep -q '^rocommunity' /tmp/snmpd.conf || echo 'rocommunity <snmpCommunity> default .1' >> /tmp/snmpd.conf\n"
 - "grep -q '^rwcommunity' /tmp/snmpd.conf || echo 'rwcommunity <snmpCommunity> default .1' >> /tmp/snmpd.conf\n"
 - "cp -f /tmp/snmpd.conf /etc/snmpd.conf\n"
 - "y"
 - "/etc/bigstart/scripts/bigsnmpd-ctrl reinit\n"
- ◆ Account
 - "passwd <username>"
 - "<Password>"

Device monitoring

- ◆ "bigstart reinit"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/config/bigip.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/bigip_base.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ipfw.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/bigip.license	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/routes	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/bigconfig/openssl.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/bigconfig/users	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/bigconf.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/passwd	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/hosts	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/hosts.allow	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/rateclass.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/ipfwrate.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/snmpd.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/etc/snmptrap.conf	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ssh/sshd_config	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ssh/ssh_config	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ssh/ssh_host_dsa_key	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ssh/ssh_host_dsa_key.pub	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ssh/ssh_host_key.pub	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ssh/ssh_host_key	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/user.db	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
/config/ipfw.filt	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

F5 Load Balancer Rev 9

Device Type	Load Balancer
Specific Model(s)	BIG-IP 1500, BIG-IP 3400,D39
Operating System and Firmware Versions	Operating systems for BIG-IP 1500 models: 9.1.2.40.6, 9.2.0.167.4, 9.2.4.13.1, 9.4.0.517.5 Operating systems for all other models: 9.1.2 40.2 Operating System for BigIP model D39: 9.4.7 320.1 Operating Systems for models C103, C106, D63a, D104, D106, and A107: 10.2.0, 10.2.1
Communication Protocols	SSH, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	SCP
Quick Commands	Ping, View Arp, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.3375.2.1.3.4
- ◆ Terminal
 - OS version is checked using **bigpipe version**
 - Model number is retrieved using:
 - "bigpipe platform show" for D39
 - "bigpipe platform type" for all other models
 - Chassis Serial number is retrieved using:
 - "bigpipe platform show" for D39
 - "bigpipe platform chassis show" for all other models

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/SCP
 - The configuration file units in the package/pkgxml/F5_30/F5_R9.xml file are retrieved using a combination of SSH and SCP commands.
 - The files listed in the Multi-Config Files section for this device are retrieved using a combination of SSH and SCP commands.

Configuration deploy

- ◆ Terminal/SCP
 - The configuration file units in the package/pkgxml/F5_9x/F5_R9.xml file are transferred using a combination of SSH and SCP commands.
 - The files listed in the Multi-Config Files section for this device are pushed using a combination of SSH and SCP commands.

Credential management

- ◆ Account
 - passwd <username>
- ◆ SNMP
 - cat SnmpConfPath_ | sed 's/^ (ro | rw)community <oldSnmpCommunity>/ (ro | rw)community <snmpCommunity>/' > /tmp/snmpd.conf

- `cat SnmpConfPath_ | sed 's/^ (ro | rw)community [-_[:alnum:]]\+/(ro | rw)community <snmpCommunity>/' > /tmp/snmpd.conf`
- `grep -q '^ (ro | rw)community' /tmp/snmpd.conf || echo '(ro | rw)community <snmpCommunity> default .1' >> /tmp/snmpd.conf`
- `cp -f /tmp/snmpd.conf <SnmpConfPath>`
- `/usr/bin/bigstart restart snmpd`

Operating system

- ◆ `scp user@name:image /var/tmp/`
- ◆ `ls -l --color=never <imageName>`
- ◆ MD5 Hash <image>
- ◆ local-install

Device monitoring

- ◆ ifconfig
- ◆ ping
- ◆ traceroute
- ◆ apr
- ◆ netstat
- ◆ im
- ◆ local-install
- ◆ ls
- ◆ mount
- ◆ df

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/config/bigip_base.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/adjtime	Yes	Yes	NA	ASCII	SSH/SCP
/etc/host.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/hosts.allow	Yes	Yes	NA	ASCII	SSH/SCP
/etc/hosts.deny	Yes	Yes	NA	ASCII	SSH/SCP
/etc/libuser.conf	Yes	Yes	NA	ASCII	SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/nsswitch.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/passwd	Yes	Yes	NA	ASCII	SSH/SCP
/etc/pwdb.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/resolv.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/shadow	Yes	Yes	NA	ASCII	SSH/SCP
/etc/sysctl.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/time.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/pam_env.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/limits.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/group.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/console.perms	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/chroot.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/access.conf	Yes	Yes	NA	ASCII	SSH/SCP
/var/named/config/named.conf	Yes	Yes	NA	ASCII	SSH/SCP
/var/named/config/rndc.key	Yes	Yes	NA	ASCII	SSH/SCP
/config/ucs_version	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssl/ssl.crt/default.crt	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssl/ssl.crt/ca-bundle.crt	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssl/ssl.csr/default.csr	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/ldap/system-auth.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/local/system-auth	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/radius/system-auth.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/other	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/su	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/login	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/httpd	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/sshd	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/passwd	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/localusers	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/userroles	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssh/ssh_config	Yes	Yes	NA	ASCII	SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/config/ssh/moduli	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssh/sshd_config	Yes	Yes	NA	ASCII	SSH/SCP
/config/httpd/conf.d/mod_auth_pam.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/httpd/conf/workers2.properties	Yes	Yes	NA	ASCII	SSH/SCP
/config/net-snmp/snmpd.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/snmp/subagents.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/snmp/snmpd.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.crt	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.key	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.pem	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.req	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/portinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/lcdinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/ledinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/menus	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/serialinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/screens	Yes	Yes	NA	ASCII	SSH/SCP
/config/ntp.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/eventd.xml	Yes	Yes	NA	ASCII	SSH/SCP
/config/RegKey.license	Yes	Yes	NA	ASCII	SSH/SCP

Device data

The following data represents device data per device class

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	Yes

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ No volatile or non-volatile storage information is available using SNMP, for this device class.
- ◆ User accounts are defined at administrator level.
- ◆ Test device for Model D39 did not have the following configuration files and hence the pull for these files will end up with a warning:
 - /config/lcd/lcdinfo.txt
 - /config/big3d/big3d.key
 - /config/lcd/ledinfo.txt
 - /config/big3d/big3d.pem
 - /config/lcd/serialinfo.txt
 - /config/lcd/portinfo.txt
 - /config/big3d/big3d.req
 - /config/lcd/menus
 - /config/big3d/big3d.crt
 - /config/RegKey.license
 - /config/ucs_version
- ◆ Due to lack of device availability during development, operating system version 10 devices are currently supported under the version 9 driver class.

F5 Load Balancer Rev 11

Device Type	Load Balancer
Specific Model(s)	C103, Z101, BIG-IP vCMP Guest, BIG-IP VPR-C2400, BIG-IP 3900, BIG-IP 2400, BIG-IP 1600 , BIG-IP 3600, F5-BIG-LTM-2000S, BIG-IP Virtual Edition, BIG-IP 4200
Operating System and Firmware Versions	11.1.0 1943.0, 11.4.0.2434.0, 11.5
Communication Protocols	SSH, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, View ARP, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.3375.2.1.3.4
- ◆ Terminal
 - OS version is checked using **tmsch list cm device**
 - Model number and chassis serial number are extracted from the same response.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/SCP
 - The configuration file units in the package/pkgxml/F5_R11/F5_R11.xml file are retrieved using a combination of SSH and SCP commands.
 - The files listed in the Multi-Config Files section for this device are retrieved using a combination of SSH and SCP commands.

Configuration deploy

- ◆ Terminal/SCP
 - The configuration file units in the package/pkgxml/F5_R11/F5_R11.xml file are transferred using a combination of SSH and SCP commands.
 - The files listed in the Multi-Config Files section for this device are pushed using a combination of SSH and SCP commands.

Credential management

- ◆ Account
 - The root user's password is changed using the native operating system **passwd** utility.
- ◆ SNMP
 - `cat SnmpConfPath_ | sed 's/^ (ro | rw)community <oldSnmpCommunity>/ (ro | rw)community <snmpCommunity>/' > /tmp/snmpd.conf`
 - `cat SnmpConfPath_ | sed 's/^ (ro | rw)community [-_:alnum:]]\+\+ / (ro | rw)community <snmpCommunity>/' > /tmp/snmpd.conf`
 - `grep -q '^ (ro | rw)community' /tmp/snmpd.conf || echo '(ro | rw)community <snmpCommunity> default .1' >> /tmp/snmpd.conf`
 - `cp -f /tmp/snmpd.conf <SnmpConfPath>`
 - `/usr/bin/bigstart restart snmpd`

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/config/bigip_base.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/adjtime	Yes	Yes	NA	ASCII	SSH/SCP
/etc/host.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/hosts.allow	Yes	Yes	NA	ASCII	SSH/SCP
/etc/hosts.deny	Yes	Yes	NA	ASCII	SSH/SCP
/etc/libuser.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/nsswitch.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/passwd	Yes	Yes	NA	ASCII	SSH/SCP
/etc/pwdb.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/resolv.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/shadow	Yes	Yes	NA	ASCII	SSH/SCP
/etc/sysctl.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/time.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/pam_env.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/limits.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/group.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/console.perms	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/chroot.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/security/access.conf	Yes	Yes	NA	ASCII	SSH/SCP
/var/named/config/named.conf	Yes	Yes	NA	ASCII	SSH/SCP
/var/named/config/rndc.key	Yes	Yes	NA	ASCII	SSH/SCP
/config/ucs_version	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssl/ssl.crt/default.crt	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssl/ssl.crt/ca-bundle.crt	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssl/ssl.csr/default.csr	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/ldap/system-auth.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/local/system-auth	Yes	Yes	NA	ASCII	SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/config/bigip/auth/pam.d/radius/system-auth.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/other	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/su	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/login	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/httpd	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/sshd	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/pam.d/passwd	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/localusers	Yes	Yes	NA	ASCII	SSH/SCP
/config/bigip/auth/userroles	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssh/ssh_config	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssh/moduli	Yes	Yes	NA	ASCII	SSH/SCP
/config/ssh/sshd_config	Yes	Yes	NA	ASCII	SSH/SCP
/config/httpd/conf.d/mod_auth_pam.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/httpd/conf/workers2.properties	Yes	Yes	NA	ASCII	SSH/SCP
/config/net-snmp/snmpd.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/snmp/subagents.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/snmp/snmpd.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.crt	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.key	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.pem	Yes	Yes	NA	ASCII	SSH/SCP
/config/big3d/big3d.req	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/portinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/lcdinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/ledinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/menus	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/serialinfo.txt	Yes	Yes	NA	ASCII	SSH/SCP
/config/lcd/screens	Yes	Yes	NA	ASCII	SSH/SCP
/config/ntp.conf	Yes	Yes	NA	ASCII	SSH/SCP
/config/eventd.xml	Yes	Yes	NA	ASCII	SSH/SCP
/config/RegKey.license	Yes	Yes	NA	ASCII	SSH/SCP

Device data

The following data represents device data per device class

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ No volatile or non-volatile storage information is available using SNMP, for this device class.
- ◆ The root account is used for device management.
- ◆ SNMP credential roll may fail.

CHAPTER 36

Force10 Devices

This chapter contains the following topics:

- ◆ Force10 C-Series Router 450
- ◆ Force10 E-Series Router 454
- ◆ Force10 S-Series Router 458

Force10 C-Series Router

Device Type	Router
Specific Model(s)	C150, C300
Operating System and Firmware Versions	FTOS v7.9
Communication Protocols	SSH, TELNET, SSH/TFTP, TELNET/TFTP, SSH/SCP.
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP V1, V2, Account, Privilege.
Operating System Management Protocols	Not Available
Quick Commands	View Interfaces, View ARP, View Routes, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- SysOID value contains 1.3.6.1.4.1.6027.1.2
- SysDescr contains Force10 Networks Real Time Operating System Software
- ◆ Terminal
 - **show version** command response contains "Force10 Networks Real Time Operating System Software"
 - Presence of device model number in Models.xml file.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Running-config : show run
 - Startup-config : show start
- ◆ Terminal/TFTP
 - Running-config : copy running-config tftp
 - Startup-config : copy startup-config tftp
- ◆ SSH/SCP
 - Running-config : scp <remote ip>:system:running-config <localfile>
 - Startup-config : scp <remote ip>:system:startup-config <localfile>

Configuration deploy

- ◆ Terminal
 - Device is put in configuration terminal mode and if successful, Configuration(running) is sent line by line to the device.
- ◆ Terminal/TFTP
 - Running-config : copy tftp running-config
 - Startup-config : copy tftp startup-config
- ◆ SSH/SCP
 - Startup-config : scp <localfile> remote ip>:system:startup-config

Commit config

- ◆ Terminal
 - Copy running-config startup-config

Credential management

- ◆ SNMP
 - show run

- snmp-server community
- no snmp-server community
- ◆ Account
 - aaa new-model
 - username <username> password <password>
 - no username <username> password <password>
- ◆ Privilege
 - no enable password
 - enable password level

Device monitoring

- ◆ show run
- ◆ show start
- ◆ show version
- ◆ show config
- ◆ show interfaces
- ◆ configure term
- ◆ terminal length 0
- ◆ exit
- ◆ reload
- ◆ copy running-config tftp
- ◆ copy startup-config tftp
- ◆ copy running-config startup-config
- ◆ copy tftp running-config
- ◆ show ip interface brief
- ◆ traceroute
- ◆ show arp
- ◆ show ip route
- ◆ ping
- ◆ show interface
- ◆ show memory
- ◆ show file-systems
- ◆ show inventory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start, Reboot	ASCII	TELNET, TELNET/TFTP, SSH, SSH/TFTP, SH/SCP
startup	Yes	Yes	Copy To Start, Reboot	ASCII	TELNET, TELNET/TFTP, SSH, SSH/TFTP, SH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Force10 E-Series Router

Device Type	Router
Specific Model(s)	E300, E600, E1200, E600I, E1200I
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, TELNET, SSH/TFTP, TELNET/TFTP, SSH/SCP.
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP V1, V2, Account, Privilege.
Operating System Management Protocols	Not Available
Quick Commands	Standard Quick commands, View Interfaces, View ARP, View Routes, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysOID value contains 1.3.6.1.4.1.6027.1.1
 - SysDescr contains Force10 Networks Real Time Operating System Software

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Running-config : show running-config
 - Startup-config : show startup-config
- ◆ Terminal/TFTP
 - Running-config
 - copy running-config tftp://<serverIPAddress>/<filename>
 - Startup-config
 - copy startup-config tftp://<serverIPAddress>/<filename>
- ◆ SSH/SCP
 - Running-config : scp <remote ip>:system:running-config <localfile>
 - Startup-config : scp <remote ip>:system:startup-config <localfile>

Configuration deploy

- ◆ Terminal
 - Device is put in configuration terminal mode and if successful, Configuration(running) is sent line by line to the device.
- ◆ Terminal/TFTP
 - Running-config : copy tftp running-config
 - Startup-config : copy tftp startup-config
- ◆ SSH/SCP
 - Startup-config : scp <localfile> remote ip>:system:startup-config

Commit config

- ◆ Terminal
 - Copy running-config startup-config

Credential management

- ◆ SNMP
 - show run

- snmp-server community <newCommunity> <ro | rw>
- no snmp-server community <newCommunity> <ro | rw>
- ◆ Account
 - aaa new-model
 - username <username> password <password>
 - no username <username> password <password>
- ◆ Privilege
 - no enable password
 - enable password level

Device monitoring

- ◆ show run
- ◆ show start
- ◆ show version
- ◆ show config
- ◆ show interfaces
- ◆ configure term
- ◆ terminal length 0
- ◆ exit
- ◆ reload
- ◆ copy running-config tftp
- ◆ copy startup-config tftp
- ◆ copy running-config startup-config
- ◆ copy tftp running-config
- ◆ show ip interface brief
- ◆ traceroute
- ◆ show arp
- ◆ show ip route
- ◆ ping
- ◆ show interface
- ◆ show memory
- ◆ show file-systems
- ◆ show inventory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start, Reboot	ASCII	TELNET, TELNET/TFTP, SSH, SSH/TFTP, SH/SCP
Startup	Yes	Yes	Copy To Start, Reboot	ASCII	TELNET, TELNET/TFTP, SSH, SSH/TFTP, SH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Force10 S-Series Router

Device Type	Router
Specific Model(s)	S4810, S2410CP, S2410P, S25, S25V, S25N, S25P, S25P-AC, S50, S50E, S50V, S50N-AC, S50N-DC, S50P-DC, S50N, S6010-ON, I/O Aggregator
Operating System and Firmware Versions	FTOS v7.9, 8.3.10.2a
Communication Protocols	SSH, TELNET, SSH/TFTP, TELNET/TFTP.
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP V1/ V2, Account, Privilege
Operating System Management Protocols	Not Available
Quick Commands	Standard quick commands, View Interfaces, View ARP, View Routes, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - SysOID value contains .1.3.6.1.4.1.6027.1.3, .1.3.6.1.4.1.6027. 1.3.14
 - SysDescr contains "Force10 Networks Real Time Operating System"
- ◆ Terminal
 - Model no. is obtained from **show version** o/p.
 - Presence of device model no. in Models.xml file

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

Following are the commands or processes used to "pull" a configuration from your device.

- ◆ Terminal
 - Running-config : show running-config
 - Startup-config : show startup-config
- ◆ Terminal/TFTP
 - Running-config
 - copy running-config tftp://<serverIPAddress>/<filename>
 - Startup-config
 - copy startup-config tftp://<serverIPAddress>/<filename>

Configuration deploy

- ◆ Terminal
 - Device is put in configuration terminal mode and if successful, Configuration(running) is sent line by line to the device.
- ◆ Terminal/TFTP
 - Running-config
 - copy tftp://<serverIPAddress>/<filename>running-config
 - Startup-config
 - copy tftp://<serverIPAddress>/<filename>startup-config

Commit config

- ◆ Terminal
 - Copy running-config startup-config

Credential management

- ◆ SNMP
 - show run
 - snmp-server community <new community> < ro | rw >
 - no snmp-server community
- ◆ Account
 - aaa new-model
 - username <username> password <password>
 - no username <username> password <password>
- ◆ Privilege
 - no enable password
 - enable password level

Device monitoring

- ◆ show run
- ◆ show start
- ◆ show version
- ◆ show config
- ◆ show interfaces
- ◆ configure term
- ◆ terminal length 0
- ◆ exit
- ◆ reload
- ◆ copy running-config tftp
- ◆ copy startup-config tftp
- ◆ copy running-config startup-config
- ◆ copy tftp running-config
- ◆ show ip interface brief
- ◆ traceroute
- ◆ show arp
- ◆ show ip route
- ◆ ping
- ◆ show interface
- ◆ show memory
- ◆ show file-systems

- ◆ show inventory
- ◆ show processes memory dir
- ◆ show boot system stack-unit all
- ◆ show system

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start, Reboot	ASCII	TELNET, TELNET/TFTP, SSH, SSH/TFTP
Startup	Yes	Yes	Copy To Start, Reboot	ASCII	TELNET, TELNET/TFTP, SSH, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 37

Fortinet Devices

This chapter contains the following topics:

- ◆ [Fortinet Fortigate.....](#) 464

Fortinet Fortigate

Device Type	Router
Specific Model(s)	300A, Fortigate-60C, Fortigate-100D, 3700D, FortiSwitch-124D, FGT_60D, FORTIGATE-1000D
Operating System and Firmware Versions	4.0.3, v4.0.5, v4.0.0
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog & Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	Account
Operating System Management Protocols	NA
Quick Commands	View Routes View Arp View Interfaces execute cfg save Clearv Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID should have "1.3.6.1.4.1.12356"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

Following are the commands or processes used to "pull" a configuration from your device.

- ◆ Term
 - "show full-configuration"
- ◆ Term/TFTP
 - "execute backup full-config tftp <local filename> <server IP address>"

Configuration deploy

- ◆ Term
 - The config is entered line by line while monitoring responses for error messages.
- ◆ Term/TFTP
 - "execute restore config tftp <config filename> <Server IP Address>"

Credential management

- ◆ Account
 - "config user local"
 - "edit < userName>"
 - "set type password"
 - "set passwd < password >"
 - "set status enable"
 - "end"
 - "config user local"
 - "edit < userName >"
 - "set staus disable"
 - "end"

Device monitoring

- ◆ "show ip interface"

- ◆ "show port ethernet "
- ◆ "execute ping "
- ◆ "get router info routing-table all"
- ◆ "get router info routing-table static"
- ◆ "get system arp"
- ◆ "execute traceroute "
- ◆ "get system interface"
- ◆ "get system status"
- ◆ "get system snmp sysinfo"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start and Reboot	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ This driver was built using a model 300A appliance. Fortinet indicates that it should work with most Fortigate models (as of 9/2009).

CHAPTER 38

Foundry Devices

This chapter contains the following topics:

- ◆ Foundry Edgelron 470
- ◆ Foundry B4000 474

Foundry Edgelron

Device Type	Switch
Specific Model(s)	Edgelron 48G
Operating System and Firmware Versions	2.2.7.29
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- SysDescription should have "Edgelron" or "Edgeiron" or "edgeiron" or "edgelron"
- sysObjectID should have "1.3.6.1.4.1.1991.1.5.1.1.4.5.1"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show running-config"
 - "show startup-config"
- ◆ Term/TFTP
 - "copy running-config tftp"
 - "copy startup-config tftp"
 - Send "<tftp server IP address>"

Credential management

- ◆ SNMP v1/v2
 - "snmp-server community <new Community String>"
 - "snmp-server community <new Community String> rw"
 - "no snmp-server community <old Community String>"
- ◆ Account
 - User Account
 - "username <new User> access-level 0"
 - "username <new User> password 0 <new Password>"
 - "no username <old User> "
 - Global Account
 - "line vty"
 - "password 0 < new Password>"
- ◆ Privilege
 - "enable password level 15 0 <newPrivilege Password>"

Device monitoring

- ◆ "enable"
- ◆ "disable"
- ◆ "config terminal"
- ◆ "end"

- ◆ "copy running-config startup-config"
- ◆ "show ip interface"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	No	Yes	No	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Startup	No	Yes	No	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Foundry Edgelron Switch

- ◆ No volatile or non-volatile storage information is available using SNMP, for this device class.
- ◆ Configuration pushes are not supported, and can crash the device used for development. The following behavior persists through firmware upgrades:
 - When pushing commands using the command line interface, the device locks after a number of *Invalid Syntax* messages, due to a lack of exit commands (VLAN, Interface, and similar commands) for ASCII configurations.
 - For TFTP, transfer is reported as successful, but the device fails to respond to any communication protocols.
 - Comment characters, such as *!*, in the configuration cause warnings when issued using the command line interface.
 - Certain configuration commands do *not* merge, and issue *Failed to set* warnings.

Foundry B4000

Device Type	Router
Specific Model(s)	BigIron 4000, BigIron RX-4 Router, FastIron 400, FastIron 15000, FastIron 800, FastIron SuperX-PREM, FastIron SX 1600-PREM, IronWare, NetIron MLX Router, NetIron MLX Router, ServerIron
Operating System and Firmware Versions	NA
Communication Protocols	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs and Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account, Privilege
Operating System Management Protocols	NA
Quick Commands	Resync Clear Cache

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify device

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysServices should be 0x04 (i.e. Layer 3 device)
 - SysDescription should have "Foundry Networks"
 - sysObjectID should have "1.3.6.1.4.1.1991"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP/TFTP
 - Set the following OID's:
 - .1.3.6.1.4.1.1991.1.1.2.1.5.0 with "Server IP Address"
 - .1.3.6.1.4.1.1991.1.1.2.1.8.0 with "Local filename"
 - .1.3.6.1.4.1.1991.1.1.2.1.9.0 with "22" for running configuration
 - .1.3.6.1.4.1.1991.1.1.2.1.9.0 with "20" for startup configuration
- ◆ Term
 - "enable"
 - "skip-page"
 - "show configuration"
 - "show run"
 - "page"
- ◆ Term/TFTP
 - "enable"
 - "copy start tftp <Server IP Address> <local filename> "
 - "copy run tftp <Server IP Address> <local filename> "
 - "exit"

Configuration deploy

- ◆ SNMP/TFTP
 - Set the following OID's:
 - .1.3.6.1.4.1.1991.1.1.2.1.5.0 with "Server IP Address"
 - .1.3.6.1.4.1.1991.1.1.2.1.8.0 with "Local filename"
 - .1.3.6.1.4.1.1991.1.1.2.1.9.0 with "23" for running configuration

– .1.3.6.1.4.1.1991.1.1.2.1.9.0 with "21" for startup configuration

- ◆ Term
 - "enable"
 - "conf t"
 - Send configuration line by line to the device as commands
- ◆ Term/TFTP
 - "enable"
 - "copy tftp running-config <Server IP Address> <Local Configuration File>"
 - "copy tftp startup-config <Server IP Address> <Local Configuration File>"
 - "Y"

Credential management

- ◆ SNMP
 - "config terminal"
 - "snmp-server community <new SNMP Community> RO"
 - "snmp-server community <new SNMP Community> RW"
 - "no snmp-server community <old Community string> RO"
 - "no snmp-server community <old Community string> RW"
 - "exit"
- ◆ Account
 - "config terminal"
 - "username <username> password < password >"
 - "no username < oldUser >"
 - "exit"
- ◆ Privilege
 - "config terminal"
 - "enable super-user-password < newPrivilege Password >"
 - "no enable super-user-password < new Privilege Password >"
 - "exit"

Device monitoring

- ◆ "enable"
- ◆ "disable"
- ◆ "reload"
- ◆ "write mem"

- ◆ "conf t"
- ◆ "exit"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start	ASCII	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP
Startup	Yes	Yes	Reboot	ASCII	SNMP/TFTP, Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 39

GE Devices

This chapter contains the following topics:

- ◆ [GE MDS Access Point and Remote.....](#) 480

GE MDS Access Point and Remote

Device Type	Router
Specific Model(s)	MDS Mercury 3650
Operating System and Firmware Versions	aw20100512_01
Communication Protocols	SNMP/TFTP, Telnet, SSH, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	No
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID should contain "1.3.6.1.4.1.4130.2.1.1.5"
- Should be able to retrieve Serial Number from "1.3.6.1.4.1.4130.2.1.4.2.3"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP/TFTP
 - Set ".1.3.6.1.4.1.4130.2.1.4.2.56.0" to <Server IP Address>
 - Set ".1.3.6.1.4.1.4130.2.1.4.2.62.0" to <local file name>
 - Set ".1.3.6.1.4.1.4130.2.1.4.2.63.0" to "3"(send).
 - Check ".1.3.6.1.4.1.4130.2.1.4.2.64.0" for status of TFTP operation
- ◆ Term/TFTP
 - Using the "Configuration Scripts Menu" of the device set the following,
 - Set TFTP Host Address to <Server IP Address>
 - Set Config Filename to <local file name>
 - Set Send File to Y
 - Check "Send File" for status of completion

Configuration deploy

- ◆ SNMP/TFTP
 - Set ".1.3.6.1.4.1.4130.2.1.4.2.56.0" to <Server IP Address>
 - Set ".1.3.6.1.4.1.4130.2.1.4.2.62.0" to <configuration file name>
 - Set ".1.3.6.1.4.1.4130.2.1.4.2.63.0" to "2"(receive).
 - Check ".1.3.6.1.4.1.4130.2.1.4.2.65.0" for status of TFTP operation
- ◆ Term/TFTP
 - Using the "Configuration Scripts Menu" of the device set the following,
 - Set "TFTP Host Address" to <Server IP Address>
 - Set "Config Filename" to <config file name>
 - Set "Retrieve File" to Y
 - Check "Retrieve File" for status of completion

Credential management

- ◆ SNMP
 - At "SNMP Agent Config Menu" set the following
 - Set "A) Read Community" for <new Community String>

- Set "B) Write Community" for <new Community String>
- ◆ Account(Only Password change)
 - At "User Passwords Menu" set the following,
 - Set "A) Change Admin Password" for <new Password>

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Text Configuration	Yes	Yes	NA	ASCII	SNMP/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ GE MDS Access Point and Remote devices can only be discovered by SNMP.

- ◆ Push and pull are only supported through SNMP.
- ◆ For configuration pushes and pulls, two directories must be created in the */tftpboot/* directory. For example, */tftpboot/backup/* and */tftpboot/restore/*.

CHAPTER 40

Gigamon Devices

This chapter contains the following topics:

- ◆ [Gigamon Switch](#)..... 486
- ◆ [Gigamon 4.7](#) 490

Gigamon Switch

Device Type	Switch
Specific Model(s)	GigaVUE-MP, GigaVUE-2404
Operating System and Firmware Versions	5.0.17, 7.1.03, 8.2.01
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslogs and Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Ping View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.26866"
 - Hostname, device properties, and interfaces must be successfully retrieved or discovery is aborted.
- ◆ Term
 - Hostname, device properties, and interfaces must be successfully retrieved or discovery is aborted.
 - Model must map to sysObjectID in GigamonModels.xml.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal (report running or report startup):
 - "config save <file name>"
 - "show file <file name>"
 - "delete file < filename >"
- ◆ Terminal/TFTP (running or startup)
 - "config save <file name>"
 - "show file <file name>"
 - "upload -cfg <filename> <Server IP Address> <remotefilename>"

Configuration deploy

- ◆ Term
 - Send configuration line by line as device commands.
- ◆ Term/TFTP
 - "install -cfg <Configuration filename> <Server IP Address>"
 - "config restore < filename >" for running config
 - "config file <filename> nb" for startup config

Credential management

- ◆ SNMP
 - "config snmp_server community < new Community String >"
- ◆ Account
 - "show rad_server"
 - "show tac_server"
 - "config password user <oldUser> password < password > "

- "config user <username>password <password> level super"
- "delete user < oldUser >"

Device monitoring

- ◆ "show system"
- ◆ "reboot"
- ◆ "show port-params all"
- ◆ "show file"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Report running	No	Yes	NA	ASCII	Telnet, SSH
report startup	No	Yes	NA	ASCII	Telnet, SSH
running	Yes	Yes	Copy To Start	Binary	Telnet/TFTP, SSH/TFTP
startup	Yes	Yes	Reboot	Binary	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ The following hardware information is not reported by the device; memory and file system information are disabled in the device package:
 - Memory
 - File system information
 - Inventory (SNMP)
 - IP addresses (SNMP)
- ◆ The model name is now obtained from the GIGAMON-SNMP-MIB for SNMP (falling back to standard oids for pre 8.x firmware), and the device banner for terminal. If the banner is customized, this may prevent mapping to a sysObjectID value in the GigamonModels.xml, and fail device discovery via terminal protocols.
- ◆ If the device is completely unmanaged and later rediscovered, the startup file set for the current management instance will change. The previous file must be deleted manually after a successful push to startup following rediscovery, since the Device ID (which is part of the filename) will have changed. This approach is required due to the lack of vendor support for specifying the source and destination filenames for the **install -cfg** command.
- ◆ Configlets and remediation are not supported by this device class, since the text representation of the configuration cannot be pushed to the device, which is a prerequisite for configlet pushes.
- ◆ The managed device model(s) appear to only support a single read-only community string.
- ◆ The **show diag** command has been observed to disconnect communication sessions with the device after partial output. As a result, some diagnostic information that may assist with resolving missing hardware information is currently unavailable to the driver.

Gigamon 4.7

Device Type	Switch
Specific Model(s)	HB1/HC2
Operating System and Firmware Versions	GigaVUE-OS 4.7.01 Build
Communication Protocols	Telnet, SSH, SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, SSH
Credential Management	SNMP v1/v2, Terminal
Operating System Management Protocols	NA
Quick Commands	Ping,Interfaces,Arp, Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- SysObjectID must contain "1.3.6.1.4.1.26866"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
- ◆ Config dump

Device monitoring

- ◆ "ping"
- ◆ "show interface status"

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 41

H3C Devices

This chapter contains the following topic:

- ◆ H3C Switch 494
- ◆ H3C Router 498

H3C Switch

Device Type	Switch
Specific Model(s)	S5820X-28S, S5120-52C-PWR-EI, S5800-32C-PWR
Operating System and Firmware Versions	5.20
Communication Protocols	SSH, Telnet, SSH/TFTP, SNMP
Configuration Files Content	ASCII
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID should contain "1.3.6.1.4.1.25506"
 - SysDescription should contain "H3C"
- ◆ Terminal
 - Output of “display device manuinfo” contains model name and serial number.
 - Output of “display version” contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - "display current-configuration"
 - "display saved-configuration"
- ◆ Term/TFTP
 - "backup startup-configuration to <SERVERIPADDR> <LOCALFILE>"

Configuration deploy

- ◆ Terminal
 - issue command “save force”
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential Management

- ◆ SNMP v1/v2
 - "snmp-agent community read <newCommunity>"
 - "snmp-agent community write <newCommunity> "
 - "undo snmp-agent community read <oldCommunity>"
- ◆ Account
 - "local-user <user> +password simple <password> +authorization-attribute level 3 +service-type telnet +service-type ssh"
 - "undo local-user <user>"

Device monitoring

- ◆ "display device manuinfo"
- ◆ "save force"
- ◆ "quit"

- ◆ "system-view"
- ◆ "display version"
- ◆ "display current-configuration"
- ◆ "display saved-configuration"
- ◆ "screen-length disable"
- ◆ "reboot"
- ◆ "display arp"
- ◆ "display ip routing-table"
- ◆ "display interfaces"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy To Start	ASCII	SSH, Telnet
Startup Configuration	Yes	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- TFTP has not been tested

H3C Router

Device Type	Router
Specific Model(s)	MSR20-20
Operating System and Firmware Versions	5.20
Communication Protocols	SSH, Telnet, SSH/TFTP, SNMP
Configuration Files Content	ASCII
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID should contain "1.3.6.1.4.1.25506"
 - SysDescription should contain "H3C"
- ◆ Terminal
 - Output of “display device manuinfo” contains model name and serial number.
 - Output of “display version” contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - "display current-configuration"
 - "display saved-configuration"
- ◆ Term/TFTP
 - "backup startup-configuration to <SERVERIPADDR> <LOCALFILE>"

Configuration deploy

- ◆ Terminal
 - issue command “save force”
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential Management

- ◆ SNMP v1/v2
 - "snmp-agent community read <newCommunity>"
 - "snmp-agent community write <newCommunity> "
 - "undo snmp-agent community read <oldCommunity>"
- ◆ Account
 - "local-user <user> +password simple <password> +authorization-attribute level 3 +service-type telnet +service-type ssh"
 - "undo local-user <user>"

Device monitoring

- ◆ "display device manuinfo"
- ◆ "save force"
- ◆ "quit"

- ◆ "system-view"
- ◆ "display version"
- ◆ "display current-configuration"
- ◆ "display saved-configuration"
- ◆ "screen-length disable"
- ◆ "reboot"
- ◆ "display arp"
- ◆ "display ip routing-table"
- ◆ "display interfaces"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy To Start	ASCII	SSH, Telnet
Startup Configuration	Yes	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- TFTP has not been tested.

CHAPTER 42

Hirschmann Devices

This chapter contains the following topics:

- ◆ [Hirschmann Rail Switch](#) 504

Hirschmann Rail Switch

Device Type	Switch
Specific Model(s)	Hirschmann Railswitch, Hirschmann PowerMice
Operating System and Firmware Versions	L2E-07.1.01, L2P-07.1.05
Communication Protocols	SSH/Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	ARP, Interface, Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- SysObjectID must contain "1.3.6.1.4.1.248.14.10"
- sysDescr contains "Hirschmann railswitch" or "Hirschmann PowerMICE"
- OS version is available from .1.3.6.1.4.1.248.14.1.1.2.0 OID
- ◆ Term
 - Output of "show sysinfo" contains model name and serial number.
 - Output of "show sysinfo" contains hostname of the device.
 - Output of "show sysinfo" contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
- ◆ Term/TFTP
 - copy system:running-config tftp://<SERVERIPADDR>/<LOCALFILE>
 - copy nvram:startup-config tftp://<SERVERIPADDR>/<LOCALFILE>

Configuration deploy

- ◆ Term
 - Issue command system paste-config start
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
 - Issue command system paste-config stop
- ◆ Term/TFTP
 - copy tftp://<SERVERIPADDR>/<REMOTEFILE> system:running-config
 - copy tftp://<SERVERIPADDR>/<REMOTEFILE> nvram:startup-config

Credential management

- ◆ SNMP
 - snmp-server community <newCommunity>
 - snmp-server community <newCommunity>
 - no snmp-server community <oldCommunity>
- ◆ Account – Credential roll is not supported as of now.

Device monitoring

- ◆ Show sysinfo
- ◆ copy system:running-config nvram:startup-config
- ◆ enable
- ◆ exit
- ◆ configure
- ◆ show arp switch
- ◆ show interface ethernet switchport
- ◆ reboot
- ◆ show running-config

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes		TEXT	SSH, Telnet,SSH/TF Tp.Telnet/TFTP
startup	Yes	Yes		TEXT	SSH,Telnet/TF TP,SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ TFTP has not been tested.
- ◆ Account credential role is not supported.

CHAPTER 43

HP Devices

This chapter contains the following topic:

- ◆ [HP GbE2c BladeSwitch.....](#) 510
- ◆ [HP ProCurve Switch.....](#) 515
- ◆ [HP 3600V2 Switch](#) 522

HP GbE2c BladeSwitch

Device Type	Switch
Specific Model(s)	GbE2c
Operating System and Firmware Versions	5.1.3
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	View Routes View Interfaces Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - SysObjectID should contain "1.3.6.1.4.1.11.2.3.7.11.33.[4-6].1.1"
 - SysDescription should contain "GbE2c.+Ethernet Blade Switch for HP"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show running-config"
 - "show active-config"
 - "show backup-config"
- ◆ Term/TFTP
 - "copy running-config tftp address <SERVERIPADDR> filename <LOCALFILE>"
 - "copy active-config tftp://<SERVERIPADDR>/<LOCALFILE>"
 - "copy backup-config tftp://<SERVERIPADDR>/<LOCALFILE>"

Configuration deploy

- ◆ Term
 - Configuration can be send line by line to the device as device command
 - "copy running-config startup-config"
- ◆ Term/TFTP
 - "copy tftp running-config address <SERVERIPADDR> filename <config filename> "
 - "y"
 - "copy running-config startup-config"
- ◆ Note
 - Optionally, the copy running-config active-config command can be issued following a configuration deployment. This command copies the previous active configuration to the backup configuration.

Credential Management

- ◆ SNMP v1/v2
 - "enable"
 - "snmp-server read-community < new SnmpCommunity >"
 - "snmp-server write-community < new SnmpCommunity >"
- ◆ Account

- "enable"
- "configure terminal"
- "show access user"
- "access user user-password"
- "access user operator-password"
- "access user administrator-password"
- <password>
- "no access user <oldUserNum> enable"
- "end"
- "access user <enableUser> name < userName >"
- "access user <enableUser > level admin"
- "access user <enableUser > password"
- <password>
- "access user <enableUser> enable"
- "no access user <disableUser> enable"
- "end"

Device monitoring

- ◆ "show interface info"
- ◆ "show interface link"
- ◆ "show interface portchan info"
- ◆ "show interface portchan link"
- ◆ "show ip route"
- ◆ "terminal-length "
- ◆ "enable"
- ◆ "disable"
- ◆ "show sys-info"
- ◆ "show snmp"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
active	Yes	Yes	NA	ASCII	Telnet, SSH
backup	Yes	Yes	NA	ASCII	Telnet, SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	No	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ When sending a config line by line using Telnet or SSH, sending an *ip-mgmt interface address* command causes the terminal session to drop. Due to this, the driver will intentionally filter out any configuration line that starts with *ip-mgmt interface address* when sending in line by line mode.

- ◆ When sending a config line by line using Telnet or SSH, it is not clear whether commands that change passwords are processed correctly because password commands in the command-line interface are normally interactive. Due to this, any job that sends a password command line by line receives a warning message. The command is sent but the job result will note that the command may not be processed correctly.
- ◆ The local AAA system only supports a total of 10 user accounts. When rolling users/passwords, if the new user does not already exist, the driver first attempts to reuse the old user account if it exists. If the old user account does not exist, the driver looks for one available user account out of the possible 10. If there are no available user accounts, no changes are made and the job will fail.
- ◆ The HP GbE2c Bladeswitch has console logging enabled by default and sends console messages immediately upon login. This can cause automated logins to fail in certain circumstances. It is advisable to permanently turn off console logging on any GbE2c device that is to be managed. In most cases the driver still manages to login, but the messages slow down the login procedure dramatically. For best performance, turn off console logging permanently using the following:
 - configure terminal
 - no logging console
 - end
 - save running-config startup-config

HP ProCurve Switch

Device Type	Switch
Specific Model(s)	J3245A ProCurve Switch 800T, J3245A ProCurve Switch 200, J4850A ProCurve Switch 5304XL, J3288A ProCurve 10/100 Hub 12M, J4865A ProCurve Switch 4108GL, J3245A ProCurve Switch 212M, J3299A, J4899A ProCurve Switch 4874A, J4899A ProCurve Switch 2650, J4120A ProCurve Switch 1600M, J4122A ProCurve Switch 2400M, J4093A ProCurve Switch 2424M, J4812A ProCurve Switch 2512, J4813A. J4899B ProCurve Switch 2650, J4900 ProCurve Switch 2626, ProCurve Switch Unknown, ProCurve Switch 2000, ProCurve Switch 2000B, ProCurve Switch 2524, ProCurve Switch A6713A, ProCurve Switch A6716A, ProCurve Switch A6717A, ProCurve Switch 4104GL, ProCurve Switch 224M, ProCurve Switch J4902, ProCurve Switch J4903A, ProCurve Switch J4904A, ProCurve Switch Proliant, ProCurve Switch J4900A, ProCurve Switch J8165A, ProCurve Switch J8164A, ProCurve Switch J8130A, ProCurve Switch J8133A, ProCurve Switch J8153A, ProCurve Switch J8154A, ProCurve Switch J8155A, ProCurve Switch J4905A, ProCurve Switch J4906A, ProCurve Switch J8718A, ProCurve Switch J8719A, ProCurve Switch J8433A, ProCurve Switch J8474A, 9308 Routing Switch, 9304 Routing Switch, 5308 Routing Switch, 6208 Routing Switch, 5308XL ProCurve Switch HP Ether Switch
Operating System and Firmware Versions	<p>Operating systems for 2600 series models: H.10.31, H.10.35, H.10.43</p> <p>Operating systems for 3500-YLseries models: K.11.69, K.12.02, K.12.05</p> <p>Operating systems for 5300-XL series models: E.10.55, E.10.61</p>
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, V3, Account
Operating System Management Protocols	FTP, SCP, TFTP
Quick Commands	Ping Traceroute Ping Device

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysDescription must contain "ProCurve"
 - SysObjectID must contain "1.3.6.1.4.1.11.2.3.7.11"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show config"
 - "show run"
- ◆ SCP
 - Running config and Startup config can be pulled using SCP.

Configuration deploy

- ◆ Term

- Configuration can be send line by line as device commands
- ◆ Term/TFTP
 - "copy tftp startup-config "<SERVERIPADDR> <Config filename>"
 - "y"
 - "exit"

Credential management

- ◆ SNMP
 - "no snmp-server community < old Snmp Community>"
 - "snmp-server community <newSnmpRWCommunity> Manager unrestricted"
 - "snmp-server community <new SnmpROCommunity> Manager restricted"
- ◆ Account
 - "conf t"
 - "password manager user-name <username>"
 - "password manager"
 - "<password>"
 - "exit"

Operating System management

- ◆ Via SCP/FTP
 - "show version"
 - Retrieve image using SCP/FTP from image Server
 - SCP put the retrieved image on the device
 - Wait till device Reboot
- ◆ Via TFTP
 - "show version"
 - "copy tftp flash <tftpServer> <imageName> <destFlash> "
 - destFlash value can be either "primary" or "secondary"
 - "y"
 - Wait till device Reboot

Device Monitoring

- banner
- boot system flash destFlash
- configure terminal
- no page
- show config

- show flash
- show running
- show ver
- show version
- terminal width
- write memory
- reload
- ping
- traceroute

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	Telnet, SSH, SSH/SCP
Startup	Yes	Yes	NA	ASCII	Telnet, SSH, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	Yes	No
Identity	No	Yes
Interfaces	Yes	No
Keys	Yes	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	Yes	No
Physical Hardware	No	Yes
Routes	Yes	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

HP ProCurve 2650 - Invalid Command ip proxy-arp

- ◆ The configuration command for the default VLAN does *not* process correctly. This is an issue for *all* push types. A Push, using the terminal protocol, provides a warning but cannot be used for **Push to Start**.

This error has been ignored for pushes to the running configuration but can not be ignored for a Push to Start, using TFTP.

- HP 2650# sh ver

```
Image stamp: /sw/code/build/fish(ts_08_5)
```

```
May 26 2005 17:11:52
```

```
H.08.69
```

```
973
```

```
Boot Image: Primary
```

```
VLAN 1
```

```
name "DEFAULT_VLAN"
untagged 1-47,50-Trk1
ip address 172.18.1.1 255.255.255.0
ip proxy-arp
exit
```

```
Failed during execution
```

```
Line=exit
```

```
Error In Configuration File On Line #21
```

```
Invalid input: proxy-arp
```

```
Error: Push Failed, Pull Succeeded
```

```
HP 2650# copy start tftp 192.168.1.1 hp1
```

```
HP 2650# copy tftp start 192.168.1.1 hp1
```

```
Device may be rebooted, do you want to continue [y/n]? y
```

line: 22. Invalid input: proxy-arp

HP ProCurve 2650 - Push to Start causes Reboot

- ◆ The device can reboot after a Push to Start.
 - HP 2650# copy tftp start 192.168.1.1 hp1
Device may be rebooted, do you want to continue [y/n]? y
Rebooting switch...
The ProCurve 2650 switch may reboot after a Push to Start.

HP ProCurve

- ◆ The HP Switch does *not* support Non-SNMP Management. For manageability, ensure that SNMP is turned **On**.

HP Switch - Configuration Pushes

- ◆ **Issue:** Configuration pushes executed to the HP switch using the push types **Push to Run** and **Push to Run Copy Start** may fail, due to line entries within the device configuration which contain the *delete command*.
- ◆ **Resolution:** Remove lines from the configuration that may issue delete commands *before* pushing the configuration.
- ◆ RollBack
 - When pushing a configuration to the HP switch, to remove lines from the configuration, that line must be *prefixed* with the word **no**.
 - For example:


```
ip default-gateway 172.17.0.1
snmp-server community "public" Operator Unrestricted
snmp-server community "Cust3"
```
 - To remove "**public**" you need to push the following:


```
ip default-gateway 172.17.0.1
no snmp-server community "public" Operator Unrestricted
snmp-server community "Cust3"
```

Note that the second line snmp-server community "public", Operator Unrestricted is removed by prefixing the line with **no**, and then pushing the configuration. For lines which contain **delete**, follow the same procedure.

HP ProCurve 2626 and 3500-ly

- ◆ Configuration management using SCP
 - This capability is OS-dependent. Consult the applicable device documentation for details. For certain versions, SFTP (currently unsupported) is available, but SCP is not.
- ◆ OS Upgrades using SCP

- Image transfers generally succeed, but the devices fail to acknowledge the end-of-file sequence, leaving subsequent terminal sessions unable to complete the reload procedure. This can take the form of unresponsive SSH sessions or an indication that a transfer is still in progress. In some cases, the image file may also be truncated. A cold boot is the only current workaround.

HP 3600V2 Switch

Device Type	Switch
Specific Model(s)	A3600-48-POE,A5800-24G 5800-24G-POE 1810-24G 5700-40XG-2QSFP+
Operating System and Firmware Versions	5.20.99
Communication Protocols	SSH, Telnet, SSH/TFTP, SNMP
Configuration Files Content	ASCII
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID should contain "1.3.6.1.4.1.25506.11.1.98"
 - SysDescription should contain "HP A3600"
- ◆ Terminal
 - Output of “display device manuinfo” contains model name and serial number.
 - Output of “display version” contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - "display current-configuration"
 - "display saved-configuration"
- ◆ Term/TFTP
 - "backup startup-configuration to <SERVERIPADDR> <LOCALFILE>"

Configuration deploy

- ◆ Terminal
 - issue command “save force”
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential Management

- ◆ SNMP v1/v2
 - "snmp-agent community read <newCommunity>"
 - "snmp-agent community write <newCommunity> "
 - "undo snmp-agent community read <oldCommunity>"
- ◆ Account
 - "local-user <user> +password simple <password> +authorization-attribute level 3 +service-type telnet +service-type ssh"
 - "undo local-user <user>"

Device monitoring

- ◆ "display device manuinfo"

- ◆ "save force"
- ◆ "quit"
- ◆ "system-view"
- ◆ "display version"
- ◆ "display current-configuration"
- ◆ "display saved-configuration"
- ◆ "screen-length disable"
- ◆ "reboot"
- ◆ "display arp"
- ◆ "display ip routing-table"
- ◆ "display interfaces"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy To Start	ASCII	SSH, Telnet
Startup Configuration	Yes	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes

Attributed data	Terminal	SNMP
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- TFTP has not been tested.

HP 3600V2 Router

Device Type	Router
Specific Model(s)	A-MSR900 , A-MSR20-11, A-MSR920
Operating System and Firmware Versions	5.20.106
Communication Protocols	TELNET, SSH,SNMP , TELNET/TFTP , SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMPv1/v2, Terminal, Privilege
Operating System Management Protocols	NA
Quick Commands	Ping,Interfaces,Arp, Routes ,Traceroute and Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains 1.3.6.1.4.1.25506
- SysDescription should contain "HP"
- ◆ Terminal
 - Output of “display device manuinfo” contains model name and serial number.
 - Output of “display version” contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - display current-configuration
 - display saved-configuration"Configuration Deploy
- ◆ Term/TFTP
 - backup startup-configuration to <SERVERIPADDR> <LOCALFILE>

Configuration deploy

- ◆ Terminal
 - Issue command “save force”
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential Management

- ◆ SNMP v1/v2
 - "snmp-agent community read <newCommunity>"
 - "snmp-agent community write <newCommunity> "
 - "undo snmp-agent community read <oldCommunity>"
- ◆ Account
 - "local-user <user> +password simple <password> +authorization-attribute level 3 +service-type telnet +service-type ssh"
 - "undo local-user <user>"

Device monitoring

- ◆ "display device manuinfo"
- ◆ "save force"
- ◆ "quit"
- ◆ "system-view"

- ◆ "display version"
- ◆ "display current-configuration"
- ◆ "display saved-configuration"
- ◆ "screen-length disable"
- ◆ "reboot"
- ◆ "display arp"
- ◆ "display ip routing-table"
- ◆ "display interfaces"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	NA	ASCII	SSH, Telnet
Startup Configuration	Yes	Yes	NA	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 44

Huawei Devices

This chapter contains the following topic:

- ◆ Huawei Router 532
- ◆ Huawei Switch 537
- ◆ Huawei SmartAX 542

Huawei Router

Device Type	Switch
Specific Model(s)	AR19-10, AR19-13, AR19-15, AR29-21, AR49-45 NE40-E, NE40-4, NE80
Operating System and Firmware Versions	For NE40-E, NE40-4, NE80: VRP 5.30, NE40: VRP5.130 For AR19-10, AR19-13, AR19-15, AR29-21, AR49-45: VRP 5.20
Communication Protocols	Telnet, SSH, SSH/FTP, Telnet/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.2011"
 - SysDescription must contain "VRP" or "Versatile Routing Platform" or "Quidway"
 - PackageID should be retrievable from the model no.
- ◆ Term
 - Result of **display version** should have "Versatile Routing Platform" or "VRP"
 - Host name must be retrieved from **display current-configuration** command
 - Model name must be retrieved from **display version** command and that should resolve to the Package ID

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ *Term*
 - *"display current-configuration"*
 - *"display saved-configuration"*
- ◆ *Term/FTP*
 - *"save <config filename.cfg>" for ASCII*
 - *"save <config filename.zip>" for Binary*
 - *"y"*
 - *"display startup"*
 - *FTP the configuration file.*

Configuration deploy

- ◆ Term
 - "system-view"
 - Configuration can be send line by line as device commands
 - "save"
- ◆ Term/TFTP
 - "display startup"
 - FTP the configuration file
 - "startup saved-configuration < pushed Config Filename >"
 - "reboot"

Credential management

- ◆ SNMP v1/v2

- "system-view"
- "undo snmp-agent community < old Snmp Community >"
- "undo snmp-agent community read < old Snmp Community >"
- "undo snmp-agent community write < old Snmp Community >"
- "snmp-agent community read < new Snmp Community >"
- "snmp-agent community write < new Snmp Community >"
- ◆ Account
 - "system-view"
 - "aaa"
 - "local-user <username> password simple/cipher < password >"
 - "local-user <username> service-type < protocol>"
 - "local-user <username> level 15"
 - "undo local-user < oldUser >"
 - "local-user < userName >"
 - "password simple < password >"
 - "service-type < protocol >"
 - "level 3"
 - "quit"

Device monitoring

- ◆ "display acl config all"
- ◆ "display acl all"
- ◆ "display startup"
- ◆ "ping "
- ◆ "tracert "
- ◆ "dir "
- ◆ "display version"
- ◆ "display ip interface brief"
- ◆ "display ip routing-table"
- ◆ "display current-configuration"
- ◆ "user-interface "
- ◆ "screen-length "
- ◆ "display arp all"
- ◆ "display vlan"
- ◆ "display vlan all"

- ◆ "display interface"
- ◆ "display mac-address"
- ◆ "display ospf brief"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Current	Yes	Yes	CopyToSaved	ASCII	Telnet, SSH
Saved	Yes	Yes	Reboot	ASCII	Telnet, SSH
Current-binary	Yes	Yes	Reboot	Binary	SSH/FTP, Telnet/FTP
Saved-binary	Yes	Yes	Reboot	Binary	SSH/FTP, Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	Yes	No
CAM Table	Yes	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	Yes	No
OSPF Settings	Yes	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	Yes	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

- ◆ Huawei devices do not support FTP or Telnet/SSH access from the same account. FTP access is hardcoded in the driver. For FTP configuration to work an FTP login **emcftp** with password **emctester** must exist.
- ◆ Some configuration commands may cause a premature connection failure and fail the push job when pushed to the NE-series routers. For example, the *shutdown* command for interfaces.
- ◆ Some router configurations may show out-of-sync indications, when no visual differences are shown. This is due to random spaces introduced by the device after Terminal pulls.
- ◆ Configuration pull and push:
 - Configuration pull and push is done using FTP for devices that support binary(.zip) configurations.
 - Configuration pull and push is done using Terminal for devices that support text (.cfg) configurations.
 - Configuration pull and push is done using FTP for devices that support both binary(.zip) and text(.cfg) configurations.
- ◆ Serial number and physical hardware are not available using terminal.
- ◆ Memory, file system information, and interfaces are not supported using SNMP.

Huawei Switch

Device Type	Switch
Specific Model(s)	S2326TP-SI, S2326TP-PWR-SI, S3352P-SI, S3352P-PWR-EI, S3352P-EI-24S, S3552, S5324TP-SI, S5324TP-PWR-SI, S5328C-EI-24S, S5328C-EI, S5348TP-SI, S5352C-PWR-SI, S5652 S8500, S8505, S6503, , S9303, S9303 Terabit Routing Switch, S9306, S9306 Terabit Routing Switch, S9312, S3352P-EI-48S, S3328TP-EI-24S,S7706
Operating System and Firmware Versions	For S3552: VRP 5.20 For S2326, S3352, S5324, S5328, S5352, S5348, S5652: VRP 5.30 For S8500, S8505: VRP 3.10 For S9303, S9303 Terabit Routing Switch, S9306, S9306 Terabit Routing Switch, S9312: VRP 5.7
Communication Protocols	Telnet, SSH, SSH/FTP, Telnet/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes

Features Available	Support
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.2011"
 - SysDescription must contain "VRP" or Versatile Routing Platform" or "Quidway"
 - PackageID should be retrievable from the model no.
- ◆ Term
 - Result of **display version** should have "Versatile Routing Platform" or "VRP"
 - Host name must be retrieved from **display current-configuration** command
 - Model name must be retrieved form **display version** command and that should resolve to the Package ID

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ *Term*
 - *"display current-configuration"*
 - *"display saved-configuration"*
- ◆ *Term/FTP*
 - *"save <config filename.cfg>" for ASCII*
 - *"save <config filename.zip>" for Binary*
 - *"y"*
 - *"display startup"*
 - *FTP the configuration file.*

Configuration deploy

- ◆ Term
 - "system-view"
 - Configuration can be send line by line as device commands

- "save"
- ◆ Term/TFTP
 - "display startup"
 - FTP the configuration file
 - "startup saved-configuration < pushed Config Filename >"
 - "reboot"

Credential management

- ◆ SNMP v1/v2
 - "system-view"
 - "undo snmp-agent community < old Snmp Community >"
 - "undo snmp-agent community read < old Snmp Community >"
 - "undo snmp-agent community write < old Snmp Community >"
 - "snmp-agent community read < new Snmp Community >"
 - "snmp-agent community write < new Snmp Community >"
- ◆ Account
 - "system-view"
 - "local-user < userName >"
 - "password simple < password >"
 - "service-type < protocol >"
 - "level 3"
 - "quit"
 - "aaa"
 - "local-user <username> password simple < password >"
 - "local-user <username> service-type < protocol>"
 - "local-user <username> level 15"
 - "undo local-user < oldUser >"

Device monitoring

- ◆ "display acl config all"
- ◆ "display acl all"
- ◆ "display startup"
- ◆ "ping "
- ◆ "tracert "
- ◆ "dir "

- ◆ "display version"
- ◆ "display ip interface brief"
- ◆ "display ip routing-table"
- ◆ "display current-configuration"
- ◆ "user-interface "
- ◆ "screen-length "
- ◆ "display arp all"
- ◆ "display vlan"
- ◆ "display vlan all"
- ◆ "display interface"
- ◆ "display mac-address"
- ◆ "display ospf brief"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Current	Yes	Yes	copyToSaved	ASCII	Telnet, SSH
Saved	Yes	Yes	Reboot	ASCII	Telnet, SSH
Current-binary	Yes	Yes	Reboot	Binary	SSH/FTP, Telnet/FTP
Saved-binary	Yes	Yes	Reboot	Binary	SSH/FTP, Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	Yes	No
CAM Table	Yes	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	Yes	No
OSPF Settings	Yes	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	Yes	No

Known issues

The following existing device issues have been discovered with other releases. In most cases, a resolution is included to address the issue.

- ◆ Huawei devices do not support FTP or Telnet/SSH access from the same account. FTP access is hardcoded in the driver. For FTP configuration to work an FTP login **emcftp** with password **emctester** must exist.
- ◆ For S2326TP-SI, S2326TP-PWR-EI, S3352P-PWR-EI, S5324TP-PWR-SI, and S5352C-PWR-SI models, configuration files are saved in zipped format. These configurations cannot be viewed in the user interface, but backup and restore operation can be performed.
- ◆ Configuration pull and push:
 - Configuration pull and push is done using FTP for devices that support binary(.zip) configurations.
 - Configuration pull and push is done using Terminal for devices that support text (.cfg) configurations.
 - Configuration pull and push is done using FTP for devices that support both binary(.zip) and text(.cfg) configurations.
- ◆ Serial number and physical hardware are not available using terminal.
- ◆ Memory, file system information, and interfaces are not supported using SNMP.

Huawei SmartAX

Device Type	Switch
Specific Model(s)	MA5300
Operating System and Firmware Versions	V3R000M03
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	View Routes View Arp View Interfaces Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.2011."
 - Model ID should be mapped to the SysObjectID and that should match to the package ID.
- ◆ Term
 - **show version** command must have "Huawei Versatile Routing Platform"
 - **show version** command must also have "SmartAX" and model no of the device.
 - **show running-config | include hostname** is used to get the hostname.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show running-config"
 - "show startup-config "
- ◆ Term/TFTP
 - "configure terminal"
 - "tftp put flash:/ vrpcfg.txt //<SERVERIPADDR>/<local filename>"
 - "end"

Configuration deploy

- ◆ Term
 - "configure terminal"
 - Send configuration line by line to the device as device commands
 - "end"
 - "write"
 - "y"
- ◆ Term/TFTP
 - "configure terminal"
 - "tftp get //<SERVERIPADDR>/<local filename> flash:/ vrpcfg.txt "
 - "end"

Credential management

- ◆ SNMP v1/v2

- "configure terminal"
- "snmp-server community <newString> ro"
- "snmp-server community <newString> rw"
- "no snmp-server community < oldString >"
- "end"
- ◆ Account
 - "configure terminal"
 - "terminal user password "
 - "<username>"
 - "<password>"
 - "end"

Device monitoring

- ◆ "enable"
- ◆ "no smart"
- ◆ "disable"
- ◆ "configure terminal"
- ◆ "reboot system"
- ◆ "show version"
- ◆ "show ip interface"
- ◆ "show ip route"
- ◆ "show arp"
- ◆ "show interface"
- ◆ "show ip route static"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Startup	Yes	Yes	Reboot	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. In most cases, a resolution is included to address the issue.

- ◆ Until a command line interface command is identified to determine the name of the startup configuration file, the literal name **vrpcfg.txt** is currently used in the driver. This will result in startup file management errors in the event Huawei changes the name of the startup file in later software releases.
- ◆ There does not appear to be a way to query the system for serial number or memory information.
- ◆ Full configuration pushes using terminal are not supported due to the content of the configuration not merging correctly from the command line interface when issued line-by-line. Some commands result in sub-levels of config prompts without corresponding **exit** commands, and the comment character **!** does not serve this purpose. This leaves the device in a state where normally legal commands are not recognized, and the resulting errors fail the push.
- ◆ The concept of privilege mode with password authorization does not exist for this device class, so privilege password jobs are failed with **change not supported**.

CHAPTER 45

IBM Devices

This chapter contains the following topic:

- ◆ IBM BladeCenter 1/10Gb Uplink Ethernet 548
- ◆ IBM BladeCenter Virtual Fabric 551

IBM BladeCenter 1/10Gb Uplink Ethernet

Device Type	Switch
Specific Model(s)	1/10Gb Uplink Ethernet Switch Module
Operating System and Firmware Versions	7.4.1.0
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, Interface,routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .26543.1.18.5
- ◆ Terminal
 - Output of "show sys-info" contains model name and serial number.
 - Output of "show system" contains hostname of the device.
 - Output of "show version" contains the software version.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
 - show active-config
 - show backup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ SNMP
 - snmp-server read-community <newCommunity>
 - snmp-server write-community <newCommunity>

Device monitoring

- ◆ Show sys-info
- ◆ Show version
- ◆ Show system
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ show active-config
- ◆ show backup-config
- ◆ show interface information

- ◆ show route-map
- ◆ show arp
- ◆ write memory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	TEXT	SSH, Telnet
startup	No	Yes	No	TEXT	SSH, Telnet
active	No	Yes	No	TEXT	SSH, Telnet
backup	No	Yes	No	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

IBM BladeCenter Virtual Fabric

Device Type	Switch
Specific Model(s)	Virtual Fabric 10Gb Switch Module
Operating System and Firmware Versions	7.2.2.0
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, Interface,routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .26543.1.18.11
- ◆ Terminal
 - Output of "show sys-info" contains model name and serial number.
 - Output of "show system" contains hostname of the device.
 - Output of "show version" contains the software version.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
 - show active-config
 - show backup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ SNMP
 - snmp-server read-community <newCommunity>
 - snmp-server write-community <newCommunity>

Device monitoring

- ◆ Show sys-info
- ◆ Show version
- ◆ Show system
- ◆ ping
- ◆ traceroute
- ◆ show running-config
- ◆ show startup-config
- ◆ show active-config
- ◆ show backup-config
- ◆ show interface information

- ◆ show route-map
- ◆ show arp
- ◆ write memory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	TEXT	SSH, Telnet
startup	No	Yes	No	TEXT	SSH, Telnet
active	No	Yes	No	TEXT	SSH, Telnet
backup	No	Yes	No	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 46

Intermec Devices

This chapter contains the following topic:

- ◆ [Intermec MobileLAN.....](#) 556

Intermec MobileLAN

Device Type	Wireless AP
Specific Model(s)	Tested: WA21 Untested: WA22
Operating System and Firmware Versions	2.30
Communication Protocols	Telnet, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysDescription must contain " Intermec Technologies AP"
 - Device should have valid system properties information
- ◆ Term
 - Banner contains Access Point Configuration
 - Main menu contains About entry
 - Summary screen listing WA2n as model

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - Maintenance › About This Access Point
 - The resulting pages are captured as a read-only information configuration.

Credential management

- ◆ Account
 - Change the username through Menu "Security->User Name"
 - Change the password through menu "Security->Password"
 - Save the changes using menu "Save config"
 - Reboot the device using menu "Reboot"
- ◆ SNMP v1/v2
 - Change the SNMP community string through menu "Management->Network Management"
 - Save the changes using menu "Save config"
 - Reboot the device using menu "Reboot"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Devinfo	No	Yes	NA	ASCII	Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. In most cases, a resolution is included to address the issue.

Intermec MobileLAN

- ◆ Configlets and termlets are not supported, since the device is menu oriented with almost no command-line interface. The lack of configlets and termlets results in no remediation and diagnostic support.
- ◆ This device supports only one session at a time. Any session established to the device while a pull or credential roll is attempted, will cause the job to fail with a message referencing the inability to establish a session.
- ◆ All configuration changes, including credential rolls, require a save and reboot of the device. The current driver does this for each credential roll, as a current limitation.
- ◆ The *TFTP PUT* command fails with the message *File not found*, making file transfer of the binary configuration to the server unworkable. This prevents normal pull/push configuration management.
- ◆ ARP and Static Routes are only available using SNMP.
- ◆ Memory and Hardware Inventory are only available using Terminal.

CHAPTER 47

Juniper Devices

This chapter contains the following topics:

◆ Juniper ERX (E Series)	562
◆ Juniper Router	567
◆ Juniper EX2500 Switch	573
◆ Juniper Switch (EX Series)	578
◆ Juniper WXC	584
◆ NetScreen Firewall	589

Juniper ERX (E Series)

Device Type	Switch
Specific Model(s)	E120, E320, ERX-310, ERX-700, ERX-705, ERX-1400, ERX-1440
Operating System and Firmware Versions	JunOSe v8.2 and 9.1
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP, Telnet/FTP, SSH/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	NA
Operating System Management Protocols	FTP
Quick Commands	View Routes View Arp View Interfaces View Processor CPU Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.4874."
- ◆ Term
 - **show version** should come back to a correct prompt
 - **show configuration | include hostname** or **show running-configuration | include hostname** should return hostname and model name.
 - Model name should be resolved to SysObjectID which contains "1.3.6.1.4.1.4874."

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show ?"
 - "show configuration"
 - "show running-configuration"
 - Term/FTP
 - "delete /outgoing/< fileName >"
 - "show configuration > /outgoing/< fileName >"
 - "copy running-configuration /outgoing/< fileName >"
 - "show running-configuration > /outgoing/voyence.txt"
 - "copy startup-configuration /outgoing/< fileName >"
 - FTP the file to device server.
- ◆ Term/TFTP
 - "delete <fileName>"
 - "show configuration > < fileName >"
 - "copy running-configuration < fileName >"
 - "show running-configuration > < fileName >"
 - "copy startup-configuration < fileName >"
 - "Y"
 - "copy "<filename> tftp://<SERVERIPADDR>/<local filename>"

Configuration deploy

- ◆ Term
 - "configure terminal"
 - Configuration can be send line by line to the device as device commands.
 - "end"
- ◆ Term/TFTP
 - "copy tftp://<SERVERIPADDR>/<local config filename> <configuration FileName>"
 - "configure terminal"
 - "boot config <configuration FileName>"
 - "Y"
 - "end"
- ◆ Term/FTP
 - "delete /incoming/voyence.cnf"
 - FTP the configuration file to the device
 - "copy /incoming/voyence.cnf <configuration FileName>"
 - "configure terminal"
 - "boot config <configuration FileName>"
 - "Y"
 - "end"

Operating System management

- ◆ FTP
 - "enable"
 - "dir"
 - "configure terminal"
 - "disable-autosync"
 - "copy ftp://<ftpUser>:<ftpPassword>@<Server IP Address>/<imageName> <imageNameRegEx>"
 - "boot system <imageNameRegEx>"
 - "synchronize"
 - "srp switch"
 - "y"
 - "no disable-autosync"
 - "end"
 - "reload"

Device Monitoring

- ◆ "SHOW version"
- ◆ "show configuration | include hostname"
- ◆ "show running-configuration | include hostname"
- ◆ "enable"
- ◆ "show version"
- ◆ "show configuration"
- ◆ "show hardware"
- ◆ "show process memory"
- ◆ "ping "
- ◆ "traceroute "
- ◆ "show route"
- ◆ "show ip interface"
- ◆ "show arp"
- ◆ "show processes"
- ◆ "show environment"
- ◆ "show snmp delta"
- ◆ "show configuration category interfaces"
- ◆ "show running-configuration category interfaces"
- ◆ "terminal length 0"
- ◆ "terminal width 512"
- ◆ "show ?"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
text	Yes	Yes	commitConfig, reboot	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP, Telnet/FTP, SSH/FTP
binary	Yes	Yes	commitConfig, reboot	Binary	Telnet/TFTP, SSH/TFTP, Telnet/FTP, SSH/FTP

Device data

The following data represents device data per device class

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ The Binary config cannot be pushed or pulled using Telnet or SSH alone.
- ◆ When entering a Text config using the command line interface, any line that matches the following pattern is not sent, otherwise the command line interface session is dropped.
 - no neighbor * rib-out disable

Juniper Router

Device Type	Router
Specific Model(s)	A20, A40, J2300, J2320, J2350, J4300, J4320, J4350, J6300, J6350, M10, M10i, M120, M160, M20, M320, M40, M40e, M5, M7i, MX240, MX480, MX960, SRX210, SRX240, SRX3400, SRX3600, SRX5600, SRX5800, SRX650, T320, T640, T1600, TX, SRX100, SRX220, SRX220H, SRX100-HM, SRX240H, QFX3500S, QFX3000-M
Operating System and Firmware Versions	JUNOS v8.2 ,9.1 and 10.1, 11.2R5.4, 12.1 X 49 -D1.2, 12.2X50-D50.1
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP, SCP, TFTP
Quick Commands	View Routes View Arp View Interfaces View Processor CPU Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes

Features Available	Support
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.2636" and should not contain "1.3.6.1.4.1.2636.1.1.1.[1-4].3[0-3]."
 - SysObjectID must contain .1.3.6.1.4.1.2636. 1.1.1.4.82.1
 - SysObjectID must contain .1.3.6.1.4.1.2636. 1.1.1.4.84.2
- ◆ Term
 - **show version** result must contain "JUNOS"
 - **show version** result should contain hostname and model name.
 - Model name should be resolved to SysObjectID which should not contain "1.3.6.1.4.1.2636.1.1.1.[1-4].3[0-3]."

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show configuration | display ?"
 - "show configuration | display set"
 - "show configuration"
 - "show configuration | "<format>"
- ◆ Term/FTP
 - "file delete voyence.cfg"
 - "save voyence.cfg\n"
 - "show configuration | display ?"
 - "show configuration | display set | save voyence.cfg"
 - "show configuration | save voyence.cfg"
 - FTP the voyence.cfg to device server.

Configuration deploy

- ◆ Term
 - "configure terminal"
 - Configuration can be send line by line to the device as device commands.
 - "end"
- ◆ Term/FTP or Term/SCP
 - "file delete voyence.cfg"
 - FTP the configuration file to the device
 - "configure"
 - "load set voyence.cfg"
 - "load override voyence.cfg"
 - "load replace voyence.cfg"
 - "top"
 - "commit check"

Credential management

- ◆ SNMP v1/v2
 - "delete snmp community < old Snmp Community >"
 - "set snmp community <new Snmp Community> authorization read-only"
 - "set snmp community <new Snmp Community> authorization read-write"
 - "commit"
- ◆ Account
 - "configure"
 - "edit system login"
 - "delete user < old User >"
 - "set user <username> class superuser authentication plain-text-password"
 - < password>
 - "commit"
 - "top"
 - "exit"

Operating System management

- ◆ "file list /cf/var/tmp detail"
- ◆ "file delete /cf/var/tmp/<filename>"
- ◆ "request system software delete-backup"
- ◆ "yes"

- ◆ "show system storage"
- ◆ "show chassis routing-engine"
- ◆ show chassis hardware"
- ◆ "request routing-engine login < engine >"
- ◆ "configure" or "configure private"
- ◆ "delete chassis redundancy"
- ◆ "commit synchronize and-quit"
- ◆ "file copy ftp://< ftp User>:<ftpPassword>@<server IP address>/<imageName>/var/tmp/<imageNameRegEx>"
- ◆ "file copy ftp://< ftp User>@<server IP address>/<imageName>/var/tmp/<imageNameRegEx>"
- ◆ "request system software add validate /var/tmp/< imageNameRegEx>"
- ◆ "request system reboot"

Device monitoring

- ◆ "show version"
- ◆ "show configuration"
- ◆ "show chassis hardware"
- ◆ "show system virtual-memory | find Totals "
- ◆ "show system storage"
- ◆ "show snmp mib walk"
- ◆ "show chassis hardware detail"
- ◆ "start shell"
- ◆ "cd /"
- ◆ "ping count 10 "
- ◆ "traceroute "
- ◆ "show interfaces | no-more"
- ◆ "show route | no-more"
- ◆ "show arp | no-more"
- ◆ "show system processes | no-more"
- ◆ "show chassis hardware | no-more"
- ◆ "show snmp statistics | no-more"
- ◆ "rollback 0"
- ◆ "set cli screen-length 0"
- ◆ "set cli screen-width 0"
- ◆ "set cli terminal vt100"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	Yes	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	Yes	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	Yes	No

Known issues

The following information details existing device issues that have been discovered within other releases. In most cases, a resolution is included to address the issue.

Juniper J Series

- ◆ In a Juniper device, the SNMP Contact and SNMP Location values must be set as alphabetical. If the SNMP Contact and SNMP Location are set with special wild card characters (such as hyphen or slash (-, \, and others), only the information before the wild card character is displayed within the General Tab of the Device Properties.

◆ **For OS Upgrade:**

- During the OS upgrade process, Juniper does not allow the deletion of some files within the Temp Folder (**/var/tmp**). To clean the Temp Folder, manually **delete** any unneeded files to free up additional system space.

Separate Push and Commit Operations

- ◆ Previously, this driver had separate push and commit operations. Currently this is reversed, and all pushes will be committed (or rolled back) automatically at the end of the push.

Rollback Command

- ◆ A rollback 0 command is issued after entering global config mode, but before sending any commands.
 - Any time the driver fails to commit changes, a rollback 0 command is issued before exiting configuration mode.

Juniper Router

◆ OS Upgrade:

- OS Upgrade will not upgrade a Juniper Router that has more than one routing engine.

◆ Configlets may contain config mode command-line interface commands, such as:

```
set snmp contact EMCcontact
set snmp location EMClocation
```

or formatted config snippets, such as:

```
snmp{
    contact EMCcontact
    location EMClocation
}
```

but **must not** contain both formats.

Juniper QFX3500S

Juniper QFX3500S is supported on the operating system, Junos 12.1 X 49 -D1.2 which is similar to the operating systems supported for the Juniper Routers that are certified for NCM DSr. Since the device certifications are based on the operating system, Juniper QFX3500S is listed under Juniper Router.

Juniper QFX3000-M

Juniper QFX3000-M is supported on the operating system, Junos 12.2 X 50-D50.1 which is similar to the operating systems supported for the Juniper Routers that are certified for NCM DSr. Since the device certifications are based on the operating system, Juniper QFX3000-M is listed under Juniper Router.

Credential roll for QFX3000-M is not tested.

Juniper EX2500 Switch

Device Type	Switch
Specific Model(s)	EX2500
Operating System and Firmware Versions	EX2500 OS v3.0+
Communication Protocols	Telnet, SSH, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	ViewRoutes View Interfaces Resync Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain "1.3.6.1.4.1.1411.102"
 - SysDescription must contain "Juniper Networks EX2500"
- ◆ Term
 - **show sys-info** is used to get Model info, Serial No for discovery and identification

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show running-config"
 - "show active-config"
 - "show backup-config"
- ◆ Term/TFTP
 - "copy running-config tftp://<SERVERIPADDR> /<LOCALFILE>"
 - "copy active-config tftp://<SERVERIPADDR>/<LOCALFILE>"
 - "copy backup-config tftp://<SERVERIPADDR>/<LOCALFILE>"

Configuration deploy

- ◆ Term
 - Configuration can be send line by line to the device as device commands.
- ◆ Term/TFTP
 - "copy tftp://<SERVERIPADDR>/<local config filename> running-config"
 - "copy tftp://<SERVERIPADDR>/<local config filename> active-config"
 - "copy tftp://<SERVERIPADDR>/<local config filename> backup-config"
 - "y"

Credential management

- ◆ SNMP v1/v2
 - "enable"
 - "snmp-server read-community < new SnmpCommunity >"
 - "snmp-server write-community < new SnmpCommunity >"
- ◆ Account

- "enable"
- "configure terminal"
- "show access user"
- "access user user-password"
- "access user operator-password"
- "access user administrator-password"
- <password>
- "no access user <oldUserNum> enable"
- "end"
- "access user <enableUser> name < userName >"
- "access user <enableUser > level admin"
- "access user <enableUser > password"
- <password>
- "access user <enableUser> enable"
- "no access user <disableUser> enable"
- "end"

Device monitoring

- ◆ "show ip route"
- ◆ "show sys-info"
- ◆ "show snmp"
- ◆ "ping "
- ◆ "traceroute "
- ◆ "show interface info"
- ◆ "show interface link"
- ◆ "show interface portchan info"
- ◆ "show interface portchan link"
- ◆ "show ip route"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Active	Yes	Yes	Reboot	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Backup	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ When sending a config line by line using Telnet or SSH, sending an ip-mgmt interface address command causes the immediate dropping of the terminal session.
 - The driver intentionally filters out any configuration line that starts with ip-mgmt interface address when sending in line by line mode.
- ◆ The Juniper EX2500 local AAA system only supports 10 user accounts. If the new user does not already exist when rolling users and passwords, the driver will attempt to reuse the old user account if it exists. If the old user account does not exist, the driver will look for an available user account. If there are no available user accounts, no changes will be made and the job will fail.
- ◆ The Juniper EX2500 has console logging enabled by default. It is advisable to permanently turn off console logging on any Juniper EX2500 devices that will be managed by this application, since the device sends console messages during the login procedure. During testing, the driver managed to login despite these console messages, but the messages slow down the login procedure dramatically. For best performance, turn off console logging permanently using the following commands:
 - configure terminal
 - no logging console
 - end
 - save running-config startup-config

Juniper Switch (EX Series)

Device Type	Switch
Specific Model(s)	EX3200, EX3200-24T, EX3200-24T-DC, EX3200-24P, EX3200-48T, EX3200-48T-DC, EX3200-48P, EX4200, EX4200-24T, EX4200-24T-DC, EX4200-24P, EX4200-24F, EX4200-24F-DC, EX4200-48T, EX4200-48T-DC, EX4200-48P, EX8208, EX8216
Operating System and Firmware Versions	JunOS v9.2 and 9.3
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslogs & Traps
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP, SCP, TFTP
Quick Commands	View Routes View Arp View Interfaces View Processor CPU Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes

Features Available	Support
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID must contain ""1.3.6.1.4.1.2636.1.1.1.[1-4].3[0-3]."
- ◆ Term
 - **show version local** result must contain "JUNOS" and "Model: [Ee][Xx]"
 - **show version local** result should contain hostname and model name.
 - Model name should be resolved to SysObjectID.
 - **show configuration** should respond with a stdEnablePrompt.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term
 - "show configuration | display ?"
 - "show configuration | display set"
 - "show configuration"
- ◆ Term/FTP
 - "file delete voyence.cfg"
 - "save voyence.cfg\n"
 - "show configuration | display ?"
 - "show configuration | display set | save voyence.cfg"
 - "show configuration | save voyence.cfg"
 - FTP the voyence.cfg to device server.

Configuration deploy

- ◆ Term
 - "configure terminal"
 - Configuration can be send line by line to the device as device commands.

- "end"
- ◆ Term/FTP or Term/SCP
 - "file delete voyence.cfg"
 - FTP the configuration file to the device
 - "configure"
 - "load set voyence.cfg"
 - "load override voyence.cfg"
 - "load replace voyence.cfg"
 - "top"
 - "commit check"

Credential management

- ◆ SNMP v1/v2
 - "delete snmp community < old Snmp Community >"
 - "set snmp community <new Snmp Community> authorization read-only"
 - "set snmp community <new Snmp Community> authorization read-write"
 - "commit"
- ◆ Account
 - "configure"
 - "edit system login"
 - "delete user < old User >"
 - "set user <username> class superuser authentication plain-text-password"
 - < password>
 - "commit"
 - "top"
 - "exit"

Operating System Management

- ◆ "file list /cf/var/tmp detail"
- ◆ "file delete /cf/var/tmp/<filename>"
- ◆ "request system software delete-backup"
- ◆ "yes"
- ◆ "show system storage"
- ◆ "show chassis routing-engine"
- ◆ show chassis hardware"
- ◆ "request routing-engine login < engine >"

- ◆ "configure" or "configure private"
- ◆ "delete chassis redundancy"
- ◆ "commit synchronize and-quit"
- ◆ "file copy ftp://< ftp User>:<ftpPassword>@<server IP address>/<imageName>/var/tmp/<imageNameRegEx>"
- ◆ "file copy ftp://< ftp User>@<server IP address>/<imageName>/var/tmp/<imageNameRegEx>"
- ◆ "request system software add validate /var/tmp/< imageNameRegEx>"
- ◆ "request system reboot"

Device monitoring

- ◆ "show version"
- ◆ "show configuration"
- ◆ "show chassis hardware"
- ◆ "show system virtual-memory | find Totals "
- ◆ "show system storage"
- ◆ "show snmp mib walk"
- ◆ "show chassis hardware detail"
- ◆ "start shell"
- ◆ "cd /"
- ◆ "ping count 10 "
- ◆ "traceroute "
- ◆ "show interfaces | no-more"
- ◆ "show route | no-more"
- ◆ "show arp | no-more"
- ◆ "show system processes | no-more"
- ◆ "show chassis hardware | no-more"
- ◆ "show snmp statistics | no-more"
- ◆ "rollback 0"
- ◆ "set cli screen-length 0"
- ◆ "set cli screen-width 0"
- ◆ "set cli terminal vt100"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	Yes	No
CAM Table	No	No
File System Information	Yes	No
Identity	No	Yes
Interfaces	Yes	Yes
Keys	Yes	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	Yes	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	Yes	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

Juniper EX2500 Switch - Not Supported with Juniper Switch (EX Series) Driver

- Juniper EX2500 models are not supported by the Juniper Switch (EX Series) device driver. Use the Juniper EX2500 Switch driver for EX2500 model support.

Separate Push and Commit Operations

- ◆ Previously, this driver had separate push and commit operations. Currently this is reversed, and all pushes will be committed (or rolled back) automatically at the end of the push.

Rollback Command

- ◆ A rollback 0 command is issued after entering global config mode, but before sending any commands.
- ◆ Any time the driver fails to commit changes, a rollback 0 command is issued before exiting configuration mode.

Juniper EX

- ◆ When managing a stack of EX4200s, the system properties and hardware are shown for the master switch only.
- ◆ Configlets may contain config mode command-line interface commands, such as:

```
set snmp contact EMCcontact
```

```
set snmp location EMClocation
```

or formatted config snippets, such as:

```
snmp
```

```
{
```

```
    contact EMCcontact
```

```
    location EMClocation
```

```
}
```

but must not contain both formats.

Juniper WXC

Device Type	Router
Specific Model(s)	WXC-500, WXC-590, WXC-100, WXC 250, WXC1800, WXC-2600, WXC 3400
Operating System and Firmware Versions	WXOS 5.7.5.0
Communication Protocols	SNMP, TELNET, TELNET/FTP, SSH, SSH/FTP
Configuration Files Content	Ascii
Configuration Change Notification (Events)	Syslog
Discovery/Identify Methods	SNMP, Term
Credential Management	SNMPv1/v2, Account
Operating System Management Protocols	FTP, TFTP
Quick Commands	Ping, traceroute

Features available

Feature	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID value contains
 - 1.3.6.1.4.1.8239.1.2.5
 - 1.3.6.1.4.1.8239.1.2.3
 - 1.3.6.1.4.1.8239.1.2.6
 - 1.3.6.1.4.1.8239.1.2.12
 - 1.3.6.1.4.1.8239.1.2.1
 - 1.3.6.1.4.1.8239.1.2.9
 - 1.3.6.1.4.1.8239.1.2.7
 - Serial number is retrieved from .1.3.6.1.4.1.8239.2.1.2.1.3.0
 - sysName will be used for discovery
- ◆ Terminal:
 - Model number is extracted using "show version"
 - Chassis Serial number is extracted using "show license"
 - Host name is extracted using "show system"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration Capture

- ◆ Terminal
 - show config
- ◆ Terminal/TFTP:
 - save-config <filename>
 - copy /ata0/cfg/<filename>.cfg tftp://<Server IP address /tftpboot/<filename>
- ◆ Terminal/FTP:
 - save-config <filename>
 - copy /ata0/cfg/<filename>.cfg ftp://<Server IP address>:<username>:<password>/tftpboot/<filename>

Configuration Deploy

- ◆ Terminal
 - Configuration is sent line by line to the device
 - commit
- ◆ Terminal/TFTP:
 - copy ftp://<Server IP address> /tftpboot/<filename> /ata0/cfg/<filename>.cfg

- load-config <filename>
- save-config
- ◆ Terminal/FTP:
 - copy ftp://<Server IP address>:<username>:<password> /tftpboot/<filename> /ata0/cfg/<filename>.cfg
 - load-config <filename>
 - save-config

Credential Management

- ◆ SNMP
 - config snmp set read-community <newSnmpCommunity>
 - config snmp set write-community <newSnmpCommunity>
 - commit
- ◆ Account
 - passwd
 - <old password>
 - <new password>

Operating System Management

- ◆ upgrade tftp://<serverIp>/<imageName>
- ◆ upgrade ftp://<serverIp>:<Username>:<upgradePass>/tftpboot/<imageName>
- ◆ reboot

Device Monitoring

- ◆ ls
- ◆ show version
- ◆ show system
- ◆ show license
- ◆ ping <ip address>
- ◆ traceroute <ip address>

Multi-Config Files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Saved	Ascii	TELNET,SSH, TELNET/FTP, SSH/FTP, TELNET/TFTP, SSH/TFTP
Startup	Yes	Yes	Copy To Saved	Ascii	TELNET/FTP, SSH/FTP, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
Access Control Lists Match Counts	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue:

- ◆ Account name change is not supported by device. Only password can be changed.

- ◆ Only WXC 500 device has been used for development/testing and other models were not tested for this release as they were not available.
- ◆ An FTP login "emcftp" with password as "ftp@emc" must exist on the NCM device server for Push and Pull operation to work using FTP.
- ◆ Pull and Push operation using TFTP could not be tested due to environmental restrictions.
- ◆ Pull operation can be performed for startup and running configuration, but push operation can be performed only for running configuration.
- ◆ During an operating system upgrade on Juniper WXC devices, if you choose only the **Copy** option to copy the operating system image and not the **Install** option, manually rebooting the device will automatically install the new operating system.
- ◆ After upgrading the operating system on a Juniper WXC device, SNMP credentials must be set to match the SNMP credentials in NCM before performing a second upgrade.

NetScreen Firewall

Device Type	Firewall
Specific Model(s)	NS5, NS10, NS100, NS1000, NS500, NS50, NS25, NS204, NS208, NS5XT, NS5XP, NS5000, NS5GT, HARDWARESECURITYCLIENT, ISG1000, ISG2000, NS5GT-ADSL-ANNEXA, NS5GT-ADSL-ANNEXB, NS5GT-WLAN, NS5GT-ADSL-ANNEXA-WLAN, NS5GT-ADSL-ANNEXB-WLAN, SSG5, SSG5-ISDN, SSG5-V92, SSG5-WLAN, SSG5-ISDN-WLAN, SSG5-V92-WLAN, SSG20, SSG20-WLAN, SSG-520, SSG-550, SSG-140, SSG-250, SSG-320M, SSG-350
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Interfaces, View Routes, View ARP, Resync, View SA, View Processor CPU

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	No
Rollback	Yes

Features Available	Support
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains "1.3.6.1.4.1.3224"
- ◆ Terminal
 - Get the model Number from the output of the **get system** command by matching the regular expression "^Product Name: (.*)"
 - Get the Hostname from the output of the **get hostname** command by matching the regular expression "^Hostname: (.*)"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - get config
 - get config saved
- ◆ Terminal/TFTP
 - exec save config to tftp <serverIPAddress> <filename>
 - save config from flash to tftp <serverIPAddress> <filename>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - save config from tftp <serverIPAddress> <filename> merge
 - save config from tftp <serverIPAddress> <filename> to flash

Credential management

- ◆ Account
 - set admin name <userName>
 - set admin password <password>
- ◆ SNMP
 - set snmp community <newSnmpCommunity> Read-Only | Read-Write
 - unset snmp community <oldSnmpCommunity>

Device Monitoring

- ◆ get hostname
- ◆ get system
- ◆ get interface
- ◆ ping
- ◆ trace-route
- ◆ get route
- ◆ get sa active
- ◆ get os kernel
- ◆ get memory
- ◆ get snmp settings
- ◆ exit

Multi-config files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Startup	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No

Attributed data	Terminal	SNMP
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following are existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ In NetScreen ScreenOS version 5.0, the SNMP sysName variable may not display the actual system hostname on the device. In version 5.0, the SNMP sysNAME variable is not updated when the value is changed on the device. This issue does not apply to NetScreen ScreenOS version 4.0.
- ◆ For the SNMP to display the correct system hostname, the configuration line must be set correctly with the following syntax: `set snmp name "<hostname>"`.
- ◆ The "View Processor CPU" quick command is not supported in the NetScreen ScreenOS versions, up to and including, version 4.X.

CHAPTER 48

Lantronix Devices

This chapter contains the following topic:

- ◆ Lantronix ETS 594
- ◆ Lantronix EDS 597

Lantronix ETS

Device Type	Switch
Specific Model(s)	ETS8P, ETS16P
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	Terminal, SNMP
Credential Management	Account, Privilege Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, View ports, Netstat

Features available

Feature	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectId contains 1.3.6.1.4.1.244.1(6|7)

- sysDescr should contain Lantronix ETS
- ◆ Terminal
 - show server characteristics command support available

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - show server characteristic
 - show server bootparam
 - list server characteristics
 - list server bootparam
 - show port all characteristics
 - show port all status

Device monitoring

- ◆ show server characteristics
- ◆ show server status
- ◆ save server
- ◆ netstat

Multi-config files

The following file is used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config File	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart, reboot, copyToStartAndReboot	ASCII	TELNET
startup	No	Yes	Not Available	ASCII	TELNET
Ports	No	Yes	Not Available	ASCII	TELNET

Device data

The data in the table represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Lantronix EDS

Device Type	Switch
Specific Model(s)	EDS2100
Operating System and Firmware Versions	5.4.0.0R7
Communication Protocols	TELNET, SSH,SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	Terminal, SNMP
Credential Management	Account, Privilege Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute

Features available

Feature	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectId contains 1.3.6.1.4.1.244

- ◆ Terminal
 - Show command output should have "Product Type"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - xcr dump
 - xsr dump

Device monitoring

- ◆ show
- ◆ device
- ◆ show hardware information
- ◆ filesystem
- ◆ show memory

Multi-config files

The following file is used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config File	Push	Pull	Post Operation	Content Type	Protocols
Xcr record	No	Yes	Not Available	ASCII	TELNET,SSH
Xsr record	No	Yes	Not Available	ASCII	TELNET,SSH

Device data

The data in the table represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No

Attributed Data	Terminal	SNMP
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 49

Laurel Devices

This chapter contains the following topic:

- ◆ [Laurel ST Router](#)..... 602

Laurel ST Router

Device Type	Router
Specific Model(s)	ST200
Operating System and Firmware Versions	3.1.1R2.1
Communication Protocols	SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Test Credentials, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT_Setup, View Diagnostic

Features available

Feature	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- sysObjectID value contains 1.3.6.1.4.1.5395.1.1.1.1.1
- sysDescription value contains IOS Laurel
- ◆ Terminal
 - Not Available

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal : SSH/SCP:
 - show configuration | save <txt file>
 - file delete <txt file>

Configuration deploy

- ◆ Terminal: SSH/SCP
 - Push-configType-deviceId.cmd using SCP to the device
 - Configure
 - Run test configuration push-configType-deviceId.cmd
 - If no errors occur, load merge push-configType-deviceId.cmd
 - If successful, commit confirm
 - File delete push-configType-deviceId.cmd
 - Commit

Commit config

- ◆ Terminal: SSH/SCP
 - copy running-config startup-config

Credential management

- ◆ SNMP
 - SNMP credentials are rolled by cloning the new community string from the setting for the old string in the configuration. The result is pushed as a command file to the device.
- ◆ Account
 - set system login user <newUser> authentication plain-text-password
 - delete system login user <oldUser>

Device monitoring

- ◆ configure
- ◆ show version

- ◆ run test configuration
- ◆ file delete
- ◆ load merge
- ◆ show configuration snmp
- ◆ ping
- ◆ traceroute
- ◆ show interface
- ◆ show route forwarding-table
- ◆ show arp

Multi-config files

The following file is used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config File	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy To Start	ASCII	SSH/SCP

Device data

The data in the table represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	No
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

- ◆ The config mode displays an error if any other session is in configuration mode. This avoids unrelated commits when multiple users are provisioning.
- ◆ Push to running with copy to start is the only push type, as commits must always be completed. Otherwise, the changes are rolled back after ten minutes.
- ◆ Configlets cannot contain flower braces ({} in their content since it distinguishes them from full configs in the driver.
- ◆ Configlets are sent line-by-line to the command line interface.
- ◆ Full configurations are copied, checked, and then applied using *load merge filename*.
- ◆ Account credential rolls change only the password, not the user.
- ◆ There is no volatile or non-volatile storage information available using SNMP for this device class.

CHAPTER 50

Linux Devices

This chapter contains the following topics:

- ◆ [Linux.....](#) 608

Linux

Device Type	Linux Server
Operating System and Firmware Versions	Redhat Linux - 5.6, 6.5, 6.8, 6.9
Communication Protocols	SSH, TELNET, TELNET/FTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SSH
Credential Management	Account
Operating System Management Protocols	NA
Quick Commands	Finger, ps, Ping, Traceroute, View Arp, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SSH/TELNET

- Command "uname -a" to know its Linux server.
- Command "hostname" should provide hostname of the device
- Command "dmidecode" should provide device Model & serial number

Configuration capture

- ◆ ASCII config
 - ASCII config is pulled using SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP

Configuration deploy

- ◆ ASCII config
 - Text configuration data can be pushed using SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP

Credential management

- ◆ Account
 - Account role is supported only for non root users
 - For root user only password can be changed, following are the commands used:
 - "passwd username"

Operating System management

- ◆ Not supported

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/passwd	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP
/etc/group	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP
/etc/hosts	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP
/etc/sysconfig	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	No
Memory	Yes	No
Physical Hardware	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	No

CHAPTER 51

Lucent Devices

This chapter contains the following topic:

- ◆ [Lucent Access Point.....](#) 612

Lucent Access Point

Device Type	Router
Specific Model(s)	300, 450, 600, 1000
Operating System and Firmware Versions	Not Available
Communication Protocols	Telnet, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1 / V2 ; Account
Operating System Management Protocols	Not Available
Quick Commands	Not Available

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	No
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identity methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains Lucent Access Point

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Running-config : gen-script all

Configuration deploy

- ◆ Terminal
 - Configuration is pushed line by line to the device with checks for invalid input messages

Credential management

- ◆ SNMP
 - show services snmp community <index> config services snmp community <index> community/user-name <newSnmpROCommunity> ! access readonly config services snmp community <index> community/user-name <newSnmpRWCommunity> ! access readwrite
- ◆ Account
 - services snmp community <index> config services snmp community <index> community/user-name <userNameToUse> ! <password> access readwrite

Device monitoring

- ◆ gen-script all
- ◆ show services snmp community <index>

Multiple configuration files

Following are the files used when storing and revisioning multiple configuration files for multi-config support:

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	TELNT, SSH

Device Data

Attributed Data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 52

Marconi Devices

This chapter contains the following topic:

- ◆ [Marconi ASX](#) 616

Marconi ASX

Device Type	Switch
Specific Model(s)	ASX-1000
Operating System and Firmware Versions	7.0.0
Communication Protocols	Telnet/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1 / V2 ; Account
Operating System Management Protocols	Not Available
Quick Commands	Standard quick commands, view routes, view Interfaces, View ATM ARP View LEC ARP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identity methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- sysOID value contains 1.3.6.1.4.1.326.2.2
- sysServices has value 0x04

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Term/TFTP
 - Running
 - system cdb backup -url tftp://deviceServerAddr/remoteFilename
 - Readable
 - system batch create -url tftp://deviceServerAddr/remoteFilename

Configuration deploy

- ◆ Term/TFTP
 - Running
 - system cdb restore -url tftp:// deviceServerAddr/remoteFilename

Credential management

- ◆ SNMP
 - security login new -username <community string> -application snmp -authmethod community -profile readonly
 - security login new -username <community string> -application snmp -authmethod community -profile admin
- ◆ Account
 - security login new -username <new username> -application telnet -authmethod password -profile admin
 - security login delete -username <old username> -application telnet -authmethod password -profile admin

Device monitoring

- ◆ security login new
- ◆ security login delete
- ◆ system ping
- ◆ system cdb [backup | restore]
- ◆ interfaces ip show
- ◆ interfaces ip route show
- ◆ services atmarp show

- ◆ interfaces lec arp show

Multiple config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	Binary	TELNT/TFTP
Readable	No	Yes	NA	ASCII	TELNT/TFTP

Device data

Attributed Data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

- ◆ No volatile or non-volatile storage information is available using SNMP for this device class.
- ◆ Serial number falls uses the primary MAC address if the envMgmtBoardSerialNumber OID in the Fore-SWITCH-MIB is unavailable.
- ◆ The binary configuration is represented as base64-encoded data in the Config Editor, allowing support for configlet pushes for this destination.
- ◆ The read/write community string is given the Admin profile during creation.

CHAPTER 53

McAfee Devices

This chapter contains the following topic:

- ◆ [McAfee IntruShield](#) 622

McAfee IntruShield

Device Type	Other
Specific Model(s)	I4000
Operating System and Firmware Versions	4.1.1.49
Communication Protocols	SSH, TELNET
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not supported
Discovery/Identify Methods	SNMP
Credential Management	Account
Operating System Management Protocols	Not supported
Quick Commands	Standard quick commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identity methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysOID contains 1.3.6.1.4.1.8072.3.2.10

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - running-config
 - show
 - show ssl config
 - show tacacs

Configuration deploy

- ◆ Terminal
 - running-config : Not Supported

Credential management

- ◆ Account: Only admin/user password can be changed
 - passwd cli command is sent and then the new password string is sent.

Device monitoring

- ◆ show
- ◆ show ssl config
- ◆ show tacacs

Multi-config files

The following files are used when storing and revisioning multiple configuration files for multi-config support:

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	ASCII	Telnet, SSH

Device data

The following data represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes

Attributed Data	Terminal	SNMP
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

- ◆ There is no volatile or non-volatile storage information available using SNMP for this device class.
- ◆ SNMP credential management must be performed with McAfee's ISM server. An error message will display if credential management is attempted through the server.
- ◆ The device class does not support the concept of configuration push. The output for the following commands contains all the data and cannot be edited:
 - show
 - show ssl config
 - show tacacs

CHAPTER 54

MDS Devices

This chapter contains the following topics:

- ◆ [MDS iNet](#) 626

MDS iNet

Device Type	Router
Specific Model(s)	MDS iNET 900
Operating System and Firmware Versions	6.9.1
Communication Protocols	SNMP, SSh/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP
Credential Management	Account credential, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	NA

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	No
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID should contain .1.3.6.1.4.1.4130

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Running Configuration
 - Using the "Configuration Scripts Menu" of the device set the following:
 - Set TFTP Host Address to <Server IP Address>
 - Set Config Filename to <local file name>
 - Set Send File to Y
 - Check "Send File" for status of completion

Configuration deploy

- ◆ Terminal
 - Using the "Configuration Scripts Menu" of the device set the following,
 - Set "TFTP Host Address" to <Server IP Address>
 - Set "Config Filename" to <config file name>
 - Set "Retrieve File" to Y
 - Check "Retrieve File" for status of completion

Credential management

- ◆ SNMP
 - At "SNMP Agent Config Menu" set the following
 - Set "A) Read Community" for <new Community String>
 - Set "B) Write Community" for <new Community String>
- ◆ Account(Only Password change)
 - At "User Passwords Menu" set the following,
 - Set "A) Change Admin Password" for <new Password>Device Monitoring

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	No	Text	SSH/Telnet- TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ Discovery through CLI is not supported and discovery is only supported through SNMP. This device has a device-locking issue, in which device gets locked if session is not released through menu options. Else, sessions tend to exist and thus, lock the device after a few attempted connections.
- ◆ TFTP pull/push has not been tested.
- ◆ After push or credential roll, pull of system properties and identity is successful only if snmp creds are mentioned.(As grabbing and releasing sessions cleanly in this device is an issue).

CHAPTER 55

Metamako Devices

This chapter contains the following topics:

- ◆ [MetamakoSwitch](#) 632

MetamakoSwitch

Device Type	Switch
Specific Model(s)	A32-A3, C48-A4
Operating System and Firmware Versions	0.11.0
Communication Protocols	TELNET, SSH,SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Terminal
Operating System Management Protocols	Not available
Quick Commands	Ping,Traceroute,Interfaces,Arp

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectId contains 1.3.6.1.4.1.43191

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Configuration deploy

- ◆ Terminal
 - Configlets must use the text config for the destination.

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ show interfaces status

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Not Applicable	ASCII	TELNET,SSH
startup	Yes	Yes	Not Applicable	ASCII	TELNET,SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes

Attributed data	Terminal	SNMP
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 56

Milan Devices

This chapter contains the following topic:

- ◆ [Milan](#) 636

Milan

Device Type	Switch
Specific Model(s)	SM801P, SME801P
Operating System and Firmware Versions	SM801P-V117, SM801P-V118, SME801P-V200
Communication Protocols	TELNET, SSH, SNMP/TFTP, HTTP/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1/V2, Account
Operating System Management Protocols	Not Supported
Quick Commands	Standard quick commands, View VLAN

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identity methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- sysObjectID contains "1.3.6.1.4.1.835.25.1.1.1.1"
- OS version from 1.3.6.1.4.1.835.6.10.2.1.2.1.3.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ HTTP/TFTP
 - running-config : Running configuration of the device is pulled via TFTP by accessing the device through HTTP. Below is the operation done to pull config
 - post:hostname(<DEVADDR>):readlimit(1000):username(<username>):password(<password>):/tftpup
- ◆ SNMP/TFTP
 - running-config: Following OIDs are set for pulling the running config.
 - 1.3.6.1.4.1.835.6.10.2.4.1.0 <- TFTP IP
 - 1.3.6.1.4.1.835.6.10.2.4.2.0 <- TFTP FileName.
 - 1.3.6.1.4.1.835.6.10.2.4.3.0 <- TFTP action
 - 1.3.6.1.4.1.835.6.10.2.4.4.0 <- TFTP Status

Configuration deploy

- ◆ HTTP:TFTP
 - running-config : Running configuration pushed via TFTP by accessing the device through HTTP. Below is the operation done to push config.
 - post:hostname(<DEVADDR>):readlimit(1000):username(<username>):password(<password>):/tftpdn
- ◆ SNMP/TFTP
 - Running-config: Following OIDs are set for pushing the running config.
 - 1.3.6.1.4.1.835.6.10.2.4.1.0 <- TFTP IP
 - 1.3.6.1.4.1.835.6.10.2.4.2.0 <- TFTP FileName.
 - 1.3.6.1.4.1.835.6.10.2.4.3.0 <- TFTP action
 - 1.3.6.1.4.1.835.6.10.2.4.4.0 <- TFTP Status

Credential management

Device is menu based.

- ◆ SNMP
 - After logging into the device, device is entered into following menus for changing the community strings:
 - 1. ProtocolConfig

2. SnmpConfig
 3. CommStrings
 4. Add
 5. Edit
 6. Save
- ◆ Account

After logging into the device, device is entered into following menus for changing the community strings:

 1. SwitchConfig
 2. AdminConfig
 3. UserName
 4. Edit
 5. Save
 6. Password
 7. Save

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start	ASCII	SNMP/TFTP, HTTP/TFTP

Device data

The following data represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No

Attributed Data	Terminal	SNMP
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 57

Motorola BSR

This chapter contains the following topic:

- ◆ [Motorola BSR Router..... 642](#)

Motorola BSR Router

Device Type	Router
Specific Model(s)	BSR64000, BSR1000 and OSR2000
Operating System and Firmware Versions	3.1.1.14P03C.KRCU 4.2.0.08P07.H20.KRCU
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH.TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Supported
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1/V2, Account, Privilege
Operating System Management Protocols	TFTP
Quick Commands	Standard quick commands, View Routes, View ARP, View Interfaces, View Processor CPU.

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP
 - sysObjectID MIB scalar is retrieved and checked for the RiverDeltaNetworks enterprise value (4981):
 - The value is used as an enumeration to identify the product, documented in \$VOYENCE_HOME/package/pkgxml/ MotoBSRChassisTypes.xml.
 - If the resulting product name is longer than one character, and sysServices MIB scalar has bit 3 set, discovery is successful.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - running-config : show running-config
 - startup-config : show startup-config.
- ◆ Terminal/TFTP
 - running-config: copy running-config tftp://<serverIPAddress >/<Filename>
 - startup-config: copy startup-config tftp://<serverIPAddress >/<Filename>

Configuration deploy

- ◆ Terminal
 - Running/startup configuration is sent line-by-line to the device.

Credential management

- ◆ SNMP
 - snmp-server community <communityString> ro
 - snmp-server community <communityString> rw
 - no snmp-server community <communityString>
- ◆ Account
 - password telnet
 - username <newUserName> password <password>
 - username <username> privilege rw
- ◆ Privilege
 - enable password <newPassword>
 - enable secret <newPassword>

Operating System management

- ◆ dir

- ◆ copy <fromPath> <toPath>
- ◆ delete
- ◆ update chassis <imageFile>
- ◆ show update status
- ◆ show chassis status
- ◆ dir all
- ◆ boot system

Device monitoring

- ◆ show running-config
- ◆ show startup-config
- ◆ password telnet
- ◆ snmp-server community
- ◆ ping
- ◆ traceroute
- ◆ show ip-route
- ◆ show arp
- ◆ show ip interface brief
- ◆ show process-cpu
- ◆ enable [password | secret]

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Startup	Yes	Yes	Reboot	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 58

MRV Devices

This chapter contains the following topic:

- ◆ [MRV LX Terminal Server.....](#) 648

MRV LX Terminal Server

Device Type	Switch
Specific Model(s)	All LX Series Models
Operating System and Firmware Versions	All LX Series Models
Communication Protocols	TELNET, SSH, TELNET/TFTP, SSH/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1/V2, Account, Privilege
Operating System Management Protocols	TFTP
Quick Commands	Standard quick commands.

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identity methods

The following information must be available for this driver class to manage an applicable device:

SNMP

- ◆ sysObjectID contains 1.3.6.1.4.1.33

- ◆ sysDescr contains “LX Remote Presence Manager”
- ◆ Model from OID 1.3.6.1.4.1.33.100.1.1.12.0
- ◆ OSversion from OID 1.3.6.1.4.1.33.100.1.1.4.0
- ◆ Serial number from OID 1.3.6.1.2.1.2.2.1.6.1

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - save configuration network <filename> <serverIPAdress>

Configuration deploy

- ◆ Terminal/TFTP
 - load configuration from network <filename> <serverIPAdress>

Credential management

- ◆ SNMP
 - config snmp <ro | rw > client 15 255.255.255.255
 - config snmp <ro | rw > client 15 mask 0.0.0.0
 - config snmp <ro | rw > client 15 community <newSnmpCommunity>
 - config snmp <ro | rw > client 15 version v2c
 - save config flash
- ◆ Account
 - config subscriber <newUser> password <password>
 - config no subscriber <oldUser>
 - save config flash
- ◆ Privilege
 - config password <newPrivPassword>
 - save config flash

Operating System management

- ◆ update ppciboot <imaegRepo> image name <imageName>
- ◆ save config flash

Device monitoring

- ◆ show system stat
- ◆ show system char

- ◆ config subscriber
- ◆ config snmp
- ◆ config subscriber
- ◆ save configuration
- ◆ load configuration
- ◆ ping

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Text-config	Yes	Yes	Copy to Start	ASCII	TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 59

NetCache Devices

This chapter contains the following topic:

- ◆ [NetCache](#) 652

NetCache

Device Type	ContentCache
Specific Model(s)	C1200
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1/V2, Account
Operating System Management Protocols	Not Available
Quick Commands	System config, SysConfig, Setup diagnostic, View Diagnostic Setup, Setup NAT, View NAT setup

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discover/Identity methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- sysDescr contains NetApp
- Model C1200 exists in NetCacheModels.xml

Device operations

The following device operations must be enabled to manage an applicable device using this driver class:

Configuration capture

- ◆ Terminal
 - running-config : pullrun_cmd

Configuration deploy

- ◆ Terminal
 - running-config : "priv set diag" and "batch on" commands are sent to enter into priv mode and start a new batch. Then configuration is sent line by line to the device.

Credential management

- ◆ SNMP
 - show config.snmp.communities Account :
 - config.snmp.communities = <newSnmpROCommunity>
- ◆ Account: Only admin/user password can be changed
 - passwd <new password>

Device monitoring

- ◆ show config.snmp.communities
- ◆ sysconfig
- ◆ priv set diag
- ◆ batch revert
- ◆ batch on

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy To Start	ASCII	Telnet, SSH

Device data

The following data represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 60

Netopia Devices

This chapter contains the following topic:

- ◆ [Netopia R7000 Series](#) 656

Netopia R7000 Series

Device Type	Router
Specific Model(s)	R7000 series (R7200, R7220, R7231)
Operating System and Firmware Versions	Not Available
Communication Protocols	TELNET, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP V1/V2, Account
Operating System Management Protocols	Not Available
Quick Commands	View ARP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device:

- ◆ SNMP

- sysDescr contains Netopia
- sysDescr contains R7200 or R7220 or R7231

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - running-config : send tftp config <tftp server IP> <filename>

Configuration deploy

- ◆ Term/TFTP
 - Running : receive tftp config < tftp server IP> <filename>

Credential management

- ◆ SNMP
 - snmp community ro <community string>
 - snmp community rw <community string>
- ◆ Account
 - user <user name> <password>
 - no user <old user name>

Device monitoring

- ◆ send tftp config
- ◆ receive tftp config
- ◆ show arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed Data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following are existing device issues that have been discovered with other releases.

- ◆ Push of binary-config reboots the device automatically without any warning.

CHAPTER 61

Nokia Devices

This chapter contains the following topic:

- ◆ [Nokia IP](#) 660

Nokia IP

Device Type	Firewall
Specific Model(s)	IP260, IP265, IP350, IP355, IP380, IP385, IP390, IP45, IP560, IP1220, IP1260, IP2255
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH/SCP, SSH/FTP, Telnet/FTP, SSH, Telnet
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	View Interfaces, View ARP, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains "Nokia" or "nokia" or "IPSO" or "NOKIA"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ The files listed in the Multi-Config Files section for this device are pulled via supported file transfer mechanisms using UNIX file commands.

Configuration deploy

- ◆ UNIX file commands are used to push the files back.
- ◆ The files listed in the Multi-Config Files section for this device are retrieved via supported file transfer mechanisms.

Credential management

- ◆ Account
 - `dbpasswd <oldUser> <newPassword> <oldPassword>`
- ◆ SNMP
 - `clish -c 'add snmp community <newSNMPCommunity> read-only'`
 - `clish -c 'add snmp community <newSNMPCommunity> read-write'`

Device monitoring

- ◆ `clish -c 'add snmp community ...'`
- ◆ `clish -c 'copy....'`
- ◆ `reboot`
- ◆ `ifconfig`
- ◆ `ping`
- ◆ `traceroute`
- ◆ `arp`
- ◆ `netstate`

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
\$base_dir/conf/netso.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/objects.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/InternalC A.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/snmp.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/SDS_objects.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/classes.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/lea_server_unification_scheme.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/log_unification_scheme.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/newobjects.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/refs.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/tables.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/userdef.C	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cpha.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cphaprob.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
\$base_dir/conf/cpmap_config.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cpmap_opsec.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cpmap_rulebase.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cp.lf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/product.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/fwauthd.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/fwopsec.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/slapd.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/smtp.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/omi.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/thresholds.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/fwmusers	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/gui-clients	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/external.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cp.license	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/masters	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
\$base_dir/conf/*.W	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
/config/active	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/state/*	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/serverkeys.*	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/database/*	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/fwauth.NDB	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/fwauth.keys	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/rulebases.fws	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/cp.license	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/conf/sic_policy.conf	Yes	Yes	NA	ASCII	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/database/cprid/cprid_keys/*	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP
\$base_dir/database/cprid/cprid_util_keys/*	Yes	Yes	NA	Binary	SSH/SCP, SSH/FTP, Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No

Attributed data	Terminal	SNMP
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 62

Nortel Devices

This chapter contains the following topic:

◆ Nortel Alteon.....	668
◆ Nortel Router	672
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◆ Nortel Contivity	682
◆ Nortel Multi-Service Switch	686
◆ Nortel Passport 8600	690
◆ Nortel 4500 Switch	694
◆ Nortel Passport 1648	698

Nortel Alteon

Device Type	Load Balancer
Specific Model(s)	184, 180e, 2208, 2216, 2216 E, 2424, 2424 SSL, 3408, AD3, AD4, ASF-5009-X305, iSD SSL, Application Switch 5224XL, Alteon 6420
Operating System and Firmware Versions	Application Switch 5224XL, 29.5.2.1
Communication Protocols	SNMP/TFTP, Telnet/TFTP, SSH/TFTP, SSH, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not available
Quick Commands	View Interfaces, View ARP, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .1.3.6.1.4.1.1872. 1.13.3.5.1
 - sysDescr value contains "Alteon" or "Nortel Application Switch"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Telnet and SSH
 - /cfg/dump
- ◆ Terminal/TFTP
 - /cfg/ptcfg tftplpAddress remoteFilename -tftp -mgmt
- ◆ SNMP/TFTP
 - The driver tests for ALTEON-TIGON- or ALTEON-CHEETAH-MIB support and uses corresponding MIB values to pull the configuration.

Configuration deploy

- ◆ Telnet and SSH
 - Commands are issued to the command line interface and the results are scanned for errors.
- ◆ Terminal/TFTP
 - /cfg/gtcfg tftplpAddress remoteFilename -tftp -mgmt
- ◆ SNMP/TFTP
 - The driver tests for ALTEON-TIGON- or ALTEON-CHEETAH-MIB support and uses corresponding MIB values to push the configuration.

Credential management

- ◆ Account
 - /cfg/sys/radius/cur
 - /cfg/sys/tacacs/cur
 - /cfg/sys/access/user/admpw
- ◆ SNMP
 - /cfg/sys/ssnmp/ r comm <newCommunityString>
 - /cfg/sys/ssnmp/ w comm <newCommunityString>

Device monitoring

- ◆ ping
- ◆ traceroute

- ◆ exit
- ◆ save
- ◆ apply

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP, SNMP/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ No restrictions are enforced on password length.

- ◆ For terminal pushes, the script configuration line is skipped.
- ◆ Configuration management using SSH/TFTP or Telnet/TFTP exhibits problems for push, depending on OS version.
 - For example, the Main menu is displayed and Error: Successful is reported, but the configuration changes are ignored.
- ◆ Depending on the running software version, the following commands generate errors and must be removed or commented out for a push to be successful using terminal.
 - tnet ena
 - /cfg/sys/sshd/ena
 - /cfg/sys/sshd/on

Nortel Router

Device Type	Router
Specific Model(s)	AN, ARN, BCN, BLN, ASN, Passport 2430, Router 5580, Router 5430
Operating System and Firmware Versions	15.4.0.1, 15.4.0.2, 15.4.2.6
Communication Protocols	Telnet/FTP, Telnet
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	TFTP
Quick Commands	View Memory, View ARP, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysServices value is 0x04
 - sysObjectID value contains "1.3.6.1.4.1.18.3"

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

Following are the commands or processes used to "pull" a configuration from your device.

- ◆ Terminal
 - show config -all
- ◆ Terminal/FTP
 - Determine directory and FTP using the directory number

Configuration deploy

- ◆ Terminal
 - Pushes the config one line by line.
- ◆ Terminal/FTP
 - Determine directory and FTP put using the directory number

Credential management

- ◆ Account
 - password
 - <oldPassword>
 - <newPassword>
 - <newPassword>
- ◆ SNMP
 - snmp
 - community <newCommunity>
 - access read-only | access read-write
 - manager address 0.0.0.0

Operating System management

- ◆ compact <volume>
- ◆ tftp get <serverLocation> <srcFilename> <volume>: <destFilename>
- ◆ rm <partition> <filename>
- ◆ delete <partition> <filename>

- ◆ tftp put <serverIPAddress> <imageSlot> <name > <backupFileName>
- ◆ ftp get <serverIPAddress> <name > <imageSlot> <backupFileName>

Device monitoring

- ◆ ping
- ◆ reset
- ◆ more off
- ◆ exit
- ◆ show ip arp
- ◆ show console version
- ◆ history
- ◆ show process memory total
- ◆ show hardware memory
- ◆ show ip route
- ◆ config
- ◆ config -force
- ◆ bcc
- ◆ back
- ◆ show config -all

Multi-config files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Binary config	Yes	Yes	Save Configuration	Binary	Telnet/FTP
text config	Yes	Yes	Save Configuration, Reboot	ASCII	Telnet
config report	No	Yes	NA	ASCII	Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No

Attributed data	Terminal	SNMP
File System Information	Yes	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ **Issue:** Pushing Command using Configlet is displaying as completed with a warning message when the Push type is Push to Run.
- ◆ **Resolution:** Config pushes to the ARN must be executed using the Telnet mechanism. The configuration, which is modified and pushed, must be a configuration pulled using Telnet.

An ARN config pulled using Telnet, can be edited, and will not have binary data displayed at the bottom of the configuration.

A configuration pulled using Telnet/TFTP, will have the text string `<VoyenceControl_Config_file>FilePath>Text Config</FilePath>humanReadable editable="false"<![CDATA[` displayed at the top of the configuration, and will have binary data present at the end of the configuration.

This configuration can not be edited, as indicated by the `humanReadable editable="false"` string.

The Telnet/TFTP config should be pushed back to the ARN device for rollback only.

Nortel Baystack

Device Type	Switch
Specific Model(s)	450, 410 350, 350-12T, 380-24F
Operating System and Firmware Versions	4.0.2.2, 4.4.0.6, 4.5.1.1
Communication Protocols	SNMP/TFTP, Telnet/TFTP, SSH/TFTP, SSH, Telnet
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	TFTP
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains "BayStack" or "Ethernet Switch +4[67]0 - (24|48)T"

- sysObjectID is 1.3.6.1.4.1.45

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - Tftp the config file with Menu based options
- ◆ SNMP/TFTP
 - Walk on the OIDs and create the config file

Configuration deploy

- ◆ Terminal/TFTP
 - Tftp back the config file with Menu based options.

Credential management

- ◆ Account
 - Select the proper option from the Menu and send the new password
- ◆ SNMP
 - Select the proper option from the Menu and send the newCommunity String

Operating System management

- ◆ Get into Software Download Menu, send the filename and TftpServer information.

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Binary config	Yes	Yes	NA	Binary	SSH/TFTP, Telnet/TFTP
Text config	No	Yes	NA	ASCII	SSH/TFTP, Telnet/TFTP
SNMP config	No	Yes	NA	ASCII	SNMP/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	Yes

Known issues

The following existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Cut-thru needs to be recorded so it can be sent as a termlet
- ◆ Push of binary-config reboots the device automatically without any warning

Nortel BoSS Switch

Device Type	Switch
Specific Model(s)	BPS 2000, Baystack 460 & 470, 2550T, 2550T-PWR, 3510-24T, 4524GT, 4526FX, 4526GTX, 4526GTX-PWR, 5650TD
Operating System and Firmware Versions	3.1.4.11, 3.6.03, 3.5.0.58
Communication Protocols	Telnet/TFTP, Telnet, SNMP/TFTP, SSH/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	TFTP
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr value contains "Ethernet Switch 470" or "Ethernet Switch 460" or "BayStack 470" or "BayStack 460" or "Business Policy Switch 2000" or "Ethernet Routing Switch 55" or "Ethernet Routing Switch 2550T-PWR" or "Ethernet Routing Switch 2550T-PWR (Stack Enabled)" or "Ethernet Routing Switch 4524GT" or "Ethernet Routing Switch 4526FX" or "Ethernet Routing Switch 4526GTX" or "Ethernet Routing Switch 4526GTX-PWR" or "Ethernet Routing Switch 5650TD" or "Ethernet Switch 3510-24T"
 - sysObjectID value contains "1.3.6.1.4.1.45.3"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - copy [config|running-config] tftp address <ServerIPAddress> filename <filename>
- ◆ SNMP/TFTP
 - Walk on the OIDs and return the config.

Configuration deploy

- ◆ Terminal
 - Replace "ip bootp server disabled" to "ip bootp server disable" and "\r" to "" in the config file.
 - Push the config back one line by line and check for the errors.
- ◆ Terminal/TFTP
 - copy tftp config address <ServerIPAddress> filename <filename>

Credential management

- ◆ Account
 - cli password ?
 - cli password [stack|switch] telnet local
 - cli password [stack|switch] serial local
 - cli password [stack|switch] rw admin <newPassword>
- ◆ SNMP
 - snmp-server community <newSnmpROCommunity> ro
 - snmp-server community <newSnmpRWCommunity> rw

Operating System management

- ◆ download address <TftpServerAddress> [image|diag] <filename>

Device monitoring

- ◆ conf t
- ◆ en
- ◆ exit

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Binary config	Yes	Yes	NA	Binary	Telnet/TFTP, SSH/TFTP
Text config	Yes	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP
SNMP config	No	Yes	NA	ASCII	SNMP/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	Yes
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	Yes

Nortel Contivity

Device Type	Vpn Concentrator
Specific Model(s)	600 1000, 1010, 1050, 1100, 15XX 1600, 1700, 1740, 1750, 2000, 2500, 2600, 2700, 4500, 4600
Operating System and Firmware Versions	4_70.119
Communication Protocols	Telnet/FTP, SSH/FTP, SSH, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	FTP
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - Get the EnterpriseOid from sysObjectID
 - The above EnterpriseOid should be same as the EnterpriseOid mentioned in the models file i.e. 1.3.6.1.4.1.2505
 - Use the sysObjectID to get various models from models file

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - term paging off
 - show running
- ◆ Terminal/FTP
 - Setup the FTP context
 - Delete the existing config file with the command `del /system/runconf/voyence.cli`
 - Generate running config file with the command `show running file-url voyence`
 - FTP the config file to NCM

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP
 - Delete the existing config files from the device
 - FTP the config file from NCM to the device.

Credential management

- ◆ Account
 - adminname <UserName> password <Password>
- ◆ SNMP
 - show snmp get-host
 - snmp-server get-host <IPAddress> <newSnmpROCommunity> enabled

Operating System management

- ◆ dir
- ◆ dir <partition-name> SYSTEM
- ◆ show status statistics system file-system
- ◆ retrieve software <FTP server IP> version <OS Version> path <image file name> uid <username> password <password> recurse
- ◆ boot system <new-OS-version> recurse

Device monitoring

- ◆ exit
- ◆ end
- ◆ term paging off
- ◆ show running
- ◆ dir ...
- ◆ delete <filename>
- ◆ retrieve software <serverLocation> version <SwVersion> path <srcFileName> uid <userName> password <password> recurse
- ◆ del
- ◆ show snmp get-host
- ◆ snmp-server get-host <IPAddress> "<newSnmpROCommunity>" enabled
- ◆ boot system <newOsVersion> recurse

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running-configuration	Yes	Yes	NA	ASCII	SSH/FTP, Telnet/FTP, SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No

Attributed data	Terminal	SNMP
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Nortel Multi-Service Switch

Device Type	Switch
Specific Model(s)	7480, 15000, 20000, Nortel Carrier Passport
Operating System and Firmware Versions	Not Available
Communication Protocols	Telnet/FTP, Telnet
Configuration Files Content	ASCII, ASCII XML
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Carrier Passport" string

- sysObjectID contains "1.3.6.1.4.1.562"
- sysServices is Layer2 and Layer3
- ◆ Terminal
 - system name is extracted from **display -notabular mod nodeName**. It must have nodeName = systemName content.
 - chassis serial number is derived from **display -notabular vr/* ip lf/**. It must have hardwareAddress = value. the "-" characters are removed and the remaining content is used as-it-is.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/FTP
 - FTP the config file to NCM
 - copy pr
 - save -ascii pr

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP
 - save -ascii -f(voyence_install) pr
 - FTP the config file from NCM to the device.

Credential management

- ◆ Account
 - add Ac Userid/<newUserName>
 - set Ac Userid/<newUserName> password <newPassword>...
 - del ac userid/<oldUser in uppercase>
- ◆ SNMP
 - set Vr/... <newCommunityString>,viewIndex 1,accessMode readOnly,...

Device monitoring

- ◆ display FileSystem
- ◆ d -notab shelf

- ◆ d -notabular vr/* ip if/"<DEVADDR>
- ◆ d -notab sw avl
- ◆ d -notabular shelf card/* memoryCapacity, memoryUsage
- ◆ display -o prov
- ◆ exit
- ◆ act pr
- ◆ save pr
- ◆ commit pr
- ◆ confirm pr
- ◆ quit
- ◆ d -o pr

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	Telnet/FTP
Startup	Yes	Yes	NA	ASCII	Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues that been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Chassis serial number using terminal may change based on hot-sparing behavior for control processor switchover, since it is based on the hardwareAddress information of the active CP
- ◆ Model information using terminal is based on the following criteria:
 - `display -noTabular Shelf shelfType` is `fabricBasedShelf` for Passport 15000 and 20000, and `busBasedShelf` for Passport 7400
 - `display -noTabular Shelf slotConfiguration` is `40G` for Passport 15000
- ◆ O/S version using terminal depends on the `base_` naming convention of the software distribution in the output of the `display -noTabular Sw avl` command
- ◆ The current version of the device driver pulls more than one configuration file and stores it internally with XML sections as a single "running configuration". The user must exercise special care if any changes are made in the Configuration Editor to avoid corrupting the contents prior to a push.

Nortel Passport 8600

Device Type	Router
Specific Model(s)	1050, 1200, 1250, 8106, 8110, 8310, 8603, 8606, 8610
Operating System and Firmware Versions	3.5.1.0, 3.5.3.0, 3.7.2.0
Communication Protocols	Telnet/TFTP, Telnet, SSH/TFTP, SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	TFTP
Quick Commands	View Sys Info

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysServices is Layer3
 - sysObjectID contains "1.3.6.1.4.1.2272"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - config cli more false
 - show config
- ◆ Terminal/TFTP
 - copy /flash/[config.cfg | boot.cfg] <ServerIPAddress>:<filename>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - copy <ServerIPAddress>:<filename> /flash/[config.cfg | boot.cfg]

Credential management

- ◆ Account
 - config cli password rwa <newUserName>
 - <oldPassword>
 - <newPassword>
 - <newPassword>
- ◆ SNMP
 - config sys set snmp community [ro | rw] <newCommunityString>

Operating System management

- ◆ copy <TftpserverLocation>:<srcFileName> /<partition>/<destFileName>

Device monitoring

- ◆ save config
- ◆ dir
- ◆ config cli more false|true

- ◆ show tech
- ◆ save bootconfig
- ◆ save config
- ◆ ping
- ◆ traceroute
- ◆ show sys info
- ◆ boot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	Telnet, SSH
Startup	Yes	Yes	Reboot	ASCII	Telnet/TFTP, SSH/TFTP
boot.cfg	Yes	Yes	Reboot	ASCII	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

Nortel Passport 8600 - Syntax/Constraint Violations

- ◆ Passport configurations may contain syntax or other constraint violations that prevent the configuration from being pushed to the device. These syntax constraint violations are part of the configuration retrieved from the device. Be aware you may have to correct the constraint violations when configuration pushes occur.

The Schedule Manager shows the last ten lines of the configuration push, including the devices response to aid in this effort.

Nortel Passport 8600 - Unable to Config Push to Nortel Passport 8600

- ◆ Some of the commands in the Nortel Passport 8600 device require privileged permission to modify. Access using the RWA (Read Write All) account is required. If one attempts to push the running config with a lower privileged account (e.g. Manager) the push will fail.

For example the mac-flap-time-limit is a privileged command and attempting to push it causes the Nortel Passport 8600 device to give a Permission Denied error.

Nortel Passport 8100 - Config Push fails

- ◆ **Issue:** When executing a configuration push to the Nortel Passport 8000 Series device, the configuration push may not be successful due to lines present in the device configuration that are not valid configuration commands for the device.
- ◆ **Resolution:** Determine the correct device configuration command for that particular configuration entry, and then push this command using the Configlet Editor.

Nortel 4500 Switch

Device Type	Switch
Specific Model(s)	4550T, 2526T-PWR, 4526T-PWR, 4550T-PWR, 4548GT-PWR
Operating System and Firmware Versions	5.1.2.004
Communication Protocols	Telnet/TFTP, Telnet, SSH/TFTP, SSH
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Not available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	Not Available
Quick Commands	View Routes, View ARP, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Ethernet Routing Switch"
 - sysObjectID must map to a model in NortelSwitch4500.models
- ◆ Terminal
 - the session banner must contain the model name as well as "Ethernet Routing Switch"
 - Model name must map to a sysObjectID fragment in NortelSwitchModels.xml

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
- ◆ Terminal/TFTP
 - copy [running-config | config] tftp address <ServerIPAddress> filename <filename>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - [(configure network) | (copy tftp config)] address <ServerIPAddress> filename <filename>

Credential management

- ◆ Account
 - cli password read-write <password>
 - username <username> <password> rw
- ◆ SNMP
 - snmp-server community "<newCommunityString>" [ro | rw]

Device monitoring

- ◆ terminal length 0
- ◆ terminal width 132
- ◆ show system verbose

- ◆ show tech
- ◆ show ip
- ◆ show interfaces verbose
- ◆ show running-config
- ◆ copy running-config tftp address remotIpAddr filename remoteName
- ◆ copy config tftp address remotIpAddr filename remoteName
- ◆ configure network address remotIpAddr filename remoteName
- ◆ copy tftp config address remotIpAddr filename remoteName
- ◆ write memory
- ◆ show ip default-gateway
- ◆ show arp-table

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support..

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running-config	Yes	Yes	Copy to Start	ASCII	Telnet, SSH, Telnet/TFTP, SSH/TFTP
startup-config	Yes	Yes	NA	Binary	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	Yes	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ The read-only account (typically RO) cannot be used for device management since it cannot be promoted to read-write status. Most commands will fail with Invalid input as a result.
- ◆ The device driver supports one set of account and SNMP credentials per device. This is a limitation of the device architecture.
- ◆ The delay in pulling and pushing binary configurations appears to be directly related to the number of switches in the stack.
- ◆ Pushing a binary configuration is service-affecting: other connected sessions will hang during the file transfer, and the device will reboot without any confirmation.
- ◆ Push of startup-config reboots the device automatically.

Nortel Passport 1648

Device Type	Router
Specific Model(s)	1648T
Operating System and Firmware Versions	Not available
Communication Protocols	Telnet/TFTP, SSH/TFTP, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	Not available
Operating System Management Protocols	Not Available
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - The OSI layer 3 bit (0x04) is set in sysServices
 - sysObjectID contains "1.3.6.1.4.1.2272.43" or "1.3.6.1.4.1.2272.44"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - upload configuration <ServerIPAddress> <filename>

Configuration deploy

- ◆ Terminal/TFTP
 - download configuration <ServerIPAddress> <filename>

Device monitoring

- ◆ logout
- ◆ upload configuration <ServerIPAddress> <filename>
- ◆ download configuration <ServerIPAddress> <filename>

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support..

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No

Attributed data	Terminal	SNMP
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ This device driver does not presently support command-line configuration command pushes. As a result, configlets and remediation are not supported.

CHAPTER 63

OneAccess Devices

This chapter contains the following topic:

- ◆ [OneAccess OneOS](#) 702

OneAccess OneOS

Device Type	Router
Specific Model(s)	OneOS
Operating System and Firmware Versions	OS11
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, ARP, interfaces, routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains .13191.1.1.70
- ◆ Terminal:
 - Output of "show version" contains model name and software version.
 - Output of "show device" contains hostname.
 - Output of "show system status" contains serial number.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - user add <user> <password> administrator
 - user delete <user>
 - user password <password>
- ◆ SNMP
 - snmp set-read-community <newCommunity>
 - snmp set-write-community <newCommunity>
 - no snmp set-read-community
 - no snmp set-write-community

Device monitoring

- ◆ Show system status
- ◆ Show version
- ◆ Show device
- ◆ Show interfaces
- ◆ Show routes
- ◆ Show arp
- ◆ ping

- ◆ traceroute
- ◆ show running-config

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	No	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 64

OpenGear Devices

This chapter contains the following topics:

- ◆ [OpenGear ACM50XX](#) 706

OpenGear ACM50XX

Device Type	Linux Server
Specific Model(s)	ACM50xx
Operating System and Firmware Versions	3.4.0-uc0
Communication Protocols	SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SSH
Credential Management	Account
Operating System Management Protocols	NA
Quick Commands	View Interfaces, Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SSH/TELNET
 - Command `check_version` should provide output string “OpenGear”.
 - Command “hostname” should provide hostname of the device
 - Command “hostid” should provide device serial number

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ ASCII config
 - ASCII config is pulled using SSH/SCP
- ◆ Binary config
 - Binary config is pulled using SSH/SCP, following are commands:
 - `config -e $Basedir(default:/etc/config)/backup.opg`
 - `scp <remote file > <local>`
 - `rm /etc/config/backup.opg`

Configuration deploy

- ◆ ASCII config
 - Text configuration data can be pushed using SSH/SCP
- ◆ Binary config
 - Binary config is pushed using SSH/SCP to the managing Device Server, following commands are executed:
 - `ssh <localfile> <remote file>`
 - `config -t /etc/config/backup.opg`(To verify opg status)
 - `config -i /etc/config/backup.opg`

Credential management

- ◆ Account
 - Account role is supported only for non root users
 - For root user only password can be changed, following are the commands used:
 - `config -g config.users` (to get user id)
 - `config -s config.users.<userID>.username = <new user>`
 - `config -P config.users.<userID>.password`

Operating System management

- ◆ Not supported

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/config/config.xml	Yes	Yes	NA	ASCII	SSH/SCP
backup	Yes	Yes	NA	Binary	SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	No
Memory	Yes	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Pulling “backup” configuration will save a file in \$Basedir(default:/etc/config)/backup.opg.
- ◆ backup.opg will be deleted from device after pulling data
- ◆ Push of backup will apply changes only if backup.opg is not corrupt
- ◆ Push of backup will apply the changes if file is not corrupt
- ◆ Push and pull is not tested with telnet/tftp
- ◆ If backup.opg file already exists it will be moved to backup-**<timestamp>**.opg file
- ◆ If backup.opg file already exists and permission is not there to remove or rename, pull job will fail.

CHAPTER 65

Overture Devices

This chapter contains the following topics:

◆ Overture NC	710
◆ Overture NG	713
◆ Overture NP	718
◆ Overture 1400	723

Overture NC

Device Type	Switch
Specific Model(s)	ISG 45+, 34, 45, 140, 180, 140V, 180V
Operating System and Firmware Versions	8.1.0.22.6, 9.1.0.9
Communication Protocols	SNMP/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2
Operating System Management Protocols	FTP
Quick Commands	View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	No
Hardware Information	Yes
SNMP Traps	Yes
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- The sysObjectID OID must be accessible from the device agent.
- The serial number must be available at 1.3.6.1.4.1.7950.2.10.1.2

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ ASCII config
 - Text config is captured using SNMP get requests
- ◆ Binary config
 - Binary config is pulled using anonymous FTP access to the managing Device Server
 - FTP access is initialized using SNMP requests

Configuration deploy

- ◆ ASCII config
 - Text configuration data can be pushed using Config or Configlet editor using SNMP set messages
 - User must have knowledge of what SNMP oids are writeable and can be pushed. User must adhere to the format of the pulled text config lines.
- ◆ Binary config
 - Binary config is pushed using anonymous FTP access to the managing Device Server
 - FTP access is initialized using SNMP requests

Credential management

- ◆ SNMP
 - new read-only and read-write communities are set using SNMP set requests

Operating System management

- ◆ OS upgrade is done using anonymous FTP access
- ◆ FTP access is initialized using SNMP requests

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
Text config	Yes	Yes	NA	ASCII	SNMP/FTP
Binary config	Yes	Yes	NA	Binary	SNMP/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ SNMP/TFTP is displayed in the user interface for communication, configuration capture, configuration deploy, and software upgrades, although the device driver actually uses SNMP/FTP.
- ◆ The get ARP command can return a warning message for an unavailable MAC address due to incomplete MAC address entries.
- ◆ During text configuration pulls, errors or warnings can display for the SNMP OIDs due to the SNMP OIDs not being populated for that device.
- ◆ The device file system is unavailable, resulting in a temporary file-system being used for OS upgrades.
- ◆ Push of binary-config reboots the device automatically without any warning.

Overture NG

Device Type	Switch
Specific Model(s)	ISG6000
Operating System and Firmware Versions	9.1.0.80.1, 10.1.0.46
Communication Protocols	SSH, Telnet, SSH/FTP, Telnet/FTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps, Syslog
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	FTP, SCP
Quick Commands	Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- The sysObjectID OID must be accessible from the device agent.
- The serial number must be available at 1.3.6.1.4.1.7950.2.11.1.2.3.1.8
- ◆ Terminal
 - Description or hostname must contain the model information as a string ISG6000.
 - Serial number must be available through **information** command.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration
- ◆ Terminal/FTP
 - show config tofile
 - show config file:///tmp/config.txt
 - FTP config file to NCM

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP
 - FTP/SCP the config file from the NCM to the device
 - playback <config file>

Credential management

- ◆ Account
 - account
 - show
 - password <userName> <newPassword>
 - create <userName> <password> <accessLevel>
 - no account <userName>
 - account <username>
 - password <password>
 - securitylevel security

- commit
- ◆ SNMP
 - snmp
 - V2
 - show community-list
 - community-list create [read | write] <newCommunityString>
 - community-list delete <index>
 - no community-list <index>
 - commit

Operating System management

- ◆ The device can download images to its flash using SSH/Telnet and FTP/SCP. The device must be rebooted to activate the flash image.
 - The device provides a FTP server but an FTP client is not supported for the device, to start a FTP session. The FTP session must be started from the device server.
 - The image should be copied into the \$TFTPHOMEDIR directory on the device server. The image path should be relative to the \$TFTPHOMEDIR directory. For example, if the image is in /tftpboot/ftp/image/isg6k_app.ovn.9.1.0.80.1 then the path for the image name in the operating system inventory should be ftp/image/isg6k_app.ovn.9.1.0.80.1.
 - While using the server for the operating system update, only the mechanism is used. The ftp username and password must be the same as the device account credentials.

Device monitoring

- ◆ back
- ◆ config
- ◆ main
- ◆ cli
- ◆ no more
- ◆ more
- ◆ ping
- ◆ traceroute
- ◆ information
- ◆ show config
- ◆ image install
- ◆ image switch
- ◆ show configuration

- ◆ show config tofile
- ◆ restore-defaults
- ◆ reboot
- ◆ info

Multi-Config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
text config	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/FTP, Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ No command exists to show the model information using term. When discovering using term, System Description or Hostname should contain the string ISG6000.
- ◆ The device does not disclose file system information. A dummy file-system is used for operating system upgrades.

Overture NP

Device Type	Router
Specific Model(s)	ISG 2200, ISG 5100
Operating System and Firmware Versions	8.1.0.22
Communication Protocols	SSH, Telnet, SSH/FTP, Telnet/FTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	View Interfaces, View Routes, View ARP

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- The sysObjectID OID must be accessible from the device agent.
- The serial number must be available at .1.3.6.1.4.1.7950.2.1.3.2.1.3.1
- The model must be available using OID .1.3.6.1.4.1.7950.2.1.3.2.1.4.1
- The ipTable(.1.3.6.1.2.1.4.20) must be supported by the device agent
- ◆ Terminal
 - The **information** command must list the following non-blank information:
 - Model Name under Board Type.
 - Serial Number under Main Board ESN.
 - The System Object ID must map to the model name in OvertureModels.xml.
 - The following commands must return valid interface information:
 - port show all status
 - interface show ifall
 - interface show ifName

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - configuration display
- ◆ Terminal/FTP
 - configuration save-remote
 - FTP config file to NCM using anonymous FTP access

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP
 - FTP the config file from the NCM to the device
 - configuration restore-remote

Credential management

- ◆ Account
 - account show
 - account password <userName> <newPassword> <newPassword>

- account create <userName> <accessLevel> <newPassword> <newPassword>
- account delete <username>
- ◆ SNMP
 - mgmt snmp v2only community-list show
 - mgmt snmp v2only community-list create <newCommunityString> access-level [read | write]
 - mgmt snmp v2only community-list delete entry-name <oldString>

Device monitoring

- ◆ mgmt cli-output set off
- ◆ mgmt config-server show
- ◆ port show all status
- ◆ interface show ifall
- ◆ information
- ◆ slot show cards
- ◆ mgmt contact show
- ◆ mgmt location show
- ◆ mgmt description show
- ◆ mgmt name show
- ◆ configuration save-remote
- ◆ configuration restore-defaults
- ◆ configuration restore-remote
- ◆ ping
- ◆ traceroute
- ◆ interface show ifall
- ◆ iproute show
- ◆ arp show

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Text config	Yes	Yes	NA	ASCII	SSH, Telnet
Binary config	Yes	Yes	NA	Binary	SSH/FTP, Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	Yes
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Non-volatile storage and filesystem information are not obtainable using SNMP or the command line interface for the 8.1.0.22 software version. A placeholder is returned with the flash partition name, but size and usage are not listed.
- ◆ The configuration restore-defaults command is not used as part of pushing a text configuration, since in almost all cases the managing Device Server will not be on the same subnet as the device. This command clears all settings except for the in-band IP address, which can result in loss of connectivity. As a result, some configuration commands may be listed with warnings in the job results, since these settings are already present.
- ◆ Certain commands in the mgmt category are listed with a # prefix in the resulting text configuration, although these commands are legal from the command line interface when the prefix is omitted. These commands are skipped during a configuration push because the device treats this character as an invalid command.
- ◆ An FTP transfer service must be configured for this device.

- ◆ The binary configuration push is service-affecting, since the configuration restore-remote command reboots the device after receiving the configuration from the Device Server.
- ◆ The managing account for the device must have an access-level of security or SNMP/Account Rolls cannot be performed.
- ◆ Account rolls transfer the access level of the original account to the new one when the names change.
- ◆ Default accounts cannot be removed. This impacts account credential rolls in the following ways:
 - Jobs that define new, equivalent accounts will show a message in the scheduler that the old account cannot be removed.
 - Jobs that use a default account as the new account name will simply change the password of this account before removing the non-default account.

Overture 1400

Device Type	Router
Specific Model(s)	Overture 1400
Operating System and Firmware Versions	12.1.0.36
Communication Protocols	SSH/Telnet, SNMP
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Yes
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic, Interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID value contains .1.3.6.1.4.1.7950
- ◆ Terminal
 - Output of "show system" contains host name, os version and model name.
 - Output of "info" contains serial.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Running Configuration
 - show configuration

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.

Credential management

- ◆ Account
 - account <user>
 - password <password>
 - securitylevel administrator
 - commit

Operating System management

- ◆ A dummy file system is created to support OS upgrade
- ◆ Commands used for OS upgrade are
 - image install ftp://<user>@<ftp server ip>/<image>
 - image install scp://<user>@<scp server ip>/<image>
- ◆ Copy OS image not supported. Only full install supported.
- ◆ Reboot after OS upgrade makes use of 'image switch' and makes the newly installed OS as the primary OS.

Device monitoring

- ◆ show system
- ◆ info
- ◆ show interface

- ◆ ping
- ◆ traceroute
- ◆ show configuration
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Yes	TEXT	SSH,Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 66

Packeteer Devices

This chapter contains the following topic:

- ◆ [Packeteer PacketShaper](#) 728

Packeteer PacketShaper

Device Type	Load Balancer
Specific Model(s)	Packetshaper 1000, Packetshaper 1400, Packetshaper 1500, Packetshaper 1550, Packetshaper 1700, Packetshaper 2000, Packetshaper 2500, Packetshaper 2550, Packetshaper 3500, Packetshaper 4000, Packetshaper 4500, Packetshaper 6500, Packetshaper 7500, Packetshaper 8500, Packetshaper 9500, Packetshaper 10000
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, Telnet, SSH/FTP, Telnet/FTP
Configuration Files Content	ASCII XML
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Standard Quick Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - The sysObjectID OID must contain "1.3.6.1.4.1.2334".

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/FTP
 - The following commands are executed from a command prompt:
 - mkdir 9.258/VOYENCE (if needed)
 - setup capture complete 9.258/VOYENCE/ASCIICFG.CMD
 - config save 9.258/VOYENCE/CONFIG.LDI
 - cp 9.256/CFG/SETTINGS.CFG 9.258/VOYENCE/SETTINGS.CFG
 - zip -rq 9.258/voyence/PLG.ZIP 9.256/PLG
 - The above files are then transferred, using the device's built-in FTP server, from the 9.258/VOYENCE/ directory to the device server.
 - The files are then base64 encoded (if binary) and merged into a single XML document for storage in the configuration database.

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP
 - The XML document is retrieved from the configuration database and separated into four discrete files.
 - The ASCIICFG.CMD file is a human-readable version of the binary configuration, and can not be restored, so it is discarded.
 - The remaining three files are transferred to the 9.258/VOYENCE/ directory.
 - The following commands are run:
 - cp 9.258/VOYENCE/CONFIG.LDI 9.256/CFG/CONFIG.LDI
 - setup load 9.258/VOYENCE/SETTINGS.CFG
 - The device prompts for a reboot after loading SETTINGS.CFG, and the driver answers yes to the prompt.

- The PLG.ZIP file, which is a zipped archive of the plug-ins directory is left in the 9.258/VOYENCE/ directory, and not processed in any way. The system administrator can select to restore this file manually if needed.

Credential management

- ◆ Account
 - setup password touch
 - <oldPassword>
 - <newPassword>
 - <newPassword>
- ◆ SNMP
 - setup snmp [look | touch] <newCommunity>

Device monitoring

- ◆ unit show
- ◆ reset
- ◆ ping

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	Telnet, SSH, Telnet/FTP, SSH/FTP
startup	Yes	Yes	Reboot	Binary	SSH/FTP, Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No

Attributed data	Terminal	SNMP
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 67

Palo Alto Firewall Devices

This chapter contains the following topics:

- ◆ [Palo Alto Firewall](#) 734
- ◆ [Known Issues](#)..... 737

Palo Alto Firewall

Device Type	Firewall
Specific Model(s)	PAN 5050, 5020, 4050, M-100, PA-200, PA-500, PA-3020, PA-3060, PA-7050, PA-4020, PA-3050, PA-5060, PA-5050, PA-5020, PA-2050, PA-500, WildFire, WF-500
Operating System and Firmware Versions	5.0.2, 6.0.2
Communication Protocols	SSH/Telnet
Configuration Files Content	Text
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	SNMP v1/v2, Account
Operating System Management Protocols	NA
Quick Commands	ARP, Interface, Routes, Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SNMP
 - SsysObjectID value contains 1.3.6.1.4.1.25461.2.3
 - sysDescr contains "PA-4000" or "PA-5000"
 - OS version is available from .1.3.6.1.4.1.25461.2.1.2.1.1.0 OID.
 - Serial number is available from .1.3.6.1.4.1.25461.2.1.2.1.3.0 OID
- ◆ Term
 - Output of "show system info" contains model name and serial number.
 - Output of "show system info" contains hostname of the device.
 - Output of "show system info" contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show config candidate
 - show config running

Credential management

- ◆ SNMP
 - set deviceconfig system snmp-setting access-setting version v2c snmp-community-string <newCommunity>
 - delete deviceconfig system snmp-setting access-setting version v2c snmp-community-string
- ◆ Account
 - set mgt-config users <user> permissions role-based superuser yes
 - set mgt-config users <user> password
 - delete mgt-config users <user>
 - set mgt-config users <user> password

Device monitoring

- ◆ Show system info
- ◆ commit
- ◆ exit
- ◆ configure
- ◆ show arp all

- ◆ show interface all
- ◆ show routing route
- ◆ request restart system
- ◆ show config candidate
- ◆ show config running
- ◆ set cli pager off
- ◆ set cli pager on

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	TEXT	SSH, Telnet
startup	No	Yes	NA	TEXT	SSH, Telnet
setmoderunning	No	Yes	NA	TEXT	SSH, Telnet
setmodetemplate	No	Yes	NA	TEXT	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

- ◆ Push via configlet is only supported for set commands.
- ◆ Credential roll is not tested for M-100 device

CHAPTER 68

Paradyne Devices

This chapter contains the following topic:

- ◆ [Paradyne 9100](#) 740

Paradyne 9100

Device Type	Router
Specific Model(s)	9100
Operating System and Firmware Versions	02.02.03
Communication Protocols	Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	No
Push configuration	No
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescription contains "Paradyne iMarc" (case-insensitive)
- serial number and system name are valid

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Credential management

- ◆ Account
 - Access "Main menu"
 - Go to "Add new account" menu
 - Enter <userName>
 - Enter <Password>
 - Save
 - Go to "Main Menu" again and delete the <oldUser> with menu options
- ◆ SNMP
 - Access "Main menu"
 - Go to the menu to change the community
 - Enter <newSNMPCommunity>
 - Save

Device Data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Memory and non-volatile information are not supported by the device SNMP agent. These values are defaulted to 0.
- ◆ The text ## no configuration support ## is listed in place of the device configuration.
- ◆ SNMP credentials cannot be changed if SNMP is disabled.

CHAPTER 69

Patton Devices

This chapter contains the following topic:

- ◆ [SmartNode Router](#) 744

SmartNode Router

Device Type	Router
Specific Model(s)	SN1200, SN1400, SN2300, SN2400,SN2802, SN2805, SN2821, SN2835, SN4112-JS, SN4112-JO, SN4114-JS, SN4114-JO, SN4116-JS, SN4116-JO, SN4118-JS, SN4118-JO, SN4524-SN4834-JS, SN4522-SN4832-JS, SN4526-SN4836-JS, SN4528-SN4838-JS,, SN4524-SN4834-2JS2JO, SN4526-SN4836-4JS2JO, SN4528-SN4838-4JS4JO, SN4114-2JS2JO, SN4116-4JS2JO, SN4118-4JS4JO, SN4522-SN4832-JO, SN4524-SN4834-JO, SN4526-JO, SN4528-JO, SN4552, SN4562, SN4554, SN4564, SN4908-JS, SN4912-JS, SN4916-JS, SN4924-JS, SN4932-JS, SN4634, SN4638, SN46385BIS, SN4654-C, SN4658-C, SN4654-D, SN4658-D, SN4654-T, SN4658-T, SN4654-K, SN4658-K, SN4654-AA, SN4658-AA, SN4654-AB, SN4658-AB, SN4654-G, SN4658-G, SN4635, SN4639, SN4655-AA, SN4659-AA, SN4655-AB, SN4659-AB, SN4655-G, SN4659-G, SN4960-1E15V, SN4960-1E24V, SN4960-1E30V, SN4960-4E15V, SN4960-4E24V, SN4960-4E30V, SN4960-4E48V, SN4960-4E60V, SN4960-4E96V, SN4960-4E120V, SN4961-1E15V, SN4961-1E24V, SN4961-1E30V, SN4961-4E15V, SN4961-4E24V, SN4961-4E30V, SN4961-4E48V, SN4961-4E60V, SN4961-4E96V, SN4961-4E120V, SN4908-JO, SN4912-JO, SN4916-JO, SN4924-JO, SN4932-JO, SDTA
Operating System and Firmware Versions	R5.2
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	TFTP
Quick Commands	View Interfaces, View Routes, View ARP, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes

Features Available	Support
Cut-Through Access	No
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains "1.3.6.1.4.1.1768.100."
 - sysDescr contains "SN46.+Hardware Release [0-9]+ Version [0-9]+, Software"
- ◆ Terminal
 - Get the model Number from the output of **show version** command by matching the regular expression "Product[]*[Nn]ame +: +(.)\$"
 - Get the Hostname from the output of **show snmp** command by matching the regular expression "hostname +: +(.)\$"
 - Get the Chassis Serial Number from the output of **show version** command by matching the regular expression "Serial[]*[Nn]umber +: +(.)\$"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
- ◆ Terminal/TFTP
 - copy running-config tftp://<serverIPAddress>/<filename>
 - copy startup-config tftp://<serverIPAddress>/<filename>

Configuration deploy

- ◆ Terminal

- Push by sending each line through the command-line interface.
- Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - copy tftp://<serverIPAddress>/<filename> running-config
 - copy tftp://<serverIPAddress>/<filename> startup-config

Credential management

- ◆ Account
 - administrator <username> password <password>
 - no administrator <oldUser>
- ◆ SNMP
 - snmp community <newSnmCommunity> ro
 - snmp community <newSnmCommunity> rw

Operating System management

- ◆ copy tftp://<serverIPAddress>/<imageName> flash

Device monitoring

- ◆ show memory stat
- ◆ show ip interface
- ◆ reload forced
- ◆ ping
- ◆ traceroute
- ◆ show ip route
- ◆ show arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Startup	Yes	Yes	Reboot	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Atributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 70

Qtech Devices

This chapter contains the following topic:

- ◆ [Qtech 2800.....](#) 750
- ◆ [Qtech 2900.....](#) 753

Qtech 2800

Device Type	Switch
Specific Model(s)	QSW-2800-10T-AC, QSW-2800-28T-AC, QSW-8300-52F
Operating System and Firmware Versions	6.2.150.169
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP, SNMP
Configuration Files Content	ASCII
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID should contain "1.3.6.1.4.1.27514.1.1.1|2"
 - SysDescription should contain "QSW* Device"
- ◆ Terminal
 - Output of “show version” contains model name, software version and serial number.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - "show running-config"
 - "show startup-config"

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential Management

- ◆ Account
 - "username <user> privilege 15 password 0 <password>"
 - "no username <user>"

Device monitoring

- ◆ "show version"
- ◆ "show running-config"
- ◆ "show startup-config"
- ◆ "show interface"
- ◆ "show arp"
- ◆ "reload"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy To Start	ASCII	SSH, Telnet
Startup Configuration	Yes	Yes	Reboot	ASCII	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- TFTP feature has not been tested

Qtech 2900

Device Type	Switch
Specific Model(s)	QSW-2900-24T, QSW-2910-28T-POE
Operating System and Firmware Versions	V100R001B01D003SP2
Communication Protocols	SSH, Telnet, SSH/TFTP, SNMP
Configuration Files Content	ASCII
Discovery/Identify Methods	SNMP, Terminal
Credential Management	NA
Operating System Management Protocols	NA
Quick Commands	View Arp View Interfaces Ping Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectID should contain "1.3.6.1.4.1.27514.1.3"
 - SysDescription should contain "QTECH"
- ◆ Terminal
 - Output of "show system" must contain "QTECH".

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - "show running-config"
 - "show startup-config"

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Device monitoring

- ◆ "show system"
- ◆ "show version"
- ◆ "show snmp contact"
- ◆ "show snmp location"
- ◆ "show interface"
- ◆ "show arp all"
- ◆ "show memory"
- ◆ "reboot"

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy To Start	ASCII	SSH, Telnet
Startup Configuration	Yes	Yes	Reboot	ASCII	SSH, Telnet, Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- TFTP has not been tested.

CHAPTER 71

Radware Devices

This chapter contains the following topic:

- ◆ [Radware WSD Load Balancer](#) 758

Radware WSD Load Balancer

Device Type	Router
Specific Model(s)	All Web Server Director models
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	View Interfaces, View Routes, View ARP, Resync To Storage, View CPU Processes, Reboot Unit

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectIDs contains ".1.3.6.1.4.1.89.1.1.62.(2|3|4)"

- OS version is available from .1.3.6.1.4.1.89.2.4.0 OID

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - system config immediate
- ◆ Terminal/TFTP
 - manage tftp file-type set cli
 - manage tftp config-file put <filename> <serverIPAddress>

Configuration deploy

- ◆ Terminal
 - Issue command system paste-config start
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
 - Issue command system paste-config stop
- ◆ Terminal/TFTP
 - manage tftp file-type set cli
 - manage tftp config-file get <filename> <serverIPAddress>

Credential management

- ◆ Account
 - manage user table add <username> -pw <password>
 - manage user table del <oldUser>
- ◆ SNMP
 - manage snmp community create <newSnmpCommunity> -n <newSnmpROCommunity> -sn [public | private]
 - manage snmp community del <oldSnmpCommunity>

Device monitoring

- ◆ reboot
- ◆ logout
- ◆ manage terminal more-prompt set off
- ◆ ping

- ◆ trace-route
- ◆ net 12-information
- ◆ net route table
- ◆ system os cpu
- ◆ system os tasks
- ◆ net arp table
- ◆ system file-system files sync
- ◆ disable

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Radware Switch V2

Device Type	Switch
Specific Model(s)	AppDirectorGlobalwithCookiePersistency
Operating System and Firmware Versions	2.14.06
Communication Protocols	SSH/Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	ARP, Interface, Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - SysObjectIDs contains .1.3.6.1.4.1.89.1.1.62.21

- OS version is available from .1.3.6.1.4.1.89.2.4.0 OID
- ◆ Terminal
 - Output of "system device-info" contains model name and serial number.
 - Output of "system device-info" contains hostname of the device.
 - Output of "system device-info" contains the software version.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - system config immediate
- ◆ Terminal/TFTP
 - system config download <filename> <ipaddr> regular

Configuration deploy

- ◆ Terminal
 - Issue command system paste-config start
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
 - Issue command system paste-config stop
- ◆ Terminal/TFTP
 - system config upload replace <filename> <ipaddr>

Credential management

- ◆ Account
 - manage user table add <username> -pw <password>
 - manage user table del <oldUser>
- ◆ SNMP
 - manage snmp community create <newSnmpCommunity> -n <newSnmpROCommunity> -sn [public | private]
 - manage snmp community del <oldSnmpCommunity>

Device monitoring

- ◆ reboot
- ◆ logout

- ◆ manage terminal more-prompt set off
- ◆ pingshow route-map
- ◆ show arp
- ◆ write memory
- ◆ trace-route
- ◆ net 12-information
- ◆ net route table
- ◆ system os cpu
- ◆ system os tasks
- ◆ net arp table
- ◆ system file-system files sync
- ◆ disable

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	TEXT	SSH, Telnet,SSH/TFTP. Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No

Attributed data	Terminal	SNMP
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ TFTP has not been tested.

CHAPTER 72

Redback Devices

This chapter contains the following topic:

- ◆ [Redback SmartEdge.....](#) 766

Redback SmartEdge

Device Type	Router
Specific Model(s)	SE800, SE800e, SE400
Operating System and Firmware Versions	SEOS-6.1.3.7
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, Telnet/TFTP, SSH/TFTP, SSH/SCP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, Privilege, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID value contains 1.3.6.1.4.1.2352

- sysDescr value contains "SmartEdge OS"
- ◆ Terminal
 - Output of "show version" contains "SmartEdge OS"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - Running Configuration
 - show configuration
 - Saved Configuration
 - show configuration <savedConfigFile>
- ◆ Terminal/TFTP
 - Running Configuration
 - save configuration <filename> -noconfirm
 - copy <filename> tftp://<SERVERIPADDR>/tftpboot/<filename>
 - Saved Configuration
 - Get the name of the saved configuration
 - copy <saved_filename> tftp://<SERVERIPADDR>/tftpboot/<saved_filename>
- ◆ Terminal/FTP and Terminal/SCP
 - Running Configuration
 - save configuration <filename> -noconfirm
 - FTP/SCP config file to NCM
 - Saved Configuration
 - Get the name of the saved configuration
 - FTP/SCP saved config file to NCM

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - copy tftp://<SERVERIPADDRESS>/tftpboot/<filename> /flash/<savedFileName> -noconfirm

- reboot
- ◆ Terminal/FTP and Terminal/SCP
 - FTP/SCP the config file from the NCM to the device as saved configuration
 - reboot

Credential management

- ◆ Account
 - configure
 - context local
 - administrator <username> password <password>
 - no administrator <oldUser>
 - end
- ◆ SNMP
 - snmp community <community> view InternetView read-only|read-write
 - no snmp community <oldSnmpCommunity>
 - end

Operating System Management

Not available

Device monitoring

- ◆ show version
- ◆ show chassis
- ◆ show hardware
- ◆ ping
- ◆ traceroute
- ◆ show configuration
- ◆ show arp-cache
- ◆ show ip interface
- ◆ show memory
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy to Saved	ASCII	SSH, Telnet, SSH/FTP, Telnet/FTP, SSH/TFTP, Telnet/TFTP, SSH/SCP
Saved Configuration	Yes	Yes	Reboot	ASCII	SSH/FTP, Telnet/FTP, SSH/TFTP, Telnet/TFTP, SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Push and pull via FTP, SCP and TFTP protocols not tested as the ports are not opened at the device side.

CHAPTER 73

Redline Devices

This chapter contains the following topics:

- ◆ [Redline RDL3000](#) 772

Redline RDL3000

Device Type	Wireless Access Point
Specific Model(s)	RDL3000
Operating System and Firmware Versions	5.20.99
Communication Protocols	SSH/Telnet, SSH/TFTP, SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	NA
Quick Commands	View Interfaces, Ping, Arp, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:
 - sysObjectID value contains 1.3.6.1.4.1.10728.
 - sysDescr contains “Redline”.
 - OS version is available from .1.3.6.1.2.1.1.9.1.3.1 OID.
 - Serial number is available from .1.3.6.1.4.1.10728.2.1.1.1.1.0 OID.
- ◆ SSH/TELNET
 - Output of “show stats” contains serial number.
 - Output of “get swver” contains the software version.
 - Output of “get radiotype” contains the model name.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ ASCII config
 - Terminal:
 - script
 - Terminal/TFTP:
 - script <SERVERIPADDR> <LOCALFILE>

Configuration deploy

- ◆ ASCII config
 - Terminal:
 - Issue command save force
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential management

- ◆ Account
 - user add <user> admin
 - user del <user>
- ◆ SNMP
 - snmpcommunity add <newCommunity> r
 - snmpcommunity add <newCommunity> rw

- snmpcommunity del <oldCommunity>

Operating System management

- ◆ Not supported

Device Monitoring

- ◆ show config
- ◆ get radiotype
- ◆ get swver
- ◆ show stats
- ◆ save config
- ◆ reboot
- ◆ arp print

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	NA	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Memory	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ TFTP has not been tested with device

CHAPTER 74

Riverbed Devices

This chapter contains the following topic:

- ◆ [Riverbed Steelhead..... 778](#)

Riverbed Steelhead

Device Type	Router
Specific Model(s)	Steelhead100, CX755X, 1050X, 2050X, 5050X, 550X, CX1555X, CX5055X, CX555X, CX555M, EX1160X, EX760X, 250X, CX7055X, CX255X, 6050X, 7050X, CMC8000, 8150, C8000, 9200, C9200, 9350, CX770M, CX570, CX570H, CX7070, CX7070L, CX5070, CX5070H
Operating System and Firmware Versions	7.0.3a
Communication Protocols	SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Resync, View Interfaces, View Routes, View Arp

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - The sysObjectID contains "1.3.6.1.4.1.17163"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration running

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential management

- ◆ Account
 - username <username> password 0 <password>
- ◆ SNMP
 - snmp-server community <snmpCommunity>

Device monitoring

- ◆ enable
- ◆ disable
- ◆ config terminal
- ◆ exit
- ◆ no cli session paging enable
- ◆ configuration write
- ◆ reload
- ◆ ping
- ◆ traceroute
- ◆ show interfaces brief
- ◆ show ip route

- ◆ show arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config Files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. In most cases, a resolution is included to address the issue.

Riverbed Steelhead

- ◆ There is no support for sysServices (standard MIB scalar). The sysServices variable must be edited in stdlib/stdmib.inc and be made a standard snmp type instead of a snmpcached type.
- ◆ The sysObjectID represents a vendor, *not* the model identification.

- ◆ Configuration management using file transfer is not currently supported, since the results are a binary database.
- ◆ There is no known support for configuration changes using SNMP traps or syslog facility.
- ◆ There is no SNMP support for hardware inventory, for example ENTITY-MIB. Information is taken from the HOST-RESOURCES-MIB, which does not support parent/child relationships.
- ◆ The device family does not currently support creation or management of individual accounts.

CHAPTER 75

Riverstone Devices

This chapter contains the following topic:

- ◆ [Riverstone Router.....](#) 784

Riverstone Router

Device Type	Router
Specific Model(s)	RS 500, RS 1000, RS 2000, RS 2100, RS 3000, RS 8000, RS 8600, RS 32000, RS 38000, RSLA 1100, RSLA 1200, RSLA 1500
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps, Syslog
Discovery/Identify Methods	SNMP
Credential Management	Account, Privilege, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Not Available

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	No
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Riverstone Networks"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - copy startup to tftp-server
 - copy active to tftp-server

Configuration deploy

- ◆ Terminal/TFTP
 - copy tftp to scratchpad
 - copy tftp to startup

Credential management

- ◆ Account
 - system set user <username> password <password> privilege 0
 - system set password login <password>
 - no system set user <oldUser> password <oldPass> privilege 0
- ◆ Privilege
 - system set password enable <newPrivilegePass>
- ◆ SNMP
 - snmp set community <newSnmpCommunity> privilege (read | read-write)
 - no snmp set community <oldSnmpCommunity> privilege (read | read-write)

Device monitoring

- ◆ enable
- ◆ disable
- ◆ cli set terminal rows 0
- ◆ show frame-relay map
- ◆ clear counters
- ◆ show diag
- ◆ show process cpu
- ◆ show management event
- ◆ copy active startup

- ◆ configure
- ◆ exit
- ◆ reboot
- ◆ ping
- ◆ traceroute
- ◆ show ip interface brief
- ◆ show ip route
- ◆ show arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH/TFTP, Telnet/TFTP
Startup	Yes	Yes	Reboot	ASCII	SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 76

RuggedCom Devices

This chapter contains the following topic:

- ◆ [RuggedCom RS900](#) 790

RuggedCom RS900

Device Type	Switch
Specific Model(s)	RS900G, RS900G-24-D-2SFP, RS900G-24-P-2SFP, RS900GNC-24-D-2SFP, RS416
Operating System and Firmware Versions	v3.8.4, v3.12.1
Communication Protocols	SNMP, TELNET, TELNET/TFTP, SSH, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Trap
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2c, Account
Operating System Management Protocols	NA
Quick Commands	Ping

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP:
 - sysObjectID value contains 1.3.6.1.4.1.15004.2
 - Serial number is retrieved from .1.3.6.1.4.1.15004.4.2.3.1.0
 - sysName will be used for discovery
- ◆ Terminal:
 - NA

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP
 - dir
 - type config.csv
- ◆ Terminal/TFTP
 - dir
 - tftp <Server IP Address> put config.csv <configfile name>

Configuration deploy

- ◆ Terminal/TFTP
 - dir
 - tftp <Server IP Address> put config.csv <configfile name>

Credential management

- ◆ SNMP
 - sql SELECT * FROM vacmSecurityToGroupCfg WHERE Name = <oldSnmpCommunity>
 - sql INSERT INTO vacmSecurityToGroupCfg SecurityModel,Name,Group VALUES snmpV2c, <newSnmpCommunity>, <oldGroupName>
 - sql SELECT * FROM snmpV3UsersCfg WHERE Name = <oldSnmpCommunity>
 - sql INSERT INTO snmpV3UsersCfg Name, IP Address, Auth Protocol, Priv Protocol, Auth Key, Confirm Auth Key, Priv Key, Confirm Priv Key VALUES <newSnmpCommunity>, <IP Address>, <Auth Protocol>, <Priv Protocol>, <Auth Key>, <Confirm Auth Key>, <Priv Key>, <Confirm Priv Key>
 - sql DELETE FROM snmpV3UsersCfg WHERE Name = <oldSnmpCommunity>
 - sql DELETE FROM vacmSecurityToGroupCfg WHERE Name = <oldSnmpCommunity>
- ◆ Account
 - sql UPDATE passwordCfg SET Admin Username <NewuserName>

- sql UPDATE passwordCfg SET Admin Password <password>, Confirm Admin Password <password>

Operating System Management

NA

Device monitoring

- ◆ dir
- ◆ arp
- ◆ version
- ◆ type config.csv
- ◆ ping <ip address>

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	TELNET,SSH,TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Being a menu based device, only discovery using SNMP is supported.
- ◆ There is no post operation as the device reboots itself after a configuration push.
- ◆ Interfaces pull is supported using SNMP only.

CHAPTER 77

Samsung Devices

This chapter contains the following topic:

- ◆ [Samsung Router](#) 796

Samsung Router

Device Type	Router
Specific Model(s)	iBG1000, iBG2006, iBG2016
Operating System and Firmware Versions	iBG1000_Advanced_1.6.1.4.Z
Communication Protocols	SSH/Telnet, Telnet/FTP, SSH/FTP
Configuration Files Content	Text
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Setup Diagnostic, View Diagnostic Setup, Setup NAT, View NAT Setup, View Diagnostic,Route,ARP, Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/Identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains .236.4.1.12.1.4
- Get serial number from 1.3.6.1.4.1.236.4.1.12.2.1.1.5.1.4.1
- ◆ Terminal
 - The output of **show system configuration** contains model name and serial number.
 - The output of **show hostname** contains hostname of the device.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal:
 - show run no_pageBreak
 - show startup-config
- ◆ Terminal/TFTP
 - FTP startup config file to device.

Configuration deploy

- ◆ Terminal (only for single config file)
 - Push by sending each line through the command-line interface.
- ◆ Terminal/TFTP

Config files can be pushed to the device as startup-configuration-properties file.

 - FTP the config file from the NCM to the device .

Credential management

- ◆ Account
 - user <username> level <level> password <password>
 - no user <oldUser>
- ◆ SNMP
 - snmp-server community <community> ro|rw
 - no snmp-server community <oldSnmpCommunity>

Device monitoring

- ◆ show version
- ◆ show system configuration
- ◆ show hostname
- ◆ ping
- ◆ trace

- ◆ show run no_pageBreak
- ◆ show startup-config
- ◆ show arp
- ◆ show route-map
- ◆ show ip interfaces brief
- ◆ show snmp status
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	Copy to Startup	TEXT	SSH, Telnet,SSH,Telnet/FTP
Startup Configuration	Yes	Yes	Reboot	TEXT	SSH, Telnet/FTP,SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

Samsung iBG1000 does not support PUSH operation to push existing configurations changes through Config mode.

CHAPTER 78

SEL Devices

This chapter contains the following topic:

- ◆ [SEL Switch](#) 802

SEL Switch

Device Type	Router
Specific Model(s)	SEL-2730M
Operating System and Firmware Versions	Not Available
Communication Protocols	SNMP, HTTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, SNMP Traps
Discovery/Identify Methods	SNMP
Credential Management	SNMP v1/v2/v3, Account
Operating System Management Protocols	Not Available
Quick Commands	Not Available

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	No
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	No
Quick Commands	No
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/Identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains 1.3.6.1.4.1.31823.1

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ HTTP:
 - Login to the device by posting username and password to `post:hostname(<DEVADDR>):ssl(true):/auth.sel`
 - From HTTP response, retrieve `session_id` and post it to `post:hostname(<DEVADDR>):ssl(true):/do_export.sel`
 - Check the status of configuration file generation using `post:hostname(<DEVADDR>):ssl(true):/status.sel`
 - If status returns 'done', start file download using `post:hostname(<DEVADDR>):ssl(true):/downloads/export_settings.xml`
 - Logout of the device `post:hostname("+DEVADDR+"):ssl(true):/logout.sel"`

Configuration deploy

- ◆ HTTP
 - Login to the device by posting username and password to `post:hostname(<DEVADDR>):ssl(true):/auth.sel`
 - From HTTP response, retrieve `session_id` and post it to `post:hostname(<DEVADDR>):ssl(true):/do_import.sel`
 - Check for status "FM_UPLOAD_COMPLETE" for completion for configuration file upload using `post:hostname(<DEVADDR>):ssl(true):/status.sel`
 - Device restarts after successful file upload. Wait until the device reboots and check the status in syslog report using `post:hostname(<DEVADDR>):ssl(true):/syslog_report_data.sel`
 - Logout of the device `post:hostname("+DEVADDR+"):ssl(true):/logout.sel"`

SEL configuration settings can be changed from NCM using configlet push or Automation library. Http page should be given first followed by http parameters one in each line and should be ended with `http_param_end`. All settings require `session_id` and `session_username` which will be passed from NCM to SEL switch.

For example banner can be changed using below steps.

```
GET/usage_policy_save.sel?usage_policy=Somethinghere&session_username=<user-name>&session_id=<session-id>
```

To change/set Banner settings:

```
usage_policy_save.sel
usage_policy="This%20is%20a%20test%20banner";
http_param_end
```

Params	Comment
usage_policy_save.sel	Http page
usage_policy="This%20is%20a%20test%20banner";	Banner to be set. <i>"%20" should be given for space</i>
http_param_end	NCM defined param to denote any of http parameters

Credential management

◆ Account

Account user password can be changed using "Update Credential".

Steps for Account Credential update

- In Device->Properties->Communication Tab, check if proper account credential is assigned.
- Perform test credential to check if the account credential assigned is valid. Ex: admin and admin@123.
- Create a different user with new password in NCM. Ex: test and test@123 in NCM.
- In update credential, select new account and schedule the job. ("save only" option should NOT be selected.)
- If job is successful, try logging into SEL device using new credential.
- Lastly, from NCM GUI, old credential should be selected using "save only" option in Update Credential.

◆ SNMP

SNMP v1/v2/v3 community string can be changed through configlet push and cannot be changed using "Update Credential".

To change SNMP v2 community string:

```
edit_snmp_user_save.sel
test
ro_comm_string=test
can_trap=True
can_read=True
config_type=2
http_param_end
```

Params	Comment
edit_snmp_user_save.sel	Http page
test	Name of SNMP profile for which community string is to be changed. SNMP profile name is configured in SEL GUI.This should be given immediately after the http page.
ro_comm_string=test	New community string
can_trap=True	Trap enabled
can_read=True	Read enabled
config_type=2	SNMP version 2
http_param_end	NCM defined param to denote any of http parameters

Device monitoring

- ◆ SNMP Based

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running Configuration	Yes	Yes	N.A.	ASCII	HTTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No

Attributed data	Terminal	SNMP
Physical Hardware	No	Yes
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

Note that, the SEL Driver supports config pull, configlet push & Credential management with NCM 9.5.0.2 build only or above.

CHAPTER 79

Siemens Devices

This chapter contains the following topic:

- ◆ [Siemens Router](#) 808
- ◆ [Siemens hiX56xx DSLAM](#) 812

Siemens Router

Device Type	Router
Specific Model(s)	5851, 5871, 5940
Operating System and Firmware Versions	6.1.064
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/Identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Siemens" or "Efficient".

- sysObjectID contains "1.3.6.1.4.1.1548"
- ◆ Terminal
 - The output of **version** command contains "^((Siemens|Efficient) ([0-9]+) .*)\$".
 - The output of **sys name** command contains "System name: <(.*)>".

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal: (only for single config files)
 - system configlist all
- ◆ Terminal/TFTP
 - copy <filename> tftp@<serverIPAddress>:<localFilename>

Configuration deploy

- ◆ Terminal (only for single config file)
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - copy tftp@<serverIPAddress>:<localFilename> <filename>

Credential management

- ◆ Account
 - user set password <username> <password>
 - user delete user <username>
 - user add user <username> <password> super enable
 - system admin <username>
 - save
- ◆ SNMP
 - system community|writecommunity <newCommunity>
 - save

Device monitoring

- ◆ version
- ◆ sys name
- ◆ msfs

- ◆ sys name
- ◆ sys contact
- ◆ sys location
- ◆ ifs
- ◆ ipifs
- ◆ eth list
- ◆ exit
- ◆ boot
- ◆ ping
- ◆ dir
- ◆ system configlist all

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Config	Yes	Yes	Save Config, Reboot	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Text Config Files	Yes	Yes	Save Config, Reboot	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Binary Config Files	Yes	Yes	Save Config, Reboot	Binary	SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No

Attributed data	Terminal	SNMP
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Siemens hiX56xx DSLAM

Device Type	Switch
Specific Model(s)	5635
Operating System and Firmware Versions	R1.5
Communication Protocols	SSH, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Privilege, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	View Routes, View ARP, View Interfaces, Resync

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "^hiX56[0-9][0-9]"

- sysObjectID contains "1.3.6.1.4.1.6296"
- ◆ Terminal
 - Get the model number from the output of **show system-version** command by matching the regular expression "hiX([^\s/]+)/".
 - Get the MAC Address from the output of **show interface mgmt** command by matching the regular expression "address is ([0-9a-f\.\.]+)\$".
 - Get the Hostname from the output of **show running-config hostname** command by matching the regular expression "hostname +(.*)\$".

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential management

- ◆ Privilege
 - passwd enable <newPrivPass>
- ◆ SNMP
 - snmp community ro|rw <newSnmpCommunity>

Device monitoring

- ◆ terminal length ...
- ◆ enable
- ◆ exit
- ◆ configure terminal
- ◆ end
- ◆ copy running-config startup-config
- ◆ reboot
- ◆ ping

- ◆ show ip route database
- ◆ show interface
- ◆ show arp
- ◆ show flash
- ◆ show memory

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running-config	Yes	Yes	Copy To Start	ASCII	SSH, Telnet
Startup-config	No	Yes	NA	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ As of system version R1.5, the configuration that is output from a show running-config or show startup-config cannot be pushed back to the device without significant editing, due to the following:
 - Commands that enter a subconfiguration editor, but do not exit from the subsection appropriately.
 - Commands that exit too many times from a subsection, ending configuration mode entirely, and thereby causing subsequent commands to fail.
 - Too many exit commands example:

```

ip dhcp option82 policy drop
!
!End of DHCP daemon's configuration
!
! --- eqm - BEGIN -----
configure terminal
rack alarm-severity-profile 1
...
card alarm-severity-profile 17 1
exit <<< Exit Config Mode
! --- eqm - END-----
!
no debug red-mgr
sw-keepalive
...
!
End <<< Exit Config Mode, too many times.

```

- Use of EXEC mode syntax in configuration mode commands. For example, our test device produces the following (abridged) config:

```

çEXEC mode command example:
!configdb_version 1
hostname SG1-ARC146-VIL
terminal length 0 <<<This is an EXEC mode command.
login accounting-mode none
bridge
! start> --- tracelevel submodules swchd ---
debug switch vlan 3

```

- ◆ Startup configuration can be changed only by use of the Copy to Start functionality after pushing to the running configuration.

CHAPTER 80

Solaris Devices

This chapter contains the following topic:

- ◆ [Solaris](#) 818

Solaris

Device Type	Solaris Server
Operating System and Firmware Versions	Solaris - 10
Communication Protocols	SSH, TELNET, TELNET/FTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SSH
Credential Management	Account
Operating System Management Protocols	NA
Quick Commands	Finger, ps, Ping, Traceroute, View Arp, View Interfaces, View Routes

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SSH/TELNET

- Command "uname -a" to know its Linux server.
- Command "hostname" should provide hostname of the device
- Command "sneep" should provide serial number
- Command "uname -pi" should provide model

Configuration capture

- ◆ ASCII config
 - ASCII config is pulled using SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP

Configuration deploy

- ◆ ASCII config
 - Text configuration data can be pushed using SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP

Credential management

- ◆ Account
 - Account role is supported only for non root users
 - For root user only password can be changed, following are the commands used:
 - "passwd username"

Operating System management

- ◆ Not supported

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/passwd	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP
/etc/group	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP
/etc/hosts	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP
/etc/release	Yes	Yes	NA	ASCII	SSH/SCP, TELNET/FTP, SSH/FTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	No
Memory	Yes	No
Physical Hardware	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	No

CHAPTER 81

SourceFire Devices

This chapter contains the following topic:

- ◆ [Sourcefire 3D Sensor](#) 822

Sourcefire 3D Sensor

Device Type	Other
Specific Model(s)	3D Sensor 2100
Operating System and Firmware Versions	4.8.0 -12
Communication Protocols	SSH, SSH/SCP
Configuration Files Content	ASCII, Binary
Configuration Change Notification (Events)	Syslog
Discovery/Identify Methods	Terminal
Credential Management	Account
Operating System Management Protocols	Not Available
Quick Commands	Ping, View Description, View Model, View OsVersion, View SerialNo, Up Time, View Interfaces, View Routes, View Arp, View Memory Information, View File System Information, View Hardware Inventory

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ Terminal
 - /etc/sf/model.conf file must contain the model information as a string 3D Sensor 2100.
 - Serial number must be available through **hostid** command.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - configuration files are pulled using standard unix commands

Configuration deploy

- ◆ Terminal
 - configuration files are pushed using standard unix commands

Credential management

- ◆ Account
 - passwd
 - <password>
 - <password>

Device monitoring

- ◆ df -akT
- ◆ cat /proc/meminfo
- ◆ hostname
- ◆ grep ...
- ◆ uname -a
- ◆ cat ...
- ◆ hostid
- ◆ lspci
- ◆ ifconfig -a
- ◆ uptime
- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/etc/ldap.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/modules.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/my.cnf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/nsswitch.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/passwd	Yes	Yes	NA	ASCII	SSH/SCP
/etc/resolv.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/shadow	Yes	Yes	NA	ASCII	SSH/SCP
/etc/syslog.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/cron.d/sfcrontab	Yes	Yes	NA	ASCII	SSH/SCP
/etc/openldap/ldap.conf	Yes	Yes	NA	ASCII	SSH/SCP
/etc/pam.d/system-auth	Yes	Yes	NA	ASCII	SSH/SCP
/etc/ssh/sshd_config	Yes	Yes	NA	ASCII	SSH/SCP
/etc/sysconfig/*	Yes	Yes	NA	ASCII	SSH/SCP
/etc/sysconfig/network-devices/*	Yes	Yes	NA	ASCII	SSH/SCP
/etc/sf/*	Yes	Yes	NA	ASCII	SSH/SCP
/etc/sf/de_init	Yes	Yes	NA	Binary	SSH/SCP
/etc/sf/eula.agree	Yes	Yes	NA	Binary	SSH/SCP
/etc/sf/initial_install.dat	Yes	Yes	NA	Binary	SSH/SCP
/etc/sf/feature/*	Yes	Yes	NA	Binary	SSH/SCP
/etc/sf/keys/*.pkcs12*	Yes	Yes	NA	Binary	SSH/SCP
/etc/sf/keys/*.pkcs12*	Yes	Yes	NA	ASCII	SSH/SCP
/var/sfcron.d/*	Yes	Yes	NA	ASCII	SSH/SCP
/var/sf/managed/*	Yes	Yes	NA	ASCII	SSH/SCP
/var/sf/peers/sftunnel-status	Yes	Yes	NA	ASCII	SSH/SCP
/var/sf/peers/managed	Yes	Yes	NA	ASCII	SSH/SCP

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
/var/sf/remediations/*	Yes	Yes	NA	ASCII	SSH/SCP
/var/sf/rules/*	Yes	Yes	NA	ASCII	SSH/SCP
/var/sf/time_series/*	Yes	Yes	NA	ASCII	SSH/SCP
/var/sf/snorty/*	Yes	Yes	NA	ASCII	SSH/SCP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	No
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	No	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. In most cases, a resolution is included to address the issue.

- ◆ SNMP is not supported.

CHAPTER 82

Starent Devices

This chapter contains the following topic:

- ◆ [Starent PDSN](#) 828

Starent PDSN

Device Type	Router
Specific Model(s)	ST16, ST20, ST40, ASR5000
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Interfaces, View Routes, View Arp, Set Num Backups Kept

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	Yes
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- Get the Chassis Type from ".1.3.6.1.4.1.8164.1.1.10.0" OID and determine the model on the basis of that.

Device Operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - save configuration /flash/<filename> -noconfirm verbose
 - show file url /flash/<filename>
- ◆ Terminal/TFTP
 - save configuration tftp://<serverIPAddress>/<filename> -noconfirm verbose

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Credential management

- ◆ Account
 - config
 - context local
 - administrator <userName> password <password>
 - no administrator <oldUser>
- ◆ SNMP
 - config
 - snmp community <newSnmpCommunity> read-only|read-write
 - no snmp community <oldSnmpCommunity>

Device monitoring

- ◆ config
- ◆ reload -noconfirm
- ◆ directory ...
- ◆ show resources cpu
- ◆ context local
- ◆ end
- ◆ term length 0

- ◆ show boot initial-config
- ◆ ping
- ◆ traceroute
- ◆ show ip interface

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered within other releases. A resolution is included to address the issue, if available.

- ◆ When running config is pushed it is automatically copied to startup config.

CHAPTER 83

Symbol Devices

This chapter contains the following topic:

- ◆ [Symbol WS-2000](#) 834

Symbol WS-2000

Device Type	Switch
Specific Model(s)	Symbol WS-2000
Operating System and Firmware Versions	1.5.0, 1.5.1, 2.0.0, 2.0.1, 2.0.2
Communication Protocols	SNMP/TFTP, SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	TFTP
Quick Commands	Device Uptime, Interface Summary

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Symbol WS"

- sysObjectID contains "1.3.6.1.4.1.388"
- sysServices is 0x2
- ◆ Terminal
 - Get model from the output of **summary** command by matching the regular expression "([[:alnum:]]+) firmware version "
 - Get the Serial number from the output of **show wan** command by matching the regular expression "ethernet address.*:.*([0-9A-Fa-f]{12})"
 - Get the system name from the output of the **show all** command by matching the regular expression "system name *: *(.+) \$"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP/TFTP
 - Server IP Host (a.b.c.d)
 - 1.3.6.1.4.1.388.11.2.2.6.1.0
 - TFTP Operation
 - 1.3.6.1.4.1.388.11.2.2.4.1.0
 - unspecified;
 - ftpSrvToSwitch;
 - ftpSwitchToSrv;
 - tftpSrvToSwitch;
 - tftpSwitchToSrv;
 - Filename
 - 1.3.6.1.4.1.388.11.2.2.4.3.0
 - Start the transfer
 - 1.3.6.1.4.1.388.11.2.2.4.4.0
 - Operation count
 - 1.3.6.1.4.1.388.11.2.2.4.5.0
 - Operation result string
 - 1.3.6.1.4.1.388.11.2.2.4.6.0
 - Operation success string
 - 1.3.6.1.4.1.388.11.2.2.4.7.0
 - Terminal
 - system
 - config

- export terminal

- ◆ Terminal/TFTP
 - system
 - config
 - set server <serverIPAddress>
 - set file <filename>
 - export tftp

Configuration deploy

- ◆ SNMP/TFTP
 - Same as mentioned in case of 'Configuration Capture' section
- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - system
 - config
 - set server <serverIPAddress>
 - set file <filename>
 - import tftp

Credential management

- ◆ Account
 - passwd admin
 - <oldPassword>
 - <newPassword>
 - <newPassword>
- ◆ SNMP
 - system
 - snmp
 - access
 - delete v1v2c <communityIndex>
 - add v1v2c <newSnmpCommunity> ro|rw <communityOID>
 - save

Operating System management

The Symbol Device Driver supports OS upgrade and downgrade using telnet and SSH login protocols and FTP/TFTP file transfer mechanisms.

The Symbol firmware releases 1.5.0, 1.5.1, 2.0.0, and 2.1.0 have all been qualified and tested with the upgrade/downgrade process. One issue was found when completing an upgrade or downgrade between the 2.0.0 and 2.1.0 releases using the SSH protocol.

The Symbol device 2.0.0 and 2.1.0 firmware returns different fingerprints for the RSA key. Therefore, after the upgrade/downgrade, attempts to login using SSH will fail, due to the key exchange.

From the application, the per/downgrade will show Failed, based on failure to login following the device reboot, due to SSH host key verification. Suggestions for managing this issue are as follows.

- ◆ If possible at your site, using telnet for the OS upgrade/downgrade between 2.0.0 and 2.1.0 allows the process to proceed normally and return status of the state of the device.
- ◆ If using SSH for OS upgrade, check the error status looking for a successful upload, followed by an SSH failure to connect. This is the failure signature indicating the RSA key mismatch between firmware releases.
- ◆ In either case, you need to update the SSH host key database on the HP device server to regain access to the device.
 - **For Linux and Solaris Servers:** The SSH key database is located in the `~root/.ssh/sshhostkeys` file. Edit the `sshhostkeys` file, and remove the entry associated with the Symbol device based on IP address.
 - **For Windows Servers:** The host key database is maintained in the Registry, in the `HKEY_LOCAL_MACHINE\SOFTWARE\Voyence\Control\SshHostKeys` folder. Using the `regedit` utility, remove the entry associated with the Symbol device based on IP address.

Device monitoring

- ◆ system
- ◆ exec df -T
- ◆ summary
- ◆ stats
- ◆ show wan
- ◆ system
- ◆ show all
- ◆ restart
- ◆ config
- ◆ list v1v2c
- ◆ save

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	SNMP/TFTP, SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Symbol RFS

Device Type	Wireless Switch
Specific Model(s)	RFS-6000, RFS-7000
Operating System and Firmware Versions	5.8.5.0-016R and 4.3.3.0-004R
Communication Protocols	Telnet, SSH, Telnet/FTP, SSH/FTP, SSH/SCP, Telnet/TFTP, SSH/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Traps
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	TFTP
Quick Commands	traceroute, routes, arp, interface

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	No
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termllet	No
User Mode Termllet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains "1.3.6.1.4.1.388"

- ◆ Terminal
 - Hostname, device properties, and interfaces must be successfully retrieved or discovery is aborted.
 - Model must map to sysObjectID in SymbolRFSModels.xml .

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ SNMP : Not Available
- ◆ For Telnet and SSH
 - running: show run (show config if show run fails)
 - startup: show config (show start if show config fails)
- ◆ For Telnet/TFTP and SSH/TFTP
 - running: write net ipAddress filename
 - startup: same approach as startup for Telnet and SSH above

Configuration deploy

NA

Credential management

NA

Device monitoring

- ◆ show ip interface
- ◆ show ip route
- ◆ show ip access-list
- ◆ show mac address table
- ◆ show interface

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP
startup	No	Yes	NA	ASCII	Telnet/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	Yes	Yes
File System Information	No	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 84

Tasman Devices

This chapter contains the following topic:

- ◆ [Tasman Router](#)..... 844

Tasman Router

Device Type	Router
Specific Model(s)	1004E, 1001, 1002, 1002E, 1200, 1200C, 1200E, 1200EC, 1250, 1400, 1400E, 1450, 4100, 4102, 6300
Operating System and Firmware Versions	Not Available
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Syslog, Traps
Discovery/Identify Methods	Terminal, SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	TFTP
Quick Commands	Resync, Ping, Traceroute, View Routes, View Arp, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	Yes
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysDescr contains "Tasman" or sysObjectID contains ".3174.1." or ".562.73."
- ◆ Terminal
 - Get the Hostname from the output of **show hostname** command by matching the regular expression "[Hh]ost[Nn]ame: (.*)".
 - Get the Model from the output of **show system configuration** command by matching the regular expression "Model Number: *(.*)".
 - Get the sysObjectID from models file

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
 - show configuration running
 - show configuration stored
- ◆ Terminal/TFTP
 - save network <serverIPAddress> <filename>
 - file upload flash_file <serverIPAddress> system.cfg <filename>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - file download <serverIPAddress> <filename> system.cfg
 - configure network
 - <serverIPAddress>
 - <filename>

Credential management

- ◆ Account
 - admin_name <userName>
 - password

- <userName>
- <oldPassword>
- <newPassword>
- <newPassword>
- ◆ SNMP
 - no community <oldSnmpCommunity> ro | rw
 - community <newSnmpCommunity> ro | rw

Operating System management

- ◆ file download <serverIPAddress> <srcFilename> <destFilename>

Device monitoring

- ◆ show run
- ◆ show system configuration
- ◆ dir
- ◆ configure term
- ◆ exit
- ◆ show hostname
- ◆ show version
- ◆ show system memory
- ◆ show system flash
- ◆ show interface ...
- ◆ ping
- ◆ race
- ◆ show ip routes
- ◆ show arp
- ◆ show system diagnostics

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Startup	Yes	Yes	Reboot	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	No	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

Tasman Family of Devices

- ◆ Tasman uses the concept of *account levels*. Currently, devices get Auto Discovered with low level accounts, but can not successfully complete a Pull. To Pull devices, you must ensure the devices are setup with **Level 1 accounts**.

Tasman TIOS

- ◆ Tasman TIOS does *not* allow changing the Admin Name using SSH. You must use **TELNET**.

CHAPTER 85

Telco Devices

This chapter contains the following topics:

- ◆ Telco Switch 850
- ◆ Telco T-Metro 854

Telco Switch

Device Type	Switch
Specific Model(s)	T5CL3-24G 256M, T-Marc-250, T-Marc-254
Operating System and Firmware Versions	T5CL3-24G 256M: BinOS 6.5.5 T-Marc-250: BinOS 6.6.3.4 T-Marc-254: BinOS 6.6.3.4
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, Privilege, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Routes, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP
 - sysObjectID contains either 1.3.6.1.4.1.738.1.5.100.1.1.10 or 1.3.6.1.4.1.738.1.5.100.1.1.17
 - Serial Number is retrieved from OID .1.3.6.1.4.1.738.1.5.100.1.3.1.0

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
- ◆ Terminal/TFTP
 - copy running-config upload-to <serverIPAddress> <filename>
 - copy startup-config upload-to <serverIPAddress> <filename>

Configuration Deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - copy running-config download-from <serverIPAddress> <filename>
 - copy startup-config download-from <serverIPAddress> <filename>

Credential management

- ◆ Account
 - username <userName> password <password> <password> group administrators
 - no username <oldUser>
 - Privilege
 - enable password <newPrivPassword> <newPrivPassword>
- ◆ SNMP
 - Get the commands from "running-config" for adding Snmp Community string and send those.
 - no snmp-server user <oldString>
 - no snmp-server access-list <oldString>

Device monitoring

- ◆ no terminal length
- ◆ terminal length 0
- ◆ enable
- ◆ disable
- ◆ exit
- ◆ configure terminal
- ◆ show running-config
- ◆ ping
- ◆ traceroute
- ◆ show ip route
- ◆ show ip interface

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support..

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Startup	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No

Attributed data	Terminal	SNMP
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Either Telnet/TFTP or SSH/TFTP must be enabled to push configurations. Commands issued to the CLI do not merge with the running configuration.
- ◆ The Configuration Editor does not analyze the content for the type of line termination. To insert blank lines in banner pages, at least one space-character must be present.
- ◆ Account and privilege password management is present but unverified.
- ◆ SNMP credential rolls require non-blank credentials.

Telco T-Metro

Device Type	Switch
Specific Model(s)	T-Metro 256M
Operating System and Firmware Versions	7.0.R2
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, Privilege, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Routes, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID contains 1.3.6.1.4.1.738.1.5.100.1.1.16
- Serial Number is retrieved from OID .1.3.6.1.4.1.738.1.5.100.1.3.1.0

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config
- ◆ Terminal/TFTP
 - copy running-config tftp://<serverIPAddress>/<filename>
 - copy startup-config tftp://<serverIPAddress>/<filename>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - copy tftp://<serverIPAddress>/<filename> running-config
 - copy tftp://<serverIPAddress>/<filename> startup-config

Credential management

- ◆ Account
 - username <userName> password <password> <password> group administrators
 - no username <oldUser>
- ◆ Privilege
 - enable password <newPrivPassword> <newPrivPassword>
- ◆ SNMP
 - Get the commands from "running-config" for adding Snmp Community string and send those.
 - no snmp-server user <oldString>
 - no snmp-server access-list <oldString>

Device monitoring

- ◆ no terminal length
- ◆ terminal length 0

- ◆ enable
- ◆ disable
- ◆ exit
- ◆ configure terminal
- ◆ show running-config
- ◆ ping
- ◆ traceroute
- ◆ show ip route
- ◆ show ip interface

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Startup	Yes	Yes	NA	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No

Attributed data	Terminal	SNMP
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Either Telnet/TFTP or SSH/TFTP must be enabled to push configurations. Commands issued to the CLI do not merge with the running configuration.
- ◆ The Configuration Editor does not analyze the content for the type of line termination. To insert blank lines in banner pages, at least one space-character must be present.
- ◆ Account and privilege password management is present but unverified.
- ◆ SNMP credential rolls require non-blank credentials.

CHAPTER 86

Vanguard Devices

This chapter contains the following topic:

- ◆ Vanguard Router 860

Vanguard Router

Device Type	Router
Specific Model(s)	3410
Operating System and Firmware Versions	V7.1.R00A_@Seven_3400
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID contains 1.3.6.1.4.1.449.2.1.3410
- Serial Number is retrieved from OID .1.3.6.1.4.1.449.2.1.1.2.2.3.0

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/TFTP:
 - tftp getsript <filename> <serverIPAddress>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP:
 - tftp setscript <filename> <serverIPAddress>

Credential management

- ◆ Account
 - Go to Main Menu and select the option "Update system parameters" to change the password.
- ◆ SNMP
 - Go to Main Menu and select the option "Configure" to change the snmp community

Device monitoring

- ◆ ping
- ◆ traceroute
- ◆ show ip route
- ◆ show ip interface
- ◆ show arp

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support..

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	NA	ASCII	TELNET, SSH, TELNET/TFTP, SSH/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes
Interfaces	No	Yes
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	Yes
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	No	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Only one session can be logged into the device at a time.
- ◆ SNMP community string changes require a reboot per credential to take effect.

CHAPTER 87

VegaStream Devices

This chapter contains the following topics:

- ◆ [VegaStream Vega400](#) 864

VegaStream Vega400

Device Type	Voip Device
Specific Model(s)	Vega400
Operating System and Firmware Versions	10.02.08.8
Communication Protocols	SSH/Telnet and SNMP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	NA
Discovery/Identify Methods	SSH/Telnet, SNMP
Credential Management	NA
Operating System Management Protocols	NA
Quick Commands	View Interfaces, Ping, Traceroute

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	No

Discovery/identify methods

The following information must be available for this driver class to manage an applicable

device.

- ◆ SSH/TELNET
 - Command “show version” should provide serial number.
 - Command “show banner” should provide hostname of the device

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - sput
- ◆ Terminal/FTP
 - put ftp:<LOCALFILE>

Configuration deploy

- ◆ Terminal
 - TPush by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/FTP
 - get ftp:<REMOTEFILE>

Credential management

- ◆ Not supported

Operating System management

- ◆ Not supported

Device monitoring

- ◆ show banner
- ◆ show version
- ◆ show ports
- ◆ show lan route
- ◆ show arp
- ◆ show stats
- ◆ save

Multi-Config Files

The following files are used when storing and revisioning multiple configuration files for multi-config support.

Multi-Config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	copyToStart	ASCII	SSH, Telnet FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Memory	Yes	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Device behaves inconsistently while pushing config using ftp.
- ◆ Device icon will not be displayed for this device.

CHAPTER 88

Vyatta Devices

This chapter contains the following topic:

- ◆ [Vyatta Router](#) 868

Vyatta Router

Device Type	Router
Specific Model(s)	ROUTER
Operating System and Firmware Versions	VC5.0.2
Communication Protocols	SSH, Telnet, SSH/TFTP, Telnet/TFTP
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, View Interfaces, View Routes, View Arp

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- Get the Model based on sysObjectID from the models file
- sysObjectID contains "1.3.6.1.4.1.30803"
- sysDescr contains "[Vv]yatta"
- Get the Hostname
- ◆ Terminal
 - The output of **show version** command matches to "(?i)^Copyright:\\s+.*Vyatta" regular expression
 - Get model from the output of **#VyattaRouter#** command by matching the regular expression "#(VyattaRouter)#"
 - Get the sysObjectID based on Model from models file
 - Get the Serial number from the output of **show interfaces ethernet eth0 | match ether** command by matching the regular expression "/ether +([a-fA-F0-9:]{17})"
 - Get the Hostname from the output of the **show configuration |match host-name** command by matching the regular expression "host-name +(.)\$"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show configuration all
 - cat /opt/vyatta/etc/config/config.boot
- ◆ Terminal/TFTP
 - save tftp://<serverIPAddress>/<filename>
 - tftp -p -l /opt/vyatta/etc/config/config.boot -r /<filename> <serverIPAddress>

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.
- ◆ Terminal/TFTP
 - load tftp://<serverIPAddress>/<filename>
 - tftp -g -l /opt/vyatta/etc/config/config.boot -r <filename> <serverIPAddress>

Credential management

- ◆ Account
 - set system login user <userName>

- set system login user <username> full-name "<userName> -lonixNCM-"
- set system login user <username> authentication plaintext-password <password>
- set system login user <username> level admin
- ◆ SNMP
 - set protocols snmp community <newSnmpCommunity>
 - edit protocols snmp community <newSnmpCommunity>
 - set authorization ro | rw
 - top
 - delete protocols snmp community <oldSnmpCommunity>

Device monitoring

- ◆ show system memory
- ◆ df -k
- ◆ save
- ◆ reboot
- ◆ show interfaces detail
- ◆ show version
- ◆ show arp
- ◆ show ip route
- ◆ ping
- ◆ traceroute
- ◆ terminal length ...

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support..

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	Yes	Yes	Copy to Start	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP
startup	Yes	Yes	Reboot	ASCII	SSH, Telnet, SSH/TFTP, Telnet/TFTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

CHAPTER 89

Wilibox Devices

This chapter contains the following topic:

- ◆ [Wilibox WILI-S.....](#) 874

Wilibox WILI-S

Device Type	Wireless Access Point
Specific Model(s)	RDAT-81
Operating System and Firmware Versions	WILI-S 5.24, WILI-S 5.26
Communication Protocols	SSH
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account
Operating System Management Protocols	Not Available
Quick Commands	View Status, View Interfaces

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysDescr contains "WILIBOX"
- sysObjectID contains "1.3.6.1.4.1.22972"
- ◆ Terminal
 - Get model from the output of **status** command by matching the regular expression "Hardware revision: +(\S+)"
 - Get the MAC Address from the output of **status** command by matching the regular expression "([0-9a-fA-F:]{17})"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show

Configuration deploy

- ◆ Terminal
 - Send individual lines of configuration to a temporary file.
 - After an entire configuration file is sent, the temporary file is verified to exist and have a non-zero size.
 - The temporary file is copied to the system configuration file, /tmp/system.cfg.
 - The configuration is written to flash using the sysconf -w command.

Credential management

- ◆ Account
 - passwd
 - <oldPassword>
 - <newPassword>
 - <newPassword>

Device monitoring

- ◆ ifconfig -a
- ◆ show
- ◆ exit
- ◆ status

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support..

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Running	Yes	Yes	Reboot	ASCII	SSH

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	Yes
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	Yes
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following details existing device issues that have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ A configuration capture shows what is in flash on the device. This device requires a reboot for configuration changes to take effect, therefore the flash may not always reflect what is currently running.
- ◆ **Issue:** SNMP credential changes are not supported, due to lack of command line support in the device.

Resolution: Change the SNMP credentials within the configuration file.

- ◆ **Issue:** Account changes are limited to the password changes of existing accounts. New account creation is not supported, due to the lack of command line support in the device.

Resolution: Edit the configuration file with the appropriate lines to create new users.

CHAPTER 90

Zeus Devices

This chapter contains the following topic:

- ◆ Zeus Load Balancer..... 880

Zeus Load Balancer

Device Type	Load Balancer
Specific Model(s)	Zeus Traffic Manager
Operating System and Firmware Versions	6.0
Communication Protocols	SSH, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	Terminal
Credential Management	Not Available
Operating System Management Protocols	Not Available
Quick Commands	Standard Commands

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	Yes
Credential Management	No
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ Terminal

- Get model, OS Version and Serial Number from the output of **show Info** and **show LicenseKey**

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show *

Configuration deploy

- ◆ Terminal
 - Push by sending each line through the command-line interface.
 - Release the session and throw an ERROR in the UI, if any Invalid/Unknown command is sent to the device.

Device monitoring

- ◆ System.MachineInfo.getIPAddresses
- ◆ System.MachineInfo.getMACAddresses
- ◆ show *
- ◆ show Info
- ◆ show LicenseKey

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
readonly	Yes	Yes	NA	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	No	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	No	Yes

Attributed data	Terminal	SNMP
Interfaces	Yes	No
Keys	No	No
Memory	No	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	No	No
System Properties (Serial Number, OS Version, etc)	Yes	No
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ SNMP discovery is not supported on this device because the SNMPv1 agent appears to respond with only the system name,.
- ◆ An account must be created on the host operating system with the same password as that used for the Zeus command line interpreter (zcli). This executable must be set as the shell for the account login. Implementation details are not contained in this document
- ◆ Since the device runs as a service on a Linux, Solaris, or VMware-based operating system, account credentials cannot be managed. Support for the following commands was not available when the driver was developed:
 - Users.addUser
 - Users.changePassword
 - Users.deleteUser
 - Users.listUsers
- ◆ Device file management, backup, and restore operations are not supported, due to the lack of sufficient support for HTTP POST operations in the current version of the product.
- ◆ A device with an expired license key will fail discovery. This is due to the driver using *show license* to determine the license key in place of the normally blank hardware serial number.

CHAPTER 91

Zyxel Devices

This chapter contains the following topic:

- ◆ [Zyxel Prestige.....](#) 884

Zyxel Prestige

Device Type	Router
Specific Model(s)	p660r-61
Operating System and Firmware Versions	V3.40(QG1)_20040824
Communication Protocols	Telnet, Telnet/FTP
Configuration Files Content	Binary
Configuration Change Notification (Events)	Traps
Discovery/Identify Methods	SNMP
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	Yes
Configlets	No
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	No
SNMP Traps	Yes
Syslog	Yes
Rollback	Yes
Quick Commands	Yes
Privilege Mode Termlet	No
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains "1.3.6.1.4.1.890"
- sysDescr value contains "Prestige"

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal/FTP
 - FTP the configuration file rom-0 to NCM

Configuration deploy

- ◆ Terminal/FTP
 - FTP the configuration file to the device

Credential management

- ◆ Account
 - sys password <password>
- ◆ SNMP
 - Select the correct option from Menu and change the community

Device Monitoring

- ◆ sys atsh
- ◆ sys display
- ◆ ip ping
- ◆ ip arp status
- ◆ ip ifconfig
- ◆ exit

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
Configuration	Yes	Yes	NA	Binary	Telnet/FTP

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	Yes
Access Control Lists	No	No
CAM Table	No	No
File System Information	No	No
Identity	Yes	Yes
Interfaces	Yes	Yes
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	No	No
Routes	Yes	Yes
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Only Total Memory is available.
- ◆ The user must ensure the the push process is not interrupted as the device can be permanently damaged.
- ◆ Using SNMP, the RO/RW credential validation done can fail due to a known timing issue. This cannot be addressed using device driver technology.
- ◆ Push of configuration file reboots the device automatically.
- ◆ The following interface states (getInterfaces.dlg) cannot be determined from the command-line interface output. The default value is set to **UP**.
 - adminState
 - operationalState
 - addrtype [for IpAddressAndMask field]

CHAPTER 92

ZTE Devices

This chapter contains the following topic.

- ◆ ZTE 888

ZTE

Device Type	Other
Specific Model(s)	ZXA10 C300
Operating System and Firmware Versions	V2.6.02A.21
Communication Protocols	SSH, Telnet
Configuration Files Content	ASCII
Configuration Change Notification (Events)	Not Available
Discovery/Identify Methods	SNMP, Terminal
Credential Management	Account, SNMP v1/v2
Operating System Management Protocols	Not Available
Quick Commands	Ping, Traceroute, Reboot

Features available

Features Available	Support
Auto-Discovery	Yes
Pull configuration	Yes
Push configuration	No
Configlets	Yes
Credential Management	Yes
Operating System Management	No
Cut-Through Access	Yes
Hardware Information	Yes
SNMP Traps	No
Syslog	No
Rollback	No
Quick Commands	Yes
Privilege Mode Termlet	Yes
User Mode Termlet	Yes

Discovery/identify methods

The following information must be available for this driver class to manage an applicable device.

- ◆ SNMP

- sysObjectID value contains "1.3.6.1.4.1.3902"
- sysDescr value contains "ROS" or "ZTE".
- ◆ Terminal
 - The output of **show system-group** command contains "ROS" or "ZTE" string
 - Get the System Objectid from the output of **show system-group** command and corresponding to that System Objectid, find model from the modelsXML file.

Device operations

The following device operations must be enabled to manage an applicable device using this driver class.

Configuration capture

- ◆ Terminal
 - show running-config
 - show startup-config

Credential management

- ◆ Account
 - username <username> password <password> privilege 15
 - no username <oldUser>
- ◆ SNMP
 - snmp-server community <newSnmpCommunity> ro | rw
 - no snmp-server community <oldSnmpCommunity>

Device monitoring

- ◆ configure terminal
- ◆ ping
- ◆ trace
- ◆ terminal length ...
- ◆ dir
- ◆ show system-group
- ◆ show ip interface brief
- ◆ show ip route
- ◆ show rack
- ◆ show shelf
- ◆ show card
- ◆ show arp
- ◆ exit

- ◆ reboot

Multi-config files

Following are the files used when storing and revisioning multiple configuration files for multi-config support.

Multi-config files	Push	Pull	Post Operation	Content Type	Protocols
running	No	Yes	NA	ASCII	SSH, Telnet
startup	No	Yes	NA	ASCII	SSH, Telnet

Device data

The following data represents device data per device class.

Attributed data	Terminal	SNMP
ARP Table	Yes	No
Access Control Lists	No	No
CAM Table	No	No
File System Information	Yes	No
Identity	Yes	Yes
Interfaces	Yes	No
Keys	No	No
Memory	Yes	No
Access Control Lists Match Counts	No	No
OSPF Settings	No	No
Physical Hardware	Yes	No
Routes	Yes	No
System Properties (Serial Number, OS Version, etc)	Yes	Yes
VLAN Trunk Protocol	No	No
VLANs	No	No

Known Issues

The following existing device issues have been discovered with other releases. A resolution is included to address the issue, if available.

- ◆ Serial Number is not available
- ◆ For the interfaces got via "show running-config" command, adminStatus and operationalStatus are not available via terminal, thus putting the default values as 'UP' and "Down" respectively.

- ◆ If any config line in the pulled configuration files is more than 80 characters long, it gets split into two lines. As a result, the push of the configuration files results in an error with the message "Invalid Input". Therefore, the push action is not supported.

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