



Broadcom CLP Interface

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Revision History

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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
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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_0_71906.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_PermanentAddress=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.