



UCSM 2.0(1) iSCSI Boot



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iSCSI Boot

- iSCSI boot configuration is added to UCSM 2.0(1)
- This module provides details on how to configure and tips for configuring iSCSI boot
- Makes use of iSCSI Boot Firmware Table (iBFT) to transfer iSCSI boot configuration information from the adapter to the OS during install
- This guide does not cover the basics of Service Profile creation
- This guide does not cover post-OS multipathing configuration
- This guide does not cover offload configuration. This is post-install, OS specific and specific to the Cisco UCS NIC M51KR-B Broadcom BCM57711 Network Adapter only. The Cisco UCS M81KR Virtual Interface Card (VIC) does not support offload.

iSCSI Boot Flow

- Provide UCSM with iSCSI boot information
 - Target IP, IQN
 - Initiator IP/Mask/Gateway, IQN
- Create iSCSI vNICs
- Create iSCSI boot policy
- Broadcom only – Modify adapter policy for install
- vMedia map the OS and drivers if required
- Adapter successfully initializes
- Install OS and Drivers (if required)
- Broadcom only – Modify adapter policy for boot

UCSM iSCSI Requirements

iSCSI Test Requirements

- **Test Requirements**

- Software

 - UCS 2.0(1)

 - UCS 2.0(1) driver image

- Hardware Requirements

 - UCS Test system with either of:

 - B series blade with a Cisco UCS NIC M51KR-B Broadcom BCM57711 Network Adapter

 - B series blade with a Cisco UCS M81KR VIC

 - iSCSI array or VM

 - NetApp, EMC offer VMs of their filers that can be used instead of a real array

 - Only NetApp and EMC iSCSI currently supported**

 - Alternatively some of the free filer distributions can be used but not officially supported. (useful for training or lab testing)

iSCSI Prerequisites and Caveats

- Each OS and in some cases different versions of an OS install and interact differently with the firmware on the Broadcom card. We will cover the following OS installs and caveats
- Please refer to the latest interoperability matrices for supported OS's
- Windows 2008R2, R2-SP1, x64
- RHEL
 - 5.5,5.6
 - 6.0,6.1
- ESXi 4.1U1/U2 (ESXi 5.0 not currently supported. Will be in future)

UCSM iSCSI Service Profile Changes

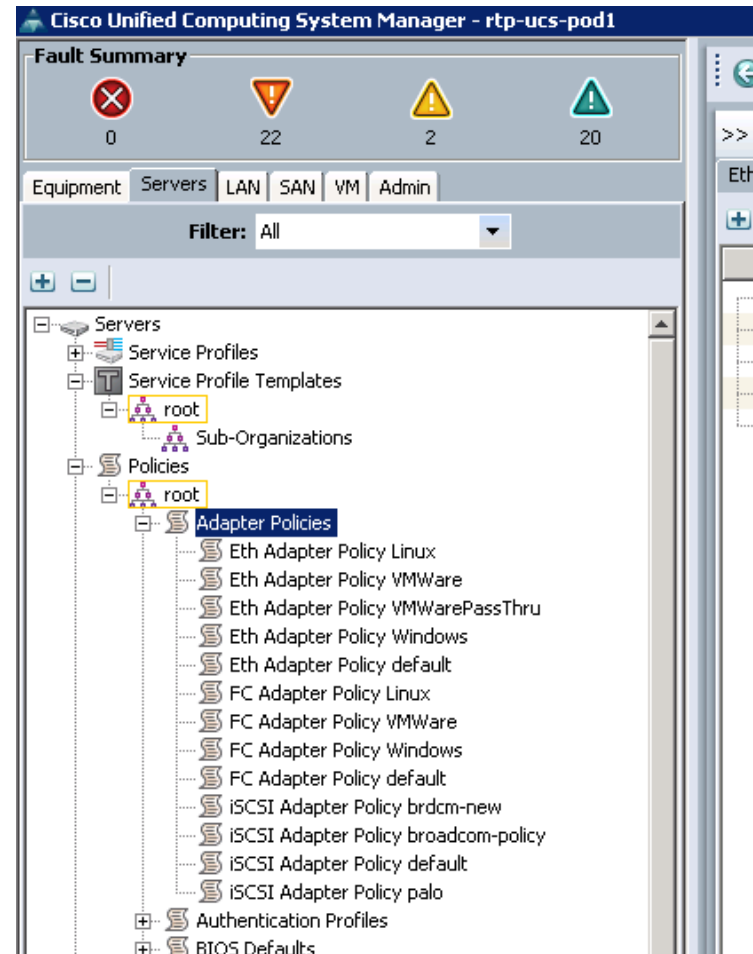
iSCSI Service Profiles

- A service profile for iSCSI boot will have subtle changes from a normal Service Profile. There is now an iSCSI NIC that needs to be created. Creating a Service Profile iSCSI boot must be done from the **Expert Service Profile** creation tool.
- There is also an iSCSI adapter policy that potentially needs to be used with the Service Profile. This will be covered later.
- Lastly, there is also a new IP pool that can be used to automatically assign IP addresses to the iSCSI NICs.
- One lacking option is a pool of IQN initiator names that can automatically be assigned to iSCSI initiators. For now this needs to be filled in by hand by the user. This is fixed in an upcoming release. [Tracked via CSCtr62641]

UCSM iSCSI boot configuration

iSCSI Adapter Policy

- iSCSI adapter policies are under the Service Profile tab under the Adapter Policies



M51KR-B Adapter Policy

- Broadcom - Required

HBA Mode - TCP offload

Boot to Target – Boot off iSCSI disk

Disabled for OS install

Enabled after OS install

Properties

Name: **default**

Connection Timeout: [0-255]

LUN Busy Retry Count: [0-60]

DHCP Timeout: [60-300]

Enable TCP Timestamp:

HBA Mode:

Boot To Target:

Install OS	HBA Mode	Boot to Target
Windows	Enabled	Disabled
RHEL	Disabled	Disabled
ESXi	Disabled	Disabled

Boot OS	HBA Mode	Boot to Target
Windows	Enabled	Enabled
RHEL	Disabled	Enabled
ESXi	Disabled	Enabled

M81KR VIC Adapter Policy

- Cisco VIC – Optional to create this adapter policy

HBA Mode - TCP offload – Not supported

Boot to Target – Not supported

Properties

Name: **default**

Connection Timeout: [0-255]

LUN Busy Retry Count: [0-60]

DHCP Timeout: [60-300]

Enable TCP Timestamp:

HBA Mode:

Boot To Target:

Install OS	HBA Mode	Boot to Target
Windows	Disabled	Disabled
RHEL	Disabled	Disabled
ESXi	Disabled	Disabled

Boot OS	HBA Mode	Boot to Target
Windows	Disabled	Disabled
RHEL	Disabled	Disabled
ESXi	Disabled	Disabled

Adapter Policy

- M51KR-B Broadcom

For installs, Boot to Target must be disabled. This forces the blade to bypass a bootable disk image and gain access to vMedia/DVD/PXE for installation

After installation, Boot to Target must be enabled

You can create a install policy and boot policy and change the SP as needed (additional reboot)

Or set the boot policy and during the initial install, break into Broadcom OptionROM and disable Boot to Target (one time only)

Or have a single adapter policy, change Boot to Target properties (additional reload, affects associated servers)

OS support for TCP off-load

- M81KR VIC

No TCP off-load support

Boot-to-Target is not used

iSCSI Adapter Policy

- Create a new iSCSI policy. You will get the following window

Create iSCSI Adapter Policy

Name:

Connection Timeout: [0-255]

LUN Busy Retry Count: [0-60]

DHCP Timeout: [60-300]

Enable TCP Timestamp:

HBA Mode:

Boot To Target:

OK Cancel

M51KR-B Broadcom Adapter Policy for Boot

- iSCSI Adapter Policy for Windows 2008

Create iSCSI Adapter Policy

Name:

Connection Timeout: [0-255]

LUN Busy Retry Count: [0-60]

DHCP Timeout: [60-300]

Enable TCP Timestamp:

HBA Mode:

Boot To Target:

OK Cancel

M51KR-B Broadcom Adapter Policy for Boot

- iSCSI Adapter Policy for Linux and ESXi

Create iSCSI Adapter Policy

Name:

Connection Timeout: [0-255]

LUN Busy Retry Count: [0-60]

DHCP Timeout: [60-300]

Enable TCP Timestamp:

HBA Mode:

Boot To Target:

OK Cancel

iSCSI IP Pool

- The iSCSI IP pool is a pool of IP addresses that get assigned to iSCSI NICs in a Service Profile as they are created. The IP pool is **optional**. Some users might instead use DHCP to give out IP addresses or you can statically assign IP addresses to the iSCSI NICs.
- The IP pool iscsi-initiator-pool is empty by default and may throw minor error in UCSM. Current workaround is to create a dummy IP address [CSCtx02611]. Future release will resolve this issue.
- What are these IP addresses used for? They become the IP address set into the M51KR-B or M81KR card to be used by the iSCSI initiator the host will use to boot. This IP address needs to have network access to the iSCSI target that will be used to boot.

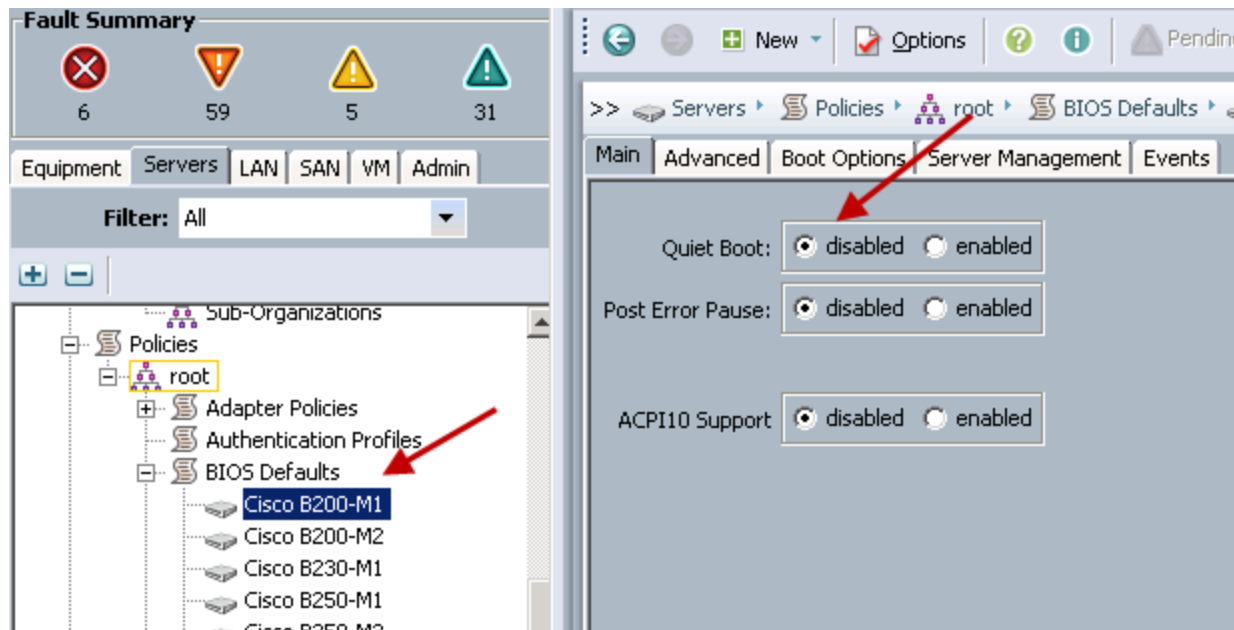
iSCSI IP

- Create iscsi-initiator-pool IP pool

The screenshot displays a network management interface with a sidebar on the left and a main content area on the right. The sidebar has tabs for 'Equipment', 'Servers', 'LAN', 'SAN', 'VM', and 'Admin'. The 'LAN' tab is selected and circled in red. Below the tabs, there is a 'Filter: Pools' dropdown and a tree view showing a hierarchy: 'Pools' > 'root' > 'IP Pool (iscsi-initiator-pool)'. A red arrow points to the 'IP Pool (iscsi-initiator-pool)' entry. The main content area has tabs for 'General', 'IP Addresses', 'IP Blocks', and 'Events'. The 'IP Addresses' tab is active, showing a table with columns: 'IP Address', 'Subnet', 'Default Gateway', 'Assigned', 'Assigned To', and 'Prev Assigned To'. The table is currently empty. A modal dialog titled 'Create Block of IP Addresses' is open in the foreground. It contains the following fields: 'From: 10.29.177.44', 'Size: 4', 'Subnet Mask: 255.255.255.0', 'Default Gateway: 10.29.177.1', 'Primary DNS: 171.70.168.183', and 'Secondary DNS: 0.0.0.0'. At the bottom of the dialog are 'OK' and 'Cancel' buttons. A red arrow points to a green plus icon in the bottom right corner of the main interface.

iSCSI IP

- Disable quiet boot for your blade models
- This makes troubleshooting so much easier
 - Allows you to see if the M81KR VIC has initialized correctly
 - Will allow you to break into the M51KR-B OptionROM



iSCSI Boot Service Policy

- Use expert mode

Create Service Profile (expert)

1. **Identify Service Profile**
2. Storage
3. Networking
4. vNIC/vHBA Placement
5. Server Boot Order
6. Maintenance Policy
7. Server Assignment
8. Operational Policies

Identify Service Profile

You must enter a name for the service profile. You can also specify a description of the profile.

Name:

The service profile will be created in the following organization. Its name must be unique.

Where: **org-root**

Specify how the UUID will be assigned to the server associated with this service profile.

UUID

UUID Assignment:

Storage

Optionally specify disk policies and SAN configuration information.

Local Storage:

Mode: **Any Configuration**

Create Local Disk Configuration Policy

Protect Configuration: **yes**

If **Protect Configuration** is set, the Local Disk Configuration is protected. On reassociation of the same Server, a configuration error will occur if the new Local Disk Configuration is different.

How would you like to configure SAN connectivity? Simple Expert No vHBAs

iSCSI Boot Service Policy

- Create vNIC0 and vNIC1, no failover, specify native

The screenshot shows the 'Create vNIC' configuration window. The 'Name' field is set to 'vNIC1'. The 'MAC Address' section shows 'MAC Address Assignment' set to 'ca3-mac(28/32)' with a '+ Create MAC Pool' button below it. The 'Fabric ID' section has 'Fabric A' selected. The 'VLANs' table has three rows: 'default', '11', and '177'. The '177' row is selected. The 'MTU' is set to '1500' and the 'Pin Group' is '<not set>'. There are several '+ Create' buttons for templates, pools, and pin groups.

Create vNIC

Name:

Use LAN Connectivity Template:

MAC Address

MAC Address Assignment:

The MAC address will be automatically assigned from the selected pool.

Fabric ID: Fabric A Fabric B Enable Failover

VLANs

Select	Name	Native VLAN
<input type="checkbox"/>	default	<input type="radio"/>
<input type="checkbox"/>	11	<input type="radio"/>
<input checked="" type="checkbox"/>	177	<input checked="" type="radio"/>

MTU:

Pin Group:

iSCSI Boot Service Policy

- With vNIC0 and vNIC1 created go to Add iSCSI vNICs

Networking
Optionally specify LAN configuration information.

Dynamic vNIC Connection Policy: [+ Create Dynamic vNIC Connection Policy](#)

How would you like to configure LAN connectivity? Simple Expert No vNICs Hardware Inherited

Click **Add** to specify one or more vNICs that the server should use to connect to the LAN.

Name	MAC Address	Fabric ID	Native VLAN
<input type="checkbox"/> vNIC vNIC0	Derived	A	
<input type="checkbox"/> Network 177			<input checked="" type="radio"/>
<input type="checkbox"/> vNIC vNIC1	Derived	B	
<input type="checkbox"/> Network 177			<input checked="" type="radio"/>

[Delete](#) [+ Add](#) [Modify](#)

Add iSCSI vNICs

iSCSI Boot Service Policy

- Overlay vNIC – the iSCSI vNIC uses the Service Profile vNIC.
- iSCSI adapter policy (Broadcom has specific requirements)
- Identify native VLAN
- MAC address:
 - M81KR – none (do not set)**
 - M51KR-B – must be set (manual or pool)**

The screenshot shows a 'Create iSCSI vNIC' dialog box with the following fields and options:

- Name: iSCSI0
- Overlay vNIC: vNIC0
- iSCSI Adapter Policy: default (with a '+ Create iSCSI Adapter Policy' button)
- VLAN: 177
- iSCSI MAC Address section (circled in red):
 - MAC Address Assignment: Select(None used by default)
 - + Create MAC Pool button

Buttons at the bottom: OK, Cancel

iSCSI Boot Broadcom

- Let the Broadcom adapter initialize. You will see success when this has happened.
- **DO NOT** interrupt the initialization by pressing F6 or F2 prior to the initialization.

This will cause card initialization failure. No LUN will be available for install/boot. You will need to reset the blade and wait for POST again

- If you properly set the adapter (disable – boot to target) will go to the next device (CD/DVD) automatically. If you need to perform an attended boot, press Ctrl-D only when prompted by the Broadcom OptionROM.

iSCSI Boot Service Policy

- You can create multiple iSCSI vNICs for HA. Only one path will be used during install. This is how iBFT works

Networking ?
Optionally specify LAN configuration information.

Dynamic vNIC Connection Policy: + Create Dynamic vNIC Connection Policy

How would you like to configure LAN connectivity? Simple Expert No vNICs Hardware Inherited

Click **Add** to specify one or more vNICs that the server should use to connect to the LAN.

Name	MAC Address	Fabric ID	Native VLAN
vNIC vNIC0	Derived	A	
Network 177			<input checked="" type="radio"/>
vNIC vNIC1	Derived	B	
Network 177			<input checked="" type="radio"/>

Delete + Add Modify

Add iSCSI vNICs ↑

Name	Overlay vNIC Name	iSCSI Adapter Policy	MAC Address
iSCSI vNIC iSCSI-vNIC0	vNIC0	default	Derived

+ Add Delete Modify

iSCSI Boot Service Policy

- Create the boot policy

Cisco VIC, CD can be first or second.

Broadcom, the iSCSI boot device must be first in the order. The Broadcom card initializes very late in POST. If anything interrupts the Broadcom initialization (CD, F6, F2) it will fail, and you will not see the iSCSI boot device to install on

Create Boot Policy

Name:

Description:

Reboot on Boot Order Change:

Enforce vNIC/vHBA/iSCSI Name:

WARNINGS:
The type (primary/secondary) does not indicate a boot order presence.
The effective order of boot devices within the same device class (LAN/Storage/iSCSI) is determined by PCIe bus scan order.
If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs/iSCSI are selected if they exist, otherwise the vNIC/vHBA/iSCSI with the lowest PCIe bus scan order is used.

Local Devices

- Add Local Disk
- Add CD-ROM
- Add Floppy
- vNICs
- vHBAs
- iSCSI vNICs
- Add iSCSI Boot

Boot Order

Name	Order	vNIC/vHBA/iSCSI vNIC	Type
CD-ROM	1		
iSCSI	2	iSCSI1	Primary

Add iSCSI Boot

iSCSI vNIC:

iSCSI Boot Service Policy

- All configured for the Cisco VIC

Name	Order	vNIC/vHBA/iSCSI vNIC	Type	Lun ID	WWN
CD-ROM	1				
iSCSI	2				
iSCSI		iSCSI-vNIC0	Primary		

iSCSI Boot Service Policy

- Assign the boot policy to the SP

Server Boot Order

Optionally specify the boot policy for this service profile.

Select a boot policy.

Boot Policy: + Create Boot Policy

Name: **Palo-iSCSI**

Description:

Reboot on Boot Order Change: **yes**

Enforce vNIC/vHBA/iSCSI Name: **no**

WARNINGS:

The type (primary/secondary) does not indicate a boot order presence.
The effective order of boot devices within the same device class (LAN/Storage/iSCSI) is determined by PCIe bus scan order.
If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs/iSCSI are selected if they exist, otherwise the vNIC/vHBA/iSCSI with the lowest PCIe bus scan order is used.

Boot Order

+ - 🔍 Filter ➡ Export 🖨 Print

Name	Order	vNIC/vHBA/iSCSI	vNIC	Type	Lun ID	WWN	
CD-ROM	1						
iSCSI	2						
iSCSI		iSCSI-vNIC0		Primary			

iSCSI Boot Service Policy

- Set the iSCSI parameters – Select the first iSCSI boot devices (you can have multiple iSCSI initiators)

If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs/iSCSI are selected if they exist, otherwise the vNIC/vHBA/iSCSI with the lowest PCIe bus scan order is used.

Name	Order	vNIC/vHBA/iSCSI vNIC	Type	Lun ID	WWN
CD-ROM	1				
iSCSI	2				
iSCSI		iSCSI-vNIC0	Primary		

Modify iSCSI vNIC Set iSCSI Boot Parameters

iSCSI Boot Service Policy

- Initiator name (EUI or IQN formats).
- Initiator IP Address
- Target name (Query your array for the correct name, usually IQN format)

CHAP Authentication

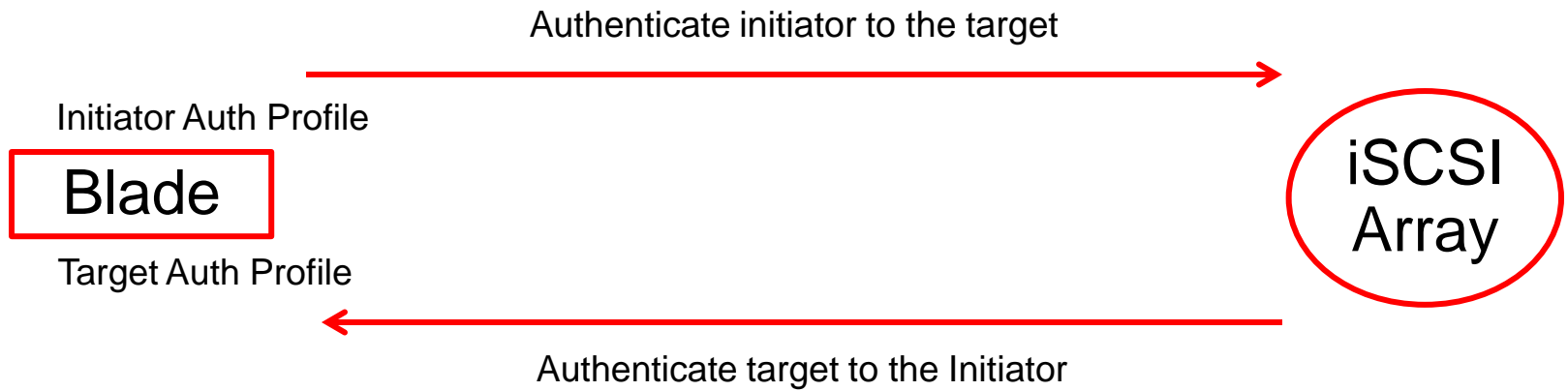
- Initiator Auth – to iSCSI array (E.g. NetApp inbound)
- Target Auth – from iSCSI array (E.g. NetApp outbound)

Target Port, IP and LUN ID

This is a simple example. Refer to configuration guide for allowable syntax

The image shows two screenshots of a network configuration interface. The top screenshot is titled 'Set iSCSI Boot Parameters' and shows the configuration for an iSCSI initiator named 'iSCSI-vNIC0'. The 'Initiator Name' is set to 'eui1223456789abcdef'. The 'Authentication Profile' is set to '<not set>', with a black arrow pointing to it labeled 'Initiator Auth'. Below this, the 'Initiator Address' section shows the 'Initiator IP Address Policy' set to 'Pool', and the IP address, subnet mask, default gateway, and secondary DNS are all set to '0.0.0.0'. The bottom screenshot is titled 'Create iSCSI Static Target' and shows the configuration for a static target. The 'Name' is set to '2-08.com.netapp:sn.101202840'. The 'Priority' is '1', the 'Port' is '3260', and the 'Authentication Profile' is '<not set>'. The 'IPv4 Address' is '10.29.177.51' and the 'LUN Id' is '0'. A black arrow points to the 'Name' field labeled 'Target Auth'.

iSCSI Authentication Simplified



iSCSI Authentication Profile

- Specify a name for the Auth profile and provide the correct username/password credentials that match that configured on the iSCSI Array



iSCSI Boot Service Policy

- Make sure you set the Initiator IP address, DHCP, pool, or static. Repeat for second iSCSI initiator
- Pool IP will not display after you hit OK. You can go back and check what was assigned after finishing SP

The image displays three overlapping screenshots of the iSCSI configuration interface. The top-left window shows the 'Initiator Address' section with the 'Initiator IP Address Policy' set to 'Pool'. The fields for IPv4 Address, Subnet Mask, Default Gateway, Primary DNS, and Secondary DNS are all set to 0.0.0.0. The top-right window shows the 'Name' field set to 'iSCSI1', the 'Initiator Name' field set to 'eui.1023456789abcdef', and the 'Authentication Profile' set to '<not set>'. The bottom window shows the 'Initiator Address' section with the 'Initiator IP Address Policy' set to 'Static'. The IPv4 Address field is highlighted in red and contains '0.0.0.0'. The Subnet Mask field contains '255.255.255.0'. The Default Gateway field is highlighted in red and contains '0.0.0.0'. The Primary DNS field contains '0.0.0.0' and the Secondary DNS field contains '0.0.0.0'.

iSCSI Boot Service Policy

- If you used a pool for the initiator, you can also check the assignments in the iscsi-initiator-table

Filter: Pools

General IP Addresses IP Blocks Events

Filter Export Print

IP Address	Subnet	Default Gateway	Assigned	Assigned To
10.29.177.44	255.255.255.0	10.29.177.1	yes	sys/chassis-1/blade-8/mgmt/ipv4-pooled-addr
10.29.177.45	255.255.255.0	10.29.177.1	yes	sys/chassis-1/blade-2/mgmt/ipv4-pooled-addr
10.29.177.46	255.255.255.0	10.29.177.1	yes	sys/chassis-1/blade-7/mgmt/ipv4-pooled-addr
10.29.177.47	255.255.255.0	10.29.177.1	yes	org-root/ls-iSCSI-1/iscsi-iSCSI0/vlan/ipv4/ipv4-pooled-iscsiaddr
10.29.177.64	255.255.255.0	10.29.177.1	no	
10.29.177.65	255.255.255.0	10.29.177.1	no	
10.29.177.66	255.255.255.0	10.29.177.1	no	
10.29.177.67	255.255.255.0	10.29.177.1	yes	org-root/ls-iSCSI-1/iscsi-iSCSI1/vlan/ipv4/ipv4-pooled-iscsiaddr
10.29.177.68	255.255.255.0	10.29.177.1	yes	org-root/ls-Palo-iSCSI-1/iscsi-iSCSI0/vlan/ipv4/ipv4-pooled-iscsiaddr
10.29.177.69	255.255.255.0	10.29.177.1	yes	org-root/ls-Palo-iSCSI-1/iscsi-iSCSI1/vlan/ipv4/ipv4-pooled-iscsiaddr

Cisco M81KR VIC Initialization

- With quiet boot disabled, if your service profile and iSCSI config is correct, you will see this during POST

```
Cisco VIC iSCSI, Boot Driver Version 2.0(0.239)
(C) 2010 Cisco Systems, Inc.
0025b530300e iSCSI METAPP :000
Option ROM installed successfully
```

Cisco M81KR VIC Initialization

- Can verify Cisco VIC configuration by connecting to the adapter and viewing the configuration

```
cae-sj-ca1-A# conn adapter 1/8/1
adapter 1/8/1 # connect
adapter 1/8/1 (top):1# attach-mcp
adapter 1/8/1 (mcp):1# iscsi_get_config

vnic iSCSI Configuration:
-----
vnic_id: 5
    link_state: Up
    Initiator Cfg:
        initiator_state: ISCSI_INITIATOR_READY
        initiator_error_code: ISCSI_BOOT_NIC_NO_ERROR
        vlan: 0
        dhcp status: false
        IQN: eui.87654321ab1234cd
        IP Addr: 172.25.183.142
        Subnet Mask: 255.255.255.0
        Gateway: 172.25.183.1
```

Cisco M81KR VIC Initialization – cont'd

Target Cfg:

Target Idx: 0

State: ISCSI_TARGET_READY

Prev State: ISCSI_TARGET_DISABLED

Target Error: ISCSI_TARGET_NO_ERROR

IQN: iqn.1992-08.com.netapp:sn.101202278

IP Addr: 172.25.183.49

Port: 3260

Boot Lun: 0

Ping Stats: Success (9.698ms)

Session Info:

session_id: 0

host_number: 0

bus_number: 0

target_id: 0

Broadcom iSCSI boot

- Let the system boot once to see that your initiator actually logs in and sees a LUN. If not check your configurations

```
Copyright (C) 2000-2011 Broadcom Corporation
iSCSI Boot (IPv4) v6.2.6

Initializing interface (00:25:B5:30:30:1A) ... Succeeded

Connecting to iSCSI targets with interface (00:25:B5:30:30:1A) ... Succeeded

Initiator Name       : eui.1023456789abcdef
Host IP Address      : 10.29.177.65
MAC Address          : 00:25:B5:30:30:1A
Subnet Mask          : 255.255.255.0
Default Gateway      : 10.29.177.1
1st Target Name      : ign.1992-08.com.netapp:sn.101202840
1st Target IP Addr   : 10.29.177.51
1st Target TCP Port  : 3260
1st Target Boot LUN  : 0
Logging in the 1st iSCSI Target ... Succeeded

SCSI Target Drive: NETAPP    LUN          (Rev: 7350)
```

Broadcom iSCSI boot

- Need to have quiet boot disabled. Either:
 - Manually through BIOS
 - Configure a BIOS policy
- When prompted, hit Ctrl-S

```
Broadcom NetXtreme Ethernet Boot Agent  
Copyright (C) 2000-2011 Broadcom Corporation  
All rights reserved.  
Press Ctrl-S to enter Configuration Menu
```

Broadcom iSCSI boot Option ROM

- Check all the settings and confirm they are what you expect.
- The top one should match your overlay vNIC so check the MAC against the service profile

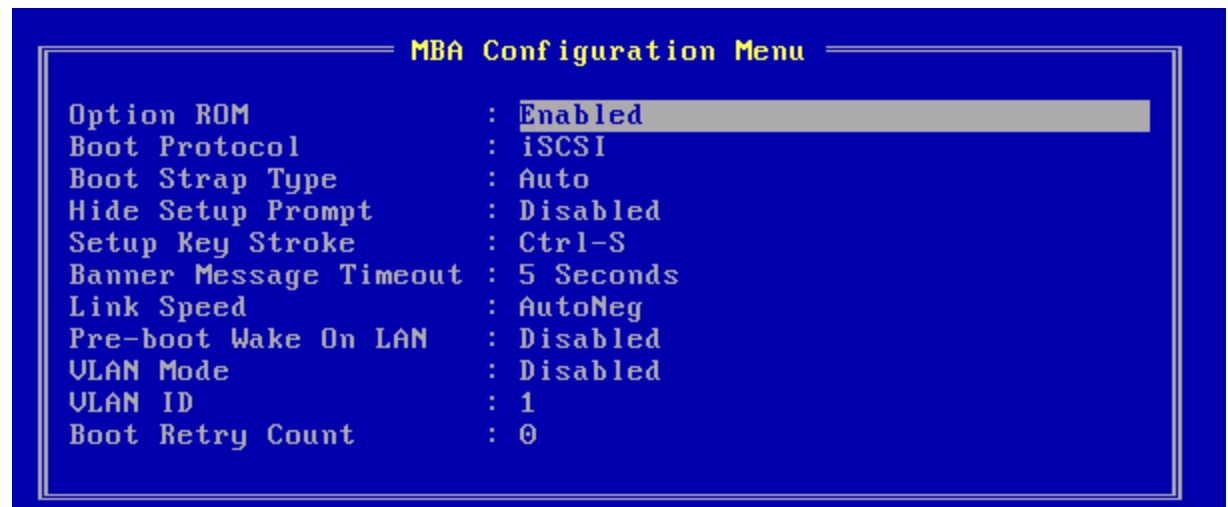
```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

----- Device List -----
<04:00:00> BCM57711 - 00:25:B5:30:30:1A MBA:v6.2.23 CCM:v6.2.21
<04:00:01> BCM57711 - 00:25:B5:30:30:0A MBA:v6.2.23 CCM:v6.2.21

Select Device to Configure
[Enter]:Enter Next Menu; [↑|↓]:Next Entry; [ESC]:Quit Menu
```

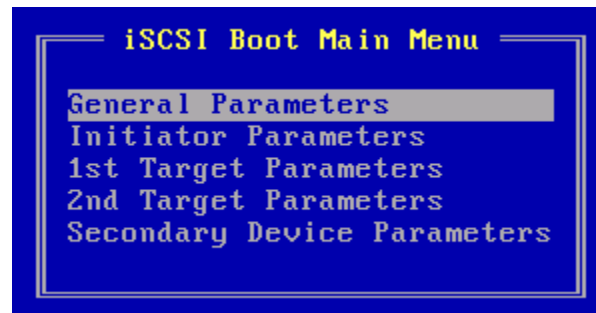

Broadcom iSCSI boot

- Select return and get to the MBA configuration, return to see the settings, Should be Boot Protocol: iSCSI
- VLAN Mode is disabled by default, therefore make use of the native VLAN for iSCSI boot



Broadcom iSCSI boot

- ESC to go back
- Select return and get to the iSCSI Boot Configuration, return to see the options, go into General



Broadcom iSCSI boot

- Display Boot to iSCSI target is enabled/disabled. Change as needed for installing O/S (disabled) or booting O/S (enabled)

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

----- General Parameters -----
TCP/IP Parameters via DHCP : Disabled
iSCSI Parameters via DHCP : Disabled
CHAP Authentication       : Disabled
Boot to iSCSI Target      : Enabled
DHCP Vendor ID           :
Link Up Delay Time       : 0
Use TCP Timestamp        : Disabled
Target as First HDD      : Enabled
LUN Busy Retry Count     : 0
IP Version               : IPv4
HBA Boot Mode            : Disabled

Enable/Disable Booting to iSCSI
[←|→][Enter][Space]:Scroll Value; [↑|↓]
Current Adapter:Primary, Bus=04 Device=00
```

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

----- General Parameters -----
TCP/IP Parameters via DHCP : Disabled
iSCSI Parameters via DHCP : Disabled
CHAP Authentication       : Disabled
Boot to iSCSI Target      : Disabled
DHCP Vendor ID           :
Link Up Delay Time       : 0
Use TCP Timestamp        : Disabled
Target as First HDD      : Enabled
LUN Busy Retry Count     : 0
IP Version               : IPv4
HBA Boot Mode            : Disabled

Enable/Disable Booting to iSCSI Target After Logon
[←|→][Enter][Space]:Scroll Value; [↑|↓]:Next Entry; [ESC]:Quit Menu
Current Adapter:Primary, Bus=04 Device=00 Func=00, MAC=00:25:B5:30:30:1A
```

Broadcom iSCSI boot

- ESC back, look at Initiator Parameters

The image shows two overlapping screenshots of a blue terminal interface. The top-left screenshot is the 'iSCSI Boot Main Menu' with 'Initiator Parameters' highlighted. The larger bottom-right screenshot is the 'Initiator Parameters' configuration screen, showing various fields with their current values. At the bottom of this screen, there is a prompt to 'Configure Initiator IP address' and a status line for the current adapter.

```
iSCSI Boot Main Menu
General Parameters
Initiator Parameters
1st Target Parameters
2nd Target Parameters
Secondary Dev

Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

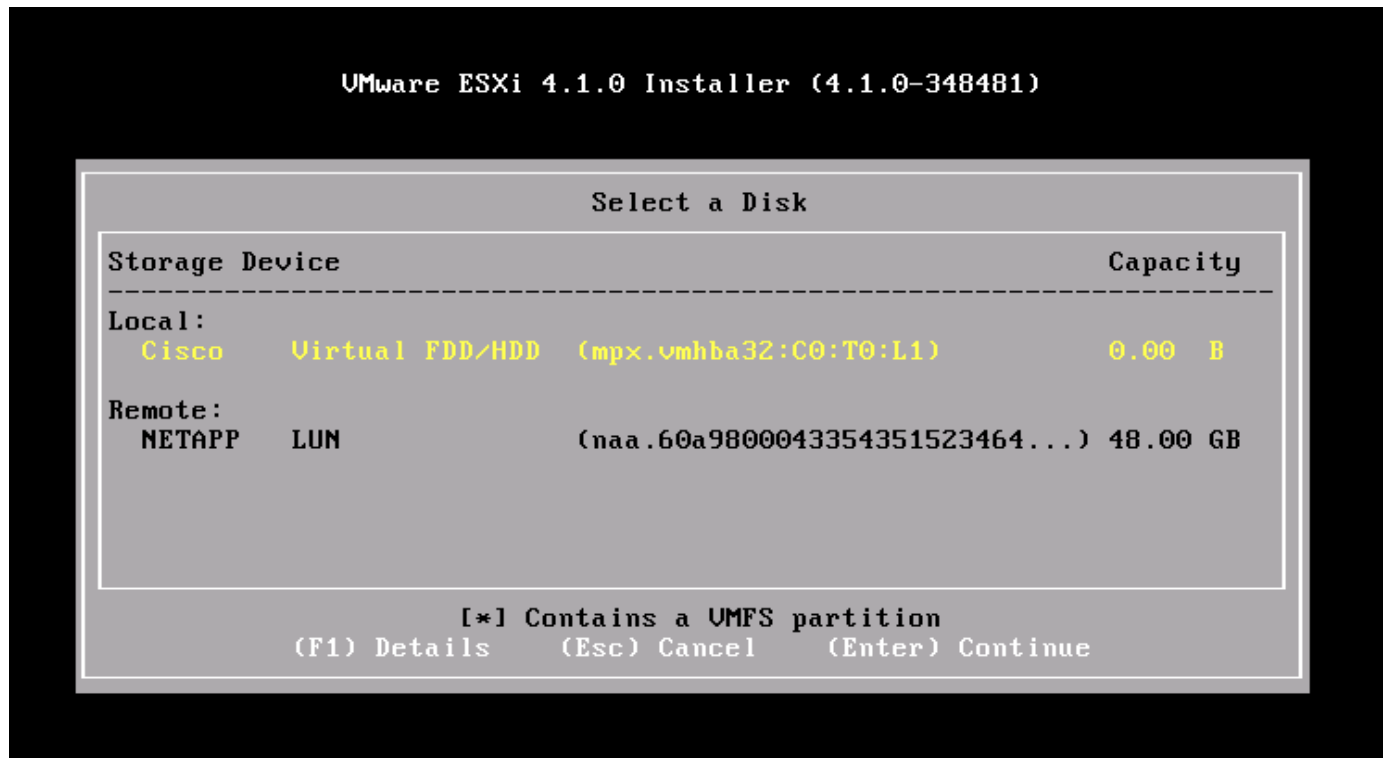
Initiator Parameters

IP Address      : 10.29.177.65
Subnet Mask    : 255.255.255.0
Default Gateway : 10.29.177.1
Primary DNS    : 171.70.168.183
Secondary DNS  : 0.0.0.0
iSCSI Name     : eui.1023456789abcdef
CHAP ID       :
CHAP Secret    :

Configure Initiator IP address
[Enter]:Enter New Value; [F1]:Next Entry; [ESC]:Quit Menu
Current Adapter:Primary, Bus=04 Device=00 Func=00, MAC=00:25:B5:30:30:1A
```

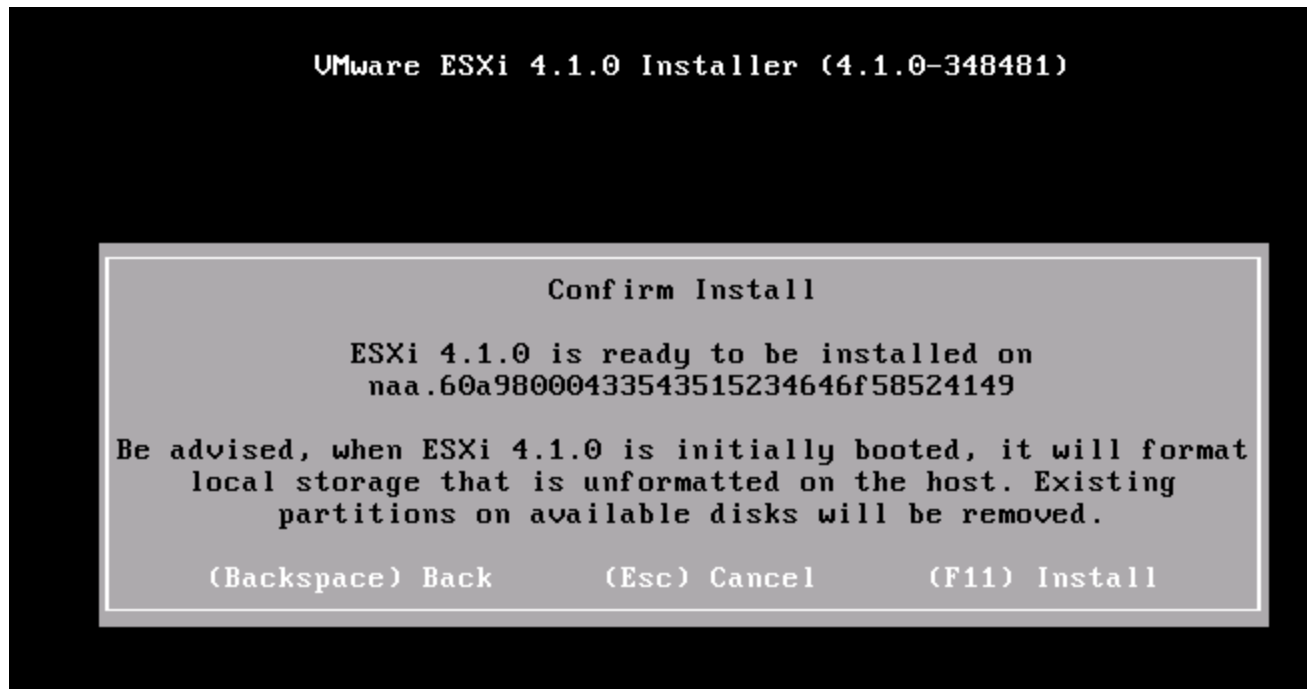
iSCSI ESXi 4.1 U1/U2

- Only this version will work
- If you don't see this screen, start over...
- If you are on a Mac, find a PC. The F-key mappings will cause you grief. You may not see this screen if you hit the wrong F-key on a Mac



iSCSI ESXi 4.1 U1/U2

- Complete the install and reboot

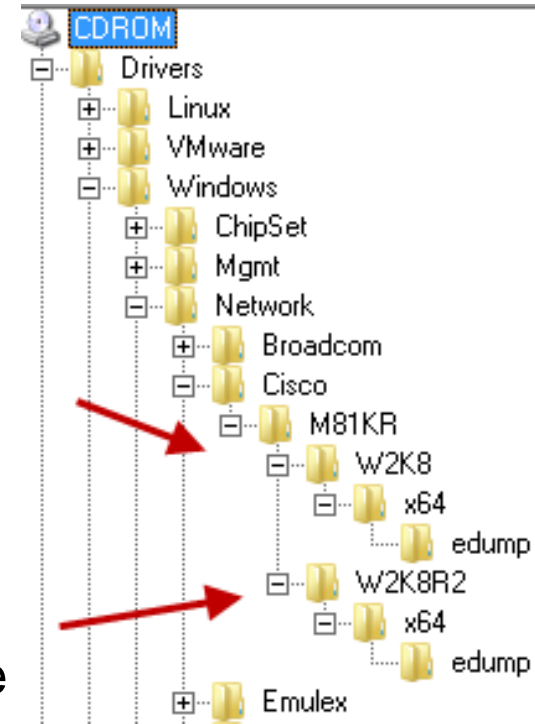


Cisco M81KR VIC Driver Requirements

Windows M81KR VIC Drivers

- Windows 2008x64
enuc6064
- Windows 2008r2 (sp1)
enic6264

In the vMedia browser, select the appropriate x64 folder, NOT the edump folder



RHEL M81KR VIC Drivers

- For RHEL 5.5, 5.6, 6.0, 6.1 use the in-box drivers for install

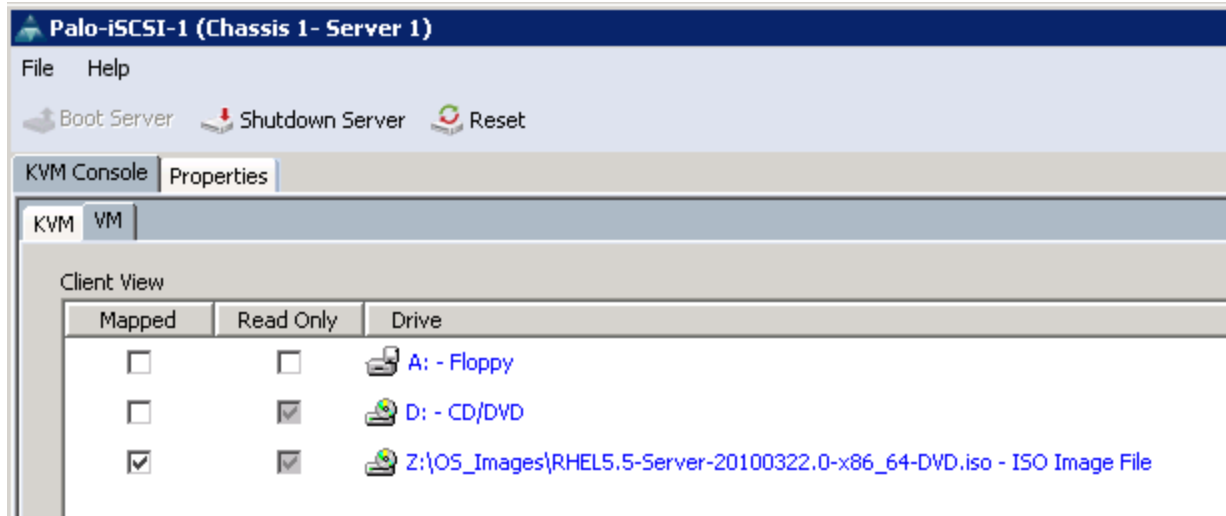
ESXi 4.1 U1/U2 M81KR VIC Drivers

- For ESXi 4.1 U1/U2 use the in-box drivers.
- Only ESXi 4.1 U1/U2 is supported for iBFT.
- ESX classic (non -i) is not supported.
- ESXi 5.0 is currently not supported, however it will be in the future.

RedHat Enterprise Linux 5.5, 5.6 iSCSI boot configuration – M81KR VIC

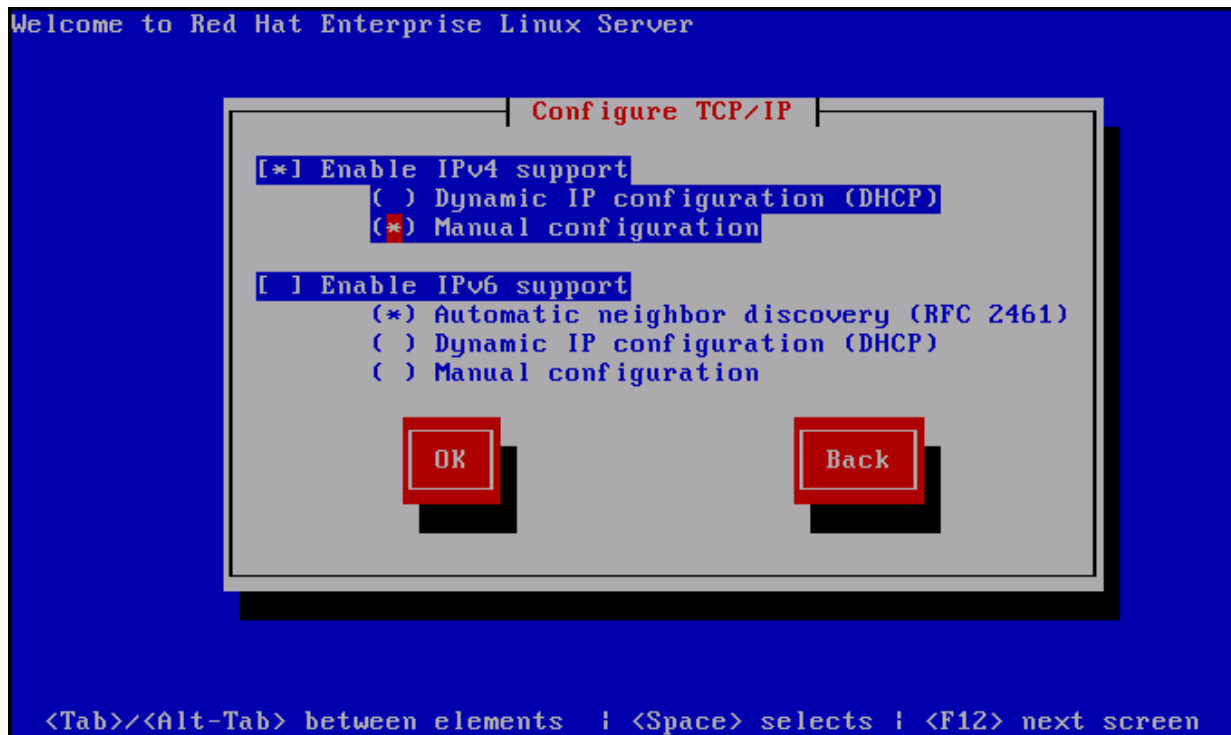
RHEL 5.5

- Use the Service Profile example
- Map the RHEL 5.5 ISO



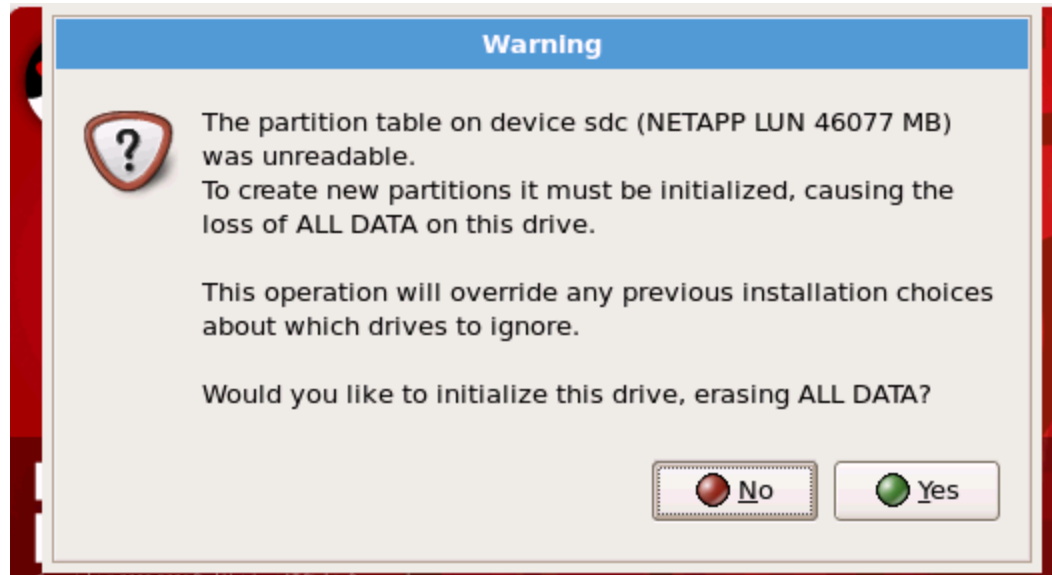
RHEL 5.5

- Configure the mgmt interface.
- 5.5, 5.6 uses the same IP as the iscsi-initiator



RHEL 5.5

- iSCSI LUN is detected



RHEL 5.5

- The iSCSI initiator is identified
- Advanced storage configuration will not display the iSCSI initiator configuration

Installation requires partitioning of your hard drive. By default, a partitioning layout is chosen which is reasonable for most users. You can either choose to use this or create your own.

Remove all partitions on selected drives and create default layout.

Remove linux partitions on selected drives and create default layout.

Use free space on selected drives and create default layout.

Create custom layout.

<input checked="" type="checkbox"/>	sdc	46077 MB	NETAPP LUN
-------------------------------------	-----	----------	------------


[Advanced storage configuration](#)

[Review and modify partitioning layout](#)

RHEL 5.5

- Continue the install

Warning

 You have chosen to remove all partitions (ALL DATA) on the following drives:

sdc (NETAPP LUN 46077 MB)

Are you sure you want to do this?

No

Network Devices

Active on Boot	Device	IPv4/Netmask	IPv6/Prefix
<input checked="" type="checkbox"/>	eth0	10.29.177.80/24	Disabled
<input type="checkbox"/>	eth1	DHCP	Auto

Hostname

Set the hostname:

automatically via DHCP

manually (e.g., host.domain.com)

Miscellaneous Settings

Gateway:

Primary DNS:

Secondary DNS:

RHEL 5.5

- Reboot to iSCSI LUN

```
[root@localhost ~]# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:25:B5:30:30:0E
          inet addr:10.29.177.80  Bcast:10.29.177.255  Mask:255.255.255.0
          inet6 addr: fe80::225:b5ff:fe30:300e/64  Scope:Link
          UP BROADCAST DEBUG RUNNING PROMISC ALLMULTI MULTICAST  MTU:1500  Metric:1
          RX packets:290867 errors:0 dropped:0 overruns:0 frame:0
          TX packets:79745 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:403881468 (385.1 MiB)  TX bytes:57050460 (54.4 MiB)
```

RHEL 5.5

▪ Reboot to iSCSI LUN

```
[root@localhost ~]# modinfo fnic
filename:          /lib/modules/2.6.18-194.el5/kernel/drivers/scsi/fnic/fnic.ko
version:           1.4.0.98
license:           GPL v2
author:            Abhijeet Joglekar <abjoglek@cisco.com>, Joseph R. Eykholt
                  <jeykholt@cisco.com>
description:       Cisco FCoE HBA Driver
srcversion:        5D933891A944F5A83BA516D
alias:             pci:v00001137d00000045sv*sd*bc*sc*i*
depends:            libfc,libfcoe,scsi_mod,scsi_transport_fc
vermagic:          2.6.18-194.el5 SMP mod_unload gcc-4.1
parm:              fnic_log_level:bit mask of fnic logging levels (int)
module_sig:        883f3504ba0378078ccfeaa942826a112e6a209f79195eab32159bcec54ea9e6fdabd31a83b8a6f0a0c04
                  d7b36d77fd1ffd1b421afdeb93ba188a35e7
```

RHEL 5.5

▪ Reboot to iSCSI LUN

```
[root@localhost ~]# modinfo enic
filename:          /lib/modules/2.6.18-194.el5/kernel/drivers/net/enic/enic.ko
version:          1.1.0.241a
license:          GPL
author:           Scott Feldman <scofeldm@cisco.com>
description:      Cisco 10G Ethernet Driver
srcversion:       11FF197F3EB2D2114615A57
alias:            pci:v00001137d00000043sv*sd*bc*sc*i*
depends:
vermagic:         2.6.18-194.el5 SMP mod_unload gcc-4.1
parm:             lro_disable:disable Large Receive Offload (int)
module_sig:
883e3504ba0378378ccfeaa942826a112e9aa098bfe036183341bfbe3681f9a65877380f9f409e363a
5c8098132dcd86574f9afc195ea60dcec
```

```
[root@localhost ~]# cat /etc/iscsi/initiatorname.iscsi
InitiatorName=eui.1023456789abcdef
```

RHEL 5.5

- Reboot to iSCSI LUN

```
cae-sj-ca3-A(nxos)# show mac address-table
```

Legend:

* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
age - seconds since last seen, + - primary entry using vPC Peer-Link

VLAN	MAC Address	Type	age	Secure	NTFY	Ports
* 177	0025.b530.300e	static	0	F	F	Veth757
* 177	0025.b530.301c	static	0	F	F	Veth759

RedHat Enterprise Linux 6.0 iSCSI boot configuration – M81KR VIC

RHEL 6.0

- iBFT pulls all information from the adapter
- Will automatically insert the iSCSI vNIC IP for the mgmt IP

RHEL 6.0

- Select Specialized Storage Devices

What type of devices will your installation involve?

Basic Storage Devices

- Installs or upgrades to typical types of storage devices. If you're not sure which option is right for you, this is probably it.

Specialized Storage Devices

- Installs or upgrades to enterprise devices such as Storage Area Networks (SANs). This option will allow you to add FCoE / iSCSI / zFCP disks and to filter out devices the installer should ignore.

RHEL 6.0

- Information is pulled from iBFT
- Continue with installation and reboot


Please select the drives you'd like to install the operating system on, as well as any drives you'd like to automatically mount to your system, below:

Basic Devices Firmware RAID Multipath Devices **Other SAN Devices** Search

Filter By: Show Only Devices Using:

<input type="checkbox"/>	Identifier	Capacity	Vendor	Interconnect
<input checked="" type="checkbox"/>	ip-10.29.177.51:3260-iscsi-iqn.1992-08.com.netapp:sn.101202840-lun-0	46080 MB	NETAPP	SCSI

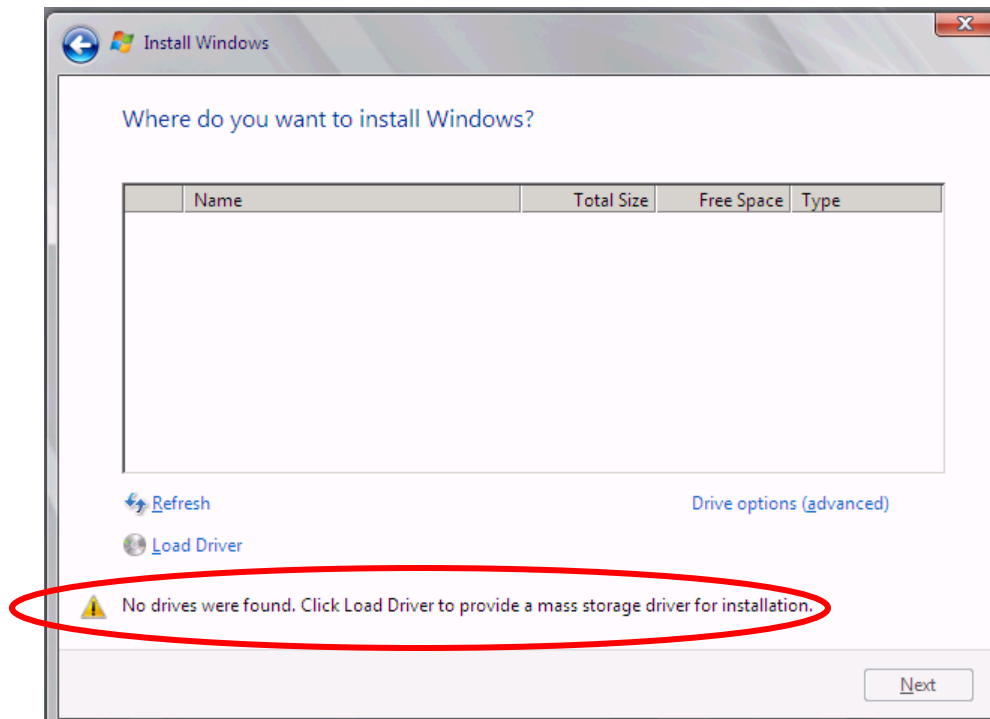
1 device(s) (46080 MB) selected out of 1 device(s) (46080 MB) total.

 **Tip:** Selecting a drive on this screen does not necessarily mean it will be wiped by the installation process. Also, note that post-installation you may mount drives you did not select here by modifying your `/etc/fstab` file.

Windows 2008r2 and r2sp1 iSCSI boot configuration – M81KR VIC

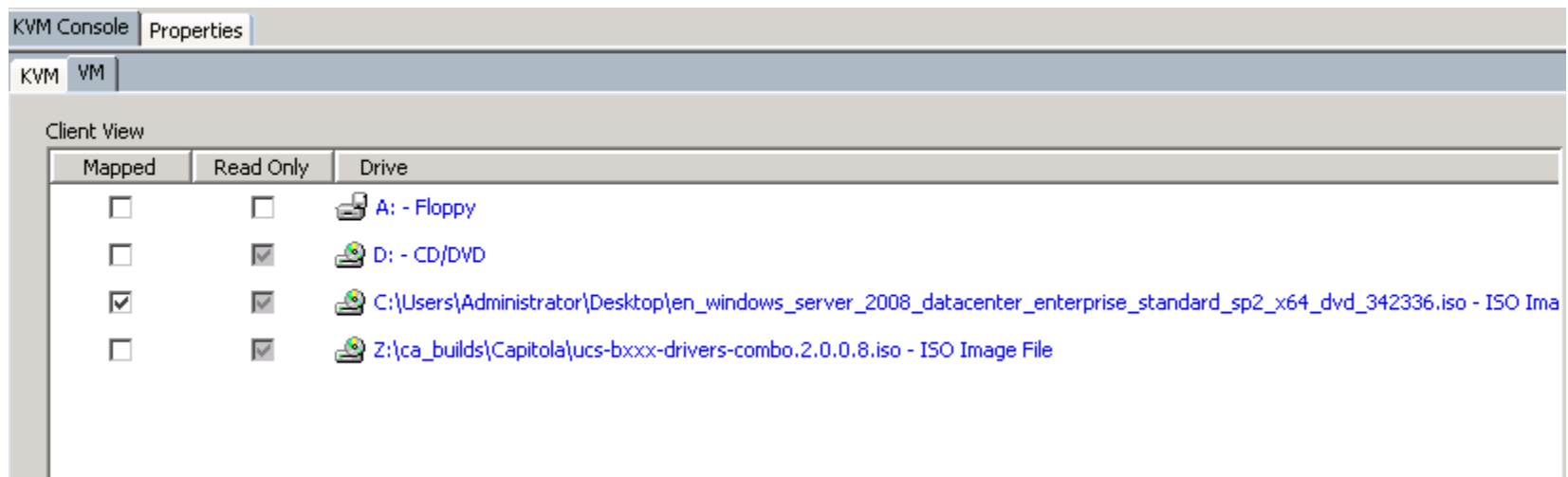
Windows 2008 R2 and R2-SP1

- Install Cisco VIC drivers during install.
- Initially, there will be no disk to install on



Windows 2008 R2 and R2-SP1

- Map the driver ISO – available for download from Cisco.com



Windows 2008 r2 and r2-sp1

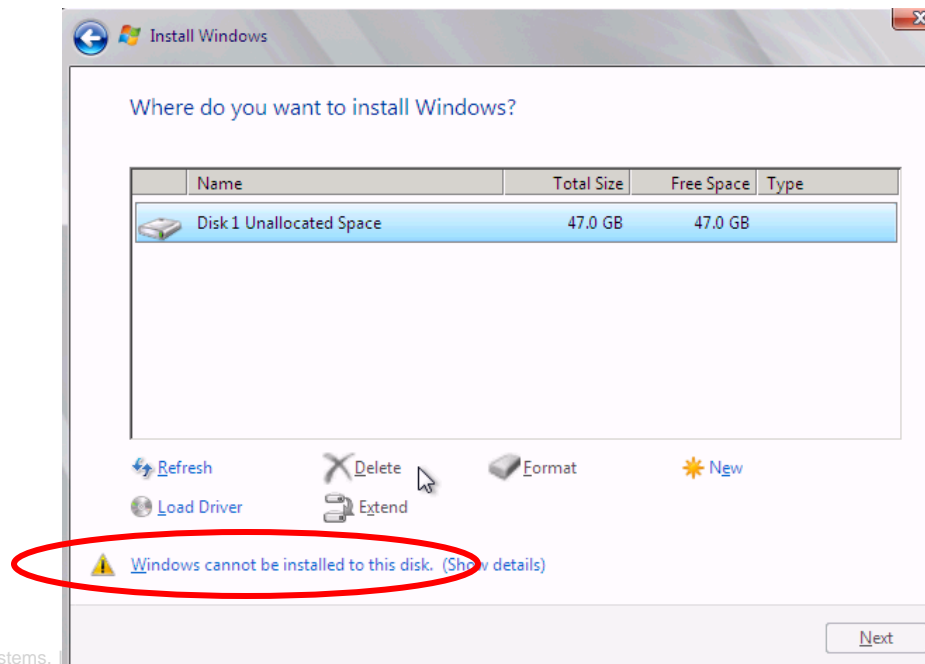
- This driver will appear

Select the driver to be installed.

sco VIC Ethernet Interface (D:\Drivers\Windows\Network\Cisco\M81KR\W2K8R2\x64\enic6264.inf)

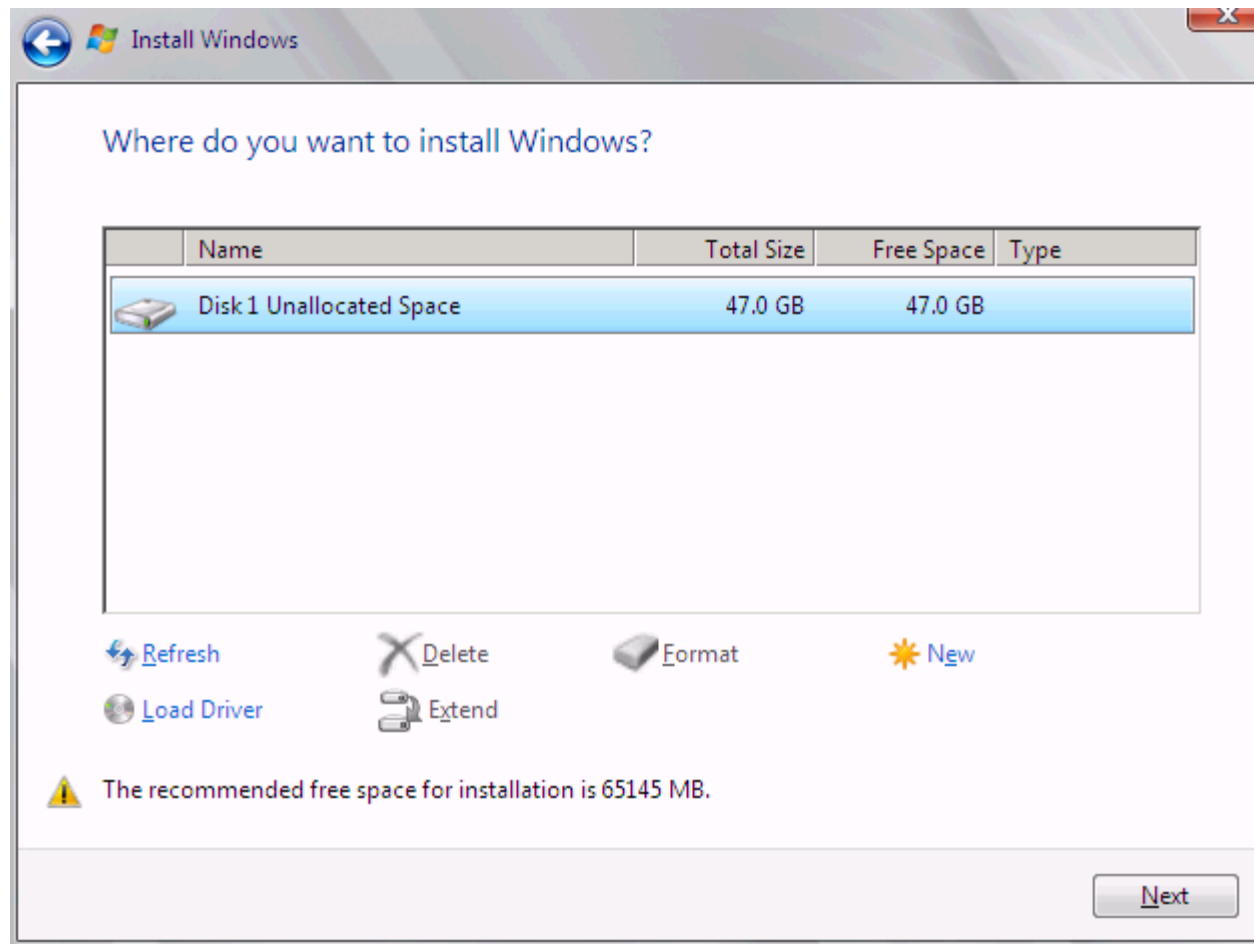
Windows 2008 R2 and R2-SP1

- Once the partitions are deleted, there is the warning:
Windows cannot be installed on this disk
- This happens because the installer is currently running from RAM with only the driver ISO mounted. Need to un-map the driver ISO and re-map the Installation ISO to continue



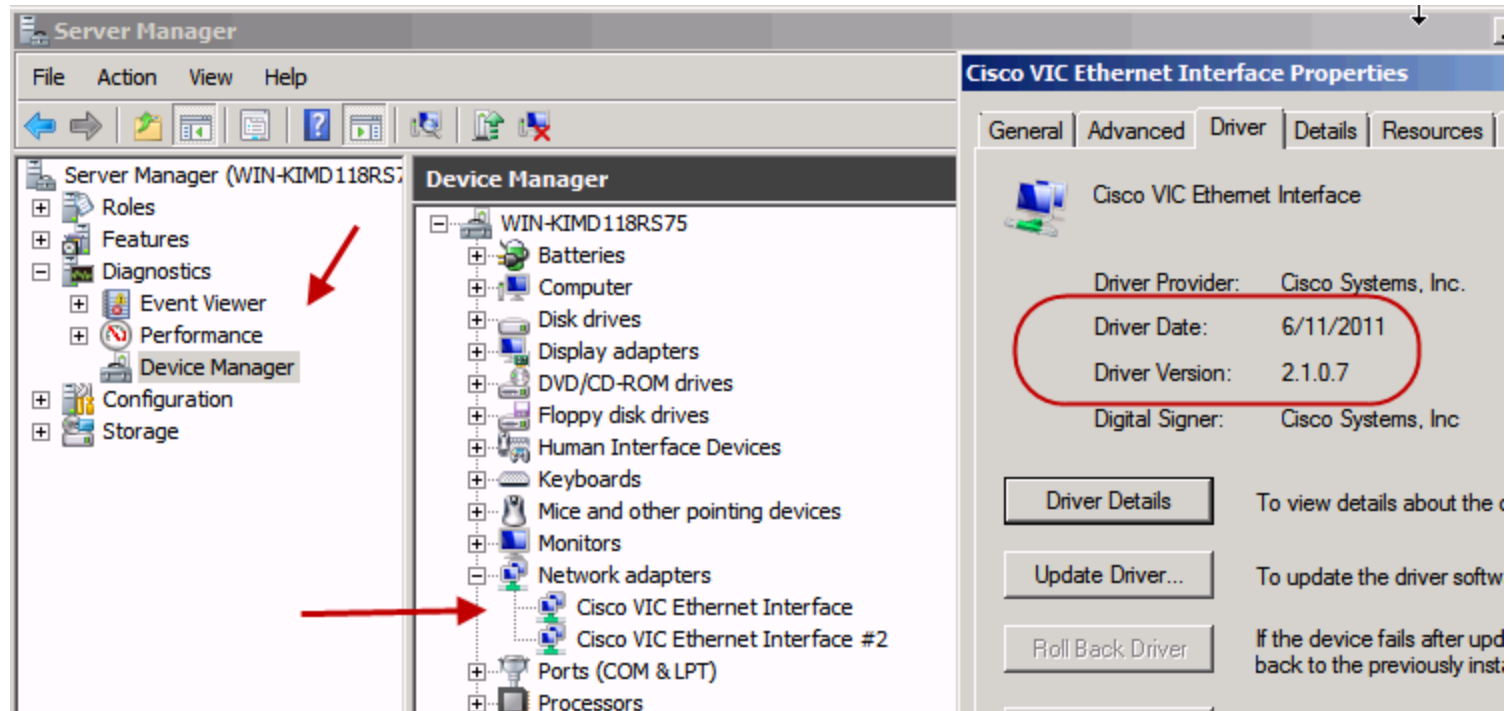
Windows 2008 R2 and R2-SP1

- Map the Installation ISO and refresh. You can continue



Windows 2008 R2 and R2-SP1

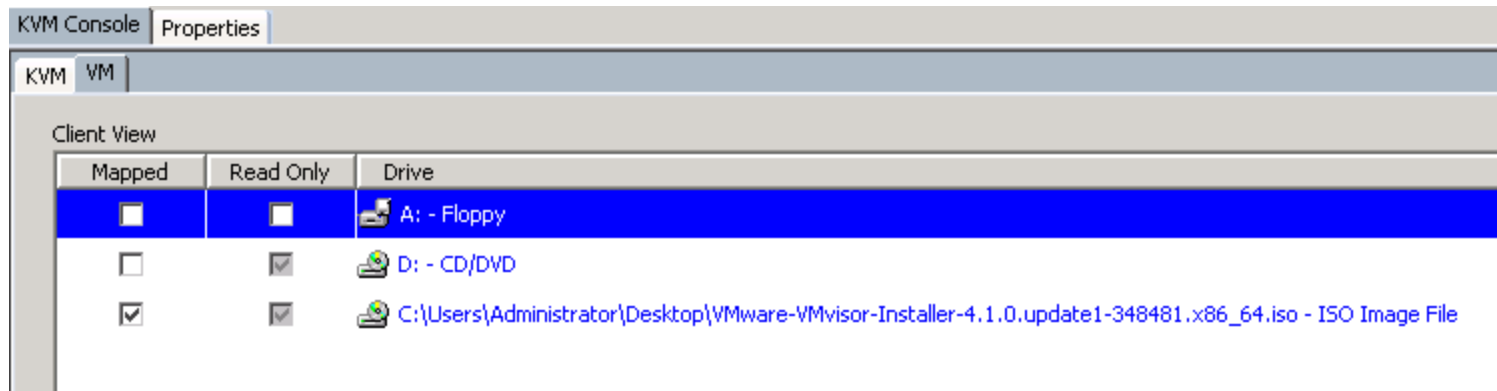
- After install, you can verify the device driver



ESXi 4.1 U1 iSCSI boot configuration – M81KR VIC

ESXi 4.1 U1

- Map the ESXi 4.1 U1 visor ISO



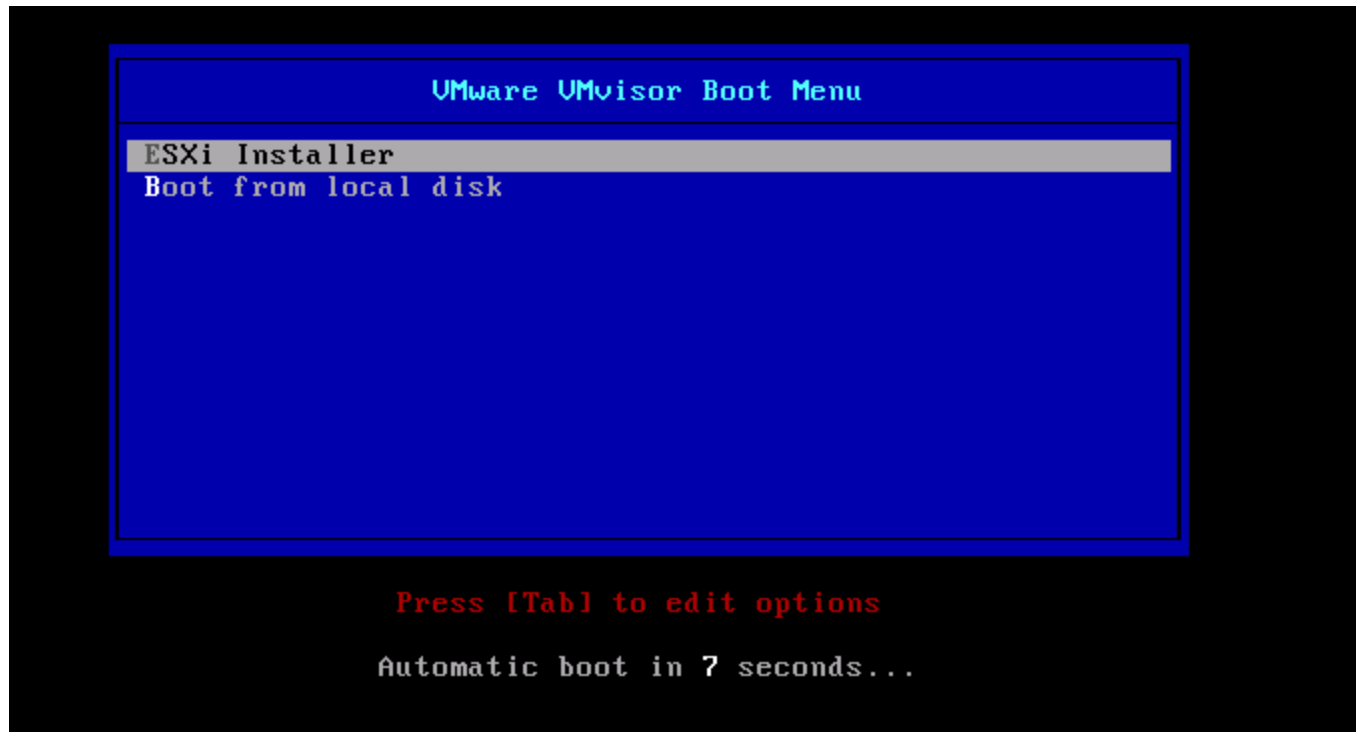
ESXi 4.1 U1

- Wait until you see the Cisco VIC initialize and see the iSCSI target (ensure quiet boot is disabled).

```
Cisco VIC iSCSI, Boot Driver Version 2.0(0.239)
(C) 2010 Cisco Systems, Inc.
0025b530300e iSCSI METAPP :000
Option ROM installed successfully
```

ESXi 4.1 U1

- Select ESXi Installer



ESXi 4.1 U1

- This step seems to take a minute or so

```
VMware ESXi 4.1.0 (VMKernel Release Build 348481)

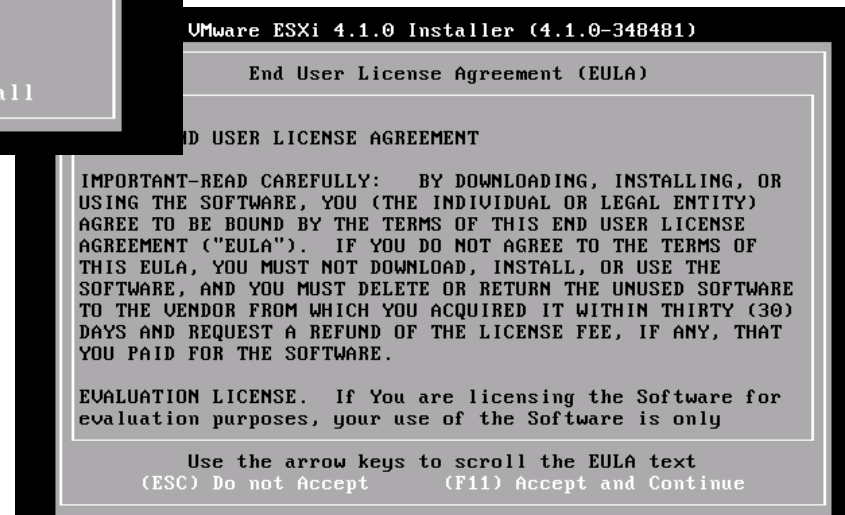
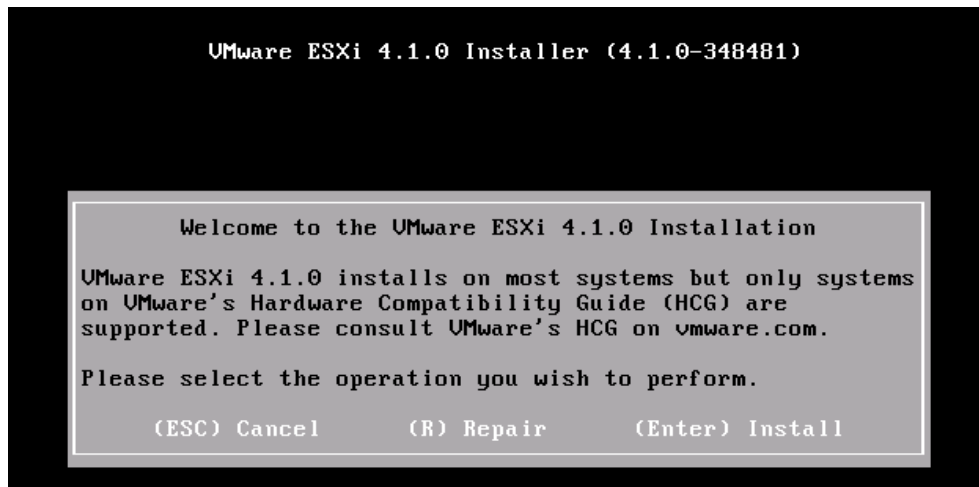
Cisco Systems Inc N20-B6620-1

2 x Intel(R) Xeon(R) CPU X5570 @ 2.93GHz
48 GB Memory

vmkibft loaded successfully.
```

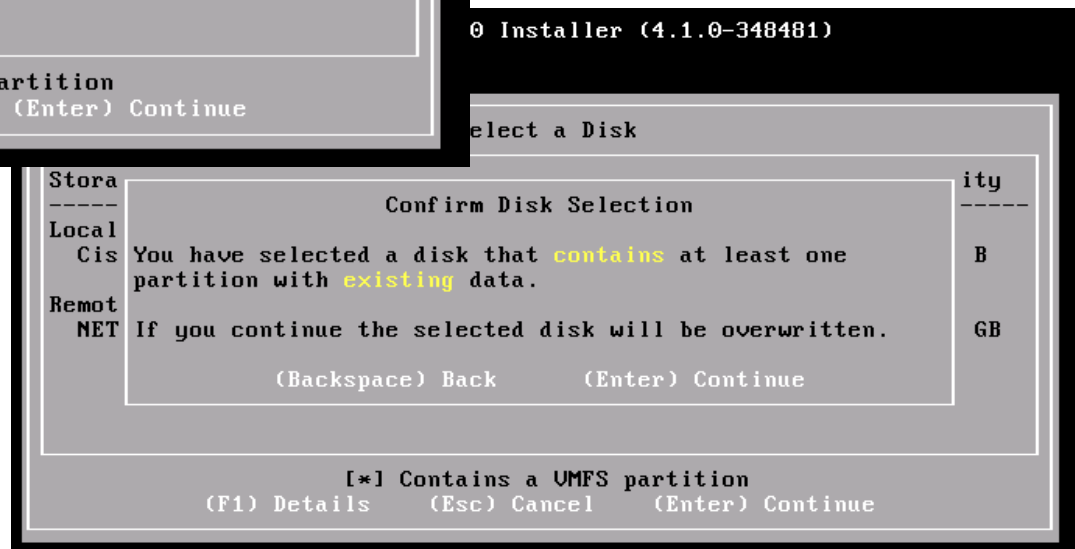
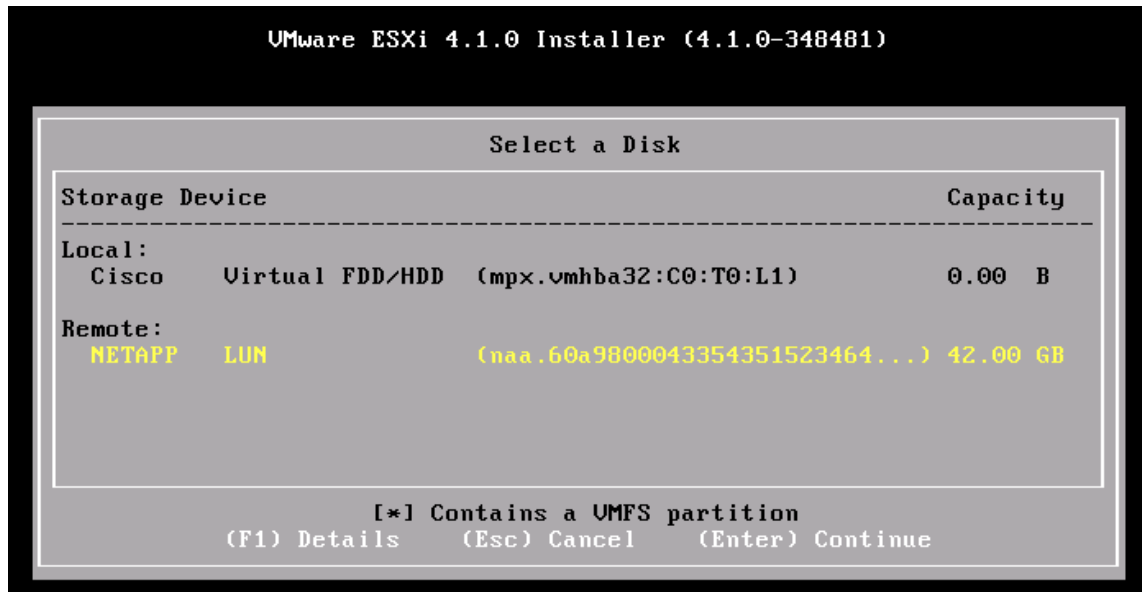
ESXi 4.1 U1

- Enter and F11



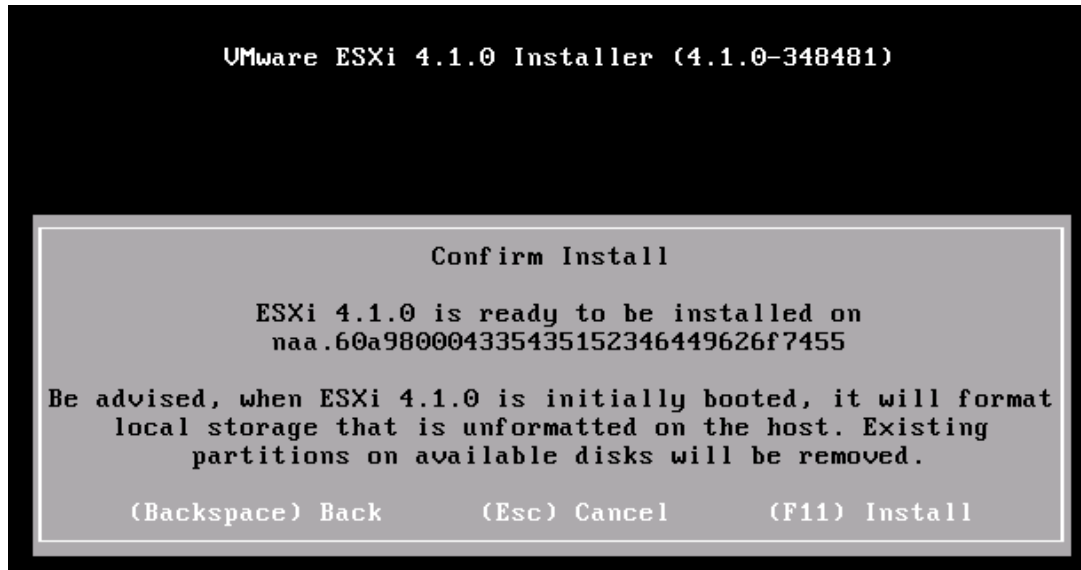
ESXi 4.1 U1

- Select your iSCSI target



ESXi 4.1 U1

- After hitting Enter several times, the install proceeds



ESXi 4.1 U1

- Install complete, reboot

```
VMware ESXi 4.1.0 Installer (4.1.0-348481)

Installation Complete

ESXi 4.1.0 has been successfully installed.

ESXi 4.1.0 will operate in evaluation mode for 60 days. To
use ESXi 4.1.0 after the evaluation period, you must
register for a VMware product license. To administer your
server, use the vSphere Client or the Direct Console User
Interface.

You must reboot the server to start using ESXi 4.1.0.

Be sure to remove the installation disc before you reboot.

(Enter) Reboot
```


ESXi 4.1 U1

- ESXi installed

```
VMware ESXi 4.1.0 (UMKernel Release Build 348481)
```

```
Cisco Systems Inc N20-B6620-1
```

```
2 x Intel(R) Xeon(R) CPU X5570 @ 2.93GHz  
48 GB Memory
```

```
Download tools to manage this host from:  
http://localhost/  
http://10.29.177.69/ (STATIC)
```

```
<F2> Customize System
```

```
<F12> Shut Down/Restart
```

ESXi 4.1 U1

- Go in and enable tech support mode, SSH

The image shows a sequence of three overlapping screenshots from the ESXi 4.1 U1 System Customization menu. The top screenshot shows the main menu with 'Troubleshooting Options' highlighted. The middle screenshot shows the 'Troubleshooting Mode Options' menu with 'Disable Remote Tech Support (SSH)' highlighted. The bottom screenshot shows the 'Remote Tech Support Mode (SSH)' screen with 'Remote TSM (SSH) is Enabled' displayed.

```
System Customization
-----
Configure Password
Configure Lockdown Mode

Configure Management Network
Restart Management Network
Test Management Network
Disable Management Network
Restore Standard Switch

Configure Keyboard
View Support Information
View System Logs

Troubleshooting Options
Reset System Configuration
Remove Customization

<Up/Down> Select

-----
Troubleshooting Mode Options
-----
Disable Local Tech Support
Disable Remote Tech Support (SSH)
Modify Tech Support timeout
Restart Management Agents

-----
Remote Tech Support Mode (SSH)
-----
Remote TSM (SSH) is Enabled

Change current state of Remote Tech Support Mode (SSH)
```

ESXi 4.1 U1

- Check the iBFT configuration

```
bash-3.00$ ssh root@10.29.177.69
root@10.29.177.69's password:
~ # cd /sbin
/sbin # esxcfg-swiscsi -bq
iBFT Settings :-
  INITIATOR :
    Name: eui.1123456789abcdef
    Alias:
    Boot Flags: 3
  TARGET :
    Name: iqn.1992-08.com.netapp:sn.101202840
    IP: 10.29.177.51
    Port: 3260
    ChapType: 0
    Lun: 0
    Boot Flags: 3
```

- Primary NIC :
 - MAC: 00:25:b5:30:30:0e
 - PCI: 768
 - IP: 10.29.177.69
 - Netmask: 255.255.255.0
 - Gateway: 10.29.177.1
 - DHCP: 0
 - VLAN: 0
 - Flags: 3

ESXi 4.1 U1 known issues

- If you see this screen, ESXi can't find the iSCSI LUN.
- You've made a configuration error. Best to start completely from scratch

```
VMware ESXi 4.1.0 (VMKernel Release Build 348481)

Cisco Systems Inc N20-B6620-1

2 x Intel(R) Xeon(R) CPU X5570 @ 2.93GHz
48 GB Memory

0:00:01:42.215 cpu15:5024)Warning: Syslog not configured. Please check Syslog op
tions under Configuration.Software.Advanced Settings in vSphere client.
```

Broadcom Details

Broadcom Fool Proof Configuration Method

Broadcom iSCSI boot – Fool Proof

- Set Adapter policy to “boot to target”
- Let the POST complete to make sure your iSCSI initiator did succeed
- Reboot and select Ctrl-S to make the following changes
- Investigate the first initiator for correct information, boot details, initiator details, target details.
- On the first initiator, in general disable Boot to iSCSI target, which is the adapter policy you set above. So, now your BRCM is configured for OS install
- Set the second initiator boot to “none” from “PXE”. This way it will not time out and cause any issues. It will go to the vMEDIA CD

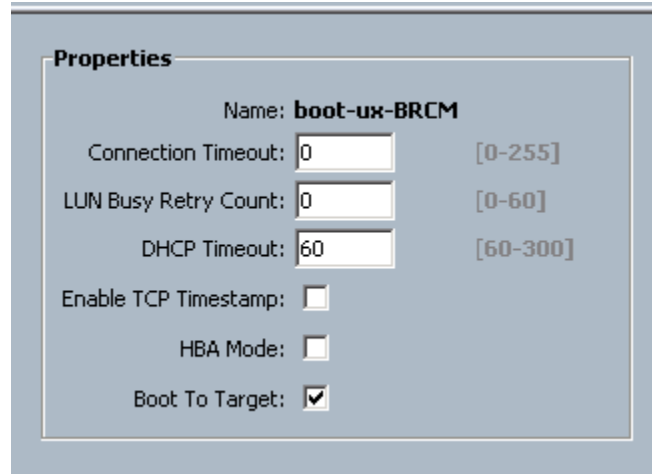
Broadcom iSCSI boot – Fool Proof

- This initial procedure applies to any supported OS.
- Once you've gotten all of the UCSM parts correctly configured map the desired OS ISO and drivers as required
- This example shows how to install ESXi 4.1 U1.

ESXi 4.1 U1 iSCSI boot configuration – M51KR-B

Broadcom iSCSI boot – ESXi 4.1 U1

- Create the boot adapter profile for ESX, enable boot to iSCSI target



The screenshot shows the 'Properties' configuration window for a boot adapter profile. The profile name is 'boot-ux-BRCM'. The configuration includes the following settings:

Property	Value	Range
Name	boot-ux-BRCM	
Connection Timeout	0	[0-255]
LUN Busy Retry Count	0	[0-60]
DHCP Timeout	60	[60-300]
Enable TCP Timestamp	<input type="checkbox"/>	
HBA Mode	<input type="checkbox"/>	
Boot To Target	<input checked="" type="checkbox"/>	

Broadcom iSCSI boot – ESXi 4.1 U1

- Create a SP for Broadcom

Identify Service Profile

You must enter a name for the service profile. You can also specify how the description of the profile.

Name:

The service profile will be created in the following organization. Its name must be unique within the organization.

Where: **org-root**

Specify how the UUID will be assigned to the server associated with this service profile.

UUID

UUID Assignment:

[+ Create UUID Service Profile](#)

The UUID will be assigned to the server associated with this service profile.

Storage

Optionally specify disk policies and SAN configuration information.

Local Storage:

Mode: **Any Configuration**

Protect Configuration: **yes**

[+ Create Local Disk Configuration Policy](#)

If **Protect Configuration** is set, the Local Disk Configuration is preserved on disk. On reassociation of the same Server, a configuration error will be raised if the new Local Disk Configuration is different.

How would you like to configure SAN connectivity? Simple Expert No vHBAs Hardware Inherited

This server associated with this service profile will not be connected to a storage area network.

Broadcom iSCSI boot – ESXi 4.1 U1

- Create 2 vNICs 0 and 1

Create vNIC

Name:

MAC Address:

Use LAN Connectivity Template:

The MAC address will be automatically assigned from the selected pool.

Fabric ID: Fabric A Fabric B Enable Failover

Select	Name	Native VLAN
<input type="checkbox"/>	default	<input type="radio"/>
<input type="checkbox"/>	11	<input type="radio"/>
<input checked="" type="checkbox"/>	177	<input checked="" type="radio"/>

MTU:

Pin Group:

Operational Parameters

Adapter Performance Profile

Adapter Policy:

Create vNIC

Name:

MAC Address:

Use LAN Connectivity Template:

The MAC address will be automatically assigned from the selected pool.

Fabric ID: Fabric A Fabric B Enable Failover

Select	Name	Native VLAN
<input type="checkbox"/>	default	<input type="radio"/>
<input type="checkbox"/>	11	<input type="radio"/>
<input checked="" type="checkbox"/>	177	<input checked="" type="radio"/>

MTU:

Pin Group:

Operational Parameters

Adapter Performance Profile

Adapter Policy:

OoS Policy:

Broadcom iSCSI boot – ESXi 4.1 U1

- After creating an iSCSI vNIC, you should end up with 2 x vNICs and 1 x iSCSI-vNIC0

Networking ?

Optionally specify LAN configuration information.

Dynamic vNIC Connection Policy: Select a Policy to use (no Dynamic vNIC Policy by default) + Create Dynamic vNIC Connection Policy

How would you like to configure LAN connectivity? Simple Expert No vNICs Hardware Inherited

Click **Add** to specify one or more vNICs that the server should use to connect to the LAN.

Name	MAC Address	Fabric ID	Native VLAN
vNIC vNIC0	Derived	A	
Network 177			
vNIC vNIC1	Derived	B	
Network 177			

Delete + Add Modify

Add iSCSI vNICs


Name	Overlay vNIC Name	iSCSI Adapter Policy	MAC Address
iSCSI vNIC iSCSI-vNIC0 vNIC0		boot-ux-BRCM	Derived

+ Add Delete Modify





Broadcom iSCSI boot – ESXi 4.1 U1

- Default vNIC placement

vNIC/vHBA Placement specifies how vNICs and vHBAs are placed on physical network interface (mezzanine) cards in a server hardware configuration independent way.

Select Placement:  Create Placement Policy

System will perform automatic placement of vNICs and vHBAs based on PCI order.

Name	Address	Order	
 vNIC vNIC0	Derived	1	
 vNIC vNIC1	Derived	2	

Broadcom iSCSI boot – ESXi 4.1 U1

- Boot Order – iSCSI-vNIC must be first, cd/install media second

Server Boot Order
Optionally specify the boot policy for this service profile.

Select a boot policy.

Boot Policy:

Name: **BRCM-ESX-1**
Description:
Reboot on Boot Order Change: **no**
Enforce vNIC/vHBA/iSCSI Name: **no**

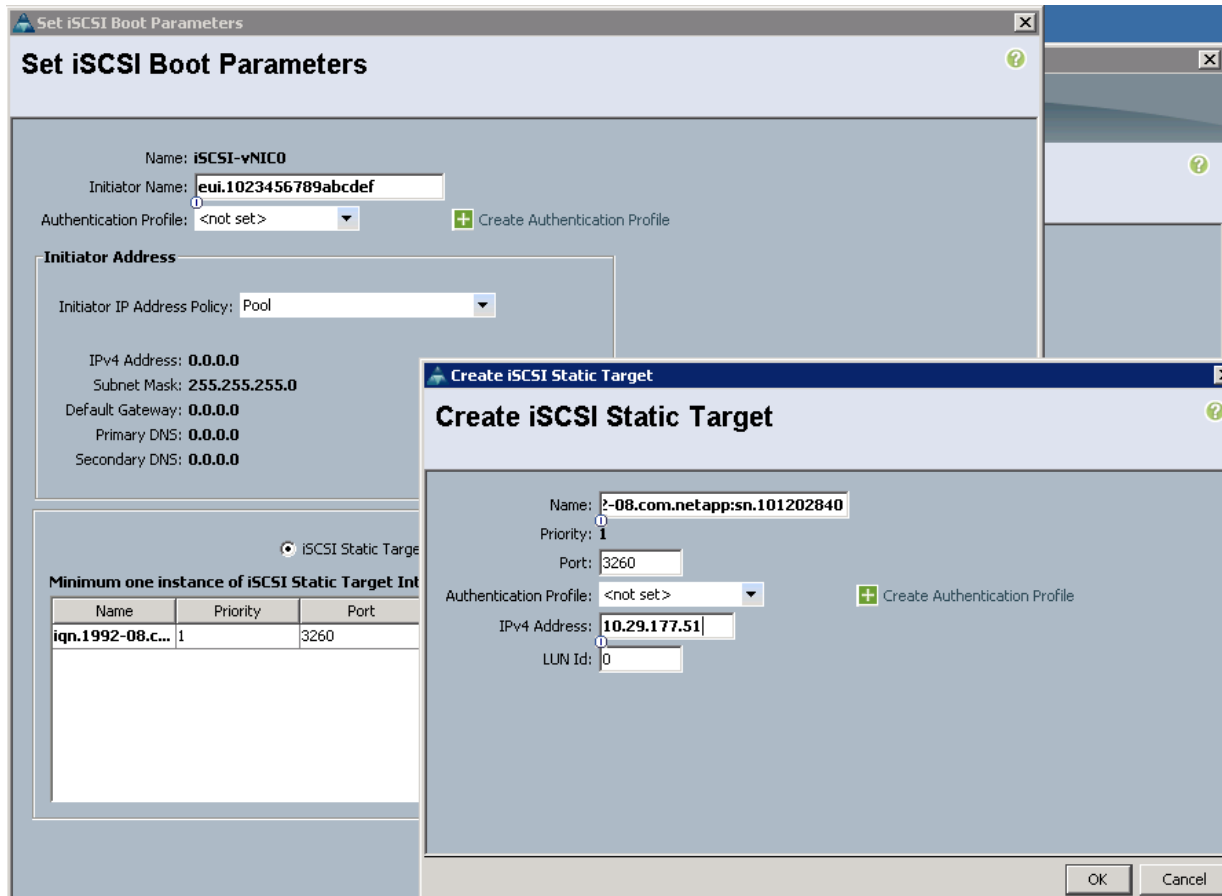
WARNINGS:
The type (primary/secondary) does not indicate a boot order presence.
The effective order of boot devices within the same device class (LAN/Storage/iSCSI) is determined by PCIe bus scan order.
If **Enforce vNIC/vHBA/iSCSI Name** is selected and the vNIC/vHBA/iSCSI does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs/iSCSI are selected if they exist, otherwise the vNIC/vHBA/iSCSI with the lowest PCIe bus scan order is used.

Boot Order

Name	Order	vNIC/vHBA/iSCSI vNIC	Type	Lun ID	WWN
iSCSI	1	iSCSI-vNIC0	Primary		
CD-ROM	2				

Broadcom iSCSI boot – ESXi 4.1 U1

- Configure the iSCSI boot parameters. Initiator, target details



Broadcom iSCSI boot – ESXi 4.1 U1

- If you used the iSCSI-initiator-pool, verify by going to the SP

Fault Summary

Equipment: Servers | LAN | SAN | VM | Admin

Filter: All

Servers > Service Profiles > root > Service Profile BRCM-ESX-1

General | Storage | Network | iSCSI vNICs | **Boot Order** | Virtual Machines | Policies

Actions: Modify Boot Policy

Global Boot Policy

Name: **BRCM-ESX-1**

Boot Policy Instance: org-root/boot-policy-BRCM-ESX-1

Description:

Reboot on Boot Order Change: **no**

Enforce vNIC/vHBA/iSCSI Name: **no**

WARNINGS:
The type (primary/secondary) does not indicate a boot order presence. The effective order of boot devices within the same device class (LAN/Storage) is determined by the **Enforce vNIC/vHBA/iSCSI Name** property. If it is not selected, the vNICs/vHBAs/iSCSI are selected if they exist, otherwise the CD-ROM is used.

Boot Order

Name	Order	vNIC/vHBA/iSCSI vNIC
iSCSI	1	
iSCSI		iSCSI-vNIC0
CD-ROM	2	

Modify iSCSI vNIC | **Set iSCSI Boot Parameters**

Set iSCSI Boot Parameters

Name: **iSCSI-vNIC0**

Initiator Name: eui.1023456789abcdef

Authentication Profile: <not set> + Create

Initiator Address

Initiator IP Address Policy: Pool

IPv4 Address: **10.29.177.65**

Subnet Mask: **255.255.255.0**

Default Gateway: **10.29.177.1**

Primary DNS: **171.70.168.183**

Secondary DNS: **0.0.0.0**

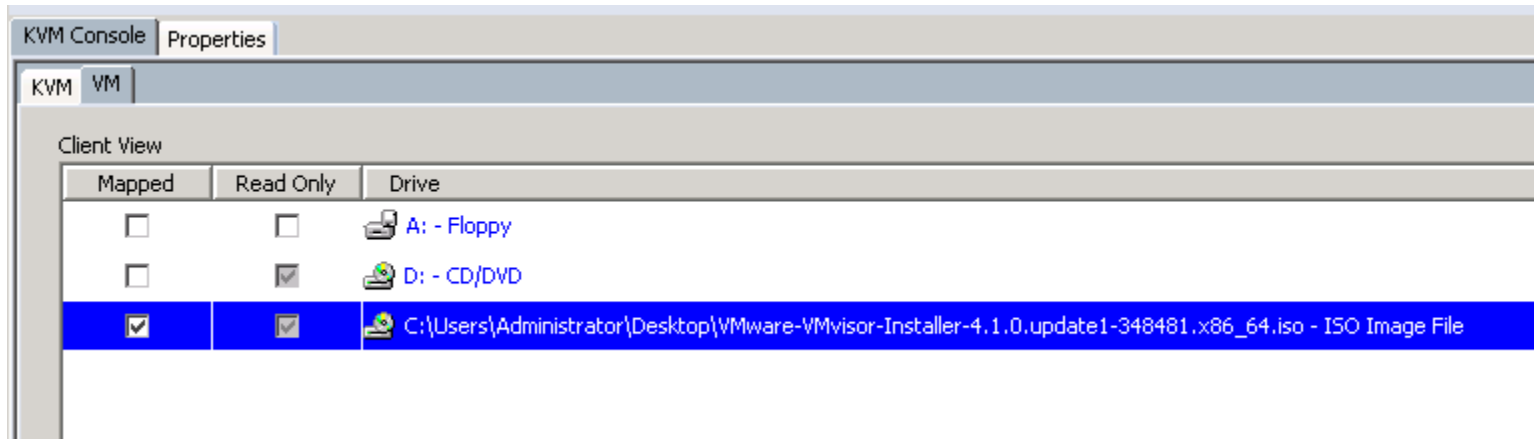
iSCSI Static Target Interface

Minimum one instance of iSCSI Static Target Interface and m

Name	Priority	Port	Authenticati
...

Broadcom iSCSI boot – ESXi 4.1 U1

- Associate to a Broadcom blade, watch the KVM, watch UUOS configure the blade. Then on the second reboot, map in your ESXi 4.1 U1 release media



Broadcom iSCSI boot – ESXi 4.1 U1

- Let the system boot once to see that your initiator actually logs in and sees a LUN. If not check your configurations

```
Copyright (C) 2000-2011 Broadcom Corporation
iSCSI Boot (IPv4) v6.2.6

Initializing interface (00:25:B5:30:30:1A) ... Succeeded

Connecting to iSCSI targets with interface (00:25:B5:30:30:1A) ... Succeeded

Initiator Name       : eui.1023456789abcdef
Host IP Address      : 10.29.177.65
MAC Address          : 00:25:B5:30:30:1A
Subnet Mask          : 255.255.255.0
Default Gateway      : 10.29.177.1
1st Target Name      : ign.1992-08.com.netapp:sn.101202840
1st Target IP Addr   : 10.29.177.51
1st Target TCP Port  : 3260
1st Target Boot LUN  : 0
Logging in the 1st iSCSI Target ... Succeeded

SCSI Target Drive: NETAPP    LUN          (Rev: 7350)
```

Broadcom iSCSI boot – ESXi 4.1 U1

- Reboot and wait for this screen and hit Ctrl-S. Ensure that you have disabled quiet boot.

```
Broadcom NetXtreme Ethernet Boot Agent  
Copyright (C) 2000-2011 Broadcom Corporation  
All rights reserved.  
Press Ctrl-S to enter Configuration Menu
```

Broadcom iSCSI boot – ESXi 4.1 U1

- Check all the settings and confirm they are what you expect.
- The top one should match your overlay vNIC so check the MAC against the service profile

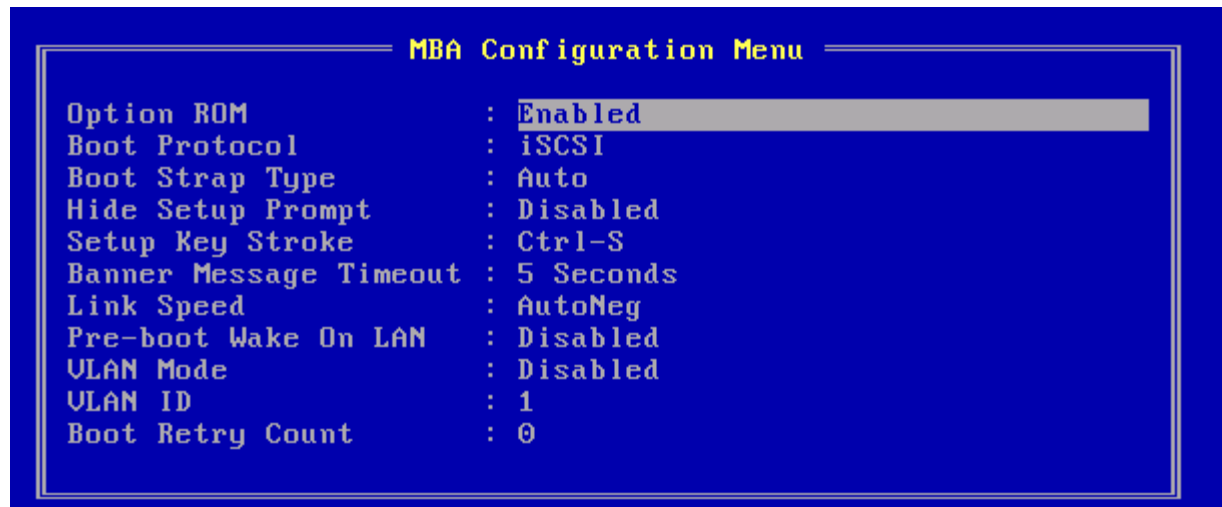
```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

----- Device List -----
<04:00:00> BCM57711 - 00:25:B5:30:30:1A MBA:v6.2.23 CCM:v6.2.21
<04:00:01> BCM57711 - 00:25:B5:30:30:0A MBA:v6.2.23 CCM:v6.2.21

Select Device to Configure
[Enter]:Enter Next Menu; [↑|↓]:Next Entry; [ESC]:Quit Menu
```

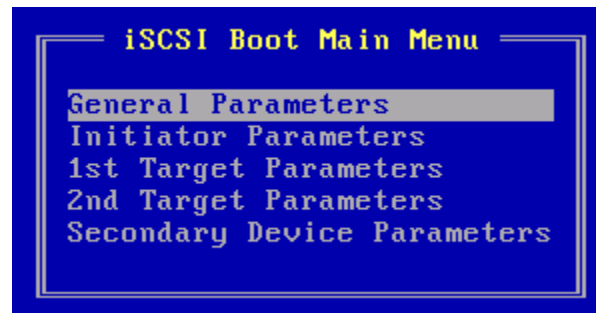
Broadcom iSCSI boot – ESXi 4.1 U1

- Select return and get to the MBA Configuration, return to see the settings, Should be Boot Protocol: iSCSI



Broadcom iSCSI boot – ESXi 4.1 U1

- ESC to go back
- Select return and get to the iSCSI Boot Configuration, return to see the options, go into General



Broadcom iSCSI boot – ESXi 4.1 U1

- Boot to iSCSI target is enabled, because that was the adapter profile we used. But, for install, you can change it to Disabled. We'll set it back after installation

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

----- General Parameters -----
TCP/IP Parameters via DHCP : Disabled
iSCSI Parameters via DHCP : Disabled
CHAP Authentication       : Disabled
Boot to iSCSI Target      : Enabled
DHCP Vendor ID           :
Link Up Delay Time       : 0
Use TCP Timestamp        : Disabled
Target as First HDD      : Enabled
LUN Busy Retry Count     : 0
IP Version               : IPv4
HBA Boot Mode            : Disabled

Enable/Disable Booting to iSCSI
[←|→][Enter][Space]:Scroll Value; [↑|↓]
Current Adapter:Primary, Bus=04 Device=00
```

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

----- General Parameters -----
TCP/IP Parameters via DHCP : Disabled
iSCSI Parameters via DHCP : Disabled
CHAP Authentication       : Disabled
Boot to iSCSI Target      : Disabled
DHCP Vendor ID           :
Link Up Delay Time       : 0
Use TCP Timestamp        : Disabled
Target as First HDD      : Enabled
LUN Busy Retry Count     : 0
IP Version               : IPv4
HBA Boot Mode            : Disabled

Enable/Disable Booting to iSCSI Target After Logon
[←|→][Enter][Space]:Scroll Value; [↑|↓]:Next Entry; [ESC]:Quit Menu
Current Adapter:Primary, Bus=04 Device=00 Func=00, MAC=00:25:B5:30:30:1A
```


Broadcom iSCSI boot – ESXi 4.1 U1

- ESC back, look at Initiator Parameters

The image shows two overlapping screenshots from the ESXi 4.1 U1 iSCSI boot environment. The top-left screenshot shows the 'iSCSI Boot Main Menu' with 'Initiator Parameters' selected. The larger bottom-right screenshot shows the 'Initiator Parameters' configuration screen with the following settings:

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

Initiator Parameters

IP Address      : 10.29.177.65
Subnet Mask     : 255.255.255.0
Default Gateway : 10.29.177.1
Primary DNS     : 171.70.168.183
Secondary DNS   : 0.0.0.0
iSCSI Name     : eui.1023456789abcdef
CHAP ID        :
CHAP Secret    :
```

At the bottom of the configuration screen, the following text is displayed:

```
Configure Initiator IP address
[Enter]:Enter New Value; [↑|↓]:Next Entry; [ESC]:Quit Menu
Current Adapter:Primary, Bus=04 Device=00 Func=00, MAC=00:25:B5:30:30:1A
```

Broadcom iSCSI boot – ESXi 4.1 U1

- ESC back and look at the 1st Target Parameters. iBFT only reads from the 1st target. If it's blank, your boot priority is wrong

```
iSCSI Boot Main Menu
General Parameters
Initiator Parameters
1st Target Parameters
2nd Target Parameters
Secondary Device
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.

1st Target Parameters

Connect      : Enabled
IP Address   : 10.29.177.51
TCP Port     : 3260
Boot LUN     : 0
iSCSI Name  : iqn.1992-08.com.netapp:sn.101202840
CHAP ID     :
CHAP Secret  :

Enable/Disable Target Establishment
[←|→][Enter][Space]:Toggle Value; [↑|↓]:Next Entry; [ESC]:Quit Menu
Current Adapter:Primary, Bus=04 Device=00 Func=00, MAC=00:25:B5:30:30:1A
```

Broadcom iSCSI boot – ESXi 4.1 U1

- Boot Priority must be 1 otherwise will not display within Broadcom OptionROM

Set iSCSI Boot Parameters

Name: **iSCSI-vNIC0**

Initiator Name:

Authentication Profile: [+ Create Authentication Profile](#)

Initiator Address

Initiator IP Address Policy:

IPv4 Address: **10.29.177.65**
Subnet Mask: **255.255.255.0**
Default Gateway: **10.29.177.1**
Primary DNS: **171.70.168.183**
Secondary DNS: **0.0.0.0**

iSCSI Static Target Interface iSCSI Auto Target Interface

Minimum one instance of iSCSI Static Target Interface and maximum two are allowed.

Name	Priority	Port	Authentication Profile	iSCSI IPv4 Address	LUN Id
iqn.1992-08.co...	1	3260		10.29.177.51	0

Broadcom iSCSI boot – ESXi 4.1 U1

- 2nd target should be blank

```
iSCSI Boot Main Menu
General Parameters
Initiator Parameters
1st Target Parameters
2nd Target Parameters
Secondary Device Parameters
```

```
2nd Target Parameters
Connect      : Disabled
IP Address   : 0.0.0.0
TCP Port     : 3260
Boot LUN     : 0
iSCSI Name   :
CHAP ID      :
CHAP Secret  :
```

Broadcom iSCSI boot – ESXi 4.1 U1

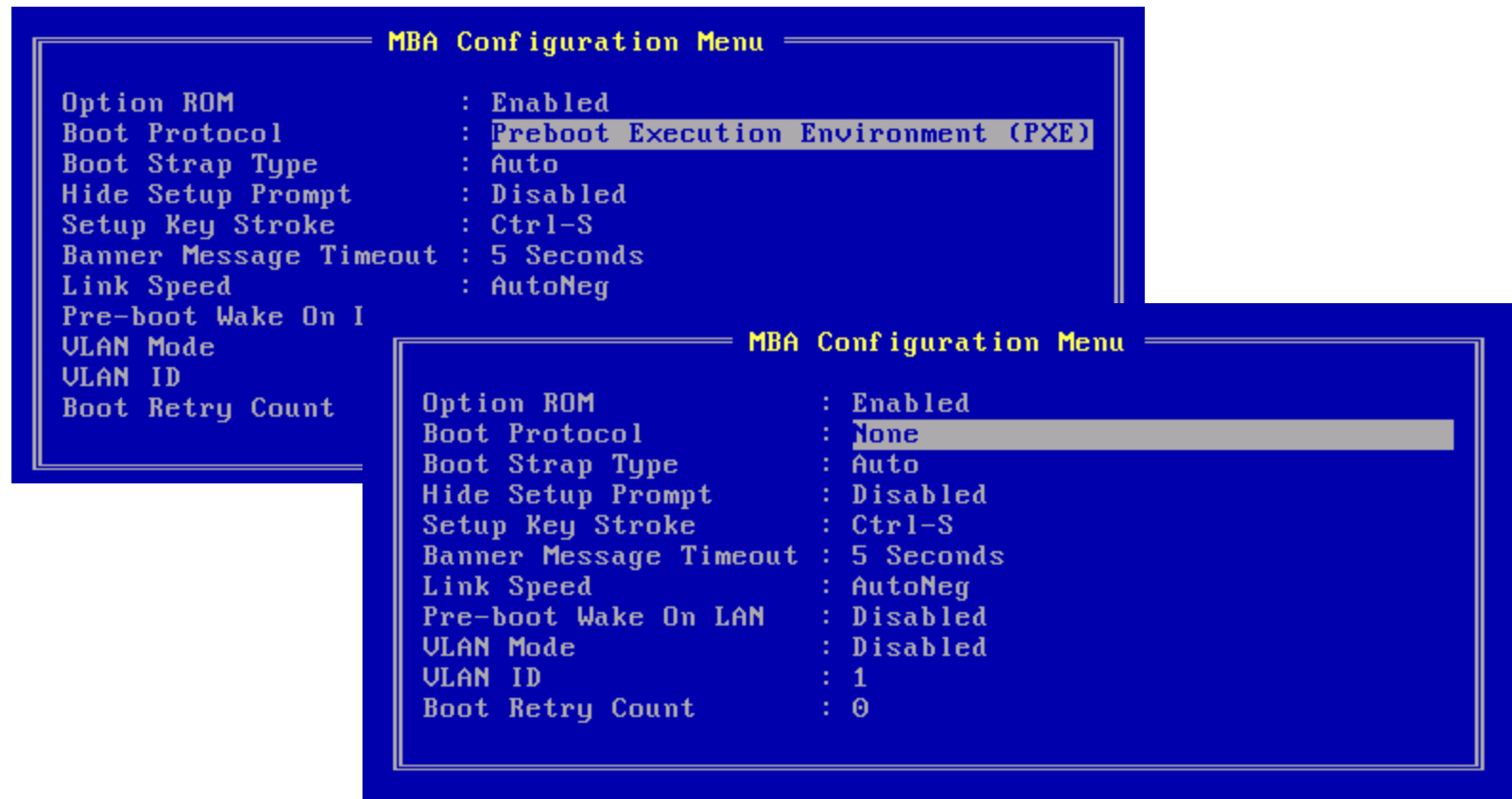
- We're going to disable the second iSCSI vNIC boot preference now.
- This reduces the PXE timeouts during boot
- Select the second adapter and enter the MBA Configuration

```
Device List
<04:00:00> BCM57711 - 00:25:B5:30:30:1A MBA:v6.2.23 CCM:v6.2.21
<04:00:01> BCM57711 - 00:25:B5:30:30:0A MBA:v6.2.23 CCM:v6.2.21
```

```
Main Menu
MBA Configuration
iSCSI Boot Configuration
```

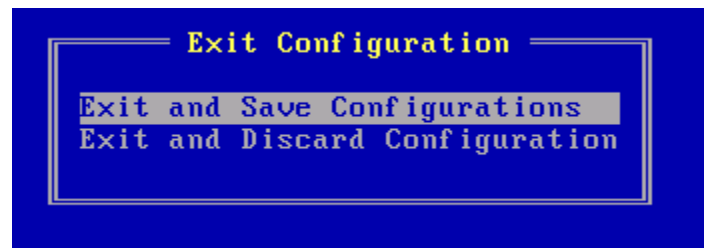
Broadcom iSCSI boot – ESXi 4.1 U1

- Change PXE to none, unless you are using PXE to install



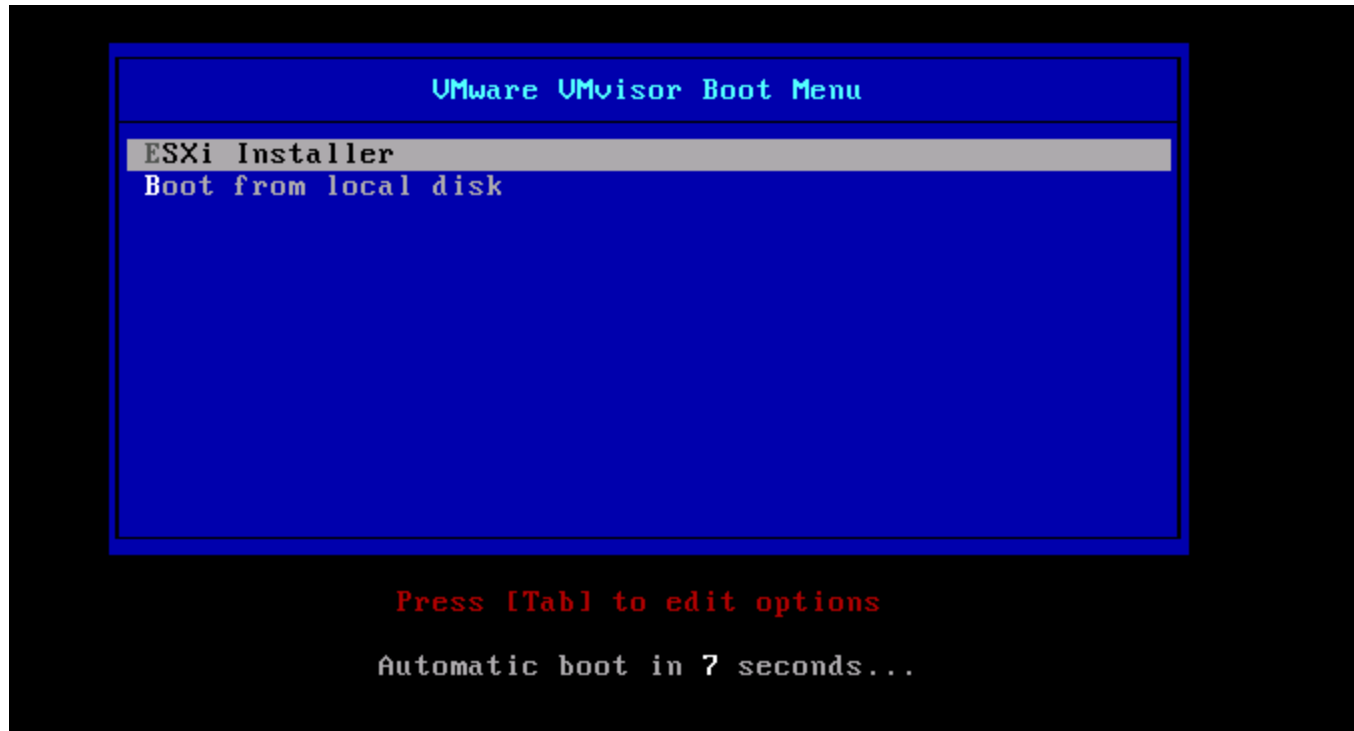
Broadcom iSCSI boot – ESXi 4.1 U1

- Carriage Return to save



Broadcom iSCSI boot – ESXi 4.1 U1

- It should go quickly to the ESXi install menu at this point after you save and exit the BRCM Option ROM



Broadcom iSCSI boot – ESXi 4.1 U1

- Follow the installation instructions

```
VMware ESXi 4.1.0 (VMKernel Release Build 348481)
Cisco Systems Inc N20-B6620-1
2 x Intel(R) Xeon(R) CPU X5570 @ 2.93GHz
48 GB Memory

vmkibft loaded
```

```
VMware ESXi 4.1.0 Installer (4.1.0-348481)

Welcome to the VMware ESXi 4.1.0 Installation

VMware ESXi 4.1.0 installs on most systems but only systems
on VMware's Hardware Compatibility Guide (HCG) are
supported. Please consult VMware's HCG on vmware.com.

Please select the operation you wish to perform.

(ESC) Cancel      (R) Repair      (Enter) Install
```

Broadcom iSCSI boot – ESXi 4.1 U1

- Select your iSCSI LUN

The image shows two overlapping screenshots from the VMware ESXi 4.1.0 Installer. The background screenshot displays the End User License Agreement (EULA) with the title 'VMware ESXi 4.1.0 Installer (4.1.0-348481)'. The foreground screenshot shows the 'Select a Disk' screen, also titled 'VMware ESXi 4.1.0 Installer (4.1.0-348481)'. It lists two storage devices: a local Cisco Virtual FDD/HDD and a remote iSCSI LUN. The remote LUN is highlighted in yellow and has a capacity of 42.00 GB. At the bottom of the foreground screen, there are instructions: '[*] Contains a VMFS partition', '(F1) Details', '(Esc) Cancel', and '(Enter) Continue'.

VMware ESXi 4.1.0 Installer (4.1.0-348481)

End User License Agreement (EULA)

VMWARE END USER LICENSE AGREEMENT

IMPORTANT-READ CAREFULLY: BY DOWNLOADING, INSTALLING, OR USING THE SOFTWARE, YOU (THE INDIVIDUAL OR LEGAL ENTITY) AGREE TO AGREEMEN THIS EUL SOFTWARE TO THE U DAYS AND YOU PAID EVALUATI evaluati (ES

VMware ESXi 4.1.0 Installer (4.1.0-348481)

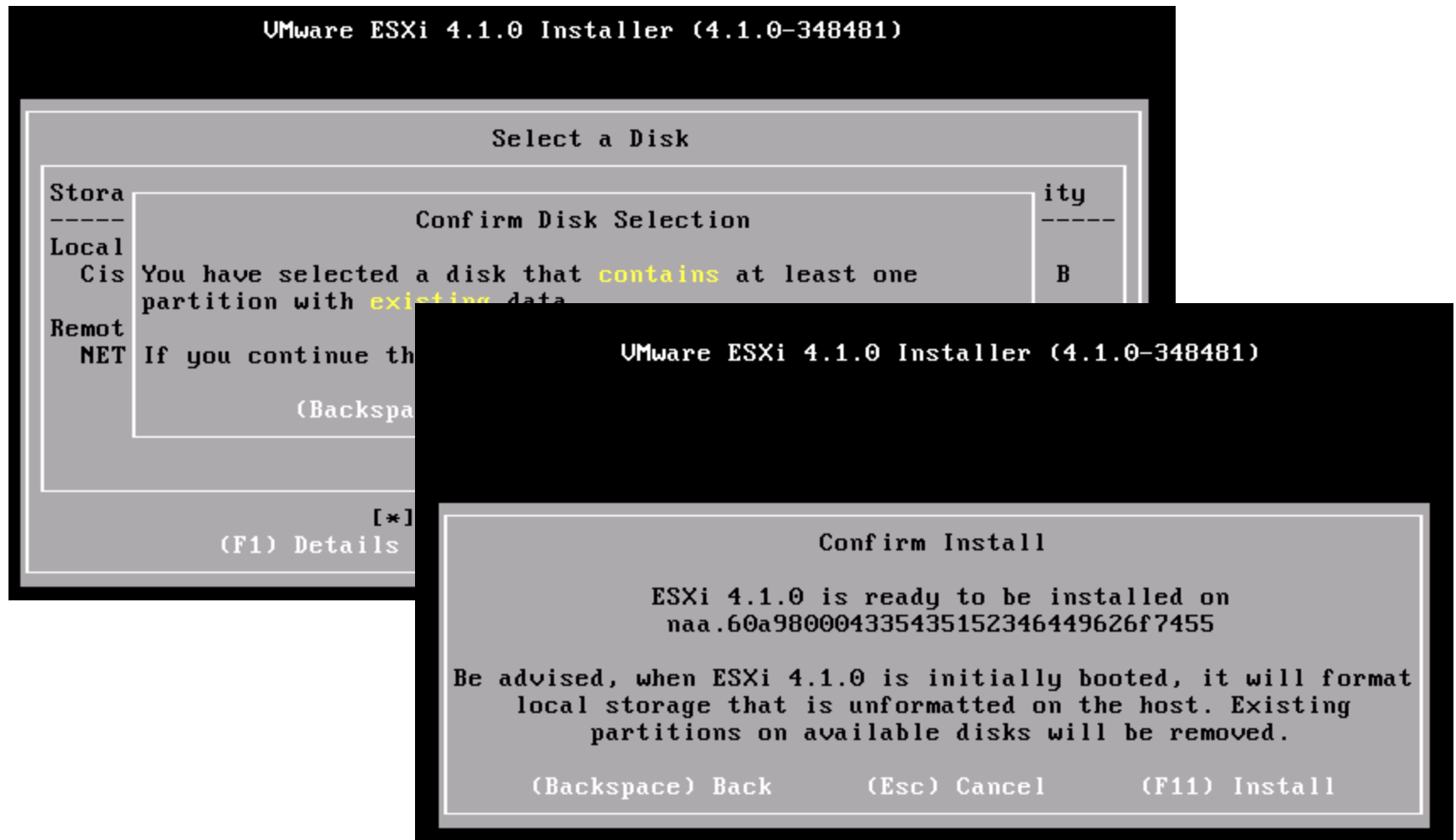
Select a Disk

Storage Device	Capacity
Local:	
Cisco Virtual FDD/HDD (mpx.vmhba32:C0:T0:L1)	0.00 B
Remote:	
NETAPP LUN (naa.60a9800043354351523464...)	42.00 GB

[*] Contains a VMFS partition
(F1) Details (Esc) Cancel (Enter) Continue

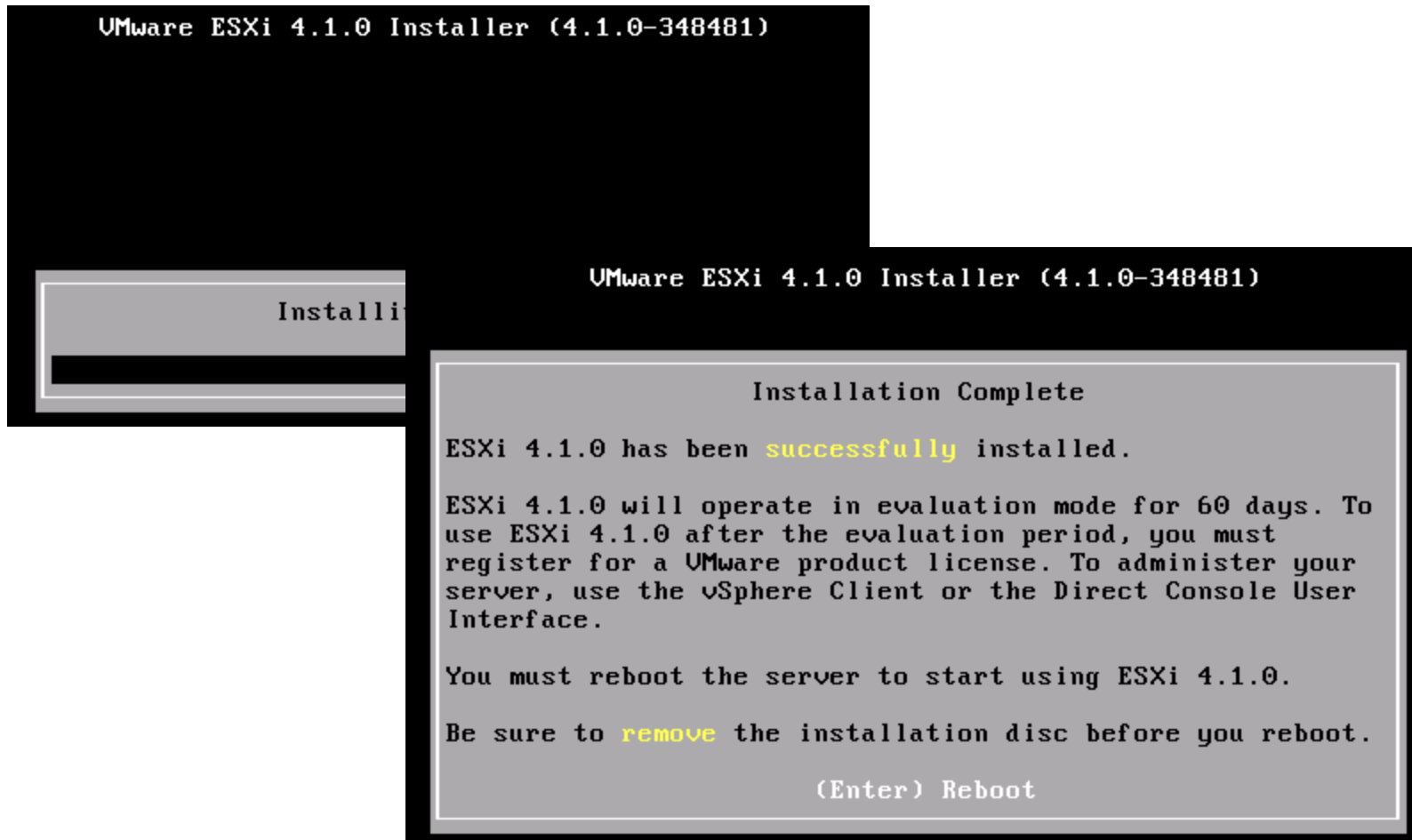
Broadcom iSCSI boot – ESXi 4.1 U1

- Follow the installation instructions



Broadcom iSCSI boot – ESXi 4.1 U1

- Follow the installation instructions, when you reboot, you need to select Ctrl-S to set the BRCM to boot from target



Broadcom iSCSI boot – ESXi 4.1 U1

- Ctrl-S, go into vNIC0

```
Broadcom NetXtreme Ethernet Boot Agent  
Copyright (C) 2000-2011 Broadcom Corporation  
All rights reserved.  
Press Ctrl-S to enter Configuration Menu
```

Device List

```
<04:00:00> BCM57711 - 00:25:B5:30:30:1A MBA:v6.2.23 CCM:v6.2.21  
<04:00:01> BCM57711 - 00:25:B5:30:30:0A MBA:v6.2.23 CCM:v6.2.21
```

Select Device to Configure

```
[Enter]:Enter Next Menu; [↑↓]:Next Entry; [ESC]
```

Main Menu

```
MBA Configuration  
iSCSI Boot Configuration
```

Broadcom iSCSI boot – ESXi 4.1 U1

- Change Boot to iSCSI Target from disabled to enabled

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.
```

General Parameters

```
TCP/IP Parameters via DHCP : Disabled
iSCSI Parameters via DHCP : Disabled
CHAP Authentication        : Disabled
Boot to iSCSI Target      : Disabled
DHCP Vendor ID            :
Link Up Delay Time        : 0
Use TCP Timestamp         : Disabled
Target as First HDD       : Enabled
LUN Busy Retry Count      : 0
IP Version                 : IPv4
HBA Boot Mode             : Disabled
```

Enable/Disable

[←→][Enter][Space]

Current Adapter:Primary

```
Comprehensive Configuration Management v6.2.21
Copyright (C) 2000-2011 Broadcom Corporation
All rights reserved.
```

General Parameters

```
TCP/IP Parameters via DHCP : Disabled
iSCSI Parameters via DHCP : Disabled
CHAP Authentication        : Disabled
Boot to iSCSI Target      : Enabled
DHCP Vendor ID            :
Link Up Delay Time        : 0
Use TCP Timestamp         : Disabled
Target as First HDD       : Enabled
LUN Busy Retry Count      : 0
IP Version                 : IPv4
HBA Boot Mode             : Disabled
```

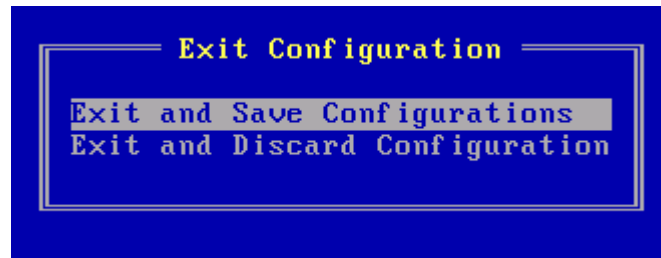
Enable/Disable Booting to iSCSI Target After Logon

[←→][Enter][Space]:Scroll Value; [↑↓]:Next Entry; [ESC]:Quit Menu

Current Adapter:Primary, Bus=04 Device=00 Func=00, MAC=00:25:B5:30:30:1A

Broadcom iSCSI boot – ESXi 4.1 U1

- Carriage Return to save the change. It now matches the Adapter Policy. So any SP re-ack, will use this boot policy



Broadcom iSCSI boot – ESXi 4.1 U1

- When you exit the BRCM Option ROM, you'll see this screen. That Ctrl-D is important if you want to reinstall, or install a new OS. Otherwise, it will boot iSCSI first and not the CD
- This is a BRCM idiosyncrasy

```
Copyright (C) 2000-2011 Broadcom Corporation
iSCSI Boot (IPv4) v6.2.6

Initializing interface (00:25:B5:30:30:1A) ... Succeeded

Connecting to iSCSI targets with interface (00:25:B5:30:30:1A) ... Succeeded

Initiator Name       : eui.1023456789abcdef
Host IP Address      : 10.29.177.65
MAC Address          : 00:25:B5:30:30:1A
Subnet Mask          : 255.255.255.0
Default Gateway      : 10.29.177.1
1st Target Name      : iqn.1992-08.com.netapp:sn.101202840
1st Target IP Addr   : 10.29.177.51
1st Target TCP Port  : 3260
1st Target Boot LUN  : 0
Logging in the 1st iSCSI Target ... Succeeded

SCSI Target Drive: NETAPP    LUN          (Rev: 7350)

Press <Ctrl-D> within 4s to stop booting from the target ..
```


Broadcom iSCSI boot – ESXi 4.1 U1

- Success!

```
VMware ESXi 4.1.0 (UMKernel Release Build 348481)

Cisco Systems Inc N20-B6620-1

2 x Intel(R) Xeon(R) CPU E5540 @ 2.53GHz
24 GB Memory

Download tools to manage this host from:
http://localhost/
http://10.29.177.65/ (STATIC)

<F2> Customize System                                <F12> Shut Down/Restart
```

RHEL 5.5 iSCSI boot configuration Broadcom

RHEL 5.5 BRCM

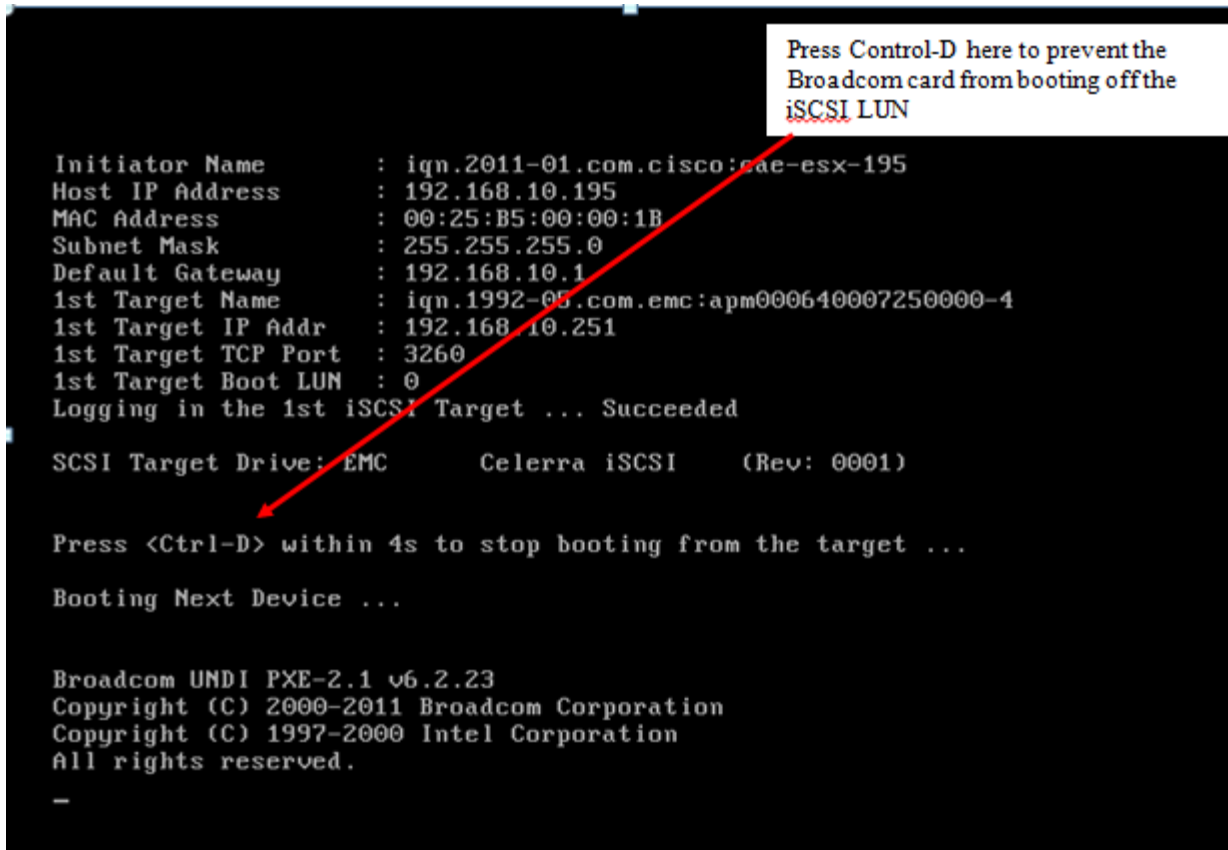
- Use the foolproof method to set up UCSM

RHEL 5.5 BRCM

- RHEL does not support iSCSI offload for installation.
- You will need to configure the eth0 interface to attach to the iSCSI NIC
- Recommended that the iSCSI NIC be on the native VLAN (tagging is supported but works better on the native VLAN)
- Inbox drivers on RHEL 5.5/5.6 work. No need to install new drivers unless you want to
- Open a KVM console to the Service Profile and power on the server.
- The iSCSI profile we created will force the server to try and boot off the iSCSI LUN before the CDROM. We need to interrupt this process so that we can boot the ISO image and start the install – Boot to Target mode

RHEL 5.5 BRCM

- DO NOT press F6 to force the BIOS to allow you to choose the CDROM first. If you press F6 the Broadcom card never tries to login to the iSCSI LUN and the LUN will not show up to the RHEL installer. Let the Broadcom initialize and login and then interrupt the boot process.



Press Control-D here to prevent the Broadcom card from booting off the iSCSI LUN

```
Initiator Name       : iqn.2011-01.com.cisco:cae-esx-195
Host IP Address      : 192.168.10.195
MAC Address          : 00:25:B5:00:00:1B
Subnet Mask          : 255.255.255.0
Default Gateway      : 192.168.10.1
1st Target Name      : iqn.1992-05.com.emc:apm000640007250000-4
1st Target IP Addr   : 192.168.10.251
1st Target TCP Port  : 3260
1st Target Boot LUN  : 0
Logging in the 1st iSCSI Target ... Succeeded

SCSI Target Drive: EMC          Celerra iSCSI      (Rev: 0001)

Press <Ctrl-D> within 4s to stop booting from the target ...

Booting Next Device ...

Broadcom UNDI PXE-2.1 v6.2.23
Copyright (C) 2000-2011 Broadcom Corporation
Copyright (C) 1997-2000 Intel Corporation
All rights reserved.

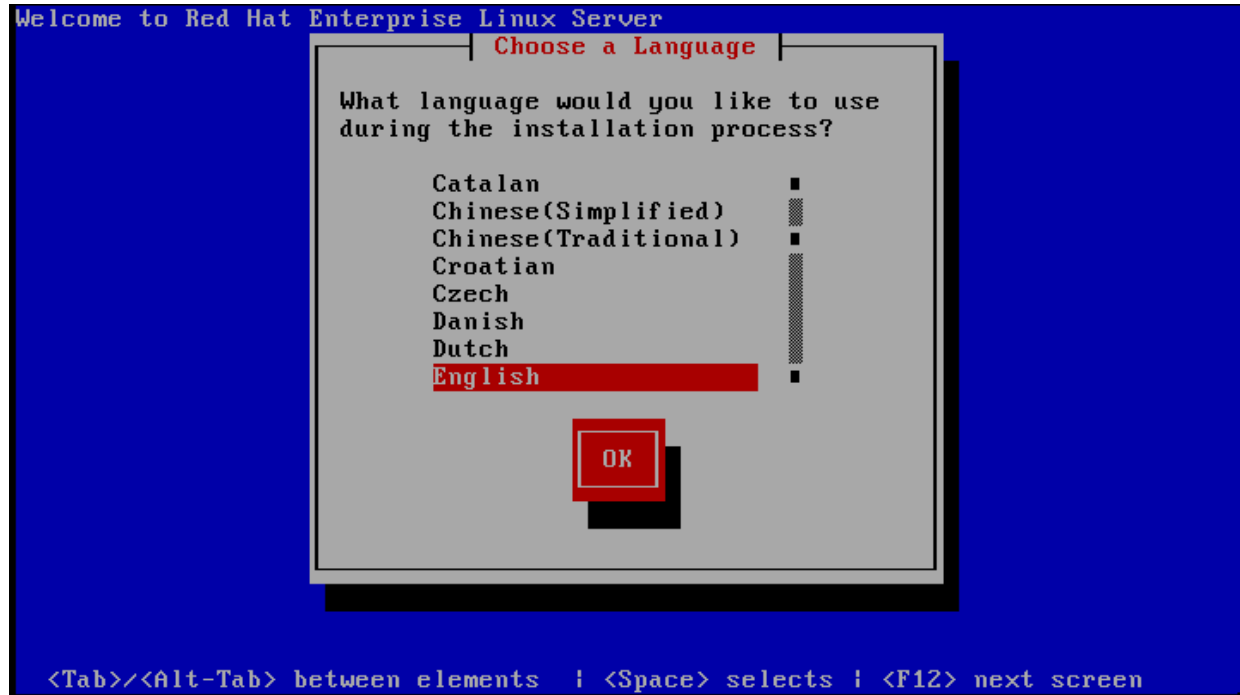
-
```

RHEL 5.5 BRCM

- After you hit control-D the host will scan the second iSCSI NIC and attempt a DHCP boot and then move to the CDROM to boot the RHEL ISO
- If you used the foolproof method, you've disabled the second NIC PXE, you disabled boot to target and the boot order will automatically move to vMEDIA/DVD
- When you install RHEL 5.5/5.6 it will appear as if the install is defaulting from GUI mode to basic entry mode. What is happening is that Anaconda (RHEL install program) is detecting the iSCSI LUN and needs some info before progressing. After skipping the CD/ISO image test you should get the below screen.

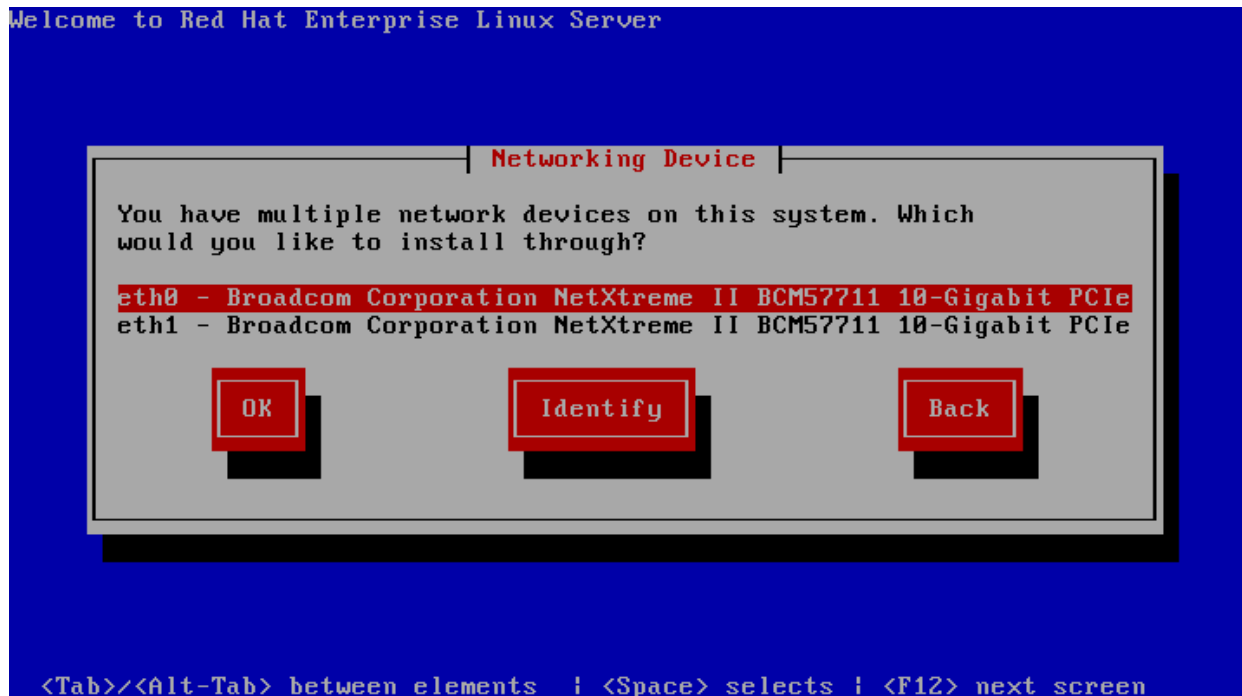
RHEL 5.5 BRCM

- Choose your language and click OK
- Next choose the keyboard type and click OK



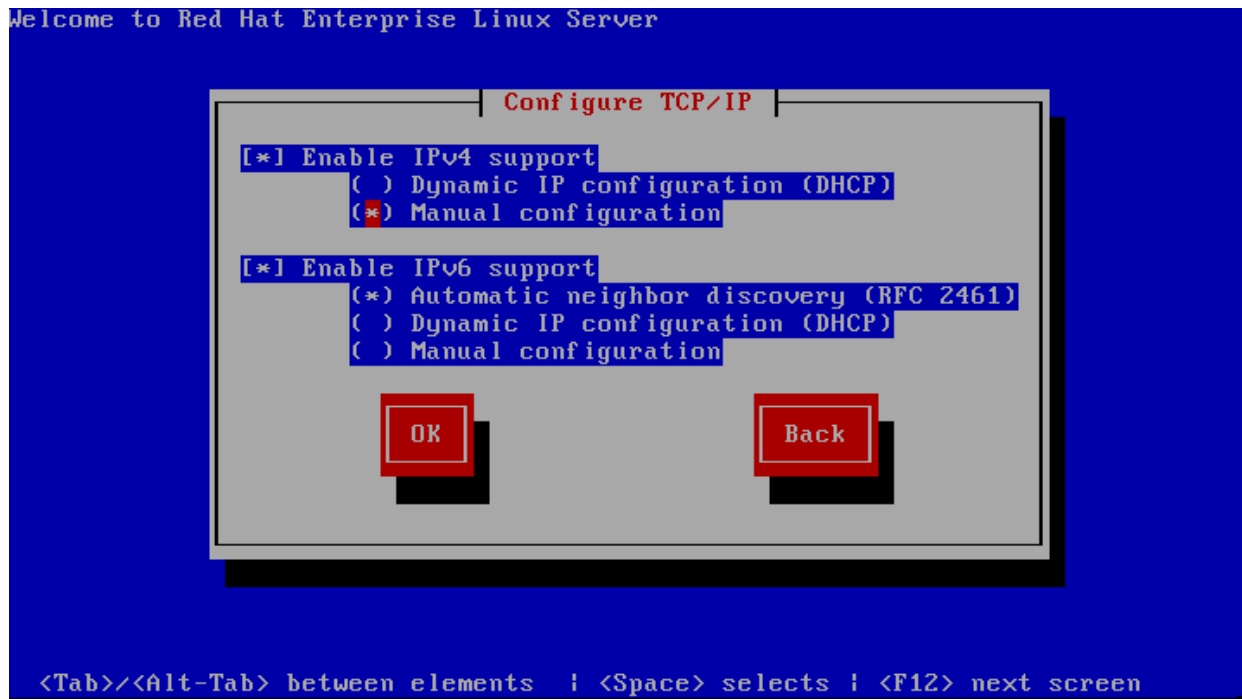
RHEL 5.5 BRCM

- Now you should see the screen below. Unfortunately RHEL does not support full offload so we need to configure some aspects of the network to see the iSCSI LUN.



RHEL 5.5 BRCM

- Choose eth0 and setup the IP settings to be the same settings you set in the UCS Service Profile.
- On the next screen choose “MANUAL” configuration



RHEL 5.5 BRCM

- At this point the RHEL installer will set the IP parameters for eth0 and look for any iSCSI LUNs that are available.
- Anaconda will start and ask you some basic questions about the RHEL install. You should then see a few small pop-ups where the installer is searching for iSCSI LUNs. You should then be presented with the following screen

RHEL 5.5 BRCM

- Here you can see that installer sees the iSCSI LUN. Accept the default layout or change it to what you desire and click next



RHEL 5.5 BRCM

- You can now proceed with the rest of the installation.
- After the install succeeds the host will ask for a reboot.
- You need to set “Boot to Target” as enabled
- On reboot you should see the Broadcom card login to the iSCSI LUN and boot off the new image you just installed.

```
Copyright (C) 2000-2011 Broadcom Corporation
iSCSI Boot (IPv4) v6.2.6

Initializing interface (00:25:B5:00:00:1B) ... Succeeded

Connecting to iSCSI targets with interface (00:25:B5:00:00:1B)

Initiator Name       : iqn.2011-01.com.cisco:cae-esx-195
Host IP Address      : 192.168.10.195
MAC Address          : 00:25:B5:00:00:1B
Subnet Mask           : 255.255.255.0
Default Gateway      : 192.168.10.1
1st Target Name      : iqn.1992-05.com.emc:apm000640007250000-4
1st Target IP Addr   : 192.168.10.251
1st Target TCP Port  : 3260
1st Target Boot LUN  : 0
Logging in the 1st iSCSI Target ... Succeeded

SCSI Target Drive: EMC          Celerra iSCSI          (Rev: 0001)

Press <Ctrl-D> within 4s to stop booting from the target ...
GRUB Loading stage2...
```

Troubleshooting Tips

Confirming Configuration

Show vnic-iscsi detail

- `switch /org # show service-profile mv detail expand`
- `switch /org/service-profile # show vnic-iscsi [detail | expand]`

Show inventory after association

- `switch /org/service-profile # scope adapter 1/1/1`
- `switch/chassis/server/adapter#show host-iscsi-if`

UCSM configuration failures/solutions

These are issues which result in a config failure of the SP

- **iSCSI invalid mac-address setting**

During iSCSI vNIC creation set mac-address only for M51KR-B, for Cisco M81KR VIC it should be set to 'none'

- **Overlay vNIC issues**

See if the overlay vNIC is empty or is being used by another another vNIC

- **VLAN issues**

For Cisco VIC non native VLAN boot is not supported, so the iSCSI VLAN should be native on the overlay vNIC

See if the VLAN name is in the allowed VLAN list of the overlay vNIC

- **Boot Policy issues**

Boot the iSCSI vNIC and overlay vNIC should not be present in boot policy
iSCSI vNIC in the boot policy doesn't have any targets configured

- **iSCSI initiator address pool empty**

Dynamic iSCSI boot related issues

DHCP server configuration

- Set mac-address of the overlay vNIC in the DHCP configuration file
- Set mac-address of the iSCSI vNIC in the DHCP configuration file
- Verify that DHCP server has correct initiator/target names configured in the correct format (reference the config guides)

Target not reachable

M51KR-B

- From the option ROM display make sure that UCSM has configured VLAN mode and VLAN ID properly, or if disabled, the VLAN in use is the native VLAN.
- For dynamic iSCSI boot make sure that the OptionROM display shows the correct initiator/target IP, initiator name etc

M81KR VIC

- Ensure the VLAN in use is the native VLAN
- Check for errors
 - connect adapter <chassis-id>/<blade-id>/<adapter-id>
 - connect
 - attach-mcp
 - iscsi_get_config

Authentication Issues

Authentication failures

- Cisco VIC OBFL shows authentication failure or via `iscsi_get_config`
- Broadcom optionROM screen shows authentication failures

Solution

- Make sure target CHAP is enabled on the array when authentication profile is selected in the target configuration screen in UCSM
- Make sure that initiator CHAP is enabled on the array side when authentication profile is selected in the initiator configuration screen
- Make sure the User ID and password matches on UCSM side as well as on the Array side

OS Installation

M51KR-B

- Make sure that BootToTarget Flag is disabled (either via adapter policy or via OptionROM).
- For ESX/Linux, HBA Boot Mode should be disabled.
- Make sure that the iSCSI vNIC is in the top of the boot order (to make sure that iSCSI option ROM executes)

Boot LUN not visible

- During OS install LUN is not visible
- Reasons and solutions
 - Incorrect LUN mapping on the array side. (make sure that initiator has access to the target LUNs)
 - Incorrect drivers for Windows (follow install guide)
 - iBFT mismatch for Linux (verify the Linux version is supported)

iSCSI Storage Setup Correctly

- Could attempt to install an O/S locally and then attempt to map in the iSCSI LUN. If this works, you know that there is a configuration error in the service profile
- If it doesn't work, identify the issue elsewhere. No point in troubleshooting iSCSI boot if the target isn't setup correctly

