



Broadcom NetXtreme Controller 5741x(Wh+) /5750x (Thor) /5760x (Thor2)

NICCLI User Guide

Broadcom Limited

Web: www.broadcom.com

Corporate Headquarters: San Jose, CA

Revision History

Rev.	Date	Notes
01	09/16/2024	Initial release
02	07/01/2025	Updated the niccli command syntax and added outputs.
03	08/19/2025	Updated niccli VMware plugin command mapping table
04	03/10/2026	Updated VMware limitation for help
05	07/16/2026	Updated the copyright year

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1. Introduction

The NICCLI configuration utility sets the nonvolatile configuration elements of the Broadcom Ethernet network adapter, such as enabling or disabling RoCE, SR-IOV, and other options. The NICCLI configuration utility can also perform firmware upgrades. The NICCLI configuration utility uses the L2 driver in Linux, VMWare and FreeBSD and Windows. In the UEFI environment, the NICCLI configuration interacts with the PCIe hardware. The NICCLI configuration utility supports the BCM9574XX, BCM95750X, and BCM957608 family of devices.

2. Supported OSes

Architecture	Linux	Windows	Esxi 8	Esxi9	FreeBSD	UEFI	Darwin (macOS)
x86_64	x	x	x	x	x	x	x (Intel)
aarch64	x					x	x (Apple Silicon)

3. Installing the NICCLI Configuration Utility

This section provides information on installing/executing the NICCLI configuration Utility:

3.1 Installing the NICCLI package in Linux

- Using NICCLI RPM:

```
sudo rpm -i niccli -<version>.rpm
```
- Using the NICCLI deb package:

```
sudo dpkg -i niccli-<version>.deb
```

3.1.1 Executing the NICCLI package in Linux

- Users can execute the niccli binary by using the niccli-<release_version>-linux_<arch>.tar.gz package without installing the rpms/deb packages. The user has to unzip the file and execute the niccli.<arch> on the OS.

3.2 Executing the NICCLI Configuration Utility in Windows

To execute the NICCLI configuration utility, unzip the provided Windows package file and use the `niccli_x64.exe` file to run it on Windows OS.

3.3 Installing the NICCLI Configuration Utility in VMware

To install the NICCLI configuration utility using a vib package:

```
esxcli software vib install -v <VIB package> --no-sig-check
```

NOTE:

The vib packaging is under the process of VMware signing.

To install the NICCLI configuration utility using a signed .zip bundle:

```
esxcli software vib install -d <zip package>
```

3.4 Executing the NICCLI Configuration Utility in FreeBSD

To execute the NICCLI configuration Utility, unzip the provided FreeBSD package file and use the `niccli.freebsd` executable to run it on FreeBSD OS.

3.5 Executing the NICCLI Configuration Utility in UEFI

To execute the NICCLI configuration utility, unzip the provided uefi package file in the uefi environment and use the `niccli<arch>.efi` executable file to run on the UEFI shell.

3.6 Executing the NICCLI Configuration Utility in Darwin (macOS)

To execute the NICCLI Configuration Utility on Darwin (macOS), unzip the provided Darwin package file and use the `'niccli'` binary to run it on Broadcom Ethernet Network interface cards.

4. NICCLI Configuration Utility Usage and Commands

Provides information on PCI and operational inband communication using NICCLI.

The NICCLI Configuration Utility is a management tool that is used to perform operations on Broadcom Ethernet network adapters. This utility provides support for PCI and operational inband communication. The utility also accepts arguments to select the communication interface or the specified device in which to communicate from the device list.

4.1 NICCLI Configuration Utility Interface and Usage

The NICCLI configuration utility provide three different types of interfaces. By default, the utility starts with the interactive interface. The utility accepts three groups of command arguments based on the existing CLI standards.

```
<niccli> <HW i/f argument> [util arguments] [Target command]
```

4.1.1 NICCLI Configuration and Usage on VMWare 8.x onwards

The following syntax is used when the signed bundle of NICCLI is installed:

```
esxcli niccli <command> <connection_type> -v <connection_type_value> [command options]
```

connection_type : The value assigned to the connection type, which can be one of the following <--dev | -c i | --pci>.

-v : Specifies the connection type value.

connection_type_value : Acceptable values include index number, MAC Address, or PCI address

Examples:

1. esxcli niccli list
2. esxcli niccli debug -c i -v 1 --coredump
3. esxcli niccli link --dev -v BC:97:E1:70:14:10 --status
4. esxcli niccli debug --pci -v 0000:86:00.00 --coredump

4.2 Hardware Interface Group of Arguments

The interface arguments depend on the hardware connection type and its specified dependent arguments. The NICCLI configuration utility supports the --pci interface which takes the PCI Bus/Device/Location of the device. Alternatively, the utility also offers to

list all the available Ethernet network adapter PCI devices in the system along with the appropriate Ethernet/Network interface names.

The NICCLI configuration utility has the `-i/--dev` index support which can select when more than one device is found within the host.

NICCLI Configuration Utility Arguments

The utility arguments are optional. These are specific to the NICCLI configuration utility itself. E.g. convert all the output into JSON or increase the logger verbosity, and so forth.

Target Command

The target is nothing but the NICCLI configuration utility connected device. These targets offer a specific set of commands depending on the connected interface/device. The target-specific commands are executed upon acquiring the connection with the target.

4.3 NICCLI Configuration Utility Commands

All the commands that are provided are case-sensitive and operate with any of the interface modes. The following rules are for the newly defined NICCLI configuration utility syntax. The commands use a specific syntax as follows:

- `< >` mandates user to specify the value
- `[ ]` is an optional parameter.
- Parameter syntaxes can also be combined such as `[ -i <index value>]` optional `-i` index argument but mandatory index value, if `-i` switch specified.
- The NICCLI configuration utility provides "help" commands with brief information for every command.
- The NICCLI configuration utility shall accept combinations such as `-h`, `-?`, `'--help'` to display the help.
- Every command also has a detailed help description.
- The NICCLI configuration utility also displays the supported commands and/or valid command syntax when the user executes an invalid command. The NICCLI configuration supports the user command line argument as follows:

```
./niccli -i <index> <command line>
```

```
./niccli --pci <domain:bus:device.function> <command line>
```

NICCLI Configuration Utility Help

To access the NICCLI configuration utility help, use the following command:

```
./niccli [--help | help] -h]
```

Example:

```
./niccli -h
```

The utility provides three modes of execution:

4.3.1 Oneline Mode

Execute the NICCLI configuration utility on a per-target command basis. In this mode, specify the hardware interface and target command with appropriate arguments. The NICCLI configuration utility connects to the target, executes the target command, and exits from the application. The return status of the command is the exit status of the NICCLI configuration utility.

To list the available targets for Oneline mode use the following command:

```
niccli --list
```

Use the following command to display the list of available commands for Oneline Mode:

```
niccli [-i <index of the target> | --pci <NIC pci address>] --help
```

Use the following command to display the help for a specific command:

```
niccli [-i [<index of the target> | <mac addr> | <NIC pci address>]] --help  
    <command>
```

Example:

```
niccli -i 1 --help nvm
```

4.3.2 Interactive Mode

The NICCLI configuration utility starts in interactive console mode if no target command is provided. The interface starts with the target prompt upon a successful connection with the target.

This mode is best suited for connecting to the target and executing multiple operations/commands without having to disconnect from the target. This improves performance and time in establishing a connection with the target each time while executing a command. This is only for interactive usage and is not designed or meant for scripting.

To launch in Interactive Mode, use the following command:

```
<NIC CLI executable> [-i <index of the target> | --pci <NIC pci address>]
```

Use the following command to display the list of available commands for Interactive Mode:

```
'help'
```

4.3.3 Batch Mode

Write the list of commands into a flat text file and execute them in the NICCLI configuration utility without disconnecting. This combines Interactive and OneLine modes without disconnecting the target. If any one of the commands fails, the NICCLI configuration utility exits and shall not continue to execute the rest of the commands from the script.

To launch in Batch Mode, use the following command:

```
<NIC CLI executable> [-i <index of the target> | --pci <NIC pci address>] --batch  
  <batch file>
```

Batch mode requires a flat text file with utility-supported commands. Supported commands can be listed using OneLine mode or Interactive mode. Upon failure of any commands, the utility exits without continuing with other commands.

5. NICCLI Logging

1. By default, the logging will be done in the following locations :

Linux, FreeBSD	: /var/log
Windows	: C:\ProgramData\Broadcom\logs
EFI	: Current location

2. VMware staging does not allow you to create or log files other than a datastore directory. So manually use the "nicclilog.ini" file.
3. Users can disable the default logging by removing or renaming the "nicclilog.ini" file.
4. In the UEFI environment, continuous file write calls are synchronous and blocks execution until all data is transmitted.
5. If the system is still in early boot or pre-OS state, there's no buffering or optimization. This is a limitation from the Preboot environment itself.

Sample nicclilog.ini file.

```
; Configuration file for NICCLI/NICCLID/NICCLIF/NICCLILOM
; Created: 2025-03-21
```

```
; Logging Level 1(DEBUG), 2(VERBOSE), 4(FUNC)
; Logging level can be combined. For E.g.
; DEBUG_LOG_LEVEL_ALL = 3 (1(DEBUG), 2(VERBOSE))
```

```
[Logging Level]
DEBUG_LOG_LEVEL_ALL=3
```

```
; Logging type can either NULL, DEFAULT, Log_file
;     NULL : Displays the debug prints on the terminal
;           or command prompt.
;     DEFAULT : Log in default location. (For Eg. /var/log)
;           Default file name : <utility_name>_d_<time_stamp>.log
;     Log_file : Provided file name will be logged.
```

```
[Logging Type]
DEBUG_LOG_FILE=DEFAULT
```

6. Enabling NICCLI Commands Autocompletion

- 1) User has to copy the niccli-autocomplete file to
"/usr/share/bash-completion/completions/".
- 2) Then run "source /usr/share/bash-completion/completions/niccli-autocomplete" to
enable the NICCLI command autocompletion.
- 3) The user has to run "niccli <tab> <tab>" to see auto-completion commands.

7. Known Limitations/issues & usage guidelines

- 1) NICCLI framework does not support running multiple instances in parallel,
sometimes it may lead to a system crash and this scenario should be avoided.
- 2) White space characters other than plain space like tab etc. are not supported as
argument separators in the interactive mode.
- 3) Interrupting niccli during the middle of some operations may result in

unknown/undefined/unexpected behavior.

- 4) QOS commands i.e. pfc, apptlv, up2tc, getqos, ets, listmap, dscp2prio and tcrlmt to work, user has to disable the following nvm options "lldp_nearest_bridge", "lldp_nearest_non_tpmr_bridge" and "dcbx_mode".
- 5) The error codes will be supported only for the online mode, the interactive mode and the batch mode will not have error codes displayed.
- 6) Unless -all option is explicitly specified, resmgmt command works based on its default mode (for a selected single PF or for all PFs/entire NIC device) which is printed when it's executed or its help is displayed. -all option performs the given command/operation for all the PFs of the given NIC device.
- 7) NICCLI in the Linux secure boot environment displays the "Firmware Reset Counter" and "Error Recovery Counter" fields in the show command always as zero as the mmap fails due to security considerations.
- 8) In XenServer 9.0 and above if the operating system kernel is in lockdown mode, then the user has to disable the secure boot and remove the lockdown for niccli to function properly.
Commands to remove the kernel lockdown in Xenserver 9.0:

```
# bootctl | grep Secure
# /opt/xensource/libexec/xen-cmdline --set-dom0 module.sig_enforce=0
# /opt/xensource/libexec/xen-cmdline --set-dom0 lockdown_disable
# reboot
```
- 9) For Blade Servers, the Network Interface Card on these servers remains powered during a server reboot. To ensure proper recovery of the card, particularly after a fastboot followed by NVM programming, it is essential to completely disconnect the power cables to the server. Failure to perform this step may result in the card returning in an unknown or bad condition.
- 10) If the user updates certain parameter values on the NIC controller via niccli, the user can query the updated status from niccli. However the change may or may not get reflected if queried from any other utility till reboot or L2 driver unload/load.
- 11) In FreeBSD for DCB commands to work, user has to make sure logical link of the interface should be UP. This is BSD layer2 driver (if_bnxt.ko) limitation.

7.1 VMWare Limitations

- 1) In interactive mode, editing the command by moving the cursor using the left/right arrow will not work. The user has to re-issue the command.
- 2) Interactive mode will not be supported in the niccli Plugin model.
- 3) The user has to provide an option "-s" (silent mode) for the command named "restorefactorydefaults" which requires user confirmation 'Yes/No'.
- 4) VMware ESXCLI plugin does not support underscore (_) to be included as part of niccli command name. The command names can only contain lower-case alphanumeric characters, numbers and '-'.
Because of VMWare ESXCLI Plugin limitation, the esxcli niccli json format has the discrepancy in the command executed and command displayed in json output.

7.2 Linux inbox limitations in secure kernel

- 1) In Linux OS, When the secure boot is enabled the adapter configuration/query commands using niccli will not work as the mapping to the PCI BAR is not allowed by the OS.
- 2) Running multiple instances of niccli at the same time can result in the unexpected outputs and command timeouts.
- 3) In a multihost environment, race conditions can occur if more than one host attempts to utilize the USHI channel at the same time and this can result in the corruption of the control and data registers, timeouts, etc.
- 4) When the kernel configuration parameter CONFIG_IO_STRICT_DEVMEM=y is enabled and the inbox bnxt_en driver is loaded, niccli adapter configuration/query commands will not work. This is because from the user space niccli cannot map the PCI BAR to access the hardware. Below are the two work-arounds for this issue.
 - A) Unbind the L2 driver from the PF.
 - B) Enable the iomem=relaxed in the grub and reboot the server.
- 5) niccli adapter configuration/query commands in the guest OS or VM can cause unexpected outputs and command timeouts when the guest OS is loaded with the inbox bnxt_en driver and the PF is binded to the vfio-pci driver in the hypervisor and is attached to the guest OS or VM. In this case, guest OS or VM should be loaded with the out-of-box bnxt_en driver.

- 6) The NICCLI command execution will be slow when inbox/upstream drivers are loaded.
- 7) In case of writing/reading huge amounts of data from the hardware to user space, users might notice the considerable delay in the command completion when inbox/upstream drivers are loaded.
- 8) When logging options such as --verbose, --debug and --log are specified with a filename, only the required and debug specific output is written to a specified file. These options need not redirect every output to the given file.

8. Command Line Options

To get a current list of supported commands by the niccli utility, use the niccli help option.

NAME

niccli

DESCRIPTION

Broadcom NetXtreme-C/E/S Firmware update, Configuration and Debug utility.
It supports 3 modes of execution. Interactive mode, Online Mode and Batch Mode.

SYNOPSIS

niccli [OPTIONS] <COMMAND> [Params]

Options

Command	Description
-i --index	Index of the target
--search	Search for a keyword(s) to match the relevant Commands
--pci	NIC PCI address
--dev	Index or MAC or NIC PCI address or NIC interface
-j --json	List the output in JSON format

Generic commands (Interface/device not required)

Command	Description
-v --version	Shows the version of the utility
-h --help	Lists the available commands
-l --list	Lists all the supported devices with target indexes
-d --list_devices	Lists all the supported devices with basic information
-e --list_ethernet	Lists all the supported device interface names
--batch	Enter into batch mode
devid	Query Broadcom device id's.
quit	Quits from the application (Applicable in interactive mode only)

Command categories (require specifying device - index or PCIe BDF or MAC)

show	Shows NIC specific device information
nvm	Query or Configure device NVM
fw	Firmware manager
qos	Query or configure device QOS parameters
linkdiag	Link Diagnostics
serdes	Plots the SERDES eyes values
vf	Performs VF operations
udcc	User defined congestion control operations
cable	Display the cable information
link	Link Operations
timesync	Peer to Peer related operations
counters	Display and clear the PCIe port counters
tunnel	Performs Custom, GRE Tunnel and RSS(receive side scaling) operations
msix	Query or configure MSIX vector of VF's for each PF
mh	Modify and retrieve the PF count for each PCIe endpoint
resmgmt	Query and Configure resources of the device
ccparams	Query or configure the congestion control(cc) parameters for

	RoCE.
debug	Dumps device internal configuration registers
pcie	Query and configure the PCIe operations

fw commands

=====

DESCRIPTION :

Performs Firmware operations

- 1) The online option is supported only on Linux, Darwin and Windows operating systems.
- 2) recovery option is supported only in Linux operating system and UEFI Platform.
- 3) reset --immediate option is supported only on Linux operating systems.

NOTE:

- Multi-card firmware update updates devices serially (one at a time) for stability.
- Devices without compatible firmware packages are automatically skipped.
- A summary is displayed after all devices have been processed.
- The update continues even if some devices fail or are skipped.
- Multi-card firmware update (using multiple -f options or shell wildcard expansion with *.pkg) is not supported on VMware. For VMware, use single-device firmware update by specifying the device index (-i) with a single -f option.

SYNTAX :

```
fw <-u|--update> -f <package file> [--force] [-y|--yes]
fw <-u|--update> <--online> [--force] [-y|--yes]
fw <-u|--update> -f <package file> <-r|--recovery> [--force] [-y|--yes]
fw <--reset> [--immediate]
fw <-l|--livepatch> <--show>
fw <-l|--livepatch> <-a|--activate> [target_fw]
fw <-l|--livepatch> <-d|--deactivate> [target_fw]
fw <-l|--livepatch> <-p|--patch_update> [target_fw] -f <patch file>
```

OPTIONS :

- u|--update : Perform the firmware install/update.
- f|--file : This option is to provide the package file.
- force : Forces the installation of the package file. This option can also be used with the --recovery option to erase the complete NVM.
- reset : This option is to perform the reset operations.
- y|--yes : Answer as "yes" in prompts.
- immediate : This option is to reset the device without reloading the drivers.
- l|--livepatch : Perform the firmware live patch operations.

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--show : Show the livepatch target firmware versions.
-a|--activate : Activate the firmware livepatch from the NVM.
-d|--deactivate : Deactivate the firmware livepatch from the NVM.
-p|--patch_update : Update the patch file directly to the device i.e. without installing it in NVM
target_fw : Target firmware is an optional parameter to activate/deactivate the livepatch. By default the tool updates all the supported target firmwares. target_fw strings supported are "common_fw" or "secure_fw" on BCM95750x devices. "chimp_fw" string is supported on BCM9574x devices.
--online : Fetch firmware image online from Broadcom web server & perform update.
-r|--recovery : Recovers the adapter and updates the package file.

EXAMPLES :

To perform the firmware update

1) `niccli -i 1 fw --update -f FW.pkg --yes`

WARNING : Don't perform power cycle or reboot the system while firmware update is in progress as the device may become inoperable.

Active Package Version - 235.1.30.0 : Package Version on NVM - 235.1.30.0

```

NetXtreme-E Controller at PCI Domain 0000:1e:00:0
Device 0000:1e:00:0 : Installing package file BCM957608-P2200GQF00.pkg
Device 0000:1e:00:0 : will be updated to package version 235.1.41.0
Firmware Update is in progress. Please wait ...
#####
  
```

Firmware update is completed.

A system reboot or device reset is needed for the firmware update to take effect.

2) `niccli -i 1 fw --update --online --yes`

WARNING : Don't perform power cycle or reboot the system while firmware update is in progress as the device may become inoperable.

Active Package Version - 235.1.44.0 : Package Version on NVM - 235.1.44.0

```

NetXtreme-E Controller at PCI Domain 0000:1e:00:0
Device 0000:1e:00:0 : Installing package file BCM14e41760.pkg
Device 0000:1e:00:0 : will be updated to package version 233.1.135.7
Firmware Update is in progress. Please wait ...
  
```

```
#####
```

Firmware update is completed.

A system reboot or device reset is needed for the firmware update to take effect.

3) niccli -i 1 fw --update -f FW.pkg --recovery

WARNING : Don't perform power cycle or reboot the system while firmware update is in progress as the device may become inoperable.

Performing recovery...

- Initializing fastboot registers.
- Reading RPB populated by SBL.
- Board is ABPROD
- CRID Value = 0x1
- Performing SBI based fastboot.
- Verifying fastboot/CFB image header.
- Starting fastboot image download to SRAM.
- Downloading at Offset [0x180064], Len [0x65970], Addr [0x20000000]
- Fastboot image download finished.
- Enabling fastboot mode ...OK
- Waiting for SBI to boot up ...SBI ready!.
- Downloading firmware image. Please wait !
- Downloading at Offset [0x64], Len [0x87400], Addr [0x20000000]
- Download firmware image done.
- Waiting for firmware to become ready ...Firmware READY.
- Firmware is up and running.

NVM Defragmentation might take a few minutes to finish. Please wait ...

NVM Defragmentation completed successfully.

Active Package Version - 233.1.135.7 : Package Version on NVM - 233.1.135.7

NetXtreme-E Controller at PCI Domain 0000:1e:00:0

Device 0000:1e:00:0 : Installing package file BCM957608-P2200GQF00.pkg

Device 0000:1e:00:0 : will be updated to package version 235.1.41.0

Firmware Update is in progress. Please wait ...

```
#####
```

Firmware update is completed.

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PCI Device 0000:1e:00.0 recovered successfully.

A system cold boot is needed for recovery to take effect.

4) niccli -i 1 fw --update -f FW.pkg --recovery --force

WARNING : Don't perform power cycle or reboot the system while firmware update is in progress as the device may become inoperable.

Performing recovery...

- Initializing fastboot registers.
- Reading RPB populated by SBL.
- Board is ABPROD
- CRID Value = 0x1
- Performing SBI based fastboot.
- Verifying fastboot/CFB image header.
- Starting fastboot image download to SRAM.
- Downloading at Offset [0x180064], Len [0x65970], Addr [0x20000000]
- Fastboot image download finished.
- Enabling fastboot mode ...OK
- Waiting for SBI to boot up ...SBI ready!.
- Downloading firmware image. Please wait !
- Downloading at Offset [0x64], Len [0x87400], Addr [0x20000000]
- Download firmware image done.
- Waiting for firmware to become ready ...Firmware READY.
- Firmware is up and running.

NVM Defragmentation might take a few minutes to finish. Please wait ...
NVM Defragmentation completed successfully.

Active Package Version - 235.1.41.0 : Package Version on NVM - 235.1.41.0

NetXtreme-E Controller at PCI Domain 0000:1e:00:0
Device 0000:1e:00:0 : Installing package file BCM957608-P2200GQF00.pkg
Device 0000:1e:00:0 : will be updated to package version 235.1.41.0
Firmware Update is in progress. Please wait ...

#####

Firmware update is completed.

PCI Device 0000:1e:00.0 recovered successfully.

To reset the device

1) niccli -i 1 fw --reset

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Device reset issued successfully.
Please reload the NetXtreme drivers for reset to take effect

2) niccli -i 1 fw --reset --immediate

```
Sending device reset command to the    firmware                - Done
- Unbinding all the active interfaces related to PCI device 0000:61:00
- Done
-Checking the    firmware    status                - Done
- Firmware is up and    running                    -Done
- Firmware reset counter updated.
- Binding all the PCI functions related to PCI device 0000:61:00
- Done
- Device reset    was    successful
- Done
- States of NIC resources including rings, filters, and flows need to
be reinstated
- Syncing the primary and secondary images
```

To query the livepatch firmware versions

1) niccli -i 1 fw --livepatch --show

```
Common Firmware livepatch versions :
Active livepatch version   : N/A
livepatch version on NVM   : N/A
```

```
Secure Firmware livepatch versions :
Active livepatch version   : N/A
livepatch version on NVM   : N/A
```

To activate the livepatch firmware from NVM

1) niccli -i 1 fw --livepatch --activate

```
"Common Firmware" livepatch activated successfully.
"Secure Firmware" livepatch activated successfully.
```

To deactivate the livepatch firmware from NVM

1) niccli -i 1 fw --livepatch --deactivate

```
"Common Firmware" livepatch deactivated successfully.
"Secure Firmware" livepatch deactivated successfully.
```

To update the patch file directly to the device

1) `niccli -i 1 fw --livepatch --patch_update -f patch.pkg`

WARNING : Don't perform power cycle or reboot the system while firmware update is in progress as the device may become inoperable.

Active Package Version - 232.1.76.0 : Package Version on NVM - 232.1.76.0
 NetXtreme-E Controller at PCI Domain 0000:39:00:0
 Device 0000:39:00:0 : Installing package file thor_patch.pkg

Do you want to continue (y/n)?y
 Firmware Update is in progress. Please wait ...
 #

Firmware update is completed.
 FW package update SUCCESS!

To update all cards with multiple packages (heterogeneous environment)

- 1) `niccli -i 1 fw --update -f pkg1.pkg pkg2.pkg pkg3.pkg --yes`
- 2) `niccli -i 1 fw --update -f *.pkg --yes`

Multi-card firmware update mode detected

```
=====
MULTI-CARD FIRMWARE UPDATE - SERIAL MODE
=====
Total cards discovered: 3
Package files: 3
[1] BCM957504-P425G.pkg
[2] BCM957608-P2200GQF00.pkg
[3] Th57414_2x25.pkg
```

NOTE: Each device will be matched with compatible package(s)

WARNING: Do not power cycle or reboot the system while firmware update is in progress as devices may become inoperable.

Updating firmware on all 3 discovered NIC device(s) ...

```
=====
Updating Device 1: NIC [0000:1d:00.0]
=====
Active Package Version - 239.1.53.0 : Package Version on NVM -
239.1.53.0
```

```

NetXtreme-E Controller at PCI Domain 0000:1d:00:0
Device 0000:1d:00:0 : Installing package file BCM957608-P2200GQF00.pkg
Device 0000:1d:00:0 : will be updated to package version 238.1.120.0
Firmware Update is in progress. Please wait ...
#####
#####

```

```

Firmware update is completed.
A system reboot or device reset is needed for the firmware update to
take effect.
Device 1: Firmware update completed successfully

```

```

=====
Updating Device 3: NIC [0000:38:00.0]
=====
Active Package Version - 39.10.45.00 : Package Version on NVM -
39.10.45.00

```

```

NetXtreme-E Controller at PCI Domain 0000:38:00:0
Device 0000:38:00:0 : Installing package file Th57414_2x25.pkg
Device 0000:38:00:0 : will be updated to package version 38.11.20.00
Firmware Update is in progress. Please wait ...
#####

```

```

Firmware update is completed.
A system reboot or device reset is needed for the firmware update to
take effect.
Device 3: Firmware update completed successfully

```

```

=====
Updating Device 5: NIC [0000:39:00.0]
=====
Active Package Version - 239.1.44.0 : Package Version on NVM -
239.1.44.0

```

```

NetXtreme-E Controller at PCI Domain 0000:39:00:0
Device 0000:39:00:0 : Installing package file BCM957504-P425G.pkg
Device 0000:39:00:0 : will be updated to package version 238.1.120.0
Firmware Update is in progress. Please wait ...
#####

```

Firmware update is completed.

A system reboot or device reset is needed for the firmware update to take effect.

Device 5: Firmware update completed successfully

```
=====
MULTI-CARD FIRMWARE UPDATE SUMMARY
=====
```

[SUCCESS] Device 1: NIC [0000:1d:00.0]

[SUCCESS] Device 3: NIC [0000:38:00.0]

[SUCCESS] Device 5: NIC [0000:39:00.0]

```
-----
Successful:      3
```

```
Failed:         0
=====
```

NOTE: A system reboot is required for the firmware updates to take effect.

Total number of cards updated: 3

nvm commands

```
=====
```

DESCRIPTION :

NVM configuration option of a device

This command provides :

- Display the current settings of the NVM configuration.
- Configure the current settings of the NVM configuration.
- Save the current settings of the NVM configuration.

- 1) The view option is supported on Linux, Windows, VMWare, Darwin and FreeBSD operating systems.
- 2) The backup [--cfg] option is supported on Linux, Windows, VMWare, Darwin operating systems and UEFI Platform.
- 3) The nvm --dir_read and --dir_write options are supported on Linux, Windows, VMWare, Darwin and FreeBSD operating systems.
- 4) The nvm --dump option is supported on Linux, Windows, VMWare, Darwin and FreeBSD operating systems.

Note:

1. While writing the VPD .txt file using --dir_write command, the user has to add the comment section with required VPD tags. If not, the command will fail to write the VPD .txt file.
2. "nvm --restore_factory_defaults --link" is only supported for BCM9575xxx and above devices.
3. "--default" is only supported for BCM9575xxx and above devices. This option is valid only when used with the "--getoption" and "--setoption" command options.

SYNTAX :

```

nvm --view [-V] [-f <firmware package file name>] [-t|--type <nvm directory name>]
nvm -l|--list [-V] [-f <firmware package file name>]
nvm --verify [-V] [-f <firmware package file name>]
nvm -n|--sync
nvm -F|--restore_factory_defaults [--silent]
nvm -D|--defrag
nvm -r|--dir_read -f <file name> -t|--type <nvm directory name>
nvm -w|--dir_write -f <file name> -t|--type <nvm directory name>
nvm -S|--saveoptions -f <file name>
nvm -O|--optionhelp <option name>
nvm -g|--getoption <option name> [--scope <scope index>]
nvm -s|--setoption <option names with comma separated>
    -v|--value <option value with comma separated> [--scope <scope index>]
nvm -L|--listoptions --diff
nvm --dump <-o|--offset> <val> <--length> <val> -f <filename>

```

OPTIONS :

```

--view           : View the NVM item data.
-l|--list        : Display the NVM components and its associated version details.
--verify         : Verify packages & NVM.
-F|--restore_factory_defaults : Restores NVM configuration to factory defaults.
-n|--sync        : Synchronize SBI, SRT and CRT Primary and Secondary FW images.
                  Supported on BCM9575xxx and BCM9576xxx devices.
-r|--dir_read    : Read the NVM item data and write its contents to a file.
-w|--dir_write   : Create or overwrite NVM data item with a file.
-S|--saveoptions : Save NVM configuration options on the device to a file.
                  Only the end user access NVM configuration options are saved.
-D|--defrag      : This option is used to reduce the fragmentation of the nvm.
-O|--optionhelp  : Detailed help for the NVM configuration option.

```

-g|--getoption : Get NVM configuration option of a device.
 --setoption : Set NVM configuration option of a device.
 -v|--value : The value for the specified option. Value can be in hex or decimal format
 --scope : The scope can be either of 'function' or 'port' index.
 -L|--listoptions : Displays current and default NVM configuration options of a device.
 --diff : Displays the difference between current and default NVM configuration options of a device.
 --silent : Silent option. Do not prompt for user message.
 -V : Verbosity.
 -f : Input file name.
 -t|--type : Input NVM directory name string.

EXAMPLE :

To view the NVM directory entries in detail:

1) `niccli -i 1 nvm --view`

```

Device Interface Name: ens6f0np0
  type      ord.ext  data/length  attr version
CertChain   0.0      4144/8192    0001
  type      ord.ext  data/length  attr version
SRTImage    0.0      542112/544768 0000 235.1.41.0
  type      ord.ext  data/length  attr version
MBA         1.0      352544/356352 0010 235.1.42.0
  type      ord.ext  data/length  attr version
update      0.0      3501848/3506176 0001
  type      ord.ext  data/length  attr version
SBIIImage   0.0      449168/524288 0000 232.0.7.0
  type      ord.ext  data/length  attr version
SRTImage    1.0      542112/544768 0000 235.1.41.0
  type      ord.ext  data/length  attr version
CRTImage    1.0      2118912/2121728 0000 235.1.41.0
  type      ord.ext  data/length  attr version
systemCfg   0.0      36864/36864   0001
  type      ord.ext  data/length  attr version
VPD         0.0      176/4096     0000
VPD Image Version: 1
VPD Resource Tag ID ""Broadcom BCM57608 2x200G PCIe Ethernet NIC""
VPD Resource Tag VPD-R
PN: ""BCM957608-P2200GQF00""
MN: ""14E41""
SN: ""P2200YYWWXXXXXXFG""
V0: "235.1.41.0"
V1: "235.1.41.0"
  
```

V3: "235.1.41.0"

VC: "232.0.7.0"

VPD Resource Tag END

type	ord.ext	data/length	attr	version
manufacturing	0.0	36864/36864	0001	
type	ord.ext	data/length	attr	version
MBA	0.0	353056/356352	0010	235.1.41.0
type	ord.ext	data/length	attr	version
CRTImage	0.0	2118912/2121728	0000	235.1.41.0
type	ord.ext	data/length	attr	version
pkgLog	0.0	1660/4096	0000	235.1.41.0

		2024-12-19 07:56:37Z	Broadcom BCM57608 2x200G PCIe	
Ethernet NIC	233.1.57.0	2024-12-02 21:42:52Z	Success 79B488F0	
7	fe 0 cfw	Nov 18 2024 0		
		2025-02-03 06:30:35Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	234.1.8.0	2025-01-26 21:21:17Z	Success CD05C22C	6
be	0 cfw	Dec 2 2024 0		
		2025-03-19 09:17:22Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	234.0.81.0	2025-03-18 14:52:43Z	Success 65D5FFD9	6
be	0 cfw	Jan 25 2025 0		
		2025-04-08 10:10:50Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	234.1.66.0	2025-04-07 16:30:41Z	Success 3618AA93	6
be	0 cfw	Mar 18 2025 0		
		2025-04-22 06:34:45Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	235.1.35.0	2025-04-21 14:46:52Z	Success FEEC314B	6
be	0 cfw	Apr 7 2025 0		
		2025-04-22 06:45:11Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	235.1.30.0	2025-04-15 15:02:28Z	Success 71F2DE8E	6
be	0 cfw	Apr 21 2025 0		
		2025-04-22 06:51:24Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	235.1.30.0	2025-04-15 15:02:28Z	Success 71F2DE8E	6
be	0 cfw	Apr 15 2025 0		
		2025-04-30 08:59:53Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	235.1.41.0	2025-04-28 15:02:51Z	Success 6B7BB128	6
be	0 cfw	Apr 15 2025 0		
		2025-05-02 07:40:39Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	235.1.44.0	2025-05-01 14:53:57Z	Success 3BBC42BC	6
be	0 cfw	Apr 28 2025 0		
		2025-05-06 07:05:17Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	233.1.135.7	2025-04-04 01:27:04Z	Success EB573541	6
be	0 cfw	May 1 2025 0		
		2025-05-06 07:12:14Z	Broadcom BCM57608 2x200G PCIe Ethernet	
NIC	235.1.41.0	2025-04-28 15:02:51Z	Success 6B7BB128	6
be	0 cfw	Nov 18 2024 0		

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```

2025-05-06 07:26:07Z    Broadcom BCM57608 2x200G PCIe Ethernet
NIC      235.1.41.0      2025-04-28 15:02:51Z    Success 6B7BB128      6
be      0    cfw Nov 18 2024    0
type      ord.ext      data/length  attr version
CfgCRCs    0.0      8192/8192    0001
type      ord.ext      data/length  attr version
CrashDmpData 0.0    1048576/1048576 0001
type      ord.ext      data/length  attr version
CrashDmpData 1.0    1048576/1048576 0001
type      ord.ext      data/length  attr version
SBIImage   1.0    449168/524288 0000 232.0.7.0
type      ord.ext      data/length  attr version
factoryCfg 2.0    36864/36864 0001
type      ord.ext      data/length  attr version
systemCfg  2.0    36864/36864 0001
type      ord.ext      data/length  attr version
factoryCfg 0.0    36864/36864 0001

```

To list the NVM directory entries:

1) `niccli -i 1 nvm -l -f BCM957608-P2200GQF00.pkg`

Package File: BCM957608-P2200GQF00.pkg

```

item type      ord.ext      data/length  attr version
1 update      0.0      0/2826240 0000
2 CRTImage    0.0    2118912/2118912 0000 235.1.41.0
3 SRTImage    0.0    542112/542112 0000 235.1.41.0
4 SBIImage    0.0    449168/449168 0000 232.0.7.0
5 MBA         0.0    353056/353056 0010 235.1.41.0
6 factoryCfg  0.0    36864/36864 0001
7 VPD         0.0    324/324 0000
8 VPD         0.0    160/160 0000

```

Device Interface Name: ens6f0np0

```

item type      ord.ext      data/length  attr version
1 CertChain   0.0    4144/8192 0001
2 SRTImage    0.0    542112/544768 0000 235.1.41.0
3 MBA         1.0    352544/356352 0010 235.1.42.0
4 update      0.0    3501848/3506176 0001
5 SBIImage    0.0    449168/524288 0000 232.0.7.0
6 SRTImage    1.0    542112/544768 0000 235.1.41.0
7 CRTImage    1.0    2118912/2121728 0000 235.1.41.0
8 systemCfg   0.0    36864/36864 0001
9 VPD         0.0    176/4096 0000

```

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10	manufacturing	0.0	36864/36864	0001	
11	MBA	0.0	353056/356352	0010	235.1.41.0
12	CRTImage	0.0	2118912/2121728	0000	235.1.41.0
13	pkgLog	0.0	1660/4096	0000	235.1.41.0
14	CfgCRCs	0.0	8192/8192	0001	
15	CrashDmpData	0.0	1048576/1048576	0001	
16	CrashDmpData	1.0	1048576/1048576	0001	
17	SBIImage	1.0	449168/524288	0000	232.0.7.0
18	factoryCfg	2.0	36864/36864	0001	
19	systemCfg	2.0	36864/36864	0001	
20	factoryCfg	0.0	36864/36864	0001	

To verify the NVM directory entries:

1) `niccli -i 1 nvm --verify`

Device Interface Name: ens6f0np0

All the NVM components are verified successfully

To Sync the primary and secondary firmware images:

1) `niccli -i 1 nvm -n`

Firmware sync is in progress. Please wait ...

Firmware images are already synchronized

To read NVM directory:

1) `niccli -i 1 nvm -r -t pkglog -f data.txt`

Saving contents of NVM item pkgLog to a file data.txt

To write NVM directory:

1) `niccli -i 1 nvm -w -f data.txt -t pkglog`

Command Executed Successfully

To restore the config to factory defaults:

1) `niccli -i 1 nvm --restore_factory_defaults --silent`

- WARNING : User has enabled silent flag. Continuing
the NVM restore factory defaults operation
without confirmation.

Restored NVM Factory Defaults. A system reboot is needed to take
effect.

To save the NVM config to a file:

1) `niccli -i 1 nvm --saveoptions -f output.txt`

All NVM options are saved to `output.txt`

To display the current settings for the NVM option:

1) `niccli -i 1 nvm --getoption mac_address --scope 0`

`mac_address = 8c-84-74-01-a5-c2`

To configure the current settings of the NVM configuration:

1) `niccli -i 1 nvm --setoption an_protocol --value 1 --scope 0`

`an_protocol is set successfully`

`Please reboot the system to apply the configuration`

1) `niccli -i 1 nvm -s 1,1 --scope 0,1 -v B0:26:28:99:88:14,B0:26:28:99:88:15`

`mac_address is set successfully`

`Please cold boot the system to apply the configuration`

`mac_address is set successfully`

`Please cold boot the system to apply the configuration`

To list the current and default config settings:

1) `niccli -i 1 nvm -L --diff`

NVM Option Name	Current Configuration	Default Configuration
-----	-----	-----
<code>mac_address</code>	<code>b0-26-28-99-88-14</code>	<code>00-00-00-00-00-00</code>

To get the help of each NVM config:

1) `niccli -i 1 nvm --optionhelp an_protocol`

```

Name                : an_protocol
Description          : This per-port option configures the link AN
protocol. The device can support various combinations of IEEE standard
802.3 AN protocol, Consortium AN protocol,
or Broadcom proprietary Auto Negotiation protocol.
Option Type          : Multi Instance Type
Instance Indexes     : 0 to 15
Valid values         :
    0 (IEEE802.3by and BAM)
    1 (IEEE802.3by and Consortium)

```

- 2 (IEEE802.3by)
- 3 (BAM only)
- 4 (Consortium only)

To extract the NVRAM content and perform a raw dump:

1) `niccli -i 1 nvm --dump --cfg -f cfg.txt`

```
BNX_DIR_TYPE_FUNC_CFG -----> {1 = 8c-84-74-01-a5-c2}
BNX_DIR_TYPE_PORT_CFG -----> {4 = 14e4}
BNX_DIR_TYPE_PORT_CFG -----> {5 = 1760}
BNX_DIR_TYPE_PORT_CFG -----> {6 = 14e4}
BNX_DIR_TYPE_PORT_CFG -----> {7 = 9120}
BNX_DIR_TYPE_SHARED_CFG -----> {10 = 30}
...
BNX_DIR_TYPE_PORT_CFG -----> {1465 = 0}
NVM dump operation successful
```

```
#-----
#Dir Type           : FUNCTION
#Option             : 1
#Name               : mac_address
#Description        :
#                   : This per-PF option configures the MAC address
#                   : to be used by the PF. It is
#                   : typically programmed at manufacturing time and
#                   : does not need to be configured
#                   : by the user.
#Valid values       :
#                   : 0 to 0
#-----
#Dir Type           : PORT
#Option             : 4
#Name               : vendor_id
#Description        :
#                   : PCI Vendor ID
#Valid values       :
#                   : 0 to 0
#-----
#Dir Type           : PORT
#Option             : 5
#Name               : vendor_device_id
#Description        :
#                   : PCI Device ID
#Valid values       :
#                   : 0 to 0
```

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```
#-----
#Dir Type           : PORT
#Option             : 6
#Name               : subsystem_vendor_id
#Description        :
#                   : PCI Subsystem Vendor ID
#Valid values       :
#                   : 0 to 0
#-----
#Dir Type           : PORT
#Option             : 7
#Name               : subsystem_device_id
#Description        :
#                   : PCI Subsystem Device ID
#Valid values       :
#                   : 0 to 0
```

2) niccli -i 1 nvm --dump -f nvmdump.bin

```
Executing nvmdump. Please wait...
NVM dump operation successful
```

3) niccli -i 1 nvm --dump -o 0x0 --length 0x10 -f nvmdump.bin

```
Executing nvmdump. Please wait...
NVM dump operation successful
```

To reduce the fragmentation of the NVM:

1) niccli -i 1 nvm --defrag

```
NVM defragmentation is in progress. Please wait for few minutes
to complete
```

```
NVM defragmentation completed successfully
```

qos commands

=====

DESCRIPTION :

This command can be used to query and configure the various QOS parameters such as ETS, priority to traffic class, application TLV's, receive rate control, tx and rx rate limits,

transmit(egress) and receive(ingress) buffer threshold input parameters.

- 1) This command is supported on Linux, Windows, VMWare, Darwin and FreeBSD operating systems.
- 2) The following options ets, pfc, up2tc, apptlv, dscp2prio, listma, tc, rx_port_rate_limit, rx_rate_limit, rx_ep_rate_limit, tx_partition_rate_limit, tx_port_rate_limit and tx_ep_rate_limit are supported only in Linux and FreeBSD operating systems.
- 3) --sch_grp commands are supported only in the Linux operating system.
- 4) roce-app-pri option is supported only in the VmWare operating system.

SYNTAX :

```

qos <-E|--ets> --show
qos <-E|--ets --tsa <tc[0-7]:[ets|strict], ...> --up2tc <priority[0-7]:tc>, ...> --tcw <list>
qos --pfc --enable <pfc list>
qos --up2tc --pri <priority[0-7]:tc, ...>
qos --apptlv <-a|--add> [<-d|--del>] --app <priority,selector,protocol>
qos <-D|--dscp2prio>
qos <-l|--listmap> --pri2cos
qos --tc --set <-T|--rate_limit> <list of rate limit>
qos <-r|--rx_port_rate_limit> --set --max <value> [-p|--persistent]
qos <-R|--rx_rate_limit> --show [-p|--persistent]
qos <-X|--rx_ep_rate_limit> --set --ep0 <value> [--ep1 <value>] [--ep2 <value>] [--ep3
    <value>] [-p|--persistent]
qos <-t|--tx_partition_rate_limit> --show [-p|--persistent]
qos <-t|--tx_partition_rate_limit> --set --max <value> [-p|--persistent]
qos <-P|--tx_port_rate_limit> --show
qos <-P|--tx_port_rate_limit> --set -max <value>
qos <-x|--tx_ep_rate_limit> --show
qos <-x|--tx_ep_rate_limit> --set <--port> <port number> --ep0 <value> [--ep1 <value>] [--
ep2
    <value>] [--ep3 <value>] [-p|--persistent]
qos <-n|--ingress> --cosq --show [-p|--persistent]
qos <-n|--ingress> --cosq --set --state <value> [--mode <value>] [-p|--persistent]
qos <-e|--egress> --cosq --show [-p|--persistent]
qos <-e|--egress> --cosq --set --state <value> [-p|--persistent]
qos -g|--timed_tx_pacing_rate_profile --show
qos --sch_grp -a|--add
qos --sch_grp --id <group id> -E|--ets --tsa <tc[0-7]:[ets|strict], ...> --tcw <list>
qos --sch_grp --id <group id> --max_bw <max bandwidth value>
qos --sch_grp --id <group id> --fid_map [--pf <comma separated pf ids|range>]
    [--pf0_vf <comma separated vf ids|range>] [--pf1_vf <comma separated vf ids|range>]

```

```

qos --sch_grp --id <group id> --show
qos --sch_grp --id <group id> -d|--del
qos --sch_grp --list

```

OPTIONS :

-E --ets	: Query or Configure enhanced transmission selection, priority to traffic class, traffic class bandwidths and the list of configured application tlvs.
--tsa	: Transmission selection algorithm, sets a comma separated list of traffic classes to the corresponding selection algorithm. Valid algorithms include "ets" and "strict".
--up2tc	: Comma separated list mapping user priorities to traffic classes.
--tcbw	: Comma separated list of bandwidths for each traffic class the first value being assigned to traffic class 0 and the second to traffic class 1 and so on.
--pfc	: Enable priority based flow control on a given priority.
-apptlv	: Configure the priority of the application TLV.
-a --add	: Add the priority of the application TLV.
-d --del	: Delete the priority of the application TLV.
--app	: Key to provide the priority, selector, protocol for configuring the application TLV.
-D --dscp2prio	: query the dscp to priority mapping.
-l --listmap	: List the priority mapping and related queue id for a given physical function.
--pri2cos	: List the priority to traffic class mapping.
--tc	: Command to set the rate limit for each traffic class.
-T --rate_limit	: Option to provide the comma separated percentage limit for each TC.
-r --rx_port_rate_limit	: Configure the receive side port rate limit
--max	: The max option specifies an 8-bit rate limit as a percentage of total link bandwidth with a range of 0 to 100 percent. A value of 0 indicates no rate limit and deletes the previously configured rate limit.
-p --persistent	: Option to write the configuration to NVRAM, but it does not take effect immediately.
-R --rx_rate_limit	: Query the configured receive side rate control parameters.

- X|--rx_ep_rate_limit : Configure the receive side rate control parameters for a given endpoint.

- t|--tx_partition_rate_limit : Query and Configure the transmit side partition. Rate limit applies to traffic sent from a partition, which is one PF and all of its child VFs.

- P|--tx_port_rate_limit : Query and Configure the transmit side port rate limit.
- port : Specify the index of the external port of the device.
- ep(x) : Specify the Tx or Rx endpoints rate limit values.
- x|--tx_ep_rate_limit : Query and Configure the PCIe endpoint transmit rate control.

- n|--ingress : Query and configure the QoS dynamically to receive buffer thresholds by configuring different input parameters.

- e|--egress : Query and configure the QoS dynamically at transmit buffer thresholds by configuring different input parameters.

- cosq : This option is used to query or set the cosq parameter i.e. cosq state and the mode.

- state : Bitmask field indicating which traffic classes are enabled or disabled. Each bit represents a specific traffic class, where bit 0 represents traffic class 0 and so on. A value of 0 indicates that the traffic class is not enabled.

- mode : Bitmask field indicating which traffic class is lossy or lossless. Each bit represents a specific traffic class, where bit 0 represents traffic class 0 and so on. A value of 0 indicates that the traffic class is lossy and value 1 indicates that the traffic class is lossless.

- g|--timed_tx_pacing_rate_profile : Query the timed tx pacing rate profile.

- sch_grp : This option is used to add, configure, query, or delete scheduler groups.

- id : This option is used for user to provide the valid scheduler group id.

- max_bw : This option is used to assign maximum bandwidth in units of Mbps to a scheduler group. Users can configure the max bandwidth for default (0) scheduler group ID.

- `--fid_map` : This option is used to map the function ids to an existing scheduler group.
- `--list` : This option is used to list all the available scheduler group.
- `--pf` : This option is used to map the physical functions to an existing scheduler group. The input can be a comma separated list of physical function IDs or a range(x-y).
- `--pf0_vf` : This option is used to map PF0 virtual functions to an existing scheduler group. The input can be comma separated list of PF0 virtual function IDs or a range(x-y).
- `--pf1_vf` : This option is used to map PF1 virtual functions to an existing scheduler group. The input can be comma separated list of PF0 virtual function IDs or a range(x-y).
- `--pf2_vf` : This option is used to map PF2 virtual functions to an existing scheduler group. The input can be comma separated list of PF0 virtual function IDs or a range(x-y).
- `--pf3_vf` : This option is used to map PF3 virtual functions to an existing scheduler group. The input can be comma separated list of PF0 virtual function IDs or a range(x-y).

EXAMPLES :

To show the ETS(enhanced transmission selection) configuration

1) `niccli -i 1 qos --ets --show`

```
IEEE 8021QAZ ETS Configuration TLV:
PRIO_MAP: 0:0 1:0 2:0 3:0 4:0 5:0 6:0 7:0
TC Bandwidth: 0% 0% 0%
TSA_MAP: 0:strict 1:strict 2:strict
IEEE 8021QAZ PFC TLV:
PFC enabled: none
```

Below ets show command is observed only in VMWare OS.

`esxcli niccli qos --dev -v vmnic5 --ets --show`

DCBX Standard : IEEE

Queue Information

```

-----
MAX Configurable Queues           : 3
MAX Configurable Lossless Queues  : 3
MAX Configurable Lossy Queues     : 0
ETS Information
-----

```

```

Willing                           : Yes
Max no. of TCs                    : 3
Traffic Class to BW and Scheduling algo map
-----

```

TCs	BW	Sched.Algo
---	--	-----
0	50	2 (ETS Priority)
1	50	2 (ETS Priority)
2	N.A	255 (Vendor Specific Priority)
3	N.A	255 (Vendor Specific Priority)
4	N.A	255 (Vendor Specific Priority)
5	N.A	255 (Vendor Specific Priority)
6	N.A	255 (Vendor Specific Priority)
7	N.A	255 (Vendor Specific Priority)

```

Priorities to TC map
-----

```

```

Pri. 0 is mapped to TC0
Pri. 1 is mapped to TC0
Pri. 2 is mapped to TC0
Pri. 3 is mapped to TC0
Pri. 4 is mapped to TC0
Pri. 5 is mapped to TC1
Pri. 6 is mapped to TC0
Pri. 7 is mapped to TC0

```

PFC Information

```

-----
Max PFC TCs                       : 0
MAC security Bypass Capacity      : 0
Priority bitmap                    : (0 0 0 0 0 0 0 0 )

```

APP Information

```

-----
Protocol ID: 0x12b7, Protocol Selector: 1, Priority: 3

```

To configure the ETS(enhanced transmission selection)

- 1) `niccli -i 1 qos --ets --tsa 0:ets,1:ets,2:strict,3:strict,4:strict,5:strict,6:strict,7:strict --up2tc 0:0,1:0,2:0,3:0,4:0,5:1,6:0,7:0 --tcbw 70,30`

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Enhanced transmission selection (ets) configured successfully.

To enable priority based flow control on a given priority

1) `niccli -i 1 qos --pfc --enable 5,6`

pfc configured successfully.

1) `niccli -i 1 qos --pfc --enable 0xFF`

pfc configured successfully.

To set the user priorities to traffic classes

1) `niccli -i 1 qos --up2tc 0:0,1:0,2:0,3:0,4:0,5:1,6:0,7:0`

User priority to traffic classes are configured successfully.

To add the priority of the application TLV

1) `niccli -i 1 qos --apptlv --add --app 5,1,35093`

AppTLV configured successfully.

To delete the priority of the application TLV

1) `niccli -i 1 qos --apptlv --del --app 5,1,35093`

AppTLV deleted successfully.

To query the dscp to priority mapping

1) `niccli -i 1 qos --dscp2prio`

```
dscp2prio mapping:
priority:3 dscp:26
priority:7 dscp:48
```

To list the priority to traffic class mapping

1) `niccli -i 1 qos --listmap --pri2cos`

```
Base Queue is 0 for port 0
-----
Priority  TC    HW Queue ID
-----
0         0      4
1         0      4
2         0      4
```

3	1	0
4	0	4
5	0	4
6	0	4
7	2	5

RoCE Bi-Di Optimization : Disabled

To set the rate limit for each traffic class in units of percentage

1) `niccli -i 1 qos --tc --set --rate_limit 10,20,30`

Traffic class rate limit configured successfully

2) `niccli -i 1 qos --tc --set --rate_limit 10`

Traffic class rate limit configured successfully

To configure receive rate control that applies to all traffic in a receive CoS queue group

1) `niccli -i 1 qos --rx_port_rate_limit --set --max 40`

Rx Port rate limit configured successfully

2) `niccli -i 1 qos --rx_port_rate_limit --set --max 70 -persistent`

Rx Port rate limit configured successfully
Please reboot the system for changes to take effect.

To show the receive side rate limits

1) `niccli -i 1 qos --rx_rate_limit --show`

QueueGroup0 Max : 40%
QueueGroup1 Max : None

2) `niccli -i 1 qos --rx_rate_limit --show --persistent`

QueueGroup0 Max : 70%
QueueGroup1 Max : None

To configure endpoint rate limit for all endpoints from one host

1) `niccli -i 1 qos --rx_ep_rate_limit --set --ep0 0`

Configured receive endpoint rate limit successfully.

2) `niccli -i 1 qos --rx_ep_rate_limit --set --ep0 0 --persistent`

Configured receive endpoint rate limit successfully.
Please cold boot the system for changes to take effect.

To show the Tx partition rate limit

1) `niccli -i 1 qos --tx_partition_rate_limit --show`

Max : None

To configure the Tx partition rate limit

1) `niccli -i 1 qos --tx_partition_rate_limit --set --max 2`

Transmit partition rate limit configured successfully

To show the transmit side port rate limit

1) `niccli -i 1 qos --tx_port_rate_limit --show`

Tx Port Rate Limit: Not Applicable

To configure the transmit side port rate limit

1) `niccli -i 1 qos --tx_port_rate_limit --set --max 2`

Port rate limit configured successfully

To query the PCIe endpoint transmit rate control

1) `niccli -i 1 qos --tx_ep_rate_limit --port 0 --show`

No endpoint transmit rate limits are configured.

To configure the PCIe endpoint transmit rate control for two endpoints

1) `niccli -i 1 qos --tx_ep_rate_limit --set --port 0 --ep0 50 --ep2 40`

Endpoint transmit rate limit configured successfully.

To query the ingress cosq parameters

1) `niccli -i 1 qos --ingress --cosq --show`

TC	State	Mode
**	*****	*****
0	Enabled	Lossy
1	Disabled	Lossy
2	Disabled	Lossy
3	Disabled	Lossy
4	Disabled	Lossy
5	Disabled	Lossy

```

6   Disabled   Lossy
7   Disabled   Lossy

```

To enable all the 8 traffic classes and mode lossless(1) is configured on traffic class 4
 niccli -i 1 qos --ingress --cosq --set --state 255 --mode 16

```
ingressqos parameters configured successfully
```

To query the egress cosq parameters

1) niccli -i 1 qos --egress --cosq --show

```
Transmit side CoSQ Information :
```

```

TC   State
**   *
0   Enabled
1   Enabled
2   Enabled
3   Disabled
4   Disabled
5   Disabled
6   Disabled
7   Disabled

```

To configure the egress cosq parameters. Below example enables all the 8 queues

1) niccli -i 1 qos --egress --cosq --set --state 255

```
egressqos parameters configured successfully
```

To query the timed tx pacing rate profile.

1) niccli -i 1 qos --timed_tx_pacing_rate_profile --show

```
Active timed tx pacing rate profile : 60 Mbps
```

To query a scheduler group configuration

1) niccli -i 3 qos --sch_grp --id 1 --show

```

Scheduler Group ID      : 1
Max Bandwidth           : 200000 Mbps
Number of FIDs Mapped   : 14
Queue (TC) Configuration :
TC  TSA    Min BW (%)
--  ---    -
0   ETS     70

```

```

1  ETS      20
2  ETS      10
Scheduler Group FID Mapping :
Index  Description      FID
-----
0  PF          0
1  PF0 VF       0-3, 6-7
2  PF1 VF       0-5, 7

```

To create a fid mapping to a scheduler group

```
2) niccli -i 3 qos --sch_grp --id 1 --fid_map --pf 0,1 --pf0_vf 0-5,7 --pf1_vf 0-2,4-7
```

Function IDs are mapped successfully to the given scheduler group ID.

Below command is observed only in VmWare OS

```
esxcli niccli qos --dev -v vmnic5 --roce-app-pri --set --pri 1
```

Command executed successfully.

linkdiag command

=====

DESCRIPTION :

This command is used to perform the link diagnostic tests like PRBS, loopback, DSCDump and TXFIR settings.

- 1) fdrstat options are supported on Linux, Windows, VMWare and Darwin operating system
- 2) DSC Dump options are supported on Linux, VMWare, Darwin and FreeBSD operating systems.
- 3) Loopback options are supported only Linux and Darwin operating systems.
- 4) PRBS Test options are supported on the Linux and Darwin operating system and UEFI Platform.
- 5) TxFir options are supported on Linux, Windows, Darwin, VMWare and FreeBSD Platforms

SYNTAX :

```

linkdiag -T|--txfir --show <-M|--modulation_type> <mod_type> <-l|--lane> <lane_number>
linkdiag -T|--txfir --set <-M|--modulation_type> <mod_type> <-l|--lane> <lane_mask>
--pre1 <value> --pre2 <value> [--pre3 <value>] --main <value> --post1 <value>
--post2 <value> [--post3 <value>] --amp <value> --nlcl <value> --nlcu <value>]

```

```
linkdiag -F|--fdrstat [--start] [--stop] [--clear] [--counters]
```

```
linkdiag -D|--dscdump -l|--lane <lane_number> [-a|--diag_level <level>]
```

```
linkdiag -L|--loopback --show
```

```
linkdiag -L|--loopback [<-R|--phy_remote> | <-p|--phy_local> | <-m|--mac_local> |  
  <-d|--disable>]
```

```
linkdiag -L|--loopback [--external] [--RJ45]
```

```
linkdiag -P|--prbs_test <-e|--enable | -d|--disable> [--mode <mode_value>]  
  [<-r|--rx_lane_mask> <value>] [<-t|--tx_lane_mask> <value>]  
  [<-s|--duration> <value in seconds>][--speed <speed_value>] [--tcode] [-b|--ber  
  <value>]
```

OPTIONS :

- T|--txfir : This option is used to query and configure the TX FIR (transmitter finite impulse response)
- F|--fdrstat : This option is used for FDR(Flight Data Recorder) to collect the FEC Performance data.
- D|--dscdump : This option is used to retrieve DSC dump data from a device
- L|--loopback : This option is used to query and configure the different loopback Modes i.e. phy loopback, mac loopback and external loopback.
- P|--prbs_test : This option is used in port interface debugging to analyze the quality of the link. The test can be run on a port or per lane with a specific polynomial.

Note:

- 1) The interface(s) should be fully initialized prior to the testing.
- 2) During the testing, there should not be any queries or configs sent to the card. "ifdown" the interface(s) is recommended.

-M|--modulation_type : Modulation types of TxFIR. Supported values are 'NRZ','PAM4','C2MNRZ','C2MPAM4', 'PAM4-112','C2MPAM4-112G' and 'LPOPAM4-112G' of the device. The modulation types 'PAM4-112','C2MPAM4-112G' and 'LPOPAM4-112G' are only supported on BCM5760x devices. The modulation types 'PAM4' and 'C2MPAM4' are supported on BCM5750x and BCM5760x devices.

-l|--lane : TXFIR show command takes the MRS lane number and lane mask for the TXFIR configuration. To collect the dsc dump on all the supported lanes,

please provide a value of 65535. DSC dump on all lanes is supported only on BCM9576xx devices.

- pre1 : This is a mandatory parameter to configure the TXFIR settings. This parameter is supported for all the modulation types and the valid range is from -32768 to 32767.
- pre2 : This is a mandatory parameter to configure the TXFIR settings. This parameter is supported for all the modulation types and the valid range is from -32768 to 32767.
- main : This is a mandatory parameter to configure the TXFIR settings. This parameter is supported for all the modulation types and the valid range is from -32768 to 32767.
- post1 : This is a mandatory parameter to configure the TXFIR settings. This parameter is supported for all the modulation types and the valid range is from -32768 to 32767.
- post2 : This is a mandatory parameter to configure the TXFIR settings. This parameter is supported for all the modulation types and the valid range is from -32768 to 32767.
- pre3 : This is an optional parameter to configure the TXFIR settings. This parameter is supported on following modulation types i.e, 'LPOPAM4-112G', 'PAM4-112', 'C2MPAM4' and 'C2MPAM4-112G'. The valid range is from -32768 to 32767.
- post3 : This is an optional parameter to configure the TXFIR settings. This parameter is supported on the following modulation types i.e, 'NRZ','PAM4' and 'C2MNRZ'. The valid range is from -32768 to 32767.
- amp : This is an optional parameter to configure the TXFIR settings. This parameter is supported on following modulation types i.e, 'NRZ','PAM4','C2MNRZ','PAM4-112','C2MPAM4' and 'C2MPAM4-112G'. The valid range is from -32768 to 32767.
- nlcu : This is an optional parameter to configure the TXFIR settings. This parameter is supported only on 'LPOPAM4-112G' modulation type. The valid range is from -100 to 100.
- nlcl : This is an optional parameter to configure the TXFIR settings. This parameter is supported only on 'LPOPAM4-112G' modulation type. The valid range is from 0 to 100.

- start : This is an optional parameter to start the fdrstat.
- stop : This is an optional parameter to stop the fdrstat.
- clear : This is an optional parameter to clear the fdrstat.
- counters : This is an optional parameter to pull the fdrstat counters information.
- a|--diag_level : This is an optional parameter. If the user does not specify this parameter by default DSC dump will be collected on all the supported diag levels.
Supported diag levels are as follows:
 - 0 = diag lane
 - 1 = diag core
 - 2 = diag event
 - 3 = diag eye
 - 4 = diag reg core
 - 5 = diag reg lane
 - 6 = diag uc core
 - 7 = diag uc lane
 - 8 = diag lane debug
 - 9 = diag ber vert
 - 10 = diag ber horz
 - 11 = diag event safe
 - 12 = diag timestamp
- R|--phy_remote : This option enables loopback of local PHY Rx to peer PHY Tx. The packets transmitted by peer are looped back to the peer at the PHY. No packets will reach the host. The host will see a link down.
- p|--phy_local : This option enables a loopback of local TX to local RX at the PHY. Any packets transmitted from the host are looped back to the host. No packets will be transmitted on the line. If any peer is connected, the peer should ignore the link status from the host.
- m|--mac_local : This option enables a loopback of local TX to local RX at the MAC. Any packets transmitted from the host are looped back to the host. No packets will be transmitted on the line. If any peer is connected, the peer should ignore the link status from the host.
- d|--disable : This option disables the current loopback settings. In case of prbs_test this option disables the PRBS test.
- external : This option prepares the PHY from external loopback and suppresses

NONCE generation for auto negotiation to work with an external loopback. This option should only be used if the same port external loopback dongle or equivalent is used. Without this option and AN enabled, the host may not see a link up.

- RJ45 : This test is designed for dual port 10GBase-T where the PRBS test is not applied. A compliant UTP cable is needed to connect between the two ports of the controller because auto-negotiation is required to establish a link, traffic is initiated from one port. The PHY of the other port is put into a remote loopback mode, essentially serving as a loopback plug, to bounce packets back to the initiating port. This test requires the production Linux driver (bnxt_en) to be loaded in order to execute. Packets are sent and received through the Linux OS network stack
- e|--enable : Enable the PRBS test
- mode : Specify the supported modes. And the supported modes are 'PRBS31','PRBS7','PRBS9','PRBS11','PRBS15','PRBS23','PRBS58','PRBS49','PRBS10','PRBS20' and 'PRBS13'. The default mode value is PRBS31
- r|--rx_lane_mask : Receiver lane mask value.
- t|--tx_lane_mask : Transmitter lane mask value.
- s|--duration : Duration to run the prbs test. Default time is 10 seconds
- tcode : If this option was provided. The prbs test will run on a t-code project as Well.
- speed : Specify the link speed (e.g., 100Gb-PAM4-56, 100Gb-PAM4-112, 100Gb). If not specified, maximum supported speed will be set automatically.

EXAMPLES :

To set the TXFIR settings

- 1) `niccli -i 1 linkdiag -T --set --modulation_type LPOPAM4-112G --lane 1 --pre1 1 --pre2 -2 --pre3 10 --main 12 --post1 -10 --post2 15 --nlcl 0 --nlcu 1`

Command executed successfully.

- 2) `niccli -i 1 linkdiag -T --set --modulation_type PAM4 --lane 1 --pre1 1 --pre2 -2 --main 12 --amp 10 --post1 -10 --post2 15 --post3 10`

Command executed successfully.

- 3) `niccli -i 1 linkdiag -T --set --modulation_type NRZ --lane 1 --pre1 1 --pre2 -2 --main 12 --amp 10 --post1 -10 --post2 15 --post3 10`

Command executed successfully.

- 4) `niccli -i 1 linkdiag -T --set --modulation_type PAM4-112 --lane 1 --pre1 1 --pre2 -2 --pre3 5 --main 12 --amp 10 --post1 -10 --post2 15`

Command executed successfully.

To get the TxFIR settings

- 1) `niccli -i 1 linkdiag -T --show --modulation_type LPOPAM4-112G --lane 0`

```
Transmit Finite Impulse Response (TxFIR):
Pre1      : 1
Pre2      : -2
Pre3      : 10
Main      : 12
Post1     : -10
Post2     : 15
Nlcl      : 0
Nlcu      : 1
```

- 2) `niccli -i 1 linkdiag -T --show --modulation_type PAM4 --lane 0`

```
Transmit Finite Impulse Response (TxFIR):
Pre1      : 1
Pre2      : -2
Main      : 12
Post1     : -10
Post2     : 15
Post3     : 10
Amp       : 10
```

- 3) `niccli -i 1 linkdiag -T --show --modulation_type NRZ --lane 0`

```
Transmit Finite Impulse Response (TxFIR):
Pre1      : 0
Pre2      : 0
Main      : 127
Post1     : 0
Post2     : 0
Post3     : 0
Amp       : 10
```

4) `niccli -i 1 linkdiag -T --show --modulation_type PAM4-112 --lane 0`

```

Transmit Finite Impulse Response (TxFIR):
Pre1    : 0
Pre2    : 0
Pre3    : 0
Main    : 168
Post1   : 0
Post2   : 0
Amp     : 10

```

To Start the fdrstat

1) `niccli -i 1 linkdiag --fdrstat --start`

```
FDRSTAT started successfully.
```

To Stop the fdrstat

2) `niccli -i 1 linkdiag --fdrstat --stop`

```
FDRSTAT stopped successfully.
```

To Clear the fdrstat

1) `niccli -i 1 linkdiag --fdrstat --clear`

```
FDRSTAT cleared successfully.
```

To Pull the fdrstat counters

1) `niccli -i 1 linkdiag --fdrstat --counters`

```

Port mode type: PAM4
port 0: Collecting Data ...
FDR start to collect data timestamp : 0.000000000 sec
FDR end to collect data timestamp   : 0.000000000 sec

```

	Accumulated	Last cycle
	-----	-----
Number of Uncorrected codewords:	0	0
Number of Corrected codewords:	0	0
Symbol errors:	0	0
Code words err S0:	0	0
Code words err S1:	0	0
Code words err S2:	0	0
Code words err S3:	0	0

Code words err S4:	0	0
Code words err S5:	0	0
Code words err S6:	0	0
Code words err S7:	0	0
Code words err S8:	0	0
Code words err S9:	0	0
Code words err S10:	0	0
Code words err S11:	0	0
Code words err S12:	0	0
Code words err S13:	0	0
Code words err S14:	0	0
Code words err S15:	0	0
Code words err S16:	0	0

To get the DSC Dump**1) niccli -i 1 linkdiag -D --lane 0**

Note : While the dscdump operation is running, firmware does not service other commands that operate on the PHY
System logs may indicate command timeouts while the dscdump operation is in progress.

Retrieving dsc dump, please wait...

Generated dscdump file dhcp-10-123-240-239_20250506_233430_374795.dmp successfully

2) niccli -i 1 linkdiag -D --lane 0 --diag_level 2

Note : While the dscdump operation is running, firmware does not service other commands that operate on the PHY
System logs may indicate command timeouts while the dscdump operation is in progress.

Retrieving dsc dump, please wait...

Generated dscdump file dhcp-10-123-240-239_20250506_233525_375367.dmp successfully

To get loopback status**1) niccli -i 1 linkdiag --loopback --show**

Configured LoopBack Mode : NA

To disable the loopback mode**1) niccli -i 1 linkdiag --loopback --disable**

Command Executed Successfully

To enable the mac_local loopback mode

1) niccli -i 1 linkdiag --loopback --mac_local

Command Executed Successfully

To enable the phy_local loopback mode

1) niccli -i 1 linkdiag --loopback --phy_local

Command Executed Successfully

To enable the phy_remote loopback mode

1) niccli -i 1 linkdiag --loopback --phy_remote

Command Executed Successfully

To enable the external loopback mode

1) niccli -i 1 linkdiag --loopback --external

Command Executed Successfully

To enable the external RJ45 loopback mode

1) niccli -i 1 linkdiag --loopback --external --RJ45

Starting the loopback test with RJ45 connected.

Command Executed Successfully

To enable the PRBS Test with default

1) niccli -i 1 linkdiag --prbs_test --enable

PRBS Test is running. Please wait....

Stopping PRBS Test....

PRBS DETAILED DISPLAY :

LN	TX-Mode	TX-PRBS-Inv	TX-PMD-Inv	RX-Mode	RX-PRBS-Inv	RX-PMD-Inv	Lck	LL	PRBS-Err-Cnt	BER
(result)	3	PRBS_31	0	0	PRBS_31	0	0	0	1	0000000000
										!Lock

PRBS loopback test report is generated successfully.

To disable the PRBS Test

1) niccli -i 1 linkdiag --prbs_test --disable

```

PRBS DETAILED DISPLAY :
LN TX-Mode TX-PRBS-Inv TX-PMD-Inv RX-Mode RX-PRBS-Inv RX-PMD-Inv
Lck LL PRBS-Err-Cnt      BER
  (result)  3  OFF      -          0          OFF      -
0          0  1  0000000000
!LPRBS loopback test report is generated successfully.

```

To run the PRBS Test with user provided params

```

1) niccli -i 1 linkdiag --prbs_test --enable --mode PRBS31 --rx_lane_mask 255
   --tx_lane_mask 255 --duration 10

```

Stopping PRBS Test....

```

PRBS DETAILED DISPLAY :
LN TX-Mode TX-PRBS-Inv TX-PMD-Inv RX-Mode RX-PRBS-Inv RX-PMD-Inv
Lck LL PRBS-Err-Cnt      BER
  (result)  3 PRBS_31      0          0          PRBS_31      0
0          0  1  0000000000 !Lock
PRBS loopback test report is generated successfully.

```

To run the PRBS Test with user specified speed

```

1) niccli -i 1 linkdiag --prbs_test --enable --mode PRBS31 --rx_lane_mask 255 --
   tx_lane_mask 255 --speed 100Gb-PAM4-56

```

PRBS Test is running. Please wait....

Stopping PRBS Test....

```

PRBS DETAILED DISPLAY :
LN TX-Mode TX-PRBS-Inv TX-PMD-Inv RX-Mode RX-PRBS-Inv RX-PMD-Inv
Inv Lck LL PRBS-Err-Cnt      BER
  (result)  0 PRBS_31      0          1          PRBS_31      0          1
0  1  0000000000 !Lock
  (result)  1 PRBS_31      0          0          PRBS_31      0          0
0  1  0000000000 !Lock
  (result)  2 PRBS_31      0          1          PRBS_31      0          0
0  1  0000000000 !Lock
  (result)  3 PRBS_31      0          0          PRBS_31      0          1
0  1  0000000000 !Lock
DSC ready for command is not working; SerDes lane is probably reset!
DSC ready for command is not working; SerDes lane is probably reset!
PRBS loopback test report is generated successfully.

```

serdes command

=====

DESCRIPTION :

This command is used to plot the serdes ethernet eye, PCI eye scope and margin values of the eye. This command is supported only on Linux operating systems.

Note:

1. While plotting the serdes ethernet eye the link toggling is expected.
2. Serdes ethernet and pci eye shares the resources of the NIC. Therefore, these commands cannot be run concurrently. If pci eye is running and you attempt to run ethernet eye tool will return failure.

SYNTAX :

```
serdes --eye -e|--ethernet [-l|--lane <ethernet lane number>] [<-P|--plot>]
serdes --eye -p|--pci <-l|--lane> <pci_lane_number> [-P|--plot] [-t|--target_ber <value>]
serdes --eye -p|--pci -s|--stop
```

OPTIONS :

- eye** : This option is used to plot the serdes pci and ethernet eye.
- e|--ethernet** : This option is used to plot the serdes ethernet eye.
By default this option displays only horizontal and vertical margin values, including the test result.
- p|--pci** : This option is used to plot the serdes pci eye.
- l|--lane** : This option is used to specify the lane number. For pcie serdes test, the maximum value is the device pcie lane width minus 1. Valid values are from 0 to 15. For ethernet serdes test the valid range is from 0 to 7.
- P|--plot** : This is an optional parameter. When the user specifies this option, it will plot the eye and display the horizontal and vertical margin values, including the test result.
- t|--targetber** : This option is used to specify the target bit error rate. By default serdes pci eye is plotted with BER "1e-8". This option is only supported on BCM9575xxx and above devices. The supported target BER values are "1e-8", "1e-9", "1e-10" and "1e-11"
- s|--stop** : This option is used to stop the running serdes pci eye plotting. This option is only supported on BCM9575xxx and above devices.

EXAMPLES :

To plot the ethernet serdes eye

- 1) `niccli -i 1 serdes --eye -e -P`
- 2) `niccli -i 1 serdes --eye --ethernet --plot`

Plotting serdes ethernet eye. This may take several minutes ...

Each character N represents approximate error rate $1e-N$ at that location

[illegible]

```

139mV : 111122223333444445555566767 7776777 767665555544444333322221111
137mV : 11112222333344445555556766 7 : 7 6676555555444433322221111
135mV : 1112222233334445555566666--7----7----7--6666555554443332222111
133mV : 11222223333444555556666 : : : 666655555444333222211
131mV : 112222233344455555566767 : : : 767665555544433222211
129mV : 12222223334445556666677 7 : 7 77666655544433222221
127mV : 222222333445556666 7: : : : :7 66665554433322222
125mV : 2222223344455666666-77----+----+----+----77-66666554443322222
123mV : 222222334455567 66 : : : : : 66 765554433222222
121mV : 222223334555666777 : : : : : 777666555433322222
119mV : 2222233445566777: : : : : : :7776655443322222
117mV : 2222333445666 777 : : : : : 777 6665443332222
115mV : 22223334556677--+-+----+----+----+----+----+----+----77665543332222
113mV : 222333345667 : : : : : : : 766543333222
111mV : 2223334456667 : : : : : : : 7666544333222
109mV : 2223334456677 : : : : : : : 7766544333222
107mV : 223333456677 : : : : : : : 776654333322
105mV : 22333445677+-+----+----+----+----+----+----+----+----77654433322
103mV : 23333445677: : : : : : : : :77654433332
101mV : 233344457 : : : : : : : : : 754443332
99mV : 33334456 7 : : : : : : : : : 7 65443333
97mV : 3333445677 : : : : : : : : : 7765443333
95mV : 333444567--+-+----+----+----+----+----+----+----+----765444333
93mV : 333445567 : : : : : : : : : 765544333
91mV : 33344557 : : : : : : : : : 75544333
89mV : 33445567 : : : : : : : : : 76554433
87mV : 33445567 : : : : : : : : : 76554433
85mV : 3444567----+----+----+----+----+----+----+----+----7654443

```

[illegible]

```

27mV : : : : : : : : : : : : : : :
25mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
23mV : : : : : : : : : : : : : : :
21mV : : : : : : : : : : : : : : :
19mV : : : : : : : : : : : : : : :
17mV : : : : : : : : : : : : : : :
15mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
13mV : : : : : : : : : : : : : : :
11mV : : : : : : : : : : : : : : :
9mV : : : : : : : : : : : : : : :
7mV : : : : : : : : : : : : : : :
5mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3mV : : : : : : : : : : : : : : :
1mV : : : : : : : : : : : : : : :
-1mV : : : : : : : : : : : : : : :
-3mV : : : : : : : : : : : : : : :
-5mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-7mV : : : : : : : : : : : : : : :
-9mV : : : : : : : : : : : : : : :
-11mV : : : : : : : : : : : : : : :
-13mV : : : : : : : : : : : : : : :
-15mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-17mV : : : : : : : : : : : : : : :
-19mV : : : : : : : : : : : : : : :
-21mV : : : : : : : : : : : : : : :
-23mV : : : : : : : : : : : : : : :
-25mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-27mV : : : : : : : : : : : : : : :

```

```

-29mV : : : : : : : : : : : : : :
-31mV : : : : : : : : : : : : : :
-33mV : : : : : : : : : : : : : :
-35mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-37mV : : : : : : : : : : : : : :
-39mV : : : : : : : : : : : : : :
-41mV : : : : : : : : : : : : : :
-43mV : : : : : : : : : : : : : :
-45mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-47mV : 7: : : : : : : : : : : : : : :7
-49mV : 66 : : : : : : : : : : : : : : 66
-51mV : 677 : : : : : : : : : : : : : : 776
-53mV : 67 : : : : : : : : : : : : : : 76
-55mV : 567---+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----765
-57mV : 567 : : : : : : : : : : : : : : 765
-59mV : 566 : : : : : : : : : : : : : : 665
-61mV : 5567 : : : : : : : : : : : : : : 7655
-63mV : 4566 : : : : : : : : : : : : : : 6654
-65mV : 45566-+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----66554
-67mV : 45566 : : : : : : : : : : : : : : 66554
-69mV : 445567: : : : : : : : : : : : : : :765544
-71mV : 445566: : : : : : : : : : : : : : :665544
-73mV : 444567: : : : : : : : : : : : : : :765444
-75mV : 4445567---+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----7655444
-77mV : 3445567 : : : : : : : : : : : : : : 7655443
-79mV : 3444566 : : : : : : : : : : : : : : 6654443
-81mV : 3444556 : : : : : : : : : : : : : : 6554443
-83mV : 33445566 : : : : : : : : : : : : : : 66554433

```

```

-85mV : 33444566---+---+---+---+---+---+---+---+---+---+---66544433
-87mV : 33344556 : : : : : : : : : : 65544333
-89mV : 33344556 : : : : : : : : : : 65544333
-91mV : 333344567 : : : : : : : : : : 765443333
-93mV : 3333445677 : : : : : : : : : : 7765443333
-95mV : 2333344567-+---+---+---+---+---+---+---+---+---+---7654433332
-97mV : 23333445667: : : : : : : : : : :76654433332
-99mV : 223334456777 7 : : : : : : : : : 7 777654433322
-101mV : 22333345567: : : : : : : : : : :76554333322
-103mV : 22333344567: 7 : : : : : : : : : 7 :76544333322
-105mV : 22233344556+7---+---+---+---+---+---+---+---7+65544333222
-107mV : 22233334556: 7 7: : : : : : : : :7 7 :65543333222
-109mV : 222233345566667 : : : : : : : : : : 766665543332222
-111mV : 222233344556667 :7 : : : : : : : 7: 766655443332222
-113mV : 2222233345566666: : : : : : : : : :6666655433322222
-115mV : 222223334455666767---+---+---+---+---+---+---767666554433322222
-117mV : 2222223344556566677 : : : : : : 7766656554433222222
-119mV : 222222334445556667 67: : : : : : :76 766655544433222222
-121mV : 22222233444555566667:7 : : : : 7:76666555544433222222
-123mV : 12222223344555556666 777 : : : : 777 66665555544332222221
-125mV : 122222233444555556666+---+---+---+---+---+666655555444332222221
-127mV : 112222233344445555566667 : : : : 76666555554443332222211
-129mV : 1112222233444444555566667 7 : : 7 766665555444443322222111
-131mV : 11122222333444444555556677 77777:77777 776655555444443332222111
-133mV : 111122223334444444555556666:76 : 67:66665555544444433322221111
-135mV : 11112222233344444444555656666767776766665655544444433322221111
-137mV : 111112222333334444444555556666667666666555554444443333222211111
-139mV : 111112222233333444444455555566666666665555554444443333222211111

```

-141mV : 111111222233333344444445555555555555555544444443333332222111111
-143mV : 111111222223333334444444555555555555555544444443333332222111111
-145mV : 11111112222333333344444444444455555444444444443333332222111111
-147mV : 11111112222233333333444444444444444444443333333222221111111
-149mV : 111111112222233333333344444444444444444433333333222221111111
-151mV : 11111111222222333333333434444444444434333333322222211111111
-153mV : 11111111122222233333333333333333333333332222221111111111
-155mV : 11111111112222222333333333333333333333332222221111111111
-157mV : 1111111111222222222333333333333333333333222222221111111111
-159mV : 111111111112222222222222333333333322222222222211111111111
-161mV : 1111111111112222222222222222222222222222222222211111111111
-163mV : 1111111111111222222222222222222222222222222222211111111111
-165mV : 1111111111111112222222222222222222222222222221111111111111
-167mV : 1111111111111111122222222222222222222222221111111111111111
-169mV : 1111111111111111111111111211121111111111111111111111111111
-171mV : 11
-173mV : 11
-175mV : 11
-177mV : 11
-179mV : 11
-181mV : 11
-183mV : 11
-185mV : 11
-187mV : 11
-189mV : 11
-191mV : 11
: -|----|----|----|----|----|----|----|----|----|----|----|----|
UI/64 : -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30

To plot the ethernet serdes eye with specific lane number

- 1) `niccli -i 1 serdes --eye -e -l 0 -P`
- 2) `niccli -i 1 serdes --eye --ethernet --lane 0 --plot`

Warning: Link toggling is expected while executing serdes ethernet command.

Plotting serdes ethernet eye. This may take several minutes ...

Each character N represents approximate error rate $1e^{-N}$ at that location

```

UI/64  : -30  -25  -20  -15  -10  -5    0    5    10   15   20   25   30
        : -|----|----|----|----|----|----|----|----|----|----|----|----|
191mV  : 1111111111111111111111111111111111111111111111111111111111111111
189mV  : 1111111111111111111111111111111111111111111111111111111111111111
187mV  : 1111111111111111111111111111111111111111111111111111111111111111
185mV  : 1111111111111111111111111111111111111111111111111111111111111111
183mV  : 1111111111111111111111111111111111111111111111111111111111111111
181mV  : 1111111111111111111111111111111111111111111111111111111111111111
179mV  : 1111111111111111111111111111111111111111111111111111111111111111
177mV  : 1111111111111111111111111111111111111111111111111111111111111111
175mV  : 1111111111111111111111111111111111111111111111111111111111111111
173mV  : 1111111111111111111111111111111111111111111111111111111111111111
171mV  : 111111111111111111111112222222222222222222222221111111111111111111
169mV  : 111111111111111111111122222222222222222222222222222211111111111111
167mV  : 111111111111111111111122222222222222222222222222222211111111111111
165mV  : 111111111111111111111122222222222222222222222222222211111111111111
163mV  : 111111111111111111111122222222222222222222222222222211111111111111
161mV  : 111111111111111111111122222222222222222222222222222211111111111111
159mV  : 111111111111111111111122222222222222222222222222222211111111111111
157mV  : 111111111111111111111122222222222222222222222222222211111111111111
155mV  : 111111111111111111111122222222222222222222222222222211111111111111
153mV  : 111111111111111111111122222222222222222222222222222211111111111111

```

Broadcom NetXtreme - NICCLI Readme

[illegible]

```

95mV : 333344567--+-+---+---+---+---+---+---+---+---+---+---+---765443333
93mV : 33344557   :   :   :   :   :   :   :   :   :   :   :   75544333
91mV : 33344557   :   :   :   :   :   :   :   :   :   :   :   75544333
89mV : 33444567   :   :   :   :   :   :   :   :   :   :   :   76544433
87mV : 33445567   :   :   :   :   :   :   :   :   :   :   :   76554433
85mV : 3444556---+-+---+---+---+---+---+---+---+---+---+---6554443
83mV : 3444566    :   :   :   :   :   :   :   :   :   :   :   6654443
81mV : 4445567    :   :   :   :   :   :   :   :   :   :   :   7655444
79mV : 444566:    :   :   :   :   :   :   :   :   :   :   :   :665444
77mV : 445566:    :   :   :   :   :   :   :   :   :   :   :   :665544
75mV : 44556+-+---+---+---+---+---+---+---+---+---+---+---65544
73mV : 45567 :    :   :   :   :   :   :   :   :   :   :   :   :76554
71mV : 455677:    :   :   :   :   :   :   :   :   :   :   :   :776554
69mV : 45567 :    :   :   :   :   :   :   :   :   :   :   :   :76554
67mV : 5566  :    :   :   :   :   :   :   :   :   :   :   :   :6655
65mV : 556777+-+---+---+---+---+---+---+---+---+---+---+---777655
63mV : 5667   :    :   :   :   :   :   :   :   :   :   :   :   :7665
61mV : 56     :    :   :   :   :   :   :   :   :   :   :   :   :65
59mV : 667    :    :   :   :   :   :   :   :   :   :   :   :   :766
57mV : 66     :    :   :   :   :   :   :   :   :   :   :   :   :66
55mV : 67-----+-+---+---+---+---+---+---+---+---+---+---76
53mV : 6:      :    :   :   :   :   :   :   :   :   :   :   :   :6
51mV : 7:      :    :   :   :   :   :   :   :   :   :   :   :   :7
49mV : 6:      :    :   :   :   :   :   :   :   :   :   :   :   :6
47mV : 7:      :    :   :   :   :   :   :   :   :   :   :   :   :7
45mV : -+-+---+---+---+---+---+---+---+---+---+---+---+-
43mV : :        :    :   :   :   :   :   :   :   :   :   :   :   :
41mV : :        :    :   :   :   :   :   :   :   :   :   :   :   :

```

```

39mV : : : : : : : : : : : : : :
37mV : : : : : : : : : : : : : :
35mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+
33mV : : : : : : : : : : : : : :
31mV : : : : : : : : : : : : : :
29mV : : : : : : : : : : : : : :
27mV : : : : : : : : : : : : : :
25mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+
23mV : : : : : : : : : : : : : :
21mV : : : : : : : : : : : : : :
19mV : : : : : : : : : : : : : :
17mV : : : : : : : : : : : : : :
15mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+
13mV : : : : : : : : : : : : : :
11mV : : : : : : : : : : : : : :
9mV : : : : : : : : : : : : : :
7mV : : : : : : : : : : : : : :
5mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3mV : : : : : : : : : : : : : :
1mV : : : : : : : : : : : : : :
-1mV : : : : : : : : : : : : : :
-3mV : : : : : : : : : : : : : :
-5mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-7mV : : : : : : : : : : : : : :
-9mV : : : : : : : : : : : : : :
-11mV : : : : : : : : : : : : : :
-13mV : : : : : : : : : : : : : :
-15mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

```

-17mV : : : : : : : : : : : : : :
-19mV : : : : : : : : : : : : : :
-21mV : : : : : : : : : : : : : :
-23mV : : : : : : : : : : : : : :
-25mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-27mV : : : : : : : : : : : : : :
-29mV : : : : : : : : : : : : : :
-31mV : : : : : : : : : : : : : :
-33mV : : : : : : : : : : : : : :
-35mV : -+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-37mV : : : : : : : : : : : : : :
-39mV : 7: : : : : : : : : : : : : : :7
-41mV : : : : : : : : : : : : : :
-43mV : : : : : : : : : : : : : :
-45mV : 77-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----77
-47mV : : : : : : : : : : : : : :
-49mV : 66 : : : : : : : : : : : : : 66
-51mV : 67 : : : : : : : : : : : : : 76
-53mV : 677 : : : : : : : : : : : : : 776
-55mV : 66-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----66
-57mV : 566 : : : : : : : : : : : : : 665
-59mV : 5577 : : : : : : : : : : : : : 7755
-61mV : 5567 : : : : : : : : : : : : : 7655
-63mV : 55677 : : : : : : : : : : : : : 77655
-65mV : 55567-+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----76555
-67mV : 4556 : : : : : : : : : : : : : 6554
-69mV : 455566: : : : : : : : : : : : : :665554
-71mV : 445566: : : : : : : : : : : : : :665544

```

-73mV	:	4455667	:	:	:	:	:	:	:	:	:	7665544	
-75mV	:	444566+	---	+	---	+	---	+	---	+	---	+	665444
-77mV	:	444556:	:	:	:	:	:	:	:	:	:	:655444	
-79mV	:	3444566	:	:	:	:	:	:	:	:	:	6654443	
-81mV	:	3444557	:	:	:	:	:	:	:	:	:	7554443	
-83mV	:	33445567	:	:	:	:	:	:	:	:	:	76554433	
-85mV	:	33445567	---	+	---	+	---	+	---	+	---	+	76554433
-87mV	:	33344556	:	:	:	:	:	:	:	:	:	65544333	
-89mV	:	333444567	:	:	:	:	:	:	:	:	:	765444333	
-91mV	:	333344567	:	:	:	:	:	:	:	:	:	765443333	
-93mV	:	3333445567	:	:	:	:	:	:	:	:	:	7655443333	
-95mV	:	3333445567	+	---	+	---	+	---	+	---	+	---	7655443333
-97mV	:	2333344577	:	:	:	:	:	:	:	:	:	7754433332	
-99mV	:	23333445667:	:	:	:	:	:	:	:	:	:	:76654433332	
-101mV	:	22333345667:7	:	:	:	:	:	:	:	:	:	7:76654333322	
-103mV	:	22333344567:7	:	:	:	:	:	:	:	:	:	7:76544333322	
-105mV	:	22233344556+6	---	+	---	+	---	+	---	+	---	+	6+65544333222
-107mV	:	2223334455676	:	:	:	:	:	:	:	:	:	6765544333222	
-109mV	:	2222333445567	:	:	:	:	:	:	:	:	:	7655443332222	
-111mV	:	2222333445567	:	7	:	:	:	:	:	7	:	7655443332222	
-113mV	:	22223334455666	7:7	7	:	:	:	:	:	7	7:7	66655443332222	
-115mV	:	2222233344565677777	--	+	7	---	+	---	+	---	+	7+--7777765654433322222	
-117mV	:	222222334455566	6777	:	:	:	:	:	:	7776	665554433222222		
-119mV	:	2222223344455666676	7:	:	:	:	:	:	7	6766665544433222222			
-121mV	:	222222334445556667676:	:	:	:	:	:	:	676766655544433222222				
-123mV	:	222222233445555566677:	7	:	:	:	:	7	:776665555544332222222				
-125mV	:	12222223344455555666677	-77	+	---	+	---	+	77	-77666655555444332222221			
-127mV	:	11222223334445555566676	7	:	:	:	:	7	67666555554443332222211				

-129mV : 1122222333444455555556676 : 7 : 67665555554444333222211
-131mV : 11122222333444455555566666:77 : 77:666665555544443332222111
-133mV : 111122223334444455555666667 777:777 76666555554444433322221111
-135mV : 1111222223334444454555556666-77+77-666655555454444433322221111
-137mV : 11111222233334444444555556667677767666555544444443333222211111
-139mV : 1111122222333344444445555566666666666555544444443333222211111
-141mV : 11111122223333334444445555556566656555554444443333332222111111
-143mV : 111111222223333334444444555555555555544444443333332222111111
-145mV : 111111122222333333344444445555555554444444333333322221111111
-147mV : 1111111222223333333334444444544544544444443333333322221111111
-149mV : 11111111222222333333333434444444444444443433333332222211111111
-151mV : 1111111122222233333333333344444444444333333333332222211111111
-153mV : 111111111222222233333333334444444443333333333222222111111111
-155mV : 1111111112222222222333333333333333333333222222222111111111
-157mV : 11111111112222222222333333333333333333332222222221111111111
-159mV : 1111111111122222222222222333333333322222222222211111111111
-161mV : 11111111111122222222222222332232233222222222222111111111111
-163mV : 1111111111111222222222222222222222222222222221111111111111
-165mV : 1111111111111122222222222222222222222222222221111111111111
-167mV : 1111111111111111222222222222222222222222111111111111111111
-169mV : 1111111111111111112221222122211111111111111111111111111111
-171mV : 11
-173mV : 11
-175mV : 11
-177mV : 11
-179mV : 11
-181mV : 11
-183mV : 11

- 1) niccli -i 1 serdes --eye --pci --lane 0
- 2) niccli -i 1 serdes --eye -p -l 0

```
Result for PCI Lane 0      : Passed
Horizontal Eye Left       : 24/64 UI
Horizontal Eye Right      : 24/64 UI
Vertical Eye Top          : 391 (425 mV)
Vertical Eye Bottom       : 383 (417 mV)
```

```
Rx Settings:
iskew_signed           : 0
qskew_signed           : 0
irphase_signed         : -1
dlev00_signed          : -41
dlev01_signed          : 462
dlev10_signed          : -43
dlev11_signed          : 432
hlne                   : 18
hlno                   : 24
hlpe                   : -7
hlpo                   : -3
h2                     : -1
h3                     : 0
h4                     : 1
h5                     : 0
h6                     : 0
h7                     : 0
h8                     : 0
h9                     : 0
aeq                    : 240
vga                    : 53
appmd                  : 5
shd                    : 04
```

To plot the PCI serdes eye with specific lane number

- 1) `niccli -i 1 serdes --eye --pci --lane 0 --plot`
- 2) `niccli -i 1 serdes --eye -p -l 0 -P`

Retrieving Eye Scope data from hardware. Please wait several minutes...

100% completed

Plotting serdes pci eye diagram...

Each character N represents approximate error rate 1e-N at that location

```

25      UI/64   :   -30   -25   -20   -15   -10   -5     0     5     10    15    20

      :  -|----|----|----|----|----|----|----|----|----|----|----|----|
459mV :  1111111111111111111111111111111111111111111111111111111111111111
437mV :  1111111111111111111111111111111111111111111111111111111111111111
415mV :  1111111111111111111111111111111111111111111111111111111111111111
393mV :  1111111111111111111111111122211111111111111111111111111111111111
371mV :  1111111111111111111111222233445542221211111111111111111111111111
349mV :  11111111111111111122233446688      85553433332222221111111111111111
327mV :  111111111111112222335577---+---+---+887755342322121111111111111111
305mV :  1111111111112222335577:      :      :      :      8866443322121111111111
284mV :  111111111111222334577  :      :      :      :      :  88564423221211111111
262mV :  11111111112233446688  :      :      :      :      :  77553322221111111111
240mV :  111111122233455  :      :      :      :      :      :  :664433221211111111
218mV :  111111122334577-+-----+-----+-----+-----+-----+-----+8855342322111111
196mV :  111111223446688  :      :      :      :      :      :      :  7744332212111111
174mV :  1111122335577      :      :      :      :      :      :      :  8856342222111111
152mV :  11112223466:      :      :      :      :      :      :      :  66443322121111
130mV :  11122234477:      :      :      :      :      :      :      :  88553322121111
109mV :  11122335588+-----+-----+-----+-----+-----+-----+-----+-----+6644232211
 87mV :  112224466  :      :      :      :      :      :      :      :      :  7755332212
 65mV :  112234577  :      :      :      :      :      :      :      :      :  8866342222
 43mV :  122335588  :      :      :      :      :      :      :      :      :  66442322
 21mV :  1223466    :      :      :      :      :      :      :      :      :  88553322
  0mV :  1223466---+-----+-----+-----+-----+-----+-----+-----+-----+553322
-22mV :  122335588  :      :      :      :      :      :      :      :      :  88553322

```

```

-44mV : 122334577 : : : : : : : : : : 66443322
-65mV : 122224466 : : : : : : : : : : 8856342222
-87mV : 12222335588: : : : : : : : : : 7755332212
-109mV : 11222334577+----+----+----+----+----+----+----+----+6644232211
-131mV : 11222233466: : : : : : : : : 885534222211
-153mV : 1112222335588 : : : : : : : : 774533221211
-175mV : 111122223446688 : : : : : : : : 88564423221111
-197mV : 111122222335577 : : : : : : : : 77453322121111
-218mV : 11111122233446688----+----+----+----+----+----+8856442322111111
-240mV : 11111122222335577 : : : : : : :7745332222111111
-262mV : 1111111122223445688 : : : : : : 885634232212111111
-284mV : 111111112222233446688: : : : : : 88664433221211111111
-306mV : 11111111112222233456788 : : : : : 66453322221111111111
-328mV : 11111111111122222334566---+----+----+---8866453322221111111111
-350mV : 111111111111112222233446688 : 77664533232212111111111111
-372mV : 11111111111111112222233355666432222211111111111111111111
-393mV : 1111111111111111111122222222211111111111111111111111111
-415mV : 1111111111111111111111111111111111111111111111111111111
-437mV : 1111111111111111111111111111111111111111111111111111111
-459mV : 1111111111111111111111111111111111111111111111111111111

: -|----|----|----|----|----|----|----|----|----|----|----|
---|-
UI/64 : -30 -25 -20 -15 -10 -5 0 5 10 15 20 25
30

```

Extrapolating BER at 1e-12...

```
=====
```

Extrapolation BER at 1e-12 is completed

<Test Result>:

Eye height and width margins are > 0.2UI and 15mV, test PASSED.

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<Margins>:

Eye width margin at 1e-12 is 0.688129 UI

Eye height margin at 1e-12 is 677.184692 mV

To plot the PCI serdes eye with specific lane number and target BER

1) `niccli -i 1 serdes --eye --pci --lane 0 --plot --target_ber 1e-8`

2) `niccli -i 1 serdes --eye -p -l 0 -P -t 1e-8`

Retrieving Eye Scope data from hardware. Please wait several minutes...

100% completed

Plotting serdes pci eye diagram...

Each character N represents approximate error rate $1e^{-N}$ at that location

```

UI/64 : -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30
      : -|----|----|----|----|----|----|----|----|----|----|----|----|
459mV : 1111111111111111111111111111111111111111111111111111111111111111
437mV : 1111111111111111111111111111111111111111111111111111111111111111
415mV : 1111111111111111111111111111111111111111111111111111111111111111
393mV : 1111111111111111111111111222111111111111111111111111111111111111
371mV : 1111111111111111111111122223344544222121111111111111111111111111
349mV : 1111111111111111122233445688      85553433332222221111111111111111
327mV : 11111111111112222335577---+---+---+---+---+---+665534232212111111111111
305mV : 111111111112222335577: : : : 88664433221211111111111111111111
284mV : 1111111111222335577 : : : : : 88564423221211111111111111111111
262mV : 1111111122334466 : : : : : 7755332222111111111111111111111111
240mV : 11111112223345688 : : : : : :6644332212111111111111111111111111
218mV : 111111122335577+---+---+---+---+---+---+88563423221111111111111111
196mV : 111111223446688 : : : : : : : 77453322121111111111111111111111
174mV : 1111122335577 : : : : : : : 8856342222111111111111111111111111
152mV : 11112224466: : : : : : : 774433221211111111111111111111111111
130mV : 11122234477: : : : : : : 775533222211111111111111111111111111
109mV : 11122335688+---+---+---+---+---+---+---+---+6644232211111111111111
87mV : 112224466 : : : : : : : : : 775533221211111111111111111111111111
65mV : 112234577 : : : : : : : : : 663422221111111111111111111111111111
43mV : 122335588 : : : : : : : : : 774423221111111111111111111111111111
21mV : 1223466 : : : : : : : : : 885533221111111111111111111111111111
0mV : 1223466---+---+---+---+---+---+---+---+5533221111111111111111111111
-22mV : 1223355 : : : : : : : : : 885533221111111111111111111111111111

```

```

-44mV : 122334577 : : : : : : : : : : 77443322
-65mV : 122234466 : : : : : : : : : : 8866342222
-87mV : 12222335588: : : : : : : : : : 7755332212
-109mV : 11222334577+----+----+----+----+----+----+----+----+----+6644232211
-131mV : 1122223446688 : : : : : : : : : 885534222211
-153mV : 1112222335577 : : : : : : : : : 664433221211
-175mV : 1111222334466 : : : : : : : : : 88564423221111
-197mV : 111122222345588 : : : : : : : : : 77453322121111
-218mV : 111111222334466-+----+----+----+----+----+----+----+8856442322121111
-240mV : 11111122222335577 : : : : : : : : :7745332222111111
-262mV : 1111111222223446688 : : : : : : : 885634232211111111
-284mV : 111111112222233446688: : : : : : : 664433221211111111
-306mV : 111111111122222334566: : : : : : : 66443322221111111111
-328mV : 11111111111122222334566---+----+----+----+--886645332222111111111111
-350mV : 111111111111112222233446688 : 7766443323221211111111111111
-372mV : 111111111111111122222334556663322212111111111111111111111111
-393mV : 111111111111111111112222222221111111111111111111111111111111
-415mV : 111111111111111111111111111111111111111111111111111111111111
-437mV : 111111111111111111111111111111111111111111111111111111111111
-459mV : 111111111111111111111111111111111111111111111111111111111111
      : -|----|----|----|----|----|----|----|----|----|----|----|----|
UI/64 : -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30

```

Extrapolating BER at 1e-12...

=====

Extrapolation BER at 1e-12 is completed

<Test Result>:

Eye height and width margins are > 0.2UI and 15mV, test PASSED.

<Margins>:

Eye width margin at 1e-12 is 0.687464 UI

Eye height margin at 1e-12 is 670.539307 mV

To stop the PCI serdes eye test

- 1) niccli -i 1 serdes --eye --pci --stop
- 2) niccli -i 1 serdes --eye -p -s

Stopping serdes pci eye scope test...

cable command

=====

DESCRIPTION :

Query/Decode Module EEPROM information and optical diagnostics.

This command is supported on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.

SYNTAX :

```
cable -m|--module_info --show
cable -r|--read_module_eeprom [-p|--page_number <page number> -o|--offset <byte offset>
    -l|--length <number of bytes> -b|--bank <bank number> -i|--i2c_address <i2c addr>]
cable -w|--write_module_eeprom -p|--page_number <page number> -o|--offset <byte offset>
    -v|--value <bytes>
cable -M|--module_loopback -t|--loopback_type <type> [--lane <module_lane_number>]
cable -P | --power <0/1>
cable -T | --tx_disable <0/1>
```

OPTIONS:

```
-m|--module_info          : Get the module information

-r|--read_module_eeprom  : Read the module EEPROM in hex format

-w|--write_module_eeprom : Write the bytes into the module EEPROM

-i|--i2c_address          : I2C address of a page. Value less than 0x7f expected
                           Most of the EEPROMs use 0x50 or 0x51

-p|--page_number          : The page number that is being accessed over I2C
-l|--length               : Length of EEPROM data to read or write
```

- o|--offset : Offset within the page that is being accessed over I2C
- b|--bank : The bank number of the page that is being accessed over I2C
- v|--value : Bytes to write into module EEPROM
- M|--module_loopback : This option is used to perform the various module loopbacks. This operation is supported only on CMIS 4.0 and above supported modules.
- t|--loopback_type : This option is used to run the module loopback on the specified loopback type.
The supported module loopback types are as below:
1 - Media Side Output Loopback
2 - Media Side Input Loopback
3 - Host Side Output Loopback
4 - Host Side Input Loopback
- lane : This is an optional parameter. If the user specifies this option with a valid lane mask, then the module loopback will be run on the specified lanes.
- show : Displays the information in detail.
- P|--power : This option is used to control the physical power to the transceiver module. The valid values are 0 (power off) and 1 (power on)
- T|--tx_disable : This option is used to enable or disable the module transmitter. The valid values are 0 (disable) and 1 (enable)

EXAMPLES:

To show the module information

- 1) `niccli -i 1 cable -m --show`
- 2) `niccli -i 1 cable --module_info --show`

```

Identifier                : 0x11   (QSFP28)
Extended identifier       : 0x00
Extended identifier description : 1.5W max. Power
                                consumption
Extended identifier description : No CDR in TX, No
                                CDR in RX

```

```

Extended identifier description      : High Power Class
                                     (> 3.5 W) not enabled
Power set                           : Off
Power override                       : Off
Connector                           : 0x23 (No separable
                                     connector)
Transceiver codes                    : 0x88 0x00 0x00 0x00
                                     0x00 0x00 0x00 0x00
Transceiver type                     : 40G Ethernet: 40G
                                     Base-CR4
Transceiver type                     : 50GBASE-CR,
                                     100GBASE-CR2, or
                                     200GBASE-CR4
Encoding                            : 0x08 (PAM4)
BR, Nominal                          : 25500Mbps
Rate Identifier                      : 0x00
Length (SMF, km)                     : 0km
Length (OM3 50um)                   : 0m
Length (OM2 50um)                   : 0m
Length (OM1 62.5um)                 : 0m
Length (Copper or Active cable)      : 3m
Transmitter technology               : 0xf0 (Copper cable,
                                     linear active
                                     equalizers)
Attenuation at 2.5GHz                : 5db
Attenuation at 5.0GHz                : 7db
Attenuation at 7.0GHz                : 9db
Attenuation at 12.9GHz               : 14db
Vendor name                          : FS
Vendor OUI                           : 64:9d:99
Vendor PN                           : QSFP-200G-AC03
Vendor rev                           : A
Vendor SN                           : C2501289981-1
Date code                           : 250208
Revision Compliance                  : Unallocated
Module temperature                   : 0.00 degrees C /
                                     32.00 degrees F
Module voltage                       : 0.0000 V

```

To Read the module eeprom

- 1) `niccli -i 1 cable -r -p 0 -o 0 -l 128 -b 0 -i 0x50`
- 2) `niccli -i 1 cable --read_module_eeprom --page_number 0 --offset 0 --length 128 --bank 0 --i2c_address 0x50`

Offset	Values
-----	-----
0x0000:	11 08 06 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0010:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0020:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0030:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0040:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0050:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x0060:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 08 00
0x0070:	00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00

To Write to module eeprom

- 1) `niccli -i 1 cable -w -p 0 -o 0 -v 20`
- 2) `niccli -i 1 cable --write_module_eeprom --page_number 0 --offset 0 --value 20`

Module eeprom write succeeded.

To run the 'Media Side Output Loopback'

- 1) `niccli -i 1 cable -M -t 1 -l 0`
- 2) `niccli -i 1 cable --module_loopback --loopback_type 1 --lane 1`

"Media Side OutPut" loopback enabled successfully.

To run the 'Media Side Input Loopback'

- 1) `niccli -i 1 cable -M -t 2 -l 0`
- 2) `niccli -i 1 cable --module_loopback --loopback_type 2 --lane 1`

"Media Side InPut" loopback enabled successfully.

To run the 'Host Side Output Loopback'

- 1) `niccli -i 1 cable -M -t 3 -l 0`
- 2) `niccli -i 1 cable --module_loopback --loopback_type 3 --lane 1`

"Host Side OutPut" loopback enabled successfully.

To run the 'Host Side Input Loopback'

- 1) `niccli -i 1 cable -M -t 4 -l 0`
- 2) `niccli -i 1 cable --module_loopback --loopback_type 4 --lane 0`

"Host Side InPut" loopback enabled successfully.

To power up the module

- 1) `nicclid -i 1 cable -P 1`
- 2) `nicclid -i 1 cable --power 1`

Module powered up successfully.

To power down the module

- 1) nicclid -i 1 cable -P 0
- 2) nicclid -i 1 cable --power 0

Module powered down successfully.

To enable the module transmitter

- 1) nicclid -i 1 cable -T 1
- 2) nicclid -i 1 cable --tx_disable 1

Module transmitter enabled successfully.

To disable the module transmitter

- 1) nicclid -i 1 cable --tx_disable 0
- 2) nicclid -i 1 cable -T 0

Module transmitter disabled successfully.

link command

=====

DESCRIPTION :

This command is used to query the link status, BER information, physical counters and configure the port state.

This command is supported on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.

Note:

- 1) As a prerequisite, user has to run the "linkdiag --fdrstat --start" command to query the link BER and physical counters on BCM576xxx devices.
- 2) All the counters are accumulated since board reset.
- 3) RS corrected errors, RS uncorrectable errors, and CRC Error Frames can be cleared by using the command "link --counters --clear".
- 4) Effective Physical Errors and Raw Physical Errors can be restarted by cleared by using command "linkdiag --fdrstat --stop" on BCM576xxx devices.
- 5) RS corrected errors refers to corrected errors from FEC.
- 6) RS uncorrectable errors refers to uncorrectable errors from FEC.
- 7) CRC Error Frames refers to error frames from CRC.
- 8) Effective Physical Errors refers to uncorrectable codewords from FDR on BCM576xxx

devices.

- 9) Effective Physical BER refers to BER based on Effective Physical Errors on BCM576xxx devices.
- 10) Raw Physical Errors refers to symbol errors from FDR on BCM576xxx devices.
- 11) Raw Physical BER refers to BER based on Raw Physical Errors on BCM576xxx devices.
- 12) Precoding enable/disable operation will toggle the link. At this time firmware does not service other commands that operate on the PHY. System logs may indicate command timeouts.
- 13) When port is connected to BMC, firmware doesn't honour the link toggle via port_state option.
- 14) BER information and physical counters are only supported on BCM576xxx devices.

SYNTAX :

```
link -s|--status
link -c|--counters --show
link -p|--port_state <port state value>
link -r|--fec_force <0/1>
link -S|--port_speed [--speed <value>] [--lanes <number_of_lanes>] -a|--autoneg <on/off>
    [--fec <value>] [-t|--training <on/off>]
link -P|--precoding <enable/disable>
link -e|--pm_event_log
```

OPTIONS :

- s|--status : Shows the link status and related information
- c|--counters : Show physical counters and BER Info
- p|--port_state : Configures the portstate. The valid values are 0(Down), 1(UP) and 2(Toggle)
- p|--port_state : Configures the portstate. The valid values are 0(Down), 1(UP) and 2(Toggle)
- S|--port_speed: Configures the port speed for the number of lanes, Link training, Autoneg and FEC.
- speed : Option to provide the speed value in MB.
- lanes : Option to provide the number of lanes. The valid values are 1,2,4 and 8
- a|--autoneg : Option to on/off the autoneg speed. The valid values are "on", "off"
- t|--training : Option to on/off the link training. The valid values are "on", "off"

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- `--fec` : This option is to configure the provided FEC type. The valid values are:
- 1 - Autoneg
 - 2 - CL74 Fire Code
 - 3 - CL91 Reed Solomon
 - 4 - RS544 1xN
 - 5 - RS544 2xN
 - 6 - RS272 1xN
 - 7 - RS272 2xN
- `-p|--precoding` : This option is used to forward transformation of data that helps mitigate channel-induced signal distortion. The valid values are "enable" and "disable"
- `-r|--fec_force` : This option is used to enable or disable FEC on the port.
The valid values are 0 (disable) and 1 (enable)
- `-e|--pm_event_log` : This option is used to display the port module event logs.

EXAMPLES :

To get the link information

- 1) `niccli -i 1 link -s`
- 2) `niccli -i 1 link --status`

```
Physical link state           : Link Down
Supported link modes         : 25Gb 50Gb 100Gb 50Gb-PAM4-56
                              100Gb-PAM4-56 200Gb-PAM4-56
                              100Gb-PAM4-112 200Gb-PAM4-112
                              400Gb-PAM4-112
Current link speed           : Unknown
Duplex State                 : Half duplex
Auto Negotiation             : on
Active FEC Signal Mode       : NRZ Signaling
Loopback                    : None
Active Lanes                 : 0 (Link Down)
FEC Supported                : Yes
Module Status                : Transceiver module not inserted
Preemphasis                 : 0
PHY Type                    : Unknown
Media Type                  : Unknown
Precoding                   : Disabled
Current MAD mode             : AN and AD
Current MAD state           : Auto Negotiation
```

```

Transceiver                : Internal
Rx Lane Polarity           : 1:0:0:1:1:0:0:1
Tx Lane Polarity           : 0:0:0:1:0:1:0:1
Rx Lane Map to connector   : 3:2:0:1:4:5:7:6
Tx Lane Map to connector   : 3:1:0:2:7:6:5:4

```

To get the physical counters and BER information

- 1) `niccli -i 1 link -c --show`
- 2) `niccli -i 1 link --counters --show`

```

Effective Physical Errors   : 0
Effective Physical BER      : 15E-255
Raw Physical Errors        : 0
Raw Physical BER (Accumulated) : 0
RS corrected errors        : 0
RS uncorrectable errors    : 0
CRC Error Frames           : 0

```

To configure the port state to down

- 1) `niccli -i 1 link -p 0`
- 2) `niccli -i 1 link --port_state 0`

```

Configuring port state (Down) ....
Port state configured successfully.

```

To configure the port state to up

- 1) `niccli -i 1 link -p 1`
- 2) `niccli -i 1 link --port_state 1`

```

Configuring port state (Up) ....
Port state configured successfully.

```

To toggle the port state

- 1) `niccli -i 1 link -p 2`
- 2) `niccli -i 1 link --port_state 2`

```

Toggling port state ....
Port state configured successfully.

```

To set the port link speed to autoneg

- 1) `niccli -i 1 link --port_speed --autoneg on`

```

Port speed configured successfully.

```

To set the port link speed to 100G on 4 lanes and associated params

1) `niccli -i 1 link --port_speed --autoneg off --speed 100000 --lanes 4 --fec 3 --training on`

Port speed configured successfully.

To enable the precoding

1) `niccli -i 1 link --precoding enable`

Note: Precoding enable/disable operation will toggle the link. At this time firmware does not service other commands that operate on the PHY. System logs may indicate command timeouts.

Precoding enabled successfully.

To get the port module event logs

1) `niccli -i 1 link -e`

2) `niccli -i 1 link --pm_event_log`

idx	timestamp	port_id	extraInfo	pm_event_string
0	0	0	00000000	
1	0	0	00000000	
2	0	0	00000000	
3	0	0	00000000	
4	0	0	00000000	
5	0	0	00000000	
6	0	0	00000000	
7	0	0	00000000	
8	0	0	00000000	
9	0	0	00000000	
10	0	0	00000000	
11	0	0	00000000	
12	0	0	00000000	
13	0	0	00000000	
14	0	0	00000000	
15	0	0	00000000	
16	0	0	00000000	
17	0	0	00000000	
18	0	0	00000000	
19	0	0	00000000	
20	0	0	00000000	

```

21 |          0 |          0 | 00000000 |
22 |          0 |          0 | 00000000 |
23 |          0 |          0 | 00000000 |
24 |          0 |          0 | 00000000 |
25 |          0 |          0 | 00000000 |
26 |          0 |          0 | 00000000 |
27 |          0 |          0 | 00000000 |
28 |          0 |          0 | 00000000 |
29 |          0 |          0 | 00000000 |
30 |          0 |          0 | 00000000 |
31 |          0 |          0 | 00000000 |

```

To disable FEC

- 1) `niccli -i 1 link -r 0`
- 2) `niccli -i 1 link --fec_force 0`

FEC disabled successfully.

To enable FEC

- 1) `niccli -i 1 link -r 1`
- 2) `niccli -i 1 link --fec_force 1`

FEC enabled successfully.

timesync command

=====

DESCRIPTION :**Timesync operations**

Timesync command provides the user to:

- To set duty cycle on TSIO outgoing signal.
- To set the DLL source for PHC.
- Set PTP extended parameters operation. All the parameters are optional.
- Configure and display the synchronous ethernet frequency profile, primary and secondary clock state.
- TSIO operations for the requested PF/VF

This command is supported on Linux, Windows, FreeBSD and VMWare operating systems

SYNTAX :

`timesync < -d | --duty cycle> <--period> <value> --up <value>`

`timesync <--dll> <-s | --source> <value> <-q | --frequency> <value>`

```
timesync <--ptp> --show
timesync <--ptp> --set <-p | --primary_pf> <pid> [<-v | --primary_vf> <vfid>]
[<-P | --secondary_pf> <pfid>] [<-V | --secondary_vf> <vfid>]
```

```
timesync <--synce> --show
timesync <--synce> --set <-Q | --frequency_profile> <value> [<-c | --primary_clock_state>
<value>] [<-C | --secondary_clock_state> <value>]
```

```
timesync <--tsio> --show
timesync <--tsio> <-t | --tsio_function_pin> <idx> <-u | --pin_usage_string> <value>
<--state> <value>
```

OPTIONS :

-d|--dutycycle : To set duty cycle on TSIO outgoing signal.

--period : value for period will be treated as in nanoseconds.

--up : Up flag is used to set the duty cycle and should be less than the period value.

--dll : To set the DLL source for PHC.

-s | --source : The valid values range from 0 to 4.

-q | --frequency : The valid values range from 0 to 3.

-p | --ptp : PTP extended parameters operation.

--show : Displays timesync operation.

--set : Configures timesync operation.

-p | --primary_pf : Primary physical function ID.

-v | --primary_vf : Primary virtual function ID belongs to primary PF ID.

-P | --secondary_pf : Secondary physical function ID.

-V | --secondary_vf : secondary virtual function ID belongs to secondary PF ID.

--synce : Configure and display the synchronous ethernet frequency profile. primary and secondary clock state. This command is supported only on BCM9575xxx devices.

- Q | --frequency_profile : Frequency profile for SyncE recovered clock. Supported profiles are "25MHz"
- c | --primary_clock_state : Enable or disable primary clock for PF or port, overriding previous primary clock setting.
- C | --secondary_clock_state : Enable or disable secondary clock for PF or port, overriding previous secondary clock setting.
- tsio : Displays or Configures tsio function capability on the pin
- t | --tsio_function_pin : Pin Index. Valid Index 0 to 3
- u | --pin_usage_string : Pin usage string.
- state : Enable/Disable function capability on the pin

EXAMPLES :

Setting duty cycle on TSIO outgoing signal

- 1) niccli -i 1 timesync -d --period 1 --up 0
- 2) niccli -i 1 timesync --dutycycle --period 1 --up 0

Command Executed Successfully

To configure the DLL source for PHC

- 1) niccli -i 1 timesync --dll -s 1 -q 3
- 2) niccli -i 1 timesync --dll --source 1 --frequency 3

Command Executed Successfully

To perform PTP extended parameters operation

- 1) niccli -i 1 timesync --synce --show

```
Frequency Profile      : 25MHz
Primary clock state    : Enabled
Secondary clock state  : Enabled
```

- 2) niccli -i 1 timesync --synce --set -Q 25MHz
- 3) niccli -i 1 timesync --synce --set --frequency_profile 25MHz

Command Executed Successfully

To perform TSIO function capability on the pin

1) `niccli -i 1 timesync --tsio --show`

TSIO			
PIN	STATE	USAGE	
0	Disable	NONE	
1	Disable	NONE	
2	Disable	NONE	
3	Disable	NONE	

2) `niccli -i 1 timesync --tsio -t 3 -u 1 --state 1`

3) `niccli -i 1 timesync --tsio --tsio_function_pin 3 --pin_usage_string 1 --state 1`

TSIO pin configured successfully.

TSIO

PIN	STATE	USAGE	
Switch loopIndex = 0			
0	Disable	NONE	
Switch loopIndex = 1			
1	Disable	NONE	
Switch loopIndex = 2			
2	Disable	NONE	
Switch loopIndex = 3			
3	Disable	NONE	

To perform PTP extended parameters operation.

1) `niccli -i 1 timesync --ptp --show`

PTP Extended Parameters Information:

```

PHC master function           : Not Available
PHC secondary function        : Not Available
Last non primary/secondary function : Not Available
Second Last non primary/secondary function : Not Available
Failover Timestamp            : Not Available
Failed over from master function : Not Available
Failed over to secondary function : Not Available

```

- 2) `niccli -i 1 timesync --ptp --set -p 1 -v 1`
- 3) `niccli -i 1 timesync --ptp --set --primary_pf 1 --secondary_pf 1`

PTP Extended parameters set succeed

Counters command

=====

DESCRIPTION :

This command is used to display the L2/RoCE, Port, PCIe counters and clear the port counters. This command is supported only on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.

SYNTAX :

```
counters -p | --pcie
counters -c | --clear
counters -P | --port [--dir <rx/tx>]
counters -r | --roce
counters --l2
```

OPTIONS :

```
-p | --pcie      : Display Pcie Counters.
-c | --clear     : Clear the port counters
-V              : Display the detailed information of the PCIe Counters.
-P | --port      : This option is used to get the port statistics. By default Tx statistics will be
                  collected.
-r | --roce      : This option is used to get the RoCE statistics.
--dir            : This is an optional parameter. This option is used to collect the port stats for
                  Rx/Tx direction.
--l2            : This option is used to get the L2 statistics.
```

EXAMPLES :

To display the PCIe port counters

- 1) `niccli -i 1 counters -p`
- 2) `niccli -i 1 counters --pcie`

Thor2 (BCM9576xxxx):

```
-----
PCie Counters :
-----
```

Physical Layer Receiver Errors

: 0

```

DLLP CRC Errors : 0
TLP LCRC Sequence Number Errors : 0
No of times LTSSM Entered Recovery State : 5
No of TLP Bytes Transmitted : 0
No of TLP Bytes Received : 0
No of DLLP Bytes Transmitted :
185900667560
No of DLLP Bytes Received :
254654814856
Equalization Time :
3098482337543421952
LTSSM Histogram (Low 8 Bytes) :
0X120217227202122
LTSSM Histogram (High 8 Bytes) :
0X2021220124252627
Recovery Histogram :
0XFFFFFFF580000000FF
No of posted packets sent to the PCI-e : 1817066
No of non-posted packets sent to the PCI-e : 819
No of other packets sent to the PCI-e : 34
No of blocked packets sent to the PCI-e : 0
No of completion packets sent to the PCI-e : 629905
Longest read completion time (in micro secs) : 1
Shortest read completion time (in micro secs) : 0
Latest read completion time (Low 8 Bytes in micro secs) :
4294967297
Latest read completion time (High 8 Bytes in micro secs) :
4294967297
Longest read completion header for tag0(Low 8 Bytes) :
0X000000009C705003
Longest read completion header for tag0(High 8 Bytes) :
0X0000000000200601
Longest read completion header for tag1(Low 8 Bytes) :
0X000000009C705003
Longest read completion header for tag1(High 8 Bytes) :
0X0000000000200601
Longest read completion header for tag2(Low 8 Bytes) :
0X000000009C705003
Longest read completion header for tag2(High 8 Bytes) : 2098689
Longest read completion header for tag3(Low 8 Bytes) :
0X000000009C705003
Longest read completion header for tag3(High 8 Bytes) :
0X0000000000200601
Shortest read completion header for tag0(Low 8 Bytes) :
0X000000009AD79003

```

```

Shortest read completion header for tag0(High 8 Bytes)      :
0X0000000000A00601
Shortest read completion header for tag1(Low 8 Bytes)       :
0X000000009AD79003
Shortest read completion header for tag1(High 8 Bytes)      :
0X0000000000A00601
Shortest read completion header for tag2(Low 8 Bytes)       :
0X000000009AD79003
Shortest read completion header for tag2(High 8 Bytes)      :
0X0000000000A00601
Shortest read completion header for tag3(Low 8 Bytes)       :
0X000000009AD79003
Shortest read completion header for tag3(High 8 Bytes)      :
0X0000000000A00601
Latest read completion header for tag0(Low 8 Bytes)         :
0X0000000019E60000
Latest read completion header for tag0(High 8 Bytes)        :
0X0000000000200601
Latest read completion header for tag1(Low 8 Bytes)         :
0X000000008C813001
Latest read completion header for tag1(High 8 Bytes)        :
0X0000000000200600
Latest read completion header for tag2(Low 8 Bytes)         :
0X00000000D4AB1002
Latest read completion header for tag2(High 8 Bytes)        :
0X0000000000200600
Latest read completion header for tag3(Low 8 Bytes)         :
0X000000009C705003
Latest read completion header for tag3(High 8 Bytes)        :
0X0000000000200601
TL credit npb histogram counter for bucket0                 : 0
TL credit npb histogram counter for bucket1                 : 0
TL credit npb histogram counter for bucket2                 : 0
TL credit npb histogram counter for bucket3                 : 0
TL credit npb histogram counter for bucket4                 : 0
TL credit npb histogram counter for bucket5                 : 0
TL credit npb histogram counter for bucket6                 : 0
TL credit npb histogram counter for bucket7                 :
4233784482
TL credit pb histogram counter for bucket0                   : 0
TL credit pb histogram counter for bucket1                   : 0
TL credit pb histogram counter for bucket2                   : 0
TL credit pb histogram counter for bucket3                   : 0
TL credit pb histogram counter for bucket4                   : 0
TL credit pb histogram counter for bucket5                   : 0

```

```

TL credit ph histogram counter for bucket6          : 0
TL credit ph histogram counter for bucket7          :
4233784482
TL credit pd histogram counter for bucket0          : 0
TL credit pd histogram counter for bucket1          : 0
TL credit pd histogram counter for bucket2          : 0
TL credit pd histogram counter for bucket3          : 0
TL credit pd histogram counter for bucket4          : 0
TL credit pd histogram counter for bucket5          : 0
TL credit pd histogram counter for bucket6          : 0
TL credit pd histogram counter for bucket7          :
4233784482
Write latency histogram data counter for bucket0     : 0
Write latency histogram data counter for bucket1     : 0
Write latency histogram data counter for bucket2     : 0
Write latency histogram data counter for bucket3     : 0
Write latency histogram data counter for bucket4     : 0
Write latency histogram data counter for bucket5     : 0
Write latency histogram data counter for bucket6     : 0
Write latency histogram data counter for bucket7     : 0
Write latency histogram minimum data value           : 65535
Write latency histogram maximum data value           : 0
Write latency histogram event counter value          : 0
Write latency histogram accumulator value            : 0
Write latency all normal count value                 : 1817066
Read latency histogram data counter for bucket0      : 0
Read latency histogram data counter for bucket1      : 0
Read latency histogram data counter for bucket2      : 0
Read latency histogram data counter for bucket3      : 0
Read latency histogram data counter for bucket4      : 0
Read latency histogram data counter for bucket5      : 0
Read latency histogram data counter for bucket6      : 0
Read latency histogram data counter for bucket7      : 0
Read latency histogram minimum data value            : 65535
Read latency histogram maximum data value            : 0
Read latency histogram event counter value           : 0
Read latency histogram accumulator value             : 0
Read latency all normal count value                  : 819

```

Thor (BCM9575xxx) and Whitney+ (BCM9574xxx):

```
-----
PCIe Counters :
-----
```

```
Physical Layer Receiver Errors      : 0
DLLP CRC Errors                     : 0
TLP LCRC Sequence Number Errors    : 0
No of times LTSSM Entered Recovery State : 4
No of TLP Bytes Transmitted         : 0
No of TLP Bytes Received            : 0
No of DLLP Bytes Transmitted        : 1680
No of DLLP Bytes Received           : 1200
Equalization Time                   : 282043720575156240
LTSSM Histogram (Low 8 Bytes)       : 0X120212327202122
LTSSM Histogram (High 8 Bytes)     : 0X2021220124252627
Recovery Histogram                  : 0XFFFFFF58000000FF
```

To clear the port counters

- 1) `niccli -i 1 counters -c`
- 2) `niccli -i 1 counters --clear`

```
Clearing port counters...
Port counters cleared successfully.
```

To display the port counters

- 1) `niccli -i 1 counters --port --dir rx`

```
Link down events      : 0
Resume pause events   : 0
Continuous pause events : 0
Continuous roce pause events : 0
Resume roce pause events : 0
Rx Bytes cos0         : 0
Rx Bytes cos1         : 0
Rx Bytes cos2         : 0
Rx Bytes cos3         : 0
Rx Bytes cos4         : 0
Rx Bytes cos5         : 0
Rx Bytes cos6         : 0
Rx Bytes cos7         : 0
Rx packets cos0       : 0
```

```

Rx packets cos1                : 0
Rx packets cos2                : 0
Rx packets cos3                : 0
Rx packets cos4                : 0
Rx packets cos5                : 0
Rx packets cos6                : 0
Rx packets cos7                : 0
Rx pfc pri0 duration           : 0
Rx pfc pri0 transitions        : 0
Rx pfc pri1 duration           : 0
Rx pfc pri1 transitions        : 0
Rx pfc pri2 duration           : 0
Rx pfc pri2 transitions        : 0
Rx pfc pri3 duration           : 0
Rx pfc pri3 transitions        : 0
Rx pfc pri4 duration           : 0
Rx pfc pri4 transitions        : 0
Rx pfc pri5 duration           : 0
Rx pfc pri5 transitions        : 0
Rx pfc pri6 duration           : 0
Rx pfc pri6 transitions        : 0
Rx pfc pri7 duration           : 0
Rx pfc pri7 transitions        : 0
Total number of received bits  : 0
Rx buffer passed threshold     : 0
Uncorrected symbol errors post-FEC : 0
Corrected bit active FEC       : 0
Rx discards byte cos0         : 0
Rx discards byte cos1         : 0
Rx discards byte cos2         : 0
Rx discards byte cos3         : 0
Rx discards byte cos4         : 0
Rx discards byte cos5         : 0
Rx discards byte cos6         : 0
Rx discards byte cos7         : 0
Rx discards packets cos0      : 0
Rx discards packets cos1      : 0
Rx discards packets cos2      : 0
Rx discards packets cos3      : 0
Rx discards packets cos4      : 0
Rx discards packets cos5      : 0
Rx discards packets cos6      : 0
Rx discards packets cos7      : 0
FEC corrected blocks          : 0
FEC uncorrectable blocks      : 0

```

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```

Rx filter miss : 0
FEC symbol errors : 0
Rx shared pool memory (KiB) : 3477.50
Rx total memory available (KiB) : 4096.00
Cell size (bytes) : 128
Rx PFC Enabled COS0 : 1
Rx RoCE Optimized COS0 : 1
Rx Reserved memory COS0 (KiB) : 36.62
Rx Reserved memory COS4 (KiB) : 18.38
Rx Reserved memory COS5 (KiB) : 36.62
Rx Shared memory COS0 (KiB) : 248.12
Rx Shared memory COS4 (KiB) : 244.25
Rx Shared memory COS5 (KiB) : 488.38
Rx Shared Combined memory COS0 (KiB) : 3609.62
Rx Shared Combined memory COS4 (KiB) : 3495.88
Rx Shared Combined memory COS5 (KiB) : 3514.12
Rx Headroom memory COS0 (KiB) : 95.50
Rx Headroom memory COS4 (KiB) : 0.00
Rx Headroom memory COS5 (KiB) : 0.00
Rx Headroom Combined memory COS0 (KiB) : 95.50
Rx Headroom Combined memory COS4 (KiB) : 0.00
Rx Headroom Combined memory COS5 (KiB) : 0.00
Rx In-Use Memory COS0 (KiB) : 8.00
Rx In-Use Memory COS4 (KiB) : 8.00
Rx In-Use Memory COS5 (KiB) : 8.00

```

To display the RoCE counters

1) niccli -i 1 counters --roce

```

Timeouts in retransmission : 0
Sequence errors naks rcvd : 0
Max retry exceeded : 0
Number of rnr naks rcvd : 0
Missing response packets : 0
Unrecoverable error : 0
Bad response error : 0
local qp operational error : 0
local protection error : 0
Memory mgmt operational error : 0
Remote invalid request error : 0
Remote access error : 0
Remote operational error : 0
duplicate request : 0
Resource exceed max : 0
Resource length mismatch : 0

```

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```

Resource exceeds wqe : 0
Resource opcode error : 0
Resource rx invalid rkey : 0
Resource rx domain error : 0
Resource rx no permission : 0
Resource rx range error : 0
Resource tx invalid rkey : 0
Resource tx domain error : 0
Resource tx no permission : 0
Resource tx range error : 0
Resource irq overflow : 0
Resource unsupported opcode : 0
Resource unaligned atomic : 0
Resource remote invalidate error : 0
Resource memory error : 0
Resource srq error : 0
Resource completion error : 0
Resource invalid duplicate rkey : 0
Resource wqe format error : 0
Resource cq load error : 0
Resource srq load error : 0
Resource tx pci error : 0
Resource rx pci error : 0
Resource oos drop count : 0
Active qp count p0 : 0
Active qp count p1 : 0
Active qp count p2 : 0
Active qp count p3 : 0
Xp sq overflow error : 0
Xp rq overflow error : 0
Tx atomic request packets : 0
Tx read request packets : 0
Tx read response packets : 0
Tx write request packets : 0
Tx send request packets : 0
Tx RoCE packets : 0
Tx RoCE header and payload bytes : 0
Rx atomic request packets : 0
Rx read request packets : 0
Rx read response packets : 0
Rx write request packets : 0
Rx send request packets : 0
Rx RoCE packets : 0
Rx RoCE bytes : 0
Rx RoCE good packets : 0

```

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```

Rx RoCE good bytes           : 0
Rx drops lack of buffers     : 0
Rx out of sequence packets   : 0
Tx cnp packets               : 0
Rx cnp packets               : 0
Rx ecn marked packets        : 0
Tx cnp bytes                 : 0
Rx cnp bytes                 : 0
HW sequence error naks rcvd  : 0
Rx dcn payload cut packets   : 0
Tx packets bypassed transmit engine : 0
HW rnr naks received         : 0
HW missing response packets   : 0
HW retransmission timeouts    : 0
HW duplicate read/atomic requests : 0
Tx dcn cnp packets           : 0
Rx dcn cnp packets           : 0
Rx payload cut packets       : 0
Rx payload cut packets ignored : 0
Rx dcn cnp packets ignored    : 0
Tx unicast packets           : 0
Tx broadcast packets          : 0
Tx discard packets           : 0
Tx dropped packets           : 0
Tx bytes for unicast          : 0
Rx unicast packets           : 0
Rx discard packets           : 0
Rx dropped packets           : 0
Rx bytes for unicast          : 0
Clear sequence                : 0

```

To display the L2 counters

1) niccli -i 1 counters --l2

```

Tx unicast packets           : 0
Tx broadcast packets          : 0
Tx discard packets           : 0
Tx dropped packets           : 0
Tx bytes for unicast          : 0
Rx unicast packets           : 0
Rx discard packets           : 0
Rx dropped packets           : 0
Rx bytes for unicast          : 0
Clear sequence                : 0
Rx multicast packets          : 0

```

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```

Rx broadcast packets           : 0
Rx packets with errors         : 0
Rx bytes for multicast         : 0
Rx bytes for broadcast         : 0
Rx TPA eligible packets       : 0
Rx TPA eligible bytes         : 0
Rx TPA packets                 : 0
Rx TPA bytes                   : 0
Rx TPA errors                  : 0
Rx TPA events                  : 0
Tx multicast packets           : 0
Tx packets with errors         : 0
Tx bytes for multicast         : 0
Tx bytes for broadcast         : 0

```

vf configuration commands

=====

DESCRIPTION :

Performs VF operations

- 1) Trusted VF operations are supported only in the Linux, Darwin and FreeBSD operating systems.
- 2) Reserve roce resources option is supported only in the Linux operating system.
- 3) add_ntuple_filter, free_ntuple_filter, peer_mem_map options are supported only in the Linux operating systems.

SYNTAX :

```

vf <-t|--trust> --set <-v|--vf_index> <idx> <--state> <enable/disable>
vf <-t|--trust> --show <-v|--vf_index> <idx>
vf <-a|--add_ntuple_filter> <-m|--macaddress> <value> <-p|--dest_port> <value>
  <-P|--dst_port_mask> <value> <-v|--vf_index> <idx> <-T|--ip_type> <value>
vf <-d|--free_ntuple_filter> <-l|--filter_id> <value>
vf <-M|--peer_mem_map> <--hpa> <list of values> <--gpa> <list of values>
  <--size> <list of values>
vf <-R|--reserve_roce_resources> <-v|--vf_index> <idx> [--qp <value>] [--cq <value>] [--srq
  <value>] [--mrw <value>] [--av <value>]
vf <-R|--reserve_roce_resources> <-v|--vf_index> <idx> --show

```

OPTIONS :

```

-t|--trust           : Perform the trusted VF operations.

-v|--vf_index        : Provide the VF index.

--state              : Option to enable or disable the trusted VF.

```

- a|--add_ntuple_filter : Option to add the ntuple flow filter.
- d|--free_ntuple_filter : Option to free the ntuple flow filter.
- m|--macaddress : MAC address in format xx:xx:xx:xx:xx:xx.
- p|--dest_port : Option to provide the destination port.
- P|--dst_port_mask : Option to provide the destination port mask.
- T|--ip_type : Option to provide the IP type. The valid values are:
1 - IPV4, 2 - IPV6, 3 - ARP-REPLY
- M|--peer_mem_map : Option to configure the GPU host and guest physical address mapping.
- hpa : This option is used to specify the list of host physical addresses. Max 8 entries are supported. The user has to provide the list with a comma separated for each host physical address. The value should be in the hexadecimal.
- gpa : This option is used to specify the list of guest physical addresses. Max 8 entries are supported. The user has to provide the list with a comma separated for each guest physical address. The value should be in the hex-decimal.
- size : This option is a comma separated list in kilobytes for each mapping. Max 8 entries are supported. The value should be in the hex-decimal.
- R|--reserve_roce_resources : Option is used for dynamic reservation of roce resources.
The vf should be down to reserve the roce resources.
- qp : Max number of QPs per VF. The valid range is from 0 to 65536.
- cq : Max number of CQs per VF. The valid range is from 0 to 131072.
- srq : Max number of SRQs per VF. The valid range is from 0 to 4096.
- mrw : Max number of MR/MWs per VF. The valid range is from 0 to 65536.
- av : Max number of AVs per VF. The valid range is from 0 to 65536.
- ds_port : This is an optional parameter. And this option is to used to configure the

PCI ID of the PCIe switch downstream port. The valid range is from 1 to 65535.

EXAMPLES :

To query trusted vf state

```
1) niccli -i 1 vf --trust --show --vf_index 0
```

```
Trusted VF : Disabled
Command Executed Successfully
```

To enable trusted vf state

```
1) niccli -i 1 vf --trust --set --vf_index 1 --state enable
```

```
Command Executed Successfully
```

To add ntuple flow filter for the specified MAC and destination port

```
1) niccli -i 1 vf --add_ntuple_filter --macaddress 00:01:02:03:04:a3 -p 1023 -P 0xFFFF -v 1
-T 1
```

```
Successfully added N-tuple filter with filterId=8016000000000414
```

To free ntuple flow filter for the specified filter id

```
1) niccli -i 1 vf --free_ntuple_filter --filter_id F06C0000D6C22414
```

```
Successfully freed the given N-Tuple filter F06C0000D6C22414
```

To configure the GPU host and guest physical address mapping

```
1) niccli -i 1 vf --peer_mem_map --hpa
0x1FFFFFFFF,0x2FFFFFFFF,0x3FFFFFFFF,0x4FFFFFFFF
--gpa 0x9FFFFFFFF,0xAFFFFFFFF,0xBFFFFFFFF,0xCFFFFFFFF
--size 0x10000,0x10000,0x8000,0x8000
```

```
host/guest physical address mapping configured successfully.
```

```
2) niccli -i 1 vf --peer_mem_map --hpa
0x1FFFFFFFF,0x2FFFFFFFF,0x3FFFFFFFF,0x4FFFFFFFF --gpa
0x9FFFFFFFF,0xAFFFFFFFF,0xBFFFFFFFF,0xCFFFFFFFF --size
0x10000,0x10000,0x8000,0x8000 --ds_port 20
```

```
host/guest physical address mapping configured successfully.
```

To query the VF0 resource capabilities and its active usage

```
1) niccli -i 1 vf --resource_counts --vf_index 0 --show
```

Device 0000:0b:00.0 resource capabilities on VF 0 :

```

Min MSIX                : 0
Max MSIX                : 64
Min RSS/COS Contexts   : 8
Max RSS/COS Contexts   : 4144
Min Completion Rings    : 64
Max Completion Rings    : 5696
Min Tx Rings            : 32
Max Tx Rings            : 5088
Min Rx Rings            : 64
Max Rx Rings            : 1216
Min L2 Contexts         : 2
Max L2 Contexts         : 2
Min VNICS               : 2
Max VNICS               : 508
Min Stat Contexts       : 33
Max Stat Contexts       : 1005
Min HW Ring Groups      : 0
Max HW Ring Groups      : 0
Min KTLS Tx Key Contexts : 0
Max KTLS Tx Key Contexts : 0
Min KTLS Rx Key Contexts : 0
Max KTLS Rx Key Contexts : 0
Min QUIC Tx Key Contexts : 0
Max QUIC Tx Key Contexts : 0
Min QUIC Rx Key Contexts : 0
Max QUIC Rx Key Contexts : 0
VF Reservation Strategy : 1
Max VFs                 : 0

```

Device 0000:0b:00.0 active configuration on VF 0 :

```

RSS/COS contexts        : 8
Completion rings         : 64
Transmit rings           : 32
Receive rings            : 64
Number of L2 contexts    : 2
Number of vnics          : 1
Statistics context Id    : 0
Default VNIC Id         : 4
Number of VFs            : 0
Rx multicast filters     : 64

```

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```

HW ring groups           : 0
Reserved statistics contexts : 33
Active MSIX              : 64
RoCE VNIC Id            : 65535
Number of KTLS Tx Key contexts : 0
Number of KTLS Rx Key contexts : 0
Number of QUIC Tx Key contexts : 0
Number of QUIC Rx Key contexts : 0

```

tunnel commands

=====

DESCRIPTION :

Performs Custom, GRE Tunnel and RSS(receive side scaling) operations.

This command is supported on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.

SYNTAX :

```

tunnel --cfg --vxlan <-t|--type> <ipv4|ipv6> --show
tunnel --cfg --vxlan <--add> <-t|--type> <ipv4|ipv6> <-p|--dest_port> <value>
tunnel --cfg --vxlan <--del> <-t|--type> <ipv4|ipv6> <-p|--dest_port> <value>
tunnel --cfg <--rss> --show
tunnel --cfg <--rss> --set <--mode> <inner/outer>
tunnel --cfg <-g|--gre_tunnel_offload> --show
tunnel --cfg <-g|--gre_tunnel_offload> --set --state <enable/disable>

```

OPTIONS :

```

--cfg           : Perform Custom, GRE Tunnel and RSS(receive side scaling) operations.

--vxlan         : Option to query or configure vxlan type.

-t|--type       : Option to provide the IP type. The valid values are "ipv4" and "ipv6".

-p|--dest_port  : Option to provide the destination port. Valid range is 0-65535.

--rss           : Option to query and configure RSS(receive side scaling).

--mode          : Option to configure the RSS mode. The valid values are "inner" and
                  "outer".

-g|--gre_tunnel_offload : Option to query and configure the custom GRE tunnel offload.

--state         : Option to enable or disable the non udp port based GRE tunnel offload.

```

EXAMPLES :

To show the custom tunnel configuration

1) `niccli -i 1 tunnel --cfg --vxlan --type ipv4 --show`

```
Custom Tunnel Destination Port : 0
```

To add the custom tunnel configuration on destination port

1) `niccli -i 1 tunnel --cfg --vxlan --add --type ipv4 --dest_port 1024`

```
Command Executed Successfully.
```

To delete the custom tunnel configuration on destination port

1) `niccli -i 1 tunnel --cfg --vxlan --del --type ipv4 --dest_port 1024`

```
Command Executed Successfully.
```

To show the RSS mode configuration

1) `niccli -i 1 tunnel --cfg --rss --show`

```
RSS Hashing Mode : inner
```

To configure the RSS inner mode

1) `niccli -i 1 tunnel --cfg --rss --set --mode inner`

```
Command Executed Successfully.
```

To show the state of GRE tunnel offload

1) `niccli -i 1 tunnel --cfg --gre_tunnel_offload --show`

```
Device Level Tunnel Parsing is disabled.
On this function tunnel parsing is disabled.
```

To enable the non udp port based GRE tunnel offload

1) `niccli -i 1 tunnel --cfg --gre_tunnel_offload --set --state enable`

```
GRE tunnel configuration enabled on chip level. This configuration is
not persistent across reboots.
```

msix commands

=====

DESCRIPTION :

Query and configure the number of MSI-X max vectors values for VF's per each PF.
This command is supported only on Linux and Windows operating systems

SYNTAX :

```
msix -m|--max_vectors --show [--all | --pf <pf number>]
msix -m|--max_vectors --set [--pf <pf number>]
```

OPTIONS :

-m|--max_vectors : Retrieves the register dump and crashdump from the firmware.

--pf : PF Number to query the table of 8 rows for msix max vectors.

--show : Get the msix max vectors for PF.

--set : Configure the msix max vectors for PF.

--all : Displays msix max vectors for all the PF's.

EXAMPLES :

To display the MSI-X max vectors values

1) `niccli -i 1 msix --max_vectors --show --pf 0`

MSI-X Vector Table for PF 0 :

ROW	START VF		MSI-X	

0	0		0	
1	0		0	
2	0		0	
3	0		0	
4	0		0	
5	0		0	
6	0		0	
7	0		0	

To display all the values of MSI-X max vectors

1) `niccli -i 1 msix --max_vectors --show --all`

MSI-X Vector Table for PF 0 :

ROW	START VF	MSI-X
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

MSI-X Vector Table for PF 1 :

ROW	START VF	MSI-X
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

MSI-X Vector Table for PF 2 :

ROW	START VF	MSI-X
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

MSI-X Vector Table for PF 3 :

ROW	START VF	MSI-X
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

To configure the MSI-X max vectors values for PF 0

1) `niccli -i 1 msix --max_vectors --set --pf 0`

Currently configured MSI-X Vector Table for PF 0 :

ROW	START VF	MSI-X
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0

Configuring MSI-X Vector Table for PF 0 :

```

Enter the number of row to change [1 to 8, ENTER=Exit] : 8
Enter Start VF Value of Row 0 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 0 [ENTER=Do not change] : 1
Enter Start VF Value of Row 1 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 1 [ENTER=Do not change] : 1
Enter Start VF Value of Row 2 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 2 [ENTER=Do not change] : 1
Enter Start VF Value of Row 3 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 3 [ENTER=Do not change] : 1

```

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```

Enter Start VF Value of Row 4 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 4 [ENTER=Do not change] : 1
Enter Start VF Value of Row 5 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 5 [ENTER=Do not change] : 1
Enter Start VF Value of Row 6 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 6 [ENTER=Do not change] : 1
Enter Start VF Value of Row 7 [ENTER=Do not change] : 1
Enter MSI-X Vector Value of Row 7 [ENTER=Do not change] : 1

```

mh command

=====

DESCRIPTION :

Query and configure the Broadcom Multi-Host PF information. This command is supported only on Linux, FreeBSD and Windows operating systems.

SYNTAX :

```

mh -p|--pf_alloc --show
mh -p|--pf_alloc --set --ep0 <pf_cnt> --ep1 <pf_cnt> --ep2 <pf_cnt> --ep3 <pf_cnt>

```

OPTIONS :

```

-p|--pf_alloc : PF Number to query Multi-Host PF information

--show       : Query Multi-Host PF information

--set        : Configure the Multi-Host PF information

--ep0        : number of PF to be written on EP0

--ep1        : number of PF to be written on EP1

--ep2        : number of PF to be written on EP2

--ep3        : number of PF to be written on EP3

```

NOTE: The number of non-zero values can be for 2 endpoints or 4 endpoints.

NOTE: The sum of all the endpoints should be less than or equal to 16.

EXAMPLES :

To display the Multi-Host PF information

1) `niccli -i 1 mh --pf_alloc --show`

```

EP 1 = 0
EP 2 = 0
EP 3 = 0

```

```
EP 4 = 0
```

To configure the Multi-Host PF information

```
1) niccli -i 1 mh --pf_alloc --set --ep0 0 --ep1 0 --ep2 0 --ep3 0
```

Multi-host PF allocation applied successfully.

A cold boot is required for new allocation to take effect.

ring resource command

=====

DESCRIPTION :

Query and Configure resources of the device.

This command is supported on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.

SYNTAX :

```
resmgmt [--pf/--all] [<-p|--profile> | < --min > | < --max > | <-r | --roce_max> | < -m |  
--max_completion_rings> | < -s | --strategy >] --show
```

```
resmgmt [--pf/--all] --set [<-p|--profile> | < --min > | < --max > | <-r | --roce_max> | < -m |  
--max_completion_rings>] [< --bw <bandwidth of each pf with comma separated>] [< -s |  
--strategy > | < minimal/maximal/minimal-static>]
```

OPTIONS :

- p|--profile : Active profile of the device
- r|--roce_max : RoCE enabled PF's on the device(supported only for Stratus & Cumulus-B/WHP)
- m|--max_completion_rings : maximum completion rings for each active PF
- s|--strategy : strategy associated with each active PF.
- min : Minimum bandwidth associated with each active PF
- max : Maximum bandwidth associated with each active PF
- show : Displays resources of the device
- set : Configures resources of the device

--bw : Bandwidth to configure for PF N. This is applicable for min, max, roce_max and max_cmpl

EXAMPLES :

To query resources of the device

1) `niccli -i 1 resmgmt --all --profile --show`

```
resmgmt mode: Entire NIC device
Number of PFs in the NIC device: 8
Profile Type : Asymmetric
```

To configure resources of the device

1) `niccli -i 1 resmgmt --pf --set --bw 1,2,3 --strategy minimal`

```
resmgmt mode: only for the selected PF
A system cold boot is needed for configuration package update to
take effect.
Resource management settings are applied Successfully
```

Congestion Control command

=====

DESCRIPTION :

This command is used to query and configure the congestion control(cc) parameters for RoCE. This command is supported on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.

SYNTAX :

```
ccparams -d|--dump
ccparams --set -f <configuration file>
ccparams -D|--dyncc [-c|--cfg_table <binary file>] [-a|--dyncc_args <binary file>]
```

OPTIONS :

-d|--dump : Dumps the congestion control parameters into a configuration <xxx>.CFG file. The file will be generated in the same directory where the executable is running.

--set : To configure the congestion control parameters using a <xxx>.CFG file.

-f : Configuration file to configure the congestion control (cc) parameters.

-D|--dyncc : To configure the dynamic congestion control (cc) parameters.

-c|--cfg_table : This option is used to configure the dyncc tables. The user has to provide the binary file and this is an optional parameter.

-a|--dyncc_args : This option is used to configure the dynamic cc related arguments. The User has to provide the binary file and this is an optional parameter.

EXAMPLES :

To dump the congestion control params

- 1) `niccli -i 1 ccparams -d`
- 2) `niccli -i 1 ccparams --dump`

Generated congestion control file "BCM957608-P2200GQF00"_congestion_control_20250508_231306_85634.CFG

To configure the congestion control params

- 1) `niccli -i 1 ccparams --set -f BCM957608-P2200GQF00_congestion_control_20250210_025627_19427.CFG`

CC parameter	value	status
-----	-----	-----
abs_max_quota	1	Success

debug command

=====

DESCRIPTION :

Dumps device internal configuration registers. The dump file can be used by the Broadcom Support for hardware troubleshooting.

- 1) Snapdump option is supported on Linux, Windows, FreeBSD, Darwin and VMWare operating systems.
- 2) Debug --token options are supported on Linux, Windows, Darwin and FreeBSD operating systems.

SYNTAX :

```
debug -c|--coredump [-d|--ddr] [-l|--l1cc] [-f <file name>]
debug -s|--snapdump [-f <file name>]
debug -D|--drv_dbg_mask --show -T|--drv_type <value>
debug -D|--drv_dbg_mask --value <value> -T|--drv_type <value>
debug -K|--token -a|--supported_claims [ --show | -f <output_filename>]
debug -K|--token -A|--active_claims [ --show | -f <output_filename>]
debug -K|--token -G|--generate -f|--file <claims_file> [-o|--output_file <unsigned_CBOR_file>]
debug -K|--token -I|--insert -N|--signature_file <signature file> -f|--file <claims_file>
    [-o|--output_file <signed_CBOR_file>]
debug -K|--token -E|--enable -f|--file <signed_CBOR_file>
```

debug -K|--token -B|--disable

OPTIONS :

- c|--coredump : Retrieves the register dump and crashdump from the firmware.
- s|--snapdump : Retrieves the register dump, crashdump, firmware log, driver logs and host tool logs.
- d|--ddr : Retrieves crashdump from the DDR if available and this option is only applicable to the coredump command.
- l|--l1cc : Retrieves the context l1 cache and this option is only applicable to coredump command.
- f|--file : File name to dump the coredump/snapdump. This is an optional Parameter.
- D|--drv_dbg_mask : This option is used to set the driver debug mask value.
- T|--drv_type : This option is used to set the driver debug mask for a given driver type.
The valid values for this option are:
0 - Bnxtnet
1 - RoCE
- K|--token : Perform debug token operations.
- a|--supported_claims : Retrieves the supported debug tokens. Below are the supported tokens.
 - fwcli : Provides access to the production firmware command list. The valid values are from 0 to 2.
 - diagrw_en : Enable or disable the GRC register access. The valid values are 0 and 1.
 - persist : Persist the token until expired. The valid values are 0 and 1.
 - exp : Expiration time to indicate when the token expires. Value is an epoch based 64-bit integer value. The value indicates the number of seconds relative to 1970-01-01T00:00Z in UTC time.
- A|--active_claims : Retrieves the active debug tokens.
- G|--generate : Generate the unsigned debug token binary for the provided debug claims.
- I|--insert : Insert the signature into the unsigned debug token binary for the provided debug claims.

Note: The debug tokens in the claims file for the generate and insert command should match.

-N|--signature_file : Option to provide the signature file.

-E|--enable : Enable the debug token.

-B|--disable : Disable the debug token.

EXAMPLES :

To collect the coredump

- 1) niccli -i 1 debug -c
- 2) niccli -i 1 debug --coredump

```
Retrieving CoreDump, please wait...
Generated CoreDump file
dhcp-10-123-240-239_20250512_204028_121995.core
```

- 3) niccli -i 1 debug --coredump -f test.core

```
Retrieving CoreDump, please wait...
Generated CoreDump file test.core
```

To collect the crashdump from the DDR

- 1) niccli -i 1 debug --coredump --ddr

```
Retrieving CoreDump, please wait...
Generated CoreDump file roce-auto-1_20240830_164241_70201.core
```

To collect the coredump with L1 context cache

- 1) niccli -i 1 debug --coredump --l1cc

```
Retrieving CoreDump, please wait...
Generated CoreDump file
dhcp-10-123-240-239_20250512_204215_122024.core
```

To collect the snapdump

- 1) niccli -i 1 debug -s
- 2) niccli -i 1 debug --snapdump

```
Retrieving SnapDump, please wait...
Generated SnapDump file
```

```
dhcp-10-123-240-239_20250512_204509_122065.core
```

To retrieve the firmware supported debug token claims and dump into JSON file

- 1) `niccli -i 1 debug --token --supported_claims --file supported_claims.json`

```
Operation completed successfully.
```

To retrieve the active debug token claims configured by the firmware and dump into JSON file

- 1) `niccli -i 1 debug --token --active_claims --file active_claims.json`

```
Operation completed successfully.
```

To generate the unsigned debug token binary file for the provided debug claims

- 1) `niccli -i 1 debug --token --generate --file supported_claims.json --output_file niccwt_P2200_unsigned.cbor`

```
Successfully created unsigned CBOR debug token file
"niccwt_P2200_unsigned.cbor"
```

To insert the signature into the unsigned debug token binary file

- 1) `niccli -i 1 debug --token --insert --signature_file sig.txt --file active_claims.json --output_file niccwt_P2200_signed.cbor`

```
Successfully created signed CBOR debug token file
"niccwt_P2200_signed.cbor"
```

To enable the debug token using signed debug token binary file

- 1) `niccli -i 1 debug --token --enable --file niccwt_P2200_signed.cbor`

```
Debug token enabled successfully.
```

To disable the debug token

- 1) `niccli -i 1 debug --token --disable`

```
Debug token disabled successfully.
```

Below commands are supported only in ESXI 8.0 onwards

- 1) `esxcli niccli debug --dev -v vmnic5 --drv-dbg-mask --show --drv-type 1`

```
Debug mask = 0x0
```

- 2) `esxcli niccli debug --dev -v vmnic5 --drv-dbg-mask --value 0x1 --drv-type 1`

Command executed successfully.

show command

=====

DESCRIPTION :

This command will display all the basic details of the device

- 1) `pcb_gen2_otp` option is supported on Linux and Darwin operating systems.
- 2) recommendations options are supported only on Linux, Windows, VMWare and FreeBSD operating systems.

SYNTAX :

```
show [-d | --device_info]
show -p | --pkg_ver [-f <firmware package file(s)>]
show -D | --device_pci_ids [-f <firmware package file(s)>]
show -c | --certificate [-s | --slot <number>]
show -n | --nvm_measurement
show --all
show --health
show -g | --pcb_gen2_otp
show -r | --recommendations [--pcie] [-V]
```

OPTIONS :

- | | |
|------------------------------------|---|
| <code>-p --pkg_ver</code> | : Display firmware package version installed on the device or in the package file. |
| <code>-f</code> | : Display firmware package file information. |
| <code>-D --device_pci_ids</code> | : Display Broadcom device id information. |
| <code>-d --device_info</code> | : Display the basic details of the device |
| <code>--all</code> | : Display all the details of the device. |
| <code>-c --certificate</code> | : Display the imported certificate chain on the device.
This command is supported on BCM9575xxx and BCM9576xxx devices. |
| <code>-s --slot</code> | : Slot number is where the certificate chain on the device is imported. The valid values are from 0 to 7. The default value is 0. |

- n | --nvm_measurement : Display whether the NVM configuration that is active in the system has been changed or not. To facilitate this, a hash is generated based on nvm configuration. The hash represents the measurement of the configuration. This command is supported on BCM9575xxx and BCM9576xxx devices.
- health : Display the device health.
- r | --recommendations : Display the self debug recommendations to the user.
This option is only supported on BCM9575xxx and BCM9576xxx devices.
- pcie : This option is used to show the PCIe self debug recommendations to the user. This option is only supported on BCM9575xxx and BCM9576xxx devices.
- V : Verbosity, shows the detailed information.
- g | --pcb_gen2_otp : Display the PCB gen2 device OTP. This command is supported on BCM9574xxx devices.

EXAMPLES :

To display firmware package version installed on the device or in the package file

1) `niccli -i 1 show -p -f BCM957508-N2100G.pkg`

```

Package File           : BCM957608-P2200GQF00.pkg
Package Version        : 235.1.41.0
Timestamp              : 2025-04-28 15:02:51Z
Checksum               : 0x6B7BB128
Description            : Broadcom BCM57608 2x200G PCIe
                        Ethernet NIC
SBI Revision ID        : 0x0
SRT Revision ID        : 0x0
CRT Revision ID        : 0x0

```

```

Package Information :
  Active Package Version : 235.1.41.0
  Package Version on NVM : 235.1.41.0
  Primary SBI Version    : 232.0.7.0
  Secondary SBI Version  : 232.0.7.0
  Primary SRT Version    : 235.1.41.0
  Secondary SRT Version  : 235.1.41.0

```

```

Primary CRT Version      : 235.1.41.0
Secondary CRT Version    : 235.1.41.0
SBI Revision ID          : 0x0
RT Revision ID           : 0x0
CRT Revision ID          : 0x0

```

2) niccli -i 1 show --pkg_ver

```

Package Information :
Active Package Version      : 235.1.41.0
Package Version on NVM     : 235.1.41.0
Primary SBI Version        : 232.0.7.0
Secondary SBI Version      : 232.0.7.0
Primary SRT Version        : 235.1.41.0
Secondary SRT Version      : 235.1.41.0
Primary CRT Version        : 235.1.41.0
Secondary CRT Version      : 235.1.41.0
SBI Revision ID            : 0x0
SRT Revision ID            : 0x0
CRT Revision ID            : 0x0

```

To display the basic details of the device

1) niccli -i 1 show -d

2) niccli -i 1 show --device_info

```

NIC State                : Down
Device Type              : THOR2
PCI Vendor ID            : 0x14E4
PCI Device ID            : 0x1760
PCI Revision ID          : 0x11
PCI Subsys Vendor ID     : 0x14E4
PCI Subsys Device ID     : 0x9120
Device Interface Name    : ens6f0np0
MAC Address              : 8C:84:74:01:A5:C2
Base MAC Address         : 8C:84:74:01:A5:C2
Serial Number            : "P2200YYWWXXXXXFG"
Part Number              : "BCM957608-P2200QQF00"
PCI Address              : 0000:1e:00.0
Chip Number              : BCM57608
Chip Name                : THOR2
Description              : Broadcom BCM57608 2x200G
                          PCIe Ethernet NIC
Firmware Name            : PRIMATE_FW
Firmware Version         : 235.1.41.0

```

RoCE Firmware Version	: 235.1.41.0
HWRM Interface Spec	: 1.10.3
Kong mailbox channel	: Not Applicable
Active Package Version	: 235.1.41.0
Package Version on NVM	: 235.1.41.0
Active NVM config version	: 234.0.48
NVM config version	: 0.0.48
Reboot Required	: No
Firmware Reset Counter	: 1
Error Recovery Counter	: 0
Crash Dump Timestamp	: Not Available
Secure Boot	: Enabled
Secure Firmware Update	: Enabled
FW Image Status	: Operational
Crash Dump Available in DDR	: No
Device Temperature	: 41 Celsius
PHY Temperature	: Not Available
Optical Module Temperature	: Not Available
Device Health	: Good

Below show command is observed only in VmWare OS.

```
esxcli niccli show --dev -v vmnic8
```

NIC State	: Down
Device Type	: THOR
PCI Vendor ID	: 0x14E4
PCI Device ID	: 0x1751
PCI Revision ID	: 0x12
PCI Subsys Vendor ID	: 0x14E4
PCI Subsys Device ID	: 0x4250
Device Interface Name	: vmnic24
MAC Address	: 8C:84:74:C4:8E:72
Base MAC Address	: 8C:84:74:C4:8E:70
Serial Number	: P425G25030001BFG
Part Number	: BCM957504-P425G
PCI Address	: 0000:61:00.2
Chip Number	: BCM57504
Chip Name	: THOR
Description	: Broadcom NetXtreme E-Series Quad-port 25Gb SFP28 PCIe Ethernet Adapter
Firmware Name	: PRIMATE_FW
Firmware Version	: 235.1.73.0

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```

RoCE Firmware Version           : 235.1.73.0
HWRM Interface Spec             : 1.10.3
Kong mailbox channel             : Not Applicable
Trusted VFs                      : Supported
Active Package Version           : 235.1.74.0
Package Version on NVM           : 235.1.74.0
Active NVM config version        : 0.0.30
NVM config version               : 0.0.30
Reboot Required                  : No
Firmware Reset Counter           : 0
Error Recovery Counter           : 0
Crash Dump Timestamp             : Not Available
Secure Boot                      : Enabled
Secure Firmware Update           : Enabled
FW Image Status                  : Operational
Crash Dump Available in DDR      : No
Device Temperature               : 46 Celsius
PHY Temperature                  : 46 Celsius
Optical Module Temperature       : Not Available
Device Health                    : Good
MTU                              : 1500
Number of VFs configured         : 0
Bridge mode                      : (1)VEB is configured
Driver Name                      : bnxtnet
Driver Version                   : 236.1.3.6
RoCE Driver Name                 : bnxtroce
RoCE Driver Version              : 236.1.3.6
RoCE V2                          : Enabled
L2 Driver module interface       : native
L2 Driver HWRM IF                : 1.10.3.96
Chip Metal                      : 2
Chip Bondid                      : 0

```

To display the device health of the interface

1) `niccli -i 1 show --health`

```

Device Health Information :
SBI Mismatch Check        : OK
SBI Booted Check          : OK
SRT Mismatch Check        : OK
SRT Booted Check          : OK
CRT Mismatch Check        : OK
CRT Booted Check          : OK
Second RT Image           : CRT Image
Second RT Image Redundancy : Good

```

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```

Image Fastbooted Check           : OK
Directory Header Booted Check    : OK
Directory Header Mismatch Check  : OK
MBR Corrupt Check                : OK
NVM Configuration                : OK
FRU Configuration                : OK
-----
Overall Device Health            : Healthy

```

To display the imported certificate chain on the device

- 1) `niccli -i 1 show -c -s 1`
- 2) `niccli -i 1 show --certificate --slot 0`

Cert Provision State : The attestation agent has not yet initialized and not completed verification of the provisioned certificate chain.

To display whether the NVM configuration that is active in the system

- 1) `niccli -i 1 show -n`
- 2) `niccli -i 1 show --nvmmmeasurement`

```

NVM Measurement Calculated Time   : BootUp
NVM Configuration HMAC SHA384
HASH :
67206532f220d9c113438db3b8b58316721d76797d78effa026c35ca5be0b6a62016fe
15e933723fc293ddabb88c2ef8

```

To display Broadcom device id information

- 1) `niccli -i 1 show -D -f BCM957608-P2200GQF00.pkg`
- 2) `niccli -i 1 show --device_pci_ids -f BCM957608-P2200GQF00.pkg`

```

Target Device Package Information :
Package File   : BCM957608-P2200GQF00.pkg
Target PCI-ID  : 0x14E4:0x1760:0x14E4:0x9120

```

```

Adapter #1 :
-----
Device Interface Name      : ens6f0np0
PCI Vendor ID              : 0x14E4
PCI Device ID              : 0x1760
PCI Revision ID            : 0x11
PCI Subsys Vendor ID       : 0x14E4
PCI Subsys Device ID       : 0x9120
PCI Address                 : 0000:1e:00.0

```

To display all the details of the device

1. `niccli -i 1 show --all`

```

NIC State                               : Down
Device Type                             : THOR2
PCI Vendor ID                           : 0x14E4
PCI Device ID                           : 0x1760
PCI Revision ID                         : 0x11
PCI Subsys Vendor ID                    : 0x14E4
PCI Subsys Device ID                    : 0x9120
Device Interface Name                   : ens6f0np0
MAC Address                             : 8C:84:74:01:A5:C2
Base MAC Address                        : 8C:84:74:01:A5:C2
Serial Number                           : "P2200YYWWXXXXXFG"
Part Number                             : "BCM957608-P2200GQF00"
PCI Address                             : 0000:1e:00.0
Chip Number                             : BCM57608
Chip Name                               : THOR2
Description                             : Broadcom BCM57608
                                         2x200G PCIe Ethernet NIC

Firmware Name                           : PRIMATE_FW
Firmware Version                         : 235.1.41.0
RoCE Firmware Version                   : 235.1.41.0
HWRM Interface Spec                     : 1.10.3
Kong mailbox channel                     : Not Applicable
Active Package Version                  : 235.1.41.0
Package Version on NVM                  : 235.1.41.0
Active NVM config version                : 234.0.48
NVM config version                      : 0.0.48
Reboot Required                         : No
Firmware Reset Counter                  : 1
Error Recovery Counter                  : 0
Crash Dump Timestamp                    : Not Available
Secure Boot                            : Enabled
Secure Firmware Update                  : Enabled
FW Image Status                         : Operational
Crash Dump Available in DDR              : No
Device Temperature                      : 43 Celsius
PHY Temperature                         : Not Available
Optical Module Temperature              : Not Available
Device Health                           : Good

Primate Firmware Livepatch Versions
  Common Active Livepatch Version       : Not Available
  Common Livepatch Version on NVM       : Not Available
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```

```

Secure Active Livepatch Version : Not Available
Secure Livepatch Version on NVM : Not Available
Backup Power Info Version       : Not Supported
Backup Power Load               : Not Supported
Backup Time                     : Not Supported
Platform Backup Power Count     : Not Supported
Backup Power Status             : Not Supported
Backup Power Charge Time       : Not Supported

```

To display the recommendation for self debug.

- 1) `niccli -i 1 show -r`
- 2) `niccli -i 1 show --recommendations`

Checking NIC status...

Checker #1: Link detected

Condition #1: The Ethernet link is down or the cable is not detected.

Recommendation for condition #1:

The Ethernet link is down. If the link is expected to be up:

1) If the port has a SFP or QSFP cage, ensure that the module is detected properly and there are no faults reported for the module. The 'recommendations' command will determine if a module is absent or otherwise reporting a fault.

2) Do some characterization to rule out whether the module and cable are a factor:

a) Try connecting two switch ports with the cable and see if link comes up on the switch

b) Try connecting two NIC ports with the cable and see if link comes up Disable autodetect on at least one NIC port using following niccli command. 'niccli --dev <device_name> --setoption media_auto_detect --scope <port_num> --value <mode>'

c) Try a different instance of the same cable brand/type

d) Try a different cable brand/type

e) Use one of the cables that are verified by Broadcom. See the following link for the list of verified cables:

<https://techdocs.broadcom.com/us/en/storage-and-ethernet-connectivity/ethernet-nic-controllers/bcm957xxx/adapters/installation/connecting-the-network-cables/interconnect-compatibility-for-brcm9575xx--bcm9574xx--and-earlier-adapters-.html>

- 3) Check the switch status for the port connected to the NIC.

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Some switches will disable the port if the link has toggled too frequently. If the switch disables the link then the NIC will be unable to get a link until the switch reenables the port.

4) Some higher power class modules come up in a lower power class so that the user has an option to switch to a higher power class, if the board has the ability to support this power. The NIC firmware has the capability to detect and configure these modules to higher power class automatically. The switch may not be capable of this automatic configuration and may need manual intervention to support higher power class modules.

5) Run the 'niccli --dev <device_name> linkdiag --dscdump --lane <X> --diag_level 0' command on each of the SERDES lanes associated with the port. The output for SD indicates if a signal is detected on that lane. The output for LCK indicates if the PMD has locked on that lane. For example, the following indicates that both signal is detected and PMD has locked on lane 0:

```
LN .... SD LCK ...
0 .... 1* 1* ...
```

Condition #2: The NIC port is configured to use 'autodetect' mode

Recommendation for condition #2:

The NIC port is configured to use 'autodetect' mode. When 'autodetect' is enabled, the NIC attempts to get a link on all valid combinations of speed, NRZ/PAM4 signaling, FEC, and link training configurations. The 'niccli --dev <device_name> link --status' command shows the supported link modes for this device. Check to ensure that the link partner supports at least one of the NIC's supported link modes. If the NIC is configured to use 'autodetect' mode, ensure that the link partner is not using 'autodetect' mode. If the NIC is connected to a switch, then the switch is not using 'autodetect' mode. If the NIC is connected directly to another NIC port, then disable 'autodetect' on at least one of the NIC ports. 'autodetect' mode can be configured using the 'niccli --dev <device_name> nvm --setoption media_auto_detect --scope <port_num> --value <mode>' command.

Checker #2: Module detected

Condition #1: Module is inserted and accepted

Recommendation for condition #1:

No recommendation.

Checker #3: Link Toggling

Condition #1: Link down events are nominal.

Recommendation for condition #1:

No recommendation.

Checker #4: MAC and PHY Counters

Condition #1: The NIC has no receive side corrected blocks, uncorrectable FEC blocks and FCS errors

Recommendation for condition #1:

No recommendation.

Checker #5: mbuf discards

Condition #1: The NIC has no receive discards

Recommendation for condition #1:

No recommendation.

Checker #6: ring discards

Condition #1: The NIC has no receive discard packets

Recommendation for condition #1:

No recommendation.

Checker #7: Firmware operational status

Condition #1: Firmware is healthy

Recommendation for condition #1:

No recommendation.

Checker #8: Firmware synchronization status

Condition #1: All the actively running firmware images are synchronized with the backup slot

Recommendation for condition #1:

No recommendation.

Checker #9: Firmware error recovery count

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Condition #1: The NIC firmware error recovery counter is zero.

Recommendation for condition #1:

No recommendation.

Checker #10: Firmware errors

Condition #1: The NIC active firmware has no errors.

Recommendation for condition #1:

No recommendation.

Checker #11: Non Default nvm configuration

Condition #1: The current NIC nvm configuration is a default configuration.

Recommendation for condition #1:

No recommendation.

Checker #12: PCIe Lanes used

Condition #1: PCIe link width is optimal

Recommendation for condition #1:

No recommendation.

Checker #13: PCIe Link speed

Condition #1: PCIe link speed is downgraded

Recommendation for condition #1:

The NIC is capable of linking at 32GT/s per lane but has only linked at 16GT/s per lane.

This impacts the total bandwidth available to the NIC. Consider moving the NIC to a different

PCIe slot that can support the NIC's maximum link speed.

Checker #14: PCIe Errors

Condition #1: There is no PCIe errors.

Recommendation for condition #1:

No recommendation.

Checker #15: PCIe Flow Control Credits

Condition #1: PCIe flow control credits are below a certain threshold

Recommendation for condition #1:

No recommendation.

Checker #16: Context Cache Misses

Condition #1: The Context cache memory utilized by the NIC indicates no cache misses

Recommendation for condition #1:

No recommendation.

3) niccli -i 1 show --recommendations --pcie

Checking NIC status...

Checker #1: PCIe Lanes used

Condition #1: PCIe link width is downgraded

Recommendation for condition #1:

The NIC is capable of linking at 16 lanes but has only linked at 8 lanes. This impacts the total bandwidth available to the NIC. Consider moving the NIC to a different PCIe slot with a matching number of lanes.

Checker #2: PCIe Link speed

Condition #1: PCIe link speed is downgraded

Recommendation for condition #1: The NIC is capable of linking at 32GT/s per lane but has only linked at 16GT/s per lane. This impacts the total bandwidth available to the NIC. Consider moving the NIC to a different PCIe slot that can support the NIC's maximum link speed.

Checker #3: PCIe Errors

Condition #1: There is no PCIe errors.

Recommendation for condition #1:

No recommendation.

Checker #4: PCIe Flow Control Credits

Condition #1: PCIe flow control credits are below a certain threshold

Recommendation for condition #1:

No recommendation.

Checker #5: Context Cache Misses

Condition #1: The Context cache memory utilized by the NIC indicates no cache misses

Recommendation for condition #1:

No recommendation.

4) niccli -i 1 show --recommendations -V

Checking NIC status...

Checker #1: Link detected

Condition #1: The ethernet link is up and the active link speed is the maximum supported link speed.

Recommendation for condition #1:

No recommendation.

Condition #2: The NIC port is configured to use 'autodetect' mode

Recommendation for condition #2:

The NIC port is configured to use 'autodetect' mode. When 'autodetect' is enabled, the NIC attempts to get a link on all valid combinations of speed, NRZ/PAM4 signaling, FEC, and link training configurations.

The 'niccli --dev <device_name> link --status' command shows the supported link modes for this device. Check to ensure that the link partner supports at least one of the NIC's supported link modes.

If the NIC is configured to use 'autodetect' mode, ensure that the link partner is not using 'autodetect' mode.

If the NIC is connected to a switch, then the switch is not using 'autodetect' mode. If the NIC is connected directly to another NIC port, then disable 'autodetect' on at least one of the NIC ports.

'autodetect' mode can be configured using the 'niccli --dev <device_name> nvm --setoption media_auto_detect --scope <port_num> --value <mode>' command.

Checker #2: Module detected

Condition #1: Module is inserted and accepted

a) Media Type : Direct Attached Copper

b) Module Status : Transceiver module inserted and accepted.

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Recommendation for condition #1:

No recommendation.

Checker #3: Link Toggling

Condition #1: Link down events are nominal.

a) link_down_events : 3

Recommendation for condition #1:

No recommendation.

Checker #4: MAC and PHY Counters

Condition #1: The NIC has 0 FCS errors and 1 uncorrectable FEC blocks

a) rx_fcs_err_frames : 0

b) rx_fec_uncorrectable_blocks : 1

Recommendation for condition #1:

The NIC has 0 FCS errors and 1 uncorrectable FEC blocks.

A non-zero count indicates that the NIC is dropping packets because there is an issue with

signal integrity on the physical link.

1) Consider running the prbs_test, serdes, and dsdump commands to further analyze the link quality

2) Consider using a different cable (e.g. a shorter cable, or different manufacturer)

Consider tuning the Tx FIR (finite impulse response) settings. The Tx FIR settings can be tuned via the 'niccli --dev <device_name> linkdiag --txfir' command.

Checker #5: mbuf discards

Condition #1: The NIC has no receive discards

a) rx_stat_discard : 0

Recommendation for condition #1:

No recommendation.

Checker #6: ring discards

Condition #1: The NIC has no receive discard packets

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a) rx_discard_pkts : 0

Recommendation for condition #1:

No recommendation.

Checker #7: Firmware operational status

Condition #1: Firmware is healthy

a) Firmware health status register value : 0x8000

Recommendation for condition #1:

No recommendation.

Checker #8: Firmware synchronization status

Condition #1: All the actively running firmware images are synchronized with the backup slot

a) Firmware health status register value : 0x0

Recommendation for condition #1:

No recommendation.

Checker #9: Firmware error recovery count

Condition #1: The firmware has crashed and collected debug information.

a) error_recovery_counter : 0

b) Error recovery timeStamp : 04/13/2025 16:54:38 IST

Recommendation for condition #1:

The firmware has crashed and collected debug information.
Retrieve a coredump using niccli command
'niccli --dev <device_name> debug --coredump' and provide it to
your support contact.

Checker #10: Firmware errors

Condition #1: The NIC active firmware has no errors.

Recommendation for condition #1:

No recommendation.

Checker #11: Non Default nvm configuration

Condition #1: The current NIC nvm configuration has non default configuration.

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a) There are 3 nvm configuration options which have non default configuration.

Recommendation for condition #1:

Some of the NVM configurations differ from the default values and may affect the functionality of the NIC. Review the differences by running the 'niccli --dev <device_name> nvm --listoptions --diff' command.

Restore the configuration to factory defaults by running the 'niccli --dev <device_name> nvm --restore_factory_defaults' command.

Checker #12: PCIe Lanes used

Condition #1: PCIe link width is downgraded

a) NIC is capable of 16 lanes but only 8 lanes are used

Recommendation for condition #1:

The NIC is capable of linking at 16 lanes but has only linked at 8 lanes.

This impacts the total bandwidth available to the NIC. Consider moving the NIC to a different PCIe slot with a matching number of lanes.

Checker #13: PCIe Link speed

Condition #1: PCIe link speed is downgraded

a) NIC is capable of 32GT/s per lane but only 16GT/s per lanes are used

Recommendation for condition #1:

The NIC is capable of linking at 32GT/s per lane but has only linked at 16GT/s per lane. This impacts the total bandwidth available to the NIC. Consider moving the NIC to a different

PCIe slot that can support the NIC's maximum link speed.

Checker #14: PCIe Errors

Condition #1: There are no PCIe errors.

a) pcie_pl_signal_integrity = 0

b) pcie_dl_signal_integrity = 0

c) pcie_tl_signal_integrity = 0

Recommendation for condition #1:

No recommendation.

Checker #15: PCIe Flow Control Credits

Condition #1: PCIe flow control credits are below a certain threshold

PCIe credits:

```

a) pcie_credit_fc_hdr_posted      = 127
b) pcie_credit_fc_hdr_nonposted   = 127
c) pcie_credit_fc_hdr_cmpl       = 255
d) pcie_credit_fc_data_posted     = 863
e) pcie_credit_fc_data_nonposted  = 96
f) pcie_credit_fc_data_cmpl      = 4095

```

PCIe TL credits:

```

a) pcie_tl_credit_nph_htg[0]     = 0
b) pcie_tl_credit_nph_htg[1]     = 0
c) pcie_tl_credit_nph_htg[2]     = 0
d) pcie_tl_credit_ph_htg[0]      = 0
e) pcie_tl_credit_ph_htg[1]      = 0
f) pcie_tl_credit_ph_htg[2]      = 0
g) pcie_tl_credit_pd_htg[0]      = 0
h) pcie_tl_credit_pd_htg[1]      = 0
i) pcie_tl_credit_pd_htg[2]      = 0

```

Recommendation for condition #1:

No recommendation.

Checker #16: Context Cache Misses

Condition #1: The Context cache memory utilized by the NIC indicates no cache misses

```

a) cache_miss_count_cfcq = 0
b) cache_miss_count_cfcs = 0
c) cache_miss_count_cfcc = 0
d) cache_miss_count_cfcf = 0

```

Recommendation for condition #1:

No recommendation.

To display the PCB gen2 device OTP.

- 1) niccli -i 1 show -g
- 2) niccli -i 1 show --pcb_gen2_otp

```

PCB Gen2 OTP Bit           : Not configured

```

PCIe operations command

```
=====
```

DESCRIPTION :

Query and configure the PCIe operations. This command is supported on Linux, Windows, VMWare and FreeBSD operating systems.

SYNTAX :

```

pcie <-c|--compliance> --state <0/1>
pcie <-c|--compliance> --show
pcie <-M|--peer_mem_map> <--hpa> <list of values> <--gpa> <list of values>
    <--size> <list of values> [--ds_port <value>]
pcie <-M|--peer_mem_map> --show

```

OPTIONS :

-c|--compliance : This option is used to query or configure the pcie compliance operations.

--state : This option is used to configure the pcie compliance state to enable/disable.
The valid values for this option are:
0 - Disable
1 - Enable

--show : This option is used to query the pcie compliance state.

-M|--peer_mem_map : Option to configure the GPU host and guest physical address mapping.

--hpa : This option is used to specify the list of host physical addresses.
Max 8 entries are supported. The user has to provide the list with a comma separated for each host physical address. The value should be in the hex-decimal.

--gpa : This option is used to specify the list of guest physical addresses.
Max 8 entries are supported. The user has to provide the list with a comma separated for each guest physical address. The value should be in the hex-decimal.

--size : This option is a comma separated list in kilobytes for each mapping.
Max 8 entries are supported. The value should be in the hex-decimal.

--ds_port : This is an optional parameter. And this option is to used to configure the PCI ID of the PCIe switch downstream port. The valid range is from 1 to 65535.

EXAMPLES :

- 1) `niccli -i 1 pcie --compliance --show`

```
PCIe Compliance : Disabled
```

- 2) `niccli -i 1 pcie --compliance --state 0`

```
PCIe compliance disabled successfully.
```

```
A system reboot is needed for the PCIe compliance to take effect.
```

To configure the GPU host and guest physical address mapping

- 1) `nicclid -i 1 pcie --peer_mem_map --hpa
0x1FFFFFFF,0x2FFFFFFF,0x3FFFFFFF,0x4FFFFFFF
--gpa 0x9FFFFFFF,0xAFFFFFFF,0xBFFFFFFF,0xCFFFFFFF
--size 0x10000,0x10000,0x8000,0x8000`
- 2) `nicclid -i 1 pcie --peer_mem_map --hpa
0x1FFFFFFF,0x2FFFFFFF,0x3FFFFFFF,0x4FFFFFFF
--gpa 0x9FFFFFFF,0xAFFFFFFF,0xBFFFFFFF,0xCFFFFFFF
--size 0x10000,0x10000,0x8000,0x8000 --ds_port 20`

```
host/guest physical address mapping configured successfully.
```

To show the peer memory mapping information

- 1) `niccli -i 1 pcie --peer_mem_map --show`

```
Peer mmap Info:
```

Mapping	HPA	GPA	Size (KB)
0	0x1FFFFFFF	0x9FFFFFFF	0x10000
1	0x2FFFFFFF	0xAFFFFFFF	0x10000
2	0x3FFFFFFF	0xBFFFFFFF	0x8000
3	0x4FFFFFFF	0xCFFFFFFF	0x8000

udcc Command

```
=====
```

DESCRIPTION :

This command is used to query and configure user defined congestion control of IFA 2.0 (In-band Flow Analyzer) to improve the accuracy of network congestion estimation using network telemetry such as network latency and/or destination port utilization.

This command is supported only on the linux operating system.

SYNTAX :

To get and set the UDCC probe parameters

```
udcc --probe --show
```

```
udcc --probe --set [-t|--format <value>] [-p|--pad_cnt <value>] [-k|--ack <1-bit value>]
[-r|--rsvd7 <7-bit value>] [-g|--gns <value>] [-l|--hop_limit <value>] [-e|--req_vec
<value>]
```

OPTIONS :

- `--show` : This option is used to show the udcc configuration details.

- `--probe` : This option is used to query or configure the UDCC probe parameters.

- `--set` : This option is used to configure the udcc parameters.

- `-p|--pad_cnt` : This is an optional parameter used to configure the UDCC probe pad count.
The supported probe pad count values are as below :
 - 0 - No custom changes to probe packet.
 - 1 - The UDCC probe packet header's "PADCNT" field is set to 1
 - 2 - The UDCC probe packet header's "PADCNT" field is set to 2
 - 3 - The UDCC probe packet header's "PADCNT" field is set to 3

- `-t|--format` : This is an optional parameter used to configure the UDCC probe format type. The Supported UDCC probe format types are as below :
 - 0 - MAD (Management Datagram)
 - 1 - IFA 2.0 (Inband Flow Analyzer)

- `-g|--gns` : This is an optional parameter used to configure the global name space.
The valid range is from 0 to 15.

- `-l|--hop_limit` : This is an optional parameter used to configure the hop limit value.
The valid range is from 0 to 255.

- `-e|--req_vec` : This is an optional parameter used to configure the request vector value.
The valid range is from 0 to 255.

- `-k|--ack` : This is an optional parameter used to configure the probe packet's bth.ack field. The valid range is from 0 to 1.

- `-r|--rsvd7` : This is an optional parameter used to configure the probe response packet's bth.rsvd7 field. The valid range is from 0 to 127.

EXAMPLES :

To show the UDCC IFA 2.0 (Inband Flow Analyzer) details

1) `niccli -i 1 udcc --probe --show`

```

Probe Packet Pad Count      : 0
Probe Format                 : MAD
BTH header Ack              : 1
BTH header rsvd7           : 64
Global Name Space          : 15
Hop Limit                   : 10
Request Vector              : 0

```

To set the UDCC probe packet pad count and format parameters

1) `niccli -i 1 udcc --probe --set --format 1 --pad_cnt 1`

UDCC parameters configured successfully.

Note: Changing the UDCC probe type can result in incompatibility with the UDCC program running currently. In case of such incompatibility: the UDCC program will be disabled. Installing a compatible UDCC program package matching the configured probe type will be required to activate the UDCC program and enable it.

To set the UDCC probe packet parameters with BTH ack and rsvd7

1) `niccli -i 1 udcc --probe --set --ack 1 --rsvd7 2`

UDCC parameters configured successfully.

Note: Changing the UDCC probe type can result in incompatibility with the UDCC program running currently. In case of such incompatibility the UDCC program will be disabled. Installing a compatible UDCC program package matching the configured probe type will be required to activate the UDCC program and enable it.

To set the UDCC probe IFA parameters

1) `niccli -i 1 udcc --probe --set --format 1 --gns 15 --hop_limit 255 --req_vec 255`

UDCC parameters configured successfully.

Note: Changing the UDCC probe type can result in incompatibility with the UDCC program running currently. In case of such incompatibility the UDCC program will be disabled. Installing a compatible UDCC program package matching the configured probe type will be required to activate the UDCC program and enable it.

To set all UDCC probe parameters

- 1) `niccli -i 1 udcc --probe --set --format 1 --pad_cnt 1 --gns 15 --hop_limit 255 --req_vec 255 --ack 1 --rsvd7 2`

UDCC parameters configured successfully.

Note: Changing the UDCC probe type can result in incompatibility with the UDCC program running currently. In case of such incompatibility the UDCC program will be disabled. Installing a compatible UDCC program package matching the configured probe type will be required to activate the UDCC program and enable it

RoCE commands

=====

DESCRIPTION :

Query and configure the congestion notification and TOS DSCP parameters

SYNTAX :

```
roce --cnp --show
roce --cnp --set [--state <0/1>] --dscp <value> -p|--priority <value> -E|--tos-ecn <value>
roce --stats --show
roce --set -T|--tos-dscp <value>
```

OPTIONS :

```
--show      : Gets parameters of the bnxtroce driver.
--set       : Sets congestion notification parameters for the bnxtroce driver.
--state     : congestion control Disable(0)/enable(1) setting
--dscp      : DSCP value for congestion notification packets (0-0x3F, default: 0).
-p|--priority : priority value for congestion notification packets.
-E|--tos-ecn  : IP TOS ECN value settings 1 (0x1b) , 2(0x10b).
--stats     : Gets the stats for the NIC
-T|--tos-dscp : IP TOS DSCP value for RoCEv2 Traffic
```

EXAMPLES :

To display the cnp parameter

- 1) `esxcli niccli roce --dev -v vmnic4 --cnp --show`

```
Status      : Disabled
TOS ECN     : 0x1
TOS DSCP    : 0x0
Priority     : 0x0
```

To configure the cnp parameters

- 1) `esxcli niccli roce --dev -v vmnic4 --cnp --set --dscp 0 --state 0 -E 1`

Command executed successfully.

To display the stats of bnxtroce driver

- 1) `esxcli niccli roce --dev -v vmnic4 --stats --show`

```
port_id: 0
qp_cnt: 1
qp_reset_cnt: 0
qp_init_cnt: 0
qp_rtr_cnt: 0
qp_rts_cnt: 0
qp_sqd_cnt: 0
qp_sqe_cnt: 0
qp_err_cnt: 0
qp_event_cnt: 0
cq_cnt: 1
cq_event_cnt: 0
srq_cnt: 0
srq_event_cnt: 0
pd_cnt: 1
mr_cnt: 3
ah_cnt: 0
mw_cnt: 0
to_retransmits: 0
seq_err_naks_rcvd: 0
max_retry_exceeded: 0
rnr_naks_rcvd: 0
missing_resp: 0
unrecoverable_err: 0
```

```
bad_resp_err: 0
local_qp_op_err: 0
local_protection_err: 0
mem_mgmt_op_err: 0
remote_invalid_req_err: 0
remote_access_err: 0
remote_op_err: 0
dup_req: 0
res_exceed_max: 0
res_length_mismatch: 0
res_exceeds_wqe: 0
res_opcode_err: 0
res_rx_invalid_rkey: 0
res_rx_domain_err: 0
res_rx_no_perm: 0
res_rx_range_err: 0
res_tx_invalid_rkey: 0
res_tx_domain_err: 0
res_tx_no_perm: 0
res_tx_range_err: 0
res_irrq_oflow: 0
res_unsup_opcode: 0
res_unaligned_atomic: 0
res_rem_inv_err: 0
res_mem_error: 0
res_srq_err: 0
res_cmp_err: 0
res_invalid_dup_rkey: 0
res_wqe_format_err: 0
res_cq_load_err: 0
res_srq_load_err: 0
res_tx_pci_err: 0
res_rx_pci_err: 0
tx_atomic_req_ext: 0
tx_read_req_ext: 0
tx_read_res_ext: 0
tx_write_req_ext: 0
tx_send_req_ext: 0
tx_roce_pkts_ext: 0
tx_roce_bytes_ext: 0
rx_atomic_req_ext: 0
rx_read_req_ext: 0
rx_read_res_ext: 0
rx_write_req_ext: 0
rx_send_req_ext: 0
```

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```
rx_roce_pkts_ext: 0
rx_roce_bytes_ext: 0
rx_roce_good_pkts_ext: 0
rx_roce_good_bytes_ext: 0
rx_out_of_buffer_ext: 0
rx_out_of_sequence_ext: 0
tx_cnp_pkts_ext: 0
rx_cnp_pkts_ext: 0
tx_cnp_bytes_ext: 0
rx_cnp_bytes_ext: 0
rx_ecn_marked_ext: 0
ctx_tx_pkts_ext: 0
ctx_tx_bytes_ext: 0
ctx_rx_pkts_ext: 0
ctx_rx_bytes_ext: 0
ctx_rx_ucast_pkts: 0
ctx_rx_mcast_pkts: 0
ctx_rx_bcast_pkts: 0
ctx_rx_discard_pkts: 0
ctx_rx_error_pkts: 0
ctx_rx_ucast_bytes: 0
ctx_rx_mcast_bytes: 0
ctx_rx_bcast_bytes: 0
ctx_tx_ucast_pkts: 0
ctx_tx_mcast_pkts: 0
ctx_tx_bcast_pkts: 0
ctx_tx_discard_pkts: 0
ctx_tx_error_pkts: 0
ctx_tx_ucast_bytes: 0
ctx_tx_mcast_bytes: 0
ctx_tx_bcast_bytes: 0
ctx_rx_tpa_eligible_pkt: 0
ctx_rx_tpa_eligible_bytes: 0
ctx_rx_tpa_pkt: 0
ctx_rx_tpa_bytes: 0
ctx_rx_tpa_errors: 0
[0] num_ints: 13402
[1] num_ints: 0
[2] num_ints: 0
[3] num_ints: 0
[4] num_ints: 0
[5] num_ints: 0
[6] num_ints: 0
```

To configure the information of bnxtroce driver

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1) `esxcli niccli roce --dev -v vmnic4 --set --tos-dscp 0x1`

Command executed successfully.

NOTE: This command is supported only in VmWare OS.

9. VMware plugin command mapping table

From the VMWare version ESXi8.0 onwards niccli is signed to support the VMWare plugin standards in secure and non-secure mode. Below is the mapping table of niccli commands.

Category	Unsigned niccli commands	Signed niccli commands
Generic commands	<code>niccli -v --version</code>	<code>esxcli niccli version</code>
	<code>niccli -l --list</code>	<code>esxcli niccli list</code>
	<code>niccli -d --list_devices</code>	<code>esxcli niccli listdevices</code>
	<code>niccli -e --list_ethernet</code>	<code>esxcli niccli listethernet</code>
	<code>niccli devid</code>	<code>esxcli niccli devid</code>
nvm	<code>niccli -i <index> nvm --view [-V] [-f <firmware package file name>] [-t --type <nvm directory name>]</code>	<code>esxcli niccli nvm -c i -v <index> --view [-y -verbosity] [-f --filename=<str>] [-t --type=<str>]</code>
	<code>niccli -i <index> nvm l --list [-V] [-f <firmware package file name>]</code>	<code>esxcli niccli nvm -c i -v <index> -l --list [-y -verbosity] [-f --filename=<str>]</code>
	<code>niccli -i <index> nvm --verify [-V] [-f <firmware package file name>]</code>	<code>esxcli niccli nvm -c i -v <index> --verify [-y --verbosity] [-f --filename=<str>]</code>
	<code>niccli -i <index> nvm -n --sync</code>	<code>esxcli niccli nvm -c i -v <index> -n --sync</code>
	<code>niccli -i <index> nvm -F --restore_factory_defaults [--silent]</code>	<code>esxcli niccli nvm -c i -v <index> -F --restore-factory-defaults</code>
	<code>niccli -i <index> nvm -r --dir_read -f <file name> -t --type <nvm directory name></code>	<code>esxcli niccli nvm -c i -v <index> -r --dir-read -f --filename=<str> -t --type=<str></code>

	niccli -i <index> nvm w --dir_write -f <file name> -t --type <nvm directory name>	esxcli niccli nvm -c i -v <index> -w --dir-write -f --filename=<str> -t --type=<str>
	niccli -i <index> nvm -S --saveoptions -f <file name>	esxcli niccli nvm -c i -v <index> -d --saveoptions -f --filename=<str>
	niccli -i <index> nvm -O --optionhelp <option name>	esxcli niccli nvm -c i -v <index> -o --optionhelp=<str>
	niccli -i <index> nvm -g --getoption <option name> [--scope <scope index>]	esxcli niccli nvm -c i -v <index> -g --getoption -N --optionname=<str> [--scope=<str>]
	niccli -i <index> nvm -s --setoption <option names with comma separated> -v --value <option value with comma separated> [--scope <scope index>]	esxcli niccli nvm -c i -v <index> -s --setoption=<str> -u --value=<str> [--scope=<str>]
	niccli -i <index> nvm -b --backup [--cfg]	esxcli niccli nvm -c i -v <index> -b --backup [--cfg]
	niccli -i <index> nvm -D --defrag	esxcli niccli nvm -c i -v <index> -D --defrag
	niccli -i <index> nvm -L --listoptions --diff	esxcli niccli nvm -c i -v <index> -a --listoptions --diff
	niccli -i <index> nvm --dump <-o --offset> <val> <--length> <val> > -f <filename>	esxcli niccli nvm -c i -v <index> --dump -m --offset=<str> -q --length=<str> -f --filename=<str>
fw	niccli -i <index> fw <-u --update> -f <package file> [--force] [-y --yes]	esxcli niccli fw -c i -v <index> -u --update -f --packagefile=<str> [--force] [-y --yes]
	niccli -i <index> fw --reset	esxcli niccli fw -c i -v <index> --reset
	niccli -i <index> fw <-l --livepatch> <--show>	esxcli niccli fw -c i -v <index> -p --livepatch --show
	niccli -i <index> fw <-l --livepatch> <-a --activate> [target_fw]	esxcli niccli fw -c i -v <index> -p --livepatch -a --activate [-w --targetfw=<str>]
	niccli -i <index> fw <-l --livepatch> <-d --deactivate> [target_fw]	esxcli niccli fw -c i -v <index> -p --livepatch -d --deactivate [-w --targetfw=<str>]
	niccli -i <index> fw <-l --livepatch> <-p --patch_update> [target_fw] -f <patch file>	esxcli niccli fw -c i -v <index> -p --livepatch -t --patchupdate [-w --targetfw=<str>] -f --packagefile=<str>

qos	niccli -i <index> qos <-E --ets> --show	esxcli niccli qos -c i -v <index> -E --ets --show
	niccli -i <index> qos <-n --ingress> --cosq --show [-p --persistent]	esxcli niccli qos -c i -v <index> -i --ingress --cosq --show [-p --persistent]
	niccli -i <index> qos <-n --ingress> --cosq --set --state <value> [--mode <value>] [-p --persistent]	esxcli niccli qos -c i -v <index> -i --ingress --cosq --set --state=<str> [--mode=<str>] [-p --persistent]
	niccli -i <index> qos <-e --egress> --cosq --show [-p --persistent]	esxcli niccli qos -c i -v <index> -r --egress --cosq --show [-p --persistent]
	niccli -i <index> qos <-e --egress> --cosq --set --state <value> [-p --persistent]	esxcli niccli qos -c i -v <index> -r --egress --cosq --set --state=<str> [-p --persistent]
	niccli -i <index> qos -g --timed_tx_pacing_rate_profile --show	esxcli niccli qos -c i -v <index> -g --timed-tx-pacing-rate-profile --show
	niccli -i <index> qos --roce_app_pri --set --pri <0-7>	esxcli niccli qos -c i -v <index> --roce-app-pri --set --pri=<str>
linkdiag	niccli -i <index> linkdiag -T --txfir --show <-M --modulation_type> <mod_type> <-l --lane> <lane_number>	esxcli niccli linkdiag -c i -v <index> -T --txfir --show -M --modulation-type=<str> -n --lane=<long>
	niccli -i <index> linkdiag -T --txfir --set <-M --modulation_type> <mod_type> <-l --lane> <lane_mask> --pre1 <value> --pre2 <value> [--pre3 <value>] --main <value> --post1 <value> --post2 <value> [--post3 <value>] --amp <value> --nlcl <value> --nlcu <value>]	esxcli niccli linkdiag -c i -v <index> -T --txfir --set -M --modulation-type=<str> -n --lane=<long> --pre1=<str> --pre2=<str> [--pre3=<str>] --main=<str> --post1=<str> --post2=<str> [--post3=<str>] --amp=<str> --nlcl=<str> --nlcu=<str>]
	niccli -i <index> linkdiag -F --fdrstat [--start] [--stop] [--clear] [--counters]	esxcli niccli linkdiag -c i -v <index> -F --fdrstat [--start] [--stop] [--clear] [--counters]
	niccli -i <index> linkdiag -D --dscdump -l --lane <lane_number> [-a --diag_level <level>]	esxcli niccli linkdiag -c i -v <index> -D --dscdump -n --lane=<long> [-a --diag-level=<long>]
cable	niccli -i <index> cable -m --module_info --show	esxcli niccli cable -c i -v <index> -m --module-info --show

	niccli -i <index> cable -r --read_module_eeprom -p --page_number <page number> -o --offset <byte offset> -l --length <number of bytes> -b --bank <bank number> -i --i2c_address <i2c addr>]	esxcli niccli cable -c i -v <index> -r --read-module-eeprom -p --page-number=<str> -o --offset=<str> -l --length=<str> b --bank=<str> -i --i2c-address=<str>
	niccli -i <index> cable -w --write_module_eeprom -p --page_number <page number> -o --offset <byte offset> -v --value <bytes>	esxcli niccli cable -c i -v <index> -w --write-module-eeprom -p --page-number=<str> -o --offset=<str> -a --value=<str>
	niccli -i <index> cable -M --module_loopback -t --loopback_type <type> [--lane <module_lane_mask>]	esxcli niccli cable -c i -v <index> -M --module-loopback -t --loopback-type=<long> [--lane=<str>]
	niccli -i <index> cable -P --power <0/1>	esxcli niccli cable -c i -v <index> --power=<long>
	niccli -i <index> cable -T --tx_disable <0/1>	esxcli niccli cable -c i -v <index> -T --tx-disable=<long>
link	niccli -i <index> link -s --status	esxcli niccli link -c i -v <index> -s --status
	niccli -i <index> link -c --counters --show	esxcli niccli link -c i -v <index> -o --counters --show
	niccli -i <index> link -p --port_state <port state value>	esxcli niccli link -c i -v <index> -p --portstate=<port state value>
	niccli -i <index> link -S --port_speed [--speed <value>] [--lanes <number_of_lanes>] -a --autoneg <on/off> [--fec <value>] [-t --training <on/off>]	esxcli niccli link -c i -v <index> -S --port-speed [--speed=<str>] [--lanes=<str>] -a --autoneg=<str> [--fec=<str>] [-t --training=<str>]
	niccli -i <index> link -P --precoding <enable/disable>	esxcli niccli link -c i -v <index> -P --precoding=<str>
	niccli -i <index> link -r --fec_force <0/1>	esxcli niccli link -c i -v <index> -r --fec-force=<long>
timesync	niccli -i <index> timesync <-d --dutycycle> <--period> <value> --up <value>	esxcli niccli timesync -c i -v <index> -d --dutycycle --period=<str> --up=<str>
	niccli -i <index> timesync <--dll> <-s --source> <value> <-q --frequency> <value>	esxcli niccli timesync -c i -v <index> --dll -o --source=<value> -q --frequency=<value>
	niccli -i <index> timesync <--ptp> --	esxcli niccli timesync -c i -v <index> -p --

	show	ptp --show
	niccli -i <index> timesync <--ptp> --set <-p --primary_pf> <pid> [<-v --primary_vf> <vfid>] [<-P --secondary_pf> <pfid>] [<-V --secondary_vf> <vfid>]	esxcli niccli timesync -c i -v <index> -p --ptp --set -r --primarypf=<str> [-x --primaryvf=<str>] [-z --secondarypf=<str> -w --secondaryvf=<str>]
	niccli -i <index> timesync <--synce> --show	esxcli niccli timesync -c i -v <index> -y --synce --show
	niccli -i <index> timesync <--synce> --set <-Q --frequency_profile> <value> [<-c --primary_clock_state> <value>] [<-C --secondary_clock_state> <value>]	esxcli niccli timesync -c i -v <index> -y --synce --set -b --frequency-profile=<str> [-u --primary-clock-state=<str>] [-C --secondary-clock-state=<str>]
	niccli -i <index> timesync <--tsio> --show	esxcli niccli timesync -c i -v <index> --tsio --show
	niccli -i <index> timesync <--tsio> <-t --tsio_function_pin> <idx> <-u --pin_usage_string> <value> <--state> <value>	esxcli niccli timesync -c i -v <index> --tsio -t --tsio-function-pin=<str> -k --pin-usage-string=<str> --state=<str>
counters	niccli -i <index> counters -p --pcie [-V]	esxcli niccli counters -c i -v <index> -p --pcie -V --verbosity
	niccli -i <index> counters -c --clear	esxcli niccli counters -c i -v <index> -a --clear
	niccli -i <index> counters -P --port [--dir <rx/tx>]	esxcli niccli counters -c i -v <index> -P --port --dir=<str>
	niccli -i <index> counters -r --roce	esxcli niccli counters -c i -v <index> -r --roce
	niccli -i <index> counters --l2	esxcli niccli counters -c i -v <index> --l2
show	niccli -i <index> show [-d --device_info]	esxcli niccli show -c i -v <index> [-i --device-info]
	niccli -i <index> show -p --pkg_ver [-f <firmware package file(s)>]	esxcli niccli show -c i -v <index> -p --pkg-ver [-f --filename=<str>]
	niccli -i <index> show -D --	esxcli niccli show -c i -v <index> -d --

	device_pci_ids [-f <firmware package file(s)>]	device-pci-ids [-f --filename=<str>]
	niccli -i <index> show -c --certificate [-s --slot <number>]	esxcli niccli show -c i -v <index> -R --certificate [s --slot=<value>]
	niccli -i <index> show -n --nvm_measurement	esxcli niccli show -c i -v <index> -n --nvm-measurement
	niccli -i <index> show --all	esxcli niccli show -c i -v <index> --all
	niccli -i <index> show --health	esxcli niccli show -c i -v <index> --health
	niccli -i <index> show -r --recommendations [--pcie] [-V]	esxcli niccli show -c i -v <index> -r --recommendations [--pcie] [-V --verboselevel]
tunnel	niccli -i <index> tunnel --cfg --vxlan <-t --type> <ipv4 ipv6> --show	esxcli niccli tunnel -c i -v <index> --cfg --vxlan -t --type=<str> --show
	niccli -i <index> tunnel --cfg --vxlan <--add> <-t --type> <ipv4 ipv6> <-p --dest_port> <value>	esxcli niccli tunnel -c i -v <index> --cfg --vxlan --add -t --type=<str> -p --destport=<long>
	niccli -i <index> tunnel --cfg --vxlan <--del> <-t --type> <ipv4 ipv6> <-p --dest_port> <value>	esxcli niccli tunnel -c i -v <index> --cfg --vxlan --del -t --type=<str> -p --destport=<long>
	niccli -i <index> tunnel --cfg <--rss> --show	esxcli niccli tunnel -c i -v <index> --cfg --rss --show
	niccli -i <index> tunnel --cfg <--rss> --set <--mode> <inner/outer>	esxcli niccli tunnel -c i -v <index> --cfg --rss --set --mode=<str>
	niccli -i <index> tunnel --cfg <-g --gre_tunnel_offload> --show	esxcli niccli tunnel -c i -v <index> --cfg -g --gre-tunnel-offload --show
	niccli -i <index> tunnel --cfg <-g --gre_tunnel_offload> --set --state <enable/disable>	esxcli niccli tunnel -c i -v <index> --cfg -g --gre-tunnel-offload --set --state=<str>
ring resource configuration	niccli -i <index> resmgmt [--pf/--all] [<-p --profile> <--min> <--max> <-r --roce_max> <-m --max_completion_rings> <-s --strategy>] --show	esxcli niccli resmgmt -c i -v <index> [--pf --all] [<-p --profile> --min --max <-r --roce-max> <-m --max-completion-rings> <-s --strategy>] --show

	niccli -i <index> resmgmt [--pf/--all] --set [<-p --profile> <--min> <--max> <-r --roce_max> <-m --max_completion_rings>] [< --bw <bandwidth of each pf with comma separated>] [< -s --strategy > <minimal/maximal/minimal-static>]	esxcli niccli resmgmt -c i -v <index> [--pf/--all] --set [<-p --profile> --min --max <-r --roce-max> <m --max-completion-rings>] [-b --bw=<str>] [<-s --strategy> -y --strategyto=<str>]
Congestion Control Configuration	niccli -i <index> ccparams -d --dump	esxcli niccli ccparams -c i -v <index> -d --dump
	niccli -i <index> ccparams --set -f <configuration file>	esxcli niccli ccparams -c i -v <index> --set -f --configfile=<str>
debug	niccli -i <index> debug -c --coredump [-l --l1cc] [-f <file name>]	esxcli niccli debug -c i -v <index> -r --coredump [-L --l1cc] [-f --filename=<str>]
	niccli -i <index> debug -s --snapdump [-f <file name>]	esxcli niccli debug -c i -v <index> -s --snapdump [-f --filename=<str>]
	niccli -i <index> debug -D --drv_dbg_mask --show -T --drv_type <value>	esxcli niccli debug -c i -v <index> -D --drv-dbg-mask --show -T --drv-type=<str>
	niccli -i <index> debug -D --drv_dbg_mask --value <value> -T --drv_type <value>	esxcli niccli debug -c i -v <index> -D --drv-dbg-mask --value=<str> -T --drv-type=<str>
PCIe operations command	niccli -i <index> pcie <-c --compliance> --state <0/1>	esxcli niccli pcie -c i -v <index> -C --compliance --state=<str>
	niccli -i <index> pcie <-c --compliance> --show	esxcli niccli pcie -c i -v <index> -C --compliance --show
RoCE commands	niccli -i <index> roce --cnp --show	esxcli niccli roce -c i -v <index> --cnp --show
	niccli -i <index> roce --cnp --set [--state <0/1>] --dscp <value> -p --priority <value> -E --tos_ecn <value>	esxcli niccli roce -c i -v <index> --cnp --set --dscp=<str> --priority=<str> --state=<str> -E --tos-ecn=<str>
	niccli -i <index> roce --stats --show	esxcli niccli roce -c i -v <index> --stats --show
	niccli -i <index> roce --set -T --tos_dscp <value>	esxcli niccli roce -c i -v <index> --set -T --tos-dscp=<str>

