

Broadcom CLP Interface

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Revision History

Version	Date	Auth	Description
0.01	08/06/2007	KTT	Origin
0.02	01/22/2008	JW	Update Parameter Names and descriptions. Add interface info.
1.00	08/21/2008	KTT	Update due to new parameters and implementation changes
1.01	12/19/2008	JW	Update due to new parameter – Secondary Target Name
1.02	05/18/2009	JW	Update due to new parameters
1.03	06/16/2009	JW	Update due to new parameter – Link Tuning Parameters
1.04	10/19/2009	JW	Update due to new parameters
1.05	10/22/2009	JW	Update due to new parameter - MutualUsername
1.06	05/03/2011	LX	Added FCoE and NIC Partitioning configuration parameters.

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1. Introduction

1.1 Scope

This document describes and defines the DMTF SMCLP (Server Management Command Line Protocol) specification v1.0.1a based parameter passing interface created by Broadcom for the NetXtremeII® product software drivers and firmware, specifically the iSCSI Boot & MBA drivers.

1.2 Interfaces

1.2.1 DMTF SMCLP

The DMTF Server Management Command Line Protocol (CLP) is a text based command/response protocol and scriptable command line syntax defined by the DMTF. For the scope of this document it is a text based message or parameter passing interface syntax that is used for driver configuration, instrumentation and gathering driver information. It may be used by a system BIOS in a system setup or configuration program or by network management software applications.
The CLP syntax is not case sensitive.

The basic CLP syntax can be described as follows:

<VERB> [<OPTIONS>] [<TARGET>] [<PROPERTIES>]

Where VERB is a specific command such as “set” or “show” among others
Where OPTIONS are VERB switches or modifiers
Where TARGET is the specified device that the command is acted upon
Where PROPERTIES are the device features to/from which values are moved

For example:
set netport1 OEMHP_Vlan=100

The DMTF SMCLP v1.0.1a specification can be found on the DMTF website:
http://www.dmtf.org/standards/published_documents/DSP0214.pdf

1.2.2 PCI Firmware Specification Revision 3.0

The DMTF SMCLP Entry point is described and defined in PCI Firmware Specification Revision 3.0 and the accompanying PCI Option ROM CLP Final ECN documents. The expected input arguments for the SMCLP Entry point are described in Table 5-5 and reproduced for convenience:

Table 5-5: Input Arguments for SM CLP Entry Point

Argument Number	Register	Meaning
1	[AH]	Bus number
2	[AL]	Upper 5 bits are the Device number
3	[AL]	The lower 3 bits are the Function number
4	[ES:EDI]	Pointer to NULL-terminated SM CLP Command Line string buffer
5	[DS:ESI]	Pointer to SM CLP Command Response string Buffer

The expected output arguments for the SM CLP Entry point are described in Table 5-6 and reproduced below for convenience:

Table 5-6: Output Arguments for SM CLP Entry Point

Argument Number	Register	Meaning
1	[AH]	If [AL] = 2 (COMMAND_PROCESSING_FAILED) the contents of [AH] are derived from the SM CLP Processing Error Value (see SM CLP Specification – Table 6: Processing Error Values and Tags). If [AL] = 3 (COMMAND_EXECUTION_FAILED) the contents of [AH] are derived from the SM CLP CIM Status Code Values (see SM CLP Specification – Table 9: CIM Status Code Values and Descriptions)
2	[AL]	SM CLP Command Status (see SM CLP Specification – Table 4: Command Status Values and Tags)
3	[EAX]	Bit 31: OEM Code Flag 0 = Execution Code is an SM CLP Probable Cause Value (see SM CLP Specification Table 11: Probable Cause Values and Descriptions) 1 = Execution Code is an OEM Specific value
4	[EAX]	Bits 30-16: Execution code
5	[ES:EDI]	Pointer to NULL-terminated SM CLP Command Line string buffer
6	[DS:ESI]	Pointer to NULL-terminated SM CLP Command Response string buffer

The PCI Firmware Specification Revision 3.0 can be found on the PCI SIG website:
http://www.pcisig.com/members/downloads/specifications/conventional/pcifw_r3_0_updated.pdf

The PCI Option ROM CLP Final ECN document can be found on the PCI SIG website:
http://www.pcisig.com/specifications/conventional/pci_firmware/PCIFW30_CLP_1_0_071906.pdf

2. General ISCSI Parameters

By default all parameters are initially set to their corresponding values stored in the NVRAM. Any updated parameter value will take precedence over the default value.

2.1 Network Params DHCP

set <target> OEM<vendor>_NetworkParamsDHCP = <ENABLED|DISABLED>

Description - Controls whether the iSCSI boot host software acquires the IPv4 address information using DHCP (Enabled) or through a static IP configuration (Disabled). This parameter should not be used in conjunction with IpAutoconfiguration (2.12) or IPv6 Router Advertisement (2.13).
Values – ENABLED |DISABLED
Example - set netport1 OEMHP_NetworkParamsDHCP=ENABLED

2.2 iSCSI Params DHCP

set <target> OEM<vendor>_iSCSIParamsDHCP=<ENABLED|DISABLED>

Description - Controls whether the iSCSI boot host software acquires its iSCSI target parameters using DHCP (Enabled) or through a static configuration (Disabled).
Values - ENABLED | DISABLED
Example - set netport1 OEMHP_iSCSIParamsDHCP=ENABLED

2.3 CHAP Authentication

set OEM<vendor>_ChapAuth=<ENABLED|DISABLED>

Description - Controls whether the iSCSI boot host software uses CHAP authentication when connecting to the iSCSI target. Mutual CHAP occurs dynamically if during the CHAP process, the target CHAP configuration is available to the initiator.
Values - ENABLED | DISABLED
Example - set netport1 OEMHP_ChapAuth=DISABLED

2.4 Boot to iSCSI target

set <target> OEM<vendor>_BootToTarget=<ENABLED|DISABLED|ONE TIME DISABLED>

Description - Controls whether the iSCSI boot host software attempts to boot from the iSCSI target after successfully connecting to it. When this option is enabled, the iSCSI boot host software immediately attempts to boot from the iSCSI target image. Otherwise, if disabled, the iSCSI boot host software does not attempt to boot from the iSCSI target and control returns to the system BIOS so that the next boot device may be used. This option is useful when performing installations directly to an iSCSI target.
Values - ENABLED | DISABLED | ONE TIME DISABLED
Example - set netport1 OEMHP_BootToTarget=ENABLED

2.5 DHCP Vendor ID

set <target> OEM<vendor>_DhcpVendorId=< String up to 32 characters >

Description – Controls how the iSCSI boot host software interprets the Vendor Class ID field used during DHCP. If the Vendor Class ID field in the DHCP Offer packet matches the value in the field, the iSCSI boot host software looks into the DHCP Option 43 fields for the required iSCSI boot extensions.
Values – String up to 32 characters
Example – set netport1 OEMHP_DhcpVendorId=BRCMISAN

2.6 Link Up Delay Time

set <target> OEM<vendor>_LinkUpDelay=<decimal number>

Description - Controls how long the iSCSI boot host software waits, in seconds, after an Ethernet link is established before sending any data over the network.
Values – 0 - 255
Example – set netport1 OEMHP_LinkUpDelay=60

2.7 Use TCP Timestamp

set <target> OEM<vendor>_UseTcpTimeStamp=<ENABLED|DISABLED>

Description – Controls if the TCP Timestamp option is enabled or disabled.
Values - ENABLED | DISABLED
Example - set netport1 OEMHP_UseTcpTimeStamp=DISABLED

2.8 Target as First HDD

set <target> OEM<vendor>_TargetAsFirstHDD=<ENABLED|DISABLED>

Description - Allows specifying that the iSCSI target drive will appear as the first hard drive in the system.
Values – ENABLED | DISABLED
Example – set netport1 OEMHP_TargetAsFirstHDD=ENABLED

2.9 LUN Busy Retry Count

set <target> OEM<vendor>_LunBusyRetries=<decimal number>

Description - Controls the number of connection retries the iSCSI Boot initiator will attempt if the iSCSI target LUN is busy.
Values – 0 - 60.
Example – set netport1 OEMHP_LunBusyRetries=60

2.10 Windows HBA Boot Mode

set <target> OEM<vendor>_WindowsHbaMode=<ENABLED|DISABLED>

Description – If this option is enabled, the iSCSI Boot initiator will boot using the iSCSI offload path. If this option is disabled, the iSCSI Boot initiator will boot using the non-offload path (with MSFT iSCSI initiator and NDIS).
Values – ENABLED|DISABLED
Example – set netport1 OEMHP_WindowsHbaMode=DISABLED

2.11 IP Version

set <target> OEM<vendor>_IpVersion=<IPv4|IPv6>

Description – Controls the Internet Protocol version used by the iSCSI Boot initiator.
Values – IPv4|IPv6
Example – set netport1 OEMHP_IpVersion=IPv6

2.12 IP Autoconfiguration

set <target> OEM<vendor>_IpAutoconfiguration = <ENABLED|DISABLED>

Description - Controls whether the iSCSI boot host software should acquire the IPv6 address information using Stateful/Stateless autoconfiguration(Enabled) or through a static IP configuration(Disabled). This parameter should not be used in conjunction with Network Params DHCP (2.1).
Values – ENABLED | DISABLED
Example - set netport1 OEMHP_IpAutoconfiguration=ENABLED

2.13 IPv6 Router Advertisement

set <target> OEM<vendor>_RadvIPv6 = <ENABLED|DISABLED>

Description - Controls whether the iSCSI boot host software should acquire the IPv6 address information using Stateful/Stateless autoconfiguration(Enabled) or through a static IP configuration(Disabled). This parameter should not be used in conjunction with Network Params DHCP (2.1).
Values – ENABLED | DISABLED
Example - set netport1 OEMHP_RadvIPv6=ENABLED

2.14 CHAP Authentication Method

set OEM<vendor>_authenticationMethod=<None|CHAP|MutualCHAP>

Description - Controls whether the iSCSI boot host software uses authentication when connecting to the iSCSI target. The available authentication methods are: None, CHAP, and Mutual CHAP.
Values – None|CHAP|MutualCHAP
Example - set netport1 OEMHP_authenticationMethod=CHAP

3. ISCSI Initiator Parameters

By default all parameters are initially set to their corresponding values stored in the NVRAM. Any updated parameter value will take precedence over the default value.

3.1 IP Address

set <target> OEM<vendor>_InitiatorIP=<IPv4|IPv6 Address>

Description – Static IP Address of iSCSI initiator
Values – IPv4 Address(Dotted-decimal notation) | IPv6 Address
Example – set netport1 OEMHP_InitiatorIP=60.2.1.80
Example – set netport1 OEMHP_InitiatorIP=fe80::210:18ff:fe04:24bc

3.2 Subnet Mask

set <target> OEM<vendor>_InitiatorNetmask=<subnet mask>

Description – Static IPv4 Subnet Mask of iSCSI Initiator. This parameter should not be used in conjunction with Subnet Mask Prefix (3.9) or IPv6 Netmask (3.10).
Values – IPv4 subnet mask(Dotted-decimal notation)
Example – set netport1 OEMHP_InitiatorNetmask=255.255.0.0

3.3 Default Gateway

set <target> OEM<vendor>_InitiatorRoute=<IPv4|IPv6 Address>

Description – Static IP Gateway of iSCSI Initiator
Values – IPv4 Address(Dotted decimal notation) | IPv6 Address
Example – set netport1 OEMHP_InitiatorRoute=60.2.1.254

3.4 Primary DNS

set <target> OEM<vendor>_PrimaryDNS=<IPv4| IPv6 Address>

Description – Static Primary DNS IP Address of iSCSI Initiator
Values – IPv4 Address(Dotted decimal notation) | IPv6 Address
Example – set netport1 OEMHP_PrimaryDNS=60.2.1.20

3.5 Secondary DNS

set <target> OEM<vendor>_SecondaryDNS=<IPv4|IPv6 Address>

Description – Static Secondary DNS IP Address of iSCSI Initiator
Values – IPv4 Address(Dotted decimal notation) | IPv6 Address
Example – set netport1 OEMHP_SecondaryDNS=60.2.1.20

3.6 iSCSI Name

set <target> OEM<vendor>_InitiatorName=<String up to 128 characters>

Description – iSCSI Initiator name.
Values – String up to 128 characters
Example – set netport1 OEMHP_InitiatorName=iqn.1995-05.com.broadcom.iscsiboot

3.7 CHAP ID

set <target> OEM<vendor>_UserName=<String up to 128 bytes>

Description – iSCSI Initiator CHAP ID. Applicable if CHAP authentication is enabled.
Values – String up to 128 bytes
Example – set netport1 OEMHP_UserName=initiatorChapId

3.8 CHAP Secret

set <target> OEM<vendor>_Secret=<String between 12 – 16 characters>

Description – iSCSI Initiator CHAP secret. Applicable if CHAP authentication is enabled.
Values – String between 12 – 16 characters
Example – set netport1 OEMHP_Secret=secret123456

3.9 Subnet Mask Prefix

set <target> OEM<vendor>_InitiatorNetmaskPrefix=<decimal number>

Description – Static IPv6 subnet mask prefix length. This parameter should not be used in conjunction with Subnet Mask (3.2).
Values – 0 – 128
Example – set netport1 OEMHP_InitiatorNetmaskPrefix=64

3.10 IPv6 NetMask

set <target> OEM<vendor>_IPv6Netmask=<decimal number>

Description – Static IPv6 subnet mask prefix length. This parameter should not be used in conjunction with Subnet Mask (3.2).
Values – 0 – 128
Example – set netport1 OEMHP_IPv6Netmask=64

4. ISCSI 1st Target Parameters

By default all parameters are initially set to their corresponding values stored in the NVRAM. Any updated parameter value will take precedence over the default value.

4.1 Target Mode

set <target> OEM<vendor>_TargetMode=<ENABLED|DISABLED>

Description –Use the 1st target info to attempt an iSCSI Boot connection.
Values – ENABLED | DISABLED
Example – set netport1 OEMHP_TargetMode=DISABLED

4.2 IP Address

set <target> OEM<vendor>_TargetIp=<IPv4|IPv6 Address>

Description – Static IP address of iSCSI target
Values – IPv4 Address(Dotted-decimal notation) | IPv6 Address
Example – set netport1 OEMHP_TargetIp=60.2.1.60

4.3 TCP Port

set <target> OEM<vendor>_TargetPort=<decimal number>

Description – Static TCP port number of iSCSI target
Values – 1 - 65535
Example – set netport1 OEMHP_TargetPort=3260

4.4 Boot LUN

set <target> OEM<vendor>_TargetLun=<decimal number>

Description – Static boot LUN of iSCSI target
Values 0 - 255
Example – set netport1 OEMHP_TargetLun=0

4.5 iSCSI Name

set <target> OEM<vendor>_TargetName1=<String up to 128 characters>

Description – iSCSI name of 1st target
Values –String up to 128 characters
Example – set netport1 OEMHP_TargetName1=iqn.target1

4.6 CHAP ID

set <target> OEM<vendor>_TargetUserName=<String up to 128 characters>

Description – CHAP ID of iSCSI 1st target.
Values – string up to 128 characters
Example – set netport1 OEMHP_TargetUserName=Target1ChapId

4.7 CHAP Secret

set <target> OEM<vendor>_TargetSecret=<String between 12 – 16 characters>

Description – CHAP secret of 1st target. If present, Mutual CHAP authentication will be used. If absent, one-way CHAP authentication will be used.
Values – String between 12 – 16 characters
Example – set netport1 OEMHP_TargetSecret=target1secret

4.8 Target Name

set <target> OEM<vendor>_TargetName=<String up to 128 characters>

Description – iSCSI name of iSCSI targets. This parameter will set both 1st and 2nd target iSCSI name parameters to the same value.
Values –String up to 128 characters
Example – set netport1 OEMHP_TargetName=iqn.target12

4.9 LUN

set <target> OEM<vendor>_Lun=<decimal number|hexadecimal number>

Description – Static boot LUN of iSCSI targets. This parameter will set both 1st and 2nd target boot LUN parameters to the same value. Hexadecimal values must be preceded by "0x".
Values 0 – 255(in decimal or hexadecimal form)
Example – set netport1 OEMHP_Lun=0

4.10 CHAP Mutual Username

set <target> OEM<vendor>_MutualUsername=<String up to 128 characters>

Description – CHAP ID of iSCSI targets. This parameter will set both 1st and 2nd target CHAP IDs to the same value.
Values – string up to 128 characters
Example – set netport1 OEMHP_MutualUsername=TargetChapId

4.11 CHAP Mutual Secret

set <target> OEM<vendor>_mutualSecret=<String between 12 – 16 characters>

Description – CHAP secret of iSCSI targets. This parameter will set both 1st and 2nd target CHAP secret parameters to the same value.
Values – String between 12 – 16 characters
Example – set netport1 OEMHP_mutualSecret=targetsecret

5. ISCSI 2nd Target Parameters

By default all parameters are initially set to their corresponding values stored in the NVRAM. Any updated parameter value will take precedence over the default value.

5.1 Target Mode

set <target> OEM<vendor>_TargetMode2=<ENABLED|DISABLED>

Description –Use the 2nd target info to attempt an iSCSI Boot connection.
Values – ENABLED | DISABLED
Example – set netport1 OEMHP_TargetMode2=DISABLED

5.2 IP Address

set <target> OEM<vendor>_TargetIp2=<IPv4|IPv6 Address>

Description – Static IP address of iSCSI target.
Values – IPv4 Address(Dotted decimal notation) | IPv6 Address
Example – set netport1 OEMHP_TargetIp2=60.2.1.60

5.3 TCP Port

set <target> OEM<vendor>_TargetPort2=<decimal number>

Description – Static TCP port number of iSCSI target.
Values – 1 - 65535
Example – set netport1 OEMHP_TargetPort2=3260

5.4 Boot LUN

set <target> OEM<vendor>_TargetLun2=<decimal number>

Description – Static boot LUN of iSCSI target.
Values 0 - 255
Example – set netport1 OEMHP_TargetLun2=0

5.5 iSCSI Name

set <target> OEM<vendor>_TargetName2=<String up to 128 characters>

Description – iSCSI name of 2nd target.
Values –String up to 128 characters
Example – set netport1 OEMHP_TargetName2=iqn.target2

5.6 CHAP ID

set <target> OEM<vendor>_TargetUserName2=<String up to 128 characters>

Description – CHAP ID of iSCSI 2nd target.
Values – String up to 128 characters
Example – set netport1 OEMHP_TargetUserName2=Target2ChapId

5.7 CHAP Secret

set <target> OEM<vendor>_TargetSecret2=<String between 12 – 16 characters>

Description – 2nd target CHAP Password. If present, Mutual CHAP authentication will be used. If absent, one-way CHAP authentication will be used.
Values – String between 12 – 16 characters
Example – set netport1 OEMHP_TargetSecret2=target2secret

6. Secondary Device Info

By default all parameters are initially set to their corresponding values stored in the NVRAM. Any updated parameter value will take precedence over the default value.

6.1 Secondary Target Portal

set <target> OEM<vendor>_UseSecTargetPortal=<ENABLED|DISABLED>

Description – Configures if iSCSI Boot driver should use target portal of secondary interface. This allows iSCSI target to have two portals (different IP address and TCP port number).

Values – ENABLED | DISABLED
Example – set netport1 OEMHP_UseSecTargetPortal=DISABLED

6.2 Secondary Target Name

set <target> OEM<vendor>_UseSecTargetName=<ENABLED|DISABLED>

Description – Configures if iSCSI Boot driver should use target name of secondary interface. This allows iSCSI target to have two names (different iSCSI Names).

Values – ENABLED | DISABLED
Example – set netport1 OEMHP_UseSecTargetName=DISABLED

6.3 Secondary Device MAC Address

set <target> OEM<vendor>_SecondaryDevice=<12 hex digits>

Description – MAC Address of Secondary device.
Values – 12 hexadecimal digits
Example – set netport1 OEMHP_SecondaryDevice=001018040102

7. Ethernet & MBA Parameters

By default all parameters are initially set to their corresponding values stored in the NVRAM. Any updated parameter value will take precedence over the default value.

7.1 Permanent Address

set <target> OEM<vendor>_PermanentAddress=<12 hex digits>

Description – Ethernet MAC address for boot instance. This is a standard CLP string.
Values – 12 hexadecimal digits
Example – set netport1 OEMHP_PemanentAddresss=001018123456

7.2 Boot Protocol

set <target> OEM<vendor>_BootProtocol=<PXE|BOOTP|RPL|ISCSI|None>

Description – Boot protocol type
Values – PXE, BOOTP, RPL, ISCSI
Example – set netport1 OEMHP_BootProtocol=ISCSI

7.3 Banner Timeout

set <target> OEM<vendor>_BannerTimeout=<decimal number>

Description – Controls the amount of time the MBA Configuration Menu banner is displayed
Values – 0 - 14
Example – set netport1 OEMHP_BannerTimeout=5

7.4 VLAN

set <target> OEM<vendor>_Vlan=<decimal number>

Description – Determines VLAN ID tag. Setting this to a non-zero value will enable VLAN support.
Values – 0 - 4095
Example – set netport1 OEMHP_Vlan=100

7.5 Boot Enable

set <target> OEM<vendor>_BootEnable=<ENABLED|DISABLED>

Description – Controls whether this device is available as a bootable device.
Values – ENABLED| DISABLED
Example – set netport1 OEMHP_BootEnable=ENABLED

Note : User can also configure iSCSI boot option using netport2.

To disable iSCSI Boot
set netport2 OEMHP_BootEnable=Disabled
To enable iSCSI Boot
set netport2 OEMHP_BootEnable=Enabled

7.6 iSCSI MAC Address

set <target> OEM<vendor>_iScsiAddress=<12 hex digits>

Description – iSCSI MAC Address
Values – 12 hexadecimal digits
Example – set netport1 OEMHP_iScsiAddress=001018123457

Note : User can also configure iSCSI MAC address with the following command:
set netport2 OEMHP_PermanentAddress=0010181234567

7.7 Link Tuning Parameters

set <target> OEM<vendor>_LinkTuningParameters=
<TxLane0:TxLane1:TxLane2:TxLane3:RxLane0:RxLane1:RxLane2:RxLane3>

Description – Controls Tx pre-emphasis matrix coefficients and Rx equalizer matrix coefficients.
Values – Eight(8) 16-bit hexadecimal digits
Example – set netport1 OEMHP_LinkTuningParameters=1111:990:990:990:15:15:15:15
Note : This parameter is applicable to 10G devices only.

7.8 FCoE FIP MAC Address

set <target> OEM<vendor>_FCoEFipMACAddress=<FCoE Mac Address>

Description : Configure FCoE FIP MAC Address.
Values : 12 hexadecimal digits.
Restriction : None

Example : **set netport1 OEMHP_FCoEFipMACAddress=001018123457**

7.9 FCoE World Wide Port Name

set <target> OEM<vendor>_FCoEWWPN=<FCoE WWPN>

Description : Configure FCoE WWPN.
Values : 16 hexadecimal digits.
Restriction : None
Example : **set netport1 OEMHP_FCoEWWPN=2000001018123457**

7.10 FCoE World Wide Node Name

set <target> OEM<vendor>_FCoEWWNN=<FCoE WWNN>

Description : Configure FCoE WWNN.
Values : 16 hexadecimal digits.
Restriction : None
Example : **set netport1 OEMHP_FCoEWWNN=1000001018123457**

8. NIC Partitioning Parameters

8.1 NIC Partitioning Enable

```
set <target> OEM<vendor>_NparMode=<Enabled|Disabled>
```

Description : Enable|Disable NIC Partition function.
Values : **Enabled|Disabled.**
Restriction : Two ports' NIC Partition function need to be Enabled or Disabled at the same time, i.e. the case where NIC Partition is enabled in one port and disabled in the other port is an illegal case. The consistency will be checked in then end of "exit" string is input. If error of this item is detected, only generic "error" string will be returned without indicating this specific item.
Example : **set netport1 OEMHP_NparMode=Enabled**

8.2 NIC Partitioning Flow Control

```
set <target> OEM<vendor>_NparFlowControl=<Auto|Tx|Rx|Tx/Rx|None>
```

Description : Configure NIC Partition Flow Control mode.
Values : **Auto|Tx|Rx|Tx/Rx|None.**
Restriction : None.
Example : **set netport1 OEMHP_NparFlowControl=Auto**

8.3 NIC Partitioning Physical Function Parameters

```
set <target> OEM<vendor>_NparPF(n)="<Ethernet|FCoE|iSCSI>;<Bandwidth
    Weight>;<Maximum Bandwidth>;<Network MAC Address>;<iSCSI MAC
    Address>;<FCoE FIP MAC Address>;<FCoE WWPN>;<FCoE WWNN>"
```

Description : Configure NIC Paritioning Physical Function Parameters. "n" inside OEM<vendor>_NparPF(n) represents physical function number from 0 to 7, e.g. OEMHP_NparPF2 represents physical number 2.
Values : The parameters in the string are interpreted by their positions within the string. Each field is delimited by semicolons. If a certain parameter is to be skipped, an empty string MUST be used thus concatenate two neighbor semicolons together. If all parameters after a certain position to the end are all to be skipped, semicolons can be skipped as well. See examples below as reference.

- Ethernet|FCoE|iSCSI : Physical Function offloaded protocols. For each physical function, only One protocol is allowed to offload. For each port, total maximum two iSCSI protocols or one FCoE

protocol are allowed to offload. Here, Ethernet is not counted as an offloaded protocol.

- Bandwidth Weight : 0 – 100. Specify Bandwidth Weight in percentage of physical port bandwidth allowed for this physical function. The total bandwidth weight of all physical functions need to be either 100 or 0. All 0s are default values meaning all physical functions have the same weight thus equivalent to all 25s values.
- Maximum Bandwidth : 1 – 100. Specify Maximum bandwidth in Percentage of Physical Bandwidth. The configuration allows sum of maximum bandwidths of a physical port to exceed physical port bandwidth. Therefore, the actual bandwidth of a partition will be gated by Bandwidth Weight, Maximum Bandwidth or physical port bandwidth, which ever is the smallest.
- Network MAC Address : Specify Network MAC address for this physical function, 12 hexadecimal digits.
- iSCSI MAC Address : Specify iSCSI MAC address for this physical function, 12 hexadecimal digits.
- FCoE FIP MAC Address: Specify FCoE MAC address for this physical function, 12 hexadecimal digits.
- FCoE WWPN : FCoE World-Wide Port Name, 16 hexadecimal digits.
- FCoE WWNN : FCoE World-Wide Node Name. 16 hexadecimal digits.

Restriction : Please see description of each value above. The consistency of offloaded protocol, Bandwidth Weight and Maximum Bandwidth will be checked when "Exit" command is executed. If error is found, only generic string "error" will be returned without indicating the specific items above.

Example :

```
set netport1 OEMHP_NparPF2="Ethernet|iSCSI"
```

Set Physical Function 2 with Ethernet attribute and iSCSI offloaded.

```
set netport1 OEMHP_NparPF2=";0;30;001018123456;;;;2000001018123456
```

Set Physical function 2's Bandwidth Weight to be 0; Maximum Bandwidth to be 30; Network MAC Address to be 001018123456; FCoE WWNN to be 2000001018123456.

9. FCoE Boot Configuration Parameters

9.1 FCoE Boot General Parameters

9.1.1 FCoE Boot To Target Parmeter

```
set <target> OEM<vendor>_FCoEBootToTarget=<Enabled|Disabled>
```

Description : Enable/Disable FCoE Boot To Target Option.
Values : **Enabled|Disabled.**
Restriction : None.
Example : **set netport1 OEMHP_FCoEBootToTarget=Enabled**

9.1.2 FCoE Boot Target as First HDD

```
set <target> OEM<vendor>_FCoEBootTargetAsFirstHDD=<Enabled|Disabled>
```

Description : Enable/Disable FCoE Boot Target as First HDD.
Values : **Enabled|Disabled.**
Restriction : None.
Example : **set netport1 OEMHP_FCoEBootTargetAsFirstHDD=Enabled**

9.1.3 FCoE Boot Link up Delay Time

```
set <target> OEM<vendor>_FCoEBootLinkUpDelayTime=<Seconds>
```

Description : Configure FCoE Boot Link up Delay Time.
Values : **0 – 255**
Restriction : None.
Example : **set netport1 OEMHP_FCoEBootLinkUpDelayTime=4**

9.1.4 FCoE Boot LUN Busy Retry Count

```
set <target> OEM<vendor>_FCoEBootLUNBusyRetryCount=<Counts in 2s Interval>
```

Description : Configure FCoE Boot LUN Busy Retry Count.
Values : **0 – 60.**
Restriction : None.
Example : **set netport1 OEMHP_FCoEBootLUNBusyRetryCount=3**

9.1.5 FCoE Boot Fabric Discovery Retry Count

```
set <target> OEM<vendor>_FCoEBootFabricDiscoveryRetry=<Retry Counts>
```

Description : Configure FCoE Boot Fabric Discovery Retry Count.
Values : **0 to 8.**
Restriction : None.
Example : **set netport1 OEMHP_FCoEBootFabricDiscoveryRetry=4**

9.1.6 FCoE Boot HBA Boot Mode

```
set <target> OEM<vendor>_FCoEBootHbaBootMode=<Enabled|Disabled>
```

Description : Enable/Disable FCoE Boot HBA Boot Mode.
Values : **Enabled|Disabled.**
Restriction : None.
Example : **set netport1 OEMHP_FCoEBootHbaBootMode=Enabled**

9.2 FCoE Boot Target Information

```
set <target>
     OEM<vendor>_FCoEBootTarget(n)="<Enabled|Disabled>;<WWPN>;<BootLUN#>"
```

Description : Configure FCoE Target information. Here "n" inside OEM<vendor>_FCoEBootTarget(n) represents target index number from 1 to 8, e.g. OEMHP_FCoEBootTarget2 represents FCoE Boot Target number 2.
Values : The parameters in string are interpreted by their positions within the string. Each field is delimited by semicolons. If a certain parameter is to be skipped, empty string MUST be used thus concatenate two neighbor semicolons together. If all parameters from a certain position to the end are all to be skipped, semicolons can be skipped as well. Please see examples below as reference.

- Enabled|Disabled : Enable/Disable this FCoE Boot Target.
- WWPN : FCoE Boot Target World-Wide Port Name, 16 hexadecimal digits.
- Boot LUN# : LUN number to be used in FCoE Boot Target.

Example :

```
set netport1 OEMHP_FCoEBootTarget2="Enabled;2000001018123456;2"
```

Set FCoE Boot Target #2 enabled, target's WWPN to be 2000001018123456 and Boot LUN to be 2.