Enterprise SONIC Distribution by Dell Technologies

SONiC CLI Reference Guide Release 3.0

April 2020
Rev. A01

DELL EMC

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

1 Revision history

Table 1. Revision history

Release	Revision	Description
3.0.1	A01 (April 2020)	Updated SONiC CLI command syntaxes and examples
3.0.0	A00 (March 2020)	Initial release

Additional documentation

Table 2. Additional documentation

Document	Description
Enterprise SONiC Distribution by Dell Technologies User Guide Release 3.0	User guide
Enterprise SONiC Distribution by Dell Technologies Management Framework CLI Reference Guide Release 3.0	Management Framework CLI command syntaxes and examples
Enterprise SONiC Distribution by Dell Technologies Quick Start Guide Release 3.0	Installation and initial configuration
Enterprise SONiC Distribution by Dell Technologies Release Notes Release 3.0	New features introduced in the release; known and fixed issues

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Introduction

SONiC is an open-source network operating system based on Linux that runs on switches from multiple vendors and ASICs. SONiC offers a full-suite of network functionality, like BGP and RDMA, that has been production-hardened in the data centers of some of the largest cloud-service providers. It offers teams the flexibility to create the network solutions they need while leveraging the collective strength of a large ecosystem and community.

SONiC software shall be loaded on supported devices and this CLI guide shall be used to configure the devices as well as to display the configuration, state, and status. Follow the user manual to boot the device in ONIE mode, install the SONiC software using the steps that are specified in the document and login to the device using the default username and password.

After logging into the device, SONiC software can be configured in three methods:

1. Command-line interface (CLI)
2. *config_db.json*
3. *minigraph.xml*

This guide explains the first method and gives the complete list of commands that are supported in SONiC 201904 version (build #19). All the configuration commands need root privileges to run them. Show commands can be run by all users without root privileges. Root privileges can be obtained either by using `sudo` keyword in front of all `config` commands, or by going to root prompt using `sudo -i`. All commands are case-sensitive.

Example

```
admin@sonic:~$ sudo config aaa authentication login tacacs+

OR

admin@sonic:~$ sudo -i
root@sonic:~# config aaa authentication login tacacs+
```

The command list provided is a subset of all possible configurations in SONiC. Follow *config_db.json* based configuration for the complete list of configuration options.

Scope of the document

It is assumed that all configuration commands start with the keyword "config" as prefix. Any other scripts/utilities/commands that need user configuration control are wrapped as subcommands under the "config" command. The direct scripts/utilities/commands (examples provided) that are not wrapped under the `config` command are not in the scope of this document.

- *acl_loader* — Script is already wrapped inside the `config acl` command; any ACL configuration is already part of this command; users are not expected to use the *acl_loader* script directly and this guide need not explain the *acl_loader* script.
- SONiC utilities — Scripts are not explained in this document such as `sonic-clear`, `sfputil`, and so on.

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Basic configuration and show

SSH login

All SONiC devices support both the serial console-based login and the SSH-based login by default. The default credential (if not modified at image build time) for login is `admin/YourPaSsWoRd`.

If there is SSH login available, users can log in to the Management interface (eth0) IP address after configuring the same using serial console. See the next sections for configuring the IP address for the Management interface.

```
At Console:
Debian GNU/Linux 9 sonic ttyS1

sonic login: admin
Password: YourPaSsWoRd

SSH from any remote server to sonic can be done by connecting to SONiC IP
user@debug:~$ ssh admin@sonic_ip_address(or SONIC DNS Name)
admin@sonic's password:
```

By default, login takes the user to the default prompt from which all the `show` commands can be run.

Configuring Management interface

The Management interface (eth0) is configured (by default) to use a DHCP client to obtain IP addresses from the DHCP server. Connect the Management interface to the same network that your DHCP server is connected to dynamically obtain IP addresses.

The IP address received from DHCP server can be verified using the `/sbin/ifconfig eth0` Linux command. SONiC does not provide a CLI to configure the static IP for the Management interface. There are few alternate ways by which a static IP address can be configured for the Management interface.

1. Use the `ifconfig eth0` Linux command (`ifconfig eth0 10.11.12.13/24`). This configuration will not be preserved across reboot.

   ```
   admin@sonic:~$ /sbin/ifconfig eth0 10.11.12.13/24
   ```

2. Use *config_db.json*, and configure the `MGMT_INTERFACE` key with the appropriate values.
3. Use *minigraph.xml*, and configure `ManagementIPInterfaces` attribute inside the `DpgDesc` attribute.

Once the IP address is configured, the same can be verified using the `/sbin/ifconfig eth0` Linux command. Users can SSH log in to this Management interface IP address from their management network.

```
admin@sonic:~$ /sbin/ifconfig eth0
 eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
       inet 10.11.11.13 netmask 255.255.255.0 broadcast 10.11.12.255
```

Config help

All commands have help that aid the user to understand the command and the available subcommands and options.

- `--help` — Used at any level of the command; command level, subcommand level, or at argument level. Help displays the next possibilities corresponding to that particular command or subcommand
- `config --help` — Lists all possible configuration commands at the top-level

```
admin@sonic:~$ config --help
Usage: config [OPTIONS] COMMAND [ARGS]
SONiC command line - 'config' command
```

```
Options:
  --help  Show this message and exit.

Commands:
  aaa                    AAA command line
  acl                    ACL-related configuration tasks
  bgp                    BGP-related configuration tasks
  ecn                    ECN-related configuration tasks
  interface              Interface-related configuration tasks
  interface_naming_mode  Modify interface naming mode for interacting...
  load                   Import a previous saved config DB dump file.
  load_mgmt_config       Reconfigure hostname and mgmt interface based...
  load_minigraph         Reconfigure based on minigraph.
  mirror_session
  platform               Platform-related configuration tasks
  portchannel
  portgroup              Port-group configuration tasks
  qos
  radius                 RADIUS server configuration
  reload                 Clear current configuration and import a...
  save                   Export current config DB to a file on disk.
  tacacs                 TACACS+ server configuration
  vlan                   VLAN-related configuration tasks
  warm_restart           warm_restart-related configuration tasks
  watermark              Configure watermark
```

Show help

This command displays the full list of `show` commands available; the output of each command can be used to analyze, debug, or troubleshoot the network node.

```
admin@sonic:~$ show -?
Usage: show [OPTIONS] COMMAND [ARGS]...
  SONiC command line - 'show' command

Options:
  -?, -h, --help  Show this message and exit.

Commands:
  aaa                   Show AAA configuration
  acl                   Show ACL related information
  arp                   Show IP ARP table
  clock                 Show date and time
  ecn                   Show ECN configuration
  environment           Show environmentals (voltages, fans, temps)
  interfaces            Show details of the network interfaces
  ip                    Show IP (IPv4) commands
  ipv6                  Show IPv6 commands
  line                  Show all /dev/ttyUSB lines and their info
  lldp                  LLDP (Link Layer Discovery Protocol)...
  logging               Show system log
  mac                   Show MAC (FDB) entries
  mirror_session        Show existing everflow sessions
  mmu                   Show mmu configuration
  ndp                   Show IPv6 Neighbour table
  ntp                   Show NTP information
  pfc                   Show details of the priority-flow-control...
  platform              Show platform-specific hardware info
  priority-group        Show details of the PGs
  processes             Display process information
  queue                 Show details of the queues
  radius                Show RADIUS configuration
  reboot-cause          Show cause of most recent reboot
  route-map             show route-map
  runningconfiguration  Show current running configuration...
  services              Show all daemon services
  startupconfiguration  Show startup configuration information
  system-memory         Show memory information
  tacacs                Show TACACS+ configuration
  techsupport           Gather information for troubleshooting
```

```
  uptime                Show system uptime
  users                 Show users
  version               Show version information
  vlan                  Show VLAN information
  warm_restart          Show warm restart configuration and state
  watermark             Show details of watermark
```

The same syntax applies to all subgroups of `show` which themselves contain subcommands, and subcommands which accept options/arguments.

```
admin@sonic:~$ show interfaces -?

  Show details of the network interfaces

Options:
  -?, -h, --help  Show this message and exit.

Commands:
  counters     Show interface counters
  description  Show interface status, protocol and...
  naming_mode  Show interface naming_mode status
  neighbor     Show neighbor related information
  pktdrops     Show interface packet drops
  portchannel  Show PortChannel information
  status       Show Interface status information
  transceiver  Show SFP Transceiver information
```

Show versions

This command displays software component versions of the currently running SONiC image. This includes the SONiC image version and Docker image versions. This command displays relevant information as the SONiC and Linux kernel version being used, and the commit-id that is used to build the SONiC image. The second section of the output displays the various Docker images and their associated IDs.

```
admin@sonic:~$ show version
SONiC Software Version: SONiC.Dell_SONiC_2.0
Product: Dell Cloud Base
Distribution: Debian 9.9
Kernel: 4.9.0-9-2-amd64
Build commit: 4ef307ee
Build date: Tue Aug 13 08:22:41 UTC 2019
Built by: sonicbld@sonic-server

Platform: x86_64-accton_as7326_56x-r0
HwSKU: Accton-AS7326-56X
ASIC: broadcom
Serial Number: 732656XXXXXXXXX
Uptime: 17:51:44 up 35 min,  1 user,  load average: 0.44, 0.59, 1.14

Docker images:
REPOSITORY                 TAG                             IMAGE ID            SIZE
docker-fpm-frr             latest                          1c32fd90d830        477MB
docker-fpm-frr             Dell_SONiC_2.0   1c32fd90d830       477MB
docker-orchagent           latest                          df15e4f011e5        447MB
docker-orchagent           Dell_SONiC_2.0   df15e4f011e5       447MB
docker-vrrp                latest                          e6284352dcd8        444MB
docker-vrrp                Dell_SONiC_2.0   e6284352dcd8       444MB
docker-stp                 latest                          28edfe4c92fe        429MB
docker-stp                 Dell_SONiC_2.0   28edfe4c92fe       429MB
docker-teamd               latest                          fa79c9545898        430MB
docker-teamd               Dell_SONiC_2.0   fa79c9545898       430MB
docker-nat                 latest                          d4d7efc58d8b        433MB
docker-nat                 Dell_SONiC_2.0   d4d7efc58d8b       433MB
docker-syncd-brcm          latest                          63870c20e45a        443MB
docker-syncd-brcm          Dell_SONiC_2.0   63870c20e45a       443MB
docker-tam                 latest                          59b95af125ae        675MB
docker-tam                 Dell_SONiC_2.0   59b95af125ae       675MB
docker-lldp-sv2            latest                          3d1643706454        333MB
docker-lldp-sv2            Dell_SONiC_2.0   3d1643706454       333MB
docker-snmp-sv2            latest                          95253ab2447c        343MB
docker-snmp-sv2            Dell_SONiC_2.0   95253ab2447c       343MB
```

```
docker-platform-monitor    latest                          fee943fc2389        376MB
docker-platform-monitor    Dell_SONiC_2.0   fee943fc2389       376MB
docker-sonic-telemetry     latest                          cd8f502a0ee6        312MB
docker-sonic-telemetry     Dell_SONiC_2.0   cd8f502a0ee6       312MB
docker-dhcp-relay          latest                          c56dddd78a74        292MB
docker-dhcp-relay          Dell_SONiC_2.0   c56dddd78a74       292MB
docker-database            latest                          e5c7e3fa6540        282MB
docker-database            Dell_SONiC_2.0   e5c7e3fa6540       282MB
docker-router-advertiser   latest                          301ca6f95737        281MB
docker-router-advertiser   Dell_SONiC_2.0   301ca6f95737       281MB
```

Show system status

show clock

Displays the current date and time that is configured on the system.

- `show clock`
-
```
admin@sonic:~$ show clock
Mon Mar 25 20:25:16 UTC 2019
```

show environment

Displays the platform environmental, such as voltages, temperatures, and fan speeds.

- `show environment`
-
```
admin@sonic:~$ show environment
coretemp-isa-0000
Adapter: ISA adapter
Core 0:       +28.0 C  (high = +98.0 C, crit = +98.0 C)
Core 1:       +28.0 C  (high = +98.0 C, crit = +98.0 C)
Core 2:       +28.0 C  (high = +98.0 C, crit = +98.0 C)
Core 3:       +28.0 C  (high = +98.0 C, crit = +98.0 C)
SMF_Z9100_ON-isa-0000
Adapter: ISA adapter
CPU XP3R3V_EARLY:             +3.22 V
<... few more things ...>

Onboard Temperature Sensors:
CPU:                           30 C
BCM56960 (PSU side):           35 C
<... few more things ...>

Onboard Voltage Sensors:
  CPU XP3R3V_EARLY               3.22 V
<... few more things ...>

Fan Trays:
Fan Tray 1:
  Fan1 Speed:     6192 RPM
  Fan2 Speed:     6362 RPM
  Fan1 State:        Normal
  Fan2 State:        Normal
  Air Flow:            F2B
<... few more things ...>

PSUs:
  PSU 1:
    Input:           AC
<... few more things ...>
```

NOTE: The show output has got lot of information; only the sample output is given in the example.

Though the output slightly differs from one platform to another platform, the overall content is similar to the example.

show reboot-cause

Displays the cause of the previous reboot.

- Usage: `show reboot-cause`

- Example:

```
admin@sonic:~$ show reboot-cause
User issued reboot command [User: admin, Time: Mon Mar 25 01:02:03 UTC 2019]
```

show uptime

Displays the current system uptime.

- `show updtime`
-
```
admin@sonic:~$ show uptime
up 2 days, 21 hours, 30 minutes
```

show logging

Displays all currently stored log messages. All the latest processes and corresponding transactions are stored in the *syslog* file. This file is saved in the */var/log* path and can be viewed using `sudo cat syslog` as this requires root login. Individual process can also be viewed using `ps -ax | grep \process name`.

- `show logging ([<process_name>] [-l lines] | [-f])`
-
```
admin@sonic:~$ show logging
```

  It can be useful to pipe the output from `show logging` to the `more` to examine one screenful of log messages at a time.

```
admin@sonic:~$ show logging | more
```

  You can specify a process name to display only log messages mentioning that process.

```
admin@sonic:~$ show logging sensord
```

  You can specify several lines to display using `-l` or `--lines`. Only the most recent *N* lines display. Also note that this option can be combined with a process name.

```
admin@sonic:~$ show logging --lines 50
```

```
admin@sonic:~$ show logging sensord --lines 50
```

  You can follow the log live as entries are written to it by specifying the `-f` or `--follow` flag

```
admin@sonic:~$ show logging --follow
```

show users

Displays a list of users who are currently logged in to the device.

- `show users`
-
```
admin@sonic:~$ show users
admin    pts/9    Mar 25 20:31 (100.127.20.23)

admin@sonic:~$ show users
admin    ttyS1    2019-03-25 20:31
```

Show hardware platform

This command output partially overlaps with the one generated by `show environment`. The information is in a more succinct fashion.

show platform summary

Displays a summary of the device's hardware platform.

- `show platform summary`
-
```
admin@sonic:~$ show platform summary
Platform: x86_64-dell_s6000_s1220-r0
HwSKU: Force10-S6000
ASIC: broadcom
```

show platform syseeprom

This command displays information that is stored on the system EEPROM. The output of this command is not the same for all vendor's platforms.

- `show platform syseeprom`

```
admin@sonic:~$ show platform syseeprom
lsTLV Name             Len Value
-------------------- --- -----
PPID                  20 XX-XXXXXX-00000-000-0000
DPN Rev                3 XXX
Service Tag            7 XXXXXXX
Part Number           10 XXXXXX
Part Number Rev        3 XXX
Mfg Test Results       2 FF
Card ID                2 0x0000
Module ID              2 0
Base MAC Address      12 FE:EC:BA:AB:CD:EF
(checksum valid)
```

```
admin@sonic:~$ show platform syseeprom
TlvInfo Header:
  Id String:    TlvInfo
  Version:      1
  Total Length: 527
TLV Name             Code Len Value
---- --- -----
Product Name         0x21  64 MSN2700
Part Number          0x22  20 MSN2700-CS2FO
Serial Number        0x23  24 MT1822K07815
Base MAC Address     0x24   6 50:6B:4B:8F:CE:40
Manufacture Date     0x25  19 05/28/2018 23:56:02
Device Version       0x26   1 16
MAC Addresses        0x2A   2 128
Manufacturer         0x2B   8 Mellanox
Vendor Extension     0xFD  36
Vendor Extension     0xFD 164
Vendor Extension     0xFD  36
Vendor Extension     0xFD  36
Vendor Extension     0xFD  36
Platform Name        0x28  18 x86_64-mlnx_x86-r0
ONIE Version         0x29  21 2018.08-5.2.0006-9600
CRC-32               0xFE   4 0x11C017E1

(checksum valid)
```

show platform psustatus

Displays the status of the device's power supply units (PSUs).

- `show platform psustatus`

```
admin@sonic:~$ show platform psustatus
PSU    Status
-----  --------
PSU 1  OK
PSU 2  OK
```

show platform psusummary

This command displays various manufacturer and runtime information of the device's PSUs.

- `show platform psusummary`

```
admin@sonic:~$ show platform psusummary
PSU 1: NOT OK

PSU 2: OK
Manufacturer Id: 3Y POWER
Model: YM-2651Y
Serial Number: SA290N091739133077
Output Voltage (mV): 11906.0
Output Current (mA): 11421.0
```

```
Output Power (mW): 137000.0
Fan Direction: INTAKE
Fan Speed (RPM): 4696
admin@sonic:~$
```

```
admin@sonic:~$ show platform psusummary
PSU 1: OK
Manufacturer Id: None
Model: None
Serial Number: None
Output Voltage (mV): None
Output Current (mA): None
Output Power (mW): None
Fan Direction: None
Fan Speed (RPM): 0

PSU 2: NOT OK
admin@sonic:~$
```

show platform fanstatus

This command displays various information of the device's FAN units.

- `show platform fanstatus`

```
admin@sonic:~$ show platform fanstatus
FAN     Status      Speed (RPM)  Direction
------  --------  -------------  -----------
FAN 1   OK                8700  INTAKE
FAN 2   OK                7500  INTAKE
FAN 3   OK                8600  INTAKE
FAN 4   OK                7300  INTAKE
FAN 5   OK                8800  INTAKE
FAN 6   OK                7500  INTAKE
FAN 7   OK                8800  INTAKE
FAN 8   OK                7500  INTAKE
FAN 9   OK                8600  INTAKE
FAN 10  OK                7300  INTAKE
FAN 11  OK                8600  INTAKE
FAN 12  OK                7300  INTAKE
admin@sonic:~$
```

Transceivers

show interfaces transceiver

Displays information for all interfaces for the transceiver requested or a specific interface.

- `show interfaces transceiver [eeprom [-d | --dom] | lpmode | presence] [interface_name]`

```
admin@sonic:~$ show interfaces transceiver eeprom --dom Ethernet0
Ethernet0: SFP detected
        Connector : No separable connector
        Encoding : Unspecified
        Extended Identifier : Unknown
        Extended RateSelect Compliance : QSFP+ Rate Select Version 1
        Identifier : QSFP+
        Length Cable Assembly(m) : 1
        Specification compliance :
                10/40G Ethernet Compliance Code : 40GBASE-CR4
                Fibre Channel Speed : 1200 Mbytes/Sec
                Fibre Channel link length/Transmitter Technology : Electrical inter-
enclosure (EL)
                Fibre Channel transmission media : Twin Axial Pair (TW)
        Vendor Date Code(YYYY-MM-DD Lot) : 2015-10-31
        Vendor Name : XXXXX
        Vendor OUI : XX-XX-XX
        Vendor PN : 1111111111
        Vendor Rev :
        Vendor SN : 111111111
        ChannelMonitorValues:
```

```
               RX1Power: -1.1936dBm
               RX2Power: -1.1793dBm
               RX3Power: -0.9388dBm
               RX4Power: -1.0729dBm
               TX1Bias: 4.0140mA
               TX2Bias: 4.0140mA
               TX3Bias: 4.0140mA
               TX4Bias: 4.0140mA
        ModuleMonitorValues :
                 Temperature : 1.1111C
                 Vcc : 0.0000Volts
```

View low-power mode status

```
admin@sonic:~$ show interfaces transceiver lpmode Ethernet100
Port         Low-power Mode
-----------  ----------------
Ethernet100  On
```

View SFP transceiver presence

```
admin@sonic:~$ show interfaces transceiver presence Ethernet100
Port         Presence
-----------  ----------
Ethernet100  Present
```

4

AAA TACACS+ and RADIUS configuration and show

You can configure the type of authentication (local or remote TACACS+ based) required for users and also the authentication fail through and fall back options. These `show` command display the current running configuration that is related to AAA.

AAA configuration and show

AAA show commands

show aaa

Displays the AAA settings currently present in the network node.

- `show aaa`
- ```
  admin@sonic:~$ show aaa
  AAA authentication login local (default)
  AAA authentication failthrough True (default)
  AAA authentication fallback True (default)
  ```

AAA config commands

aaa authentication failthrough

Enable or disable the failthrough option. This command is useful when user has configured more than one TACACS+/RADIUS server and when user has enabled TACACS+/RADIUS authentication. When authentication request to the first server fails, this configuration allows to continue the request to the next server. When this configuration is enabled, authentication process continues through all servers configured. When this is disabled and if the authentication request fails on first server, authentication process stops and the login is disallowed.

- `aaa authentication failthrough {enable | disable | default}`
  - `enable` — allows AAA to process with local authentication if remote authentication fails
  - `disable` — disallows AAA to proceed further if remote authentication fails
  - `default` — reconfigures the default value (enable)
- ```
  admin@sonic:~$ sudo config aaa authentication failthrough enable
  ```

aaa authentication fallback

When the TACACS+ authentication fails, it falls back to local authentication by default.

- `config aaa authentication fallback {enable | disable | default}`
- ```
  admin@sonic:~$ sudo config aaa authentication fallback enable
  ```

aaa authentication login

Configures if AAA should use the local database, remote radius, or remote TACACS+ databases for user authentication. By default, AAA uses local database for authentication. New users can be added/deleted using the Linux commands. The configuration done using Linux commands are not preserved during reboot.

You can enable remote TACACS+/RADIUS server-based authentication by selecting the AUTH_PROTOCOL as TACACS+/RADIUS in this command. You must configure the TACACS+/RADIUS server accordingly and ensure that the connectivity to TACACS+/RADIUS server is available using the Management interface.

Once you select remote TACACS+/RADIUS authentication, all user logins are authenticated by the TACACS+/RADIUS server. If the authentication fails, AAA checks the `failthrough` configuration and authenticates the user based on local database if failthrough is enabled.

- `switch login authentication [ {tacacs+, radius, local} | default ]`
  ```

- `tacacs+` — enables remote authentication based on TACACS+
- `radius` — enables remote authentication based on RADIUS
- `local` — disables remote authentication and uses local authentication
- `default` — resets back to default value (local)

- Configure authentication with TACACS+ and fallback to local

```
admin@sonic:~$ sudo config aaa authentication login tacacs+ local
```

Configure authentication with RADIUS and fallback to local

```
admin@sonic:~$ sudo config aaa authentication login radius local
```

TACACS+ configuration and show

TACACS+ show commands

show tacacs

Displays the global configuration fields and the list of all TACACS+ servers and their corresponding configurations.

- `show tacacs`

```
admin@sonic:~$ show tacacs
TACPLUS global auth_type pap (default)
TACPLUS global timeout 99
TACPLUS global passkey <EMPTY_STRING> (default)

TACPLUS_SERVER address 10.11.12.14
               priority 9
               tcp_port 50
               auth_type mschap
               timeout 10
               passkey testing789

TACPLUS_SERVER address 10.0.0.9
               priority 1
               tcp_port 49
```

TACACS+ config commands

Explains `config tacacs` and its subcommands that are used to configure the TACACS+ parameters. Some of the parameters (authtype, passkey, and timeout) can be either configured at per-server level or at global level (global value will be applied if there no server level configuration).

1. Add/delete the TACACS+ server details.
2. Set the `authtype` — global configuration that is applied to all servers if there is no server-specific configuration.
3. Set the `default` — reset the authtype or passkey or timeout to the default values.
4. Set the `passkey` — global configuration that is applied to all servers if there is no server-specific configuration.
5. Set the `timeout` — global configuration that is applied to all servers if there is no server-specific configuration.

config tacacs add

This command is used to add a TACACS+ server to the TACACS+ server list. More than one TACACS+ (up to eight) can be added in the device. When a user tries to log in, the TACACS+ client contacts the servers one by one.

When any server times out, device attempts the next server one by one based on the priority value that is configured for that server. When this command is run, the configured TACACS+ server addresses are updated in the */etc/pam.d/common-auth-sonic* configuration file which is being used by TACACS+ service.

- `config tacacs add` *`ip_address`* `[-t | --timeout` *`SECOND`*`] [-k | --key` *`SECRET`*`] [-a | --type` *`TYPE`*`] [-o | --port` *`PORT`*`] [-p | --pri` *`PRIORITY`*`] [-m | --use-mgmt-vrf]`
  - `ip_address` — TACACS+ server IP address
  - `timeout` — transmission timeout interval in seconds (1 to 60, default 5)
  - `key` — shared secret
  - `type` — authentication type, `chap`, `pap` (default), `mschap`, or `login`
  - `port` — TCP port range (1 to 65535, default 49)

- `pri` — priority, priority range (1 to 64, default 1)
- `use-mgmt-vrf` — server is part of Management `vrf`, default is `no vrf`

```
admin@sonic:~$ sudo config tacacs add 10.11.12.13 -t 10 -k testing789 -a mschap -o 50 -p 9

Example Server Configuration in /etc/pam.d/common-auth-sonic configuration file:

auth    [success=done new_authtok_reqd=done default=ignore]     pam_tacplus.so
server=10.11.12.14:50 secret=testing789 login=mschap timeout=10  try_first_pass
auth    [success=done new_authtok_reqd=done default=ignore]     pam_tacplus.so
server=10.11.12.24:50 secret=testing789 login=mschap timeout=987654321098765433211
0987  try_first_pass
auth    [success=done new_authtok_reqd=done default=ignore]     pam_tacplus.so
server=10.0.0.9:49 secret= login=mschap timeout=5  try_first_pass
auth    [success=done new_authtok_reqd=done default=ignore]     pam_tacplus.so
server=10.0.0.8:49 secret= login=mschap timeout=5  try_first_pass
auth    [success=done new_authtok_reqd=done default=ignore]     pam_tacplus.so
server=10.11.12.13:50 secret=testing789 login=mschap timeout=10  try_first_pass
auth    [success=1 default=ignore]      pam_unix.so nullok try_first_pass

NOTE: In the above example, the servers are stored (sorted) based on the priority value
configured for the server.
```

config tacacs delete

Deletes the configured TACACS+ server.

- `config tacacs delete` *`ip_address`*

```
admin@sonic:~$ sudo config tacacs delete 10.11.12.13
```

config tacacs authtype

Modifies the global value for the TACACS+ authtype. If you have not configured a server-specific authtype, this global value is used for that server.

- `config tacacs authtype [chap | pap | mschap | login]`

```
admin@sonic:~$ sudo config tacacs authtype mschap
```

config tacacs default

This command is used to reset the global value for authtype or passkey or timeout to default value. Default for authtype is `pap`, default for passkey is EMPTY_STRING, and default for timeout is 5 seconds.

`config tacacs default [authtype | passkey | timeout]`

```
admin@sonic:~$ sudo config tacacs default authtype
This will reset the global authtype back to the default value "pap".
```

config tacacs passkey

This command is used to modify the global value for the TACACS+ passkey. If you have not configured a server-specific passkey, this global value is used for that server. The passkey can include all printable ASCII characters with a few exceptions (#, SPACE, and COMMA) and up to 65 characters.

- `config tacacs passkey` *`pass_key`*

```
admin@sonic:~$ sudo config tacacs passkey testing123
```

config tacacs timeout

Modifies the global value for the TACACS+ timeout. When user has not configured server-specific timeout, this global value is used for that server. Valid values for timeout is 1 to 60 seconds. When the optional keyword `default` is specified, timeout_value_in_seconds parameter is not used; default value of 5 is used.

- `config tacacs [default] timeout [`*`timeout_value_in_seconds`*`]`

```
admin@sonic:~$ sudo config tacacs timeout 60
```

RADIUS configuration and show

RADIUS show commands

show radius

Displays the global configuration fields and the list of all RADIUS servers and their corresponding configurations.

- `show radius`
- ```
  root@sonic:~$ show radius
       RADIUS global auth_type pap (default)
        RADIUS global retransmit 3 (default)
    RADIUS global timeout 5 (default)
    RADIUS global passkey <EMPTY_STRING> (default)

    RADIUS_SERVER address 10.11.12.17
                  priority 1
                  auth_port 1812
                  auth_type mschapv2
                  retransmit 2
                  timeout 10
                  passkey testing123
                  vrf mgmt

    RADIUS_SERVER address 10.0.0.15
                  priority 1
                  auth_port 1645
  ```

RADIUS configuration commands

Explains `config radius` and its subcommands that are used to configure the RADIUS parameters. Some of the parameters (authtype, passkey, retransmit, and timeout) can be either configured at per-server level or at global level (global value is applied if there no server-level configuration).

1. Add/delete the RADIUS server details.
2. Set the `authtype` — global configuration that is applied to all servers if there is no server-specific configuration.
3. Set the `default` — reset the authtype, passkey, retransmit, or timeout to the default values.
4. Set the `passkey` — global configuration that is applied to all servers if there is no server-specific configuration.
5. Set the `timeout` — global configuration that is applied to all servers if there is no server-specific configuration.
6. Set the `retransmit` — global configuration that is applied to all servers if there is no server-specific configuration.

config radius add

Adds a RADIUS server to the radius server list. More than one RADIUS server (up to eight) can be added in the device. When a user attempts to log in, the RADIUS client contacts the servers one by one. When any server times out, device attempts the next server one by one based on the priority value that is configured for that server. When this command is run, the configured RADIUS server addresses are updated.

- `config radius add` *`ip_address`* `[-r | --retransmit` *`INTEGER`*`] [-t | --timeout` *`SECOND`*`] [-k | --key` *`SECRET`*`] [-a | --type` *`TYPE`*`] [-o | --auth-port` *`PORT`*`] [-p | --pri` *`PRIORITY`*`] [-m | --use-mgmt-vrf]`
  - `ip_address` — RADIUS server IP address
  - `retransmit` — retransmit attempts (0 to 10, default 3)
  - `timeout` — transmission timeout interval in seconds (1 to 60, default 5)
  - `key` — shared secret
  - `type` — authentication type; `chap`, `pap` (default), or `mschapv2`
  - `auth-port` — UDP port (1 to 65535, default 1812)
  - `pri` — priority range (1 to 64, default 1)
  - `use-mgmt-vrf` — server is part of Management `vrf`, default is `no vrf`
- ```
  admin@sonic:~$ sudo config radius add 10.11.12.17 -t 10 -k testing123 -a mschapv2 -o 1645 -
  p 9
  ```

config radius delete

Deletes the RADIUS servers configured.

- `config radius delete ip_address`
- ```
  admin@sonic:~$ sudo config radius delete 10.11.12.17
  ```

config radius authtype

Modifies the global value for the RADIUS authtype. If you have not configured a server-specific authtype, this global value is used for that server.

- `config radius authtype [chap | pap | mschapv2]`
- ```
  admin@sonic:~$ sudo config radius authtype mschapv2
  ```

config radius default

Resets the global value for authtype, passkey, retransmit, or timeout to default value. Default for authtype is `pap`, default for passkey is EMPTY_STRING, default for retransmit is 3, and default for timeout is 5 seconds.

- `config radius default [authtype | passkey | retransmit | timeout]`
- ```
  admin@sonic:~$ sudo config radius default authtype
  This will reset the global authtype back to the default value "pap".
  ```

config radius passkey

Modifies the global value for the RADIUS passkey. If you have not configured a server-specific passkey, this global value is used for that server. The passkey can include all printable ASCII characters with a few exceptions (#, SPACE, and COMMA), up to 65 characters.

- `config radius passkey pass_key`
- ```
  admin@sonic:~$ sudo config radius passkey testing123
  ```

config radius retransmit

Modifies the global value for the RADIUS retransmit. If you have not configured a server specific retransmit, this global value is used for that server. Valid values for retransmit are from 0 to 10 seconds. When the optional keyword `default` is specified, retransmit_attempts parameter will not be used; default value of 3 is used.

- `config radius [default] retransmit [retransmit_attempts]`
- ```
  admin@sonic:~$ sudo config radius retransmit 2
  ```

config radius timeout

This command is used to modify the global value for the RADIUS timeout. If you have not configured a server-specific timeout, this global value is used for that server. Valid values for timeout is 1 to 60 seconds. When the optional keyword `default` is specified, `timeout_value_in_seconds` parameter wont be used; default value of 5 is used.

- `config radius [default] timeout [timeout_value_in_seconds]`
- ```
  admin@sonic:~$ sudo config radius timeout 60
  ```

5

ACL configuration and show

ACL show commands

show acl table

Displays either all the ACL tables that are configured or only the specified TABLE_NAME. Output from the command displays the table name, type of the table, the list of interfaces to which the table is bound and the description about the table.

- `show acl table [TABLE_NAME]`
- ```
  admin@sonic:~$ show acl table
  Name       Type       Binding           Description
  --------   ---------  ---------------   -------------
  EVERFLOW   MIRROR     Ethernet16        EVERFLOW
                        Ethernet96
                        Ethernet108
                        Ethernet112
                        PortChannel0001
                        PortChannel0002
  SNMP_ACL   CTRLPLANE  SNMP              SNMP_ACL
  DT_ACL_T1  L3         Ethernet0         DATA_ACL_TABLE_1
                        Ethernet4
                        Ethernet112
                        Ethernet116
  SSH_ONLY   CTRLPLANE  SSH               SSH_ONLY
  ```

show acl rule

Displays all the ACL rules present in all the ACL tables or only the rules present in specified table TABLE_NAME or only the rule matching the RULE_ID option.

- `show acl rule [TABLE_NAME] [RULE_ID]`
- ```
  admin@sonic:~$ show acl rule
  Table      Rule           Priority    Action    Match
  --------   ------------   ----------  --------  ------------------
  SNMP_ACL   RULE_1         9999        ACCEPT    IP_PROTOCOL: 17
                                                  SRC_IP: 1.1.1.1/32
  SSH_ONLY   RULE_1         9999        ACCEPT    IP_PROTOCOL: 6
                                                  SRC_IP: 1.1.1.1/32
  SNMP_ACL   DEFAULT_RULE   1           DROP      ETHER_TYPE: 2048
  SSH_ONLY   DEFAULT_RULE   1           DROP      ETHER_TYPE: 2048
  ```

Command output provides information about the rules:

- `Table` — ACL table name to which the rule belongs to
- `Rule` — ACL rule name
- `Priority` — priority for this rule
- `Action` — action to be performed if the packet matches with this ACL rule. It could be either Drop or Permit. Users can choose to have a default permit rule or default deny rule. If there is a default `deny all` rule, add the permitted rules on top of the deny rule. If there is a default *permit all* rule, users can add the deny rules on top of it. If users have not configured any rule, SONiC allows all traffic (which is *permit all*).
- `Match` — fields from the packet header that must be matched against the same present in the incoming traffic

ACL config commands

Explains the list of configuration options available for ACL module. There is no direct command to add or delete or modify the ACL table and ACL rule. Existing ACL tables and ACL rules can be updated by specifying the ACL rules in JSON file formats and configure those files using this command.

config acl update full

Updates the rules in all the tables or in one specific table in full. If a `table_name` is provided, the operation is restricted in the specified table. All existing rules in the specified table or all tables are removed. New rules that are loaded from file will be installed. If the `table_name` is specified, only rules within that table will be removed and new rules in that table will be installed. If the `table_name` is not specified, all rules from all tables will be removed and only the rules present in the input file will be added.

The command does not modify anything in the list of ACL tables. It modifies only the rules present in those preexisting tables. In order to create ACL tables, either follow the *config_db.json* method or *minigraph.xml* method to populate the list of ACL tables.

After creating tables, you can use *config_db.json*, *minigraph.xml*, or the CLI to populate the rules in those ACL tables. This command updates only the ACL rules and it does not disturb the ACL tables; the output of `show acl table` is not altered by using this command; only the output of `show acl rule` is changed after this command.

When `--session_name`is specified, the command sets the `session_name` for the ACL table with this mirror session name. It fails if the specified mirror session name does not exist. When `max_priority` is specified, each rules priority is calculated by subtracting its `sequence_id` from the `max_priority`. If this value is not passed, the default `max_priority` 10000 is used.

- `config acl update full` *`FILE_NAME`*
  - `--table_name <table_name>` — Example: `config acl update full " --table_name DT_ACL_T1 /etc/sonic/acl_table_1.json "`
  - `--session_name <session_name>` — Example: `config acl update full " --session_name mirror_ses1 /etc/sonic/acl_table_1.json "`
  - `--max_priority <priority_value>` — Example: `config acl update full " --max-priority 100 /etc/sonic/acl_table_1.json "`

```
admin@sonic:~$ sudo config acl update full /etc/sonic/acl_full_snmp_1_2_ssh_4.json
```

```
admin@sonic:~$ sudo config acl update full " --table_name SNMP-ACL /etc/sonic/
acl_full_snmp_1_2_ssh_4.json "
```

```
admin@sonic:~$ sudo config acl update full " --session_name everflow0 /etc/sonic/
acl_full_snmp_1_2_ssh_4.json "
```

This command removes all rules from all the ACL tables and insert the rules present in this input file. See the *acl_full_snmp_1_2_ssh_4.json* example file that adds two rules for SNMP (Rule1 and Rule2) and one rule for SSH (Rule4).

NOTE: All these optional parameters should be inside the double quotes. If none of the options are provided, double quotes are not required for specifying filename alone. Any number of optional parameters can be configured in the same command.

config acl update incremental

Performs incremental update of ACL rule table. This command gets existing rules from Config database and compares with rules that are specified in input file and performs corresponding modifications.

Regarding DATA ACLs, the command does not assume that new data plane ACLs can be inserted in between by shifting existing ACLs in all ASICs. This command performs a full update on data plane ACLs. Regarding control plane ACLs, this command performs an incremental update. If we assume that *file1.json* is the already loaded ACL rules file and if *file2.json* is the input file that is passed as parameter for this command, these requirements are valid for the input file.

1. Copy the *file1.json* to *file2.json*.
2. Remove the unwanted ACL rules from *file2.json*.
3. Add the newly required ACL rules into *file2.json*.
4. Modify the existing ACL rules (that require changes) in *file2.json*.

NOTE: If any ACL rule that is already available in *file2.json* is required even after this command runs, such rules should remain unaltered in *file2.json*. Do not remove them. Note that "incremental" is working like "full".

When `--session_name`is specified, command sets the `session_name` for the ACL table with this mirror session name. It fails if the specified mirror session name does not exist. When `max_priority` is specified, each rule`s priority is calculated by subtracting the `sequence_id` from the `max_priority`. If this value is not passed, the default max_priority 10000 is used.

- `config acl update incremental` *`FILE_NAME`*
  - `--session_name` *`session_name`* — Example: `config acl update full " --session_name mirror_ses1 /etc/sonic/acl_table_1.json "`

- `--max-priority priority_value` — Example: `config acl update full " --max-priority 100 /etc/sonic/acl_table_1.json "`

```
admin@sonic:~$ sudo config acl update incremental /etc/sonic/
acl_incremental_snmp_1_3_ssh_4.json
```

```
admin@sonic:~$ sudo config acl update incremental " --session_name everflow0 /etc/sonic/
acl_incremental_snmp_1_3_ssh_4.json "
```

See the *acl_incremental_snmp_1_3_ssh_4.json* example file that adds two rules for SNMP, and one rule for SSH. When this `incremental` command is run after the `full` command, it has removed SNMP Rule2 and added SNMP Rule3 in the example. *acl_full_snmp_1_2_ssh_4.json* has an SNMP Rule1, SNMP Rule2, and SSH Rule4. *acl_incremental_snmp_1_3_ssh_4.json* has an SNMP Rule1, SNMP Rule3, and SSH Rule4. This file is created by copying *acl_full_snmp_1_2_ssh_4.json* to *acl_incremental_snmp_1_3_ssh_4.json*, then removing SNMP Rule2 and adding SNMP Rule3.

NOTE: All these optional parameters should be inside the double quotes. If none of the options are provided, double quotes are not required for specifying filename alone. Any number of optional parameters can be configured in the same command.

config acl rule delete

Deletes a specified rule from the ACL. If the rule name is not provided then deletes all the rules for the ACL.

- `config acl rule delete TABLE_NAME [RULE_NAME]`

```
admin@sonic:~$ sudo config acl rule delete l3_acl_0 rule_1
```

```
admin@sonic:~$ sudo config acl rule delete l3_acl_0
```

config acl table delete

Deletes a specified ACL table. If the table name is not provided then deletes all the ACL tables.

- `config acl table delete [TABLE_NAME]`

```
admin@sonic:~$ sudo config acl table delete l3_acl_0
```

```
admin@sonic:~$ sudo config acl table delete
```

6

ARP and NDP show

ARP show commands

show arp

Displays ARP entries specific to an interface, specific to an IP address, or entries specific to the VRF.

- `show arp [-if if_name] [ip_address] [-vrf vrf_name]`
  - `show arp` — displays all entries
  - `show arp -if if_name` — displays the ARP entries specific to the interface
  - `show arp ip_address` — displays the ARP entries specific to the IP address
  - `show arp -vrf vrf_name` — displays the ARP entries specific to the VRF

```
admin@sonic:~$ show arp
 Address          MacAddress            Iface         Vlan
-------------     -----------------     -------       ------
192.168.1.183     88:5a:92:fb:bf:41     Ethernet44    -
192.168.1.175     88:5a:92:fc:95:81     Ethernet28    -
192.168.1.181     e4:c7:22:c1:07:7c     Ethernet40    -
192.168.1.179     88:5a:92:de:a8:bc     Ethernet36    -
192.168.1.118     00:1c:73:3c:de:43     Ethernet64    -
192.168.1.11      00:1c:73:3c:e1:38     Ethernet88    -
192.168.1.161     24:e9:b3:71:3a:01     Ethernet0     -
192.168.1.189     24:e9:b3:9d:57:41     Ethernet56    -
192.168.1.187     74:26:ac:8b:8f:c1     Ethernet52    -
192.168.1.165     88:5a:92:de:a0:7c     Ethernet8     -

Total number of entries 10
```

```
admin@sonic:~$ show arp -if Ethernet40
  Address          MacAddress          Iface        Vlan
  -------------    -----------------   ----------   ------
  192.168.1.181    e4:c7:22:c1:07:7c   Ethernet40   -
  Total number of entries 1
```

```
admin@sonic:~$ show arp 192.168.1.181
  Address          MacAddress          Iface        Vlan
  -------------    -----------------   ----------   ------
  192.168.1.181    e4:c7:22:c1:07:7c   Ethernet40   -
  Total number of entries 1
```

```
root@sonic:~# show arp -vrf Vrf-blue
  Address     MacAddress         Iface      Vlan
  ----------  -----------------  ---------  ------
  192.85.2.2  00:10:94:00:00:02  Ethernet4  -
  192.85.2.3  00:10:94:00:00:02  Ethernet4  -
  Total number of entries 2
```

NDP show commands

show ndp

Displays MAC address of all IPv6 neighbors, a specific neighbor, all neighbors reaching using a specific interface, and all neighbors reachable using a specific VRF.

- `show ndp [-if | --iface interface_name] [IPv6_ADDRESS] [-vrf | --vrf vrf_name]`

-
```
admin@sonic:~$ show ndp
  Address                   MacAddress         Iface    Vlan    Status
  ------------------------  -----------------  -------  ------  ---------
  fe80::20c:29ff:feb8:b11e  00:0c:29:b8:b1:1e  eth0     -       REACHABLE
  fe80::20c:29ff:feb8:cff0  00:0c:29:b8:cf:f0  eth0     -       REACHABLE
  fe80::20c:29ff:fef9:324   00:0c:29:f9:03:24  eth0     -       REACHABLE
  Total number of entries 3
```

```
admin@sonic:~$ show ndp fe80::20c:29ff:feb8:b11e
  Address                   MacAddress         Iface    Vlan    Status
  ------------------------  -----------------  -------  ------  ---------
  fe80::20c:29ff:feb8:b11e  00:0c:29:b8:b1:1e  eth0     -       REACHABLE
  Total number of entries 1
```

```
admin@sonic:~$ show ndp -if eth0
  Address                   MacAddress         Iface    Vlan    Status
  ------------------------  -----------------  -------  ------  ---------
  fe80::20c:29ff:feb8:b11e  00:0c:29:b8:b1:1e  eth0     -       REACHABLE
  fe80::20c:29ff:feb8:cff0  00:0c:29:b8:cf:f0  eth0     -       REACHABLE
  fe80::20c:29ff:fef9:324   00:0c:29:f9:03:24  eth0     -       REACHABLE
  Total number of entries 3
```

```
admin@sonic:~$ show ndp -vrf Vrf-blue
  Address    MacAddress         Iface      Vlan    Status
  ---------  -----------------  ---------  ------  ---------
  2001::2    00:10:94:00:00:02  Ethernet4  -       REACHABLE
  2001::3    00:10:94:00:00:02  Ethernet4  -       REACHABLE
  Total number of entries 2
```

7

VRF configuration and show

VRF show commands

show vrf

Displays the summary of all VRFs, along with their associated interfaces. `--verbose` is an optional keyword, and also displays VRF-ID and Table ID for each VRF. This command displays a specific VRF in summary or verbose mode.

- `show vrf [--verbose] [vrf_name --verbose]`
- ```
  admin@sonic:~$ show vrf
  VRF         Interfaces
  ----------  --------------
  Vrf-Core    Ethernet200
              Ethernet204
              Ethernet208
              Ethernet212
              PortChannel213
              Vlan234
  Vrf-Edge    Ethernet108
              Ethernet100
              Ethernet112
              Ethernet104
              Vlan100
  Vrf-Green   Ethernet12
              Vlan27
  Vrf-Red     Ethernet4
              PortChannel017
  Vrf-Yellow  Ethernet32
              Vlan45
              Vlan134
  ```

  ```
  admin@sonic:~$ show vrf --verbose
  VRF         Table Id    Vrf Id    Interfaces
  ----------  ----------  --------  --------------
  Vrf-Core    1005        81        Ethernet200
                                    Ethernet204
                                    Ethernet208
                                    Ethernet212
                                    PortChannel213
                                    Vlan234
  Vrf-Edge    1004        80        Ethernet108
                                    Ethernet100
                                    Ethernet112
                                    Ethernet104
                                    Vlan100
  Vrf-Green   1002        78        Ethernet12
                                    Vlan27
  Vrf-Red     1001        77        Ethernet4
                                    PortChannel017
  Vrf-Yellow  1003        79        Ethernet32
                                    Vlan45
                                    Vlan134
  ```

  ```
  admin@sonic:~$ show vrf Vrf-Core
  VRF       Interfaces
  --------  --------------
  Vrf-Core  Ethernet200
            Ethernet204
            Ethernet208
            Ethernet212
  ```
  ```

```
          PortChannel213
          Vlan234
```

```
admin@sonic:~$ show vrf Vrf-Core --verbose
VRF       Table Id    Vrf Id    Interfaces
--------  ----------  --------  --------------
Vrf-Core  1005        81        Ethernet200
                                Ethernet204
                                Ethernet208
                                Ethernet212
                                PortChannel213
                                Vlan234
```

VRF config commands

config vrf add

Creates a VRF. You can associate interface and config routing protocols after a VRF is created. VRF name must start with `Vrf` prefix with V in upper case.

- `config vrf add vrf_name`

```
admin@sonic:~$ sudo config vrf add Vrf-Core
```

```
admin@sonic:~$ sudo config vrf add Vrf-Red
```

config vrf del

Deletes an existing VRF. All associated interfaces in this specific VRF move to the default VRF, and their IP addresses are automatically deleted.

- `config vrf del vrf_name`

```
admin@sonic:~$ sudo config vrf del Vrf-Core
```

```
admin@sonic:~$ sudo config vrf del Vrf-Red
```

config route add

Creates a static route. The static route can be created in a VRF with next-hop belonging to a different VRF. This is the typical case of an inter-VRF route. When next-hop VRF is not entered, the next-hop VRF is same as the prefix VRF. If the prefix VRF is not entered, the static route is created in the default VRF.

- `config route add [vrf vrf_name] prefix ip_address next-hop [vrf vrf_name] {nh_ip | dev dev_name}`

```
admin@sonic:~$ sudo config route add vrf Vrf-Red prefix 192.168.34.0/24 next-hop vrf Vrf-Core 10.17.34.71
```

```
admin@sonic:~$ sudo config route add vrf Vrf-Edge prefix 71.39.196.0/27 next-hop 27.58.64.1
```

config route del

Deletes an existing static route.

- `config route del [vrf vrf_name] prefix ip-address next-hop [vrf vrf_name] {nh_ip | dev dev_name}`

```
admin@sonic:~$ sudo config route del vrf Vrf-Red prefix 192.168.34.0/24 next-hop vrf Vrf-Core 10.17.34.71
```

```
admin@sonic:~$ sudo config route del vrf Vrf-Edge prefix 71.39.196.0/27 next-hop 27.58.64.1
```

8

Management VRF configuration

Management VRF is a subset of VRF which provides a separation between the out-of-band management network and the in-band data plane network. The main routing table is the default table for all the data plane switch ports. With Management VRF, a second table, mgmt, is used for routing through the Ethernet ports of the switch. By default, Management VRF is disabled. The admin user can enable it using the CLI interfaces or programmable interfaces (RESTCONF).

Management VRF config commands

Enable or disable Management VRF

config vrf add mgmt

Enables the Management VRF. Use `no ip vrf management` to disable the Management VRF.

- `config vrf del vrf_name`
- ```
  admin@sonic:~$ sudo config vrf del vrf1
  ```

Configure SNMP over Management VRF

When the Management VRF is enabled, the user must configure the SNMP agent to listen on the management VRF.

- `config snmpagentaddress [add | del] [OPTIONS] SNMP_AGENT_LISTENING_IP_Address`
  - `-p, --port SNMP_AGENT_LISTENING_PORT`
  - `-v, --vrf VRF_Name | mgmt | None`
- ```
  admin@sonic:~$ sudo snmp-server agentaddress ip interface vrf_name
  ```

ssh scp ntpstat in Management VRF

When the Management VRF is enabled, the commands such as `ssh`, `scp`, and `ntpstat` which are used from the switch to outbound must be run in the Management VRF control group using `cgexec` and `cgexec -g l3mdev:mgmt` .

- `cgexec -g l3mdev:mgmt [ssh {user@ip} | ntpstat]`
- ```
  admin@sonic:~$ cgexec -g l3mdev:mgmt ssh user@ip
  ```

  ```
  admin@sonic:~$ cgexec -g l3mdev:mgmt ntpstat
  ```
  ```

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BFD show and debug

BFD show commands

NOTE: All commands are available in the FRR BGP container vtysh shell.

show bfd peers brief

Displays all the BFD peers in brief.

- `show bfd peers brief`

```
admin@sonic:~$ show bfd peers brief
Session count: 1
SessionId      LocalAddr               NeighAddr                       State
=========      =========               =========                       =====
1              192.168.0.1             192.168.0.2                      UP
```

BFD debug commands

debug bfd

Enables BFD debug logs for troubleshooting. Use `no debug bfd` to disable debug logging for BFD.

- `debug bfd`

```
admin@sonic:~$ debug bfd
```

BFD clear commands

clear bfd peer counters

Clears BFD session counters.

- `clear bfd peer {label | A.B.C.D/A::B} [multihop | {local-address A.B.C.D/A::B} | {interface if-name}] counters`

```
admin@sonic:~$ clear bfd peer 10.1.1.1 counters
```

```
admin@sonic:~$ clear bfd peer 20.1.1.1 local-address 10.1.1.1 counters
```

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BGP configuration and show

BGP show commands

show bgp summary

Displays a summary of all IPv4 and IPv6 BGP neighbors that are configured and the corresponding states.

- `show bgp summary`
-
```
admin@sonic:~$ show bgp summary

IPv4 Unicast Summary:
BGP router identifier 10.1.0.32, local AS number 65100 vrf-id 0
BGP table version 6465
RIB entries 12807, using 2001 KiB of memory
Peers 4, using 83 KiB of memory
Peer groups 2, using 128 bytes of memory

Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ  Up/Down State/PfxRcd
10.0.0.57       4      64600    3995    4001        0    0    0 00:39:32         6400
10.0.0.59       4      64600    3995    3998        0    0    0 00:39:32         6400
10.0.0.61       4      64600    3995    4001        0    0    0 00:39:32         6400
10.0.0.63       4      64600    3995    3998        0    0    0 00:39:32         6400

Total number of neighbors 4

IPv6 Unicast Summary:
BGP router identifier 10.1.0.32, local AS number 65100 vrf-id 0
BGP table version 12803
RIB entries 12805, using 2001 KiB of memory
Peers 4, using 83 KiB of memory
Peer groups 2, using 128 bytes of memory

Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ  Up/Down State/PfxRcd
fc00::72        4      64600    3995    5208        0    0    0 00:39:30         6400
fc00::76        4      64600    3994    5208        0    0    0 00:39:30         6400
fc00::7a        4      64600    3993    5208        0    0    0 00:39:30         6400
fc00::7e        4      64600    3993    5208        0    0    0 00:39:30         6400

Total number of neighbors 4
```

show bgp neighbors

Displays all the details of IPv4 and IPv6 BGP neighbors when no optional argument is specified. When `IPv4_address` is specified, it displays the detailed neighbor information about that specific IPv4 neighbor. This command has additional optional arguments to display only the advertised routes, the received routes, or all routes.

- `show bgp neighbors [ipv4-address [advertised-routes | received-routes | routes]]`
-
```
admin@sonic:~$ show bgp neighbors
 BGP neighbor is 10.0.0.57, remote AS 64600, local AS 65100, external link
 Description: ARISTA01T1
 BGP version 4, remote router ID 100.1.0.29, local router ID 10.1.0.32
 BGP state = Established, up for 00:42:15
 Last read 00:00:00, Last write 00:00:03
 Hold time is 10, keepalive interval is 3 seconds
 Configured hold time is 10, keepalive interval is 3 seconds
 Neighbor capabilities:
   4 Byte AS: advertised and received
   AddPath:
     IPv4 Unicast: RX advertised IPv4 Unicast and received
   Route refresh: advertised and received(new)
   Address Family IPv4 Unicast: advertised and received
   Hostname Capability: advertised (name: sonic-z9264f-9251,domain name: n/a) not received
```

```
   Graceful Restart Capabilty: advertised and received
     Remote Restart timer is 300 seconds
     Address families by peer:
       none
 Graceful restart information:
   End-of-RIB send: IPv4 Unicast
   End-of-RIB received: IPv4 Unicast
 Message statistics:
   Inq depth is 0
   Outq depth is 0
                        Sent       Rcvd
   Opens:                  2          1
   Notifications:          2          0
   Updates:             3206       3202
   Keepalives:           845        847
   Route Refresh:          0          0
   Capability:             0          0
   Total:               4055       4050
 Minimum time between advertisement runs is 0 seconds

For address family: IPv4 Unicast
 Update group 1, subgroup 1
 Packet Queue length 0
 Inbound soft reconfiguration allowed
 Community attribute sent to this neighbor(all)
 6400 accepted prefixes

 Connections established 1; dropped 0
 Last reset 00:42:37, due to NOTIFICATION sent (Cease/Connection collision resolution)
 Local host: 10.0.0.56, Local port: 179
 Foreign host: 10.0.0.57, Foreign port: 46419
 Nexthop: 10.0.0.56
 Nexthop global: fc00::71
 Nexthop local: fe80::2204:fff:fe36:9449
 BGP connection: shared network
 BGP Connect Retry Timer in Seconds: 120
 Read thread: on  Write thread: on
```

Display only that particular neighbor. You can optionally specify to view all routes that are advertised to the specified neighbor, all routes received from the specified neighbor, or all routes (received and accepted) from the specified neighbor.

```
admin@sonic:~$ show bgp neighbors 10.0.0.57
```

```
admin@sonic:~$ show bgp neighbors 10.0.0.57 advertised-routes
```

```
admin@sonic:~$ show bgp neighbors 10.0.0.57 received-routes
```

```
admin@sonic:~$ show bgp neighbors 10.0.0.57 routes
```

show bgp ipv6 summary

Displays the summary of all IPv6 BGP neighbors that are configured and the corresponding states.

- `show bgp ipv6 summary`

```
admin@sonic:~$ show bgp ipv6 summary
BGP router identifier 10.1.0.32, local AS number 65100 vrf-id 0
BGP table version 12803
RIB entries 12805, using 2001 KiB of memory
Peers 4, using 83 KiB of memory
Peer groups 2, using 128 bytes of memory

Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ  Up/Down State/PfxRcd
fc00::72        4      64600    3995    5208        0    0    0 00:39:30         6400
fc00::76        4      64600    3994    5208        0    0    0 00:39:30         6400
fc00::7a        4      64600    3993    5208        0    0    0 00:39:30         6400
fc00::7e        4      64600    3993    5208        0    0    0 00:39:30         6400

Total number of neighbors 4
```

show bgp ipv6 neighbors

Displays all the details of one particular IPv6 BGP neighbor. Option is also available to display only the advertised routes, the received routes, or all routes.

- `show bgp ipv6 neighbors [ipv6-address [(advertised-routes | received-routes | routes)]]`
-
```
admin@sonic:~$ show bgp ipv6 neighbors fc00::72 advertised-routes
```

```
admin@sonic:~$ show bgp ipv6 neighbors fc00::72 received-routes
```

```
admin@sonic:~$ show bgp ipv6 neighbors fc00::72 received-routes
```

show route-map

Displays the routing policy that takes precedence over the other route processes that are configured.

- `show route-map`
-
```
admin@sonic:~$ show route-map
    ZEBRA:
    route-map RM_SET_SRC, permit, sequence 10
      Match clauses:
      Set clauses:
        src 10.12.0.102
      Call clause:
      Action:
        Exit routemap
    ZEBRA:
    route-map RM_SET_SRC6, permit, sequence 10
      Match clauses:
      Set clauses:
        src fc00:1::102
      Call clause:
      Action:
        Exit routemap
    BGP:
    route-map FROM_BGP_SPEAKER_V4, permit, sequence 10
      Match clauses:
      Set clauses:
      Call clause:
      Action:
        Exit routemap
    BGP:
    route-map TO_BGP_SPEAKER_V4, deny, sequence 10
      Match clauses:
      Set clauses:
      Call clause:
      Action:
        Exit routemap
    BGP:
    route-map ISOLATE, permit, sequence 10
      Match clauses:
      Set clauses:
        as-path prepend 65000
      Call clause:
      Action:
        Exit routemap
```

BGP config commands

Explains the list of configuration options available for BGP module for both IPv4 and IPv6 BGP neighbors.

config bgp shutdown all

Shuts down all the BGP IPv4 and IPv6 sessions. When the session is shutdown using this command, BGP state in `show ip bgp summary` displays as Idle (Admin).

- `config bgp shutdown all`

- ```
  admin@sonic:~$ sudo config bgp shutdown all
  ```

config bgp shutdown

Shuts down a BGP session with a neighbor by that neighbor's IP address or hostname.

- `config bgp shutdown neighbor [ip-address | hostname]`
- ```
  admin@sonic:~$ sudo config bgp shutdown neighbor 192.168.1.124
  ```

  ```
  admin@sonic:~$ sudo config bgp shutdown neighbor SONIC02SPINE
  ```

config bgp startup all

Starts up all the IPv4 and IPv6 BGP neighbors.

- `config bgp startup all`
- ```
  admin@sonic:~$ sudo config bgp startup all
  ```

config bgp startup

Starts up the specific IPv4 or IPv6 BGP neighbor using either the IP address or hostname.

- `config bgp startup [ip-address | hostname]`
- ```
  admin@sonic:~$ sudo config bgp startup neighbor 192.168.1.124
  ```

  ```
  admin@sonic:~$ sudo config bgp startup neighbor SONIC02SPINE
  ```

config routing_config_mode

Configures routing configuration mode. This command requires `config reload` or system `reboot` for the configurations to take effect.

- `config routing_config_mode {unified | split | separated}`
- ```
  admin@sonic:~$ sudo config routing_config_mode unified
  ```

  ```
  admin@sonic:~$ sudo config routing_config_mode split
  ```

BGP error handling

When BGP learns a prefix, it sends the route to route table manager (Zebra) to install in data plane. The routes are installed in kernel and also sent to APP_DB using fpmsyncd. The Orchagent reads the route from APP_DB, creates resources like next-hop or next-hop group ID and installs the route in ASIC_DB. The syncd triggers the appropriate SAIAPI and route is installed in hardware. Due to resource allocation failures in hardware, SAI API calls can fail and these failures should be notified to Zebra and BGP.

On learning the prefix, BGP can immediately advertise the prefix to its neighbors. If BGP error-handling feature is enabled, BGP waits for success notification from hardware installation before advertising the route to its peers. If the hardware installation returns error, the routes are not advertised to the peers.

Configuration commands

bgp error-handling

Enables or disables BGP error handling feature. BGP error handling feature is disabled by default.

- `config bgp error-handling {enable|disable}`
- ```
  admin@sonic:~$ sudo config bgp error-handling enable
  ```

  ```
  admin@sonic:~$ sudo config bgp error-handling disable
  ```

Show commands

show ip route not-installed

NOTE: This command is available in FRR BGP vtysh shell.

Displays the failed routes.

- `show {ip | ipv6} route not-installed [prefix/mask]`
-
```
sonic-frr# show ip route not-installed
Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, E - EIGRP, N - NHRP,
       T - Table, v - VNC, V - VNC-Direct, A - Babel, D - SHARP,
       F - PBR,
       > - selected route, * - FIB route # - not installed in hardware
B> # 22.1.1.1/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 22.1.1.2/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.1/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.2/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.3/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.4/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.5/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.6/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.7/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
B> # 30.1.1.8/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:20
```

`show bgp {ipv4|ipv6}` and `show ip route` outputs are also enhanced to display the routes that are failed to install in the hardware with different status code.

```
sonic-frr# show ip route
Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, E - EIGRP, N - NHRP,
       T - Table, v - VNC, V - VNC-Direct, A - Babel, D - SHARP,
       F - PBR,
       > - selected route, * - FIB route, # - Not installed in hardware

K>* 0.0.0.0/0 [0/0] via 10.59.128.1, eth0, 09:44:37
C>* 4.1.1.0/24 is directly connected, Ethernet4, 00:01:48
C>* 10.1.0.1/32 is directly connected, lo, 09:44:37
C>* 10.59.128.0/20 is directly connected, eth0, 09:44:37
B>* 21.21.21.21/32 [20/0] via 4.1.1.2, Ethernet4, 00:00:07
```

Debug commands

Retries installation of failed routes from Zebra, a clear command has been provided.

- `clear {ip | ipv6} route {not-installed | prefix/mask}`
-
```
admin@sonic:~$ clear ip route not-installed
```

BGP EVPN control plane for spine

BGP EVPN control plane for spine nodes is supported in this SONiC release. EVPN VxLAN route termination and origination functionalities are not available yet. Supported reflection/propagation of EVPN route types:

- Autodiscovery
- MAC/MACIP
- Inclusive Multicast Ethernet
- Ethernet segment
- IP prefix

BGP EVPN configuration and show commands are available only using FRR vtysh shell. FRR split mode configuration (config routing_config_mode split) is required in SONiC. And FRR configuration is required to be saved (write memory) from vtysh to retain across reloads.

Configuration Commands

NOTE: This command is available in FRR BGP vtysh shell.

BGP EVPN configuration example for eBGP and iBGP neighbors

```
sonic-frr# router bgp 65535
 neighbor Ethernet48 interface remote-as external
 neighbor 169.100.0.1 remote-as 65535
 neighbor 169.200.0.1 remote-as 65535
```

```
 neighbor 1690:100::1 remote-as 65550
 !
 address-family ipv4 unicast
  neighbor 169.100.0.1 route-reflector-client
  neighbor 169.200.0.1 route-reflector-client
 exit-address-family
 !
 address-family l2vpn evpn
  neighbor Ethernet48 activate
  neighbor 169.100.0.1 activate
  neighbor 169.100.0.1 route-reflector-client
  neighbor 169.200.0.1 activate
  neighbor 169.200.0.1 route-reflector-client
  neighbor 1690:100::1 activate
 exit-address-family
!
```

IPv4, IPv6, and BGP unnumbered can be used as underlay for EVPN. In the above example configuration, BGP unnumbered session is established on Ethernet48. Neighbors 169.100.0.1 and 169.200.0.1 are iBGP neighbors and are configured as route-reflector-client. Whereas, 1690:300::1 is an eBGP neighbor.

Show Commands

NOTE: This command is available in FRR BGP vtysh shell.

EVPN `show` commands are available only from FRR vtysh shell. These commands display a summary of EVPN neighbors.

```
sonic-frr# show bgp l2vpn evpn summary
BGP router identifier 12.1.10.1, local AS number 65535 vrf-id 0
BGP table version 0
RIB entries 3000, using 469 KiB of memory
Peers 4, using 83 KiB of memory

Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ  Up/Down State/PfxRcd
Ethernet48      4      65540    5040    5043        0    0    0 00:29:59         5000
169.100.0.1     4      65535    5040    5043        0    0    0 00:29:59         5000
169.200.0.1     4      65535    5040    5043        0    0    0 00:29:59         5000
1690:100::1     4      65550    5158 1958393        0    0    0 00:34:31         5000

Total number of neighbors 4
Total number of neighbors established 4
```

EVPN routes can be displayed using below show command. Appropriate option can be used to display detailed output or subset of routes.

```
sonic-frr# show bgp l2vpn evpn [route [{rd rd-value} [type type]] [detail] ]
```

To see specific route-type, the `type` filter can be used.

```
sonic-frr# show bgp l2vpn evpn route type ?
  ead        Ethernet Auto-Discovery (type-1) route
  es         Ethernet Segment (type-4) route
  macip      MAC-IP (Type-2) route
  multicast  Multicast (Type-3) route
  prefix     Prefix (type-5 )route
sonic-frr#
```

```
sonic-frr# show bgp l2vpn evpn route rd 32.3.10.3:1001 type multicast
EVPN type-1 prefix: [1]:[ESI]:[EthTag]
EVPN type-2 prefix: [2]:[EthTag]:[MAClen]:[MAC]
EVPN type-3 prefix: [3]:[EthTag]:[IPlen]:[OrigIP]
EVPN type-4 prefix: [4]:[ESI]:[IPlen]:[OrigIP]
EVPN type-5 prefix: [5]:[EthTag]:[IPlen]:[IP]

BGP routing table entry for 32.3.10.3:1001:[3]:[0]:[32]:[3.3.100.3]
Paths: (3 available, best #3)
  Advertised to non peer-group peers:
  Ethernet56 21.2.9.9 22.2.10.10
  Route [3]:[0]:[32]:[3.3.100.3]
  900 300
    3.3.100.3 from Ethernet56 (31.3.9.9)
```

```
      Origin IGP, valid, external
      Extended Community: RT:300:999 ET:8
      Last update: Mon Oct 28 07:02:22 2019
      PMSI Tunnel Type: Ingress Replication, label: 999
...
```

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CoPP configuration and show

CoPP show commands

show copp config

Displays the COPP configuration.

- `show copp config`
- ```
  admin@sonic:~$ show copp config
  {
    "COPP_TABLE:default": {
      "value": {
        "cbs": "600",
        "cir": "600",
        "meter_type": "packets",
        "mode": "sr_tcm",
        "queue": "0",
        "red_action": "drop"
      }
    },
    "COPP_TABLE:trap.group.arp": {
      "value": {
        "cbs": "6000",
        "cir": "6000",
        "meter_type": "packets",
        "mode": "sr_tcm",
        "queue": "3",
        "red_action": "drop",
        "trap_action": "copy",
        "trap_ids": "arp_req,arp_resp,neigh_discovery",
        "trap_priority": "3"
      }
    }
  }
  ```

show copp rate-limit

Displays the global maximu, rate limit to CPU and the current rate of packets to CPU.

- `show copp rate-limit`
- ```
  admin@sonic:~$ show copp rate-limit Rx0 max rate 30000
   Rx0 max burst 3000 Rx0 rate 0
      Rx0 tokens 3000
  ```

CoPP config commands

config copp rx-rate

Configures the global max rate limit to CPU in packets/second.

- `config copp rx-rate` *`100-100000`*
- ```
  admin@sonic:~$ sudo config copp rx-rate 20000
  ```

config copp rx-burst

Configures the global max burst limit to CPU in number of packets.

- `config copp rx-burst` *`10-10000`*
- ```
  admin@sonic:~$ sudo config copp rx-burst 2000
  ```

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Core dump configuration and show

Core dump show commands

show core

Displays list of current core files available and their information. This is a wrapper command for the *coredumpctl* utility that is provided by *systemd-coredump* package. Configuration related to administrative mode of core dump feature can also be viewed using this command.

- `show core [config | info | list]`

```
admin@sonic:~$ show core config
Coredump : Enabled
```

```
admin@sonic:~$ show cores list
TIME                            PID   UID   GID SIG COREFILE EXE
Sat 2019-09-14 12:05:50 UTC   24547     0     0   6 present  /usr/bin/vlanmgrd
Sat 2019-09-14 12:06:11 UTC   26780     0     0   6 present  /usr/bin/natmgrd

root@sonic:/home/admin# show cores list natmgrd
TIME                            PID   UID   GID SIG COREFILE EXE
Sat 2019-09-14 12:06:11 UTC   26780     0     0   6 present  /usr/bin/natmgrd
```

```
admin@sonic:~$ show cores info natmgrd
           PID: 26780 (natmgrd)
           UID: 0 (root)
           GID: 0 (root)
        Signal: 6 (ABRT)
     Timestamp: Sat 2019-09-14 12:06:11 UTC (2min 22s ago)
  Command Line: /usr/bin/natmgrd
    Executable: /usr/bin/natmgrd
 Control Group: /docker/b0774b109cca85b1c55cc632b4970a34224f27859b1c26df6174482419dc8671
         Slice: -.slice
       Boot ID: c5a8a9e4f02c49e4929361cbb5c6ce62
    Machine ID: 4e9149cb5654460eb41223b1f9755598
      Hostname: sonic
       Storage: /var/lib/systemd/coredump/
core.natmgrd.0.c5a8a9e4f02c49e4929361cbb5c6ce62.26780.156846277100000000000.lz4
       Message: Process 26780 (natmgrd) of user 0 dumped core.

                Stack trace of thread 23:
                #0  0x00007fa597ed6303 epoll_wait (libc.so.6)
                #1  0x00007fa598e83ad8
_ZN4swss6Select16poll_descriptorsEPPNS_10SelectableEj (libswsscommon.so.0)
                #2  0x00007fa598e83d0b _ZN4swss6Select6selectEPPNS_10SelectableEi
(libswsscommon.so.0)
                #3  0x000055ac9c8c1270 n/a (/usr/bin/natmgrd)
```

Core dump config commands

Explains the list of the configuration options available for core dump file generation.

config core enable

Enables the capability of application core dump file generation.

- `config core enable`

```
admin@sonic:~$ sudo config core enable
```

config core disable

Disables the capability of application core dump file generation. Even though application core dump file generation is disabled, information about the application fault is still available to view.

- `config core disable`
-
```
admin@sonic:~$ sudo config core disable
```

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Tech-support export configuration and show

Export show commands

show export

Displays list of current configuration of tech-support export feature and their information.

- `show export`
- ```
  admin@sonic:~$ show export
  Export Info : {'username': 'admin', 'servername': '10.22.33.44', 'protocol': 'scp',
  'destdir': './supportsave'}
  ```

Tech-support export configuration commands

Explains the list of the configuration options available for the techsupport export.

```
admin@sonic:~$ sudo config export --help
Usage: config export [OPTIONS] COMMAND [ARGS]...

Options:
  --help  Show this message and exit.

Commands:
  disable   Disable the tech-support export service
  enable    Enable the tech-support export service
  interval  Configure the tech-support export interval
  server    Configure the remote server name to connect


This section explains the list of the configuration options available for techsupport export
feature in SONiC.

In order to capture and export techsupport data to an remote server, the export service
should be configured with necessary remote machine credentials.

admin@sonic:~$ sudo config export server
```

config export server username destdir protocol

Configures the export server to upload the tech-support data to a remote server.

- `config export server username destdir protocol [OPTIONS] protocol: scp/sftp`
  - *server_name* — configure the remote server name to connect
  - *user_name* — configure the remote server user name to upload
  - *dest_dir* — configure the remote server directory to save the tech-support data
  - *protocol* — configure the protocol type (SCP/SFTP) to upload the tech-support data
- ```
  admin@sonic:~$ sudo config export server username destdir protocol 10.59.132.52 admin ./
  supportsave scp
  Note: User is prompted for the remote server password.
  ```

config export

Enables/disables the tech-support export service. By default techsupport export is disabled.

- `config core [enable | disable]`
- ```
  admin@sonic:~$ sudo config core enable
  ```
  ```

config export interval

Changes the techsupport interval. By default the techsupport export interval is configured as 30 minutes. If interval is 0, periodic techsupport export service is disabled.

- `config export interval`
- ```
  admin@sonic:~$ sudo config export interval 120
  ```
  ```

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CRM configuration and show

CRM config commands

- `clear` — removes the CRM polling and threshold-related configuration
- `polling` — configures the CRM polling-related configuration
- `thresholds` — configures threshold configuration

CRM config

Configures the CRM related configuration.

```
crm config [OPTIONS] COMMAND [ARGS]...
```

clear

Removes the CRM polling interval and threshold-related configuration for all CRM resources.

- `crm config clear`
- ```
  admin@sonic:~$ crm config clear
  ```

polling

Configures the polling interval for all CRM resources.

- `crm config polling interval value`
- ```
  admin@sonic:~$ crm config polling interval 100
  ```

thresholds high

Configure the high threshold value for a critical resource.

- `crm config thresholds acl group high value`
- `crm config thresholds acl group counter high value`
- `crm config thresholds acl group entry high value`
- `crm config thresholds acl table high value`
- `crm config thresholds fdb high value`
- `crm config thresholds ipv4 neighbor high value`
- `crm config thresholds ipv4 nexthop high value`
- `crm config thresholds ipv4 route high value`
- `crm config thresholds ipv6 neighbor high value`
- `crm config thresholds ipv6 nexthop high value`
- `crm config thresholds ipv6 route high value`
- `crm config thresholds nexthop group object high value`

- `crm config thresholds nexthop group member high value`

```
admin@sonic:~$ crm config thresholds acl group high 70
```

```
admin@sonic:~$ crm config thresholds acl group counter high 75
```

```
admin@sonic:~$ crm config thresholds acl group table 80
```

```
admin@sonic:~$ crm config thresholds ipv4 route 90
```

```
admin@sonic:~$ crm config thresholds nexthop group object high 95
```

```
admin@sonic:~$ crm config thresholds nexthop group member high 50
```

thresholds low

Configure the low threshold value for a critical resource.

- `crm config thresholds acl group low value`
- `crm config thresholds acl group counter low value`
- `crm config thresholds acl group entry low value`
- `crm config thresholds acl table low value`
- `crm config thresholds fdb low value`
- `crm config thresholds ipv4 neighbor low value`
- `crm config thresholds ipv4 nexthop low value`
- `crm config thresholds ipv4 route low value`
- `crm config thresholds ipv6 neighbor low value`
- `crm config thresholds ipv6 nexthop low value`
- `crm config thresholds ipv6 route low value`
- `crm config thresholds nexthop group object low value`
- `crm config thresholds nexthop group member low value`

```
admin@sonic:~$ crm config thresholds acl group low 60
```

```
admin@sonic:~$ crm config thresholds acl group counter low 65
```

```
admin@sonic:~$ crm config thresholds acl group table 60
```

```
admin@sonic:~$ crm config thresholds ipv4 route 40
```

```
admin@sonic:~$ crm config thresholds ipv6 nexthop 30
```

```
admin@sonic:~$ crm config thresholds nexthop group object low 20
```

```
admin@sonic:~$ crm config thresholds nexthop group member low 50
```

thresholds type

Configure the thresholds type for a critical resource. Threshold type can be percentage, used or free.

- `crm config thresholds acl group type [percentage | used | free]`
- `crm config thresholds acl group counter type [percentage | used | free]`
- `crm config thresholds acl group entry type [percentage | used | free]`
- `crm config thresholds acl table type [percentage | used | free]`
- `crm config thresholds fdb type [percentage | used | free]`
- `crm config thresholds ipv4 neighbor type [percentage | used | free]`
- `crm config thresholds ipv4 nexthop type [percentage | used | free]`

- `crm config thresholds ipv4 route type [percentage | used | free]`
- `crm config thresholds ipv6 neighbor type [percentage | used | free]`
- `crm config thresholds ipv6 nexthop type [percentage | used | free]`
- `crm config thresholds ipv6 route type [percentage | used | free]`
- `crm config thresholds nexthop group object type [percentage | used | free]`
- `crm config thresholds nexthop group member type [percentage | used | free]`

```
admin@sonic:~$ crm config thresholds acl group type percentage
```

```
admin@sonic:~$ crm config thresholds acl group counter type used
```

```
admin@sonic:~$ crm config thresholds acl group table free
```

```
admin@sonic:~$ crm config thresholds ipv4 route used
```

```
admin@sonic:~$ crm config thresholds ipv6 nexthop free
```

```
admin@sonic:~$ crm config thresholds nexthop group object type percentage
```

```
admin@sonic:~$ crm config thresholds nexthop group member type used
```

CRM show commands

CRM show

Displays the CRM related general, resource usage and thresholds information.

`crm show [OPTIONS] COMMAND [ARGS]...`

resources

Display currently USED and AVAILABLE number of entries for a critical resource. `crm show resources all` displays these entries for all the critical resources.

- `crm show resources acl group`
- `crm show resources acl table`
- `crm show resources all`
- `crm show resources fdb`
- `crm show resources ipv4 neighbor`
- `crm show resources ipv4 nexthop`
- `crm show resources ipv4 route`
- `crm show resources ipv6 neighbor`
- `crm show resources ipv6 nexthop`
- `crm show resources ipv6 route`
- `crm show resources nexthop group object`
- `crm show resources nexthop group member`

```
admin@sonic:$ crm show resources all

Resource Name           Used Count    Available Count
--------------------  ------------  -----------------
ipv4_route                    1007              48145
ipv6_route                    1004              11284
ipv4_nexthop                   100              32544
ipv6_nexthop                   122              32544
ipv4_neighbor                  100              20180
ipv6_neighbor                  122              10090
nexthop_group_member           200              16184
nexthop_group                    4                124
fdb_entry                       30              40929
```

```
Stage    Bind Point    Resource Name      Used Count    Available Count
-------  ------------  ---------------  ------------  -----------------
INGRESS  PORT          acl_group                   1               1023
INGRESS  PORT          acl_table                   2                  2
INGRESS  LAG           acl_group                   0               1023
INGRESS  LAG           acl_table                   0                  2
INGRESS  VLAN          acl_group                   0               1023
INGRESS  VLAN          acl_table                   0                  5
INGRESS  RIF           acl_group                   0               1023
INGRESS  RIF           acl_table                   0                  5
INGRESS  SWITCH        acl_group                   0               1023
INGRESS  SWITCH        acl_table                   0                  5
EGRESS   PORT          acl_group                   0               1023
EGRESS   PORT          acl_table                   0                  2
EGRESS   LAG           acl_group                   0               1023
EGRESS   LAG           acl_table                   0                  2
EGRESS   VLAN          acl_group                   0               1023
EGRESS   VLAN          acl_table                   0                  2
EGRESS   RIF           acl_group                   0               1023
EGRESS   RIF           acl_table                   0                  2
EGRESS   SWITCH        acl_group                   0               1023
EGRESS   SWITCH        acl_table                   0                  2


Table ID         Resource Name      Used Count    Available Count
---------------  ---------------  ------------  -----------------
0x70000000009e3  acl_entry                  20               492
0x70000000009e3  acl_counter                20             30148
```

```
admin@sonic:$ crm show resources acl group
Stage    Bind Point    Resource Name      Used Count    Available Count
-------  ------------  ---------------  ------------  -----------------
INGRESS  PORT          acl_group                   0               1024
INGRESS  PORT          acl_table                   0                  3
INGRESS  LAG           acl_group                   0               1024
INGRESS  LAG           acl_table                   0                  3
INGRESS  VLAN          acl_group                   0               1024
INGRESS  VLAN          acl_table                   0                  9
INGRESS  RIF           acl_group                   0               1024
INGRESS  RIF           acl_table                   0                  9
INGRESS  SWITCH        acl_group                   0               1024
INGRESS  SWITCH        acl_table                   0                  9
EGRESS   PORT          acl_group                   0               1024
EGRESS   PORT          acl_table                   0                  2
EGRESS   LAG           acl_group                   0               1024
EGRESS   LAG           acl_table                   0                  2
EGRESS   VLAN          acl_group                   0               1024
EGRESS   VLAN          acl_table                   0                  2
EGRESS   RIF           acl_group                   0               1024
EGRESS   RIF           acl_table                   0                  2
EGRESS   SWITCH        acl_group                   0               1024
EGRESS   SWITCH        acl_table                   0                  2
```

```
admin@sonic:$ crm show resources fdb
Resource Name      Used Count    Available Count
---------------  ------------  -----------------
fdb_entry                   2              40957
```

```
admin@sonic:$ crm show resources ipv4 route
Resource Name      Used Count    Available Count
---------------  ------------  -----------------
ipv4_route                  1              49151
```

```
admin@sonic:$ crm show resources ipv6 neighbor
Resource Name      Used Count    Available Count
```

```
---------------  ------------  -----------------
ipv6_neighbor                0              10240
```

```
admin@sonic:$ crm show resources nexthop group object
Resource Name      Used Count    Available Count
---------------  ------------  -----------------
nexthop_group                0               128
```

```
admin@sonic:$ crm show resources nexthop group member
Resource Name           Used Count    Available Count
--------------------  ------------  -----------------
nexthop_group_member             0              16384
```

summary

Displays the polling interval for CRM.

- `crm show summary`
- ```
  admin@sonic:~$ crm show summary
  Polling Interval: 100 second(s)
  ```

thresholds

Display threshold type, low and high thresholds configured for a critical resource.

- `crm show thresholds acl group`
- `crm show thresholds acl table`
- `crm show thresholds all`
- `crm show thresholds fdb`
- `crm show thresholds ipv4 neighbor`
- `crm show thresholds ipv4 nexthop`
- `crm show thresholds ipv4 route`
- `crm show thresholds ipv6 neighbor`
- `crm show thresholds ipv6 nexthop`
- `crm show thresholds ipv6 route`
- `crm show thresholds nexthop group object`
- `crm show thresholds nexthop group member`

```
admin@sonic:$ crm show thresholds acl group
Resource Name    Threshold Type      Low Threshold    High Threshold
---------------  ----------------  ---------------  ----------------
acl_group        used
```

```
admin@sonic:$ crm show thresholds acl table
Resource Name    Threshold Type      Low Threshold    High Threshold
---------------  ----------------  ---------------  ----------------
acl_table        used                           30                90
```

```
admin@sonic:$ crm show thresholds all
Resource Name          Threshold Type      Low Threshold    High Threshold
---------------------  ----------------  ---------------  ----------------
ipv4_route             used                           30                90
ipv6_route             used                           30                90
ipv4_nexthop           used                           30                90
ipv6_nexthop           used                           30                90
ipv4_neighbor          used                           30                90
ipv6_neighbor          used                           30                90
nexthop_group_member   used                           30                90
nexthop_group          used                           30                90
acl_table              used                           30                90
acl_group              used                           30                90
acl_entry              used                           30                90
```
```

```
acl_counter           used                          30                90
fdb_entry             used                          30                90
```

```
admin@sonic:$ crm show thresholds fdb
Resource Name    Threshold Type      Low Threshold    High Threshold
---------------  ----------------  ---------------  ----------------
fdb_entry        used                          30                90
```

```
admin@sonic:$ crm show thresholds ipv4 nexthop
Resource Name    Threshold Type      Low Threshold    High Threshold
---------------  ----------------  ---------------  ----------------
ipv4_nexthop     used                          30                90
```

```
admin@sonic:$ crm show thresholds ipv6 neighbor
Resource Name    Threshold Type      Low Threshold    High Threshold
---------------  ----------------  ---------------  ----------------
ipv6_neighbor    used                          30                90
```

```
admin@sonic:$ crm show thresholds nexthop group object
Resource Name    Threshold Type      Low Threshold    High Threshold
---------------  ----------------  ---------------  ----------------
nexthop_group    used                          30                90
```

```
admin@sonic:$ crm show thresholds nexthop group member
Resource Name          Threshold Type      Low Threshold    High Threshold
---------------------  ----------------  ---------------  ----------------
nexthop_group_member   used                          30                90
```

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VRRP configuration and show

VRRP show commands

show vrrp

Displays the summary of all VRRP instances for all VRRP enabled interfaces. Each row in the command output represents one VRRP instance of an interface. The row displays configuration and the dynamic state of a VRRP instance.

- `show vrrp`

```
admin@sonic:~$ show vrrp
Interface_Name  VRID   State             VIP  Cfg_Prio  Curr_Prio
         Vlan1     1  Backup       4.1.1.100       100        120
         Vlan2     2  Backup       4.1.2.100       100        100
       Vlan100     1  Master  125.125.125.50       100        100
       Vlan100     2  Master  126.126.126.50       100        100
       Vlan100     3  Master  128.128.128.50       100        100
       Vlan100     4  Master  127.127.127.50       100        100
      Vlan1000     1  Backup     40.10.1.101       100        100
      Vlan1000     2  Backup     40.10.2.101       100        100
      Vlan1000     3  Backup     40.10.3.101       100        100
```

show vrrp

Displays all the details of a specific VRRP instance on a VRRP enabled interface. `show vrrp` displays the summary of all the VRRP instances, and this command displays a specific VRRP instance in verbose mode with full configuration and state details. *`interface_name`* and *`vr_id`* both are mandatory parameters. *`interface_name`* is the name of an interface where VRRP is enabled (Ethernet40 or PortChannel003 or Vlan349), and the ID range is 1 to 255.

This command also displays the list of interfaces being tracked by this VRRP instance, along with their state (Up or Down) and configured priority.

- `show vrrp` *`interface_name vr_id`*

```
admin@sonic:~$ show vrrp Vlan1 1
Vlan1, VRID 1
Version is 2
State is Backup
Virtual IP address:
  4.1.1.100
Virtual MAC address is 0000.5e00.0101
Track interface:
  Intfname       State  Priority
  Ethernet7      Up     10
  PortChannel001 Up     10
  Vlan100        Up     10
  Vlan200        Down   20
  Vlan300        Down   30
  Vlan400        Down   40
Configured Priority is 100, Current Priority is 130
Advertisement interval is 1 sec
Preemption is enabled
```

VRRP config commands

config interface vrrp add

Creates a VRRP instance on an interface. This is an indirect way to enable or configure VRRP on an interface. Interface name can be any available L3 interface (Ethernet4 or Vlan206 or PortChannel003), and the ID range is 1 to 255.

- `config interface vrrp add` *`interface_name`*

- ```
  admin@sonic:~$ sudo config interface vrrp add Vlan206 13
  ```

```
admin@sonic:~$ sudo config interface vrrp add PortChannel007 34
```

config interface vrrp remove

Deletes a VRRP instance from an interface.

- `config vrrp remove interface_name`
- ```
  admin@sonic:~$ sudo config interface vrrp remove Vlan206 13
  ```

```
admin@sonic:~$ sudo config interface vrrp remove PortChannel007 34
```

config interface vrrp vip add

Adds one or more virtual IP addresses for a VRRP instance on an interface. Virtual IP address must be in interface's IP subnet. The command is rejected of the IP address does not belong to the interface IP subnet.

- `config interface vrrp vip add interface_name virtual_ip_address`
- ```
  admin@sonic:~$ sudo config interface vrrp vip add Vlan206 13 72.41.61.101
  ```

```
admin@sonic:~$ sudo config interface vrrp vip add PortChannel007 34 206.52.72.201
```

config interface vrrp vip remove

Deletes an existing VIP from a VRRP instance on an interface.

- `config interface vrrp vip remove interface_name virtual_ip_address`
- ```
  admin@sonic:~$ sudo config interface vrrp vip remove Vlan206 13 72.41.61.101
  ```

```
admin@sonic:~$ sudo config interface vrrp vip remove PortChannel007 34 206.52.72.201
```

config interface vrrp priority

Configures priority for a VRRP instance on an interface. Priority range 1 to 254; default 100. Priority value decides the election of a Master VRRP node for a VRRP instance.

- `config interface vrrp priority interface_name`
- ```
  admin@sonic:~$ sudo config interface vrrp priority Vlan206 13 120
  ```

```
admin@sonic:~$ sudo config interface vrrp priority PortChannel007 34 80
```

config interface vrrp adv_interval

Configures advertisement interval in seconds for a VRRP instance on an interface. Advertisement interval range 1 to 255 seconds; default 1. Advertisement interval dictates the periodicity of VRRP hello advertisement for a VRRP instance.

- `config interface vrrp adv_interval interface_name`
- ```
  admin@sonic:~$ sudo config interface vrrp adv_interval Vlan206 13 2
  ```

```
admin@sonic:~$ sudo config interface vrrp adv_interval PortChannel007 34 5
```

config interface vrrp pre_empt enable

Configures if a Master VRRP role can be preempted by a new high-priority VRRP node for a VRRP instance on an interface. By default, preemption of VRRP Master node is enabled.

- `config interface vrrp pre_empt enable interface_name`
- ```
  admin@sonic:~$ sudo config interface vrrp pre_empt enable Vlan206 13
  ```

```
admin@sonic:~$ sudo config interface vrrp pre_empt enable PortChannel007 34
```
```

config interface vrrp pre_empt disable

Disables preemption of a Master VRRP role by a new high-priority VRRP node for a VRRP instance on an interface. By default, preemption of VRRP Master node is enabled.

- `config interface vrrp pre_empt disable interface_name`
- ```
  admin@sonic:~$ sudo config interface vrrp pre_empt disable Vlan206 13
  ```

```
admin@sonic:~$ sudo config interface vrrp pre_empt disable PortChannel007 34
```

config interface vrrp track_interface add

Adds a track interface for a VRRP instance on an interface. The operational status of track interface determines the effective priority of VRR instance. When track interface is up, the effective priority of VRRP instance is +. When track interface goes down, the effective priority becomes –. This change in effective priority triggers election of a new master. Any L2 or L3 interface can be tracked using VRRP. Range is 1 to 254, with a maximum of eight track interfaces per VRRP instance.

- `config interface vrrp track_interface add interface_name track_interface`
- ```
  admin@sonic:~$ sudo config interface vrrp track_interface add Vlan206 13 Ethernet8 10
  ```

```
admin@sonic:~$ sudo config interface vrrp track_interface add PortChannel007 34 Vlan1 20
```

config interface vrrp track_interface remove

Deletes a track interface for a VRRP instance on an interface.

- `config interface vrrp track_interface remove interface_name track_interface`
- ```
  admin@sonic:~$ sudo config interface vrrp track_interface remove Vlan206 13 Ethernet8
  ```

```
admin@sonic:~$ sudo config interface vrrp track_interface remove PortChannel007 34 Vlan1
```
```

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DHCP relay configuration, show, debug, and clear

DHCP relay configuration commands

config interface ip dhcp-relay add

Configures an IPv4 DHCP server address on an interface. One address is mandatory, and a maximum of four addresses are allowed. If the command is used multiple times with different addresses, the addresses are appended to the list of server addresses.

- `config interface ip dhcp-relay add interface_name ip_addr1 ip_addr2 ip_addr3 ip_addr4`
- ```
  admin@sonic:~$ sudo config interface ip dhcp-relay add Vlan206 1.2.0.1 3.4.0.1
  ```

  ```
  admin@sonic:~$ sudo config interface ip dhcp-relay add PortChannel007 192.168.0.1
  ```

  ```
  admin@sonic:~$ sudo config interface ip dhcp-relay add Ethernet52 1.2.0.1 3.4.0.1
  192.168.0.1 192.168.5.1
  ```

config interface ip dhcp-relay remove

Removes the configured IPv4 DHCP server address on an interface. One address is mandatory, and a maximum of four addresses are allowed. A single server address can be deleted from the list of configured addresses by providing that address as argument.

- `config interface ip dhcp-relay remove interface_name ip_addr1 ip_addr2 ip_addr3 ip_addr4`
- ```
  admin@sonic:~$ sudo config interface ip dhcp-relay remove Vlan206 1.2.0.1 3.4.0.1
  ```

  ```
  admin@sonic:~$ sudo config interface ip dhcp-relay remove PortChannel007 192.168.0.1
  ```

  ```
  admin@sonic:~$ sudo config interface ip dhcp-relay remove Ethernet52 1.2.0.1 3.4.0.1
  192.168.0.1 192.168.5.1
  ```

config interface ipv6 dhcp-relay add

Configures an IPv6 DHCP server address on an interface. One address is mandatory, and a maximum of four addresses are allowed. If the command is used multiple times with different addresses, the addresses are appended to the list of server addresses.

- `config interface ipv6 dhcp-relay add interface_name ip_addr1 ip_addr2 ip_addr3 ip_addr4`
- ```
  admin@sonic:~$ sudo config interface ipv6 dhcp-relay add Vlan206 1122::1
  ```

  ```
  admin@sonic:~$ sudo config interface ipv6 dhcp-relay add PortChannel007 3366::1 1112::1
  ```

  ```
  admin@sonic:~$ sudo config interface ipv6 dhcp-relay add Ethernet52 1122::1 3366::1 1112::1
  ```

config interface ipv6 dhcp-relay remove

Removes the configured IPv6 DHCP server address on an interface. One address is mandatory, and a maximum of four addresses are allowed. A single-server address can be deleted from the list of configured addresses by providing that address as argument.

- `config interface ipv6 dhcp-relay remove interface_name ip_addr1 ip_addr2 ip_addr3 ip_addr4`
  ```

- ```
  admin@sonic:~$ sudo config interface ipv6 dhcp-relay remove Vlan206 1122::1
  ```

```
admin@sonic:~$ sudo config interface ipv6 dhcp-relay remove PortChannel007 3366::1 1112::1
```

```
admin@sonic:~$ sudo config interface ipv6 dhcp-relay remove Ethernet52 1122::1 3366::1
1112::1
```

DHCP relay show commands

show ip dhcp-relay brief

Displays all the configured IPv4 DHCP server address configurations.

- `show ip dhcp-relay brief`
- ```
  admin@sonic:~$ show ip dhcp-relay brief
  +------------------+-----------------------+
  | Interface Name   | DHCP Helper Address   |
  +==================+=======================+
  | Vlan10           | 20.20.1.2             |
  |                  | 1.2.0.1               |
  +------------------+-----------------------+
  | PortChannel10    | 40.20.1.2             |
  +------------------+-----------------------+
  | Ethernet52       | 10.10.1.2             |
  +------------------+-----------------------+
  ```

show ip dhcp-relay statistics

Displays the IPv4 DHCP relay statistics on the interface.

- `show ip dhcp-relay statistics interface_name`
- ```
  admin@sonic:~$ show ip dhcp-relay statistics Vlan10

  Packets relayed from client to server:     2
  Packets relayed from server to client:     0
  Errors relaying packets from clients:      0
  Errors relaying packets from servers:      0
  Packets dropped with bogus GIADDR:         0
  Packets dropped due to bad relay info:     0
  Packets dropped due to missing relay info: 0
  Packets dropped due to invalid hdr length: 0
  Packets dropped on interface with no IP:   0
  Replies dropped on downstream interface:   0
  Requests dropped on upstream interface:    0
  ```

show ipv6 dhcp-relay brief

Displays all the configured IPv6 DHCP server address configurations.

- `show ipv6 dhcp-relay brief`
- ```
  admin@sonic:~$ show ipv6 dhcp-relay brief
  +------------------+-----------------------+
  | Interface Name   | DHCP Helper Address   |
  +==================+=======================+
  | Vlan10           | 2002::2               |
  |                  | 1122::1               |
  +------------------+-----------------------+
  | PortChannel10    | 4422::2               |
  +------------------+-----------------------+
  | Ethernet52       | 1100::2               |
  +------------------+-----------------------+
  ```

show ipv6 dhcp-relay statistics

Displays the IPv6 DHCP relay statistics on the interface.

- `show ipv6 dhcp-relay statistics interface_name`

```
admin@sonic:~$ show ipv6 dhcp-relay statistics Vlan10

Packets relayed from client to server:                          0
Packets relayed from server to client:                          0
Errors relaying packets from clients:                           0
Errors relaying packets from servers:                           0
Packets with wrong message type dropped on downstream interface:  0
Packets with wrong message type dropped on upstream interface:    0
```

DHCP relay debug commands

debug dhcp-relay

Switches between DEBUG and INFO logging levels of syslog for all the DHCP relay processes.

- `debug dhcp-relay`
- ```
  admin@sonic:~$ debug dhcp-relay
  ```

debug ip dhcp-relay

Toggles the syslog level for the IPv4 DHCP relay process the relay interface.

- `debug ip dhcp-relay interface_name`
- ```
  admin@sonic:~$ debug ip dhcp-relay Vlan10
  ```

```
admin@sonic:~$ sudo debug ip dhcp-relay Ethernet52
```

debug ipv6 dhcp-relay

Toggles the syslog level for the IPv6 DHCP relay process the relay interface.

- `debug ipv6 dhcp-relay interface_name`
- ```
  admin@sonic:~$ debug ipv6 dhcp-relay Vlan10
  ```

```
admin@sonic:~$ sudo debug ipv6 dhcp-relay Ethernet52
```

DHCP relay clear commands

sonic-clear ip dhcp-relay statistics

Clears the IPv4 DHCP relay statistics on a relay interface.

- `sonic-clear ip dhcp-relay statistics interface_name`
- ```
  admin@sonic:~$ sonic-clear ip dhcp-relay statistics Vlan10
  ```

```
admin@sonic:~$ sudo sonic-clear ip dhcp-relay statistics Ethernet52
```

sonic-clear ipv6 dhcp-relay statistics

Clears the IPv6 DHCP relay statistics on a relay interface.

- `sonic-clear ipv6 dhcp-relay statistics interface_name`
- ```
  admin@sonic:~$ sonic-clear ipv6 dhcp-relay statistics Vlan10
  ```

```
admin@sonic:~$ sudo sonic-clear ipv6 dhcp-relay statistics Ethernet52
```
```

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ECN configuration and show

ECN show commands

show ecn

Displays all WRED profiles that are configured in the device.

- `show ecn`
- ```
  admin@sonic:~$ show ecn

  Profile: **AZURE_LOSSLESS**
  ----------------------  -------
  red_max_threshold       2097152
  red_drop_probability    5
  yellow_max_threshold    2097152
  ecn                     ecn_all
  green_min_threshold     1048576
  red_min_threshold       1048576
  wred_yellow_enable      true
  yellow_min_threshold    1048576
  green_max_threshold     2097152
  green_drop_probability  5
  wred_green_enable       true
  yellow_drop_probability 5
  wred_red_enable         true
  ----------------------  -------

  Profile: **wredprofileabcd**
  ----------------  ---
  red_max_threshold  100
  ----------------  ---
  ```

ECN configuration commands

config ecn

Configures the possible fields in a particular WRED profile that is specified using `-profile` argument. The list of the WRED profile fields that are configurable is listed in the Usage.

- `config ecn [OPTIONS]`
  - `-profile` *`profile_name`* — profile name (required)
  - `-rmax` *`red threshold max`* — red maximum threshold
  - `-rmin` *`red threshold min`* — red minimum threshold
  - `-ymax` *`yellow threshold max`* — yellow maximum threshold
  - `-ymin` *`yellow threshold min`* — yellow minimum threshold
  - `-gmax` *`green threshold max`* — green maximum threshold
  - `-gmin` *`green threshold min`* — green minimum threshold
- ```
  admin@sonic:~$ sudo config ecn -profile wredprofileabcd -rmax 100
  ```

  This command configures the red maximum threshold for the WRED profile name *wredprofileabcd*. It creates the WRED profile if it does not exist.

18

Interface configuration and show

Interface show commands

Displays interface information.

- `show interfaces`

```
admin@sonic:~$ show interfaces -?

Show details of the network interfaces

Options:
  -?, -h, --help  Show this message and exit.

Commands:
counters     Show interface counters
description  Show interface status, protocol and...
naming_mode  Show interface naming_mode status
neighbor     Show neighbor related information
pktdrops     Show interface packet drops
portchannel  Show PortChannel information
status       Show Interface status information
transceiver  Show SFP Transceiver information
```

show interfaces counters

Displays packet counters for all interfaces since the last time the counters were cleared.

- `show interfaces counters [OPTIONS]`
  - `-a, --printall` — displays `RX_PPS` and `TX_PPS`
  - `-c, --clear` — clears counters for all interfaces
  - `-i, --interface` *`TEXT`* — applies command per interface
  - `-p, --period` *`TEXT`* — specifies a period (in seconds) to gather counters over

```
admin@sonic:~$ show interfaces counters
      IFACE    STATE            RX_OK       RX_BPS    RX_UTIL    RX_ERR    RX_DRP
RX_OVR            TX_OK       TX_BPS    TX_UTIL    TX_ERR    TX_DRP    TX_OVR
-----------  -------  ---------------  -----------  ---------  --------  --------
--------  ---------------  -----------  ---------  --------  --------  --------
  Ethernet0        U  471,729,839,997  653.87 MB/s     12.77%         0    18,682
0  409,682,385,925  556.84 MB/s     10.88%         0         0         0
  Ethernet4        U  453,838,006,636  632.97 MB/s     12.36%         0     1,636
0  388,299,875,056  529.34 MB/s     10.34%         0         0         0
  Ethernet8        U  549,034,764,539  761.15 MB/s     14.87%         0    18,274
0  457,603,227,659  615.20 MB/s     12.02%         0         0         0
 Ethernet12        U  458,052,204,029  636.84 MB/s     12.44%         0    17,614
0  388,341,776,615  527.37 MB/s     10.30%         0         0         0
 Ethernet16        U   16,679,692,972   13.83 MB/s      0.27%         0    17,605
0   18,206,586,265   17.51 MB/s      0.34%         0         0         0
 Ethernet20        U   47,983,339,172   35.89 MB/s      0.70%         0     2,174
0   58,986,354,359   51.83 MB/s      1.01%         0         0         0
 Ethernet24        U   33,543,533,441   36.59 MB/s      0.71%         0     1,613
0   43,066,076,370   49.92 MB/s      0.97%         0         0         0
```

Period (in seconds) to gather counters over

```
admin@sonic:~$ show interfaces counters -p 5
      IFACE    STATE    RX_OK       RX_BPS    RX_UTIL    RX_ERR    RX_DRP    RX_OVR
TX_OK       TX_BPS    TX_UTIL    TX_ERR    TX_DRP    TX_OVR
-----------  -------  -------  -----------  ---------  --------  --------  --------
-------  -----------  ---------  --------  --------  --------
Ethernet0         U      515   59.14 KB/s      0.00%         0         0         0
```

```
1,305  127.60 KB/s      0.00%          0          0          0
Ethernet4         U      305   26.54 KB/s      0.00%          0          0          0
279   39.12 KB/s      0.00%          0          0          0
Ethernet8         U      437   42.96 KB/s      0.00%          0          0          0
182   18.37 KB/s      0.00%          0          0          0
Ethernet12        U      284   40.79 KB/s      0.00%          0          0          0
160   13.03 KB/s      0.00%          0          0          0
Ethernet16        U      377   32.64 KB/s      0.00%          0          0          0
214   18.01 KB/s      0.00%          0          0          0
Ethernet20        U      284   36.81 KB/s      0.00%          0          0          0
138  8758.25 B/s      0.00%          0          0          0
Ethernet24        U      173   16.09 KB/s      0.00%          0          0          0
169   11.39 KB/s      0.00%          0          0          0
```

Detailed counters of an interface

```
admin@sonic:~$ show interfaces counters detailed Ethernet48
Last rate cached time was 2019-09-18 21:31:58.094196
Packets Received 64 Octets..................... 4
Packets Received 65-127 Octets................. 0
Packets Received 128-255 Octets................ 842
Packets Received 256-511 Octets................ 6
Packets Received 512-1023 Octets............... 0
Packets Received 1024-1518 Octets.............. 0
Packets Received 1519-2047 Octets.............. 0
Packets Received 2048-4095 Octets.............. 0
Packets Received 4096-9216 Octets.............. 0
Packets Received 9217-16383 Octets............. 0

Total Packets Received Without Errors.......... 852
Unicast Packets Received....................... 0
Multicast Packets Received..................... 846
Broadcast Packets Received..................... 6

Jabbers Received............................... 0
Fragments Received............................. 0
Undersize Received............................. 0
Overruns Received.............................. 0

Packets Transmitted 64 Octets.................. 1
Packets Transmitted 65-127 Octets.............. 0
Packets Transmitted 128-255 Octets............. 835
Packets Transmitted 256-511 Octets............. 0
Packets Transmitted 512-1023 Octets............ 0
Packets Transmitted 1024-1518 Octets........... 0
Packets Transmitted 1519-2047 Octets........... 0
Packets Transmitted 2048-4095 Octets........... 0
Packets Transmitted 4096-9216 Octets........... 0
Packets Transmitted 9217-16383 Octets.......... 0

Total Packets Transmitted Successfully......... 836
Unicast Packets Transmitted.................... 0
Multicast Packets Transmitted.................. 836
Broadcast Packets Transmitted.................. 0
Time Since Counters Last Cleared............... None
admin@sonic:~$
```

show interfaces description

Displays the key fields of the interfaces such as Operational Status, Administrative Status, Alias, and Description.

- `show interfaces description [interface_name]`

- ```
  admin@sonic:~$ show interfaces description
  Interface    Oper    Admin            Alias           Description
  -----------  ------  -------  ---------------  --------------------
  Ethernet0    down       up   hundredGigE1/1  T0-1:hundredGigE1/30
  Ethernet4    down       up   hundredGigE1/2  T0-2:hundredGigE1/30
  ```
  ```

```
Ethernet8    down     down   hundredGigE1/3        hundredGigE1/3
Ethernet12   down     down   hundredGigE1/4        hundredGigE1/4
```

```
admin@sonic:~$ show interfaces description Ethernet4
Interface    Oper    Admin          Alias           Description
-----------  ------  -------  --------------  --------------------
Ethernet4    down       up  hundredGigE1/2  T0-2:hundredGigE1/30
```

show interfaces neighbor

Displays the list of expected neighbors for all interfaces (or for a particular interface) that is configured.

- `show interfaces neighbor expected [interface_name]`

```
admin@sonic:~# show interfaces neighbor expected
  LocalPort    Neighbor    NeighborPort    NeighborLoopback    NeighborMgmt    NeighborType
  -----------  ----------  --------------  ------------------  --------------
--------------
  Ethernet112  ARISTA01T1  Ethernet1       None                10.16.205.100   ToRRouter
  Ethernet116  ARISTA02T1  Ethernet1       None                10.16.205.101   SpineRouter
  Ethernet120  ARISTA03T1  Ethernet1       None                10.16.205.102   LeafRouter
  Ethernet124  ARISTA04T1  Ethernet1       None                10.16.205.103   LeafRouter
```

show interfaces pktdrops

Displays detailed packet drop counters for all interfaces. The optional `nonzero` argument displays only nonzero counters.

- `show interfaces pktdrops [nonzero]`

```
admin@sonic:~$ show interfaces pktdrops

  IFACE      COUNTER                     COUNT    CHANGE
  ---------  ----------------------  -------  --------
  Ethernet0  RIPD4                         0        +0
  Ethernet0  RIPHE4                        0        +0
  Ethernet0  RIPD6                         0        +0
  Ethernet0  RIPHE6                        0        +0
  Ethernet0  RPORTD                        0        +0
  Ethernet0  RPARITYD                      0        +0
  Ethernet0  ING_NIV_RX_FRAMES_ER          0        +0
  Ethernet0  ING_NIV_RX_FRAMES_FO          0        +0
  Ethernet0  ING_ECN_COUNTER_64            0        +0
  Ethernet0  EGR_ECN_COUNTER_64            0        +0
  Ethernet0  TPCE_64                       0        +0
  Ethernet0  RFCS                          0        +0
  Ethernet0  RXUO                          0        +0
  Ethernet0  RXUDA                         0        +0
  Ethernet0  RXWSA                         0        +0
  Ethernet0  RALN                          0        +0
  Ethernet0  RFLR                          0        +0
  Ethernet0  RERPKT                        0        +0
  Ethernet0  RFCR                          0        +0
  Ethernet0  ROVR                          0        +0
  Ethernet0  RJBR                          0        +0
  Ethernet0  RMTUE                         0        +0
  Ethernet0  RTRFU                         0        +0
  Ethernet0  CLMIB_RSCHCRC                 0        +0
  Ethernet0  RUND                          0        +0
  Ethernet0  RFRG                          0        +0
  Ethernet0  RRPKT                         0        +0
  Ethernet0  TJBR                          0        +0
  Ethernet0  TFCS                          0        +0
  Ethernet0  TEDF                          0        +0
  Ethernet0  TSCL                          0        +0
  Ethernet0  TMCL                          0        +0
  Ethernet0  TLCL                          0        +0
  Ethernet0  TXCL                          0        +0
  Ethernet0  TFRG                          0        +0
  Ethernet0  TERR                          0        +0
  Ethernet0  TRPKT                         0        +0
  Ethernet0  TUFL                          0        +0
  Ethernet0  CLMIB_XTHOL                   0        +0
  Ethernet0  PERQ_DROP_PKT(0)              0        +0
```

```
  Ethernet0  PERQ_DROP_PKT(1)               0        +0
  Ethernet0  PERQ_DROP_PKT(2)               0        +0
  Ethernet0  PERQ_DROP_PKT(3)               0        +0
  Ethernet0  PERQ_DROP_PKT(4)               0        +0
  Ethernet0  PERQ_DROP_PKT(5)               0        +0
  Ethernet0  PERQ_DROP_PKT(6)               0        +0
  Ethernet0  PERQ_DROP_PKT(7)               0        +0
  Ethernet0  PERQ_DROP_PKT(8)               0        +0
  Ethernet0  PERQ_DROP_PKT(9)               0        +0
  Ethernet0  DROP_PKT_ING                   0        +0
  Ethernet0  DROP_PKT_YEL                   0        +0
  Ethernet0  DROP_PKT_RED                   0        +0
  Ethernet0  OBM_LOSSY_LO_DRP_PKT(0)        0        +0
  Ethernet0  OBM_LOSSY_HI_DRP_PKT(0)        0        +0
  Ethernet0  OBM_LOSSLESS0_DRP_PK(0)        0        +0
  Ethernet0  OBM_LOSSLESS1_DRP_PK(0)        0        +0
```

```
admin@sonic:~$ show interfaces pktdrops

  COUNTER                   DESCRIPTION
  ------------------------  ------------------------------------
  RIPD4                     Rx IPv4 L3 discards
  RIPHE4                    Rx IPv4 L3 IP Header Errors
  RIPD6                     Rx IPv6 L3 discards
  RIPHE6                    Rx IPv6 L3 IP Header Errors
  RDISC                     Rx discards
  RPORTD                    Rx PortInDiscards
  RPARITYD                  Rx Parity errors
  IUNHGI_64                 Rx unknown HGI pkts
  ING_NIV_RX_FRAMES_ER      VNTAG/ETAG format errors
  ING_NIV_RX_FRAMES_FO      NIV/PE forwarding errors
  ING_ECN_COUNTER_64        Ingress ECN packets
  EGR_ECN_COUNTER_64        ECN errors
  TPCE_64                   Egress purge and cell Error drops
  RFCS                      Rx FCS error frames
  RXUO                      Rx unsupported Opcode frames
  RXUDA                     Rx unsupported DA for PAUSE/PFC
  RXWSA                     Rx wrong SA frames
  RALN                      Rx Alignment Errors
  RFLR                      Rx length out of range
  RERPKT                    Rx code errors
  RFCR                      Rx False carrier
  ROVR                      Rx oversized
  RJBR                      Rx Jabber frames
  RMTUE                     Rx MTU check error frames
  RTRFU                     Rx trauncated frames
  CLMIB_RSCHCRC             Rx SCH CRC Error
  RUND                      Rx undersize
  RFRG                      Rx frаments
  RRPKT                     Rx RUNT frames
  TJBR                      Tx Jabbers
  TFCS                      Tx FCS errors
  TEDF                      Tx Multiple Deferral frames
  TSCL                      Tx single collision frames
  TMCL                      Tx Multiple collision frames
  TLCL                      Tx Late collision frames
  TXCL                      Tx Excessive collision frames
  TFRG                      Tx Fragments
  TERR                      Tx Errors
  TRPKT                     Tx RUNT frames
  TUFL                      Tx FIFO underrun
  CLMIB_XTHOL               Tx End-to-End HOL packets
  PERQ_DROP_PKT(0)          Packet drops on queue #0
  PERQ_DROP_PKT(1)          Packet drops on queue #1
  PERQ_DROP_PKT(2)          Packet drops on queue #2
  PERQ_DROP_PKT(3)          Packet drops on queue #3
  PERQ_DROP_PKT(4)          Packet drops on queue #4
  PERQ_DROP_PKT(5)          Packet drops on queue #5
  PERQ_DROP_PKT(6)          Packet drops on queue #6
  PERQ_DROP_PKT(7)          Packet drops on queue #7
  PERQ_DROP_PKT(8)          Packet drops on queue #8
  PERQ_DROP_PKT(9)          Packet drops on queue #9
```

```
  PERQ_WRED_DROP_PKT_U(0)  WRED Drops on queue #0
  PERQ_WRED_DROP_PKT_U(1)  WRED Drops on queue #1
  PERQ_WRED_DROP_PKT_U(2)  WRED Drops on queue #2
  PERQ_WRED_DROP_PKT_U(3)  WRED Drops on queue #3
  PERQ_WRED_DROP_PKT_U(4)  WRED Drops on queue #4
  PERQ_WRED_DROP_PKT_U(5)  WRED Drops on queue #5
  PERQ_WRED_DROP_PKT_U(6)  WRED Drops on queue #6
  PERQ_WRED_DROP_PKT_U(7)  WRED Drops on queue #7
  PERQ_WRED_DROP_PKT_U(8)  WRED Drops on queue #8
  PERQ_WRED_DROP_PKT_U(9)  WRED Drops on queue #9
  DROP_PKT_ING             MMU drops due to THDI(input threshold)
  DROP_PKT_YEL             MMU YELLOW drops
  DROP_PKT_RED             MMU RED drops
  OBM_LOSSY_LO_DRP_PKT(0)  OBM Lossy Low drops
  OBM_LOSSY_HI_DRP_PKT(0)  OBM Lossy high drops
  OBM_LOSSLESS0_DRP_PK(0)  OBM lossless0 drops
  OBM_LOSSLESS1_DRP_PK(0)  OBM lossless1 drops
```

show interfaces portchannel

Displays information regarding port-channel interfaces.

- `show interfaces portchannel`

```
admin@sonic:~$ show interfaces portchannel
Flags: A - active, I - inactive, Up - up, Dw - Down, N/A - not available, S - selected, D
- deselected
  No.  Team Dev       Protocol     Ports
-----  -------------  -----------  --------------------------
   24  PortChannel24  LACP(A)(Up)  Ethernet28(S) Ethernet24(S)
   48  PortChannel48  LACP(A)(Up)  Ethernet52(S) Ethernet48(S)
   40  PortChannel40  LACP(A)(Up)  Ethernet44(S) Ethernet40(S)
    0  PortChannel0   LACP(A)(Up)  Ethernet0(S) Ethernet4(S)
    8  PortChannel8   LACP(A)(Up)  Ethernet8(S) Ethernet12(S)
```

show interface status

Displays some more fields such as lanes, speed, MTU, type, asymmetric PFC status, and also the operational and administrative status of the interfaces.

- `show interfaces status [interface_name]`

```
admin@sonic:~$ show interfaces status
Interface            Lanes    Speed    MTU            Alias    Oper    Admin    Type
Asym PFC
-----------  ---------------  -------  -----  ---------------  ------  -------  ------
----------
Ethernet0      49,50,51,52     100G   9100   hundredGigE1/1    down       up     N/
A         off
Ethernet4      53,54,55,56     100G   9100   hundredGigE1/2    down       up     N/
A         off
Ethernet8      57,58,59,60     100G   9100   hundredGigE1/3    down     down     N/
A         off
<continues to display all the interfaces>
```

```
admin@sonic:~$ show interface status Ethernet0
Interface     Lanes    Speed    MTU            Alias    Oper    Admin
-----------  --------  -------  -----  --------------  ------  -------
Ethernet0   101,102      40G   9100   fortyGigE1/1/1      up       up
```

Interface configuration commands

- `ip` — add or remove IP address for the interface
- `pfc` — set the PFC configuration for the interface
- `shutdown` — administratively shut down the interface
- `speed` — set the interface speed
- `startup` — bring up the administratively shutdown interface
- `description` — set a description for the interface
- `fec` — set the forward-error-correction mode to rs, fc or none

- `mtu` — set the MTU value (1548 to 9216)
- `vrf` — bind or unbind interface to a VRF
- `vrrp` — apply VRRP configurations on interface
- `ipv6` — enable or disable using link-local address only on the interface

config interface

Configures interface.

- `sudo config interface interface_subcommand interface_name`
- ```
  admin@sonic:~$ sudo config interface startup Ethernet63
  ```

config interface ip add

Adds the IP address for an interface. IP address for either physical interface or for port-channel or for VLAN interface can be configured using this command.

- `config interface ip add ip_addr`
- ```
  admin@sonic:~$ sudo config interface ip add Ethernet63 10.11.12.13/24
  ```

config interface ip add vlan

Adds the IP address for a VLAN interface.

- `config interface ip add ip_addr vlan_IDName`
- ```
  admin@sonic:~$ sudo config interface ip add vlan100 10.11.12.13/24
  ```

config interface ip remove

Removes an interface.

- `config interface ip remove interface_name ip_addr`
- ```
  admin@sonic:~$ sudo config interface ip remove Ethernet63 10.11.12.13/24
  ```

config interface ip remove vlan

Removes a VLAN interface.

- `config interface ip remove vlan_IDName ip_addr`
- ```
  admin@sonic:~$ sudo config interface ip remove vlan100 10.11.12.13/24
  ```

config loopback add

Once a loopback interface is created, you can bind the interface to a VRF, assign IP address, and so on.

- `config loopback add Loopback0-999`
- ```
  admin@sonic:~$ sudo config loopback add Loopback7
  ```

config looopback del

Deletes an existing loopback interface.

- `config loopback del Loopback0-999`
- ```
  admin@sonic:~$ sudo config loopback del Loopback7
  ```

config interface pfc asymmetric

Sets the asymmetric PFC for an interface to either on or off.

- `config interface pfc asymmetric interface_name [on |off]`
- ```
  admin@sonic:~$ sudo config interface pfc asymmetric Ethernet60 on
  ```

config interface shutdown

Administratively shuts down either the physical interface or port-channel interface.

- `config interface shutdown <interface_name`

- ```
  admin@sonic:~$ sudo config interface shutdown Ethernet63
  ```

config interface startup

Administratively brings up the physical interface or port channel interface. The startup of multiple physical interfaces can be done by providing range of interface names.

- `config interface startup interface_name(s)`
- ```
  admin@sonic:~$ sudo config interface startup Ethernet63
  ```

```
admin@sonic:~$ sudo config interface startup Ethernet0-62
```

config interface speed

Configures the speed for the [hysical interface. Use the value 40000 for setting it to 40G and 100000 for 100G. You must know the device to configure it properly. Dynamic breakout feature is yet to be supported, and you cannot configure any values other than 40G and 100G.

- `config interface speed interface_name speed_value`
- ```
  admin@sonic:~$ sudo config interface speed Ethernet63 40000
  ```

config interface description

Configures a user-defined description to an interface. The description can be cleared by giving value for description as None.

- `config interface description interface_name interface_description`
- ```
  admin@sonic:~$ sudo config interface description Ethernet60 South-bound
  ```

```
admin@sonic:~$ sudo config interface description Ethernet64 "North-bound interface to
Spine1"
```

```
admin@sonic:~$ show interfaces description Ethernet64
  Interface    Oper    Admin          Alias                      Description
-----------  ------  -------  -------------  -------------------------------
 Ethernet64    down       up  hundredGigE53  North-bound interface to Spine1
```

```
admin@sonic:~$ sudo config interface description Ethernet60 None
```

config interface mtu

Sets the maximum transmission unit (MTU) for the physical interface. The permitted range of MTU value is 1548B to 9216B.

- `config interface mtu interface_name 1548-9216`
- ```
  admin@sonic:~$ sudo config interface mtu Ethernet48 9200
  ```

config interface fec

Configures the forward error correction mode for the physical interface. The permitted modes are rs (RS-FEC) , fc (FC-FEC) and none. The default mode is none. The FEC mode can be changed for multiple interfaces using a single command by providing range of interface names.

- `config interface fec interface_name(s) fec_mode`
- ```
  admin@sonic:~$ sudo config interface fec Ethernet63 rs
  ```

```
admin@sonic:~$ sudo config interface fec Ethernet0-76 none
```

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Associate/disassociate an interface to/from a VRF

Bind an interface to a VRF

Binds an interface to a specific VRF. By default, all interfaces are part of default VRF. If an interface is already associated with a VRF, run this command to move the interface to a different VRF without disassociating the interface from the prior VRF.

When an interface is moved from one VRF to another, SONIC automatically deletes all the IPv4/IPv6 addresses configured on that interface. To remove an interface from a VRF to the default VRF, use `vrf unbind`. The interface and VRF must exist for this command to succeed. Interface can be Ethernet, Vlan, PortChannel, or Loopback. To successfully bind an interface to VRF, interface should not be a member of a PortChannel or a VLAN

config interface vrf bind

- `config interface vrf bind interface_name vrf_name`
- ```
  admin@sonic:~$ sudo config interface vrf bind Ethernet12 Vrf-Green
  ```

```
admin@sonic:~$ sudo config interface vrf bind PortChannel017 Vrf-Red
```

```
admin@sonic:~$ sudo config interface vrf bind Vlan27 Vrf-Green
```

```
admin@sonic:~$ sudo config interface vrf bind Loopback7 Vrf-Green
```

Unbinding an interface from a VRF

Disassociates an interface from a specific VRF and move the interface to the default VRF. While disassociating the interface, the IPv4/IPv6 addresses configured on that interface are automatically deleted.

config interface vrf unbind

- `config interface vrf unbind interface_name vrf_name`
- ```
  admin@sonic:~$ sudo config interface vrf unbind Ethernet12 Vrf-Green
  ```

```
admin@sonic:~$ sudo config interface vrf unbind PortChannel017 Vrf-Red
```

```
admin@sonic:~$ sudo config interface vrf unbind Vlan27 Vrf-Green
```

```
admin@sonic:~$ sudo config interface vrf unbind Loopback7 Vrf-Green
```

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Portgroup configuration and show

Specific hardware platforms have limitations that specific ports need to be set up at same speed together. The ports for which the speed has to be set together are grouped into multiple port groups. The `portgroup` command is used to configure port speed in same portgroup.

Portgroup show commands

show portgroup

Displays portgroup information of the current platform. It displays each portgroup, ports belong to each portgroup, and valid speeds for each portgroup.

- `show portgroup`
- ```
  admin@sonic:~$ show portgroup
    portgroup          ports      valid speeds
  -----------  -------------  ----------------
            1   Ethernet0-11  25000,10000,1000
            2  Ethernet12-23  25000,10000,1000
            3  Ethernet24-35  25000,10000,1000
            4  Ethernet36-47  25000,10000,1000
  ```

Portgroup config commands

config portgroup

Configures portgroup speed.

- `config portgroup speed` *speed*
- ```
  admin@sonic:~$ sudo config portgroup speed 1 10000
  Config portgroup 1 speed 10000
  ```

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Interface naming mode configuration and show

Interface naming mode show commands

show interface naming mode

Displays the current interface naming mode.

```
admin@sonic:~$ show interfaces naming_mode
**default**
- "default" is the name of the default naming_mode since users have not modified it in this
example.

Following example shows the modified interface_naming_mode
admin@sonic:~$ show interfaces naming_mode
**alias**
```

Interface naming mode configuration commands

config interface naming mode

Changes the interface naming mode. You can select between default mode (SONiC interface names) or alias mode (Hardware vendor names). You must log out and log back in to SONiC for the changes to take effect. That the newly applied interface mode effects all interface-related `show` and `config` commands.

NOTE: Some platforms do not support alias mapping.

- `config interface_naming_mode (default | alias)`
-

```
admin@sonic:~$ show interfaces naming_mode
default

admin@sonic:~$ show interface status Ethernet0

  Interface     Lanes    Speed    MTU            Alias    Oper    Admin
-----------  --------  -------  -----  --------------  ------  -------
  Ethernet0   101,102      40G   9100   fortyGigE1/1/1      up       up

admin@sonic:~$ sudo config interface_naming_mode alias
Please logout and log back in for changes take effect.
```

```
admin@sonic:~$ sudo config interface_naming_mode alias
Please logout and log back in for changes take effect.
```

```
admin@sonic:~$ show interfaces naming_mode
alias

admin@sonic:~$ sudo config interface fortyGigE1/1/1 shutdown
```

```
admin@sonic:~$ show interface status fortyGigE1/1/1

  Interface     Lanes    Speed    MTU            Alias    Oper    Admin
-----------  --------  -------  -----  --------------  ------  -------
  Ethernet0   101,102      40G   9100   fortyGigE1/1/1    down     down
```

22

IP show

IP show commands

show ip route

Displays either all route entries from the routing table or a specific route. VRF is an optional keyword to view IP routes in a specific VRF or all VRFs. If the VRF parameter is not used, all routes from the default VRF display.

- `show ip route [ip_address] [vrf {all | vrf_name}]`

```
admin@sonic:~$ show ip route
Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, P - PIM, A - Babel,
       > - selected route, * - FIB route
  S>* 0.0.0.0/0 [200/0] via 10.11.162.254, eth0
  C>* 1.1.0.0/16 is directly connected, Vlan100
  C>* 10.1.0.1/32 is directly connected, lo
  C>* 10.1.0.32/32 is directly connected, lo
  C>* 10.1.1.0/31 is directly connected, Ethernet112
  C>* 10.1.1.2/31 is directly connected, Ethernet116
  C>* 10.11.162.0/24 is directly connected, eth0
  C>* 10.12.0.102/32 is directly connected, lo
  C>* 127.0.0.0/8 is directly connected, lo
  C>* 240.127.1.0/24 is directly connected, docker0
```

```
admin@sonic:~$ show ip route 10.1.1.0
Routing entry for 10.1.1.0/31
  Known via "connected", distance 0, metric 0, best
  * directly connected, Ethernet112
```

```
admin@sonic:~$ show ip route vrf Vrf-Core
Codes: K - kernel route, C - connected, S - static, R - RIP,
       O - OSPF, I - IS-IS, B - BGP, E - EIGRP, N - NHRP,
       T - Table, v - VNC, V - VNC-Direct, A - Babel, D - SHARP,
       F - PBR, f - OpenFabric,
       > - selected route, * - FIB route # - not installed in hardware

VRF Vrf-Core:
C>*  179.13.79.0/24 is directly connected, Ethernet204, 00:00:40
C>*  192.168.42.0/24 is directly connected, Ethernet208, 00:00:37
```

show ip interfaces

Displays details about all Layer 3 IP interfaces with an IP address assigned. This command output displays the associated VRF for each L3 interface, and the associated VRF name. If an interface belongs to the default VRF, the VRF name displays as blank. The Flags field displays any flags that are associated with the interface.

- `show ip interfaces`

```
admin@sonic:~$ show ip interfaces
Interface       IPv4 address/mask    Master    Admin/Oper       Flags
--------------  -------------------  --------  ------------     -------
Ethernet100     161.29.39.25/27      Vrf-Edge  up/down
                12.46.83.58/29
Ethernet200     64.27.33.48/21       Vrf-Core  up/down
Ethernet204     179.13.79.31/24      Vrf-Core  up/up
Ethernet208     192.168.42.91/24     Vrf-Core  up/up
Ethernet212     27.135.72.19/24      Vrf-Core  up/down
Ethernet220        3.3.3.3/32                   down/down        U
Loopback1          3.3.3.3/32                   up/up
PortChannel213  71.141.26.9/24       Vrf-Core  up/down
Vlan234         10.27.22.219/31      Vrf-Core  down/down
```

```
docker0          240.127.1.1/24                 up/down
eth0             10.59.143.45/20                up/up
lo               127.0.0.1/8                    up/up
```

IPv4 interface types:

- Front-panel physical ports
- PortChannel interface
- VLAN interface
- Loopback interface
- Management interface
- IPv4 unnumbered interface

show ip protocol

Displays the route-map that is configured for the routing protocol. See the routing stack Quagga Command Reference or FRR Command Reference to know more about this command.

- `show ip protocol`

```
admin@sonic:~$ show ip protocol
Protocol    : route-map
------------------------
system      : none
kernel      : none
connected   : none
static      : none
rip         : none
ripng       : none
ospf        : none
ospf6       : none
isis        : none
bgp         : RM_SET_SRC
pim         : none
hsls        : none
olsr        : none
babel       : none
any         : none
```

IPv6 show commands

show ipv6 route

Displays either all IPv6 route entries from the routing table, or a specific IPv6 route. This command displays IPv6 routes from a specific VRF, or all VRFs. If the VRF is not specified, the routes display from the default VRF.

- `show ipv6 route [ipv6_address] [vrf {all | vrf_name}]`

```
admin@sonic:~$ show ipv6 route
  Codes: K - kernel route, C - connected, S - static, R - RIPng,
         O - OSPFv6, I - IS-IS, B - BGP, A - Babel,
         > - selected route, * - FIB route

  C>* ::1/128 is directly connected, lo
  C>* 2018:2001::/126 is directly connected, Ethernet112
  C>* 2018:2002::/126 is directly connected, Ethernet116
  C>* fc00:1::32/128 is directly connected, lo
  C>* fc00:1::102/128 is directly connected, lo
  C>* fc00:2::102/128 is directly connected, eth0
  C * fe80::/64 is directly connected, Vlan100
  C * fe80::/64 is directly connected, Ethernet112
  C * fe80::/64 is directly connected, Ethernet116
  C * fe80::/64 is directly connected, Bridge
  C * fe80::/64 is directly connected, PortChannel0011
  C>* fe80::/64 is directly connected, eth0
```

```
admin@sonic:~$ show ipv6 route  fc00:1::32
Routing entry for fc00:1::32/128
```

```
  Known via "connected", distance 0, metric 0, best
  * directly connected, lo
```

```
admin@sonic:~$ show ipv6 route vrf Vrf-Core
Codes: K - kernel route, C - connected, S - static, R - RIPng,
       O - OSPFv3, I - IS-IS, B - BGP, N - NHRP, T - Table,
       v - VNC, V - VNC-Direct, A - Babel, D - SHARP, F - PBR,
       f - OpenFabric,
       > - selected route, * - FIB route # - not installed in hardware

VRF Vrf-Core:
C *  fe80::/64 is directly connected, Ethernet208, 00:17:01
C>*  fe80::/64 is directly connected, Ethernet204, 00:17:04
K>*  ff00::/8 [0/256] is directly connected, Ethernet208, 00:17:01
```

show ipv6 interfaces

Displays the details about all Layer 3 IPv6 interfaces that have an IPv6 address assigned. The command output displays each interface that is associated with a VRF, and the associated VRF. A blank VRF name indicates that the interface belongs to the default VRF.

- `show ipv6 interfaces`

```
admin@sonic:~$ show ipv6 interfaces
Interface       IPv6 address/mask                          Master     Admin/Oper
--------------  -----------------------------------------  ---------  ------------
Bridge          fe80::d494:dcff:fe37:535e%Bridge/64                   up/down
Ethernet200     3001::1/64                                 Vrf-Core   up/down
Ethernet204     2001::1/64                                 Vrf-Core   up/up
                fe80::3e2c:99ff:fe2d:8235%Ethernet204/64
Ethernet208     fe80::3e2c:99ff:fe2d:8235%Ethernet208/64   Vrf-Core   up/up
Ethernet112     2018:2001::1/126                           Vrf-Red    up/up
                fe80::3617:ebff:fe38:100%Ethernet112/64
Ethernet116     2018:2002::1/126                           Vrf-Green  up/up
                fe80::3617:ebff:fe38:100%Ethernet116/64
PortChannel213  4001::1/64                                 Vrf-Core   up/down
Vlan27          6001::1/64                                 Vrf-Green  down/down
Vlan100         5001::1/64                                 Vrf-Edge   down/down
eth0            fe80::3e2c:99ff:fe2d:8235%eth0/64                     up/up
lo              ::1/128                                               up/up
```

IPv6 interface types:

- Front-panel physical ports
- PortChannel interface
- VLAN interface
- Loopback interface
- Management interface

show ipv6 protocol

Displays the route-map that is configured for the IPv6 routing protocol. See the routing stack Quagga Command Reference or FRR Command Reference to know more about this command.

- `show ipv6 protocol`

```
admin@sonic:~$ show ipv6 protocol
Protocol    : route-map
------------------------
system      : none
kernel      : none
connected   : none
static      : none
rip         : none
ripng       : none
ospf        : none
ospf6       : none
isis        : none
bgp         : RM_SET_SRC6
pim         : none
hsls        : none
olsr        : none
```

```
babel        : none
any          : none
```

23

Flow-based services configuration, show, and clear

Flow-based services configuration commands

Create classifier

Adds a classifier.

- `config classifier add [OPTIONS] name`
  - `-m, --match-type match-type` — (Optional) Match type to ACL or fields (required)
  - `-d, --description description` — (Optional) Classifier description
- ```
  admin@sonic:~$ sudo config classifier add class0 -m acl
  ```

Update classifier with match parameters

Updates a classifier with flow identification criteria.

- `config classifier update [OPTIONS] name`
  - `--acl acl-name` — (Optional) Adds an ACL table name for flow classification
  - `--no-acl` — (Optional) Deletes an ACL table name for flow classification
  - `--src-mac scr-mac` — (Optional) Matches the source MAC address in xx-xx-xx-xx-xx-xx [/xx-xx-xx-xx-xx-xx] format
  - `--no-src-mac` — (Optional) Deletes the match on the source MAC address
  - `--dst-mac dst-mac` — (Optional) Matches the destination MAC address in xx-xx-xx-xx-xx-xx [/xx-xx-xx-xx-xx-xx] format
  - `--no-dst-mac` — (Optional) Deletes the match on the destination MAC address
  - `--ether-type ether-type` — (Optional) Matches the ethertype in hex or decimal format (1536 to 65535)
  - `--no-ether-type` — (Optional) Deletes the match on ethertype
  - `--pcp pcp` — (Optional) Matches on PCP (0 to 7)
  - `--no-pcp` — (Optional) Deletes the match on PCP
  - `--scr-ip scr-ip` — (Optional) Matches the source IP address in A.B.C.D/mask format
  - `--no-src-ip` — (Optional) Deletes the match on the source IP address
  - `--dst-ip dst-ip` — (Optional) Matches on the destination IP address in A.B.C.D/mask format
  - `--no-dst-ip` — (Optional) Deletes the match on the destination IP address
  - `--src-ipv6 src-ipv6` — (Optional) Matches the source IPv6 address in X::X/mask format
  - `--no-src-ipv6` — (Optional) Deletes the match on the source IPv6 address
  - `--dst-ipv6` — (Optional)Matches on the destination IPv6 address in X::X/mask format
  - `--no-dst-ipv6` — (Optional) Deletes the match on the destination IPv6 address
  - `--ip-proto ip-proto` — (Optional) Matches on the IP protocol/next header (0 to 255)
  - `--no-ip-proto` — (Optional) Deletes the match on the IP protocol/next header
  - `--src-port value or begin-end` — (Optional) Matches on the source port or source port range (to 65535)
  - `--no-src-port` — (Optional) Deletes the match on the source port or source port range
  - `--dst-port dst-port` — (Optional) Matches on the destination port or destination port range (0 to 65535)
  - `--no-dst-port` — (Optional) Deletes the match on the destination port or destination port range
  - `--tcp-flags tcp-flags` — (Optional) Matches on the TCP flags (`fin not-fin syn not-syn rst not-rst psh not-psh ack not-ack urg not- urg ece not-ece cwr not-cwr` in comma-separated format)
  - `--no-tcp-flags` — (Optional) Deletes the match on the TCP flags
  - `--dscp dscp` — (Optional) Matches on the DSCP value (0 to 63)
  - `--no-dscp` — (Optional) Deletes the match on the DSCP value
  - `-d, --description description` — (Optional) Text description
  ```

- ```
  admin@sonic:~$ sudo config classifier update class0 -a l3_ACL_0
  ```

Delete classifier

Deletes an existing classifier.

- `config classifier del name`
- ```
  admin@sonic:~$ sudo config classifier del class1
  ```

Add policy

Adds a flow-based services policy.

- `config policy add [OPTIONS] name`
  - `-t, --type {qos | monitoring}` — (Optional) Policy type (required)
  - `-d, --description description` — (Optional) Text description
- ```
  admin@sonic:~$ sudo config policy add flow1
  ```

Delete policy

Deletes a flow-based services policy.

- `config policy del name`
- ```
  admin@sonic:~$ sudo config policy del flow1
  ```

Add flow that is identified by a classifier to a policy

Adds a flow to a policy.

- `config flow add [OPTIONS] policy name classifier_name`
  - `-p, --priority type` — (Optional) Flow priority (0 to 1023)
  - `-d, --description description` — (Optional) Text description
- ```
  admin@sonic:~$ sudo config flow add policy1 class1
  ```

Delete flow that is identified by a classifier to a policy

Deletes a flow from a policy.

- `config flow del policy_name classifier_name`
- ```
  admin@sonic:~$ sudo config flow del policy1 class1
  ```

Add actions to flows

Adds or updates flow results.

- `config flow update [OPTIONS] policy_name classifier_name`
  - `-p, --priority type` — (Optional) Flow priority (0 to 1023)
  - `--set-dscp value` — (Optional) DSCP remark to value (0 to 63)
  - `--no-set-dscp` — (Optional) Deletes DSCP remark action
  - `--set-pcp value` — (Optional) PCP remark to value (0 to 7)
  - `--no-set-pcp` — (Optional) Deletes PCP remark action
  - `--policer` — (Optional) Adds rate limiting action
  - `--no-policer` — (Optional) Deletes rate limiting action
  - `--cir cir` — (Optional) Conforms rate
  - `--cbs cbs` — (Optional) Conforms burst size
  - `--pir pir` — (Optional) Peak rate
  - `--pbs pbs` — (Optional) Peak burst rate
  - `--mirror-session session_name` — (Optional) Sets mirror destination
  - `--no-mirror-session` — (Optional) Deletes mirror destination
  - `-d, --description description` — (Optional) Text description
- ```
  admin@sonic:~$ sudo config flow update policy1 class1
  ```
  ```

The policers are implicitly configured as TRTCM policers of type bytes in color, blind mode, and drop as default action for packets of color red.

Apply and remove the policy to interface

Applies a policy to an interface.

- `config service-policy bind interface_name type stage policy-name`
- ```
  admin@sonic:~$ sudo config service-policy bind Eth1 qos 1 policy1
  ```

  ```
  admin@sonic:~$ sudo config service-policy unbind Eth1 qos 1 policy1
  ```

Examples

Create classifier class0

```
admin@sonic:~$ sudo config classifier add class0 -m acl
admin@sonic:~$ sudo config classifier update class0 -a l3_ACL_0
```

Create classifier class1

```
admin@sonic:~$ sudo config classifier add class1 -m acl
admin@sonic:~$ sudo config classifier update class1 -a l2_ACL_0
```

Create policy policy0

```
admin@sonic:~$ sudo config policy add policy0 -t qos
```

Create flow using classifier class0 and set results

```
admin@sonic:~$ sudo config flow add policy0 class0 -p 200
admin@sonic:~$ sudo config flow update policy0 class0 --set-dscp 15 --set-pcp 5
```

```
admin@sonic:~$ sudo config flow add policy0 class1 -p 100
admin@sonic:~$ sudo config flow update policy0 class1 --set-dscp 30 --set-pcp 2
```

Apply policy to required interface

```
admin@sonic:~$ sudo config service-policy bind Ethernet0 qos in policy0
admin@sonic:~$ sudo config service-policy bind Ethernet4 qos in policy0
admin@sonic:~$ sudo config service-policy bind Ethernet8 qos out policy0
```

Flow-based services show and clear commands

Show classifier details

Displays flow-based services classifiers-related information.

- `show classifier [OPTION] [NAME]`
  - `-m, --match-type match-type` — (Optional) Classifier type ACL or fields
- ```
  admin@sonic:~$ show classifier
  ```

  ```
  admin@sonic:~$ show classifier class0
  classifier class0 match-type acl
    match-acl l3_ACL_0
    Referenced in flows:
      policy policy0 at priority 200
  ```

  ```
  admin@sonic:~$ show classifier fields_class_0
  Classifier fields_class_0 match-type fields
    Description:
    Match:
      src-ip 40.1.1.100/32
    Referenced in flows:
  ```

```
    policy mon_policy_0 at priority 999
    policy qos_policy_0 at priority 999
```

Show policy details

Displays flow-based services policies related information.

- `show policy [OPTIONS] [NAME]`
  - `-f, --flow flow` — (Optional) Display information only for flow identified by classifier
  - `-t, --type type` — (Optional) Policy type (qos)

```
admin@sonic:~$ show policy qos_policy_0
Policy qos_policy_0 Type qos
  Description:
  Flow fields_class_0 at priority 999
    Description:
    set-pcp 1
    set-pcp 1
    police cir 10000000 cbs 1000000 pir 0 pbs 0
  Flow fields_class_1 at priority 998
    Description:
    set-pcp 2
    set-pcp 2
    police cir 20000000 cbs 2000000 pir 0 pbs 0
  Flow fields_class_2 at priority 997
    Description:
    set-pcp 3
    set-pcp 3
    police cir 30000000 cbs 3000000 pir 0 pbs 0
  Flow fields_class_3 at priority 996
    Description:
    set-pcp 4
    set-pcp 4
    police cir 40000000 cbs 4000000 pir 0 pbs 0
  Applied to:
    Ethernet0 at ingress
```

```
admin@sonic:~$ show policy mon_policy_0
Policy mon_policy_0 Type monitoring
  Description:
  Flow fields_class_0 at priority 999
    Description:
    mirror-session ERSPAN_DestIP_50.1.1.2
  Flow fields_class_1 at priority 998
    Description:
    mirror-session ERSPAN_DestIP_60.1.1.2
  Flow fields_class_2 at priority 997
    Description:
    mirror-session ERSPAN_DestIP_50.1.1.2
  Flow fields_class_3 at priority 996
    Description:
    mirror-session ERSPAN_DestIP_60.1.1.2
  Applied to:
    Ethernet0 at ingress
```

Show policy binding summary

Displays a summary of applied flow-based services policies.

- `show service-policy [OPTIONS]`
  - `-i, --interface interface` — (Optional) Interface name
  - `-t, --type type` — (Optional) Policy type (qos)

```
admin@sonic:~$ show service-policy summary
Ethernet0
  qos policy policy0 at ingress
  monitoring policy mon_policy_0 at ingress
Ethernet4
  qos policy policy0 at ingress
```

```
Ethernet8
  qos policy policy0 at egress
```

```
admin@sonic:~$ show service-policy summary -i Ethernet0
Ethernet0
  qos policy policy0 at ingress
```

Show/clear policy binding and counters for an interface

Displays details by interface name.

- `show service-policy interface [OPTIONS] interface_name`
  - `-t, --type type` — (Optional) Policy type (qos or monitoring)
  - `-s, --stage stage` — (Optional) Stage (in or out)
  - `-c, --clear` — (Optional) Clears statistics

```
admin@sonic:~$ show service-policy interface Ethernet0
Ethernet0
  Policy qos_policy_0 Type qos at ingress
  Description:
    Flow fields_class_3 at priority 996 (Active)
      Description:
      set-pcp 4
      set-dscp 4
      police: cir 40000000 cbs 4000000 pir 0 pbs 0
        type bytes mode color-blind
        operational cir 40000000 cbs 4000000 pir 0 pbs 0
        conformed 0 packets 0 bytes action forward
        exceed 0 frames 0 bytes action forward
        violated 0 frames 0 bytes action drop
      Packet matches: 0 frames 0 bytes
    Flow fields_class_2 at priority 997 (Active)
      Description:
      set-pcp 3
      set-dscp 3
      police: cir 30000000 cbs 3000000 pir 0 pbs 0
        type bytes mode color-blind
        operational cir 30000000 cbs 3000000 pir 0 pbs 0
        conformed 0 packets 0 bytes action forward
        exceed 0 frames 0 bytes action forward
        violated 0 frames 0 bytes action drop
      Packet matches: 0 frames 0 bytes
```

Show/clear policy binding and counters for a policy

Displays flow-based services applied policies information by policy name.

- `show service-policy policy [OPTIONS] policy_name`
  - `-t, --type type` — (Optional) Policy type (qos)
  - `-c, --clear` — (Optional) Clears statistics

```
admin@sonic:~$ show service-policy policy mon_policy_0
Ethernet0
  Policy mon_policy_0 Type monitoring at ingress
  Description:
    Flow fields_class_3 at priority 996 (Active)
      Description:
      mirror-session ERSPAN_DestIP_60.1.1.2
      Packet matches: 0 frames 0 bytes
    Flow fields_class_2 at priority 997 (Active)
      Description:
      mirror-session ERSPAN_DestIP_50.1.1.2
      Packet matches: 0 frames 0 bytes
    Flow fields_class_1 at priority 998 (Active)
      Description:
      mirror-session ERSPAN_DestIP_60.1.1.2
      Packet matches: 0 frames 0 bytes
    Flow fields_class_0 at priority 999 (Active)
      Description:
```

```
      mirror-session ERSPAN_DestIP_50.1.1.2
      Packet matches: 0 frames 0 bytes
```

24

IP helper configuration, show, and clear

IP helper show commands

show ip forward_protocol config

Displays the IP helper global configuration.

- `show ip forward_protocol config`
- ```
  admin@sonic:~$ show ip forward_protocol config

      UDP forwarding: Enabled

      UDP rate limit: 600 pps

      UDP forwarding enabled on the ports: TFTP , NTP , TACACS , 330 , 234, 1000

      UDP forwarding disabled on the ports: DNS , NetBios-Name-server , NetBios-datagram-
  server
  ```

show ip helper-address config

Displays the IP helper address configuration on all interfaces.

- `show ip helper-address config`
- ```
  admin@sonic:~$ show ip helper-address config

      Interface   Vrf         Relay address
      ------------------------------------
      Ethernet24              31.1.0.2
                              2.2.2.3
                  vrf20       11.19.0.144
      Ethernet28              31.1.0.2
  ```

show ip helper-address config

Displays the IP helper address configuration on a specific interface.

- `show ip helper-address config {interface}`
- ```
  admin@sonic:~$ show ip helper-address config Ethernet24

      Interface   Vrf         Relay address
      ------------------------------------
      Ethernet24              31.1.0.2
                              2.2.2.3
                  vrf20       11.19.0.144
  ```

show ip helper-address statistics

Displays the IP helper statistics on all interfaces.

- `show ip helper-address statistics`
- ```
  admin@sonic:~$ show ip helper-address statistics

  Ethernet24
  -----------
    Packets received                              : 1098
    Packets relayed                               :  980
    Packets dropped                               :  118
    Invalid TTL packets                           :   22
    All ones broadcast packets received           :  602
    Net directed broadcast packets received       :  496
  ```

```
Ethernet28
-----------
  Packets received                              : 100
  Packets relayed                               : 90
  Packets dropped                               : 10
  Invalid TTL packets                           : 5
  All ones broadcast packets received           : 50
  Net directed broadcast packets received       : 50
```

show ip helper-address statistics

Displays the IP helper statistics on a specific interface.

- `show ip helper-address statistics {interface}`
- ```
  admin@sonic:~$ show ip helper-address statistics Ethernet24

      Packets received                              : 1098
      Packets relayed                               :  980
      Packets dropped                               :  118
      Invalid TTL packets                           :   22
      All ones broadcast packets received           :  602
      Net directed broadcast packets received       :  496
  ```

IP helper configuration commands

config interface ip helper-address add

Adds an IP helper address on an interface.

- `config interface ip helper-address add {interface-name} {ip-address} [-vrf vrf-name]`
- ```
  admin@sonic:~$ sudo config interface ip helper_address add Ethernet28 22.22.22.22
  ```

```
admin@sonic:~$ sudo config interface ip helper_address add Ethernet24 22.22.22.22 -vrf
VrfBlue
```

config interface ip helper-address remove

Removes an IP helper address on an interface.

- `config interface ip helper-address remove {interface-name} {ip-address} [-vrf vrf-name]`
- ```
  admin@sonic:~$ sudo config interface ip helper_address remove Ethernet28 22.22.22.22
  ```

```
admin@sonic:~$ sudo config interface ip helper_address remove Ethernet24 22.22.22.22 -vrf
VrfBlue
```

config ip forward_protocol udp enable

Enables UDP broadcast forwarding. Use the `disable` option to disable UDP broadcast forwarding.

- `config ip forward_protocol udp [enable | disable]`
- ```
  admin@sonic:~$ sudo config ip forward_protocol udp enable
  ```

config ip forward_protocol udp add

Adds a UDP port to the list of forwarding ports.

- `config ip forward_protocol udp add {[tftp/dns/ntp/netbios-name-server/netbios-datagram-server/tacacs] | {port}}`
- ```
  admin@sonic:~$ sudo config ip forward_protocol udp add 330
  ```

```
admin@sonic:~$ sudo config ip forward_protocol udp add ntp
```

config ip forward_protocol udp remove
```

Removes a UDP port from the list of forwarding ports.

- `config ip forward_protocol udp remove {[tftp/dns/ntp/netbios-name-server/netbios-datagram-server/tacacs] | {port}}`
- ```
  admin@sonic:~$ sudo config ip forward_protocol udp remove 330
  ```

```
admin@sonic:~$ sudo config ip forward_protocol udp remove dns
```

config ip forward_protocol udp rate_limit

Configures UDP broadcast packet rate limiting value (600 to 10000 pps; default 600).

- `config ip forward_protocol udp rate_limit {value-in-pps}`
- ```
  admin@sonic:~$ sudo config ip forward_protocol udp rate_limit 5000
  ```

IP helper clear commands

sonic-clear ip helper-address statistics

Clears the relay statistics on all interfaces.

- `sonic-clear ip helper-address statistics`
- ```
  admin@sonic:~$ sonic-clear ip helper-address statistics
  IpHelper Address Statistics are cleared.
  ```

sonic-clear ip helper-address statistics

Clears the relay statistics on a specific interface.

- `sonic-clear ip helper-address statistics {interface}`
- ```
  admin@sonic:~$ sonic-clear ip helper-address statistics Ethernet28
  IpHelper Address Statistics are cleared on Ethernet28
  ```

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IPv4 unnumbered interface configuration

config interface ip unnumbered add

Configures an IPv4 unnumbered interface by specifying the donor interface from which the IPv4 address is borrowed.

- `config interface ip unnumbered add` *`interface_name donor_interface_name`*
- ```
  admin@sonic:~$ sudo config interface ip unnumbered add Ethernet0 Loopback1
  ```

  ```
  admin@sonic:~$ sudo config interface ip unnumbered add PortChannel1 Loopback1
  ```

config interface ip unnumbered del

Unconfigures an IPv4 unnumbered interface.

- `config interface ip unnumbered del` *`interface_name`*
- ```
  admin@sonic:~$ sudo config interface ip unnumbered del Ethernet0
  ```

  ```
  admin@sonic:~$ sudo config interface ip unnumbered del PortChannel1
  ```

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Link state tracking configuration and show

Link state tracking show commands

show link state group

Displays a link-state group, or a specific link-state group.

- `show link state group [group]`
- ```
  admin@sonic:~$ show link state group
  Name: MclagLinkTracking
  Description: Interface tracking for all MCLAGs
  Timeout: 120 seconds
  ```

  ```
  admin@sonic:~$ show link state group MclagLinkTracking
  Name: MclagLinkTracking
  Description: Interface tracking for all MCLAGs
  Timeout: 120 seconds
  Upstream Interfaces:
      Ethernet0 (Up)
      Ethernet4 (Up)
      Vlan100   (Up)
  Downstream Interfaces:
      PortChannel1 (Up)
      PortChannel2 (Up)
  ```

show link state group name

Displays a link-state group name.

- `show link state group group-name`
- ```
  admin@sonic:~$ show link state group MclagLinkTracking
  Name: MclagLinkTracking
  Description: Interface tracking for all MCLAGs
  Timeout: 60 seconds
  Upstream:
      Ethernet0 (Down)
      Ethernet4 (Down)
      Vlan100   (Down)
  Downstream:
      PortChannel1 (Disabled)
      PortChannel2 (Disabled)
  ```

Link state tracking configuration commands

config linktrack add

Adds an interface tracking group.

- `config link track add [OPTIONS] name`
  - `-u, --upstream upstream` — (Optional) Sets upstream interfaces
  - `-d, --downstream downstream` — (Optional) Sets downstream ports
  - `-t, --timeout timeout` — (Optional) Sets timeout value in seconds
  - `--description description` — (Optional) Sets group description
- ```
  admin@sonic:~$ sudo config linktrack add track1
  ```

config linktrack del
  ```

Deletes an interface tracking group.

- `config linktrack del [OPTIONS] name`
  - `-u, --upstream upstream` — (Optional) Sets upstream interfaces
  - `-d, --downstream downstream` — (Optional) Sets downstream ports
  - `-t, --timeout timeout` — (Optional) Sets timeout value in seconds
  - `--description description` — (Optional) Sets group description
- ```
  admin@sonic:~$ sudo config linktrack del track1
  ```

config linktrack update

Updates an interface tracking group.

- `config linktrack update [OPTIONS] name`
  - `-u, --upstream upstream` — (Optional) Sets upstream interfaces
  - `-d, --downstream downstream` — (Optional) Sets downstream ports
  - `-t, --timeout timeout` — (Optional) Sets timeout value in seconds
  - `--description description` — (Optional) Sets group description
- ```
  admin@sonic:~$ sudo config linktrack update track1
  ```

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LLDP show

show lldp table

Displays a brief summary of all LLDP neighbors.

- `show lldp table`

```
admin@sonic:~$ show lldp table
Capability codes: (R) Router, (B) Bridge, (O) Other
LocalPort    RemoteDevice       RemotePortID         Capability    RemotePortDescr
-----------  -----------------  -------------------  ------------  --------------------
Ethernet112  T1-1               hundredGigE1/2       BR            T0-2:hundredGigE1/29
Ethernet116  T1-2               hundredGigE1/2       BR            T0-2:hundredGigE1/30
eth0         swtor-b2lab2-1610  GigabitEthernet 0/2  OBR
-------------------------------------------------
Total entries displayed:  3
```

show lldp neighbors

Displays details about all LLDP neighbors or only the neighbors that are connected to a specific interface.

- `show lldp neighbors [interface_name]`

```
admin@sonic:~$ show lldp neighbors
------------------------------------------------------------------------------
LLDP neighbors:
------------------------------------------------------------------------------
Interface:    eth0, via: LLDP, RID: 1, Time: 0 day, 12:21:21
  Chassis:
    ChassisID:    mac 00:01:e8:81:e3:45
    SysName:      swtor-b2lab2-1610
    SysDescr:     Dell Force10 Networks Real Time Operating System Software. Dell Force10
Operating System Version: 1.0. Dell Force10 Application Software Version: 8.3.3.10d.
Copyright (c) 1999-2012 by Dell Inc. All Rights Reserved.Build Time: Tue Sep 22 11:21:54
PDT 2015
    TTL:          20
    Capability:   Repeater, on
    Capability:   Bridge, on
    Capability:   Router, on
  Port:
    PortID:       ifname GigabitEthernet 0/2
  VLAN:         162, pvid: yes
------------------------------------------------------------------------------
Interface:    Ethernet116, via: LLDP, RID: 3, Time: 0 day, 12:20:49
  Chassis:
    ChassisID:    mac 4c:76:25:e7:f0:c0
    SysName:      T1-2
    SysDescr:     Debian GNU/Linux 8 (jessie) Linux 4.9.0-8-amd64 #1 SMP Debian
4.9.110-3+deb9u6 (2015-12-19) x86_64
    TTL:          120
    MgmtIP:       10.11.162.40
    Capability:   Bridge, on
    Capability:   Router, on
    Capability:   Wlan, off
    Capability:   Station, off
  Port:
    PortID:       local hundredGigE1/2
    PortDescr:    T0-2:hundredGigE1/30
------------------------------------------------------------------------------
```

```
admin@sonic:~$ show lldp neighbors Ethernet112
show lldp neighbors Ethernet112
------------------------------------------------------------------------------
LLDP neighbors:
------------------------------------------------------------------------------
```

```
Interface:    Ethernet112, via: LLDP, RID: 2, Time: 0 day, 19:24:17
  Chassis:
    ChassisID:    mac 4c:76:25:e5:e6:c0
    SysName:      T1-1
    SysDescr:     Debian GNU/Linux 8 (jessie) Linux 4.9.0-8-amd64 #1 SMP Debian
4.9.110-3+deb9u6 (2015-12-19) x86_64
    TTL:          120
    MgmtIP:       10.11.162.41
    Capability:   Bridge, on
    Capability:   Router, on
    Capability:   Wlan, off
    Capability:   Station, off
  Port:
    PortID:       local hundredGigE1/2
    PortDescr:    T0-2:hundredGigE1/29
------------------------------------------------------------------------------
```

show lldp statistics

Displays LLDP packet statistics for all interfaces or a specific interface.

- `show lldp statistics [interface_name]`
-
```
admin@sonic:~$ show lldp statistics
  ------------------------------------------------------------------------------
  LLDP statistics:
  ------------------------------------------------------------------------------
  Interface:    Ethernet0
  Transmitted:  150
  Received:     145
  Discarded:    1
  Unrecognized: 0
  Ageout:       0
  Inserted:     0
  Deleted:      0
  ------------------------------------------------------------------------------
  Interface:    Ethernet1
  Transmitted:  0
  Received:     0
  Discarded:    1
  Unrecognized: 0
  Ageout:       0
  Inserted:     0
  Deleted:      0
  ------------------------------------------------------------------------------
  Interface:    Ethernet2
  Transmitted:  0
  Received:     0
  Discarded:    1
  Unrecognized: 0
  Ageout:       0
  Inserted:     0
  Deleted:      0
  ------------------------------------------------------------------------------
```

```
admin@sonic:~$ show lldp statistics Ethernet6
  ------------------------------------------------------------------------------
  LLDP statistics:
  ------------------------------------------------------------------------------
  Interface:    Ethernet6
  Transmitted:  1460
  Received:     1465
  Discarded:    1
  Unrecognized: 2
  Ageout:       0
  Inserted:     2
  Deleted:      0
  ------------------------------------------------------------------------------
```

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UDLD configuration, show, and clear

UDLD is a Layer 2 protocol that allows detection of unidirectional link failures which is required in spanning-tree topologies for avoiding loops caused due to unidirectional link failures.

UDLD configuration commands

UDLD supports global configuration commands. For more information, see the *Management Framework CLI Reference Guide*.

- `[no] udld enable`
- `[no] udld aggressive`
- `[no] udld message-time value`
- `[no] udld multiplier value`

UDLD supports interface configuration commands. For more information, see the *Management Framework CLI Reference Guide*.

- `[no] udld enable`
- `[no] udld aggressive`

UDLD show commands

UDLD supports show commands. For more information, see the *Management Framework CLI Reference Guide*.

- `show udld global`
- `show udld neighbors`
- `show udld interface ifname`
- `show udld statistics [interface ifname]`

UDLD debug commands

Debug commands are supported for enabling additional logging, all the logs in the context of UDLDd and UDLDMgr are stored in */var/log/udldd.log*. Any logs in orchagent context are available in */var/log/syslog*.

- `debug udld packet [ tx | rx | both] ifname`
- `debug udld [set | reset] trace_lvl module`
- `debug udld set log_lvl level`

These debug commands are supported to display internal information.

- `debug udld dump all`
- `debug udld dump global`
- `debug udld dump interface ifname`

UDLD clear commands

Clears the UDLD statistics.

- `sonic-clear udld statistics [interface ifname]`

Resets the interfaces which are shutdown by UDLD.

- `udld reset`

UDLD errdisable command

Errdisable recovery functionality allows automatic recovery of ports that are shutdown due to specific conditions detected by a feature like unidirectional failures in case of UDLD. When errdisable recovery is enabled, post shutdown of a port a recovery timer is started as per the configured recovery interval, on expiry of this timer the port is enabled back. This helps in automatic recovery of the port without user intervention.

Configures the recovery interval (30 to 65535 seconds; default 300).

- `config errdisable recovery interval` *value*

Enables/disables of errdisable recovery functionality for UDLD. By default it is disabled.

- `config errdisable recovery cause [enable | disable] {udld}`

Displays the errdisable recovery status of UDLD and the recovery interval configured.

- `show errdisable recover`

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Load, reload, and save configurations

Load config command

This command is used to load the configuration from configDB. It loads the configuration from the input file (if optional filename is specified, it uses that input file; otherwise it uses the */etc/sonic/config_db.json* as the input file) into the CONFIG_DB.

The configurations in the input file are applied on top of the already running configuration. This command does not flush the configDB before loading the new configuration. If the configuration present in the input file is same as the current running-configuration, nothing happens. If the config present in the input file is not present in running-configuration, it is added.

If the configuration present in the input file matches (when key matches) with the running-configuration, it is modified as per the new values for those keys. If you specify the optional argument `-y` or `--yes`, this command forces the loading without prompting for confirmation. If the argument is not specified, it prompts to confirm if you want to load this configuration file.

- `config load [-y | --yes] [FILENAME]`
- ```
  admin@sonic:~$ sudo config load
  Load config from the file /etc/sonic/config_db.json? [y/N]: y
  Running command: /usr/local/bin/sonic-cfggen -j /etc/sonic/config_db.json --write-to-db
  ```

Load_mgmt_config command

This command is used to reconfigure hostname, and Mangement interface based on the device description file. This command either uses the optional file that is specified as an argument, or looks for the */etc/sonic/device_desc.xml* file. If the file does not exist or if the file does not have valid fields for `hostname` and `ManagementAddress`, it fails.

If you specify the optional argument `-y` or `--yes`, this command forces the loading without prompting for confirmation. If the argument is not specified, it prompts to confirm if you want to load this configuration file.

- `config load_mgmt_config [-y | --yes] [FILENAME]`
- ```
  admin@sonic:~$ sudo config load_mgmt_config
  Reload config from minigraph? [y/N]: y
  Running command: /usr/local/bin/sonic-cfggen -M /etc/sonic/device_desc.xml --write-to-db
  ```

Load_minigraph configuration command

This command is used to load the configuration from */etc/sonic/minigraph.xml*. If you do not want to use configuration from config_db.json, you can copy the minigraph.xml configuration file to the device and load it using this command. This command restarts various services running in the device, and it takes some time to complete the command.

NOTE: If the user had logged in using SSH, they might get disconnected and some configuration failures might happen which might be hard to recover. Users must reconnect their SSH sessions after configuring the management IPaddress. It is recommended to run this command from console port.

NOTE: Management interface IP address and default route (or specific route) may require reconfiguration in case if those parameters are not part of the minigraph.xml. When user specifies the optional argument `-y` or `--yes`, this command forces the loading without prompting the user for confirmation. If the argument is not specified, it prompts the user to confirm whether user really wants to load this configuration file.

- `config load_minigraph [-y | --yes]`
- ```
  admin@sonic:~$ sudo config load_minigraph
  Reload config from minigraph? [y/N]: y
  Running command: /usr/local/bin/sonic-cfggen -j /etc/sonic/config_db.json --write-to-db
  ```
  ```

Reload configuration command

This command is used to clear current configuration and import new configuration from the input file or from */etc/sonic/config_db.json*. This command stops all services before clearing the configuration, and then restarts those services. This command restarts various services running in the device, and it takes some time to complete the command.

NOTE: If the user had logged in using SSH, they might get disconnected depending on the new management IP address. Users must reconnect their SSH sessions.

In general, it is recommended to run this command from console port after disconnecting all SSH sessions to the device. When you run `config reload`, the newly loaded config may have management IP address, or it may not have management IP address. If mgmtIP is there in the newly loaded config file, that mgmtIP might be same as previously configured value or it might be different. This difference in mgmtIP address values results in these possible behaviors:

- Case1 — Previously configured mgmtIP is same as newly loaded mgmtI P. The SSH session may not be affected at all, but it?s possible that there will be a brief interruption in the SSH session. But, assuming the client's timeout value is not on the order of a couple of seconds, the session would most likely resume again when the interface is reconfigured and up with the same IP.
- Case2 — Previously configured mgmtIP is different from newly loaded mgmtI P. Users lose their SSH connections.
- Case3 — Newly loaded config does not have any mgmtI P. Users lose their SSH connections.

NOTE: Management interface IP address and default route (or specific route) may require reconfiguration in case if those parameters are not part of the minigraph.xml.

When you specify the optional argument `-y` or `--yes`, this command forces the loading without prompting the user for confirmation. If the argument is not specified, it prompts to confirm if you want to load this configuration file.

- `config reload [-y | --yes] [-l | --load-sysinfo] [FILENAME]`

```
admin@sonic:~$ sudo config reload
Clear current config and reload config from the file /etc/sonic/config_db.json? [y/N]: y
Running command: systemctl stop dhcp_relay
Running command: systemctl stop swss
Running command: systemctl stop snmp
Warning: Stopping snmp.service, but it can still be activated by:
  snmp.timer
Running command: systemctl stop lldp
Running command: systemctl stop pmon
Running command: systemctl stop bgp
Running command: systemctl stop teamd
Running command: /usr/local/bin/sonic-cfggen -H -k Force10-Z9100-C32 --write-to-db
Running command: /usr/local/bin/sonic-cfggen -j /etc/sonic/config_db.json --write-to-db
Running command: systemctl restart hostname-config
Running command: systemctl restart interfaces-config
Timeout, server 10.11.162.42 not responding.
```

Save config command

This command is to save the config database configuration into the user-specified filename or into the default */etc/sonic/config_db.json*. This saves the configuration into the disk which is available even after reboots.

Saved file can be transferred to remote machines for debugging. To load the configuration from this new file at any time, use `config load` and provide this newly generated file as input. For the generated file to be used during reboot, copy this file to */etc/sonic/config_db.json*.

- `config save [-y | --yes] [FILENAME]`

```
admin@sonic:~$ sudo config save -y /etc/sonic/config2.json
- this saves to the filename specified.
admin@sonic:~$ sudo config save -y
- this saves to /etc/sonic/config_db.json.
```

Configuration erase command

This command is used to remove configuration changes to restore the switch to a factory default configuration state. For the changes to take effect, a switch reboot is required after running the command.

- `config erase [boot | cancel | install | -y | --yes]`
- ```
  admin@sonic:~$ sudo config erase
  Existing switch configuration files except management interface configuration will be
  removed, continue? [y/N] y
  SONiC configuration files will be restored to default values on next reboot
  ```

  ```
  admin@sonic:~$ sudo config erase cancel -y
  Configuration erase operation is cancelled
  ```

  ```
  admin@sonic:~$ sudo config erase install -y
  All SONiC switch content will be restored to default values on next reboot
  ```

Options:

- **config erase** — Deletes the startup configuration JSON file */etc/sonic/config_db.json* and all other application configuration files in the */etc/sonic* directory. The management interface configuration in the startup configuration file is retained so that the user can access the switch using the same management address along with other factory default configuration after the switch reboots.
- **config erase boot** — Deletes the startup configuration JSON file and all other application configuration files in the */etc/sonic* directory. The management interface configuration in the startup configuration JSON file is also removed. The SONiC switch boots with a factory default configuration file.
- **config erase install** — Removes all changes that are made by the user. All user installed packages and file changes are removed. It also deletes the startup configuration JSON file and the files in */etc/sonic* directory. The SONiC switch is reverted to a state similar to a newly installed image. After the SONiC switch is rebooted, if the zero touch provisioning (ZTP) feature is enabled, the SONIC switch will start performing ZTP to discover and download the switch configuration.
- **config erase cancel** — For the *config erase* command operation to take effect, the user has to reboot the switch after issuing the command. If the user wants to not proceed with the configuration removal operation, the *config erase cancel* command can be used to undo the previously issued *config erase* command.
  ```

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MCLAG configuration and show

MCLAG configuration commands

NOTE: Only one MCLAG domain can be created in a device.

MCLAG domain configuration

Creates a MCLAG domain. The local IP address is the local source IPv4 address used for the MCLAG session, which can be loopback, router interface, or ve interface. The peer interface name is mandatory for L2 as this link is used to carry traffic when the MCLAG interface is down — optional for L3 as data forwarding depends on the routing information and the peer links is not required.

NOTE: To bring up MCLAG session between two MCLAG peer nodes, configure the MCLAG domain on both ends. One end's source/local IP address becomes the peer address in the other end and the opposite way.

- `config mclag add domain_id local_ip_addr peer_ip_addr [peer_interface_name]`
- ```
  admin@sonic:~$ sudo config mclag add 10 10.1.1.1 10.1.1.2 PortChannel2
  ```

MCLAG member addition

Adds MCLAG interfaces to a MCLAG domain user. MCLAG interfaces must be port-channels. Multiple MCLAG interfaces can be added separated by comma.

- `config mclag member add domain_id portchannel_name(s)`
- ```
  admin@sonic:~$ sudo config mclag member add 10 PortChannel10,PortChannel20
  ```

MCLAG member deletion

Deletes the MCLAG domain including all MCLAG member interfaces. MCLAG interfaces must be port-channels. Multiple MCLAG interfaces can be added separated by comma.

- `config mclag member del domain_id portchannel_name(s)`
- ```
  admin@sonic:~$ sudo config mclag member del 10 PortChannel10,PortChannel20
  ```

MCLAG domain deletion

Deletes the MCLAG domain using the Domain ID.

NOTE: You must delete all MCLAG interfaces before removing the MCLAG domain (see `mclag member deletion`).

- `config mclag del domain_id`
- ```
  admin@sonic:~$ sudo config mclag del 10
  MCLAG Domain delete takes care of deleting all associated MCLAG Interfaces
  ```

Modify MCLAG keepalive/session timer values

Modifies the MCLAG keepalive/session timer values. The default keepalive interval is 1 second, and the default session timeout is 15 seconds.

NOTE: The session timeout value should be at least three times greater than the keepalive timer value.

- `config mclag [keepalive-interval | session-timeout] domain_id value`
- ```
  admin@sonic:~$ sudo config mclag keepalive-interval 10 5
  ```

  ```
  admin@sonic:~$ sudo config mclag session-timeout 10 20
  ```
  ```

MCLAG show commands

mclag brief

Displays brief information about the configured MCLAG domain. There can be only one MCLAG domain that is configured in the system.

- `mclagdctl dump state`

```
admin@sonic:~$ sudo mclagdctl dump state
The MCLAG's keepalive is: OK
MCLAG info sync is: completed
Domain id: 10
Local Ip: 10.1.1.1
Peer Ip: 10.1.1.2
Peer Link Interface: PortChannel2
Keepalive time: 1
sesssion Timeout : 15
Peer Link Mac: b8:6a:97:73:6c:96
Role: Active
MCLAG Interface: PortChannel10
```

mclag local interface state

Displays information about the local interface state, MCLAG port-channel interface status, and underlying MCLAG port-channel interfaces state.

- `mclagdctl dump portlist local -i domain_id`

```
admin@sonic:~$ sudo mclagdctl dump  portlist local -i 10
--------------------------------------------------------------
Ifindex: 66
Type: Ethernet
PortName: Ethernet48
State: Up
--------------------------------------------------------------

--------------------------------------------------------------
Ifindex: 83
Type: PortChannel
PortName: PortChannel10
MAC: 1c:ea:0b:06:9b:b5
IPv4Address: 0.0.0.0
Prefixlen: 32
State: Up
IsL3Interface: No
MemberPorts: Ethernet48
PortchannelIsUp: 1
IsIsolateWithPeerlink: Yes
IsTrafficDisable: No
VlanList:10,20
--------------------------------------------------------------
```

mclag peer interface state

Displays peer interface state information based on the peer information that is synced between MCLAG peer nodes.

- `mclagdctl dump portlist remote -i domain_id`

```
admin@sonic:~$ sudo mclagdctl dump  portlist peer -i 10
--------------------------------------------------------------
Ifindex: 10
Type: PortChannel
PortName: PortChannel10
MAC: 1c:ea:0b:06:9b:b5
State: Up
--------------------------------------------------------------
```

mclag debug counters

Displays peer interface state information based on the peer information that is synced between MCLAG peer nodes, and debug counter information.

- `mclagdctl dump debug counters`

- ```
  admin@sonic:~$ sudo mclagdctl -i 10 dump debug counters
  ICCP session down:  1
  Peer link down:     0
  Warmboot:           0

  ICCP to MclagSyncd      TX_OK       TX_ERROR
  ------------------      -----       --------
  PortIsolation           13          0
  MacLearnMode            1           0
  FlushFdb                1           0
  SetIfMac                0           0
  SetFdb                  226003      0
  SetL2mc                 0           0
  TrafficDistEnable       1           0
  TrafficDistDisable      1           0
  SetIccpState            2           0
  SetIccpRole             1           0
  SetSystemId             0           0
  DelIccpInfo             0           0
  SetRemoteIntfSts        9           0
  DelRemoteIntf           0           0

  MclagSyncd to           ICCP  RX_OK       RX_ERROR
  ------------------      -----------       --------
  FdbChange               161616            0
  CfgMclag                1                 0
  CfgMclagIface           1                 0

  ICCP to Peer   TX_OK        RX_OK        TX_ERROR    RX_ERROR
  ------------   -----        -----        --------    --------
  SysConfig      2            2            0           0
  AggrConfig     2            1            0           0
  AggrState      7            9            0           0
  MacInfo        160896       142183       0           0
  ArpInfo        0            0            0           0
  L2mcInfo       0            0            0           0
  PoInfo         2            1            0           0
  PeerLinkInfo   2            2            0           0
  Heartbeat      2533         2533         0           0
  Nak            0            0            0           0
  SyncData       2            2            0           0
  SyncReq        1            0            0           0
  Warmboot       0            0            0           0
  IfUpAck        4            3            0           0
  ```
  ```

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Mirroring configuration and show

This information explains the available `show` and `config` commands.

Mirroring show commands

show mirror_session

Displays all the mirror sessions that are configured.

- `show mirror_session [session_name]`

```
admin@sonic:~$ show mirror_session
ERSPAN Sessions
-------------------------------------------------------------------------------------------------
-----------------
Name     Status  SRC IP  DST IP      GRE    DSCP  TTL  Queue Policer Monitor Port
SRC Port   Direction
-------- ------- ------- ----------- ------ ----- ---- ----- ------- ------------------
---------- ---------
mrr_ers  active  1.2.3.4 20.21.22.23 0x6558     8  100     0         oid:0x7f620b159b00
Ethernet0  both

SPAN Sessions
-----------------------------------------------------------
Name     Status  DST Port  SRC Port   Direction
-------- ------- --------- ---------- -----------
mrr_span active  Ethernet4 Ethernet8  rx
```

Mirroring configuration commands

Adds or removes mirroring sessions. Mirror session is identified by the `session_name`.

- `config mirror_session add span session_name dst_port [src_port] [direction]`

```
admin@sonic:/~$ sudo config mirror_session add span mrr_span Ethernet4 Ethernet8 rx
admin@sonic:/~$ sudo config mirror_session add span mrr_span_1 Ethernet16
admin@sonic:/~$ show mirror_session

ERSPAN Sessions
-------------------------------------------------------------------------------------------------
----------------------
Name         Status  SRC IP  DST IP      GRE    DSCP  TTL  Queue  Policer Monitor
Port       SRC Port  Direction
------------ ------- ------- ----------- ------ ----- ---- ------ -------
------------------ --------- ---------
mrr_erspan_1 active  1.2.3.5 20.21.22.24 0x6558     8 100       0
oid:0x7f620b159b00
mrr_erspan   active  1.2.3.4 20.21.22.23 0x6558     8 100       0
oid:0x7f620b159b00 Ethernet0 both

SPAN Sessions
-------------------------------------------------
Name       Status  DST Port   SRC Port   Direction
---------- ------- ---------- ---------- ---------
mrr_span   active  Ethernet4  Ethernet8  rx
mrr_span_1 active  Ethernet16
```

- `config mirror_session add erspan session_name src_ip dst_ip [gre_type] [queue] [src_port] [direction]`

```
admin@sonic:/~$ sudo config mirror_session add erspan mrr_erspan 1.2.3.4 20.21.22.23 8 100
0x6558 0 Ethernet0 both
```

```
admin@sonic:/~$ sudo config mirror_session add erspan mrr_erspan_1 1.2.3.5 20.21.22.24 8
100 0x6558 0
admin@sonic:/~$ show mirror_session

ERSPAN Sessions
-------------------------------------------------------------------------------------------
-------------------
Name         Status  SRC IP  DST IP      GRE     DSCP TTL Queue Policer Monitor Port
SRC Port  Direction
------------ ------- ------- ----------- ------ ----- --- ----- ------- ------------------
--------- ---------
mrr_erspan_1 active  1.2.3.5 20.21.22.24 0x6558     8 100     0         oid:0x7f620b159b00
mrr_erspan   active  1.2.3.4 20.21.22.23 0x6558     8 100     0         oid:0x7f620b159b00
Ethernet0 both

SPAN Sessions
-------------------------------------------------
Name       Status  DST Port   SRC Port  Direction
---------- ------- ---------- --------- ---------
mrr_span   active  Ethernet4  Ethernet8 rx
mrr_span_1 active  Ethernet16
```

Configure these fields to add a new SPAN session:

- Destination port
- (Optional) Source port
- (Optional) Direction; supports rx, tx, and both directions

Configure these fields to add a new ERSPAN session:

- Source IP address
- Destination IP address
- DSCP (QoS) value with which mirrored packets are forwarded
- TTL value
- (Optional) GRE value to send packets using a GRE tunnel; default 0x88be
- (Optional) Queue in which packets are sent out of the device (0 to 7)
- (Optional) Source port
- (Optional) Direction; supports rx, tx, and both directions

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NAT configuration, show, and clear

NAT show commands

show nat config

Displays the NAT configuration.

- `show nat config [static | pool | bindings | zones]`
-
```
admin@sonic:~$ show nat config

Global Values

Admin Mode     : enabled
Global Timeout : 600 secs
TCP Timeout    : 86400 secs
UDP Timeout    : 300 secs

Static Entries

Nat Type    IP Protocol    Global IP    Global Port    Local IP    Local Port  Twice-NAT Id
----------  -------------  -----------  -------------  ----------  ----------  ------------
snat        all            112.0.0.2    ---            111.0.0.3   ---                1

Pool Entries

Pool Name    Global IP Range    Global Port Range
-----------  -----------------  -------------------
nat1         2.0.0.5            10-200

NAT Bindings

Binding Name    Pool Name    Access-List    Nat Type    Twice-NAT Id
--------------  -----------  -------------  ----------  --------------
bind1           nat1                        snat        ---

NAT Zones

Port         Zone
---------  ------
Ethernet0       1
Ethernet2       2
```

show nat statistics

Displays statistics per NAT entry.

- `show nat statistics`
-
```
admin@sonic:~$ show nat statistics

Protocol Source           Destination          Packets          Bytes
-------- ---------        --------------       -----------    -----------
all      10.0.0.1         ---                          802      1009280
all      10.0.0.2         ---                           23         5590
tcp      20.0.0.1:4500    ---                          110        12460
udp      20.0.0.1:4000    ---                         1156       789028
tcp      20.0.0.1:6000    ---                           30        34800
tcp      20.0.0.1:5000    65.55.42.1:2000              128       110204
tcp      20.0.0.1:5500    65.55.42.1:2000                8         3806
```

show nat translations

Displays all NAT translations entries.

- `show nat translations [count]`
- ```
  admin@sonic:~$ show nat translations

  Static NAT Entries        ..................  4
  Static NAPT Entries       ..................  2
  Dynamic NAT Entries       ..................  0
  Dynamic NAPT Entries      ..................  4
  Static Twice NAT Entries  ..................  0
  Static Twice NAPT Entries ..................  2
  Total Entries             ..................  12

  Protocol Source           Destination       Translated Source  Translated Destination
  -------- ---------        --------------    -----------------  ----------------------
  all      10.0.0.1         ---               65.55.42.2         ---
  all      ---              65.55.42.2        ---                10.0.0.1
  all      10.0.0.2         ---               65.55.42.3         ---
  all      ---              65.55.42.3        ---                10.0.0.2
  tcp      20.0.0.1:4500    ---               65.55.42.1:2000    ---
  tcp      ---              65.55.42.1:2000   ---                20.0.0.1:4500
  udp      20.0.0.1:4000    ---               65.55.42.1:1030    ---
  udp      ---              65.55.42.1:1030   ---                20.0.0.1:4000
  tcp      20.0.0.1:6000    ---               65.55.42.1:1024    ---
  tcp      ---              65.55.42.1:1024   ---                20.0.0.1:6000
  tcp      20.0.0.1:5000    65.55.42.1:2000   65.55.42.1:1025    20.0.0.1:4500
  tcp      20.0.0.1:4500    65.55.42.1:1025   65.55.42.1:2000    20.0.0.1:5000
  tcp      20.0.0.1:5500    65.55.42.1:2000   65.55.42.1:1026    20.0.0.1:4500
  tcp      20.0.0.1:4500    65.55.42.1:1026   65.55.42.1:2000    20.0.0.1:5500
  ```

NAT configuration commands

config nat add static basic

Adds a basic static NAT entry.

- `config nat add static basic {global-ip} {local-ip} -nat_type {snat | dnat} -twice_nat_id {value}`
- ```
  admin@sonic:~$ sudo config nat add static basic 65.54.0.1 10.0.0.1
  ```

```
admin@sonic:~$ sudo config nat add static basic 112.0.0.1 111.0.0.2 -nat_type dnat -
twice_nat_id 1
```

```
admin@sonic:~$ sudo config nat add static basic 112.0.0.2 111.0.0.3 -nat_type snat -
twice_nat_id 1
```

config nat remove static basic

Removes a basic static NAT entry.

- `config nat remove static basic {global-ip} {local-ip}`
- ```
  admin@sonic:~$ sudo config nat remove static basic 65.54.0.1 10.0.0.1
  ```

config nat add static

Adds a static NAT entry.

- `config nat add static {tcp | udp} {global-ip} {global-port} {local-ip} {local-port} -nat_type {snat | dnat} -twice_nat_id {value}`
- ```
  admin@sonic:~$ sudo config nat add static udp 112.0.0.1 250 10.0.0.1 111
  ```

config nat remove static

Removes a static NAT entry.

- `config nat remove static {tcp | udp} {global-ip} {global-port} {local-ip} {local-port}`
- ```
  admin@sonic:~$ sudo config nat remove static udp 112.0.0.1 250 10.0.0.1 111
  ```
  ```

config nat remove static all

Removes all static NAT configuration.

- `config nat remove static all`
- ```
  admin@sonic:~$ sudo config nat remove static all
  ```

config nat add pool

Creates a NAT pool.

- `config nat add pool {pool-name} {global-ip-range} {global-port-range}`
- ```
  admin@sonic:~$ sudo config nat add pool nat1 2.0.0.5 10-200
  ```

config nat remove pool

Removes a NAT pool.

- `config nat remove pool {pool-name}`
- ```
  admin@sonic:~$ sudo config nat remove pool nat1
  ```

config nat remove pools

Removes all NAT pools.

- `config nat remove pools`
- ```
  admin@sonic:~$ sudo config nat remove pools
  ```

config nat add binding

Creates a binding between an ACL and a NAT pool.

- `config nat add binding {binding-name} {pool-name} {acl-name} -nat_type {snat | dnat} -twice_nat_id {value}`
- ```
  admin@sonic:~$ sudo config nat add binding bind1 nat1
  ```

config nat remove binding

Removes a binding between an ACL and a NAT pool.

- `config nat remove binding {binding_name}`
- ```
  admin@sonic:~$ sudo config nat remove binding bind1
  ```

config nat remove bindings

Removes all NAT binding configuration.

- `config nat remove bindings`
- ```
  admin@sonic:~$ sudo config nat remove bindings
  ```

config nat add interface

Configures the NAT zone value on an interface.

- `config nat add interface {interface-name} {-nat_zone {zone-value}}`
- ```
  admin@sonic:~$ sudo config nat add interface Ethernet1 -nat_zone 2
  ```

  ```
  admin@sonic:~$ sudo config nat add interface Ethernet3 -nat_zone 1
  ```

config nat remove interface {interface-name}

Removes the NAT configuration on the interface.

- `config nat remove interface {interface_name}`
- ```
  admin@sonic:~$ sudo config nat remove interface Ethernet1
  ```

config nat remove interfaces
  ```

Removes the NAT configuration on all L3 interfaces.

- `config nat remove interfaces`
- ```
  admin@sonic:~$ sudo config nat remove interfaces
  ```

config nat set timeout {secs}

Configure the basic NAT entry aging timeout in seconds.

- `config nat set timeout {`*`seconds`*`}`
- ```
  admin@sonic:~$ sudo config nat timeout 10
  ```

config nat reset timeout

Resets the basic NAT entry aging timeout to default value.

- `config nat reset timeout`
- ```
  admin@sonic:~$ sudo config nat reset timeout
  ```

config nat feature

Enables or disables the NAT feature.

- `config nat feature {enable | disable}`
- ```
  admin@sonic:~$ sudo config nat feature enable
  ```

config nat set udp-timeout

Configures the UDP NAT entry aging timeout in seconds.

- `config nat udp-timeout {seconds}`
- ```
  admin@sonic:~$ sudo config nat udp-timeout 10
  ```

config nat reset udp-timeout

Resets the UDP NAT entry aging timeout to default value.

- `config nat reset udp-timeout`
- ```
  admin@sonic:~$ sudo config nat reset udp-timeout
  ```

config nat set tcp-timeout

Configures the TCP NAT entry aging timeout in seconds.

- `config nat set tcp-timeout {seconds}`
- ```
  admin@sonic:~$ sudo config set tcp-timeout 10
  ```

config nat reset tcp-timeout

Resets the TCP NAT entry aging timeout to default value.

- `config nat reset tcp-timeout`
- ```
  admin@sonic:~$ sudo config reset tcp-timeout
  ```

NAT clear commands

sonic-clear nat statistics

Clears all NAT statistics.

- `sonic-clear nat statistics`
- ```
  admin@sonic:~$ sonic-clear nat statistics
  NAT statistics are cleared.
  ```

sonic-clear nat translations
  ```

Clears all dynamic NAT translations.

- `sonic-clear nat translations`
- ```
  admin@sonic:~$ sonic-clear nat translations
  NAT entries are cleared.
  ```
  ```

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NTP show

show ntp

Displays a list of NTP peers known to the server and a summary of their state.

- `show ntp`
- ```
  admin@sonic:~$ show ntp
       remote           refid      st t when poll reach   delay   offset  jitter
  ==============================================================================
   23.92.29.245    .XFAC.          16 u    - 1024    0    0.000    0.000   0.000
  *204.2.134.164   46.233.231.73    2 u  916 1024  377    3.079    0.394   0.128
  ```
  ```

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IGMP snooping configuration and show

IGMP snooping configuration commands

Explains the list of configuration options available for IGMP snooping. Use `no` version of these commands removes non-default values configured.

- `config interface ip igmp snooping {[querier] | [fast-leave] | {[query-interval] query-interval-val} | {[last-member-query-interval] last-mem-query-interval-val} | {[query-max-response-time] query-max-response-val} | {[version] igmps-version-val} | {[mrouter] {interface mrouter-if-name}} | {[static-group] {group-addr {interface grp-if-name}}}}`

ip igmp snooping

Configures IGMP snooping on a VLAN.

- `config interface ip igmp snooping`
- ```
  admin@sonic:~$ sudo config interface Vlan 200
  admin@sonic:~$ sudo config interface ip igmp snooping
  ```

ip igmp snooping

Enables the IGMP querier on VLAN; by default the querier is disabled.

- `config interface ip igmp snooping {[querier]}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping querier
  ```

ip igmp snooping

Enables IGMP fast-leave on VLAN; by default fast-leave is disabled.

- `config interface ip igmp snooping {[fast-leave]}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping fast-leave
  ```

ip igmp snooping

Configures IGMP query-interval (1 to 18000 seconds; default 125 seconds).

- `config interface ip igmp snooping {[query-interval] query-interval-val}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping query-interval 20
  ```

ip igmp snooping

Configures the last member query interval (100 to 25500 ms; default 1000 ms).

- `config interface ip igmp snooping {[last-member-query-interval] last-mem-query-interval-val}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping last-member-query-interval 2000
  ```

ip igmp snooping

Configures the maximum response interval (1 to 25 seconds; default 10 seconds).

- `config interface ip igmp snooping {[query-max-response-time] query-max-response-val}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping query-max-response-time 12
  ```

ip igmp snooping

Configures an IGMP version (1 to 3; default Version2).

- `config interface ip igmp snooping {[version] igmps-version-val}`

- ```
  admin@sonic:~$ sudo ip igmp snooping version 3
  ```

ip igmp snooping

Configures a static multicast router (mrouter) port.

- `config interface ip igmp snooping {[mrouter] {interface mrouter-if-name}}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping mrouter interface Ethernet4
  ```

ip igmp snooping

Configures a static multicast group.

- `config interface ip igmp snooping {[static-group] {group-addr {interface grp-if-name}}}`
- ```
  admin@sonic:~$ sudo config interface ip igmp snooping static-group 225.0.0.1 interface
  PortChannel2
  ```

IGMP snooping show commands

show ip igmp snooping

Displays IGMP snooping configuration across all VLANs or a specified VLAN.

- `show ip igmp snooping {[vlan] vlan-id}`
- ```
  admin@sonic:~$ show ip igmp snooping
  Vlan ID: 100
  Querier: Disabled
  IGMP Operation mode: IGMPv1
  Is Fast-Leave Enabled: Disabled
  Query interval: 125
  Last Member Query Interval: 1000
  Max Response time: 10

  Vlan ID: 200
  Querier: Enabled
  IGMP Operation mode: IGMPv2
  Is Fast-Leave Enabled: Disabled
  Query interval: 125
  Last Member Query Interval: 1000
  Max Response time: 10

  Vlan ID: 300
  Querier: Enabled
  IGMP Operation mode: IGMPv3
  Is Fast-Leave Enabled: Disabled
  Query interval: 20
  Last Member Query Interval: 1000
  Max Response time: 10
  ```

```
admin@sonic:~$ show ip igmp snooping vlan 200
Vlan ID: 200
Querier: Enabled
IGMP Operation mode: IGMPv2
Is Fast-Leave Enabled: Disabled
Query interval: 125
Last Member Query Interval: 1000
Max Response time: 10
```

show ip igmp snooping groups

Displays IGMP snooping groups learned across all VLANs or a specified VLAN.

- `show ip igmp snooping {[vlan] vlan-id}`
- ```
  admin@sonic:~$ show ip igmp snooping groups
  Vlan ID: 100
  -----------
  1 ( *, 225.1.1.1)
  ```
  ```

```
  Outgoing Ports: Ethernet4,PortChannel3
2 ( *, 225.1.1.2)
  Outgoing Ports: Ethernet8
Total number of entries: 2

Vlan ID : 300
-------------
1 (100.10.2.3, 226.0.0.1 )
  Outgoing Ports: Ethernet8,Portchannel2
Total number of entries: 1
```

```
admin@sonic:~$ show ip igmp snooping groups vlan 100
Vlan ID: 100
-----------
1 ( *, 225.1.1.1)
  Outgoing Ports: Ethernet4, PortChannel3
2 ( *, 225.1.1.2)
  Outgoing Ports: Ethernet8
Total number of entries: 2
```

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KDUMP configuration and show

KDUMP configuration commands

Explains the list of the configuration options available for using the kernel core dump feature. Some of these configuration options change the configuration files that are used by the *kdump-tools* service which provides kdump functionality. All changes done to kdump configuration are automatically saved to the startup configuration file, */etc/sonic/config_db.json*

config kdump enable

Administratively enables kernel core file generation.

- `config kdump enable`
- ```
  admin@sonic:~$ sudo config kdump enable
  ```

Since this command requires changing the kernel parameters to specify the amount of memory reserved for the capture kernel (the kernel parameters which are exported through */proc/cmdline*), a reboot is required. By default, the command displays a message showing that kdump functionality is either enabled or disabled following the next reboot. The - *y* parameter indicates yes to automatically reboot.

config kdump disable

Administratively disables kernel core file generation. By default, kdump is administratively disabled.

- `config kdump disable`
- ```
  admin@sonic:~$ sudo config kdump disable
  ```

config kdump memory

Sets the amount of memory that is reserved for the kexec capture kernel.

- `config kdump memory string`
- ```
  admin@sonic:~$ sudo config kdump memory 0M-2G:256M,2G-4G:320M,4G-8G:512M,8G-:1024M
  ```

The amount of memory should always be specified in MB. The command `config kdump memory 512M` allocates 512 MB for the capture kernel. If the memory amount is changed and kdump is enabled, the command displays a message showing that the newly provided memory size will be used after a reboot.

If the amount of memory is set too low, kdump cannot either store the capture kernel and `initramfs` image, or store the core dump information. If this value is changed, choose a value that has been verified to be sufficient.

Default value for the memory allocated for the capture memory: 0M-2G:256M, 2G-4G:320M, 4G-8G:384M, 8G-:448M

RAM size	crashkernel parameter
<= 2 GB	384 MB
<= 4 GB	512 MB
<= 8 GB	576 MB
> 8 GB	640 MB

If the system has 8 GB of RAM, the kernel allocates 576 MB of memory for the capture kernel.

config kdump num_dumps

Controls the number of kernel core files that can be stored locally on the disk.

- `config kdump num_dumps` *`value`*
  ```

- ```
  admin@sonic:~$ sudo config kdump num_dumps 4
  ```

When a kernel core file is generated, the kdump service stores the generated core file in a compressed form. The number of kernel core files that can be stored can be configured through this command. The default value is 3, and the acceptable range is from 1 to 9.

If there are already *N* kernel cores dumps files that are stored locally and a new value which is less than *N* is specified, existing core files are deleted in the local storage. For example, if there are already 6 kernel cores dumps saved, and you specify keeping only 3 kernel core dump files, 4 of the oldest files are removed from the local storage to make room for two existing dump files plus the new core dump file to be generated. This file pruning only happens when a new kernel crash occurs.

KDUMP show commands

show kdump status

Displays complete information about the configuration settings of the kdump feature, its operational state, and the list of kernel core files stored locally on the disk.

- `show kdump status`
- ```
  admin@sonic:~$ show kdump status
  Kdump Administrative Mode:  Enabled
  Kdump Operational State:    Ready
  Memory Reserved: 0M-2G:256M,2G-4G:320M,4G-8G:384M,8G-:448M
  Maximum number of Kernel Core files Stored: 3

  Record Key           Filename
  ------------------------------------------------------------
       1 202002182141 /var/crash/202002182141/dmesg.202002182141
                      /var/crash/202002182141/kdump.202002182141
       2 202002182133 /var/crash/202002182133/dmesg.202002182133
                      /var/crash/202002182133/kdump.202002182133
       3 202002182123 /var/crash/202002182123/dmesg.202002182123
                      /var/crash/202002182123/kdump.202002182123
  ```

Output:

- `kdump administrative mode` — displays if the kdump feature is enabled or disabled
- `kdump operational state` — when kdump is enabled, displays if the kdump feature is operationally and ready to perform a kdump in the event of a kernel crash
- `Memory reserved` — displays the amount of memory that is reserved for the kdump capture kernel
- `Maximum number of kernel core files stored` — displays the allowed maximum number of kernel core files that are stored locally on the disk
- `List of kernel core files` — shows the kernel core dump files that are currently saved on the local storage. They are displayed in reverse chronological order allow with a key value which specifies exact date and time when the kernel crash has happened and the file path where the kernel core file is stored at

show kdump files

Displays the kernel core files that are stored locally.

- `show kdump log`
- ```
  admin@sonic:~$ show kdump files
  Record Key           Filename
  ------------------------------------------------------------
       1 202002182141 /var/crash/202002182141/dmesg.202002182141
                      /var/crash/202002182141/kdump.202002182141
       2 202002182133 /var/crash/202002182133/dmesg.202002182133
                      /var/crash/202002182133/kdump.202002182133
       3 202002182123 /var/crash/202002182123/dmesg.202002182123
                      /var/crash/202002182123/kdump.202002182123
  ```

show kdump log

Displays a specified number of lines of the kernel log buffer which are extracted from the stored kernel core file. When no value is not provided, a default value of 75 lines is used. The kernel log buffer typically contains the kernel back-trace which provides information about what event caused the kernel crash. The corresponding kernel core file can be specified by using either the Record number or the Key name. The filenames indicating where the kernel core file is stored locally on the disk are also listed.

- `show kdump log`
  ```

- ```
  admin@sonic:~$ show kdump log 1 10
  File: /var/crash/202002182133/dmesg.202002182133
  [  520.658277]  [<ffffffffbc02b0db>] ? write_sysrq_trigger+0x2b/0x30
  [  520.664436]  [<ffffffffbbe7ab90>] ? proc_reg_write+0x40/0x70
  [  520.670163]  [<ffffffffbbe0c430>] ? vfs_write+0xb0/0x190
  [  520.675540]  [<ffffffffbbe0d8ca>] ? SyS_write+0x5a/0xd0
  [  520.680826]  [<ffffffffbbc03b7d>] ? do_syscall_64+0x8d/0x100
  [  520.686547]  [<ffffffffbc20484e>] ? entry_SYSCALL_64_after_swapgs+0x58/0xc6
  [  520.693568] Code: 41 5c 41 5d 41 5e 41 5f e9 6c 2f cf ff 66 2e 0f 1f 84 00 00 00 00 00
  66 90 0f 1f 44 00 00 c7 05 29 28 a8 00 01 00 00 00 0f ae f8 <c6> 04 25 00 00 00 00 01 c3
  0f 1f 44 00 00 0f 1f 44 00 00 53 8d
  [  520.716174] RIP  [<ffffffffbc02a562>] sysrq_handle_crash+0x12/0x20
  [  520.722470]  RSP <ffffa8ce415e7e78>
  [  520.726018] CR2: 0000000000000000
  ```

show kdump memory

Displays the amount of memory that is reserved for the capture kernel to be used in the event of a kernel crash and the subsequent kernel core file generation.

- `show kdump memory`
- ```
  admin@sonic:~$ show kdump memory
  Memory Reserved: 0M-2G:256M,2G-4G:320M,4G-8G:384M,8G-:448M
  ```

show kdump num_dumps

Displays the maximum number of kernel core files that can be stored locally on disk.

- `show kdump num_dumps`
- ```
  admin@sonic:~$ show kdump num_dumps
  Maximum number of Kernel Core files Stored: 3
  ```
  ```

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Platform-specific commands

show platform mlnx sniffer

Displays the SDK sniffer status.

- `show platform mlnx sniffer`
- ```
  admin@sonic:~$ show platform mlnx sniffer
    sdk sniffer is disabled
  ```

show platform mlnx issu

Displays the Mellanox ISSU status. This means if ISSU is enabled on this SKU or not. A warm boot command can be run only when ISSU is enabled on the SKU.

- `show platform mlnx issu`
- ```
  admin@sonic:~$ show platform mlnx issu
  ISSU is enabled
  ```

  In the case ISSU is disabled and warm-boot is called, a notification message displays explaining that the command cannot be invoked.

  ```
  admin@sonic:~$ sudo warm-reboot
  ISSU is not enabled on this HWSKU
  Warm reboot is not supported
  ```

config platform mlnx

This command is valid only on Mellanox devices only. The subcommands for `config platform` is populated only on Mellanox platforms. There are no other subcommands on non-Mellanox devices. The platform Mellanox command currently includes a single subcommand which is the SDK sniffer. The SDK sniffer is a troubleshooting tool which records the RPC calls from the Mellanox SDK user API library to the sx_sdk task into a .pcap file. This .pcap file can be replayed afterward to get the exact same configuration state on SDK and FW to reproduce and investigate issues.

A new folder is created to store the sniffer files: */var/log/mellanox/sniffer/*. The result file is stored in a .pcap file, which includes a timestamp of the starting time in the file name (*sx_sdk_sniffer_20180224081306.pcap*). To have a complete .pcap file with all the RPC calls, disable the SDK sniffer. SWSS service is restarted and no capturing takes place from that moment. It is recommended to review the .pcap file while sniffing is disabled. Once SDK sniffer is enabled or disabled, you must request to approve that SWSS service is restarted. To change SDK sniffer status, SWSS service will be restarted, continue? [y/N]: In order to avoid that confirmation the -y / --yes option should be used.

- `config platform mlnx sniffer sdk [-y | --yes]`
- ```
  admin@sonic:~$ config platform mlnx sniffer sdk
  To change SDK sniffer status, swss service will be restarted, continue? [y/N]: y
  NOTE: In order to avoid that confirmation the -y / --yes option should be used.
  ```
  ```

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PFC configuration and show

PFC configuration commands

PFC config

Enables OR disables the asymmetric mode on an interface or all interfaces.

- `pfc config asymmetric [on | off] {interface_name | all}`
- ```
  admin@sonic:~$ sudo pfc config asymmetric on Ethernet9
  ```

```
admin@sonic:~$ sudo pfc config asymmetric on all
```

```
admin@sonic:~$ sudo pfc config asymmetric off Ethernet8
```

PFC show commands

Displays the configured PFC mode on an interface or all interfaces. By default, all interfaces are configured in symmetric PFC mode.

- `pfc show asymmetric interface_name`
- ```
  admin@sonic:~$ sudo pfc show asymmetric Ethernet9

    Interface    Asymmetric
    -----------  ------------
    Ethernet9    on
  ```

```
admin@sonic:~$ sudo pfc show asymmetric

  Interface    Asymmetric
  -----------  ------------
  Ethernet0    N/A
  Ethernet4    on
  Ethernet5    N/A
  Ethernet6    N/A
  Ethernet7    N/A
  Ethernet8    off
  Ethernet9    on
  Ethernet10   N/A
  Ethernet11   N/A
  Ethernet12   on
  Ethernet16   N/A
  Ethernet20   N/A
  Ethernet24   N/A
  Ethernet28   N/A
  Ethernet32   N/A
  Ethernet36   N/A
  Ethernet40   N/A
  Ethernet44   N/A
  Ethernet48   N/A
  Ethernet52   N/A
  Ethernet56   N/A
  Ethernet60   N/A
  Ethernet64   N/A
  Ethernet68   N/A
  Ethernet72   N/A
  Ethernet76   N/A
  Ethernet80   N/A
  Ethernet84   N/A
  Ethernet88   N/A
```

```
  Ethernet92   N/A
  Ethernet96   N/A
  Ethernet100  N/A
```

pfcstat command

Displays and removes the pause frames statistics for rx and tx priority queues of all interfaces.

- `pfcstat [-v] [-c] [-d]`
  - `-v, --version` — displays program version number and exit
  - `-c, --clear` — clears previous stats and save new ones
  - `-d, --delete` — deletes saved stats

```
admin@sonic:~$ sudo pfcstat
      Port Rx    PFC0    PFC1    PFC2    PFC3    PFC4    PFC5    PFC6    PFC7
  ----------  ------  ------  ------  ------  ------  ------  ------  ------
           CPU       0       0       0       0       0       0       0       0
     Ethernet0       0       0       0       0       0       0       0       0
     Ethernet4       0       0       0       0       0       0       0       0
     Ethernet5       0       0       0       0       0       0       0       0
     Ethernet6       0       0       0       0       0       0       0       0
     Ethernet7       0       0       0       0       0       0       0       0
     Ethernet8       0       0       0       0       0       0       0       0
     Ethernet9       0       0       0       0       0       0       0       0
    Ethernet10       0       0       0       0       0       0       0       0
    Ethernet11       0       0       0       0       0       0       0       0
    Ethernet12       0       0       0       0       0       0       0       0
    Ethernet16       0       0       0       0       0       0       0       0
    Ethernet20       0       0       0       0       0       0       0       0
    Ethernet24       0       0       0       0       0       0       0       0
    Ethernet28       0       0       0       0       0       0       0       0
    Ethernet32       0       0       0       0       0       0       0       0
    Ethernet36       0       0       0       0       0       0       0       0
    Ethernet40       0       0       0       0       0       0       0       0
    Ethernet44       0       0       0       0       0       0       0       0
    Ethernet48       0       0       0       0       0       0       0       0
    Ethernet52       0       0       0       0       0       0       0       0
    Ethernet56       0       0       0       0       0       0       0       0
    Ethernet60       0       0       0       0       0       0       0       0
    Ethernet64       0       0       0       0       0       0       0       0
    Ethernet68       0       0       0       0       0       0       0       0
    Ethernet72       0       0       0       0       0       0       0       0
    Ethernet76       0       0       0       0       0       0       0       0
    Ethernet80       0       0       0       0       0       0       0       0
    Ethernet84       0       0       0       0       0       0       0       0
    Ethernet88       0       0       0       0       0       0       0       0
    Ethernet92       0       0       0       0       0       0       0       0
    Ethernet96       0       0       0       0       0       0       0       0
   Ethernet100       0       0       0       0       0       0       0       0
   Ethernet104       0       0       0       0       0       0       0       0
   Ethernet108       0       0       0       0       0       0       0       0
   Ethernet112       0       0       0       0       0       0       0       0
   Ethernet116       0       0       0       0       0       0       0       0
   Ethernet120       0       0       0       0       0       0       0       0
   Ethernet124       0       0       0       0       0       0       0       0

      Port Tx    PFC0    PFC1    PFC2    PFC3    PFC4    PFC5    PFC6    PFC7
  ----------  ------  ------  ------  ------  ------  ------  ------  ------
           CPU       0       0       0       0       0       0       0       0
     Ethernet0       0       0       0       0       0       0       0       0
     Ethernet4       0       0       0   11805       0       0       0       0
     Ethernet5       0       0       0   11805       0       0       0       0
     Ethernet6       0       0       0       0       0       0       0       0
     Ethernet7       0       0       0       0       0       0       0       0
     Ethernet8       0       0       0       0       0       0       0       0
     Ethernet9       0       0       0       0       0       0       0       0
    Ethernet10       0       0       0       0       0       0       0       0
    Ethernet11       0       0       0       0       0       0       0       0
    Ethernet12       0       0       0       0       0       0       0       0
    Ethernet16       0       0       0       0       0       0       0       0
```

```
   Ethernet20       0       0       0       0       0       0       0       0
   Ethernet24       0       0       0       0       0       0       0       0
   Ethernet28       0       0       0       0       0       0       0       0
   Ethernet32       0       0       0       0       0       0       0       0
   Ethernet36       0       0       0       0       0       0       0       0
   Ethernet40       0       0       0       0       0       0       0       0
   Ethernet44       0       0       0       0       0       0       0       0
   Ethernet48       0       0       0       0       0       0       0       0
   Ethernet52       0       0       0       0       0       0       0       0
   Ethernet56       0       0       0       0       0       0       0       0
   Ethernet60       0       0       0       0       0       0       0       0
   Ethernet64       0       0       0       0       0       0       0       0
   Ethernet68       0       0       0       0       0       0       0       0
   Ethernet72       0       0       0       0       0       0       0       0
   Ethernet76       0       0       0       0       0       0       0       0
   Ethernet80       0       0       0       0       0       0       0       0
   Ethernet84       0       0       0       0       0       0       0       0
   Ethernet88       0       0       0       0       0       0       0       0
   Ethernet92       0       0       0       0       0       0       0       0
   Ethernet96       0       0       0       0       0       0       0       0
  Ethernet100       0       0       0       0       0       0       0       0
  Ethernet104       0       0       0       0       0       0       0       0
  Ethernet108       0       0       0       0       0       0       0       0
  Ethernet112       0       0       0       0       0       0       0       0
  Ethernet116       0       0       0       0       0       0       0       0
  Ethernet120       0       0       0       0       0       0       0       0
  Ethernet124       0       0       0       0       0       0       0       0
```

```
admin@sonic:~$ sudo pfcstat -c
  Clear saved counters
```

PFC watchdog commands

pfcwd counter_poll

Enables or disables the PFC watchdog counter monitoring.

- `pfcwd counter_poll {enable | disable}`
-
```
admin@sonic:~$ sudo pfcwd counter_poll disable
```

```
admin@sonic:~$ sudo pfcwd counter_poll enable
```

pfcwd interval

Configures the PFC watchdog counter monitoring interval (in msecs).

- `pfcwd interval` *`value`*
-
```
admin@sonic:~$ sudo pfcwd interval 100
```

pfcwd start

Configures the detection period of PFC storm detection and enables watchdog on a specified port. You can specify the action [drop | forward | alert] to be performed on detection of storm. Restoration time is two times the detection time, if not specified.

- `pfcwd start --action [drop | forward | alert] ports` *`interface_name`* `detection-time` *`value`* `--restoration-time` *`value`*
-
```
admin@sonic:~$ sudo pfcwd start --action drop ports Ethernet9 detection-time 100
restoration time not defined; default to 2 times detection time: 200 ms
```

```
admin@sonic:~$ sudo pfcwd start --action drop ports all detection-time 400 --restoration-
time 3000
```

```
admin@sonic:~$ sudo pfcwd start --action drop ports all detection-time 400 --restoration-
time 300000
Usage: pfcwd start [OPTIONS] [PORTS]... DETECTION_TIME
```

```
Error: Invalid value for "--restoration-time" / "-r": 300000 is not in the valid range of
100 to 60000.
admin@sonic:~$ sudo pfcwd start --action drop ports all detection-time 30000 --restoration-
time 3000
Usage: pfcwd start [OPTIONS] [PORTS]... DETECTION_TIME

Error: Invalid value for "detection-time": 30000 is not in the valid range of 100 to 5000.
```

pfcwd stop

Disables PFC watchdog on a specified ports. If the interface_name is not specified, PFC watchdog is disabled on all interfaces.

- `pfcwd stop [interface_name]`
- ```
  admin@sonic:~$ sudo pfcwd stop Ethernet10
  ```

```
admin@sonic:~$ sudo pfcwd stop
```

pfcwd show config

Displays the PFC watchdog configuration like action, detection time, and restoration time for a ports. If the interface_name is not specified, it displays the PFC watchdog configuration for all interfaces.

- `pfcwd show config interface_name`
- ```
  admin@sonic:~$ sudo pfcwd show config Ethernet8
  Changed polling interval to 100ms
       PORT    ACTION    DETECTION TIME    RESTORATION TIME
  ---------  --------  ----------------  ------------------
  Ethernet8      drop               400                3000
  ```

```
admin@sonic:~$ sudo pfcwd show config
Changed polling interval to 100ms
       PORT    ACTION    DETECTION TIME    RESTORATION TIME
-----------  --------  ----------------  ------------------
  Ethernet0      drop               400                3000
  Ethernet4      drop               400                3000
  Ethernet5      drop               400                3000
  Ethernet6      drop               400                3000
  Ethernet7      drop               400                3000
  Ethernet8      drop               400                3000
  Ethernet9      drop               400                3000
 Ethernet10      drop               400                3000
 Ethernet11      drop               400                3000
 Ethernet12      drop               400                3000
 Ethernet16      drop               400                3000
 Ethernet20      drop               400                3000
 Ethernet24      drop               400                3000
 Ethernet28      drop               400                3000
 Ethernet32      drop               400                3000
 Ethernet36      drop               400                3000
 Ethernet40      drop               400                3000
 Ethernet44      drop               400                3000
 Ethernet48      drop               400                3000
 Ethernet52      drop               400                3000
 Ethernet56      drop               400                3000
 Ethernet60      drop               400                3000
 Ethernet64      drop               400                3000
 Ethernet68      drop               400                3000
 Ethernet72      drop               400                3000
 Ethernet76      drop               400                3000
 Ethernet80      drop               400                3000
 Ethernet84      drop               400                3000
 Ethernet88      drop               400                3000
 Ethernet92      drop               400                3000
 Ethernet96      drop               400                3000
Ethernet100      drop               400                3000
Ethernet104      drop               400                3000
Ethernet108      drop               400                3000
Ethernet112      drop               400                3000
Ethernet116      drop               400                3000
```

```
Ethernet120      drop               400                3000
Ethernet124      drop               400                3000
```

pfcwd show stats

Displays the PFC watchdog statistics on the system. If the interface_name is not specified, it displays the PFC watchdog configuration for all interfaces.

- `pfcwd show stats interface_name`
-
```
admin@sonic:~$ sudo pfcwd show config Ethernet32

       QUEUE      STATUS STORM DETECTED/RESTORED      TX OK/DROP  RX OK/DROP TX LAST OK/
DROP  RX LAST OK/DROP
------------ ----------- ----------------------- --------------- -----------
--------------- ---------------
Ethernet32:3 operational                     4/4 1024381/1444477         0/0
32333/459167             0/0
```

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PIM source-specific multicast configuration and show

IGMP configuration commands

All IGMP configuration is done in the VTY shell. When IGMP is enabled, PIM receives IGMP reports and queries. IGMP configuration is done under an interface, where PIM is also configured.

```
sonic-frr# ip pim ssm prefix-list ssm_list
!
interface Vlan20
 ip igmp
 ip igmp join 238.1.1.1 7.7.7.7
 ip igmp last-member-query-count 3
 ip igmp last-member-query-interval 11
 ip igmp query-max-response-time 20
 ip pim
!
interface Vlan200 vrf Vrf_RED
 ip igmp
 ip igmp join 224.3.3.4 0.0.0.0
 ip igmp version 2
 ip pim
!
ip prefix-list ssm_list seq 5 permit any
!
```

PIM configuration commands

PIM SSM configuration example

```
sonic-frr# ip pim join-prune-interval 90
ip pim ssm prefix-list ssm_list
ip pim ecmp rebalance
service integrated-vtysh-config
!
vrf Vrf_RED
 ip pim ecmp rebalance
 ip pim join-prune-interval 90
 ip pim ssm prefix-list ssm_list
 exit-vrf
!
interface vlan10
 ip pim
 ip pim bfd
 ip pim drpriority 100
 ip pim hello 15
!
interface Vlan100 vrf Vrf_RED
 ip pim
 ip pim bfd
 ip pim drpriority 100
 ip pim hello 15
!
interface Vlan20
 ip igmp
 ip pim
 ip pim bfd
```

```
 ip pim drpriority 100
 ip pim hello 15
!
interface Vlan200 vrf Vrf_RED
 ip igmp
 ip pim
 ip pim bfd
 ip pim drpriority 100
 ip pim hello 15
!
ip prefix-list ssm_list seq 5 permit 232.0.0.0/24
!
```

This configuration example shows the PIM-SSM/IGMP configuration for the default VRF and the nondefault VRF (Vrf_RED). PIM is enabled on the upstream interface (Vlan10 and Vlan100, and the interfaces towards the multicast source called IIF) and IGMP and PIM are enabled on the downstream interface (Vlan20 and Vlan200, the interfaces towards the multicast host or a downstream PIM router). PIM adjacency is established on on the upstream interfaces, Vlan10 and Vlan100. The example also shows that PIM is enabled for BFD.

PIM/IGMP show commands

FRR VTYSH Shell

PIM show commands are available only from the FRR vtysh shell. PIM global configuration parameters, total multicast route count and other PIM-related information displays.

```
sonic-frr# show ip multicast
Router MLAG Role: NONE
Mroute socket descriptor: 7(default)
Mroute socket uptime: 01:36:44

Zclient update socket: 11 failures=0
Zclient lookup socket: 12 failures=0

Maximum highest VifIndex: 31
Total number of PIM/IGMP enabled interfaces: 3

Total Dynamic Multicast routes in VRF default: 1
Total Dynamic Uninstalled Multicast routes in VRF default: 0
Total Static Multicast routes in VRF default: 0
Total Static Uninstalled Multicast routes in VRF default: 0
Total Static Failed Multicast routes in VRF default: 0
Total Uninstalled Multicast routes in VRF default: 0
Total Multicast routes in VRF default: 1

Total Dynamic Multicast routes across all VRFs: 2
Total Dynamic Uninstalled Multicast routes across all VRFs: 0
Total Static Multicast routes across all VRFs: 0
Total Static Uninstalled Multicast routes across all VRFs: 0
Total Uninstalled Multicast routes across all VRFs: 0
Total Multicast routes across all VRFs: 2

Upstream Join Timer: 90 secs
Join/Prune Holdtime: 315 secs
PIM ECMP: Enable
PIM ECMP Rebalance: Enable

RPF Cache Refresh Delay:    50 msecs
RPF Cache Refresh Timer:    0 msecs
RPF Cache Refresh Requests: 0
RPF Cache Refresh Events:   0
RPF Cache Refresh Last:     --:--:--
Nexthop Lookups:            6
Nexthop Lookups Avoided:    0

Scan OIL - Last: 01:08:42  Events: 7
MFC Add  - Last: 01:08:42  Events: 3
MFC Del  - Last: 01:09:04  Events: 4

Interface        Address            ifi Vif   PktsIn PktsOut    BytesIn   BytesOut
Vlan10           192.168.10.1     66   2       0       0          0          0
```

```
Vlan20           192.168.20.1     68   1       0       0          0          0
vlan10           0.0.0.0           0  -1       0       0          0          0
```

Displays the PIM interface status

```
sonic-frr# show ip pim vrf all interface
VRF: Vrf_RED
Interface         State          Address  PIM Nbrs           PIM DR  FHR IfChannels
Vlan100              up    192.168.100.1         1            local    0          0
Vlan200              up    192.168.200.1         0            local    0          1
VRF: default
Interface         State          Address  PIM Nbrs           PIM DR  FHR IfChannels
Vlan10               up     192.168.10.1         1            local    0          0
Vlan20               up     192.168.20.1         0            local    0          1
```

Displays PIM interface related operational information in detail

```
sonic-frr# show ip pim interface Vlan10
Interface  : Vlan10
State      : up
Address    : 192.168.10.1 (primary)

Designated Router
-----------------
Address                : 192.168.10.1
Local DR Priority      : 1
Neighbors that didn't
 advertise DR Priority : 0
Uptime                 : --:--:--
Elections              : 0
Changes                : 0


FHR - First Hop Router
----------------------
232.1.2.1 : 192.168.10.10 is a source, uptime is 01:29:05


Hellos
------
Period         : 30
Timer          : 00:00:14
StatStart      : 01:30:46
Receive        : 27
Receive Failed : 0
Send           : 182
Send Failed    : 0
Generation ID  : 4b375a30


Flags
-----
All Multicast   : no
Broadcast       : yes
Deleted         : no
Interface Index : 66
Multicast       : yes
Multicast Loop  : 0
Promiscuous     : no


Join Prune Interval
-------------------
LAN Delay                    : yes
Effective Propagation Delay  : 0 msec
Effective Override Interval  : 0 msec
Join Prune Override Interval : 0 msec


LAN Prune Delay
---------------
Propagation Delay           : 500 msec
```

```
Propagation Delay (Highest) : 0 msec
Override Interval           : 2500 msec
Override Interval (Highest) : 0 msec
```

Displays IGMP interface status

```
sonic-frr# show ip igmp vrf all interface
VRF: Vrf_RED
Interface         State          Address  V  Querier  Query Timer    Uptime
Vlan100             up    192.168.100.1  3    local     00:01:33  115:09:34
Vlan200             up    192.168.200.1  3    local     00:02:01  115:06:56
VRF: default
Interface         State          Address  V  Querier  Query Timer    Uptime
Vlan10             mtrc     192.168.10.1  3    other     --:--:--  115:08:42
Vlan20              up      192.168.20.1  3    local     00:02:01  115:07:01
```

Displays PIM packet send/receive statistics per interface

```
sonic-frr# show ip pim vrf all interface traffic
VRF: Vrf_RED

Interface              HELLO            JOIN            PRUNE         REGISTER      REGISTER-
STOP      ASSERT           BSM
                       Rx/Tx            Rx/Tx           Rx/Tx            Rx/Tx           Rx/
Tx           Rx/Tx           Rx/Tx
-------------------------------------------------------------------------------------------------
-----------------------------------
Vlan100                 39/42            0/19            0/0              0/0
0/0             0/0             0/0
Vlan200                 0/407            27/0            0/0              0/0
0/0             0/0             0/0
VRF: default

Interface              HELLO            JOIN            PRUNE         REGISTER      REGISTER-
STOP      ASSERT           BSM
                       Rx/Tx            Rx/Tx           Rx/Tx            Rx/Tx           Rx/
Tx           Rx/Tx           Rx/Tx
-------------------------------------------------------------------------------------------------
-----------------------------------
Vlan10                  41/38            0/17            0/0              0/0
0/0             0/0             0/0
Vlan20                  0/408            11/0            0/0              0/0
0/0             0/0             0/0
```

Displays PIM neighbors

```
sonic-frr# show ip pim neighbor
Interface         Neighbor    Uptime  Holdtime  DR Pri
Vlan10        192.168.10.2  00:00:37  00:01:38       1
sonic#

sonic# show ip pim vrf Vrf_RED neighbor
Interface         Neighbor    Uptime  Holdtime  DR Pri
Vlan100       192.168.100.2 00:00:37  00:01:38       1
```

Displays IGMP group and source-related membership information

```
sonic-frr# show ip igmp vrf all sources
VRF: Vrf_RED
Interface        Address         Group           Source          Timer Fwd Uptime
Vlan200          192.168.200.1   232.1.2.1       192.168.100.10  02:26   Y 94:57:52
VRF: default
Interface        Address         Group           Source          Timer Fwd Uptime
Vlan20           192.168.20.1    232.1.2.1       192.168.10.10   02:19   Y 94:58:00
```

Displays multicast routes

```
sonic-frr# show ip mroute vrf all
VRF: Vrf_RED
  * -> indicates installed route
    Source          Group           Proto  Input            Output           TTL  Uptime
```

```
* 192.168.100.10  232.1.2.1       IGMP   Vlan100          Vlan200          1    00:59:25
VRF: default
  * -> indicates installed route
  Source          Group           Proto  Input            Output           TTL  Uptime
* 192.168.10.10   232.1.2.1       IGMP   Vlan10           Vlan20           1    00:59:52
```

Displays the number of multicast routes in the MRIB and if they are installed in the Linux kernel

```
sonic-frr# show ip mroute vrf all summary
VRF: Vrf_RED
Mroute Type    Installed/Total
(*, G)               0/0
(S, G)               1/1
------
Total                1/1
VRF: default
Mroute Type    Installed/Total
(*, G)               0/0
(S, G)               1/1
------
Total                1/1
```

Displays the software forwarded multicast data packets by the Linux kernel

```
sonic-frr# show ip mroute vrf all count
VRF: Vrf_RED

Source          Group           LastUsed Packets Bytes WrongIf
192.168.100.10  232.1.2.1       0        0       0          0
VRF: default

Source          Group           LastUsed Packets Bytes WrongIf
192.168.10.10   232.1.2.1       0        0       0          0
```

Displays PIM SSM range prefix-list details

```
sonic-frr# show ip pim vrf all group-type
VRF: Vrf_RED
SSM group range : ssm_list
VRF: default
SSM group range : ssm_list
```

Displays PIM upstream join state information

```
sonic-frr# show ip pim vrf all join
VRF: Vrf_RED
Interface        Address         Source          Group           State      Uptime   Expire
Prune
Vlan200          192.168.200.1   192.168.100.10  232.1.2.1       NOINFO     --:--:-- --:--
--:--
VRF: default
Interface        Address         Source          Group           State      Uptime   Expire
Prune
Vlan20           192.168.20.1    192.168.10.10   232.1.2.1       NOINFO     --:--:-- --:--
--:--
```

Displays PIM local membership details

```
sonic-frr# show ip pim vrf all local-membership
VRF: Vrf_RED
Interface         Address          Source           Group            Membership
Vlan200           192.168.200.1    192.168.100.10   232.1.2.1        INCLUDE
VRF: default
Interface         Address          Source           Group            Membership
Vlan20            192.168.20.1     192.168.10.10    232.1.2.1        INCLUDE
```

Displays PIM RPF next-hop information that is registered with Zebra

```
sonic-frr# show ip pim vrf all nexthop
VRF: Vrf_RED
```

```
Number of registered addresses: 1
Address         Interface        Nexthop
------------------------------------------
192.168.100.10  Vlan100          192.168.100.10
VRF: default
Number of registered addresses: 1
Address         Interface        Nexthop
------------------------------------------
192.168.10.10   Vlan10           192.168.10.10
```

Displays PIM upstream RPF-related information

```
sonic-frr# show ip pim vrf all rpf
VRF: Vrf_RED
RPF Cache Refresh Delay:    50 msecs
RPF Cache Refresh Timer:    0 msecs
RPF Cache Refresh Requests: 0
RPF Cache Refresh Events:   0
RPF Cache Refresh Last:     --:--:--
Nexthop Lookups:            4
Nexthop Lookups Avoided:    0

Source          Group           RpfIface         RpfAddress      RibNextHop      Metric Pref
192.168.100.10  232.1.2.1       Vlan100          0.0.0.0         192.168.100.10       0    0
VRF: default
RPF Cache Refresh Delay:    50 msecs
RPF Cache Refresh Timer:    0 msecs
RPF Cache Refresh Requests: 0
RPF Cache Refresh Events:   0
RPF Cache Refresh Last:     --:--:--
Nexthop Lookups:            6
Nexthop Lookups Avoided:    0

Source          Group           RpfIface         RpfAddress      RibNextHop      Metric Pref
192.168.10.10   232.1.2.1       Vlan10           0.0.0.0         192.168.10.10        0    0
```

Displays PIM downstream state information

```
sonic-frr# show ip pim vrf all state
VRF: Vrf_RED
Codes: J -> Pim Join, I -> IGMP Report, S -> Source, * -> Inherited from (*,G), V -> VxLAN
Installed Source           Group            IIF              OIL
1         192.168.100.10   232.1.2.1        Vlan100          Vlan200(IJ  )

VRF: default
Codes: J -> Pim Join, I -> IGMP Report, S -> Source, * -> Inherited from (*,G), V -> VxLAN
Installed Source           Group            IIF              OIL
1         192.168.10.10    232.1.2.1        Vlan10           Vlan20(IJ  )
```

Displays PIM upstream state and timers-related information

```
sonic-frr# show ip pim vrf all upstream
VRF: Vrf_RED
Iif             Source          Group           State       Uptime   JoinTimer RSTimer
KATimer   RefCnt
Vlan100         192.168.100.10  232.1.2.1       J           01:23:08 --:--:--  --:--:--
00:02:59       2
VRF: default
Iif             Source          Group           State       Uptime   JoinTimer RSTimer
KATimer   RefCnt
Vlan10          192.168.10.10   232.1.2.1       J           01:23:35 --:--:--  --:--:--
00:03:20       2
```

Displays PIM upstream state join desired information

```
sonic-frr# show ip pim vrf all upstream-join-desired
VRF: Vrf_RED
Interface        Source          Group           LostAssert Joins PimInclude JoinDesired
EvalJD
Vlan200          192.168.100.10  232.1.2.1       no         no    yes        yes         yes
VRF: default
```

```
Interface        Source          Group           LostAssert Joins PimInclude JoinDesired
EvalJD
Vlan20           192.168.10.10   232.1.2.1       no         no    yes        yes         yes
```

SONiC Click shell

These show commands are available only in the SONiC Click shell. These commands fetch the data from the Multicast OrchAgent and display the multicast routes, IPMC groups returned by SAI, IPMC RPF groups returned by SAI and some counters.

```
admin@sonic:~$ show debug ipmcorch -?
Usage: show debug ipmcorch [OPTIONS] COMMAND [ARGS]...

  Active debugging for IpmcOrch

Options:
  -?, -h, --help  Show this message and exit.

Commands:
  all          Dump all ipmcorch debugs
  counters     Dump IPMC counters
  ipmc-groups  Dump IPMC groups
  ipmc-routes  Dump ipmcorch routes
  rpf-groups   Dump RPF groups
```

```
admin@sonic:~$ show debug ipmcorch all
VRF name "Default", VRF object ID 0x300000000003a

Source IP        Group IP         Incoming Interface   Outgoing Interface(s)
---------------- ---------------- -------------------- ---------------------
192.168.10.10    232.1.2.1        Vlan10               Vlan20

Total number of IPMC entries in VRF "Default" : 1

VRF name "Vrf_RED", VRF object ID 0x30000000009ff

Source IP        Group IP         Incoming Interface   Outgoing Interface(s)
---------------- ---------------- -------------------- ---------------------
192.168.100.10   232.1.2.1        Vlan100              Vlan200

Total number of IPMC entries in VRF "Vrf_RED" : 1

Total number of IPMC entries : 2

IPMC Group ID      Ref Count Group Members (interface - object ID)
------------------ --------- -------------------------------------
0x0033000000000a25 1         Vlan20 - 0x34000000000a26
0x0033000000000a29 1         Vlan200 - 0x34000000000a2a

Total number of IPMC groups : 2

RPF Group ID       Ref Count Group Members (interface - object ID)
------------------ --------- -------------------------------------
0x002f000000000a23 1         Vlan10 - 0x30000000000a24
0x002f000000000a27 1         Vlan100 - 0x30000000000a28

Total number of RPF groups : 2

IPMC Interface     Ref Count
------------------ ---------
Vlan10             1
Vlan100            1
Vlan20             1
Vlan200            1
```

Fetches the data from the error database and displays all the multicast route entries that failed to get added to the ASIC, and the entries that hit the TABLE FULL condition

```
root@sonic:~$ show error_database
VRF Name    Source IP    Group IP      In Interface    Out Interface(s)    Error
```

```
Code          Operation
----------  -----------  ------------  --------------  ------------------
------------------  -----------
Default     112.0.0.2    232.0.31.64   Ethernet2       Ethernet0
SWSS_RC_TABLE_FULL  create
Default     112.0.0.2    232.0.31.63   Ethernet2       Ethernet0
SWSS_RC_TABLE_FULL  create
Default     112.0.0.2    232.0.31.62   Ethernet2       Ethernet0
SWSS_RC_TABLE_FULL  create
```

IGMP clear commands

Clears IGMP dynamic group information under an interface.

```
sonic-frr# clear ip igmp vrf Vrf_RED interfaces
  <cr>
sonic# clear ip igmp interfaces
  <cr>
```

PIM clear commands

Clears PIM information.

```
sonic-frr# clear ip pim
  interface   Reset PIM interfaces
  interfaces  Reset PIM interfaces
  oil         Rescan PIM OIL (output interface list)
  statistics  Specify the VRF
  vrf         Specify the VRF
```

IGMP debug commands

Debugs IP IGMP commands and can be enabled from the VTY shell.

```
sonic-frr# debug igmp
  <cr>
  events   IGMP protocol events
  packets  IGMP protocol packets
  trace    IGMP internal daemon activity
```

PIM debug commands

PIM debug commands are available only from FRR vtysh shell. Debug commands enable tracing of PIM events, packets, mroute, PIM's interaction with Zebra, and so on.

```
sonic-frr# debug pim
  <cr>
  bsm          BSR message processing activity
  events       PIM protocol events
  nht          Nexthop Tracking
  packet-dump  PIM packet dump
  packets      PIM protocol packets
  static       PIM Static Multicast Route activity
  trace        PIM internal daemon activity
  vxlan        PIM VxLAN events
  zebra        ZEBRA protocol activity
```

```
sonic-frr# debug mroute
  <cr>
  detail  detailed
```

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PortChannel configuration and show

PortChannel show commands

show interfaces portchannel

Displays all the port-channels that are configured in the device and its current status.

- `show interfaces portchannel`
- ```
  admin@sonic:~$ show interfaces portchannel
    Flags: A - active, I - inactive, Up - up, Dw - Down, N/A - not available, S - selected,
  D - deselected
      No.  Team Dev       Protocol     Ports
    -----  -------------  -----------  --------------------------
       24  PortChannel24  LACP(A)(Up)  Ethernet28(S) Ethernet24(S)
       48  PortChannel48  LACP(A)(Up)  Ethernet52(S) Ethernet48(S)
       40  PortChannel40  LACP(A)(Up)  Ethernet44(S) Ethernet40(S)
        0  PortChannel0   LACP(A)(Up)  Ethernet0(S) Ethernet4(S)
        8  PortChannel8   LACP(A)(Up)  Ethernet8(S) Ethernet12(S)
        1  PortChannel1   NONE(A)(Up)  Ethernet19(S) Ethernet18(S)
  ```

PortChannel configuration commands

config portchannel add/del

Adds or deletes a port-channel. It is recommended to use port-channel names in the format `PortChannelxxxx`, where *xxxx* is number of 1 to 4 digits (PortChannel0002).

NOTE: If you specify any other name like "pc99", the command succeeds but such names are not supported. Such names are not printed properly in the `show interface portchannel` command. It is recommended not to use such names.

When any port is already member of any other port-channel and if you try to add the same port in some other port-channel (without deleting it from the current port-channel), the command fails internally and does not print any error message. Remove the member from current port-channel and then add it to new port-channel.

- `config portchannel [add | del] portchannel_name [min-links INTEGER] [fallback true/false] [static true/false]`
  - `min-links` — minimum number of links required to bring up the port-channel
  - `fallback` — true/false. LACP fallback feature can be enabled/disabled; when it is set to true, only one member port is selected as active per port-channel during fallback mode
  - `static` — configures the port-channel as static
- ```
  admin@sonic:~$ sudo config portchannel add PortChannel0011
  This command will create the portchannel with name "PortChannel0011".
  ```

  ```
  admin@sonic:~$ sudo config portchannel add PortChannel0011 --static=true
  This command will create a static portchannel with name "PortChannel0011".
  ```

config portchannel member

Adds or deletes a member port into the already created port-channel.

- `config portchannel member [add | del] portchannel_name member_portname`
- ```
  admin@sonic:~$ sudo config portchannel member add PortChannel0011 Ethernet4
  This command will add Ethernet4 as member of the portchannel "PortChannel0011".
  ```
  ```

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QoS configuration and show

QoS show commands

PFC

show pfc counters

Displays the details of rx and tx priority-flow-control (PFC) for all ports.

- `show pfc counters [-c or --clear]`

```
admin@sonic:~$ show pfc counters
    Port Rx     PFC0     PFC1     PFC2     PFC3     PFC4     PFC5     PFC6     PFC7
  -----------  ------  ------  ------  ------  ------  ------  ------  ------
   Ethernet0        0        0        0        0        0        0        0        0
   Ethernet4        0        0        0        0        0        0        0        0
   Ethernet8        0        0        0        0        0        0        0        0
  Ethernet12        0        0        0        0        0        0        0        0

     Port Tx     PFC0     PFC1     PFC2     PFC3     PFC4     PFC5     PFC6     PFC7
  -----------  ------  ------  ------  ------  ------  ------  ------  ------
   Ethernet0        0        0        0        0        0        0        0        0
   Ethernet4        0        0        0        0        0        0        0        0
   Ethernet8        0        0        0        0        0        0        0        0
  Ethernet12        0        0        0        0        0        0        0        0
```

show queue counters

Displays packet and byte counters for all queues of all ports, or for a specific-port. The command also displays counters for CPU queues, and can be used to clear the counters for all queues of all ports or one specific-port.

- `show queue counters [-c or --clear] [interface_name]`

```
admin@sonic:~$ show queue counters
       Port    TxQ    Counter/pkts    Counter/bytes    Drop/pkts    Drop/bytes
  ---------  -----  --------------  ---------------  -----------  ------------
  Ethernet0    UC0               0                0            0             0
  Ethernet0    UC1               0                0            0             0
  Ethernet0    UC2               0                0            0             0
  Ethernet0    UC3               0                0            0             0
  Ethernet0    UC4               0                0            0             0
  Ethernet0    UC5               0                0            0             0
  Ethernet0    UC6               0                0            0             0
  Ethernet0    UC7               0                0            0             0
  Ethernet0    UC8               0                0            0             0
  Ethernet0    UC9               0                0            0             0
  Ethernet0    MC0               0                0            0             0
  Ethernet0    MC1               0                0            0             0
  Ethernet0    MC2               0                0            0             0
  Ethernet0    MC3               0                0            0             0
  Ethernet0    MC4               0                0            0             0
  Ethernet0    MC5               0                0            0             0
  Ethernet0    MC6               0                0            0             0
  Ethernet0    MC7               0                0            0             0
  Ethernet0    MC8               0                0            0             0
  Ethernet0    MC9               0                0            0             0

       Port    TxQ    Counter/pkts    Counter/bytes    Drop/pkts    Drop/bytes
  ---------  -----  --------------  ---------------  -----------  ------------
  Ethernet4    UC0               0                0            0             0
  Ethernet4    UC1               0                0            0             0
  Ethernet4    UC2               0                0            0             0
  Ethernet4    UC3               0                0            0             0
  Ethernet4    UC4               0                0            0             0
  Ethernet4    UC5               0                0            0             0
```

```
 Ethernet4    UC6                0                0              0              0
 Ethernet4    UC7                0                0              0              0
 Ethernet4    UC8                0                0              0              0
 Ethernet4    UC9                0                0              0              0
 Ethernet4    MC0                0                0              0              0
 Ethernet4    MC1                0                0              0              0
 Ethernet4    MC2                0                0              0              0
 Ethernet4    MC3                0                0              0              0
 Ethernet4    MC4                0                0              0              0
 Ethernet4    MC5                0                0              0              0
 Ethernet4    MC6                0                0              0              0
 Ethernet4    MC7                0                0              0              0
 Ethernet4    MC8                0                0              0              0
 Ethernet4    MC9                0                0              0              0
```

```
admin@sonic:~$ show queue counters Ethernet4
       Port    TxQ    Counter/pkts    Counter/bytes    Drop/pkts    Drop/bytes
  ---------  -----  --------------  ---------------  -----------  ------------
  Ethernet4    UC0                0                0            0             0
  Ethernet4    UC1                0                0            0             0
  Ethernet4    UC2                0                0            0             0
  Ethernet4    UC3                0                0            0             0
  Ethernet4    UC4                0                0            0             0
  Ethernet4    UC5                0                0            0             0
  Ethernet4    UC6                0                0            0             0
  Ethernet4    UC7                0                0            0             0
  Ethernet4    UC8                0                0            0             0
  Ethernet4    UC9                0                0            0             0
  Ethernet4    MC0                0                0            0             0
  Ethernet4    MC1                0                0            0             0
  Ethernet4    MC2                0                0            0             0
  Ethernet4    MC3                0                0            0             0
  Ethernet4    MC4                0                0            0             0
  Ethernet4    MC5                0                0            0             0
  Ethernet4    MC6                0                0            0             0
  Ethernet4    MC7                0                0            0             0
  Ethernet4    MC8                0                0            0             0
  Ethernet4    MC9                0                0            0             0
```

```
admin@sonic:~$ show queue counters CPU
   Port    TxQ    Counter/pkts    Counter/bytes    Drop/pkts    Drop/bytes
------  -----  --------------  ---------------  -----------  ------------
    CPU    MC0                0                0            0             0
    CPU    MC1                0                0            0             0
    CPU    MC2                0                0            0             0
    CPU    MC3                0                0            0             0
    CPU    MC4                0                0            0             0
    CPU    MC5                0                0            0             0
    CPU    MC6                0                0            0             0
    CPU    MC7                0                0            0             0
    ...
```

show queue watermark

Displays the watermark for the queues (egress shared pool occupancy per queue) for either the unicast queues, or multicast queues for all ports.

- `show queue watermark {multicast | unicast}`
-
```
admin@sonic:~$ show queue watermark unicast
Egress shared pool occupancy per unicast queue:
       Port    UC0    UC1    UC2    UC3    UC4    UC5    UC6    UC7
-----------  -----  -----  -----  -----  -----  -----  -----  -----
  Ethernet0      0      0      0      0      0      0      0      0
  Ethernet4      0      0      0      0      0      0      0      0
  Ethernet8      0      0      0      0      0      0      0      0
  Ethernet12     0      0      0      0      0      0      0      0
```

```
admin@sonic:~$ show queue watermark multicast (Egress shared pool occupancy per multicast
queue)
```

show priority-group

Displays the watermark or persistent-watermark for the ingress `headroom` or `shared pool occupancy` per priority-group for all ports.

- `show priority-group {watermark | persistent-watermark} {headroom | shared}`
- ```
  admin@sonic:~$ show priority-group watermark shared
  Ingress shared pool occupancy per PG:
         Port    PG0    PG1    PG2    PG3    PG4    PG5    PG6    PG7
  -----------  -----  -----  -----  -----  -----  -----  -----  -----
    Ethernet0      0      0      0      0      0      0      0      0
    Ethernet4      0      0      0      0      0      0      0      0
    Ethernet8      0      0      0      0      0      0      0      0
    Ethernet12     0      0      0      0      0      0      0      0
  ```

  ```
  admin@sonic:~$ show priority-group watermark headroom    (Ingress headroom per PG)
  ```

  ```
  admin@sonic:~$ show priority-group persistent-watermark shared (Ingress shared pool
  occupancy per PG)
  ```

  ```
  admin@sonic:~$ show priority-group persistent-watermark headroom (Ingress headroom per PG)
  ```

  Besides the watermark (`show queue|priority-group watermark ...`), a persistent watermark is available which holds values independently of this watermark. You can use the watermark to debug, clearing, and so on but the `persistent watermark` is not effected.

show queue persistent-watermark

Displays the persistent-watermark for the queues (egress shared pool occupancy per queue) for either the unicast queues, or multicast queues for all ports.

- `show queue persistent-watermark {unicast | multicast}`
- ```
  admin@sonic:~$ show queue persistent-watermark unicast
  Egress shared pool occupancy per unicast queue:
         Port    UC0    UC1    UC2    UC3    UC4    UC5    UC6    UC7
  -----------  -----  -----  -----  -----  -----  -----  -----  -----
    Ethernet0    N/A    N/A    N/A    N/A    N/A    N/A    N/A    N/A
    Ethernet4    N/A    N/A    N/A    N/A    N/A    N/A    N/A    N/A
    Ethernet8    N/A    N/A    N/A    N/A    N/A    N/A    N/A    N/A
    Ethernet12   N/A    N/A    N/A    N/A    N/A    N/A    N/A    N/A
  ```

  ```
  admin@sonic:~$ show queue persistent-watermark multicast (Egress shared pool occupancy per
  multicast queue)
  ```

  Both user watermark and persistent watermark can be cleared.

  ```
  admin@sonic:~$ sonic-clear queue persistent-watermark unicast
  ```

  ```
  admin@sonic:~$ sonic-clear queue persistent-watermark multicast
  ```

  ```
  admin@sonic:~$ sonic-clear priority-group persistent-watermark shared
  ```

  ```
  admin@sonic:~$ sonic-clear priority-group persistent-watermark headroom
  ```

QoS configuration commands

config qos clear

Clears all QoS configuration from all QoS tables in ConfigDB.

- `config qos clear`
- ```
  admin@sonic:~$ sudo config qos clear
  ```
  ```

QoS configurations:

- TC_TO_PRIORITY_GROUP_MAP
- MAP_PFC_PRIORITY_TO_QUEUE
- TC_ TO_QUEUE_MAP
- DSCP_ TO_TC_MAP
- SCHEDULER
- PFC_PRIORITY_ TO_PRIORITY_GROUP_MAP
- PORT_QOS_MAP
- WRED_PROFILE
- QUEUE
- CABLE_LENGTH
- BUFFER_POOL
- BUFFER_PROFILE
- BUFFER_PG
- BUFFER_QUEUE

config qos reload

Reloads the QoS configuration.

- `config qos reload`
- ```
  admin@sonic:~$ sudo config qos reload
  Running command: /usr/local/bin/sonic-cfggen -d -t /usr/share/sonic/device/x86_64-
  dell_z9100_c2538-r0/Force10-Z9100-C32/buffers.json.j2 >/tmp/buffers.json
  Running command: /usr/local/bin/sonic-cfggen -d -t /usr/share/sonic/device/x86_64-
  dell_z9100_c2538-r0/Force10-Z9100-C32/qos.json.j2 -y /etc/sonic/sonic_version.yml >/tmp/
  qos.json
  Running command: /usr/local/bin/sonic-cfggen -j /tmp/buffers.json --write-to-db
  Running command: /usr/local/bin/sonic-cfggen -j /tmp/qos.json --write-to-db
  ```

  This example uses the *buffers.json.j2* file and *qos.json.j2* file from platform-specific folders. When there are no changes in the platform specific configuration files, they internally use the */usr/share/sonic/templates/buffers_config.j2* and */usr/share/sonic/templates/qos_config.j2* files to generate the configuration.

QoS configuration sets:

- **Generic QoS configuration** — complete list of all possible QoS configuration, provided in the */usr/share/sonic/templates/qos_config.j2* file. You have flexibility for platform-specific QoS configuration by placing the *qos_config.j2* file at */usr/share/sonic/device///*. If you would like to modify any of the loaded QoS configuration, you can modify this file in the device, then issue the `config qos reload` command.
- **Platform-specific buffer configuration** — each platform has platform-specific and topology-specific (T0 or T1 or T2) buffer configuration at */usr/share/sonic/device/buffers_defaults_tx.j2*. Besides to platform-specific configuration file, a generic configuration file is also present at */usr/share/sonic/templates/buffers_config.j2*. You can either modify the platform-specific configuration file, or the generic configuration file and then issue this `config qos reload` command.

These configuration files are already loaded in the device as part of the reboot process. If you would like to modify any of these configurations, modify the appropriate QoS tables and fields in these files, then use the `qos reload` command. This command uses the modified *buffers.json.j2* and *qos.json.j2* files, then reloads the new QoS configuration. If you have not made any changes in these configuration files, this command need not be run.
  ```

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Spanning-tree configuration, show, debug, and clear

Spanning-tree protocol (STP) prevents Layer 2 loops in a network and provides redundant links. If a primary link fails, the backup link is activated and network traffic is not affected. STP also ensures that the least-cost path is taken when multiple paths exist between devices.

When spanning-tree is used, the network switches transform the real network topology into a spanning-tree topology. In an STP topology, any LAN in the network can be reached from any other LAN through a unique path. The network switches recalculate a new spanning-tree topology whenever there is a change to the network topology.

Two modes of STP are supported: per VLAN spanning-tree (PVST) and rapid per VLAN spanning-tree (RPVST). Only one of the modes is configurable, and most of the listed commands are applicable to both modes. Commands not applicable to a specific mode are explicitly called out.

Per VLAN spanning-tree (PVST)

PVST+ allows for running multiple instances of spanning tree on per VLAN basis.

Rapid per-VLAN spanning-tree (RPVST)

RPVST+ allows for running multiple instances of rapid spanning tree on per VLAN basis. The next sections explain PVST and RPVST configuration and show commands. The details of the equivalent PVST and RPVSTIS-CLI CLI commands are available in *Management Framework CLI Reference Guide*.

Configuration commands

Global commands

config spanning_tree enable or disable pvst or rpvst

Globally enables or disables spanning-tree mode (PVST or RPVST) for the device.

NOTE: When global PVST or RPVST mode is enabled, by default spanning0tree is enabled on VLANs up to maximum PVST or RPVST instances that are supported on the hardware; other spanning-tree VLANs are disabled.

- `config spanning_tree {enable | disable} {pvst | rpvst}`
-
```
admin@sonic:~$ sudo config spanning_tree enable pvst
```

```
admin@sonic:~$ sudo config spanning_tree enable rpvst
```

config spanning_tree root_guard_timeout

Sets a root guard timeout value. Once superior BPDUs stop coming on the port, the device waits for a period until root guard timeout before moving the port to forwarding state (5 to 600 seconds; default 30).

- `config spanning_tree root_guard_timeout value`
-
```
admin@sonic:~$ sudo config spanning_tree root_guard_timeout 40
```

config spanning_tree forward_delay

Sets the forward delay time in seconds (4 to 30; default 15 seconds).

- `config spanning_tree forward_delay value`
-
```
admin@sonic:~$ sudo config spanning_tree forward_delay 20
```

config spanning_tree hello

Sets the hello interval for transmission of BPDUs (1 to 10 seconds; default 2).

- `config spanning_tree hello value`
- ```
  admin@sonic:~$ sudo config spanning_tree hello 3
  ```

config spanning_tree max_age

Sets the maximum time to listen for root bridge in seconds (6 to 40 seconds; default 20).

- `config spanning_tree max_age value`
- ```
  admin@sonic:~$ sudo config spanning_tree max_age 25
  ```

config spanning_tree priority

Sets the bridge priority in increments of 4096 (0 to 61440; default 32768).

- `config spanning_tree priority value`
- ```
  admin@sonic:~$ sudo config spanning_tree priority 4096
  ```

VLAN commands

config spanning_tree vlan enable or disable

Enables or disables spanning-tree on a specific VLAN.

- `config spanning_tree vlan {enable | disable} vlan`
- ```
  admin@sonic:~$ sudo config spanning_tree vlan enable 100
  ```

STP VLAN parameters

These commands are similar to the global level commands but allow configuring STP parameters on per-VLAN basis.

- `config spanning_tree vlan {forward_delay | hello | max_age | priority} vlan value`
- ```
  admin@sonic:~$ sudo config spanning_tree vlan forward_delay 100 20
  ```

  ```
  admin@sonic:~$ sudo config spanning_tree vlan hello 100 3
  ```

  ```
  admin@sonic:~$ sudo config spanning_tree vlan max_age 100 25
  ```

  ```
  admin@sonic:~$ sudo config spanning_tree vlan priority 100 4096
  ```

Interface commands

config spanning_tree interface enable or disable

Enables or disables STP on an interface; by default STP is enabled on the interface if global STP mode is configured.

- `config spanning_tree interface {enable | disable} if-name`
- ```
  admin@sonic:~$ sudo config spanning_tree interface enable Ethernet0
  ```

  ```
  admin@sonic:~$ sudo config spanning_tree interface enable PortChannel100
  ```

config spanning_tree interface priority

Sets the port-level priority value (0 to 240; default 128).

- `config spanning_tree interface priority if-name value`
- ```
  admin@sonic:~$ sudo config spanning_tree interface priority Ethernet0 64
  ```

  ```
  admin@sonic:~$ sudo config spanning_tree interface priority PortChannel100 64
  ```

configure spanning_tree interface cost

Sets the port-level cost value (1 to 200000000).
  ```

- `configure spanning_tree interface cost if-name value`
- ```
  admin@sonic:~$ sudo config spanning_tree interface cost Ethernet0 100
  ```

```
admin@sonic:~$ sudo config spanning_tree interface cost PortChannel100 100
```

config spanning_tree interface root_guard

Enables or disables root guard on an interface.

- `config spanning_tree interface root_guard {enable | disable} if-name`
- ```
  admin@sonic:~$ sudo config spanning_tree interface root_guard enable Ethernet0
  ```

config spanning_tree interface bpdu_guard

Enables or disables BPDU guard on an interface. By default, BPDU guard generates a syslog indicating the condition, for taking an action like disabling the port use shutdown option.

- `config spanning_tree interface bpdu_guard {enable | disable} ifname [--shutdown | -s]`
- ```
  admin@sonic:~$ sudo config spanning_tree interface bpdu_guard enable Ethernet0
  ```

```
admin@sonic:~$ sudo config spanning_tree interface bpdu_guard enable Ethernet0 --shutdown
```

config spanning_tree interface portfast

Enables or disables portfast on an interface. Portfast command is enabled by default on all ports. This command is not applicable to RPVST.

- `config spanning_tree interface portfast {enable | disable} if-name`
- ```
  admin@sonic:~$ sudo config spanning_tree interface portfast disable Ethernet0
  ```

config spanning_tree interface uplink_fast

Enables or disables uplink_fast on an interface. uplink_fast command is disabled by default on all ports. This command is not applicable to RPVST.

- `config spanning_tree interface uplink_fast {enable | disable} if-name`
- ```
  admin@sonic:~$ sudo config spanning_tree interface uplink_fast enable Ethernet0
  ```

VLAN, Interface commands

config spanning_tree vlan interface cost

Sets the port cost value per VLAN, interface basis (1 to 200000000).

- `config spanning_tree vlan interface cost vlan if-name value`
- ```
  admin@sonic:~$ sudo config spanning_tree vlan interface cost 100 Ethernet0 100
  ```

```
admin@sonic:~$ sudo config spanning_tree vlan interface cost 100 PortChannel100 100
```

config spanning_tree vlan interface priority

Sets the port priority value VLAN, interface basis (0 to 240; default 128).

- `config spanning_tree vlan interface priority vlan if-name value`
- ```
  admin@sonic:~$ sudo config spanning_tree vlan interface priority 100 Ethernet0 100
  ```

```
admin@sonic:~$ sudo config spanning_tree vlan interface priority 100 PortChannel100 100
```

Show commands

show spanning_tree

Displays spanning-tree state information.
```

- show spanning_tree vlan *vlanid* interface *if-name*

```
admin@sonic:~$ show spanning_tree
  Spanning-tree Mode: PVST
  VLAN 100 - STP instance 3
  ------------------------------------------------------------------------
  STP Bridge Parameters:

  Bridge           Bridge Bridge Bridge Hold  LastTopology Topology
  Identifier       MaxAge Hello  FwdDly Time  Change       Change
  hex              sec    sec    sec    sec   sec          cnt
  8000002438eefbc3 20     2      15     1     0            0

  RootBridge       RootPath  DesignatedBridge Root  Max Hel Fwd
  Identifier       Cost      Identifier       Port  Age lo  Dly
  hex                        hex                    sec sec sec
  8000002438eefbc3 0         8000002438eefbc3 Root  20  2   15

  STP Port Parameters:

  Port        Prio Path Port Uplink   State      Designated  Designated       Designated
  Num         rity Cost Fast Fast                Cost        Root             Bridge
  Ethernet13  128  4    Y    N        FORWARDING 0           8000002438eefbc3
8000002438eefbc3
```

```
admin@sonic:~$ show spanning_tree
Spanning-tree Mode: RPVST
VLAN 100 - STP instance 3
------------------------------------------------------------------------
STP Bridge Parameters:

Bridge           Bridge Bridge Bridge Hold  LastTopology Topology
Identifier       MaxAge Hello  FwdDly Time  Change       Change
hex              sec    sec    sec    sec   sec          cnt
8000002438eefbc3 20     2      15     1     0            0

RootBridge       RootPath  DesignatedBridge Root  Max Hel Fwd
Identifier       Cost      Identifier       Port  Age lo  Dly
hex                        hex                    sec sec sec
8000002438eefbc3 0         8000002438eefbc3 Root  20  2   15

STP Port Parameters:

Port        Prio Path Port Uplink   State      Designated  Designated       Designated
Num         rity Cost Fast Fast                Cost        Root             Bridge
Ethernet13  128  4    Y    N        FORWARDING 0           8000002438eefbc3
8000002438eefbc3
```

show spanning_tree bpdu_guard

Displays the interfaces which are BPDU guard enabled and also the state if the interface is disabled due to BPDU guard.

- show spanning_tree bpdu_guard

```
admin@sonic:~$ show spanning_tree bpdu_guard
PortNum            Shutdown    Port shut
-------------------------------------------------
Ethernet1            Yes          Yes
Ethernet2            Yes          No
Port-Channel2        No           NA
```

show spanning_tree root_guard

Displays the interfaces where root guard is active and the pending time for root guard timer expiry.

- show spanning_tree root_guard

```
admin@sonic:~$ show spanning_tree root_guard
Root guard timeout: 120 secs

Port         VLAN    Current State
-------------------------------------------------
```

```
Ethernet1     1        Inconsistent state (102 seconds left on timer)
Ethernet8     100      Consistent state
```

show spanning_tree statistics

Displays the spanning-tree BPDU statistics. Statistics are synced to the APP database every 10 seconds.

- `show spanning_tree statistics [vlan vlanid]`
- ```
  admin@sonic:~$ show spanning_tree statistics
    VLAN 100 - STP instance 3
    ------------------------------------------------------------------------
    PortNum           BPDU Tx     BPDU Rx     TCN Tx      TCN Rx
    Ethernet13        10          4           3           4
    PortChannel15     20          6           4           1
  ```

Debug commands

Enables additional logging which can be viewed in */var/log/stpd.log*.

- `debug spanning_tree bpdu [rx | tx]`
- `debug spanning_tree event`
- `debug spanning_tree vlan id`
- `debug spanning_tree interface if-name`
- `debug spanning_tree verbose`

Disables the debugging controls enabled.

```
admin@sonic:~$ sudo debug spanning_tree bpdu -d
```

Resets and displays debugging controls that are enabled.

- `debug spanning_tree reset`
- `debug spanning_tree show`

These debug commands are supported for displaying internal data structures:

- `debug spanning_tree dump global`
- `debug spanning_tree dump vlan vid`
- `debug spanning_tree dump interface vid if-name`

Clear commands

Clear STP counters.

- `sonic-clear spanning_tree statistics`
- `sonic-clear spanning_tree statistics vlan vid`
- `sonic-clear spanning_tree statistics vlan-interface vid if-name`
- `sonic-clear spanning_tree statistics interface if-name`
```

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Startup and running configuration

Startup configuration command

show startupconfiguration bgp

Displays the BGP startup configuration.

- `show startupconfiguration bgp`
- ```
  admin@sonic:~$ show startupconfiguration bgp
    Routing-Stack is: quagga
    !
    ! ========== Managed by sonic-cfggen DO NOT edit manually! ====================
    ! generated by templates/quagga/bgpd.conf.j2 with config DB data
    ! file: bgpd.conf
    !
    !
    hostname T1-2
    password zebra
    log syslog informational
    log facility local4
    ! enable password !
    !
    ! bgp multiple-instance
    !
    route-map FROM_BGP_SPEAKER_V4 permit 10
    !
    route-map TO_BGP_SPEAKER_V4 deny 10
    !
    router bgp 65000
      bgp log-neighbor-changes
      bgp bestpath as-path multipath-relax
      no bgp default ipv4-unicast
      bgp graceful-restart restart-time 180

      <Only the partial output is shown here. In actual command, more configuration
  information will be displayed>
  ```

Running configuration command

show runningconfiguration all

Displays the running configuration.

- `show runningconfiguration all`
- ```
  admin@sonic:~$ show runningconfiguration all
  ```

show runningconfiguration bgp

Displays the BGP running configuration.

- `show runningconfiguration bgp`
- ```
  admin@sonic:~$ show runningconfiguration bgp
  ```

show runningconfiguration interfaces

Displays the interface running configuration.

- `show runningconfiguration interfaces`
- ```
  admin@sonic:~$ show runningconfiguration interfaces
  ```

show runningconfiguration ntp

Displays the NTP running configuration.

- `show runningconfiguration ntp`
- ```
  admin@sonic:~$ show runningconfiguration ntp
  ```

show runningconfiguration snmp

Displays the SNMP running configuration.

- `show runningconfiguration snmp`
- ```
  admin@sonic:~$ show runningconfiguration snmp
  ```

show runningconfiguration acl

Displays the ACL running configuration.

- `show runningconfiguration acl`
- ```
  admin@sonic:~$ show runningconfiguration acl
  ```

show runningconfiguration interface

Displays the port running configuration.

- `show runningconfiguration interface [interface_name]`
- ```
  admin@sonic:~$ show runningconfiguration interface
  ```

  ```
  admin@sonic:~$ show runningconfiguration interface interface_name
  ```

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System state show

Processes show commands

These commands are used to determine CPU utilization. It also lists the active processes along with their corresponding process ID and other relevant parameters. `show processes` commands provide a wrapper over Linux `top` command. `show process cpu` sorts the processes being displayed by cpu-utilization, where `show process memory` shows processes memory-utilization.

show processes cpu

Displays the current CPU usage by process. Use the Linux `top -bn 1 -o %CPU` command to display the output.

- `show processes cpu`

```
admin@sonic:~$ show processes cpu
top - 23:50:08 up  1:18,  1 user,  load average: 0.25, 0.29, 0.25
Tasks: 161 total,   1 running, 160 sleeping,   0 stopped,   0 zombie
%Cpu(s):  3.8 us,  1.0 sy,  0.0 ni, 95.1 id,  0.1 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem:   8181216 total,  1161060 used,  7020156 free,   105656 buffers
KiB Swap:        0 total,        0 used,        0 free.   557560 cached Mem

 PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
2047 root      20   0  683772 109288  39652 S  23.8  1.3   7:44.79 syncd
1351 root      20   0   43360   5616   2844 S  11.9  0.1   1:41.56 redis-server
10093 root      20   0   21944   2476   2088 R   5.9  0.0   0:00.03 top
   1 root      20   0   28992   5508   3236 S   0.0  0.1   0:06.42 systemd
   2 root      20   0       0      0      0 S   0.0  0.0   0:00.00 kthreadd
   3 root      20   0       0      0      0 S   0.0  0.0   0:00.56 ksoftirqd/0
   5 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kworker/0:0H
```

show processes memory

Displays the current memory usage by processes. Use the Linux `top -bn 1 -o %MEM` command to display the output.

- `show processes memory`

```
admin@sonic:~$  show processes memory
top - 23:41:24 up 7 days, 39 min,  2 users,  load average: 1.21, 1.19, 1.18
Tasks: 191 total,   2 running, 189 sleeping,   0 stopped,   0 zombie
%Cpu(s):  2.8 us, 20.7 sy,  0.0 ni, 76.3 id,  0.0 wa,  0.0 hi,  0.2 si,  0.0 st
KiB Mem :  8162264 total,  5720412 free,   945516 used,  1496336 buff/cache
KiB Swap:        0 total,        0 free,        0 used.  6855632 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
18051 root      20   0  851540 274784   8344 S   0.0  3.4   0:02.77 syncd
17760 root      20   0 1293428 259212  58732 S   5.9  3.2  96:46.22 syncd
  508 root      20   0  725364  76244  38220 S   0.0  0.9   4:54.49 dockerd
30853 root      20   0   96348  56824   7880 S   0.0  0.7   0:00.98 show
17266 root      20   0  509876  49772  30640 S   0.0  0.6   0:06.36 docker
24891 admin     20   0  515864  49560  30644 S   0.0  0.6   0:05.54 docker
17643 admin     20   0  575668  49428  30628 S   0.0  0.6   0:06.29 docker
23885 admin     20   0  369552  49344  30840 S   0.0  0.6   0:05.57 docker
18055 root      20   0  509076  49260  30296 S   0.0  0.6   0:06.36 docker
17268 root      20   0  371120  49052  30372 S   0.0  0.6   0:06.45 docker
 1227 root      20   0  443284  48640  30100 S   0.0  0.6   0:41.91 docker
23785 admin     20   0  443796  48552  30128 S   0.0  0.6   0:05.58 docker
17820 admin     20   0  435088  48144  29480 S   0.0  0.6   0:06.33 docker
  506 root      20   0 1151040  43140  23964 S   0.0  0.5   8:51.08 containerd
18437 root      20   0   84852  26388   7380 S   0.0  0.3  65:59.76 python3.6
```

show processes summary

Displays the current summary information about all the processes.

- `show processes summary`

- ```
  admin@sonic:~$  show processes summary
    PID  PPID CMD                         %MEM %CPU
      1     0 /sbin/init                   0.0  0.0
      2     0 [kthreadd]                   0.0  0.0
      3     2 [ksoftirqd/0]                0.0  0.0
      5     2 [kworker/0:0H]               0.0  0.0
  ```

Services and memory show commands

show services

Displays the state of all SONiC processes running inside a Docker container; helps to identify the status of SONiC's critical processes.

- `sonic_installer remove image_name`

- ```
  admin@sonic:~$ show services
  dhcp_relay      docker
  ---------------------------
  UID        PID  PPID  C STIME TTY          TIME CMD
  root         1     0  0 05:26 ?        00:00:12 /usr/bin/python /usr/bin/supervi
  root        24     1  0 05:26 ?        00:00:00 /usr/sbin/rsyslogd -n

  snmp    docker
  ---------------------------
  UID        PID  PPID  C STIME TTY          TIME CMD
  root         1     0  0 05:26 ?        00:00:16 /usr/bin/python /usr/bin/supervi
  root        24     1  0 05:26 ?        00:00:02 /usr/sbin/rsyslogd -n
  Debian-+    29     1  0 05:26 ?        00:00:04 /usr/sbin/snmpd -f -LS4d -u Debi
  root        31     1  1 05:26 ?        00:15:10 python3.6 -m sonic_ax_impl

  syncd   docker
  ---------------------------
  UID        PID  PPID  C STIME TTY          TIME CMD
  root         1     0  0 05:26 ?        00:00:13 /usr/bin/python /usr/bin/supervi
  root        12     1  0 05:26 ?        00:00:00 /usr/sbin/rsyslogd -n
  root        17     1  0 05:26 ?        00:00:00 /usr/bin/dsserve /usr/bin/syncd
  root        27    17 22 05:26 ?        04:09:30 /usr/bin/syncd --diag -p /usr/sh
  root        51    27  0 05:26 ?        00:00:01 /usr/bin/syncd --diag -p /usr/sh

  swss    docker
  ---------------------------
  UID        PID  PPID  C STIME TTY          TIME CMD
  root         1     0  0 05:26 ?        00:00:29 /usr/bin/python /usr/bin/supervi
  root        25     1  0 05:26 ?        00:00:00 /usr/sbin/rsyslogd -n
  root        30     1  0 05:26 ?        00:00:13 /usr/bin/orchagent -d /var/log/s
  root        42     1  1 05:26 ?        00:12:40 /usr/bin/portsyncd -p /usr/share
  root        45     1  0 05:26 ?        00:00:00 /usr/bin/intfsyncd
  root        48     1  0 05:26 ?        00:00:03 /usr/bin/neighsyncd
  root        59     1  0 05:26 ?        00:00:01 /usr/bin/vlanmgrd
  root        92     1  0 05:26 ?        00:00:01 /usr/bin/intfmgrd
  root      3606     1  0 23:36 ?        00:00:00 bash -c /usr/bin/arp_update; sle
  root      3621  3606  0 23:36 ?        00:00:00 sleep 300
  ```

show system-memory

Displays the system-wide memory utilization information.

- `show system-memory`

- ```
  admin@sonic:~$ show system-memory
  Command: free -m -h
               total        used        free      shared    buffers     cached
  Mem:          3.9G        2.0G        1.8G        33M       324M       791M
  -/+ buffers/cache:        951M        2.9G
  Swap:           0B          0B          0B
  ```

show mmu

Displays virtual address to the physical address translation status of the memory management unit (MMU).

- `show mmu`
  ```

```
admin@sonic:~$ show mmu
Pool: ingress_lossless_pool
----  --------
xoff  4194112
type  ingress
mode  dynamic
size  10875072
----  --------

Pool: egress_lossless_pool
----  --------
type  egress
mode  static
size  15982720
----  --------

Pool: egress_lossy_pool
----  -------
type  egress
mode  dynamic
size  9243812
----  -------

Profile: egress_lossy_profile
----------  -------------------------------
dynamic_th  3
pool        [BUFFER_POOL|egress_lossy_pool]
size        1518
----------  -------------------------------

Profile: pg_lossless_100000_300m_profile
----------  -----------------------------------
xon_offset  2288
dynamic_th  -3
xon         2288
xoff        268736
pool        [BUFFER_POOL|ingress_lossless_pool]
size        1248
----------  -----------------------------------

Profile: egress_lossless_profile
---------  ----------------------------------
static_th  3995680
pool       [BUFFER_POOL|egress_lossless_pool]
size       1518
---------  ----------------------------------

Profile: pg_lossless_100000_40m_profile
----------  -----------------------------------
xon_offset  2288
dynamic_th  -3
xon         2288
xoff        177632
pool        [BUFFER_POOL|ingress_lossless_pool]
size        1248
----------  -----------------------------------

Profile: ingress_lossy_profile
----------  -----------------------------------
dynamic_th  3
pool        [BUFFER_POOL|ingress_lossless_pool]
size        0
----------  -----------------------------------

Profile: pg_lossless_40000_40m_profile
----------  -----------------------------------
xon_offset  2288
dynamic_th  -3
xon         2288
xoff        71552
pool        [BUFFER_POOL|ingress_lossless_pool]
```

```
size        1248
----------  ----------------------------------
```

show line

Displays serial port or a virtual network connection status. This command is used only when SONiC is used as a console switch. This command is not applicable when SONiC used as regular switch.

- `show line`
- ```
  admin@sonic:~$ show line
  ```
  ```

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VLAN and FDB configuration and show

VLAN show commands

show vlan brief

Displays brief information about all VLANs configured. It displays the VLAN ID, IP address (if configured for the VLAN), list of VLAN member ports, if the port is tagged or in untagged mode, and the DHCP helper address.

- `show vlan brief`
- ```
  admin@sonic:~$ show vlan brief

  +-----------+--------------+-----------+----------------+-----------------------+
  |   VLAN ID | IP Address   | Ports     | Port Tagging   | DHCP Helper Address   |
  +===========+==============+===========+================+=======================+
  |       100 | 1.1.2.2/16   | Ethernet0 | tagged         | 192.0.0.1             |
  |           |              | Ethernet4 | tagged         | 192.0.0.2             |
  |           |              |           |                | 192.0.0.3             |
  +-----------+--------------+-----------+----------------+-----------------------+
  ```

show vlan config

Displays the VLAN configuration.

- `show vlan config`
- ```
  admin@sonic:~$ show vlan config
  Name       VID  Member     Mode
  -------  -----  ---------  ------
  Vlan100    100  Ethernet0  tagged
  Vlan100    100  Ethernet4  tagged
  ```

show vlan count

Displays the number count of VLANs.

- `show vlan count`
- ```
  admin@sonic:~$ show vlan count
  Total Vlan count:1
  ```

VLAN configuration commands

config vlan add/del

Adds or deletes a VLAN.

- `config vlan {add | del} vlan id`
- ```
  admin@sonic:~$ sudo config vlan add 100
  This command will create the vlan 100 if not exists.
  ```

config vlan range add/del

Adds or deletes bulk VLANs.

- `config vlan range [add | del] first_vlan_id last_vlan_id`
- ```
  admin@sonic:~$ config vlan range add 100 103
  This command will create vlans from vlan id 100 to vlan id 103. eg, vlan 100, vlan 101,
  vlan 102, vlan 103 will be created

  config vlan range del 100 103
  ```
  ```

```
This command will delete vlans from vlan id 100 to vlan id 103. eg, vlan 100, vlan 101,
vlan 102, vlan 103 will be removed
```

config vlan member range add/del

Adds or deletes a VLAN interface to a port member (1 to 4094).

- `config vlan member range [add | del] first_vlan_id last_vlan_id interface_name`

```
admin@sonic:~$ config vlan member range add 100 103 Ethernet0
This command will add Ethernet0 from vlan id 100 to vlan id 103. eg, Ethernet0 will become
the member port of vlan 100, vlan 101, vlan 102, vlan 103

admin@sonic:~$ config vlan member range del 100 103 Ethernet0
This command will delete Ethernet0 from vlan id 100 to vlan id 103. eg, Ethernet0 will be
removed from vlan 100, vlan 101, vlan 102, vlan 103
```

config vlan member add/del

Adds or deletes a member port to a VLAN by VLAN ID (1 to 4094). The `-u` option sets the port in untagged mode.

- `config vlan member [add | del] [-u | --untagged] vlan_id member_portname`

```
admin@sonic:~$ sudo config vlan member add 100 Ethernet0
This command will add Ethernet0 as member of the vlan 100
```

```
admin@sonic:~$ sudo config vlan member add 100 Ethernet4
This command will add Ethernet4 as member of the vlan 100.
```

MAC commands

MAC age out show command

show mac aging-time

Displays the MAC age out interval.

- `show mac aging-time`

```
admin@sonic:~$ show mac aging_time
Mac Aging-Time : 3000 seconds
```

MAC age out config command

config mac aging-time

Change the MAC ageout time (0 to 1000000 seconds, default 600; 0 to disable).

- `config mac aging_time ageout_interval`

```
admin@sonic:~$ config mac aging_time 3000
This command will set MAC age out to 3000 secs
```

Static MAC config command

config and delete static mac

Configures or deletes a static MAC address.

- `config mac [add | del] static_mac_address vlan_id [interface_name]`

```
admin@sonic:~$ sudo config mac add 00:10:3a:2b:05:67 100 Ethernet2
To add a static mac on vlan 100 for Ethernet2
```

```
admin@sonic:~$ sudo config mac del 00:10:3a:2b:05:67 100
To delete a static mac from vlan 100
```

FDB show commands

show mac

Displays the MAC (FDB) entries either in full or partial. The `-v` option displays the MAC entries learned on the specific VLAN ID, and the `-p` option displays the MAC entries learned on a specific port.

- `show mac [-v vlan_id] [-p port_name]`

```
admin@sonic:~$ show mac
No.    Vlan  MacAddress         Port
-----  ------  -----------------  -----------
  1    1000  E2:8C:56:85:4A:CD  Ethernet192
  2    1000  A0:1B:5E:47:C9:76  Ethernet192
  3    1000  AA:54:EF:2C:EE:30  Ethernet192
  4    1000  A4:3F:F2:17:A3:FC  Ethernet192
  5    1000  0C:FC:01:72:29:91  Ethernet192
  6    1000  48:6D:01:7E:C9:FD  Ethernet192
  7    1000  1C:6B:7E:34:5F:A6  Ethernet192
  8    1000  EE:81:D9:7B:93:A9  Ethernet192
  9    1000  CC:F8:8D:BB:85:E2  Ethernet192
 10    1000  0A:52:B3:9C:FB:6C  Ethernet192
 11    1000  C6:E2:72:02:D1:23  Ethernet192
 12    1000  8A:C9:5C:25:E9:28  Ethernet192
 13    1000  5E:CD:34:E4:94:18  Ethernet192
 14    1000  7E:49:1F:B5:91:B5  Ethernet192
 15    1000  AE:DD:67:F3:09:5A  Ethernet192
 16    1000  DC:2F:D1:08:4B:DE  Ethernet192
 17    1000  50:96:23:AD:F1:65  Ethernet192
 18    1000  C6:C9:5E:AE:24:42  Ethernet192
Total number of entries 18
```

```
admin@sonic:~$ show mac -v 1000
No.    Vlan  MacAddress         Port
-----  ------  -----------------  -----------
  1    1000  E2:8C:56:85:4A:CD  Ethernet192
  2    1000  A0:1B:5E:47:C9:76  Ethernet192
  3    1000  AA:54:EF:2C:EE:30  Ethernet192
  4    1000  A4:3F:F2:17:A3:FC  Ethernet192
  5    1000  0C:FC:01:72:29:91  Ethernet192
  6    1000  48:6D:01:7E:C9:FD  Ethernet192
  7    1000  1C:6B:7E:34:5F:A6  Ethernet192
  8    1000  EE:81:D9:7B:93:A9  Ethernet192
  9    1000  CC:F8:8D:BB:85:E2  Ethernet192
 10    1000  0A:52:B3:9C:FB:6C  Ethernet192
 11    1000  C6:E2:72:02:D1:23  Ethernet192
 12    1000  8A:C9:5C:25:E9:28  Ethernet192
 13    1000  5E:CD:34:E4:94:18  Ethernet192
 14    1000  7E:49:1F:B5:91:B5  Ethernet192
 15    1000  AE:DD:67:F3:09:5A  Ethernet192
 16    1000  DC:2F:D1:08:4B:DE  Ethernet192
 17    1000  50:96:23:AD:F1:65  Ethernet192
 18    1000  C6:C9:5E:AE:24:42  Ethernet192
Total number of entries 18
```

```
admin@sonic:~$ show mac -p Ethernet192
No.    Vlan  MacAddress         Port
-----  ------  -----------------  -----------
  1    1000  E2:8C:56:85:4A:CD  Ethernet192
  2    1000  A0:1B:5E:47:C9:76  Ethernet192
  3    1000  AA:54:EF:2C:EE:30  Ethernet192
  4    1000  A4:3F:F2:17:A3:FC  Ethernet192
  5    1000  0C:FC:01:72:29:91  Ethernet192
  6    1000  48:6D:01:7E:C9:FD  Ethernet192
  7    1000  1C:6B:7E:34:5F:A6  Ethernet192
  8    1000  EE:81:D9:7B:93:A9  Ethernet192
  9    1000  CC:F8:8D:BB:85:E2  Ethernet192
 10    1000  0A:52:B3:9C:FB:6C  Ethernet192
 11    1000  C6:E2:72:02:D1:23  Ethernet192
 12    1000  8A:C9:5C:25:E9:28  Ethernet192
 13    1000  5E:CD:34:E4:94:18  Ethernet192
 14    1000  7E:49:1F:B5:91:B5  Ethernet192
 15    1000  AE:DD:67:F3:09:5A  Ethernet192
 16    1000  DC:2F:D1:08:4B:DE  Ethernet192
 17    1000  50:96:23:AD:F1:65  Ethernet192
```

```
 18    1000  C6:C9:5E:AE:24:42  Ethernet192
Total number of entries 18
```

show mac count

Displays the number count of MAC (FDB) entries.

- `show mac count`
- ```
  admin@sonic:~$ show mac count
  Total MAC count:1
  ```

sonic-clear fdb

Clears MAC entries from the FDB. When port or VLAN is used, it clears MAC entries from the specified VLAN or port.

- `sonic-clear fdb [all | port port_id | vlan vlan_alias]`
- ```
  admin@sonic:~$ sonic-clear fdb all
  All MAC entries are cleared from FDB
  ```

  ```
  admin@sonic:~$ sonic-clear fdb vlan Vlan101
  ('Dynamic FDB entries are cleared on VLAN.', 'Vlan101')
  All MAC entries are cleared from vlan 101
  ```

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VxLAN configuration and show

VxLAN show commands

show vxlan interface

Displays the name, SIP, associated NVO name, and the Loopback interface that is configured with the VTEP SIP.

- `show vxlan interface`
- ```
  admin@sonic:~$ show vxlan interface
  VTEP Information:

            VTEP Name : VTEP1, SIP  : 4.4.4.4
            NVO Name  : nvo1,  VTEP : VTEP1
            Source interface  : Loopback33
  ```

show vxlan vlanvnimap

Displays all VLAN VNI mappings along with the count. With the count argument displays only the total count of the mappings.

- `show vxlan vlanvnimap [count]`
- ```
  admin@sonic:~$ show vxlan vlanvnimap
  +--------+-------+
  | VLAN   |   VNI |
  +========+=======+
  | Vlan5  |     5 |
  +--------+-------+
  | Vlan6  |     6 |
  +--------+-------+
  Total count : 2
  ```

  ```
  admin@sonic:~$ show vxlan vlanvnimap count
  Total mapping count:2
  ```

show vxlan vrfvnimap

Displays all VRF VNI mappings.

- `show vxlan vrfvnimap`
- ```
  admin@sonic:~$ show vxlan vrfvnimap
  +--------+-------+
  | VRF    |   VNI |
  +========+=======+
  | Vrf1   |     5 |
  +--------+-------+
  Total count : 1
  ```

show vxlan tunnel

Lists all the discovered tunnels. The optional parameter `count` displays only the total number of tunnels.

- `show vxlan tunnel [count]`
- ```
  admin@sonic:~$ show vxlan tunnel
     +---------+---------+-------------------+--------------+
     | SIP     | DIP     | Creation Source   | OperStatus   |
     +=========+=========+===================+==============+
     | 2.2.2.2 | 4.4.4.4 | EVPN              | oper_up      |
     +---------+---------+-------------------+--------------+
     | 2.2.2.2 | 3.3.3.3 | EVPN              | oper_up      |
  ```

```
   +---------+---------+------------------+--------------+
   Total count : 2
```

```
admin@sonic:~$ show vxlan tunnel count
Total mapping count:0
```

show vxlan evpn_remote_mac

Lists all the MACs learned from the specified remote IP or all the remotes for the specified/all VLANs (APP database view). The optional `count` argument when provided displays only the total number of MACs.

- `show vxlan evpn_remote_mac {remoteip | all} [count]`

-
```
admin@sonic:~$ show vxlan remote_mac all
   +---------+-------------------+--------------+-------+--------+
   | VLAN    | MAC               | RemoteVTEP   |   VNI | Type   |
   +=========+===================+==============+=======+========+
   | Vlan101 | 00:00:00:00:00:01 | 4.4.4.4      |  1001 | dynamic|
   +---------+-------------------+--------------+-------+--------+
   | Vlan101 | 00:00:00:00:00:02 | 3.3.3.3      |  1001 | static |
   +---------+-------------------+--------------+-------+--------+
   | Vlan101 | 00:00:00:00:00:03 | 4.4.4.4      |  1001 | dynamic|
   +---------+-------------------+--------------+-------+--------+
   | Vlan101 | 00:00:00:00:00:04 | 4.4.4.4      |  1001 | static |
   +---------+-------------------+--------------+-------+--------+
   | Vlan101 | 00:00:00:00:00:05 | 4.4.4.4      |  1001 | static |
   +---------+-------------------+--------------+-------+--------+
   | Vlan101 | 00:00:00:00:00:99 | 3.3.3.3      |  1001 | static |
   +---------+-------------------+--------------+-------+--------+
   Total count : 6
```

```
admin@sonic:~$ show vxlan evpn_remote_mac all count
Total mapping count:6
```

```
admin@sonic:~$ show vxlan remote_mac 3.3.3.3
   +---------+-------------------+--------------+-------+--------+
   | VLAN    | MAC               | RemoteVTEP   |   VNI | Type   |
   +=========+===================+==============+=======+========+
   | Vlan101 | 00:00:00:00:00:02 | 3.3.3.3      |  1001 | static |
   +---------+-------------------+--------------+-------+--------+
   | Vlan101 | 00:00:00:00:00:99 | 3.3.3.3      |  1001 | static |
   +---------+-------------------+--------------+-------+--------+
   Total count : 2
```

```
admin@sonic:~$ show vxlan evpn_remote_mac 3.3.3.3 count
Total mapping count:2
```

show vxlan evpn_remote_vni

Lists all VLANs learned from the specified remote IP or all the remotes (APP database view). The optional `count` when provides displays the total number of such VLANs.

- `show vxlan evpn_remote_vni {remoteip | all} [count]`

-
```
admin@sonic:~$ show vxlan evpn_remote_vni all
   +---------+--------------+-------+
   | VLAN    | RemoteVTEP   |   VNI |
   +=========+==============+=======+
   | Vlan101 | 3.3.3.3      |  1001 |
   +---------+--------------+-------+
   | Vlan101 | 4.4.4.4      |  1001 |
   +---------+--------------+-------+
   Total count : 2
```

```
admin@sonic:~$ show vxlan evpn_remote_vni all count
Total mapping count:2
```

```
admin@sonic:~$ show vxlan evpn_remote_vni 3.3.3.3
   +---------+--------------+-------+
```

```
| VLAN     | RemoteVTEP    |   VNI |
+==========+===============+=======+
| Vlan101  | 3.3.3.3       |  1001 |
+----------+---------------+-------+
Total count : 1
```

```
admin@sonic:~$ show vxlan evpn_remote_vni 3.3.3.3 count
Total mapping count:1
```

VxLAN configuration commands

config vxlan add

Creates the VTEP instance. Only a single instance is supported in this release.

- `config vxlan add vtepname src_ip`
- ```
  admin@sonic:~$ sudo config vxlan add vtep1 1.1.1.1
  ```

config vxlan del

Deletes the VTEP instance. There should be no EVPN_NVO object or VLAN/VRF VNI mapping for this command to succeed.

- `config vxlan del vtepname`
- ```
  admin@sonic:~$ sudo config vxlan del vtep1
  ```

config vxlan evpn_nvo add

Creates the EVPN instance and associates with the VTEP instance. Only a single instance is supported in this release.

- `config vxlan evpn_nvo add nvoname vtepname`
- ```
  admin@sonic:~$ sudo config vxlan evpn_nvo add nvo1 vtep1
  ```

config vxlan evpn_nvo del

Deletes the EVPN instance. There should be no VLAN VNI mappings for this command to succeed.

- `config vxlan evpn_nvo del nvoname`
- ```
  admin@sonic:~$ sudo config vxlan evpn_nvo del nvo1
  ```

config vxlan map add

Creates the VLAN VNI mapping. Requires that the VTE P, EVPN_NVO, and VLAN be created.

- `config vxlan map add vtepname vlanid vnid`
- ```
  admin@sonic:~$ sudo config vxlan map add vtep1 100 1200
  ```

config vxlan map del

Deletes the VLAN VNI mapping. Requires that there is no VRF-VNI mappings viewing the VNI being deleted.

- `config vxlan map del vtepname vlanid vnid`
- ```
  admin@sonic:~$ sudo config vxlan map del vtep1 100 1200
  ```

config vxlan map_range add

Creates contiguous VLAN VNI mappings according to the configured range. Requires that the VTEP, EVPN_NVO, and VLAN be created. If there is failures, this command displays an error and continues to the next set of VLAN IDs.

- `config vxlan map_range add vtepname start_vlanid start_vnid end_vlanid`
- ```
  admin@sonic:~$ sudo config vxlan map_range add vtep1 100 1200 200
  This creates mappings as 100-1200, 101-1201, .... , 200-1300
  ```

config vxlan map_range del

Deletes contiguous VLAN VNI mappings according to the configured range. Requires that there be no VRF-VNI mappings viewing the VNIs being deleted. If there is failures, this command displays an error and continues to the next set of VLAN IDs.
  ```

- config vxlan map_range del *vtepname start_vlanid start_vnid end_vlanid*
- ```
  admin@sonic:~$ sudo config vxlan map_range del vtep1 100 1200 200
  This deletes mappings as 100-1200, 101-1201, .... , 200-1300
  ```
  ```

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Warm restart configuration and show

Warm restart show commands

show warm_restart config

Displays all the configuration that is related to warm_restart.

- `show warm_restart config`
- ```
  admin@sonic:~$ show warm_restart config
    name    enable    timer_name        timer_duration
    ------  --------  ----------------  ----------------
    bgp     true      bgp_timer         100
    teamd   false     teamsyncd_timer   300
    swss    false     neighsyncd_timer  200
    system  true      NULL              NULL
  ```

show warm_restart state

Displays the warm_restart state.

- `show warm_restart state`
- ```
  admin@sonic:~$ show warm_restart state
  name          restore_count  state
  ----------  ---------------  ----------
  orchagent                 0
  vlanmgrd                  0
  bgp                       1  reconciled
  portsyncd                 0
  teammgrd                  1
  neighsyncd                0
  teamsyncd                 1
  syncd                     0
  ```

Warm restart configuration commands

config warm_restart bgp_timer

Sets the bgp_timer value for warm_restart of a BGP service. bgp_timer holds the time interval that is utilized by fpmsyncd during warm-restarts. During this interval fpmsyncd recovers all the routing state that is previously pushed to AppDB, and all the new state coming from Zebra/BGPD. On expiration of this timer, fpmsyncd executes the reconciliation logic to eliminate all the stale entries from AppDB. This timer should match the BGP-GR restart-timer that is configured within the elected routing stack. Supported range: 1 to 3600 seconds.

- `config warm_restart bgp_timer seconds`
- ```
  admin@sonic:~$ sudo config warm_restart bgp_timer 1000
  ```

config warm_restart enable/disable

Enables or disables the warm_restart for a specific service that supports warm reboot. When you restart the specific service using `systemctl restart service_name`, this configured value is checked if it is enabled or disabled. If this configuration is enabled for that service, it performs warm reboot for that service, or does a cold restart of the service. module_name can be either system, swss, bgp, or teamd. If module_name is not specified, it enables system module.

- `config warm_restart enable [module_name]`
  ```

- ```
  admin@sonic:~$ sudo config warm_restart enable
  The above command will set warm_restart as "enable" for the "system" service.
  ```

  ```
  admin@sonic:~$ sudo config warm_restart enable swss
  The above command will set warm_restart as "enable" for the "swss" service. When user does
  "systemctl restart swss", it will perform warm reboot instead of cold reboot.
  ```

  ```
  admin@sonic:~$ sudo config warm_restart enable teamd
  The above command will set warm_restart as "enable" for the "teamd" service. When user
  does "systemctl restart teamd", it will perform warm reboot instead of cold reboot.
  ```

config warm_restart neighsyncd_timer

Sets the neighsyncd_timer value for warm_restart of "swss" service. neighsyncd_timer is the timer that is used for `swss` (neighsyncd) service during the warm restart. Timer is started after the neighborTable is restored to internal data structures. neighborsyncd then starts to read all Linux kernel entries and marks the entries in the data structures accordingly. Once the timer is expired, reconciliation is done and the delta is pushed to appDB. Range is 1 to 9999.

- `config warm_restart bgp_timerneighsyncd_timer` *`seconds`*
- ```
  admin@sonic:~$ sudo config warm_restart neighsyncd_timer 2000
  ```

config warm_restart teamsyncd_timer

Sets the teamsyncd_timer value for warm_restart of teamd service. teamsyncd_timer holds the time interval that is utilized by teamsyncd during warm-restart. The timer is started when teamsyncd starts. During the timer interval, teamsyncd preserves all LAG interface changes, but it will not apply them. The changes will only be applied when the timer expires. When the changes are applied, the stale LAG entries are removed, the new LAG entries will be created. Range is 1 to 9999.

- `config warm_restart teamsyncd_timer` *`seconds`*
- ```
  admin@sonic:~$ sudo config warm_restart teamsyncd_timer 3000
  ```
  ```

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Watermark configuration and show

Watermark show command

show watermark telemetry interval

Displays the configured telemetry interval.

- `show watermark telemetry interval`
- ```
  admin@sonic:~$ show watermark telemetry interval
  Telemetry interval 120 second(s)
  ```

Watermark configuration command

config watermark telemetry interval

Configures the interval for telemetry; default interval is 120 seconds. There is no regulation on the valid range of values as it leverages Linux timer.

- `config watermark telemetry interval`
- ```
  admin@sonic:~$ sudo config watermark telemetry interval 999
  ```

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Software installation

If the device is already running the SONiC software, this tool can be used to install an alternate image in the partition. This tool can install an alternate image, list the available images, and set the next reboot image.

sonic_installer install

Installs a new image on the alternate image partition. This command takes a path to an installable SONiC image or URL and installs the image. This command supports SFTP/SCP protocol for image download. In such cases, extra arguments such as server address, username, password must be provided.

- `sonic_installer install` *`URL path/local path to installable SONiC image`* or `sonic_installer install --protocol {scp | sftp} --server --username`

```
admin@sonic:~$ sonic_installer install https://sonic-jenkins.westus.cloudapp.azure.com/job/
xxxx/job/buildimage-xxxx-all/xxx/artifact/target/sonic-xxxx.bin
New image will be installed, continue? [y/N]: y
Downloading image...
...100%, 480 MB, 3357 KB/s, 146 seconds passed
Command: /tmp/sonic_image
Verifying image checksum ... OK.
Preparing image archive ... OK.
ONIE Installer: platform: XXXX
onie_platform:
Installing SONiC in SONiC
Installing SONiC to /host/image-xxxx
Directory /host/image-xxxx/ already exists. Cleaning up...
Archive:  fs.zip
   creating: /host/image-xxxx/boot/
  inflating: /host/image-xxxx/boot/vmlinuz-3.16.0-4-amd64
  inflating: /host/image-xxxx/boot/config-3.16.0-4-amd64
  inflating: /host/image-xxxx/boot/System.map-3.16.0-4-amd64
  inflating: /host/image-xxxx/boot/initrd.img-3.16.0-4-amd64
   creating: /host/image-xxxx/platform/
 extracting: /host/image-xxxx/platform/firsttime
  inflating: /host/image-xxxx/fs.squashfs
  inflating: /host/image-xxxx/dockerfs.tar.gz
Log file system already exists. Size: 4096MB
Installed SONiC base image SONiC-OS successfully

Command: cp /etc/sonic/minigraph.xml /host/

Command: grub-set-default --boot-directory=/host 0

Done
```

```
admin@sonic:~$ sudo sonic_installer install --protocol scp --server 10.175.121.155 --
username admin /home/admin/sonic-img/sonic.bin
New image will be installed, continue? [y/N]: y
password:
Downloading image...
...99%, 2 M101 KB 0 onds left...
Command: /tmp/sonic_image
Verifying image checksum ... OK.
Preparing image archive ... OK.
Installing SONiC in SONiC
ONIE Installer: platform: xxxx
onie_platform: xxxx
Installing SONiC to /host/image-xxxx
Directory /host/image-xxxx/ already exists. Cleaning up...
Archive:  fs.zip
   creating: /host/image-xxxx/boot/
  inflating: /host/image-xxxx/fs.squashfs
Installed SONiC base image SONiC-OS successfully
```

```
Command: grub-set-default --boot-directory=/host 0

Command: config-setup backup
Taking backup of curent configuration

Command: sync;sync;sync

Command: sleep 3

Done
```

sonic_installer list

Displays information about currently installed images. It displays a list of installed images, currently running image, and image set to be loaded at next reboot.

- `sonic_installer list`
- ```
  admin@sonic:~$ sonic_installer list
     Current: SONiC-OS-HEAD.XXXX
     Next: SONiC-OS-HEAD.XXXX
     Available:
     SONiC-OS-HEAD.XXXX
     SONiC-OS-HEAD.YYYY
  ```

sonic_installer set_default

Changes the image which can be loaded by default in all the subsequent reboots.

- `sonic_installer set_default` *`image_name`*
- ```
  admin@sonic:~$ sonic_installer set_default SONiC-OS-HEAD.XXXX
  ```

sonic_installer set_next_boot

Changes the image that can be loaded in the *next* reboot only. It will fallback to current image in all other subsequent reboots after the next reboot.

- `sonic_installer set_next_boot` *`image_name`*
- ```
  admin@sonic:~$ sonic_installer set_next_boot SONiC-OS-HEAD.XXXX
  ```

sonic_installer remove

Removes the unused SONiC image from the disk. It is *not* allowed to remove currently running image.

- `sonic_installer remove` *`image_name`*
- ```
  admin@sonic:~$ sonic_installer remove SONiC-OS-HEAD.YYYY
  Image will be removed, continue? [y/N]: y
  Updating GRUB...
  Done
  Removing image root filesystem...
  Done
  Command: grub-set-default --boot-directory=/host 0

  Image removed
  ```

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Troubleshooting

For troubleshooting and debugging purposes, the `show techsupport` command gathers pertinent information about the state of the device including syslog entries, database state, routing-stack state, and so on. The information is then compressed into an archive file and sent to the SONiC development team for examination. Archive files are saved as */var/dump/<device_host_name>_yyyymmdd_hhmmss.tar.gz*.

- `show techsupport`
- ```
  admin@sonic:~$ show techsupport
  ```

  If the SONiC system was running for quite some time, this command produces a large dump file. To reduce the amount of syslog and core files that are gathered during system dump, use the `--since` option.

  Collects syslog and core files for the last 24 hours

  ```
  admin@sonic:~$ show techsupport --since=yesterday
  ```

  Collects syslog and core files for the last one hour

  ```
  admin@sonic:~$ show techsupport --since='hour ago'
  ```
  ```

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Routing stack show

SONiC software is agnostic of the routing software that is being used in the device. You can use either Quagga or FRR routing stack as per your requirements. A separate shell (vtysh) is provided to configure such routing stacks.

```
admin@sonic:~$ vtysh

  Hello, this is Quagga (version 0.99.24.1).
  Copyright 1996-2005 Kunihiro Ishiguro, et al.
```

```
admin@sonic:~# show route-map (This command displays the route-map that is configured for the
routing protocol.)
  ZEBRA:
  route-map RM_SET_SRC, permit, sequence 10
    Match clauses:
    Set clauses:
      src 10.12.0.102
    Call clause:
    Action:
      Exit routemap
```

For complete information on routing stack configuration, see the Quagga Command Reference or FRR Command Reference.

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Quagga BGP show

show ip bgp summary

Displays a summary of all IPv4 BGP neighbors that are configured and the corresponding states.

- `show ip bgp summary`

```
admin@sonic:~$ show ip bgp summary
BGP router identifier 1.2.3.4, local AS number 65061
RIB entries 6124, using 670 KiB of memory
Peers 2, using 143 KiB of memory

Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
192.168.1.161    4 65501   88698  102781        0    0    0 08w5d14h        2
192.168.1.163    4 65502   88698  102780        0    0    0 08w5d14h        2

Total number of neighbors 2
```

show ip bgp neighbors

Displays all the details of IPv4 and IPv6 BGP neighbors when no optional argument is specified. When the optional argument IPv4_address is specified, it displays the detailed neighbor information about that specific IPv4 neighbor. Use `show ipv6 bgp neighbor` *`ipv6_address`* to display IPv6 details.

- `show ip bgp neighbors [[advertised-routes | received-routes | routes]]`

```
admin@sonic:~$ show ip bgp neighbors
BGP neighbor is 192.168.1.161, remote AS 65501, local AS 65061, external link
 Description: ARISTA01T0
  BGP version 4, remote router ID 1.2.3.4
  BGP state = Established, up for 08w5d14h
  Last read 00:00:46, hold time is 180, keepalive interval is 60 seconds
  Neighbor capabilities:
    4 Byte AS: advertised and received
    Dynamic: received
    Route refresh: advertised and received(old & new)
    Address family IPv4 Unicast: advertised and received
    Graceful Restart Capabilty: advertised and received
      Remote Restart timer is 120 seconds
      Address families by peer:
        IPv4 Unicast(not preserved)
  Graceful restart informations:
    End-of-RIB send: IPv4 Unicast
    End-of-RIB received: IPv4 Unicast
  Message statistics:
    Inq depth is 0
    Outq depth is 0
                         Sent       Rcvd
    Opens:                  1          1
    Notifications:          0          0
    Updates:            14066          3
    Keepalives:         88718      88698
    Route Refresh:          0          0
    Capability:             0          0
    Total:             102785      88702
  Minimum time between advertisement runs is 30 seconds

 For address family: IPv4 Unicast
  Community attribute sent to this neighbor(both)
  2 accepted prefixes

  Connections established 1; dropped 0
  Last reset never
Local host: 192.168.1.160, Local port: 32961
Foreign host: 192.168.1.161, Foreign port: 179
```

```
Nexthop: 192.168.1.160
Nexthop global: fe80::f60f:1bff:fe89:bc00
Nexthop local: ::
BGP connection: non shared network
Read thread: on  Write thread: off
```

(Optional) You can specify an IP address to display only that particular neighbor. You can specify if you want to display all routes that are advertised to the specified neighbor, all routes received from the specified neighbor, or all routes (received and accepted) from the specified neighbor.

```
admin@sonic:~$ show ip bgp neighbors 192.168.1.161
```

```
admin@sonic:~$ show ip bgp neighbors 192.168.1.161 advertised-routes
```

```
admin@sonic:~$ show ip bgp neighbors 192.168.1.161 received-routes
```

```
admin@sonic:~$ show ip bgp neighbors 192.168.1.161 routes
```

show ipv6 bgp summary

Displays the summary of all IPv4 BGP neighbors that are configured and the corresponding states.

- `show ipv6 bgp summary`
-
```
admin@sonic:~$ show ipv6 bgp summary
BGP router identifier 10.1.0.32, local AS number 65100
RIB entries 12809, using 1401 KiB of memory
Peers 8, using 36 KiB of memory

Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
fc00::72        4 64600   12588   12591        0    0    0 06:51:17     6402
fc00::76        4 64600   12587    6190        0    0    0 06:51:28     6402
fc00::7a        4 64600   12587    9391        0    0    0 06:51:23     6402
fc00::7e        4 64600   12589   12592        0    0    0 06:51:25     6402

Total number of neighbors 4
```

show ipv6 bgp neighbors

Displays details of one specific IPv6 BGP neighbor. Option is also available to display only the advertised routes, or the received routes, or all routes.

- `show ipv6 bgp neighbors (advertised-routes | received-routes | routes)`
-
```
admin@sonic:~$ show ipv6 bgp neighbors fc00::72 advertised-routes
```

```
admin@sonic:~$ show ipv6 bgp neighbors fc00::72 received-routes
```

```
admin@sonic:~$ show ipv6 bgp neighbors fc00::72 routes
```

show route-map

Displays the routing policy that takes precedence over the other route processes that are configured.

- `show route-map`
-
```
admin@sonic:~$ show route-map
  ZEBRA:
  route-map RM_SET_SRC, permit, sequence 10
    Match clauses:
    Set clauses:
      src 10.12.0.102
    Call clause:
    Action:
      Exit routemap
  ZEBRA:
  route-map RM_SET_SRC6, permit, sequence 10
    Match clauses:
    Set clauses:
```

```
    src fc00:1::102
  Call clause:
  Action:
    Exit routemap
BGP:
route-map FROM_BGP_SPEAKER_V4, permit, sequence 10
  Match clauses:
  Set clauses:
  Call clause:
  Action:
    Exit routemap
BGP:
route-map TO_BGP_SPEAKER_V4, deny, sequence 10
  Match clauses:
  Set clauses:
  Call clause:
  Action:
    Exit routemap
BGP:
route-map ISOLATE, permit, sequence 10
  Match clauses:
  Set clauses:
    as-path prepend 65000
  Call clause:
  Action:
    Exit routemap
```

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Error handling framework show and clear

Error handling framework show command

show error_database

Displays the failure entries logged in the error database.

- `show error_database [table_name]`
- ```
  admin@sonic:~$ show error_database
  Prefix          Nexthop     Interface     Error Code       Operation
  --------------  ---------  -----------  --------------  -----------
  600::/64        2000::2     Ethernet28    SWSS_RC_EXISTS  create
  12.12.12.0/24   10.1.1.2    Ethernet28    SWSS_RC_EXISTS  create
  IP address     MAC address         Interface     Error Code           Operation
  -------------  -----------------  -----------  ------------------  -----------
  2000::3        00:00:00:00:00:02  Ethernet28    SWSS_RC_TABLE_FULL  create
  2000::4                           Ethernet28    SWSS_RC_NOT_FOUND   remove
  10.1.1.3       00:00:00:00:00:01  Ethernet28    SWSS_RC_TABLE_FULL  create
  10.1.1.3                          Ethernet28    SWSS_RC_NOT_FOUND   remove
  ```

  ```
  admin@sonic:~$ show error_database ERROR_ROUTE_TABLE
  Prefix          Nexthop             Interface                Error Code       Operation
  --------------  -----------------  ----------------------  --------------  -----------
  12.12.12.0/24   10.1.1.2,20.1.1.2  Ethernet28,Ethernet30   SWSS_RC_EXISTS  create
  13.13.13.0/24   10.1.1.2            Ethernet28              SWSS_RC_EXISTS  create
  ```

Error handling framework clear command

sonic-clear error_database

Clears the failure entries logged in the error database.

- `sonic-clear error_database [table_name]`
- ```
  admin@sonic:~$ sudo sonic-clear error_database
  ERROR DB entries are cleared.
  ```

  ```
  admin@sonic:~$ sudo sonic-clear error_database ERROR_ROUTE_TABLE
  ('ERROR DB entries are cleared from Table.', 'ERROR_ROUTE_TABLE')
  ```

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Threshold configuration, show, and clear

Threshold show commands

show priority-group threshold [shared/headroom]

Displays the currently configured thresholds on all ports priority-group that is shared, or headroom buffer according to the command executed.

- `show priority-group threshold [shared | headroom]`
-
```
admin@sonic:~$ show priority-group threshold shared
    Ingress shared pool threshold per PG:
            Port    PG0    PG1    PG2    PG3    PG4    PG5    PG6    PG7
    -----------  -----  -----  -----  -----  -----  -----  -----  -----
             CPU      0      0      0      0      0      0      0      0
      Ethernet0      0      0      0      0      0      0      0      5
      Ethernet4      0      0      0      0      0      0      0      0
      Ethernet8      0      0      0      0      0      0      0      0
     Ethernet12      0      0      0      0      0      0      0      0
     Ethernet16      0      0      0      0      0      0      0      0
     Ethernet20      0      0      0      0      0      0      0      0
     Ethernet24      0      0      0      0      0      0      0      0
     Ethernet28      0      0      0      0      0      0      0      0
     Ethernet32      0      0      0      0      0      0      0      0
     Ethernet36      0      0      0      0      0      0      0      0
     Ethernet40      0      0      0      0      0      0      0      0
     Ethernet44      0      0      0      0      0      0      0      0
     Ethernet48      0      0      0      0      0      0      0      0
     Ethernet52      0      0      0      0      0      0      0      0
     Ethernet56      0      0      0      0      0     20      0      0
     Ethernet60      0      0      0      0      0      0      0      0
     Ethernet64      0      0      0      0      0      0      0      0
     Ethernet68      0      0      0      0      0      0      0      0
     Ethernet72      0      0      0      0      0      0      0      0
     Ethernet76      0      0      0      0      0      0      0      0
     Ethernet80      0      0      0      0      0      0      0      0
     Ethernet84      0      0      0      0      0      0      0      0
  Ethernet88      0      0      0      0      0      0      0      0
     Ethernet92      0      0      0      0      0      0      0      0
  Ethernet96      0      0      0      0      0      0      0      0
    Ethernet100      0      0      0      0      0      0      0      0
    Ethernet104      0      0      0      0      0      0      0      0
    Ethernet108      0      0      0      0      0      0      0      0
    Ethernet112      0      0      0      0      0      0      0      0
    Ethernet116      0      0      0      0      0      0      0      0
    Ethernet120      0      0      0      0      0      0      0      0
    Ethernet124      0      0      0      0      0      0      0      0
```

show queue threshold [unicast/multicast]

Displays threshold configuration for the unicast/multicast queue buffers of all ports.

- `show queue threshold [unicast | multicast]`
-
```
admin@sonic:~$ show queue threshold unicast
Egress shared pool threshold per unicast queue:
       Port    UC0    UC1    UC2    UC3    UC4    UC5    UC6    UC7
-----------  -----  -----  -----  -----  -----  -----  -----  -----
        CPU      0      0      0      0      0      0      0      0
  Ethernet0      0      0      0      0      0      0      0      0
  Ethernet4      0      0      0      0      0      0      0      0
  Ethernet8      0      0      0      0      0      0      0      0
 Ethernet12     10      0      0      0      0      0      0      0
 Ethernet16      0      0      0      0      0      0      0      0
```

```
 Ethernet20      0       0       0       0       0       0       0       0
 Ethernet24      0       0       0       0       0       0       0       0
 Ethernet28      0       0       0       0       0       0       0       0
 Ethernet32      0       0       0       0       0       0       0       0
 Ethernet36      0       0       0       0       0       0       0       0
 Ethernet40      0       0       0       0       0       0       0       0
 Ethernet44      0      20       0       0       0       0       0       0
 Ethernet48      0       0       0       0       0       0       0       0
 Ethernet52      0       0       0       0       0       0       0       0
 Ethernet56      0       0       0       0       0       0       0       0
 Ethernet60      0       0       0       0       0       0       0       0
 Ethernet64      0       0       0       0       0       0       0       0
 Ethernet68      0       0       0       0       0       0       0       0
 Ethernet72      0       0       0       0       0       0       0       0
 Ethernet76      0       0       0       0       0       0       0       0
 Ethernet80      0       0       0       0       0       0       0       0
 Ethernet84      0       0       0       0       0       0       0       0
 Ethernet88      0       0       0       0       0       0       0       0
 Ethernet92      0       0       0       0       0       0       0       0
 Ethernet96      0       0       0       0       0       0       0       0
Ethernet100      0       0       0       0       0       0       0       0
Ethernet104      0       0       0       0       0       0       0       0
Ethernet108      0       0       0       0       0       0       0       0
Ethernet112      0       0       0       0       0       0       0       0
Ethernet116      0       0       0       0       0       0       0       0
Ethernet120      0       0       0       0       0       0       0       0
Ethernet124      0       0       0       0       0       0       0       0
```

show threshold breaches

Displays the threshold breaches recorded by the system. This command can display only the last `numbreaches` recorded by the system.

- `show threshold breaches`

```
admin@sonic:~$ show threshold breaches 2
Event-id          Buffer       Type        Port    Index    Breach Value(%)    Breach
Value(bytes)           Time-stamp
----------  --------------  ---------  ----------  -------  -----------------
---------------------  --------------------
75  priority-group     shared   Ethernet8        7                  9
1198288  2019-09-04.05:48:51
74  priority-group     shared   Ethernet8        7                  9
1198288  2019-09-04.05:48:51
```

Threshold configuration commands

config priority-group threshold

Configures a threshold on a port's priority-group shared/headroom buffer. The threshold is configured in percentage. The valid values for PG_index are 0 to 7.

- `config priority-group threshold {port_alias} {PG_index} {shared | headroom} {threshold_value}`

```
admin@sonic:~$ sudo config priority-group threshold Ethernet8 7 shared 5
```

```
admin@sonic:~$ sudo config priority-group threshold Ethernet9 7 headroom 40
```

config queue threshold

Configures a threshold on a port's unicast/multicast queue buffer. The threshold is configured in percentage. The valid values for queue_index are 0 to 7.

- `config queue threshold {port_alias} {queue_index} {unicast | multicast} {threshold_value}`

```
admin@sonic:~$ sudo config queue threshold Ethernet8 0 unicast 20
```

```
admin@sonic:~$ sudo config queue threshold Ethernet10 7 multicast 10
```

Threshold clear commands

sonic-clear priority-group threshold

Clears threshold configuration on all port's priority-groups shared and headroom or shared buffers.

- `sonic-clear priority-group threshold {port_alias} {PG_index} {shared | headroom}`
- ```
  admin@sonic:~$ sudo sonic-clear priority-group threshold
  ```

  ```
  admin@sonic:~$ sudo sonic-clear priority-group threshold Ethernet8 7 shared
  ```

sonic-clear queue threshold

Clears the threshold configuration on all port's unicast or multicast queue buffers.

- `sonic-clear queue threshold {port_alias} {queue_index} {unicast | multicast}`
- ```
  admin@sonic:~$ sudo sonic-clear queue threshold
  ```

  ```
  admin@sonic:~$ sudo sonic-clear queue threshold Ethernet8 7 unicast
  ```

sonic-clear threshold breach

Clears all threshold breaches, or a specific breach by event-id recorded by the system.

- `sonic-clear threshold breach {eventid}`
- ```
  admin@sonic:~$ sudo sonic-clear threshold breach
  ```

  ```
  admin@sonic:~$ sudo sonic-clear threshold breach 2
  ```
  ```

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ZTP configuration and show

ZTP show commands

show ztp status

Displays the current ZTP configuration of the switch. It also displays detailed information about current state of a ZTP session. It displays information that is related to all configuration sections as defined in the switch provisioning information discovered in a specific ZTP session.

- `show ztp status`
- ```
  admin@sonic:~$ show ztp status
  ZTP Admin Mode : True
  ZTP Service    : Inactive
  ZTP Status     : SUCCESS
  ZTP Source     : dhcp-opt67 (eth0)
  Runtime        : 05m 31s
  Timestamp      : 2019-09-11 19:12:24 UTC

  ZTP Service is not running

  01-configdb-json: SUCCESS
  02-connectivity-check: SUCCESS
  ```

  ```
  admin@sonic:~$ show ztp status --verbose
  Command: ztp status --verbose
  ========================================
  ZTP
  ========================================
  ZTP Admin Mode : True
  ZTP Service    : Inactive
  ZTP Status     : SUCCESS
  ZTP Source     : dhcp-opt67 (eth0)
  Runtime        : 05m 31s
  Timestamp      : 2019-09-11 19:12:16 UTC
  ZTP JSON Version : 1.0

  ZTP Service is not running

  ----------------------------------------
  01-configdb-json
  ----------------------------------------
  Status          : SUCCESS
  Runtime         : 02m 48s
  Timestamp       : 2019-09-11 19:11:55 UTC
  Exit Code       : 0
  Ignore Result   : False

  ----------------------------------------
  02-connectivity-check
  ----------------------------------------
  Status          : SUCCESS
  Runtime         : 04s
  Timestamp       : 2019-09-11 19:12:16 UTC
  Exit Code       : 0
  Ignore Result   : False
  ```

  Command output:
  ```

Output	Description
ZTP Admin Mode	Displays if the ZTP feature is administratively enabled or disabled. Possible values are True or False. Value is configurable with `config ztp enabled` and `config ztp disable`.
ZTP Service	Displays the ZTP service status. ○ Active Discovery — ZTP service is operational and performing DHCP discovery ○ Processing — ZTP service has discovered switch provisioning information and is processing
ZTP Status	Displays the current state and ZTP session result. ○ IN-PROGRESS —ZTP session is processing switch provisioning information ○ SUCCESS — ZTP service successfully processed the switch provisioning information successfully ○ FAILED — ZTP service failed to process the switch provisioning information ○ Not Started — ZTP service has not started processing the discovered switch provisioning information
ZTP Source	Displays the DHCP option and interface name that switch provision information is discovered from
Runtime	Displays the time taken for ZTP to complete from start to finish; it also indicates the time taken to process associated configurations
Timestamp	Displays the date/time stamp when the status field last changed
ZTP JSON Version	Displays the ZTP version of the JSON file used for describing switch provisioning information
Status	Displays the current state and result of configuration. ○ IN-PROGRESS — configuration is being processed ○ SUCCESS — configuration was processed successfully ○ FAILED — configuration failed to execute successfully ○ Not Started — configuration section has not started processing ○ DISABLED — configuration has been marked as disabled and will not be processed
Exit Code	Displays the program exit code of the configuration section executed; non-zero exit codes indicate the configuration has failed to execute successfully
Ignore Result	Displays the ignore result; if this value is True the result of the corresponding configuration is ignored and not used to evaluate the overall ZTP result
Activity String	Displays the activity string which indicates the current action being performed by ZTP, and how much time it has been running the specific activity (such as 04m 12s)

ZTP configuration commands

config ztp enable

Enables ZTP administrative mode.

- `config ztp enable`

```
admin@sonic:~$ sudo config ztp enable
Running command: ztp enable
```

config ztp disable

Disables ZTP administrative mode. This command can also be used to stop a current ZTP session and load the factory default switch configuration.

- `config ztp disable`

```
admin@sonic:~$ sudo config ztp disable
Active ZTP session will be stopped and disabled, continue? [y/N]: y
Running command: ztp disable -y
```

config ztp run

Manually restarts a new ZTP session. This command deletes the existing */etc/sonic/config_db.json* file and stats ZTP service. It also erases the previous ZTP session data. ZTP configuration is loaded on to the switch and ZTP discovery is performed.

- `config ztp run`

```
admin@sonic:~$ sudo config ztp run
ZTP will be restarted. You may lose switch data and connectivity, continue? [y/N]: y
Running command: ztp run -y
```

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Debug framework show

Debug framework show commands

show debug all

Displays dump routines for all registered components with default action (save to file, path: var/log/.log). Dump routine provides all debug output that is required for debugging corresponding components. This command also captures as part of `show techsupport`.

- `show debug all`
- ```
  admin@sonic:~$ show debug all
  ```

show debug component

Displays dump routines for specific component information with default action (save to file, path: Docker::var/log/_debug.log). Component-specific dump routine that outputs all required debugs.

- `show debug component <component_name>`
- ```
  admin@sonic:~$ show debug component routeorch
  ```

show debug tosyslog

Redirects the dump routine output to syslog. Information is collected all components or a specific component name.

- `show debug tosyslog [all | component]`
- ```
  admin@sonic:~$ show debug tosyslog component routeorch
  root@sonic:~# show logging
  Aug 26 04:40:24.154460 sonic DEBUG swss#orchagent: RouteOrch Dump All Start --->
  Aug 26 04:40:24.154605 sonic DEBUG swss#orchagent: RouteOrch Dump Route Table --->
  Aug 26 04:40:24.154628 sonic DEBUG swss#orchagent: ------------IPv4 Route Table
  ------------
  Aug 26 04:40:24.154720 sonic DEBUG swss#orchagent: VRF_Name = Default VRF_SAI_OID =
  0x3000000000047
  Aug 26 04:40:24.154748 sonic DEBUG swss#orchagent: Prefix
  NextHop                    SAI-OID
  Aug 26 04:40:24.154811 sonic DEBUG swss#orchagent: 0.0.0.0/0
  DROP                       0xffffffffffffffff
  Aug 26 04:40:24.154910 sonic DEBUG swss#orchagent: 100.0.0.0/16
  Vlan100                    0x6000000000c0d
  Aug 26 04:40:24.154946 sonic DEBUG swss#orchagent:
  Aug 26 04:40:24.155540 sonic DEBUG swss#orchagent: ------------IPv6 Route Table
  ------------
  Aug 26 04:40:24.155540 sonic DEBUG swss#orchagent: VRF_Name = Default VRF_SAI_OID =
  0x3000000000047
  Aug 26 04:40:24.155540 sonic DEBUG swss#orchagent: Prefix
  NextHop                    SAI-OID
  Aug 26 04:40:24.155540 sonic DEBUG swss#orchagent: ::/0
  DROP                       0xffffffffffffffff
  Aug 26 04:40:24.155558 sonic DEBUG swss#orchagent: 1001::/64
  Vlan100                    0x6000000000c0d
  Aug 26 04:40:24.155558 sonic DEBUG swss#orchagent:
  Aug 26 04:40:24.155577 sonic DEBUG swss#orchagent: RouteOrch Dump Route Table END--->
  Aug 26 04:40:24.155577 sonic DEBUG swss#orchagent: RouteOrch Dump NexhopGroup Table --->
  Aug 26 04:40:24.155577 sonic DEBUG swss#orchagent: Max Nexthop Group - 1024
  Aug 26 04:40:24.155577 sonic DEBUG swss#orchagent: NHGrpKey              SAI-
  OID               NumPath    RefCnt
  Aug 26 04:40:24.155588 sonic DEBUG swss#orchagent:
  Aug 26 04:40:24.155595 sonic DEBUG swss#orchagent: RouteOrch Dump All END <---
  ```
  ```

Component-specific show commands

Component: RouteOrch

debug routeorch routes

Displays the routes added in Routeorch, and routes that display are added to the ASIC_DB. Route information displays based on VRF name or routes matching the IP prefix.

- `show debug routeorch routes [-v vrf_name | -p addr]`

```
admin@sonic:~$ show debug routeorch routes -v VrfRED
------------IPv4 Route Table ------------

VRF_Name = VrfRED VRF_SAI_OID = 0x30000000005b1
Prefix               NextHop                   SAI-OID
100.100.4.0/24       Ethernet4                 0x60000000005b3
33.33.33.0/24        0x55c1ca5b3b98     (ECMP) 0x50000000005db
33.33.44.0/24        100.120.120.11|Ethernet8  0x40000000005d9
33.33.55.0/24        100.120.120.12|Ethernet8  0x40000000005da
100.102.102.0/24     Ethernet12                0x60000000005d3
100.120.120.0/24     Ethernet8                 0x60000000005b4

------------IPv6 Route Table ------------

VRF_Name = VrfRED VRF_SAI_OID = 0x30000000005b1
Prefix               NextHop                   SAI-OID
2001:100:120:120::/64 Ethernet8                 0x60000000005b4
```

debug routeorch nexthop group

Displays the Nexthop group/ECMP information in Routeorch.

- `show debug routeorch nhgrp`

```
admin@sonic:~$ show debug routeorch nhgrp
Max Nexthop Group - 512
NHGrpKey             SAI-OID               NumPath    RefCnt
0x55c1ca5b7bd0       0x50000000005db        3          1
                              1: 100.120.120.10|Ethernet8
                              2: 100.120.120.11|Ethernet8
                              3: 100.120.120.12|Ethernet8
```

debug routeorch all

Displays all IPv4 and IPv6 VRF route table and next-hop group table information.

- `show debug routeorch all`

```
admin@sonic:~$ show debug routeorch all
```

Component: NeighborOrch Debug

debug neighborорch nexthops

Displays the next-hops added in NeighorOrch. Next-hops display are added to the ASIC_DB and have their corresponding SAI object ID.

- `show debug neighorch nhops`

```
admin@sonic:~$ show debug neighorch nhops

NHIP                 Intf             SAI-OID           RefCnt    Flags
100.120.120.10       Ethernet8        0x40000000005d8   1          0
100.120.120.11       Ethernet8        0x40000000005d9   2          0
100.120.120.12       Ethernet8        0x40000000005da   2          0

NHIP                      Intf             SAI-OID           RefCnt    Flags
fe80::648a:79ff:fe5d:6b2a Ethernet4        0x40000000005df   0          0
fe80::fc54:ff:fe44:de2    Ethernet12       0x40000000005d4   0          0
fe80::fc54:ff:fe78:5fac   Ethernet8        0x40000000005d2   0          0
fe80::fc54:ff:fe88:6f80   Ethernet4        0x40000000005d0   0          0
fe80::fc54:ff:fe8e:d91f   Ethernet0        0x40000000005d1   0          0
```

debug neighborорch neighbors

Displays the neighbor entry and corresponding MAC information added in NeighorOrch.

- `show debug neighorch neigh`
- ```
  admin@sonic:~$ show debug neighorch neigh
  NHIP                  Intf             MAC
  100.120.120.10        Ethernet8        00:00:11:22:00:10
  100.120.120.11        Ethernet8        00:00:11:22:00:11
  100.120.120.12        Ethernet8        00:00:11:22:00:12

  NHIP                        Intf             MAC
  fe80::648a:79ff:fe5d:6b2a   Ethernet4        fe:54:00:35:18:bb
  fe80::fc54:ff:fe44:de2      Ethernet12       fe:54:00:44:0d:e2
  fe80::fc54:ff:fe78:5fac     Ethernet8        fe:54:00:78:5f:ac
  fe80::fc54:ff:fe88:6f80     Ethernet4        fe:54:00:88:6f:80
  fe80::fc54:ff:fe8e:d91f     Ethernet0        fe:54:00:8e:d9:1f
  ```
  ```

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Syslog server configuration and show

Syslog server configuration commands

config syslog server adds

Adds a syslog server to send messages generated by this device.

- `config syslog server add {name | ip}`
- ```
  admin@sonic:~$ sudo config syslog server add 100.1.100.52
  Root privileges are required for this operation
  root@sonic:~# config syslog server add 100.1.100.52
  100.1.100.52 server added to ConfigDB
  root@sonic:~# config syslog server add rmt.syslog.srv
  rmt.syslog.srv server added to ConfigDB
  ```

config syslog server del

Deletes the configured syslog server in this device.

- `config syslog server del {name | ip}`
- ```
  admin@sonic:~$ sudo config syslog server del rmt.syslog.log
  rmt.syslog.log server removed from ConfigDB
  ```

  ```
  admin@sonic:~$ sudo config syslog server del 221.22.200.21
  221.22.200.21 server removed from ConfigDB
  ```

config syslog server set

Sets rules, and filter syslog messages sent to syslog server. Rules and filters are based on rsyslogd selectors.

- `config syslog server set`
- ```
  admin@sonic:~$ sudo config syslog server set
  ```

config syslog server set priority

Sets the remote server log level/severity. If a priority is set, all logs matching this priority and higher are logged. To log only a specific priority use `--match`, or to exclude only a specific priority use `--exclude`. Priorities (*prio*) includes debug, info, notice, warning, err, crit, alert, and emerg. To delete or reset the priority configuration, run the command without the priority.

- `config syslog server set priority {[--match | --exclude] prio} {name | ip}`
- ```
  admin@sonic:~$ sudo config syslog server set priority 33.33.100.3 err
  ```

  ```
  admin@sonic:~$ sudo config syslog server set priority 100.1.100.52 -m warning
  ```

  ```
  admin@sonic:~$ sudo config syslog server set priority 221.22.200.21 -e notice
  ```

  ```
  admin@sonic:~$ sudo config syslog server set priority 50.50.50.1 -me info
  ```

config syslog server set filter

Sets the remote server log filters. Filter rules are free form text and should adhere to rsyslog selector rules. Use `--force` to remove the priority configuration if available. To delete or reset the filter configuration, run the same command without the filter rule.

- `config syslog server set filter [--force] {name | ip}`
- ```
  admin@sonic:~$ sudo config syslog server set filter -f 20.0.0.20 'mail,news.=alert;*.=crit'
  ```

config syslog restart
  ```

Applies the configured syslog configurations and restarts the syslog service. It is best to configure the syslog server, their log priority/filter rules, then restart.

- `config syslog restart`

```
admin@sonic:~$ sudo config syslog restart
Syslog Config updated and rsyslog service restarted
Please check show runningconfig syslog
```

Syslog server show commands

show syslog server

Displays all the configured remote syslog servers and the configured priorities/filter_rule.

- `show syslog server`

```
admin@sonic:~$ show syslog server
Server          Priority       FilterRules
--------------  -------------  ------------------------
50.50.50.1
rmt.syslog.srv
100.1.100.52    *.=warning
221.22.200.21   *.*;*.!notice
33.33.100.3     *.err
20.0.0.20                      mail,news.=alert;*.=crit

Note: This config may not be active
      To apply, please run rsyslog-config.sh or config syslog restart
```

show runningconfig syslog

Displays the rsyslog.conf file. Verify the rsyslog.conf to confirm whether the configured syslog servers are applied to the rsyslogd or not.

- `show runningconfig syslog`

```
admin@sonic:~$ show runningconfiguration syslog
#Set remote syslog server
mail,news.=alert;*.=crit @20.0.0.20:514;SONiCFileFormat
*.err @33.33.100.3:514;SONiCFileFormat
*.* @50.50.50.1:514;SONiCFileFormat
*.=warning @100.1.100.52:514;SONiCFileFormat
*.*;*.!notice @221.22.200.21:514;SONiCFileFormat
*.* @rmt.syslog.srv:514;SONiCFileFormat
```

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IPv6 link-local configuration

config interface ipv6 enable use-link-local-only

Enables an interface to forward L3 traffic with out configuring an address, and creates the routing interface based on the auto-generated IPv6 link-local address. This command can be used even if an address is configured on the interface.

- `config interface ipv6 enable use-link-local-only` *`interface_name`*
- ```
  admin@sonic:~$ sudo config interface ipv6 enable use-link-local-only Vlan206
  ```

  ```
  admin@sonic:~$ sudo config interface ipv6 enable use-link-local-only PortChannel007
  ```

  ```
  admin@sonic:~$ sudo config interface ipv6 enable use-link-local-only Ethernet52
  ```

config interface ipv6 disable use-link-local-only

Disables use-link-local-only configuration on an interface.

- `config interface ipv6 disable use-link-local-only` *`interface_name`*
- ```
  admin@sonic:~$ sudo config interface ipv6 disable use-link-local-only Vlan206
  ```

  ```
  admin@sonic:~$ sudo config interface ipv6 disable use-link-local-only PortChannel007
  ```

  ```
  admin@sonic:~$ sudo config interface ipv6 disable use-link-local-only Ethernet52
  ```

config ipv6 enable

Enables use-link-local-only command on all the interfaces globally.

- `config ipv6 enable`
- ```
  admin@sonic:~$ sudo config ipv6 enable
  ```

config ipv6 disable

Disables use-link-local-only command on all the interfaces globally.

- `config ipv6 disable`
- ```
  admin@sonic:~$ sudo config ipv6 disable
  ```

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BGP unnumbered configuration

neighbor interface remote-as

NOTE: This command is available in FRR BGP container vtysh shell.

Forms a BGP adjacency and adds the learned BGP routes with link-local address as the next-hop. This command can be used with `ipv6 use-link-local-only` option on the interface to form BGP peering with link-local address.

- `neighbor` *`interface_name`* `interface remote-as`
- ```
  sonic-frr# neighbor Ethernet52 interface remote-as external
  address-family ipv6 unicast
  neighbor Ethernet52 activate
  exit
  ```
  ```

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IFA configuration, show, and clear

IFA configuration commands

config tam device-id

Configures a TAM device identifier.

- `config tam device-id {value}`
- ```
  admin@sonic:~$ sudo config tam device-id 2345
  ```

config tam-int-ifa feature

Enables or disables the inband flow analyzer (IFA) feature.

- `config tam-int-ifa feature {enable|disable}`
- ```
  admin@sonic:~$ sudo config tam-int-ifa feature enable
  Enabled IFA
  ```

config tam collector-name

Configures an IFA collector. Collector configuration is required only for egress node functionality.

- `config tam collector {collector-name} {ipv4 | ipv6} {collector-ip} {collector-port}`
- ```
  admin@sonic:~$ sudo config tam collector collector1 ipv4 11.12.13.14 9070
  ```

config tam-int-ifa flow

Creates an IFA flow based on a flow matching the provided ACL. This command is not applicable for intermediate node functionality. Sampling rate is mandatory for ingress node configuration, and collector is mandatory for egress node.

- `config tam-int-ifa flow {flow_name} {acl_table_name} {acl_rule_name} {{sampling-rate {value}} | {collector {collector_name}}}`
- ```
  admin@sonic:~$ sudo config tam-int-ifa flow flow1 acl1 rule1 sampling-rate 1000
  tam_int_ifa -config --flowname flow1 --acl_table_name acl1 --acl_rule_name rule1 --
  samplingrate 1000
  ```

  ```
  admin@sonic:~$ sudo config tam-int-ifa flow flow2 acl2 rule2 collector collector1
  tam_int_ifa -config --flowname flow2 --acl_table_name acl2 --acl_rule_name rule2 --
  collectorname collector1
  ```

IFA clear commands

sonic-clear tam device-id

Clears a TAM device identifier.

- `sonic-clear tam {device-id}`
- ```
  admin@sonic:~$ sudo sonic-clear tam 3344
  ```

sonic-clear tam collector

Delete a TAM collector configuration.

- `sonic-clear tam collector {collector-name}`
- ```
  admin@sonic:~$ sudo sonic-clear tam collector collector1
  ```

sonic-clear tam-int-ifa flow

Clears an IFA flow configuration.

- `sonic-clear tam-int-ifa flow {flow-name}`
- ```
  admin@sonic:~$ sudo sonic-clear tam-int-ifa flow flow1
  ```

IFA show commands

show tam-int-ifa supported

Displays if IFA is supported or not.

- `show tam-int-ifa supported`
- ```
  admin@sonic:~$ show tam-int-ifa supported
  TAM INT IFA Supported -  True
  ```

show tam device

Displays TAM device information.

- `show tam device`
- ```
  admin@sonic:~$ show tam device
  TAM Device identifier
  ------------------------------
  Device Identifier    -  3344
  ```

show tam collector

Displays TAM collector information.

- `show tam collector [{collector-name} | all]`
- ```
  admin@sonic:~$ show tam collector
        NAME    IP TYPE           IP    PORT
  ----------  ---------  -----------  ------
  collector1       ipv4  11.12.13.14    9070
  ```

show tam-int-ifa status

Displays the current status of IFA, like device id, number of flows.

- `show tam-int-ifa status`
- ```
  admin@sonic:~$ show tam-int-ifa status
  Device Identifier    -  3344
  Number of flows      -  2
  Number of collectors -  1
  Feature Enabled      -  true
  ```

show tam-int-ifa flow

Displays IFA flow information.

- `show tam-int-ifa flow [{flow-name} | all ]`
- ```
  admin@sonic:~$ show tam-int-ifa flow
    NAME    ACL TABLE NAME    ACL RULE NAME    COLLECTOR NAME    SAMPLING RATE
  ------  ----------------  ---------------  ----------------  ---------------
   flow2              acl2            rule2        collector1
   flow1              acl1            rule1                                1000
  ```

show tam-int-ifa statistics

Displays the IFA statistics per flow or all flows.

- `show tam-int-ifa statistics [{flow-name} | all ]`
- ```
  admin@sonic:~$ show tam-int-ifa statistics
    FLOW NAME    RULE NAME    TABLE NAME    PACKETS COUNT    BYTES COUNT
  -----------  -----------  ------------  ---------------  -------------
  ```
  ```

```
        flow2           rule2           acl2                    8               8000
        flow1           rule1           acl1                    9               9000
```

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PTP configuration and show

PTP configuration commands

ptp mode

Configures the device precision time protocol (PTP) mode as boundary-clock, peer-to-peer-transparent-clock, end-to-end-transparent-clock, or disables PTP. Default value is `disable`.

- `ptp mode {boundary-clock | peer-to-peer-transparent-clock | end-to-end-transparent-clock | disable}`
- ```
  admin@sonic:~$ sudo ptp mode boundary-clock
  ```

ptp network-transport

Configures the PTP network transport, and either unicast or multicast mode. Default value is `l2` (Layer 2).

- `ptp network-transport {l2 | ipv4 | ipv6} {unicast | multicast}`
- ```
  admin@sonic:~$ sudo ptp network-transport ipv4 unicast
  ```

ptp ipv6-scope

Configures the PTP IPv6 scope to use for multicast messages. This is used as the second byte of the primary address and is relevant only in IPv6 multicast transport. Default value is `0xe`.

- `ptp ipv6-scope` *`0x0..0xf`*
- ```
  admin@sonic:~$ sudo ptp ipv6-scope 0xf
  ```

ptp domain

Configures the PTP domain number. Default value is `0`.

- `ptp domain` *`0..127`*
- ```
  admin@sonic:~$ sudo ptp domain 10
  ```

ptp domain-profile

Configures the PTP domain-profile method to use when comparing datasets during the best master clock algorithm. Default value is `default`.

- `ptp domain-profile {default | g8275.1 | g8275.2}`
- ```
  admin@sonic:~$ sudo ptp domain-profile g8275.1
  ```

ptp two step

Configures the PTP two-step mode for sync messages. One-step mode can be used only with hardware time stamping. Default value is `enable`.

- `ptp two step [enable | disable]`
- ```
  admin@sonic:~$ sudo ptp two step disable
  ```

ptp priority1

Configures the PTP priority1 attribute of the local clock. It is used in the best master selection algorithm. Lower values take precedence. Default value is `128`.

- `ptp priority1` *`0..255`*
- ```
  admin@sonic:~$ sudo ptp priority1 10
  ```
  ```

ptp priority2

Configures the PTP priority2 attribute of the local clock. It is used in the best master selection algorithm. Lower values take precedence. Default value is `128`.

- `ptp priority2 0..255`
- ```
  admin@sonic:~$ sudo ptp priority2 20
  ```

ptp announce-timeout

Configures the number of sync/follow up messages that may go missing before triggering a best master clock election. Default value is `3`.

- `ptp announce 2..128`
- ```
  admin@sonic:~$ sudo ptp announce-timeout 5
  ```

ptp log-announce-interval

Configures the mean time interval between announce messages. Default value is `1`.

- `ptp log-announce-interval -128..128`
- ```
  admin@sonic:~$ sudo ptp log-announce-interval 10
  ```

ptp log-sync-interval

Configures the mean time interval between sync messages. Default value is `0`.

- `ptp log-sync-interval -128..128`
- ```
  admin@sonic:~$ sudo ptp log-sync-interval 5
  ```

ptp log-min-delay-req-interval

Configures the minimum permitted mean time interval between delay_req messages. Default value is `0`.

- `ptp log-min-delay-req-interval -128..128`
- ```
  admin@sonic:~$ sudo ptp log-min-delay-req-interval 5
  ```

ptp port add

Specifies the interface on which PTP is enabled.

- `ptp port add interface_name`
- ```
  admin@sonic:~$ sudo ptp port add Ethernet64
  ```

ptp port del

Removes the interface on which PTP is enabled.

- `ptp port del interface_name`
- ```
  admin@sonic:~$ sudo ptp port del Ethernet64
  ```

ptp port master-table add

Configures the set of master IP addresses that the slave port uses to initiate PTP communication. This is typically the IP address that is assigned to the interface attached.

- `ptp port master-table add ip_address`
- ```
  admin@sonic:~$ sudo ptp port master-table add 192.168.64.1
  ```

ptp port master-table del

Removes from the set of master IP addresses that the slave port uses to initiate PTP communication. This is typically the IP address that is assigned to the interface attached.

- `ptp port master-table del ip_address`
- ```
  admin@sonic:~$ sudo ptp port master-table del 192.168.64.1
  ```
  ```

PTP show commands

show ptp

Displays PTP configuration information.

- `show ptp`
- ```
  admin@sonic:~$ show ptp
  ---------------------
  Interface  State
  ---------------------
  Ethernet52  master
  Ethernet64  slave
  ```

show ptp time-property

Displays PTP time-property information.

- `show ptp time-property`
- ```
  admin@sonic:~$ show ptp time-property
  Curr UTC Offset Vld  false
  Curr UTC Offset      37
  Leap59               false
  Leap61               false
  Time Traceable       false
  Freq Traceable       false
  PTP Timescale        true
  ```

show ptp clock

Displays PTP clock information.

- `show ptp clock`
- ```
  admin@sonic:~$ show ptp clock
  Mode                 BC
  Domain Profile       ieee1588
  Network Transport    L2 multicast
  Domain Number        1
  Clock Identity       b86a97.fffe.2ff1ba
  Priority1            128
  Priority2            128
  Two Step             Enabled
  Slave Only           False
  Number Ports         2
  Clock Quality:
    Clock Class        248
    Clock Accuracy     254
    Ofst Scaled Log Var 65535
  Mean Path Delay      0
  Steps Removed        0
  Ofst From Master     0
  ```

show ptp port

Displays PTP port information.

- `show ptp port`
- ```
  admin@sonic:~$ show ptp port Ethernet 52
  Port Number                    52
  Port State                     master
  Log Min delay Req Intvl        0
  Peer Mean Path Delay           0
  Log Announce Interval          1
  Log Sync Interval              0
  Delay Mechanism                e2e
  Log Min PDelay Req Interval    0
  Version Number                 2
  Unicast Master Table:
                                 192.168.64.1
  ```

show ptp parent

Displays PTP parent information.

- `show ptp parent`
- ```
  admin@sonic:~$ show ptp parent
  Parent Clock Identity          b86a97.fffe.2ff1ba
  Port Number                    0
  Grandmaster Clock Class        248
  Grandmaster Off Scaled Log Var 65535
  Grandmaster Clock Accuracy     254
  Grandmaster Identity           b86a97.fffe.2ff1ba
  Grandmaster Priority1          110
  Grandmaster Priority2          128
  Stats Valid                    False
  Observed Off Scaled Log Var    65535
  Observed Clock Phase Chg Rate  2147483647
  ```
  ```

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sFlow configuration and show

sFlow show commands

show sflow

Displays the current sFlow configuration including admin state, polling-interval, agent-id, and collectors information.

- `show sflow`

```
admin@sonic:~$ show sflow

sFlow Global Information:
  sFlow Admin State:          up
  sFlow Polling Interval:     100
  sFlow AgentID:              default

  2 Collectors configured:
    Name: collector1          IP addr: 10.0.0.1   UDP port: 6343
    Name: collector2          IP addr: 20.0.0.1   UDP port: 9898
```

show sflow interface

Displays the current running configuration of sFlow on interfaces.

- `show sflow interface`

```
admin@sonic:~$ show sflow interface
  ------------------------------------------------------------
  sFlow interface configurations
  Interface        Admin State        Sampling Rate
  Ethernet0            up                     10000
  Ethernet4            down                   10000
  Ethernet8            up                     10000
  Ethernet12           up                     10000
  Ethernet16           up                     10000
  Ethernet20           up                     10000
  Ethernet24           up                     10000
  Ethernet28           up                     10000
  Ethernet32           up                     10000
  Ethernet36           up                     10000
  Ethernet40           up                     10000
  Ethernet44           up                     10000
  Ethernet48           up                     10000
  Ethernet52           up                     10000
  Ethernet56           up                     10000
  Ethernet60           up                     10000
  Ethernet64           up                     10000
  Ethernet68           up                     10000
  Ethernet72           up                     10000
  Ethernet76           up                     10000
  Ethernet80           up                     10000
  Ethernet84           up                     10000
  Ethernet88           up                     10000
  Ethernet92           up                     10000
  Ethernet96           up                     10000
  Ethernet100          up                     10000
  Ethernet104          up                     10000
  Ethernet108          up                     10000
  Ethernet112          up                     10000
  Ethernet116          up                     10000
  Ethernet120          up                     10000
  Ethernet124          up                     10000
```

sFlow configuration commands

config sflow enable

Enables global sFlow; sFlow is globally disabled by default.

- `config sflow enable`
- ```
  admin@sonic:~$ sudo config sflow enable
  ```

config sflow disable

Disables global sFlow.

- `config sflow disable`
- ```
  admin@sonic:~$ sudo config sflow disable
  ```

config sflow collector add

Adds an sFlow collector. A maximum of two sFlow collector is allowed. Each collector name must be unique, and collector IP can be IPv4 or IPv6 address. The collector port is the UDP port of the collector (0 to 65535, default 6343).

- `config sflow collector add {collector_name} {collector_ip} [--port {collector_port}]`
- ```
  admin@sonic:~$ sudo config sflow collector add collector1 10.0.0.1
  ```

  ```
  admin@sonic:~$ sudo config sflow collector add collector2 20.0.0.1 --port 9898
  ```

config sflow collector del

Deletes an sFlow collector.

- `config sflow collector del {collector_name}`
- ```
  admin@sonic:~$ sudo config sflow collector del collector1
  ```

config sflow polling-interval

Configures an sFlow polling-interval (5 to 300, default 20, disable 0).

- `config sflow polling-interval {interval}`
- ```
  admin@sonic:~$ sudo config sflow polling-interval 100
  ```

config sflow agent-id add

Adds an sFlow agent to an interface.

- `config sflow agent-id add {interface_name}`
- ```
  admin@sonic:~$ sudo config sflow agent-id add Ethernet4
  ```

config sflow agent-id del

Deletes the sFlow agent from the configured interface.

- `config sflow agent-id del {interface_name}`
- ```
  admin@sonic:~$ sudo config sflow agent-id del Ethernetr
  ```

config sflow interface sample-rate

Configures the sampling rate for a specific interface.

- `config sflow interface sample-rate {interface_name} {rate}`
- ```
  admin@sonic:~$ sudo config sflow interface sample-rate Ethernet4 10000
  ```

The default sample rate is based on interface speeds:

- 1-in-1000 for a 1G link
- 1-in-10,000 for a 10G link
- 1-in-40,000 for a 40G link

- 1-in-50,000 for a 50G link
- 1-in-100,000 for a 100G link

config sflow interface disable

Disables sFlow for a specific interface.

- `config sflow interface disable {interface_name}`
- ```
  admin@sonic:~$ sudo config sflow interface disable Ethernet4
  ```

config sflow interface enable

Enables sFlow for a specific interface.

- `config sflow interface enable {interface_name}`
- ```
  admin@sonic:~$ sudo config sflow interface enable Ethernet4
  ```

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BUM storm control configuration and show

BUM storm control show commands

show storm-control

Displays BUM storm control configurations for all interfaces, or a specific interface.

- `show storm-control {all | interface interface_name}`
- ```
  admin@sonic:~$ show storm-control all
  +------------------+--------------------+---------------+
  | Interface Name   | Storm Type         |   Rate (kbps) |
  +==================+====================+===============+
  | Ethernet0        | broadcast          |         10000 |
  +------------------+--------------------+---------------+
  | Ethernet0        | unknown-multicast  |         30000 |
  +------------------+--------------------+---------------+
  | Ethernet0        | unknown-unicast    |         20000 |
  +------------------+--------------------+---------------+
  | Ethernet1        | broadcast          |         40000 |
  +------------------+--------------------+---------------+
  | Ethernet1        | unknown-multicast  |         60000 |
  +------------------+--------------------+---------------+
  | Ethernet1        | unknown-unicast    |         50000 |
  +------------------+--------------------+---------------+
  ```

  ```
  admin@sonic:~$ show storm-control interface Ethernet1
  +------------------+--------------------+---------------+
  | Interface Name   | Storm Type         |   Rate (kbps) |
  +==================+====================+===============+
  | Ethernet1        | broadcast          |         40000 |
  +------------------+--------------------+---------------+
  | Ethernet1        | unknown-unicast    |         50000 |
  +------------------+--------------------+---------------+
  | Ethernet1        | unknown-multicast  |         60000 |
  +------------------+--------------------+---------------+
  ```

BUM storm control configuration commands

config interface storm-control

Enables BUM storm control on an interface.

- `config interface storm-control {broadcast | unknown-unicast | unknown-multicast} {add} interface_name kbps_value`
  ```

- ```
  admin@sonic:~$ sudo config interface storm-control broadcast add Ethernet0 10000
  add broadcast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-unicast add Ethernet0 20000
  add unknown-unicast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-multicast add Ethernet0 30000
  add unknown-multicast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control broadcast add Ethernet1 40000
  add broadcast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-unicast add Ethernet1 50000
  add unknown-unicast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-multicast add Ethernet1 60000
  add unknown-multicast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control broadcast add Ethernet2 40000
  add broadcast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-unicast add Ethernet2 50000
  add unknown-unicast storm-control
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-multicast add Ethernet2 60000
  add unknown-multicast storm-control
  ```

  Enables a BUM storm control update when it is already enabled on the interface and the same command is given with a different value for kbps.

  ```
  admin@sonic:~$ sudo config interface storm-control broadcast add Ethernet2 10000
  add broadcast storm-control
  Existing value of bps 40000
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-unicast add Ethernet2 20000
  add unknown-unicast storm-control
  Existing value of bps 50000
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-multicast add Ethernet2 30000
  add unknown-multicast storm-control
  Existing value of bps 60000
  ```

config interface storm-control

Disables BUM storm control on an interface.

- `config interface storm-control {broadcast | unknown-unicast | unknown-multicast} {del}` *`interface_name`*

- ```
  admin@sonic:~$ sudo config interface storm-control broadcast del Ethernet2
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-unicast del Ethernet2
  ```

  ```
  admin@sonic:~$ sudo config interface storm-control unknown-multicast del Ethernet2
  ```

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OSPFv2 configuration, show, clear, and debug

OSPFv2 show commands

NOTE: All OSPFv2 `show` commands are available only using the FRR vtysh shell.

- show ip ospf
- show ip ospf interface [INTERFACE]
- show ip ospf neighbor
- show ip ospf neighbor INTERFACE
- show ip ospf neighbor detail
- show ip ospf neighbor INTERFACE detail
- show ip ospf database
- show ip ospf database (asbr-summary | external | network | router | summary)
- show ip ospf database (asbr-summary | external | network | router | summary) LINK-STATE-ID
- show ip ospf database (asbr-summary | external | network | router | summary) LINK-STATE-ID adv-router
- show ip ospf database (asbr-summary | external | network | router | summary) adv-router ADV-ROUTER
- show ip ospf database (asbr-summary | external | network | router | summary) LINK-STATE-ID self-originate
- show ip ospf database (asbr-summary | external | network | router | summary) self-originate
- show ip ospf database max-age
- show ip ospf database self-originate
- show ip ospf route

OSPFv2 configuration commands

NOTE: All OSPFv2 `config` commands are available only using the FRR vtysh shell.

- [no] router ospf [vrf NAME]
- [no] ospf router-id A.B.C.D
- [no] area <A.B.C.D|(0-4294967295)> authentication message-digest
- [no] area <A.B.C.D|(0-4294967295)> authentication
- [no] area <A.B.C.D|(0-4294967295)> default-cost (0-16777215)
- [no] area <A.B.C.D|(0-4294967295)> export-list NAME
- [no] area <A.B.C.D|(0-4294967295)> filter-list prefix WORD <in|out>
- [no] area <A.B.C.D|(0-4294967295)> import-list NAME
- [no] area <A.B.C.D|(0-4294967295)> range A.B.C.D/M [advertise [cost (0-16777215)]]
- [no] area <A.B.C.D|(0-4294967295)> range A.B.C.D/M cost (0-16777215)
- [no] area <A.B.C.D|(0-4294967295)> range A.B.C.D/M not-advertise
- [no] area <A.B.C.D|(0-4294967295)> range A.B.C.D/M substitute A.B.C.D/M
- [no] area <A.B.C.D|(0-4294967295)> shortcut <default|enable|disable>
- [no] area <A.B.C.D|(0-4294967295)> stub no-summary
- [no] area <A.B.C.D|(0-4294967295)> stub
- [no] area <A.B.C.D|(0-4294967295)> virtual-link A.B.C.D [authentication [<message-digest|null>]] [<message-digest-key (1-255) md5 KEY|authentication-key AUTH_KEY>]
- [no] area <A.B.C.D|(0-4294967295)> virtual-link A.B.C.D {hello-interval (1-65535)|retransmit-interval (1-65535)|transmit-delay (1-65535)|dead-interval (1-65535)}

- [no] auto-cost reference-bandwidth (1-4294967)
- [no] default-information originate [{always|metric (0-16777214)|metric-type (1-2)|route-map WORD}]
- [no] default-metric (0-16777214)
- [no] distribute-list WORD out <kernel|connected|static|bgp>
- [no] distance (1-255)
- [no] distance ospf {intra-area (1-255)|inter-area (1-255)|external (1-255)}
- [no] ip ospf [(1-65535)] area <A.B.C.D|(0-4294967295)> [A.B.C.D]
- [no] ip ospf authentication <null|message-digest> [A.B.C.D]
- [no] ip ospf authentication [A.B.C.D]
- [no] ip ospf authentication-key AUTH_KEY [A.B.C.D]
- [no] ip ospf bfd
- [no] ip ospf cost (1-65535) [A.B.C.D]
- [no] ip ospf dead-interval (1-65535) [A.B.C.D]
- [no] ip ospf dead-interval minimal hello-multiplier (1-10) [A.B.C.D]
- [no] ip ospf hello-interval (1-65535) [A.B.C.D]
- [no] ip ospf message-digest-key (1-255) md5 KEY [A.B.C.D]
- [no] ip ospf network <broadcast|non-broadcast|point-to-multipoint|point-to-point>
- [no] ip ospf priority (0-255) [A.B.C.D]
- [no] ip ospf retransmit-interval (3-65535) [A.B.C.D]
- [no] ip ospf transmit-delay (1-65535) [A.B.C.D]
- [no] log-adjacency-changes detail
- [no] log-adjacency-changes
- [no] max-metric router-lsa administrative
- [no] max-metric router-lsa on-shutdown (5-100)
- [no] max-metric router-lsa on-startup (5-86400)
- [no] neighbor A.B.C.D [priority (0-255) [poll-interval (1-65535)]]
- [no] neighbor A.B.C.D poll-interval (1-65535) [priority (0-255)]
- [no] network A.B.C.D/M area <A.B.C.D|(0-4294967295)>
- [no] ospf router-id [A.B.C.D]
- [no] passive-interface <IFNAME [A.B.C.D]|default>
- [no] redistribute <kernel|connected|static|bgp> [{metric (0-16777214)|metric-type (1-2)|route-map WORD}]
- [no] redistribute <ospf|table> (1-65535)[{metric (0-16777214)|metric-type (1-2)|route-map WORD}]
- [no] refresh timer [(10-1800)]
- [no] timers lsa min-arrival [(0-600000)]
- [no] timers throttle lsa all [(0-5000)]
- [no] timers throttle spf [(0-600000)(0-600000)(0-600000)]

OSPFv2 clear commands

NOTE: All OSPFv2 `clear` commands are available only using the FRR vtysh shell.

clear ip ospf interface

- clear ip ospf [vrf NAME] interface IFNAME

OSPFv2 debug commands

NOTE: All OSPFv2 `debug` commands are available only using the FRR vtysh shell.

- [no] debug ospf event
- [no] debug ospf ism
- [no] debug ospf lsa

- `[no] debug ospf nsm`
- `[no] debug ospf packet`
- `[no] debug ospf zebra`

Required log levels (debugging, informational, errors, and so on) have to be enabled under "log syslog " to get above enabled logs in log file.

Debug file path can be configured under configuration mode

```
log file <file_path_and_name>

 Example : log file /var/log/frr/frr.log
```

FRR OSPFv2 protocol support

- One OSPF process (single instance) per SONiC system in BGP docker container Multi-VRF OSPF (OSPF in default and user VRFs)
- OSPF over SONiC Ethernet, PortChannel, VLAN IPv4 interfaces
- OSPF in MCLAG Peers with unique IPv4 Addresses on LAG IPv4 interfaces
- OSPF Type-1 to Type-5 LSAs
- Multi-Area OSPF OSPF Stub areas
- OSPF router ABR andASBR roles
- OSPF packets simple password authentication
- OSPF packets authentication using MD5 HMACs
- OSPF Passive interfaces
- BFD on OSPF numbered interfaces
- Type-3 Summary LSA prefix substitution
- Type-3 Summary LSA filtering (using prefix/import/export lists)
- Route redistribution to/from OSPF
- Type-1 and type-2 metric for imported external protocol routes
- OSPF ECMP routes
- OSPF Warm reboot
- Maximum of 50 OSPFv2 routers per OSPF area
- Maximum of 128 OSPFv2 enabled L3 interfaces
- Maximum of 5000 Intra area routes or prefixes
- Maximum of 5000 Inter area summary routes
- Maximum of 40000 external (type-5) routes

Configuration and Management features OSPFv2 protocol support:

- OSPFv2 configuration commands using vtysh
- OSPFv2 show commands using vtysh
- SNMP AgentX protocol, providing MIB read-only access
- SNMP MIB as per RFC 1850
- SONiC split docker routing config mode

All OSPFv2 `config` and `show` commands are supported only through vtysh command interface. To retain OSPFv2 configuration across BGP docker restart and SONiC system reboot, SONiC docker routing config mode must be set to "split" mode and FRR vtysh configuration mode shall be set to "integrated mode".

OSPF Router ID selection:

- OSPF router mode configured router id value
- If user configured router ID value is not present, then choose the most recently used router ID value
- FRR Zebra daemon recommended value of Router ID. Zebra daemon will choose router ID
  - FRR global mode configured router ID value
  - Highest IPv4 address value among SONiC physical and loopback interface IPv4 addresses

SONiC OSPFv2 supports only above listed feature capabilities of FRR OSPFv2. Some FRR OSPFv2 feature capabilities like multi-instance (mutiple ospf procesess), MPLS, Segment Routing are not supported in this release.

SONiC OSPFv2 is Single instance FRR OSPFv2. Hence all OSPFv2 configuration commands shall omit intance-id command parameter.

SONiC IPv4 interfaces (Ethernet, VLAN, Portchannel) will be auto populated as FRR Zebra IPv4 interfaces. Only these auto populated IPv4 interfaces shall be used for OSPFv2 interface mode configurations

FRR show commands start with command "show ip ospf ", with optional VRF and other command parameters.

OSPFv2 route warm reboot can be enabled by enabling warm restart on four modules namely 'system', 'swss', 'teamd', and 'bgp' using SONiC CLI command 'config warm_restart enable'. When warm restart is not enabled, upon system or bgp container restart, all the OSPFv2 routes are newly populated into forwarding plane. When warm restart is enabled, upon warm reboot, system reconciles all the OSPFv2 routes with forwarding plane.

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TAM configuration and show

TAM show commands

show tam device

Display TAM device configuration.

- `show tam device`
- ```
  admin@sonic:~$ show tam device
  ------------------------------------------------------------------------------------------------
  -----
  TAM Device Information
  ------------------------------------------------------------------------------------------------
  -----
  device-id: 2345
  ```

show tam collector

Displays TAM collector information for all or a specific collector.

- `show tam collector {all | collector_name}`

Example:

```
admin@sonic:~$ show tam collector all
------------------------------------------------------------------------------------------------
--
NAME            IP TYPE         IP ADDRESS      PORT
------------------------------------------------------------------------------------------------
--
cr1             ipv4            10.10.10.2      9070
```

TAM configuration commands

device-id

Configures the TAM device ID.

- `device-id ID`

collector cr1 type

Configures the TAM collector.

- `collector cr1 type ipv4 ip ip_address port port_number`
```

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Drop monitor configuration and show

Drop monitor configuration commands

config tam-drop-monitor max-flows

Configures the maximum flows supported for drop monitor feature. This configuration modifies the system settings and requires a reboot to take effect.

- `config tam-drop-monitor max-flows flows`
- ```
  admin@sonic:~$ sudo config tam-drop-monitor max-flows 8192
  Device settings may be modified. Reboot/reload config to apply this change. , continue? [y/
  N]: y
  ```

Drop monitor show commands

show tam drop-monitor supported

Displays the TAM drop-monitor feature support.

- `show tam drop-monitor supported`
- ```
  admin@sonic:~$ show tam drop-monitor supported
  Feature Supported      : True
  ```

show tam drop-monitor flow

Displays all configured TAM drop-monitor flows, or for a specific flow.

- `show tam drop-monitor flow {all | flow-name}`
- ```
  admin@sonic:~$ show tam drop-monitor flow all
  ------------------------------------------------------------------------------------------
  -----
  FLOW           ACL TABLE      ACL RULE        COLLECTOR       SAMPLE          FLOWGROUP
  ID
  ------------------------------------------------------------------------------------------
  -----
  f1             a1             r1              cr1             s1              1
  ```

show tam drop-monitor aging-interval

Displays the TAM drop-monitor aging interval.

- `show tam drop-monitor aging-interval`
- ```
  admin@sonic:~$  show tam drop-monitor aging-interval
  Aging interval :  3 seconds
  ```

show tam drop-monitor statistics <all/flow-name>

Displays all TAM drop-monitor statistics, or for a specific flow.

- `show tam drop-monitor statistics {all | flow-name}`
- ```
  admin@sonic:~$ show tam drop-monitor statistics all
  ------------------------------------------------------------------------------------------
  -----
  FLOW     ACL RULE            ACL TABLE          PACKETS             BYTES
  ------------------------------------------------------------------------------------------
  -----
  F1          R1                  T1                 0                  0
  ```
  ```

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Tail timestamping configuration and show

Tail timestamping show commands

show tam int-ifa-ts supported

- `show tam int-ifa-ts supported`

show tam int-ifa-ts status

- `show tam int-ifa-ts status`

```
admin@sonic:~$ show tam int-ifa-ts status
------------------------------------------------------------
TAM INT IFA TS Status
------------------------------------------------------------
Device Identifier    : 2345
Number of flows      : 1
Feature Enabled      : True
```

show tam int-ifa-ts flow

- `show tam int-ifa-ts flow {`*`flow-name`*` | all}`

```
admin@sonic:~$ show tam int-ifa-ts flow TS_Flow
------------------------------------------------------------
FLOW           ACL TABLE      ACL RULE
------------------------------------------------------------
TS_Flow        T1             R1
```

show tam int-ifa-ts statistics flow

- `show tam int-ifa-ts statistics flow {`*`flow-name`*` | all}`

```
admin@sonic:~$ show tam int-ifa-ts statistics TS_Flow
------------------------------------------------------------------------------
FLOW           ACL TABLE      ACL RULE       PACKET COUNT   BYTE COUNT
------------------------------------------------------------------------------
TS_Flow        T1             R1             8              8000
------------------------------------------------------------------------------
```

Tail timestamping configuration commands

feature

Enables or disables the tail timestamping feature.

- `feature {enable | disable}`

flow acl-table acl-rule

Configures all tail timestamping flow, and associates the flow with an ACL.

- `flow acl-table `*`acl_tbl_name`*` acl-rule `*`acl_rule_name`*

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SNMP configuration and show

SNMP show commands

- show snmp-server
- show snmp-server community
- show snmp-server group
- show snmp-server host
- show snmp-server user
- show snmp-server view

SNMP configuration commands

- snmp-server [contact] [location] [engine]
- snmp-server agentaddress [port] [interface]
- snmp-server enable trap
- snmp-server community [groupname]
- snmp-server group {any | v2c | v3 { auth | noauth | priv}} [read] [write] [notify]
- snmp-server host community {[traps v2c] | informs [timeout SECONDS] [retries RETRIES]}
- snmp-server host user {[traps {auth | noauth | priv}] | [informs {auth | noauth | priv} [timeout SECONDS] [retries RETRIES]]}
- snmp-server user [group] [encrypted] [auth {md5 | sha | noauth} [auth-password] [priv { DES | AES-128} [priv-password]]
- snmp-server view {included | excluded}

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BroadView configuration

The BroadView REST interface is supported in SONiC. The is only one available command.

config broadview collector

Configures the BroadView collector.

- `config broadview collector` *`ip port`*

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Industry standard CLIs

As part of SONiC 3.0, a new management framework has been introduced. The new management framework provides industry standard CLIs. The commands modeled as industry standard CLIs can be referred to as the *Management Framework CLI Reference Guide*.

The industry-standard CLIs are run in a SONiC shell which the new management framework provides. The SONiC shell can be accessed from the host of the SONiC system.

```
admin@sonic:~$ sonic-cli

sonic#
```