Extreme ONE OS Switching v22.2.0.0 GNOI Reference Guide

Services, RPCs, and Operational Management

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Abstract

The Extreme ONE OS Switching v22.2.0.0 gNOI Reference Guide documents gRPC Network Operations Interface (gNOI) services for the Extreme 8730 hardware platform running Extreme ONE OS v22.2.0.0. OpenConfig-compliant services include file.proto for streaming file operations (Get, Put, Stat, Remove, TransferToRemote) and os.proto for OS package installation, activation, and verification RPCs. Extreme-specific extensions provide auth.proto with JWT authentication and certificate generation, cfgmgmt.proto for configuration management between default/running/file states, firmware.proto for commit/rollback/uninstall operations, and network protocol services (acl.proto, bfd.proto, bgp.proto with L2VPN-EVPN/MAC-VRF route clearing, lacp.proto, mlag.proto, qos.proto, vlan.proto) for counter clearing and operational state management. Advanced capabilities include iah.proto for virtual machine control (VmControlCommand, VmImport, VmSnapshot, TpvmUpgrade), programmable.proto for component firmware upgrades, ssh.proto for SSH server management, systemUtils.proto for system reboot, and techsupport.proto for support file collection, all implemented via gRPC transport with protocol buffer definitions available on GitHub.

Preface

Read the following topics to learn about:

- The meanings of text formats used in this document.
- Where you can find additional information and help.
- How to reach us with questions and comments.

Text Conventions

Unless otherwise noted, information in this document applies to all supported environments for the products in question. Exceptions, like command keywords associated with a specific software version, are identified in the text.

When a feature, function, or operation pertains to a specific hardware product, the product name is used. When features, functions, and operations are the same across an entire product family, such as Extreme Networks switches or routers, the product is referred to as *the switch* or *the router*.

Table 1: Notes and warnings

Icon	Notice type	Alerts you to...
	Tip	Helpful tips and notices for using the product
	Note	Useful information or instructions
	Important	Important features or instructions
	Caution	Risk of personal injury, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2: Text

Convention	Description
`screen displays`	This typeface indicates command syntax, or represents information as it is displayed on the screen.
The words *enter* and *type*	When you see the word *enter* in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says *type*.
Key names	Key names are written in boldface, for example **Ctrl** or **Esc**. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press **Ctrl**+**Alt**+**Del**
Words in italicized type	Italics emphasize a point or denote new terms at the place where they are defined in the text. Italics are also used when referring to publication titles.
NEW!	New information. In a PDF, this is searchable text.

Table 3: Command syntax

Convention	Description
bold text	Bold text indicates command names, keywords, and command options.
italic text	Italic text indicates variable content.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, such as passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, `member[member...]`.
\	In command examples, the backslash indicates a "soft" line break. When a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Documentation and Training

Find Extreme Networks product information at the following locations:

Current Product Documentation

Release Notes

Hardware and Software Compatibility for Extreme Networks products

Extreme Optics Compatibility

Other Resources such as articles, white papers, and case studies

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Extreme Networks offers product training courses, both online and in person, as well as specialized certifications. For details, visit the Extreme Networks Training page.

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

Extreme Portal

Search the GTAC (Global Technical Assistance Center) knowledge base; manage support cases and service contracts; download software; and obtain product licensing, training, and certifications.

The Hub

A forum for Extreme Networks customers to connect with one another, answer questions, and share ideas and feedback. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.

Call GTAC

For immediate support: (800) 998 2408 (toll-free in U.S. and Canada) or 1 (408) 579 2800. For the support phone number in your country, visit www.extremenetworks.com/support/contact.

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

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

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You can subscribe to email notifications for product and software release announcements, Field Notices, and Vulnerability Notices.

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2. In the list of categories, expand the **Product Announcements** list.
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- Content errors, or confusing or conflicting information.
- Improvements that would help you find relevant information.
- Broken links or usability issues.

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Provide as much detail as possible including the publication title, topic heading, and page number (if applicable), along with your comments and suggestions for improvement.

About gNOI

gNOI (gRPC Network Operations Interface) is a modern, gRPC-based protocol developed by the OpenConfig working group. It is designed specifically for performing operational and lifecycle management tasks on network devices, complementing configuration and telemetry protocols like gNMI.

gNOI uses gRPC for transport and shares the same configuration as gNMI. To send gNOI requests, a client implementing the gNOI interface is required.

The gRPC micro-service definitions are available as proto files on GitHub (OpenConfig gNOI Services and Extreme Services for ONE OS, and Extreme Services for ONE OS Switching).

Extreme ONE OS Base

Use this topic to learn about the OpenConfig gNOI protocols that are supported by Extreme ONE OS Base.

OpenConfig gNOI Services

file

Table 4: file remote procedure calls

RPC	Purpose
Get	Get reads and streams the contents of a file from the target.
TransferToRemote	Transfers the contents of a file from the target to a specified remote location.
Put	Streams data into a file on the target.
Stat	Returns metadata about a file on the target.
Remove	Removes the specified file from the target.

os

Table 5: os remote procedure calls

RPC	Purpose
Install	Transfers an OS package into the Target. No concurrent Install RPCs MUST be allowed to the same Target
Activate	Sets the requested OS version as the version which is used at the next reboot, and reboots the Target if the 'no_reboot' flag is not set.
Verify	Checks the running OS version

Extreme Services

auth.proto

Define Authenticate API which validates the credentials and provides a JWT access token.

Table 6: Authentication remote procedure calls

RPC	Purpose
Authenticate	Validate credentials and provide a JWT access token
GetAccessToken	ccept a valid refresh token and generate a new access token
ListRoles	List all available roles
GetLoggedInUsers	Fetches all authenticated users
UnlockUser	Unlocks locked users
GetLockedUsers	Lists locked users
GenerateCertificate	Generates switch certificates
GetCertificates	Shows certificates

cfgmgmt.proto

Defines a gNOI API used for configuration management feature.

Table 7: Configuration management remote procedure calls

RPC	Purpose
CopyDefaultToRunning	: Used for copying default-config to running-config.
CopyFileToRunning	Used for copying a configuration file to a running-config.
CopyRunningToFile	Used for copying running-config to a specified configuration file.

cmdhistory.proto

Defines a gNOI API used for displaying cli command history.

Table 8: CLI history remote procedure calls

RPC	Purpose
CLIHistory	Display the command history of a given user.

firmware.proto

Defines a gNOI API used for Extreme firmware commit during firmware installation.

Table 9: Firmware remote procedure calls

RPC	Purpose
Commit	Commits a firmware package into the target.
Rollback	Rollbacks the App package into the target.
Uninstall	Uninstalls the App package into the target.

intf_gnoi.proto

Defines protocol for interface clear commands.

Table 10: Interface gNOI remote procedure calls

RPC	Purpose
ClearIntfCounters	Clears interface counters.

lldp_gnoi.proto

Defines protocol or LLDP clear commands.

Table 11: LLDP gNOI remote procedure calls

RPC	Purpose
ClearLLDPCounters	Clears LLDP counters

programmable.proto

Defines protocol for extreme programmable component firmware upgrade operations.

Table 12: Programmable remote procedure calls

RPC	Purpose
Upgrade	Flash firmware file onto target programmable component,

ssh.proto

Defines a SSH API.

Table 13: SSH remote procedure calls

RPC	Purpose
RestartSSHServer	Restart SSH server service.

systemUtils.proto

Defines system functionality. Currently, only reboot is supported.

Table 14: System utils remote procedure calls

RPC	Purpose
RebootSystem	Reboot the system

techsupport.proto

Defines a gNOI API used for collection of support save, listing and clearing tech support files,

Table 15: technical support remote procedure calls

RPC	Purpose
StartTechSupport	Starts tech support operations
ListTechSupport	List tech support operations
ClearTechSupport	Clear tech support operations
ListAutoTechSupport	Automatically list tech support operations

Extreme ONE OS Switching

Extreme Services on page 17

Use this topic to learn about the Extreme gNOI protocols that are supported by Extreme ONE OS Switching.

Extreme Services

acl

Defines ACL protocol for secure access.

Table 16: ACL remote procedure calls

RPC	Purpose
ClearACLCounters	Clears ACL counters

bfd

Defines protocol for BFD clear commands.

Table 17: BFD gNOI remote procedure calls

RPC	Purpose
ClearBFDCounters	Clears BFD counters

iah

Define protocol for IAH commands.

Table 18: IAH gNOI remote procedure calls

RPC	Purpose
VmControlCommand	Controls Virtual Machine
VmImport	Imports virtual machine with computing default configs
IahFileInfo	Validate the available file, filename, size, and version
VmSnapshot	Operational state data for the snapshot state of the Guest VM
TpvmUpgrade	Upgrades TPVM
VmCommand	Start, shutdown, poweroff, reboot, suspend, or resume VM

bgp

Defines protocol for bgp or evpn clear commands.

Table 19: BGP gNOI remote procedure calls

RPC	Purpose
L2vpn-evpn	Clear rpc-services
MAC-VRF	Clear rpc-services

lacp

Define protocol for LACP..

Table 20: LACP gNOI remote procedure calls

RPC	Purpose
ClearLACPCounters	Clears LACP counters

mlag

Define protocol for MLAG.

Table 21: MLAG gNOI remote procedure calls

RPC	Purpose
ClearMLAGCounters	Clears MLAG counters

qos

Define protocol for QOS clear commands.

Table 22: QOS gNOI remote procedure calls

RPC	Purpose
ClearQOSCounters	Clears QOS counter request

tables network

Define protocol for tables_network (L3 and Mac) operational commands.

Table 23: Table networks remote procedure calls

RPC	Purpose
ClearRoute	Clears all routes from VRF address family or a route entry
ClearMacRoute	Clears all mac addresses from a bridge-domain or a single entry
ClearArpNdRoute	Clears all arpns routes from a bridge-domain or a single entry
ClearMacMoveDetection	Clears all entries from ShutPortList

vlan

Define protocol for Bridge Domain clear commands.

Table 24: VLAN gNOI remote procedure calls

RPC	Purpose
ClearBridgeDomainCounters	Clears Bridge Domain counters.

Maintenance Mode

Define protocol to enable or disable maintenance mode.

Table 25: Maintenance mode remote procedure calls

RPC	Purpose
MaintenanceModeRequest	Enable or disable maintenance mode.