ATS Power Systems Accelerator Clinic

Lab 2
Power Systems BladeCenter Advanced

Advanced Virtualization Topics on the POWER7 Blade Servers

November 2010

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Blade Hardware Configuration

The blades used for this lab (Power7 blades) will have a team number assigned to them in the charts below. Each blade has four IPs assigned allowing them to be installed as a stand-alone server or as an LPARed server. If you have chosen to work on the Basic Lab then your blade will be installed as a stand-alone server with the exception of IBM i which has to be installed on an LPAR in IVM. Since IBM i installs may take the full 90 minute lab period, we ask you to start the installation first then go back to the Navigating the Advanced Management Module Menus section of the lab (Section 1).

If you have chosen the Advanced Lab, you will be creating LPARs and will have the choice of loading either AIX or Linux on your LPAR. All of the blades have VIO already installed on them. Your team number will be assigned prior to starting the lab.

Power_BladeCenter H Chassis 1

AMM – 172.25.254.40 (Login: PSTRAIN2/PSTRAIN2)

Bay #	Server Name	Private IP Address / Purpose	LPAR Name / Hostname	LPAR IP Address / SMP	Team Number
1	**BCH1_JS12_1**	**172.25.254.21 NIM SERVER**	N/A	N/A	
2/3	BCH1_JS43_2	172.25.254.22 - IVM	BCH1_2_LP1 BCH1_2_LP2 BCH1_2_LP3 BCH1_2_LP4	172.25.254.50 - AIX 172.25.254.51 - RedHat 172.25.254.52 - SUSE 172.25.254.53 - IBM i	
4	BCH1_PS701_4	172.25.254.23 - IVM	BCH1_4_LP1 BCH1_4_LP2 BCH1_4_LP3 BCH1_4_LP4	172.25.254.54 - AIX 172.25.254.55 - RedHat 172.25.254.56 - SUSE 172.25.254.57 - IBM i	**1**
5	BCH1_PS700_5	172.25.254.24 - IVM	BCH1_5_LP1 BCH1_5_LP2 BCH1_5_LP3 BCH1_5_LP4	172.25.254.58 - AIX 172.25.254.59 - RedHat 172.25.254.60 - SUSE 172.25.254.61 - IBM I	**2**
6	BCH1_PS701_6	172.25.254.25 - IVM	BCH1_6_LP1 BCH1_6_LP2 BCH1_6_LP3 BCH1_6_LP4	172.25.254.62 - AIX 172.25.254.63 - RedHat 172.25.254.64 - SUSE 172.25.254.65 - IBM i	**3**
7	BCH1_PS701_7	172.25.254.26 - IVM	BCH1_7_LP1 BCH1_7_LP2 BCH1_7_LP3 BCH1_7_LP4	172.25.254.66 - AIX 172.25.254.67 - RedHat 172.23.254.68 - SUSE 172.25.254.69 - IBM i	**4**
8	BCH1_PS701_8	172.25.254.27 - IVM	BCH1_8_LP1 BCH1_8_LP2 BCH1_8_LP3 BCH1_8_LP4	172.25.254.70 - AIX 172.25.254.71 - RedHat 172.25.254.72 - SUSE 172.25.254.73 - IBM i	**5**
9/10	BCH1_PS702_9	172.25.254.28 - IVM	BCH1_9_LP1 BCH1_9_LP2 BCH1_9_LP3 BCH1_9_LP4	172.25.254.74 - AIX 172.25.254.75 - RedHat 172.25.254.76 - SUSE 172.25.254.77 - IBM i	**6**
11	BCH1_JS22_11	172.25.254.29 - IVM	BCH1_11_LP1 BCH1_11_LP2 BCH1_11_LP3 BCH1_11_LP4	172.25.254.78 - AIX 172.25.254.79 - RedHat 172.25.254.80 - SUSE 172.25.254.81 - IBM i	
12	BCH1_JS22_12	172.25.254.30 - IVM	BCH1_12_LP1	172.25.254.82 - AIX	

Bay #	Server Name	Private IP Address / Purpose	LPAR Name / Hostname	LPAR IP Address / SMP	Team Number
			BCH1_12_LP2 BCH1_12_LP3 BCH1_12_LP4	172.25.254.83 - RedHat 172.25.254.84 - SUSE 172.25.254.85 - IBM i	
13	BCH1_JS22_13	172.25.254.31 - IVM **DEMO**	BCH1_13_LP1 BCH1_13_LP2 BCH1_13_LP3 BCH1_13_LP4	172.25.254.86 - AIX 172.25.254.87 - RedHat 172.25.254.88 - SUSE 172.25.254.89 - IBM i	
14	BCH1_JS22_14	172.25.254.32 - IVM **DEMO**	BCH1_14_LP1 BCH1_14_LP2 BCH1_14_LP3 BCH1_14_LP4	172.25.254.90 - AIX 172.25.254.91 - RedHat 172.25.254.92 - SUSE 172.25.254.93 - IBM i	

Power BladeCenter H Chassis 2

AMM - 172.25.254.101 (Login: PSTRAIN2/PSTRAIN2)

Bay #	Server Name	Private IP Address / Purpose	LPAR Name	LPAR IP Address / Purpose	Team Number
1	BCH2_PS700_1	172.25.254.33 - IVM	BCH2_1_LP1 BCH2_1_LP2 BCH2_1_LP3 BCH2_1_LP4	172.25.254.94 - AIX 172.25.254.95 - RedHat 172.25.254.96 - SUSE 172.25.254.97 - IBM i	**7**
2	BCH2_PS700_2	172.25.254.34 - IVM	BCH2_2_LP1 BCH2_2_LP2 BCH2_2_LP3 BCH2_2_LP4	172.25.254.98 - AIX 172.25.254.99 - RedHat 172.25.254.100 - SUSE 172.25.254.120 - IBM i	**8**
3	BCH2_PS700_3	172.25.254.35 - IVM	BCH2_3_LP1 BCH2_3_LP2 BCH2_3_LP3 BCH2_3_LP4	172.25.254.121 - AIX 172.25.254.122 - RedHat 172.25.254.123 - SUSE 172.25.254.124 - IBM i	**9**
4	BCH2_PS700_4	172.25.254.36 - IVM	BCH2_4_LP1 BCH2_4_LP2 BCH2_4_LP3 BCH2_4_LP4	172.25.254.125 - AIX 172.25.254.126 - RedHat 172.25.254.127 - SUSE 172.25.254.128 - IBM i	**10**
5	BCH2_PS701_5	172.25.254.37 - IVM	BCH2_5_LP1 BCH2_5_LP2 BCH2_5_LP3 BCH2_5_LP4	172.25.254.129 - AIX 172.25.254.130 - RedHat 172.25.254.131 - SUSE 172.25.254.132 - IBM i	**11**
6	BCH2_PS701_6	172.25.254.38 - IVM	BCH2_6_LP1 BCH2_6_LP2 BCH2_6_LP3 BCH2_6_LP4	172.25.254.133 - AIX 172.25.254.134 - RedHat 172.25.254.135 - SUSE 172.25.254.136 - IBM i	**12**

Additional Network Information

Description	Private IP Address
Gateway	172.25.254.6
Subnet Mask	255.255.255.0
DNS Servers	172.16.0.1 & 172.16.0.2
Domain	training.sc.ibm.com

Lab 2 – Advanced Virtualization Topics

Introduction

In this lab, you will learn how to configure Ethernet Bridging, Shared Ethernet Adapters, Link Aggregation, NPIV, Live Partition Mobility, to create virtual adapters and LPARs. You also have the option of installing IBM i on an LPAR which may take the entire 90 minute lab period. If you are interested in installing IBM i, go to Section VI (page 65) of the lab.
Note: Make sure the pop-up blocker is "**disabled"** on your browser.

Objectives

At the completion of this lab exercise, you will be able to do the following:

- Configure VIOS/IVM
- Create a Logical Partition
- Configure Ethernet Bridging, Shared Ethernet, Live Partition Mobility, NPIV (View Only)
- Create a Virtual Adapter, SEA and VLANs
- Install Operating System on the Logical Partition (AIX, Linux or IBM i)

Materials Required for Lab

- IBM Intranet connection and standard web browser with Java to properly access the equipment over the network
- Virtual I/O Server Version 2.2 or later
- One BladeCenter Chassis with one Ethernet Switch Module and one Power processor-based Blade
- Access to SAN Storage (already setup)
- IP Address of the NIM Server
- IP address, userid and password of the Advanced Management Module (will be provided before the lab)
- If you use SOL for console session ensure SOL is Ready on the Management Module
- Required Network Information for Installing VIOS 2.2 or later
- Required Network Information for Installing the Logical Partitions
- IVM login (will be provided before the lab)
- IP address for the blade and the Logical Partition (will be provided before the lab)

Time Required for Lab

The time required to efficiently complete this lab exercise is 90 minutes.

I. Configuring IVM on the Blade

For your convenience, IVM has already been installed on your blade but has NOT been configured. The first time you login to IVM you will have to change the password and accept the license. For more information on doing a fresh installation, refer to the Virtual I/O Server Integrated Virtualization Manager Redpaper at http://www.redbooks.ibm.com/abstracts/redp4061.html?Open.

A. Login to IVM's CLI

____1. Login to IVM's CLI (using windows Telnet client or PUTTY [Windows SSH Client Program]) as user "**padmin**". You will be prompted to change the password which should be set to "**padmin**".

____2. IVM has been installed and configured on the blade. Do not close the CLI as it will be used throughout the lab.

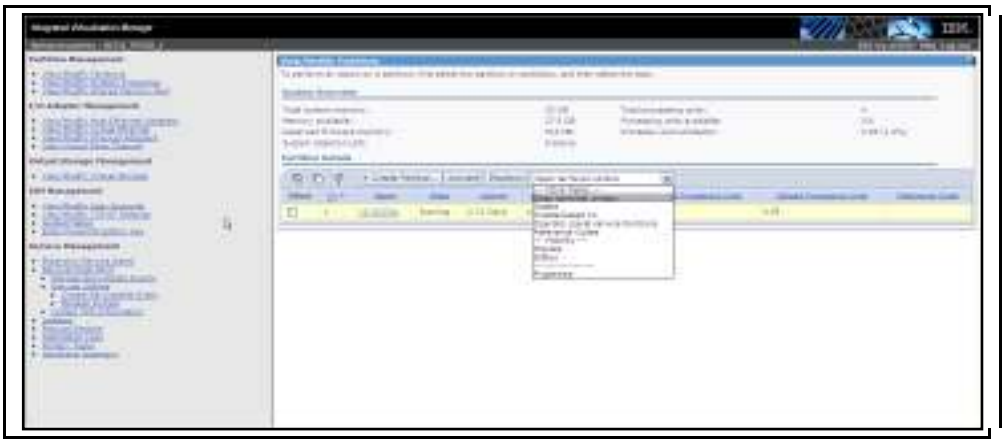
B. Login to IVM GUI

____1. To login to the IVM GUI interface, open a web browser (Internet Explorer preferred) and type the IP address of the blade. When the login screen appears, type the IVM Userid "**padmin**" and Password "**padmin**" and click "**Log in**".

____2. The first time you login to IVM, the Guide Setup menu is displayed. To bypass this menu, select View/Modify Partitions from the Partition Management Menu on the left.

The default management partition (VIOS) is displayed. This partition is automatically created when you install IVM.

____3. Open a virtual terminal window by selecting the VIO server then selecting the "**More Tasks**" drop down menu. To login to the terminal window, type "**padmin**" for the password.



____4. To view the VIO level, type "**ioslevel**" and press "**Enter**". Version 2.2 or later is installed on your blade.

____5. To list the virtual devices, type "**lsdev –virtual**" and press "**Enter**". You should have ent2 – ent5 (four virtual Ethernet adapters). If the four virtual adapters do not appear, type "**mkgencfg –o init**" and press "**Enter**".

```
$ lsdev -virtual
name             status      description
ent2             Available   Virtual I/O Ethernet Adapter (l-lan)
ent3             Available   Virtual I/O Ethernet Adapter (l-lan)
ent4             Available   Virtual I/O Ethernet Adapter (l-lan)
ent5             Available   Virtual I/O Ethernet Adapter (l-lan)
ibmvmc0          Available   Virtual Management Channel
vsa0             Available   LPAR Virtual Serial Adapter
$
```

Note: The four virtual adapters on your blade may not be labeled ent2-ent5. For example, if you are using a double wide blade or if your blade has a 10GB adapter on your blade you may see something different. Blades with 10GB adapters installed will have ent4 – ent7.

____6. To list all adapters, type "**lsdev –type adapter**" and press "**Enter**". The physical and virtual adapters are shown. The "**ibmvmc0**" is a Virtual Management Channel used as a direct Serial Hypervisor Configuration without requiring additional network connections. The "**vsa0**" is a Virtual Serial adapter used for your vterm console.

```
$ lsdev -type adapter
name             status      description
ati0             Available   Native Display Graphics Adapter
ent0             Available   Logical Host Ethernet Port (lp-hea)
ent1             Available   Logical Host Ethernet Port (lp-hea)
ent2             Available   Virtual I/O Ethernet Adapter (l-lan)
ent3             Available   Virtual I/O Ethernet Adapter (l-lan)
ent4             Available   Virtual I/O Ethernet Adapter (l-lan)
ent5             Available   Virtual I/O Ethernet Adapter (l-lan)
fcs0             Available   FC Adapter
fcs1             Available   FC Adapter
ibmvmc0          Available   Virtual Management Channel
lhea0            Available   Logical Host Ethernet Adapter (l-hea)
sissas0          Available   PCI-X266 Planar 3Gb SAS Adapter
usbhc0           Available   USB Host Controller (33103500)
usbhc1           Available   USB Host Controller (33103500)
vhost0           Available   Virtual SCSI Server Adapter
vsa0             Available   LPAR Virtual Serial Adapter
vts0             Available   Virtual TTY Server Adapter
$
```

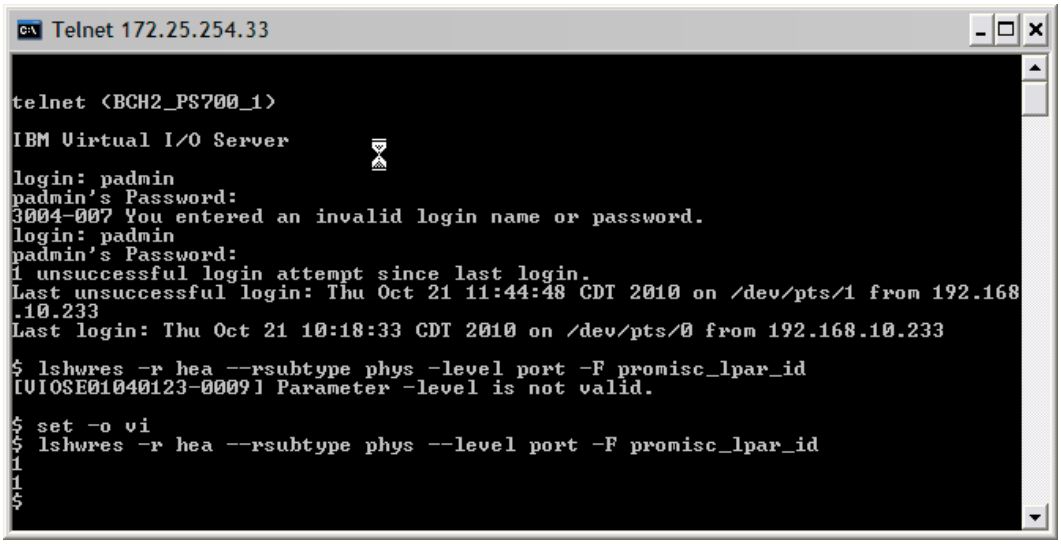
II. Configuring the VIO SERVER

A. Ethernet Bridging Setup

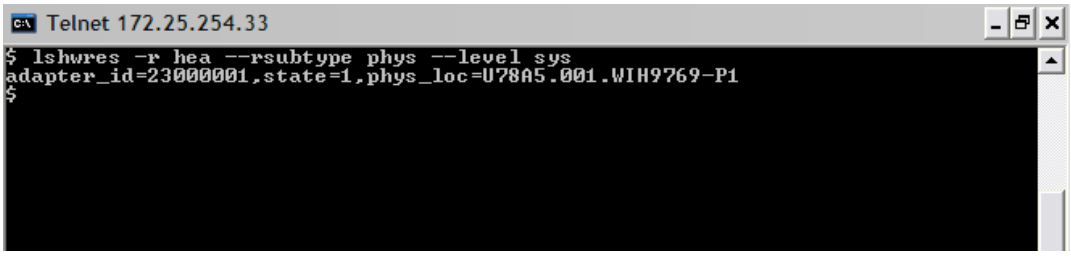
An Ethernet Bridge allows virtual Ethernet devices to access a physical Ethernet device thereby allowing access to the external network via the physical Ethernet device. Ethernet Bridging can be enabled from the IVM GUI or from the command line interface (CLI). ***Both methods are discussed in this section but only the CLI steps should be executed.***

To configure Ethernet Bridging from the CLI complete the following steps:

____1. To verify Ethernet Bridging is enabled on your blade, type "**lshwres –r hea –-rsubtype phys –-level port –F promisc_lpar_id**" and press "**Enter**". If Ethernet Bridging is configured on your blades you will see "1" for both ports. If it is not configured you will see "**none**" for both ports.



____2. Verify the adapter_ID for the Host Ethernet Adapter by typing "**lshwres –r hea –-rsubtype phys –-level sys**" and press "**Enter**".



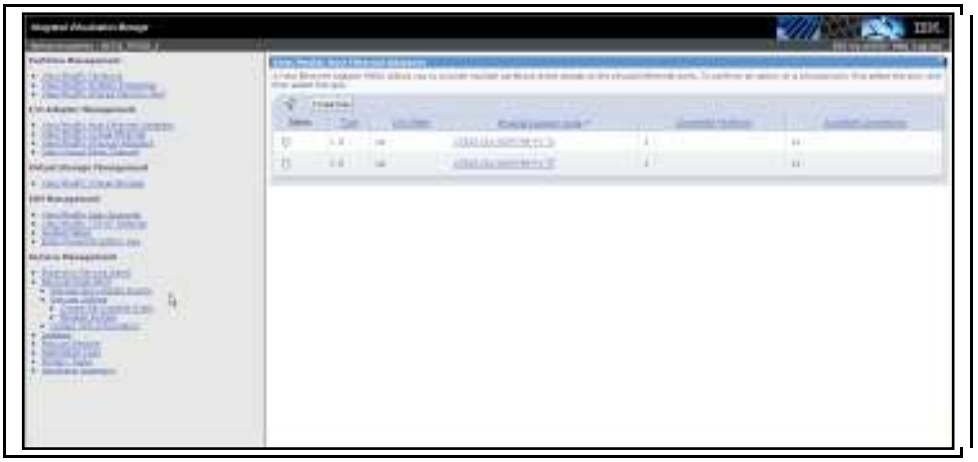
____3. To enable Ethernet Bridging (promiscuous mode) on IVE physical port 0 and 1, type the following:

"**chhwres -r hea -o s -l 23000001 -g 1 -a promisc_lpar_id=1 --physport 0**" and press "**Enter**".
"**chhwres -r hea -o s -l 23000001 -g 1 -a promisc_lpar_id=1 --physport 1**" and press "**Enter**".

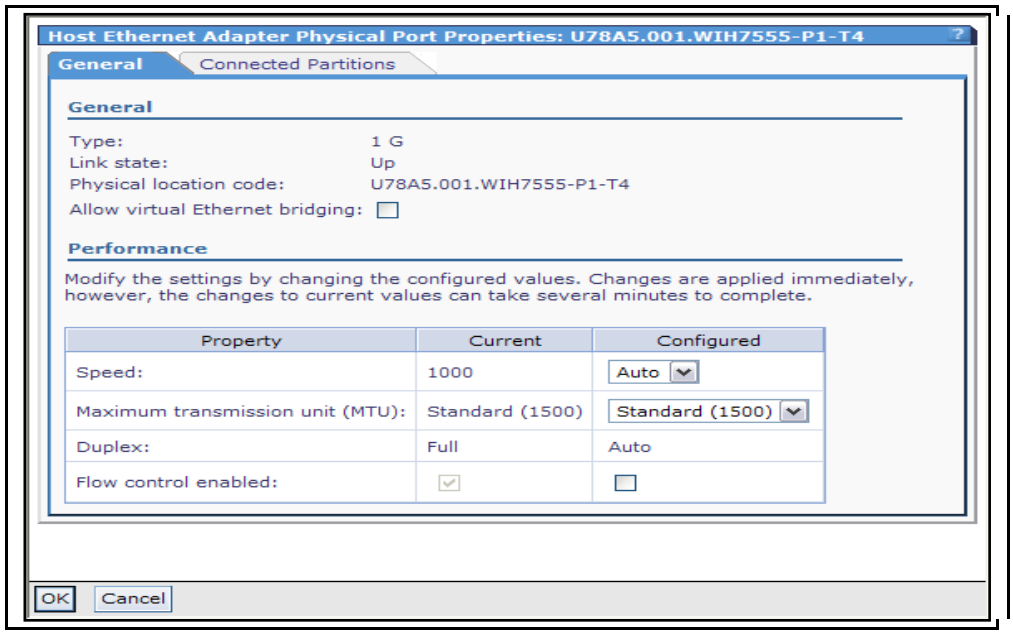
Ethernet Bridging can also be configured from the IVM GUI. These steps are provided for your reference and should not be executed.

____4. Open a virtual window on the VIO and type "**lsdev –type adapter**" and press "**Enter**" to view all adapters..

____5. From the I/O Adapter Management menu in the navigation area, select "**View/Modify Host Ethernet Adapters**", select "**ent0 (P1-T4)**" then select "**Properties**".



____6. Select the "**Allow virtual Ethernet bridging**" box then select "**OK**".



____7. Perform the same steps for the 2nd port of the Host Ethernet Adapter.

B. Shared Ethernet Adapter Setup

A shared Ethernet adapter (SEA) can be used to connect a physical Ethernet network to a virtual Ethernet network. It also allows several client partitions to share one physical adapter. The SEA can be configured from the GUI and from the CLI. ***Both methods are provided in this section but only the CLI steps should be executed.***

To configure Shared Ethernet Adapter from the CLI complete the following steps:

NOTE: Make sure you are connected via the "console" using SOL and using the following command: console –T blade[x] (where x is your team blade slot)

____1. Remove any pre-existing IP interface configurations from the adapters by typing "**rmtcpip –all**" and press "**Enter**". Type "**y**" to continue.
____2. To view all adapters, type "**lsdev –type adapter**" and press "**Enter**".
____3. Before you create the SEA, verify the physical and virtual adapters by typing "**lsdev –type adapter"**.
____4. To create a Shared Ethernet Adapter type "**mkvdev -sea ent#** (physical) **-default ent#** (virtual) **-vadapter ent#** (virtual) **-defaultid #** (vlan ID)".

Note: The mkvdev command associates the physical network with the virtual network. For the physical adapter use the lowest physical adapter in the list. For example, if you have ent0, ent1, ent2, use ent0 for the physical adapter. Same with the virtual Ethernet adapter i.e., ent4, ent5, ent6, ent7 and use ent4 for virtual.

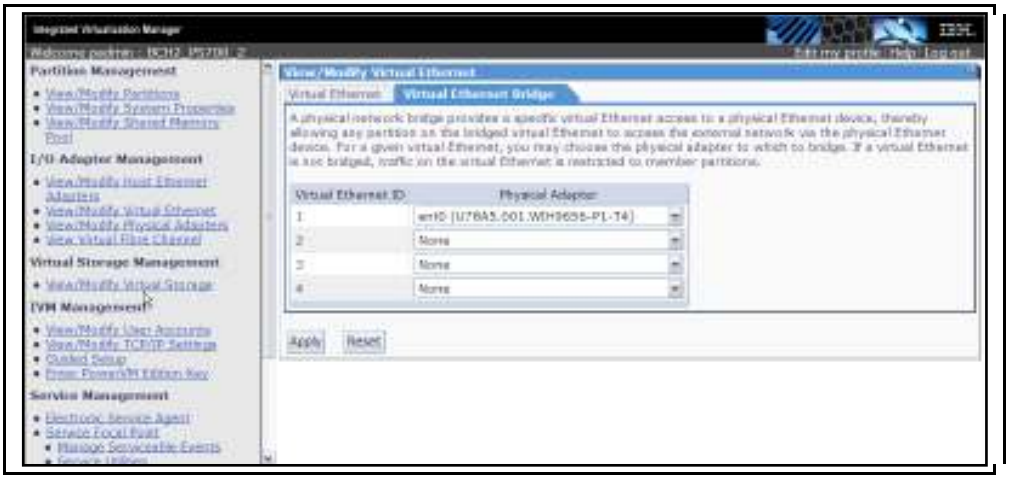
____5. To view the attributes of the SEA, type "**lsdev –dev ent# -attr**" and press "**Enter**".

```
$ lsdev -dev ent8 -attr
attribute     value    description                                                  user_settable

accounting    disabled Enable per-client accounting of network statistics           True
ctl_chan               Control Channel adapter for SEA failover                     True
gvrp          no       Enable GARP VLAN Registration Protocol (GVRP)                True
ha_mode       disabled High Availability Mode                                       True
jumbo_frames  no       Enable Gigabit Ethernet Jumbo Frames                         True
large_receive no       Enable receive TCP segment aggregation                       True
largesend     0        Enable Hardware Transmit TCP Resegmentation                  True
netaddr       0        Address to ping                                              True
pvid          1        PVID to use for the SEA device                               True
pvid_adapter  ent4     Default virtual adapter to use for non-VLAN-tagged packets   True
qos_mode      disabled N/A                                                          True
real_adapter  ent0     Physical adapter associated with the SEA                     True
thread        1        Thread mode enabled (1) or disabled (0)                      True
virt_adapters ent4     List of virtual adapters associated with the SEA (comma separated) True
$
```

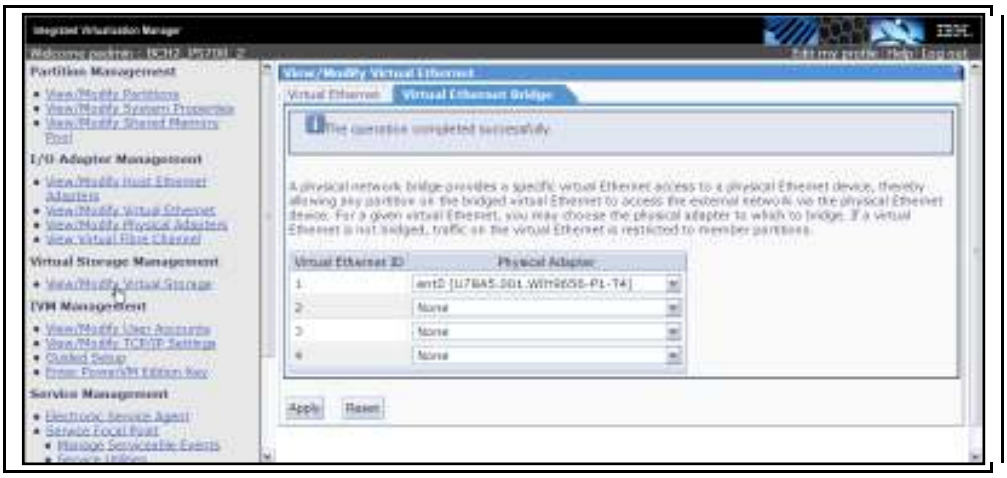
Note: The IP address will not be assigned to the SEA in this section, but it will be configured later in the lab.

The SEA can also be created from the IVM GUI. These steps are provided for your reference but should not be executed.

____6. From the I/O Adapter Management menu in the navigation area, select "**View/Modify Virtual Ethernet**" and go to the "**Virtual Ethernet Bridge**" tab. For Virtual Ethernet ID 1, select "**ent0 (P1-T4)**" then select "**Apply**".

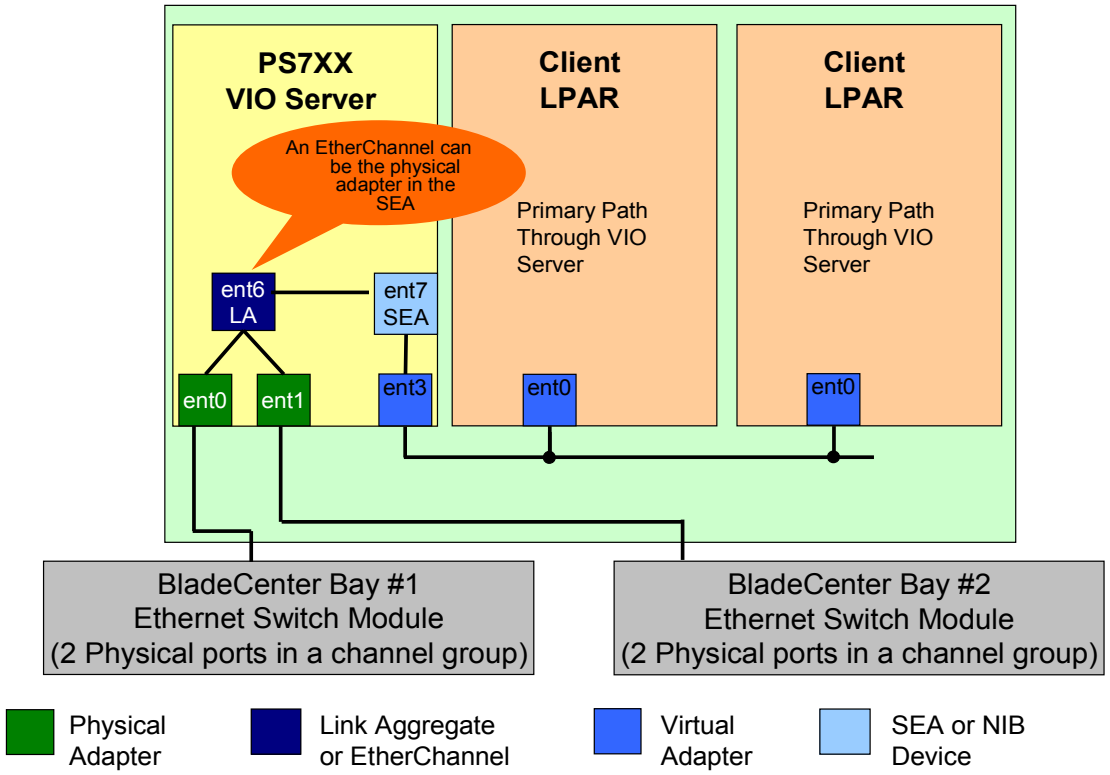


____7. A message will appear indicating the operation was successful.



III. Configuring Link Aggregation

In this section of the lab we configure Link Aggregation on the integrated HEA ports on the blade. Link aggregation enables several Ethernet adapters to be joined together to form a single virtual device. This helps to overcome the bandwidth limitation of a single network adapter and to avoid bottlenecks when sharing one network adapter among many client partitions. The following chart illustrates how Link Aggregation is configured on a VIO Server.



To configure Link Aggregation on the VIO Server, complete the following steps:

____1. SOL **MUST** be used to configure NIB/LA otherwise you will lose your session. Open a console session to your blade by typing "**console –o –T blade[#]**" and press "**Enter**". The # refer to the bay number your blade is installed in.

____2. From the VIOS shell, type "**lsdev –type adapter**" and press "**Enter**".

____3. Before you configure NIB, view the existing IP Addresses by typing "**netstat –state –num**" and press "**Enter**". Make a note of the IP Address on the blade as it will be used again in step 12.

____4. Remove any pre-existing IP interface configurations from the adapters by typing "**rmtcpip –all**" and press "**Enter**". Type "**y**" to continue.

____5. To view all adapters, type "**lsdev –type adapter**" and press "**Enter**".

____6. To remove the shared adapter created in the previous section, type the following:
rmdev –dev et# and press "**Enter**"
rmdev –dev ent# and press "**Enter**"
rmdev –dev en# and press "**Enter**"

____7. To view all adapters, type "**lsdev –type adapter**" and press "**Enter**".

____8. To configure ent0 as the primary adapter and ent1 as the backup adapter on the VIO Server, type "**mkvdev –lnagg ent0 –attr backup_adapter=ent1**" and press "**Enter**".

Note: When configuring Link Aggregation on a blade, you cannot mix IVE and non-IVE-adapters.

____9. Type "**lsdev –dev ent# –attr**" and press "**Enter**" to confirm the configuration of the Link Aggregation device.

```
$ chhwres -r hea -o s -l 23000000 -g 1 -a promisc_lpar_id=1 --physport 1
$ mkvdev -lnagg ent0 -attr backup_adapter=ent1
ent6 Available
en6
et6
$ lsdev -dev ent6 -attr
attribute       value          description                                user_
settable

adapter_names   ent0           EtherChannel Adapters                      True
alt_addr        0x000000000000 Alternate EtherChannel Address             True
auto_recovery   yes            Enable automatic recovery after failover   True
backup_adapter  ent1           Adapter used when whole channel fails      True
hash_mode       default        Determines how outgoing adapter is chosen  True
mode            standard       EtherChannel mode of operation             True
netaddr         0              Address to ping                            True
noloss_failover yes            Enable lossless failover after ping failure True
num_retries     3              Times to retry ping before failing         True
retry_time      1              Wait time (in seconds) between pings       True
use_alt_addr    no             Enable Alternate EtherChannel Address      True
use_jumbo_frame no             Enable Gigabit Ethernet Jumbo Frames       True
$
```

____10. To create the SEA using the Link Aggregation device as the physical adapter, type "**mkvdev -sea [link aggr adapter] -vadapter [virtual] -default (virtual) -defaultid 1**" and press "**Enter".**

____11. To confirm the creation of the SEA device, type "**lsdev –type adapter**" and press "**Enter**".
____12. To configure an IP Address on the newly created SEA, type "**mktcpip –hostname (hostname) –inetaddr (IVM IP address) –interface en# –netmask 255.255.255.0 –gateway 172.25.254.6 –start**" and press "**Enter**".
____13. To check the IP address on the SEA, type "**netstat –num –state**" and press "**Enter**".

For more information on setting up Network Interface Backup style EtherChannel, refer to the documentation at
http://publib.boulder.ibm.com/infocenter/pseries/index.jsp?topic=/com.ibm.aix.doc/infocenter/base/aix53.htm.

IV. Configuring Live Partition Mobility

In this section of the lab we configure LPM on the VIO, create two mobile LPARS and perform an Active and Inactive Migration. Since two blades are required for LPM you will have to work with another team to complete this section of the lab. The chart below details which teams should work together on this lab. It also details which blades share LUNs and which external disk should be used for Active Migration (AM) and Inactive Migration (IM).

Power BladeCenter H Chassis 1 AMM – 172.25.254.40					
Team Num-bers	**Bay #**	**Server Name**	**IP Address**	**Internal Drives**	**External SAN Storage / Purpose**
1 and 2	4 5	BCH1_PS701_4 BCH1_PS700_5	172.25.254.23 172.25.254.24	1 2	**Team 1: hdisk1 – 20Gb** **hdisk2 – 13Gb** **Team 2: hdisk2 - 20Gb** **hdisk3 – 13Gb**
3 and 4	6 7	BCH1_PS701_6 BCH1_PS701_7	172.25.254.25 172.25.254.26	1 1	**Teams 3/4: hdisk1 – 20Gb** **hdisk2 – 13Gb**
5 and 6	8 9/10	BCH1_PS701_8 BCH1_PS702_9	172.25.254.27 172.25.254.28	1 2	**Team 5: hdisk1 – 20Gb** **hdisk2 – 13Gb** **Team 6: hdisk2 – 20Gb** **hdisk3 – 13Gb**
Power BladeCenter H Chassis 2 AMM – 172.25.254.101					
Team Num-bers	**Bay #**	**Server Name**	**IP Address**	**Internal Drives**	**External SAN Storage / Purpose**
7 and 8	1 2	BCH2_PS700_1 BCH2_PS700_2	172.25.254.33 172.25.254.34	2 2	**Teams 7/8: hdisk2 – 20Gb** **hdisk3 – 13Gb**
9 and 10	3 4	BCH2_PS700_3 BCH2_PS700_4	172.25.254.35 172.25.254.36	2 2	**Teams 9/10: hdisk2 – 20Gb** **hdisk3 – 13Gb**
11 and 12	5 6	BCH2_PS702_5 BCH2_PS701_6	172.25.254.37 172.25.254.38	2 2	**Teams 11/12: hdisk2 – 20Gb** **hdisk3 – 13Gb**

Note: Keep in mind your neighboring team may or may NOT be doing the Advanced Lab! If that is the case you can still configure LPM on your blade but you may not be able to migrate the partition.

A. Configuring the Partition Mobility environment

To configure the VIO Server, complete the following steps:

____1. The LUN reserve_policy must be set to "**no_reserve**" on the hdisks (on the source and the destination blades) before the logical partition is created. Open a virtual terminal for the VIOS Partition (Partition 1) from the IVM GUI and type the following:
$lsdev –dev hdisk# -attr
reserve_policy single_path => needs to be changed

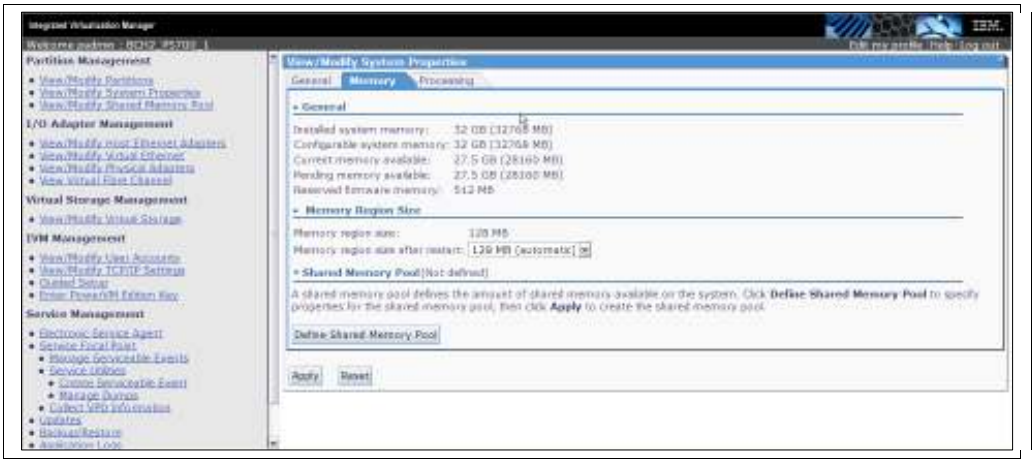
$chdev –dev hdisk# -attr reserve_policy=no_reserve

To verify this attribute has been changed, type the following:
lsdev –dev hdisk# -attr

Note: A virtual terminal can also be opened via telnet or SSH.

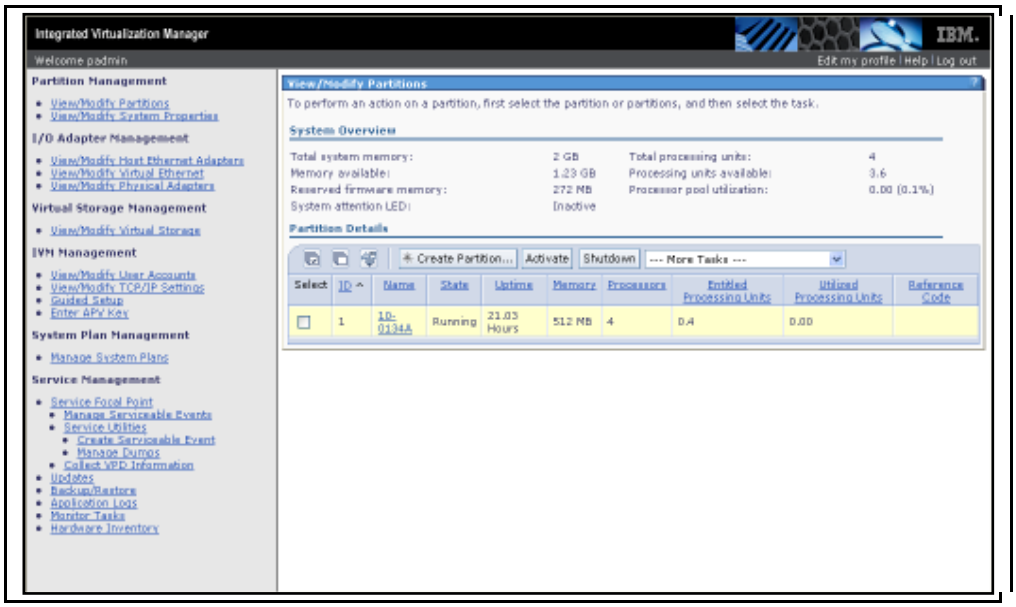
____2. The "**Memory Region Size**" value must be the same on both IVM servers. This value will depend on the amount of memory installed on the blade. To change this value from the IVM GUI, under Partition Manager select "**View/Modify System Properties**" then select the "**Memory Tab**". Now select the appropriate value from the pull down menu then select "**Apply**".

Note: Please check with the appropriate team to ensure both blades have the same value. Refer to the chart on page 17 for more information on team assignments and how the blades are configured for LPM.



____3. From the Partition Management menu, select '**View/Modify Partition**" then select the VIOS partition from under Partition Details then select "**shutdown**".

Note: If both blades have the same Memory Region Size then you do NOT have to shutdown your server.



____4. Select "**OK**" to power off the VIOS Partition which powers off the blade.

Note: The blade must be powered off and not just rebooted otherwise this change will not take effect.

____5. Once the partition has powered off, go to the Advanced Management Module (AMM), power on the blade, and then log back into IVM.

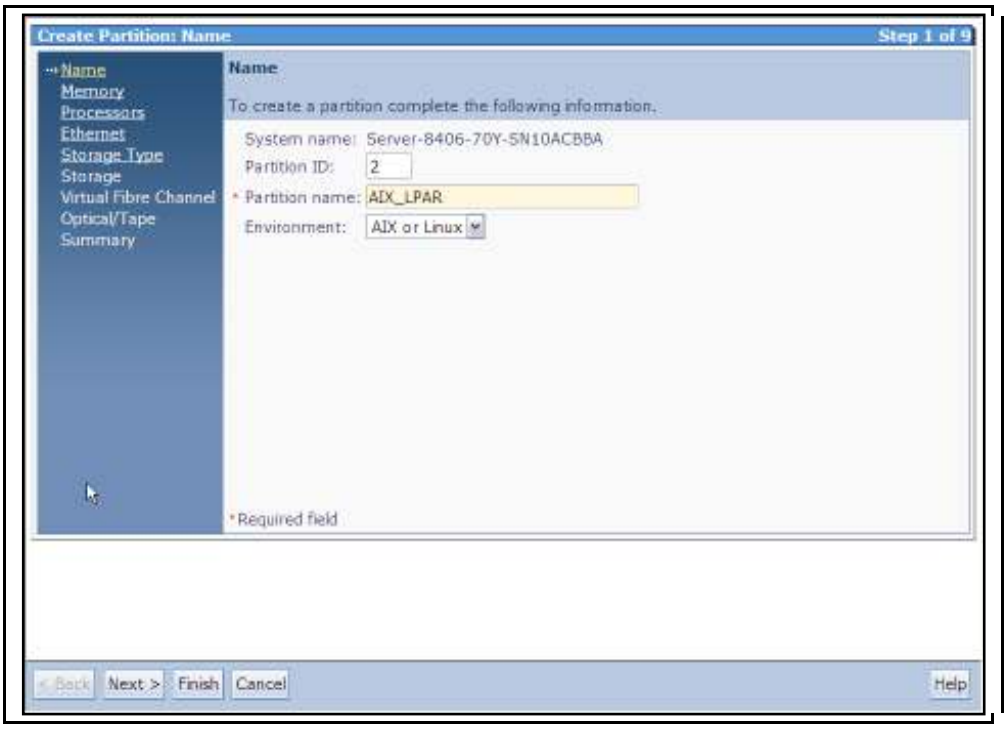
B. Creating Logical Partitions

The mobile logical partition should be created without physical I/O or virtual optical devices. Create two mobile partitions in order to perform an Active and Inactive Migration.

To create a logical partition from the IVM GUI, complete the following steps:

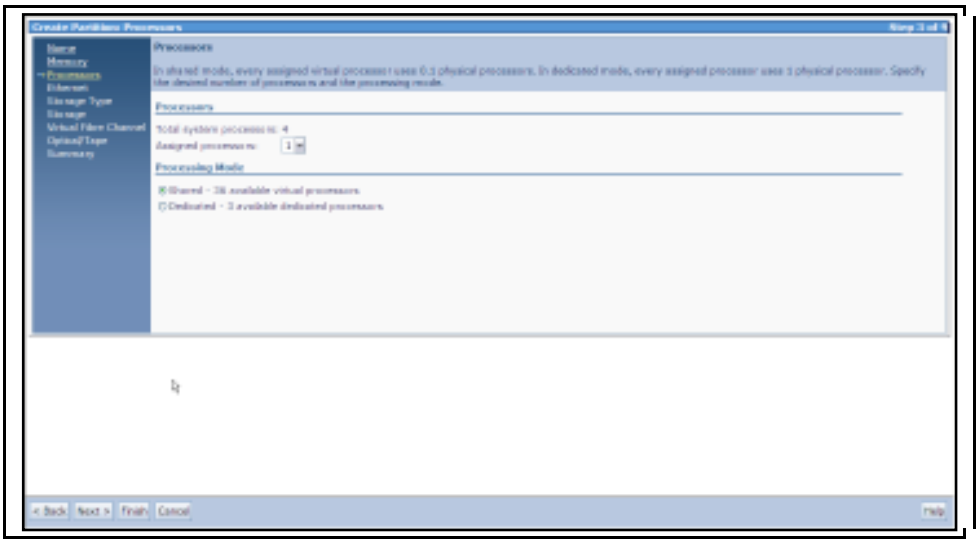
____1. From the Partition Management menu in the navigation area, select "**View/Modify Partitions**" then select "**Create Partition**" from the task bar. A pop-up window appears.

____2. Type the new partition name. For AIX, use "**TEAM#_AIX_LPAR_"** and for Linux, use "**TEAM#_LINUX_LPAR"**, depending on the Operating System you plan to install and select "**Next**".

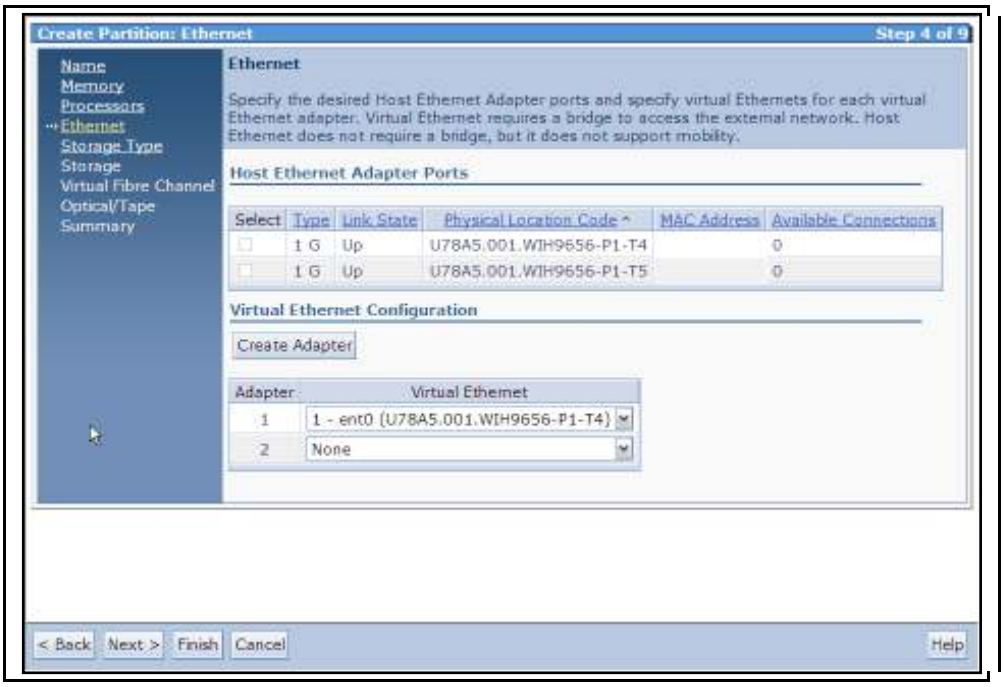


____3. Type "**1**" in the Assigned memory field and select "**GB**" from the drop-down list then select "**Next**".

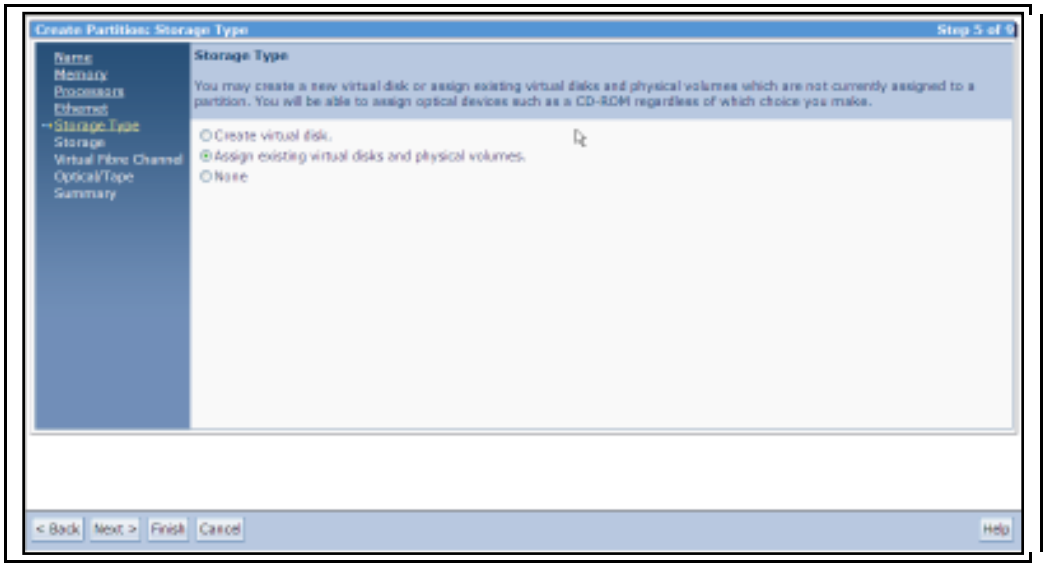
____4. Select "**Next**" to accept the default for the virtual processors.



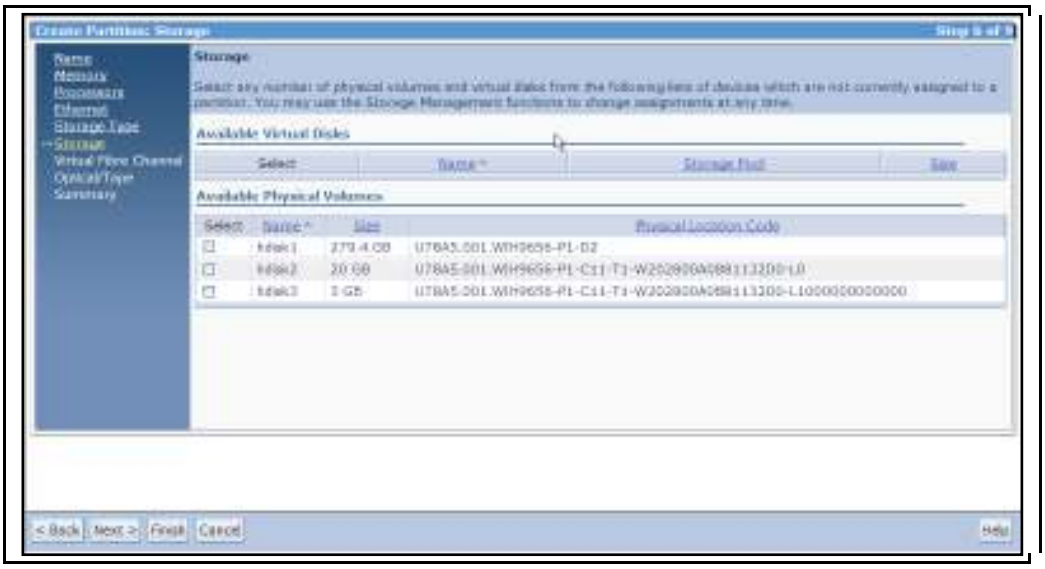
____5. Under the Virtual Ethernet Configuration section, select "**ent0 P1-T4**" for Adapter 1 then select "**Next**" to continue.



____6. Select "**Assign existing virtual disks and physical volumes**" and click "**Next**".



____7. Select the name of the hdisk# you want to assign to the logical partition then click "**Next**".

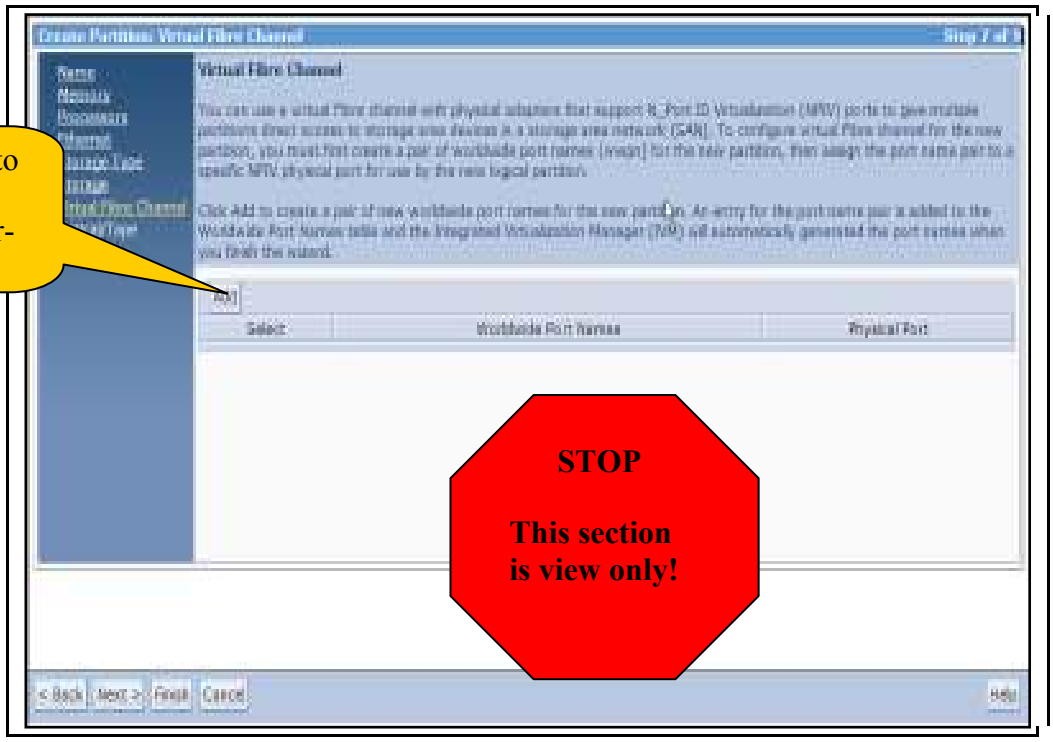


1. Configuring NPIV on the blade

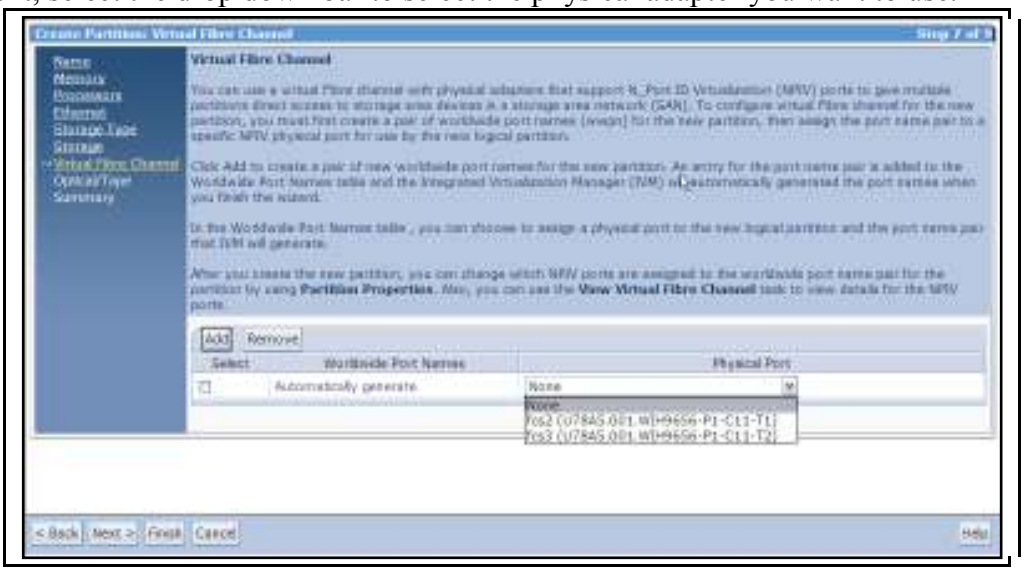
(These steps are for viewing only, please do not perform on your system)

A virtual Fibre channel with physical adapters that support N_Port ID Virtualization (NPIV) ports provides the ability to give multiple logical partitions direct access to storage area devices in a storage area network (SAN). In the Worldwide Port Names table, you can add or remove a port name pair for this logical partition. You also can change the physical port assignment for a port name pair that this partition is using. When configuring NPIV on the blade, ensure you have the correct environment, i.e., an 8GB adapter and a supported switch module as listed in the BladeCenter Interoperability Guide at http://www-947.ibm.com/support/entry/portal/docdisplay/Hardware/Systems/Hardware_options_and_upgrades/Storage_expansion/Fibre/44X1945_-_QLogic_8_Gb_Fibre_Channel_Expansion_Card_(CIOv)_for_IBM_BladeCenter?brand=5000020&lndocid=MIGR-5073016 .

____8. The next step is to configure NPIV on the blade by selecting "**Add**" to generate a pair of virtual WWNs.

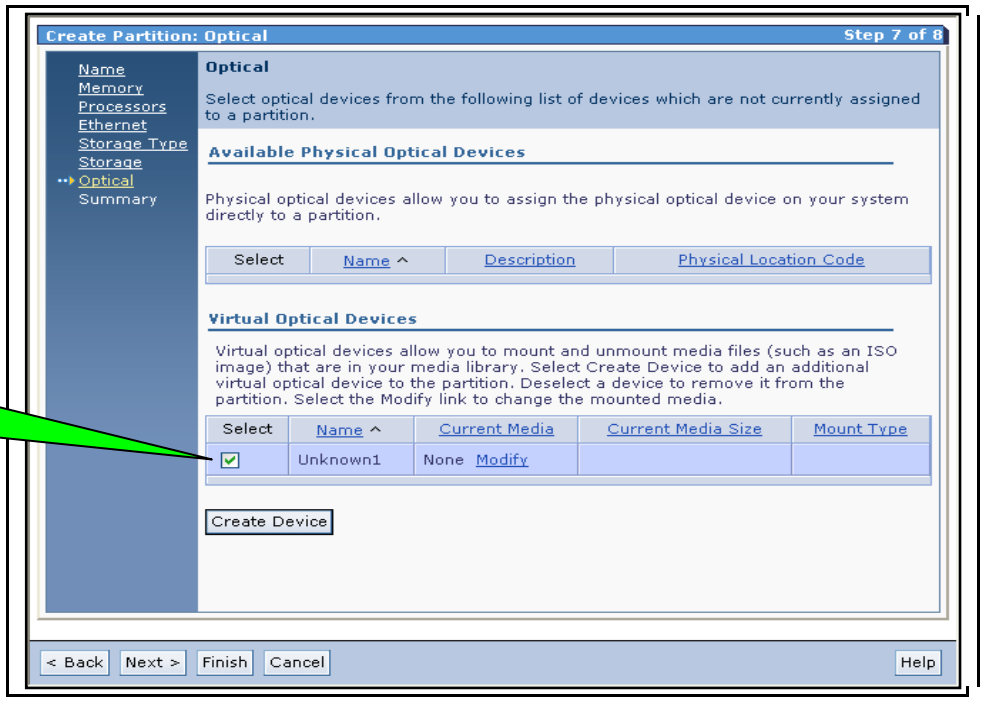


____9. Next, select the drop down bar to select the physical adapter you want to use.



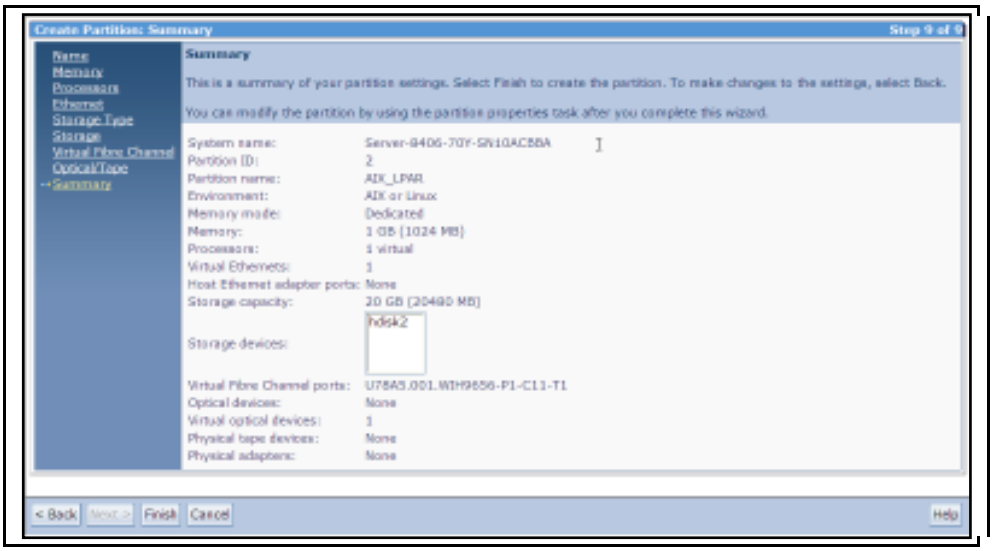
____10. Optical devices cannot be migrated, so make sure none of these values are selected then click "**Next**" to continue.

Note: Once the LPAR configuration is complete and the LPAR is activated the virtual WWN can be zoned. Depending on the type of BladeCenter Switch Module you use there may be additional configuration required on the switch.



Deselect any virtual optical devices.

____11. A summary of the partition to be created is displayed. Select "**Finish**" completing the creation of the logical partition".



____12. To activate the partition you just created, select the box next to "**AIX_LPAR**" and select "**Activate**". Select "**OK**" to continue.

Note: To activate the LPAR from the CLI, type the following:
chsysstate –o on –r lpar –n lparname

C. Configuring Linux for LPM

Complete the following steps to enable LPM:

____5. To enable LPM, you need to install the service and productivity tools. These are normally available for either Red Hat or SUSE at http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html . For the purpose of this lab, you will access the tool packages from the NIM Server used to install the OS.

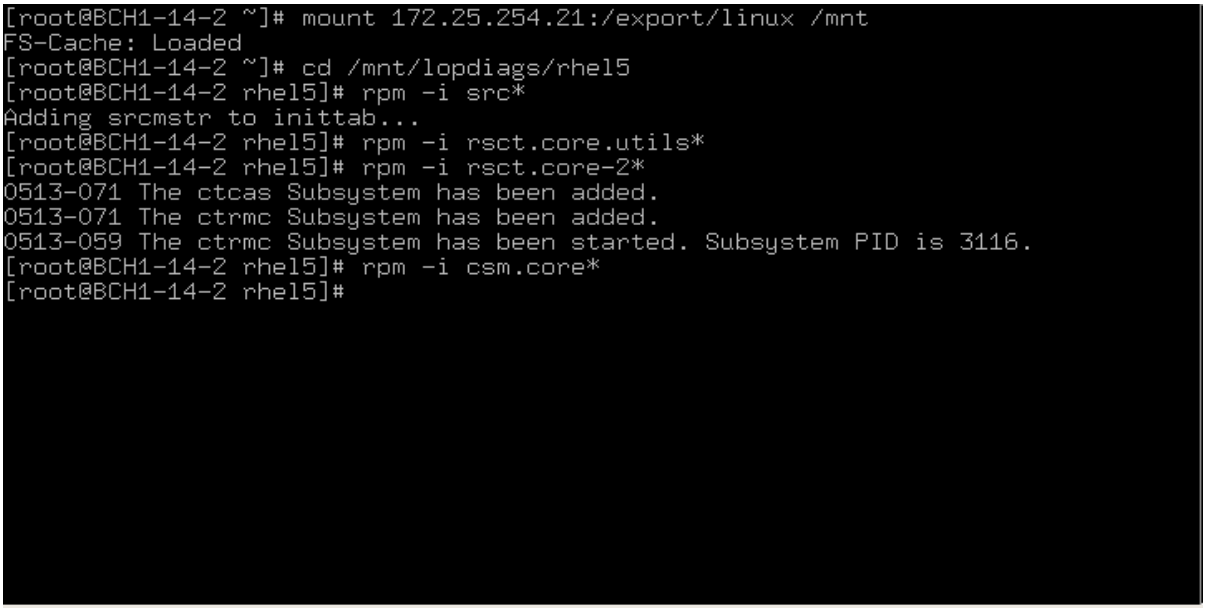
____6. Run "mount 172.25.254.21:/export/linux /mnt"

____7. cd /mnt/lopdiags/rhel5 or cd /mnt/lopdiags/sles11

____8. Install the required packages using "**rpm -i *packagename***" as shown below.

Red Hat	SUSE
rpm -i src* rpm -i rsct.core.utils* rpm -i rsct.core-2* rpm -i csm.core* rpm -i csm.client* rpm -i devices.chrp* rpm -i DynamicRM*	rpm -i librtas-32bit* rpm -i src* rpm -i rsct.core.utils* rpm -i rsct.core-2* rpm -i csm.core* rpm -i rdist* rpm -i csm.client* rpm -i devices.chrp* rpm -i DynamicRM*

Note: The librtas-32bit and rdist packages were copied off the SUSE distribution image.



____9. The LPAR is now ready to participate in LPM.

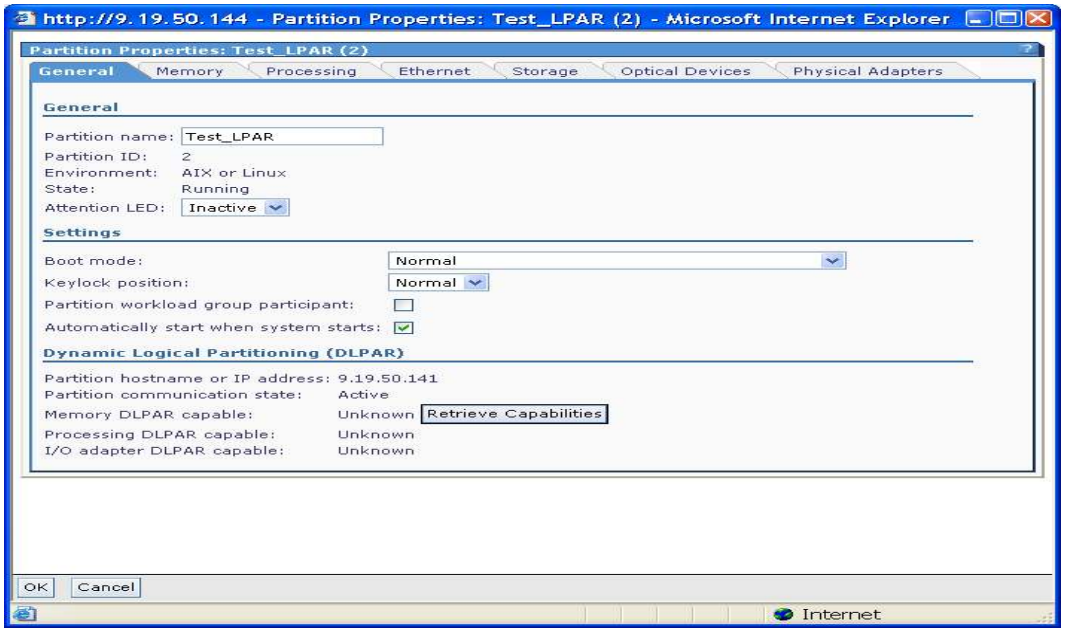
D. Active Migration Setup

Before you perform an active migration, an operating system (i.e., AIX or Linux) must be installed on your LPAR and the RMC daemon must be running, otherwise the validation process will fail. The IP Address on the logical partition must be configured before the RMC daemon will become active.

Note: The RSCT Utilities must be installed on a Linux partition for Active migration support. IBM Installation Toolkit for Linux on POWER: http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/installtools/download/home.html.

To verify the RMC daemon is running on the blade, complete the following steps:

____1. From the **View/Modify Partitions** menu, select the partition you just created then select "**Properties**" from the pull down menu. The Partition Communication State must be **Active**.

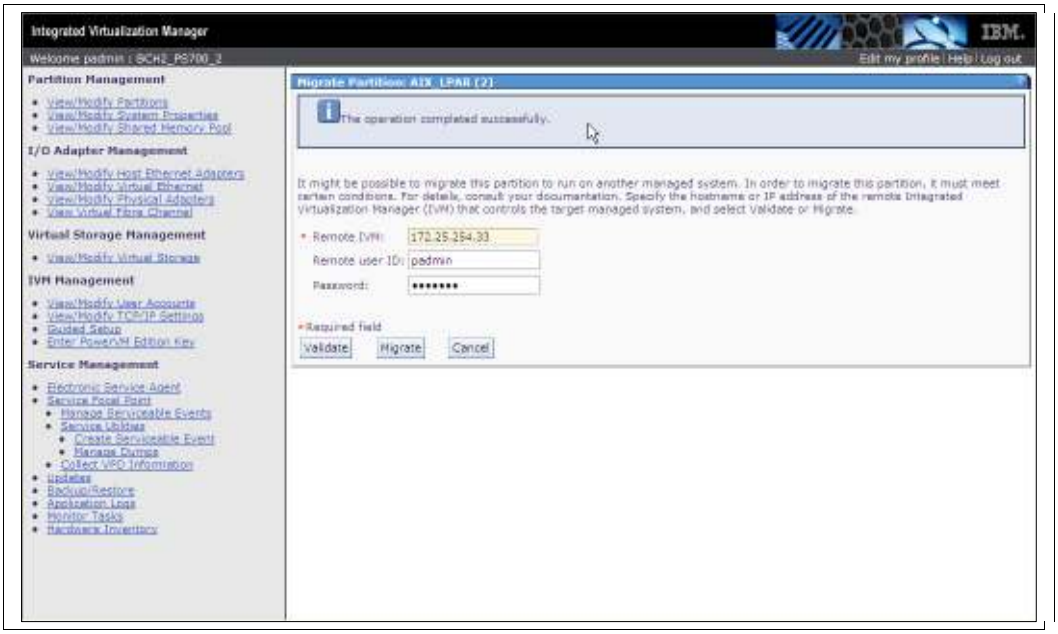


Note: To verify the RMC daemon is running from the CLI, type the following: "**lssyscfg –r lpar –F lpar_id,rmc_state**" and press "**Enter**".

If Partition Communication state is not Active, refer to the Addendum at the end of the lab to troubleshoot RMC.

____2. Select the partition you want to migrate, then select "**Migrate**" from the "**More Task**" pull down menu.

____3. Enter the IP Address of the destination blade you want to migrate to and the password, then select "**Validate**". A message should appear indicating the operation completed successfully.



____4. To move the partition to the destination blade, select "**Migrate**". The partition will be removed from the source blade.
____5. Select "**OK**" to continue the migration.
____6. The partition has now been removed from the source blade. Login to the destination blade to see your migrated partition.

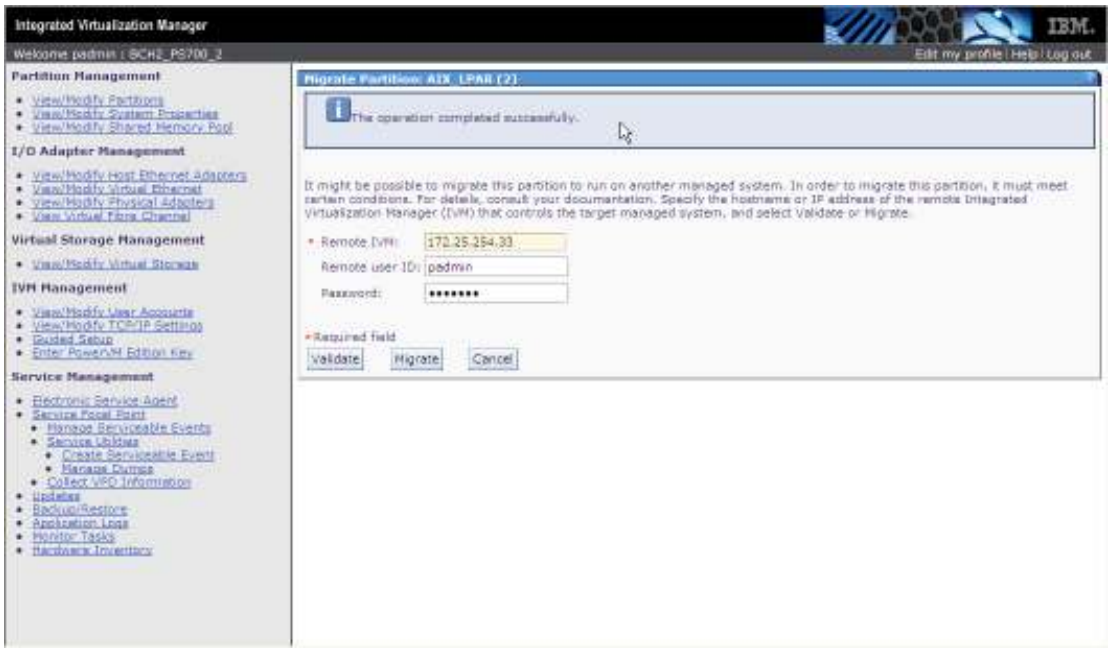
E. Inactive Migration Setup

The inactive partition migration allows you to move a logical partition that is not powered on. Before the partition is migrated it is recommended that you validate the partition before actually moving it to the destination blade. The following steps describe how to migrate the inactive partition:

____1. Select the partition you want to migrate and choose "**Shutdown**" from the GUI.
____2. Select the partition you want to migrate and choose "**Migrate**" from the "**More Task**" pull down menu.

____3. Enter the IP Address of the destination blade you want to migrate to and the password then select "**Validate**".

____4. If there are problems with the validation process an error message will be displayed. Select "**Migrate**" to move the partition to the destination blade.



____4. Select "**OK**" to continue the migration process.

____5. The partition will be removed from the source blade. Login to the destination blade and the partition you just migrated will be there.

V. Installing AIX OR Linux on the Logical Partition

In this section of the lab, we install AIX or Linux on the logical partitions. Before you start the installation, ensure your logical partition has been activated.

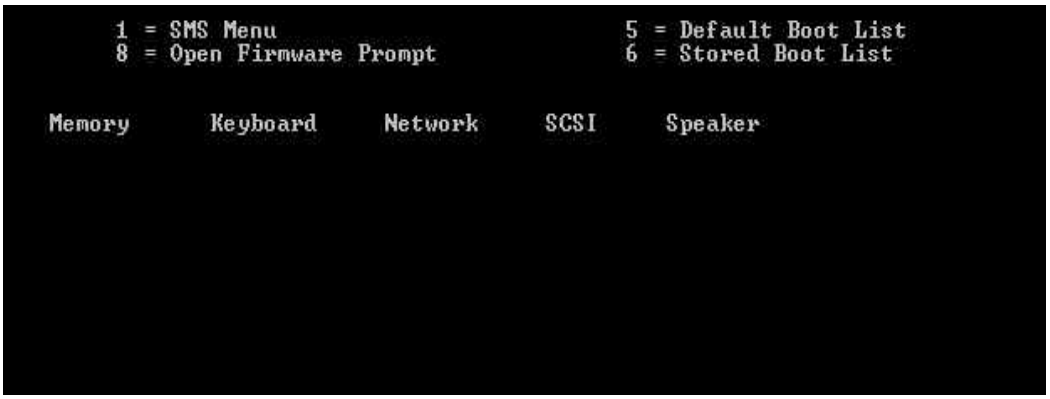
A. Configuring the LPAR for AIX install

Complete the following steps to install the LPAR:

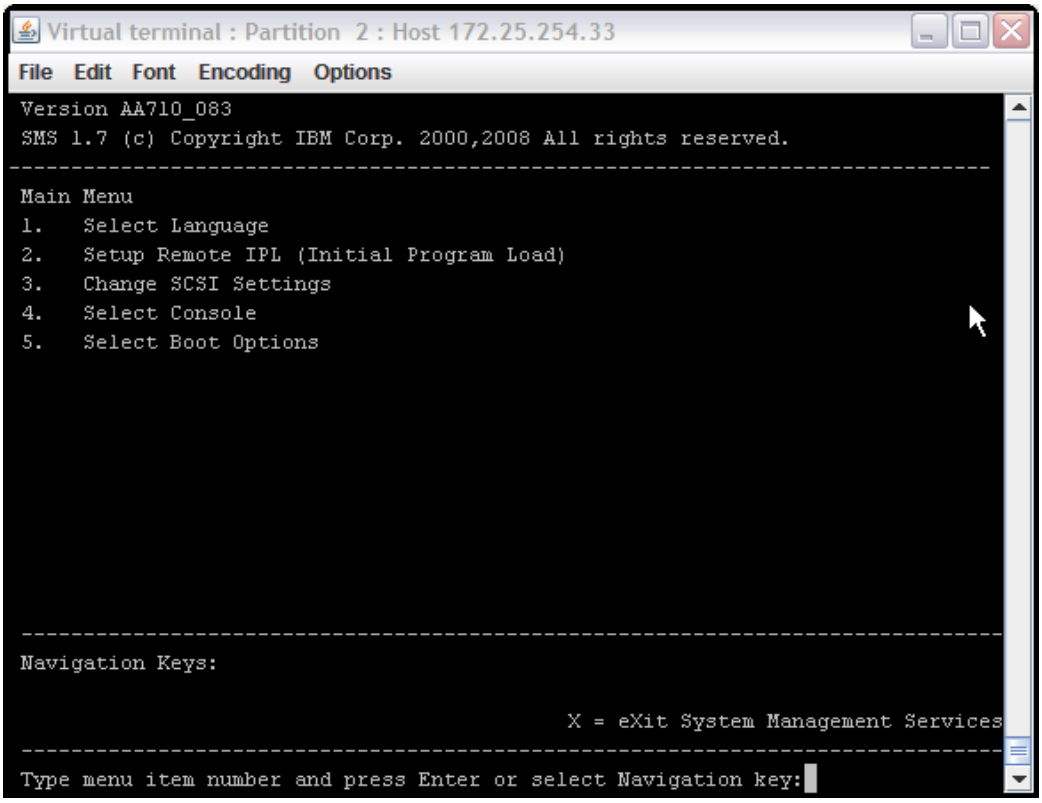
____1. The partition you created in the previous section should already be activated. Now you need to open a virtual terminal so you can install the partition. A virtual terminal can be opened from the GUI by selecting the LPAR and select "**Open a Virtual Terminal**" from the drop down list.

Note: A virtual terminal can also be opened from the CLI by typing "**mkvt –id 2**" and press "**Enter**". The '**id**' is the ID # of the logical partition you just created. To remove an existing console connection type "**rmvt –id 2**" or "**~.**" and press "**Enter**".

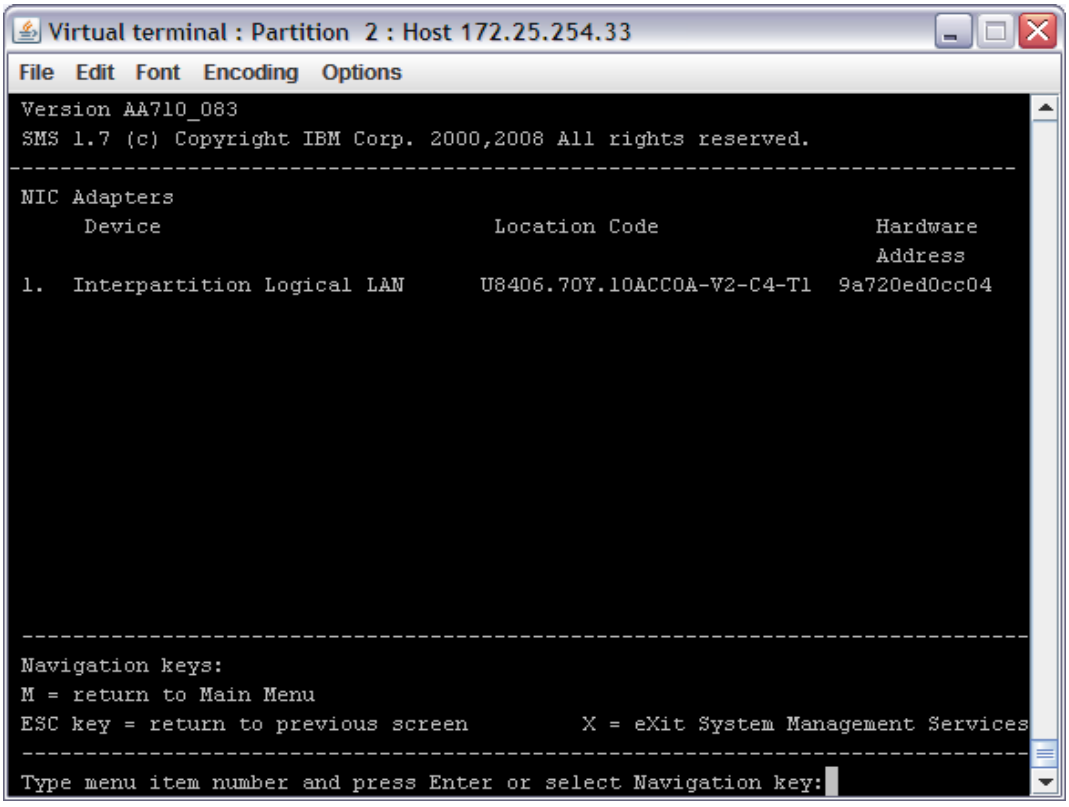
____2. Type "**1**" to access the SMS menu.



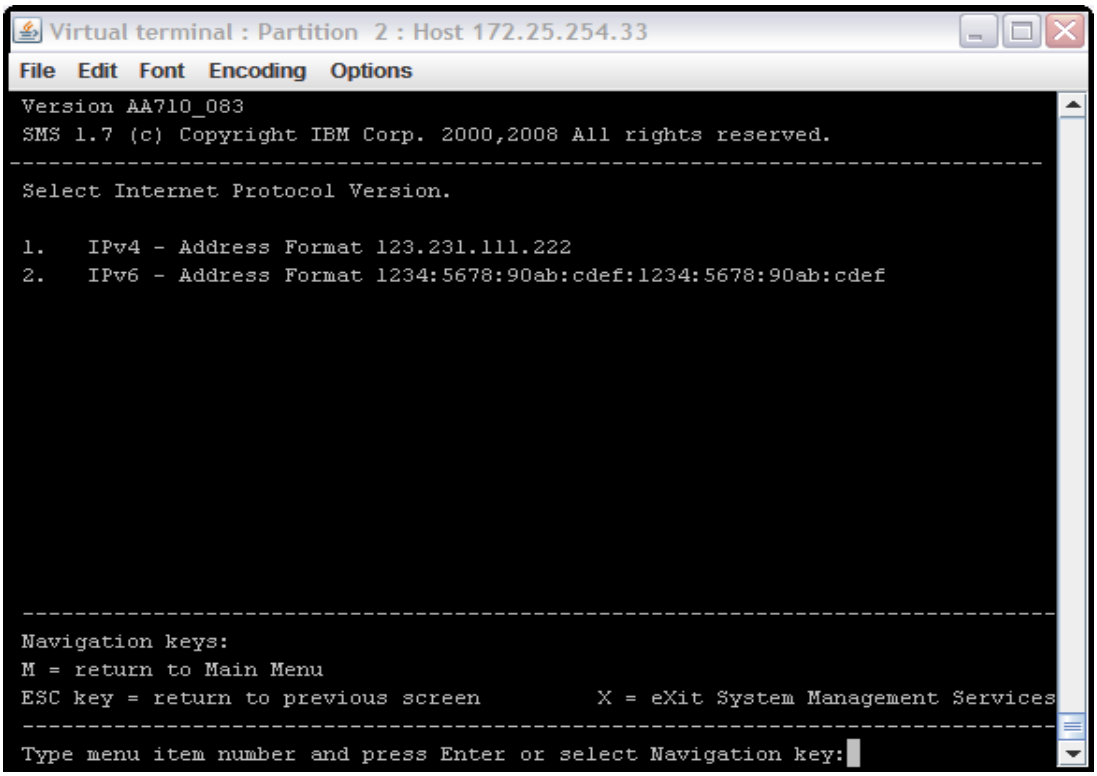
____3. From the Main Menu, select 2 for "**Setup Remote IPL (Initial Program Load)**" and press "**Enter**".



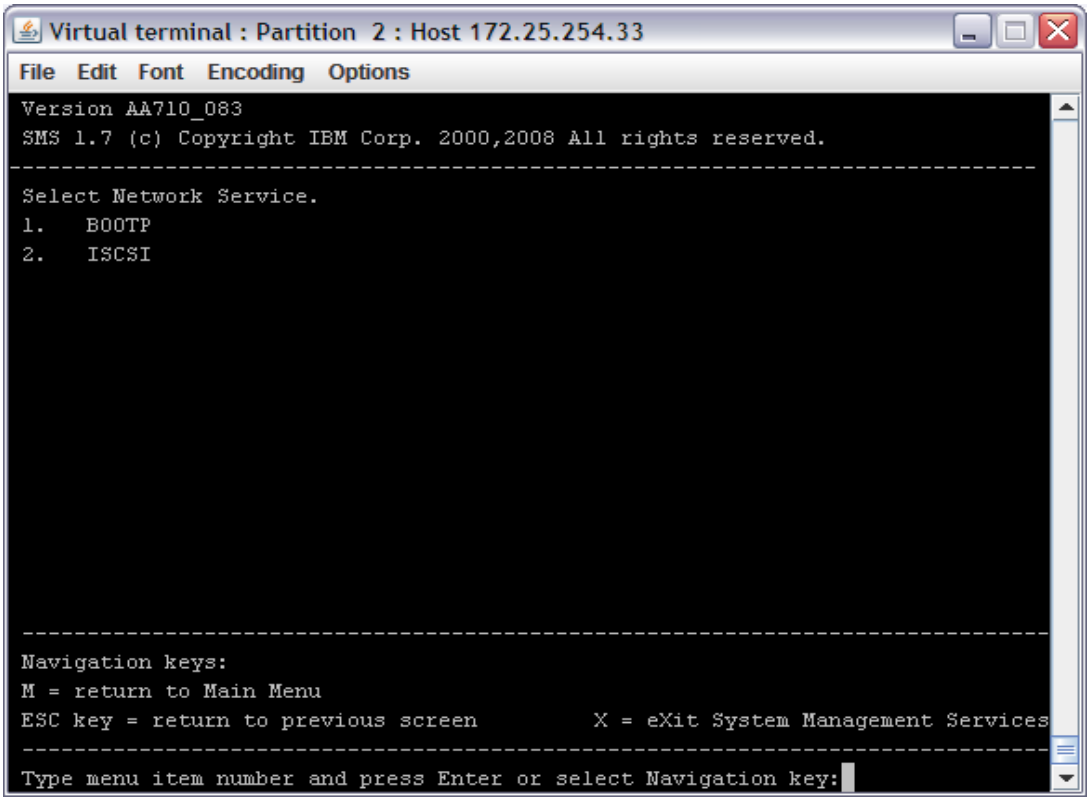
____4. From the NIC Adapters Device menu, select 1 for "**Interpartition Logical LAN U8406.70Y.10ACC0A-V2-C4-T1**" and press "**Enter**".



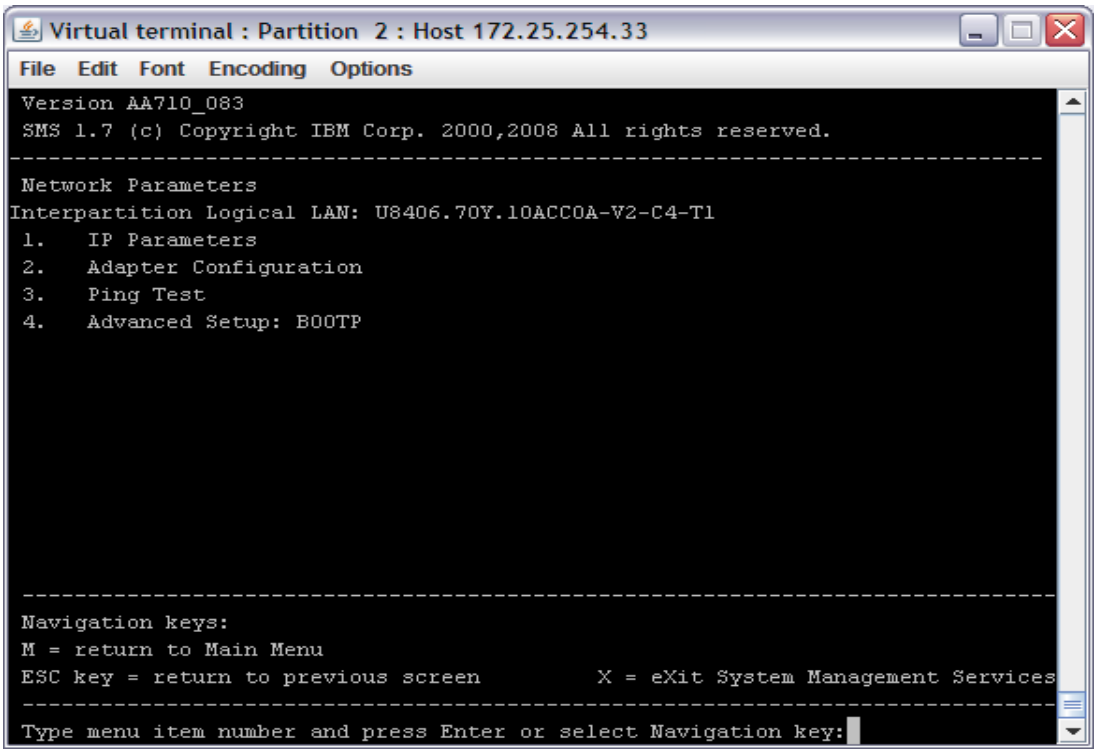
____5. Select 4 for "**IPV4 – Address Format 123.231.111.222**" and press "**Enter**".



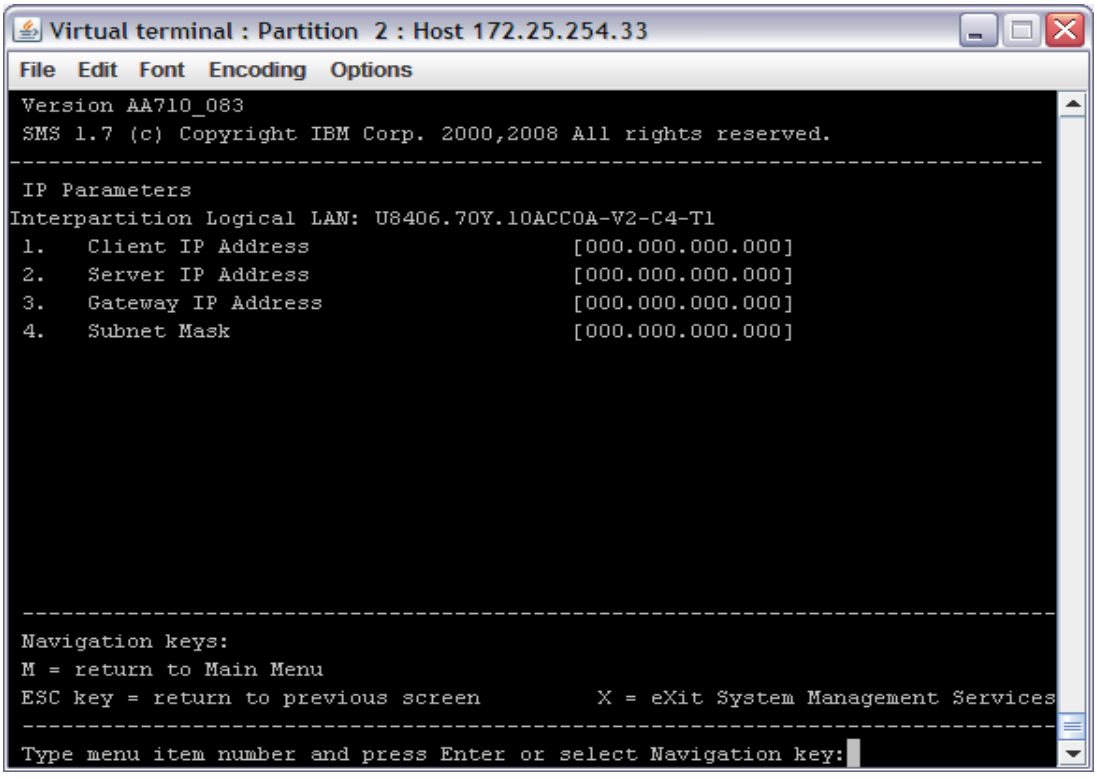
____6. From the Network Services menu, select 1 for "**BOOTP**" and press "**Enter**".



____7. From the Network Parameters menu, select 1 for "**IP Parameters**" and press "**Enter**".



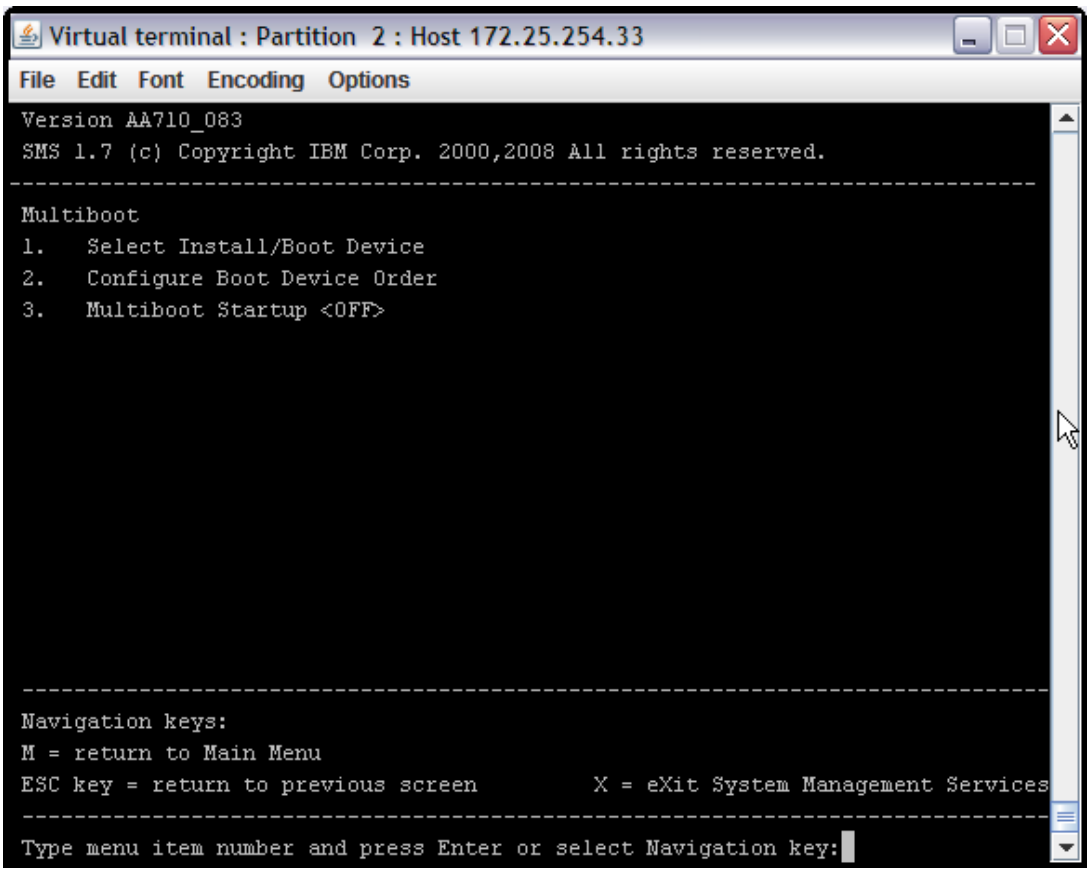
____8. At the IP Parameters menu, select the appropriate number and enter the "**Client IP Address**, **Server IP Address**, **Gateway IP Address**, and the **Subnet Mask**".



____9. Press the "**ESC**" key to go back to the Network Parameters menu and select 3 for "**Ping Test**" and press "**Enter**". Now, select 1 to "**Execute Ping Test**" and press "**Enter**".

____10. Select any key to exit from this menu. Type "**M**" to return to the Main Menu. From the Main menu, select 5 "**Select Boot Options**" and press "**Enter**".

____11. From the Multiboot menu, select 1 "**Select Install/Boot Device**" and press "**Enter**".



____12. From the Select Device Type menu, select 6 "**Network**" and press "**Enter**".

____13. From the Network Service menu, select 1 "**BOOTP**" and press "**Enter**".

____14. From the Select Device menu, select 1 "**Interpartition Logical LAN**" and press "**Enter**".

____15. From the Select Task menu, select 2 for "**Normal Mode Boot**" and press "**Enter**".

____16. At the next menu, select 1 for "**Yes**" to exit the SMS menu and install your LPAR.

For more information on installing AIX go to http://publib.boulder.ibm.com/infocenter/pseries/v6r1/index.jsp?topic=/com.ibm.aix.install/doc/insgdrf/insgdrf-kickoff.htm. The installation steps are also detailed in the Basic Lab 1.

B. Preparing the LPAR for Linux Install

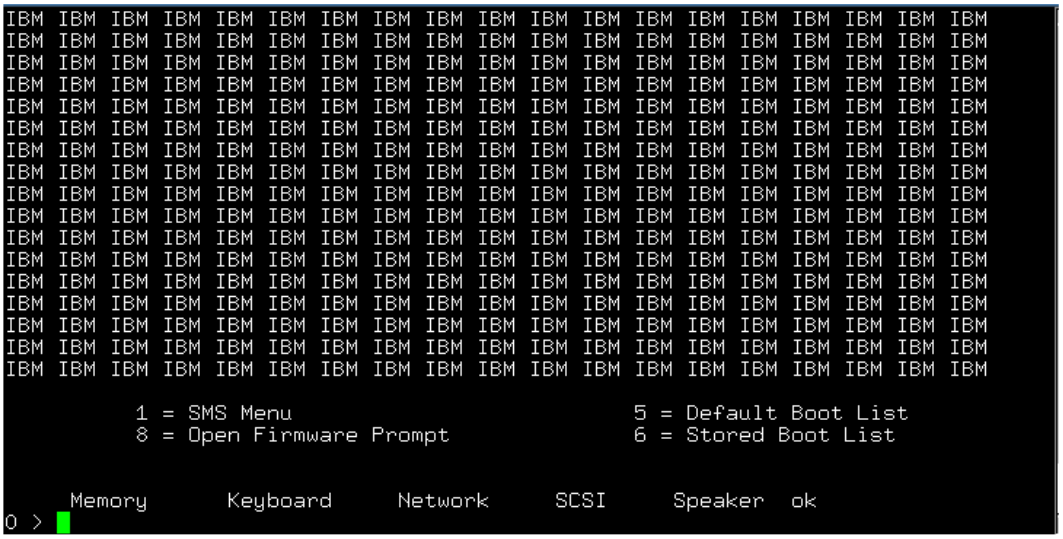
The following steps should be completed for RedHat install:

____1. Telnet using PUTTY (do not use Windows' telnet client) to the IVM on your blade. Enter the userid and password provided before the lab.

____2. To boot the logical partition, type "**chsysstate -o on -r lpar –id #**" (where # is the partition ID for your Linux install) and press "**Enter**".

____3. Type "**mkvt id #**" (where # is the partition ID for your Linux install) and press "**Enter**" to open a virtual terminal to your logical partition.

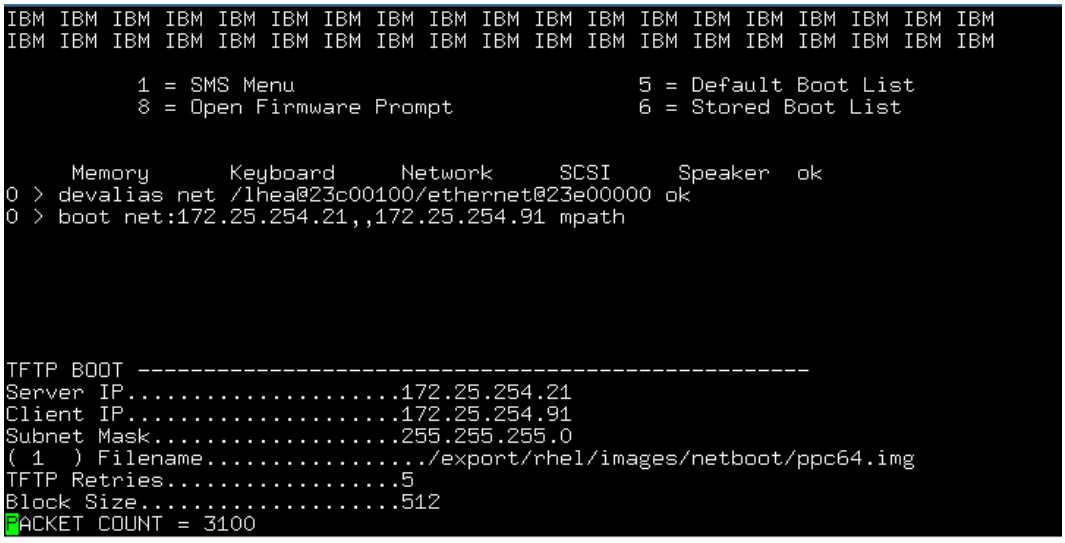
____4. Several lines will scroll up the screen. Press "**8**" on the keyboard when you see the word "**Keyboard**" and before the word "**Speaker**" to go to the Open Firmware Prompt.



____5. At the 0> prompt, enter **devalias net**. If it is set to a l-lan device, continue with the next step. If not, enter **ls** at the prompt and find the line that has **/l-lan**. Then, enter **devalias net l-lan@30000004** using the actual information returned from the ls command.

____6. At the Open Firmware prompt, enter the string "**boot net:172.25.254.21,,172.25.254.91 mpath**". The first IP address is the install server and the second IP address is for your client. Don't forget the commas between the IPs. The "mpath" after the IPs is to tell the kernel to activate multipathing support.

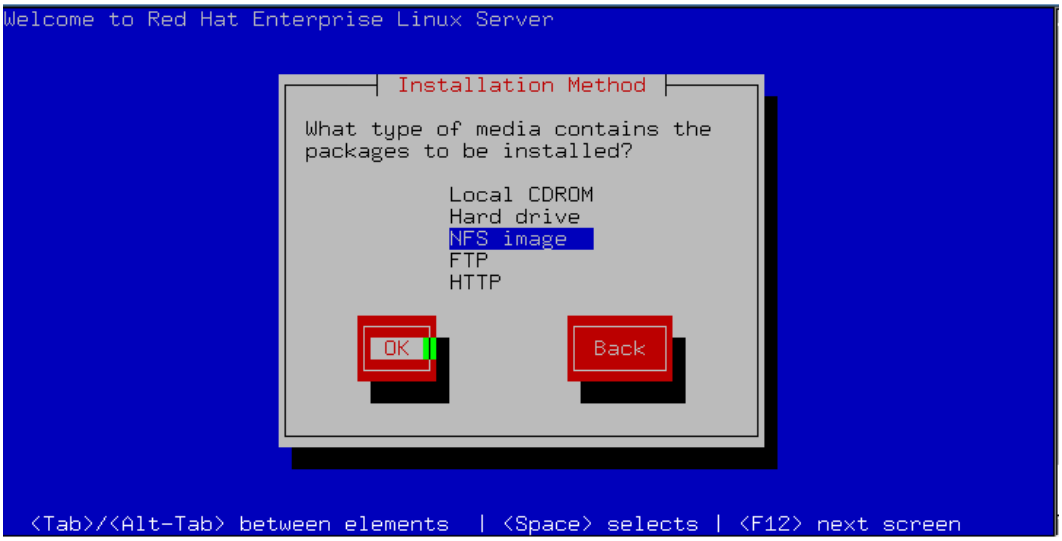
The bootp process begins and the boot image is downloaded to the blade.



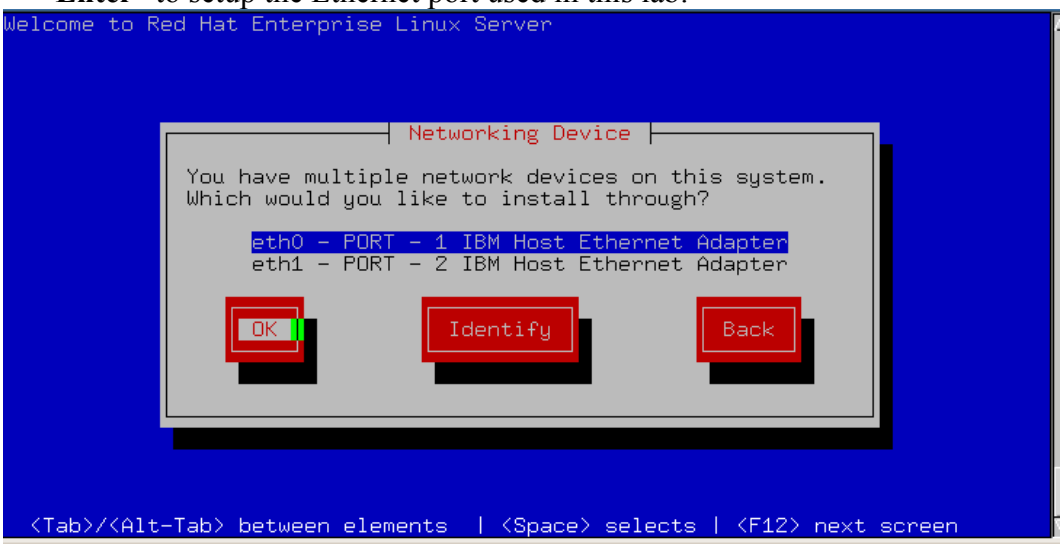
You will be presented with configuration screens from the anaconda installer. You can use the directional arrows or the Page Up or Page Down keys to scroll through lists. Use the Tab key or Alt-Tab key combination to navigate through the fields on the screen. Use the Spacebar to make your selection and the Enter key to process it.

____7. At the Choose a Language screen, scroll to the language of your choice and press "**Enter**".

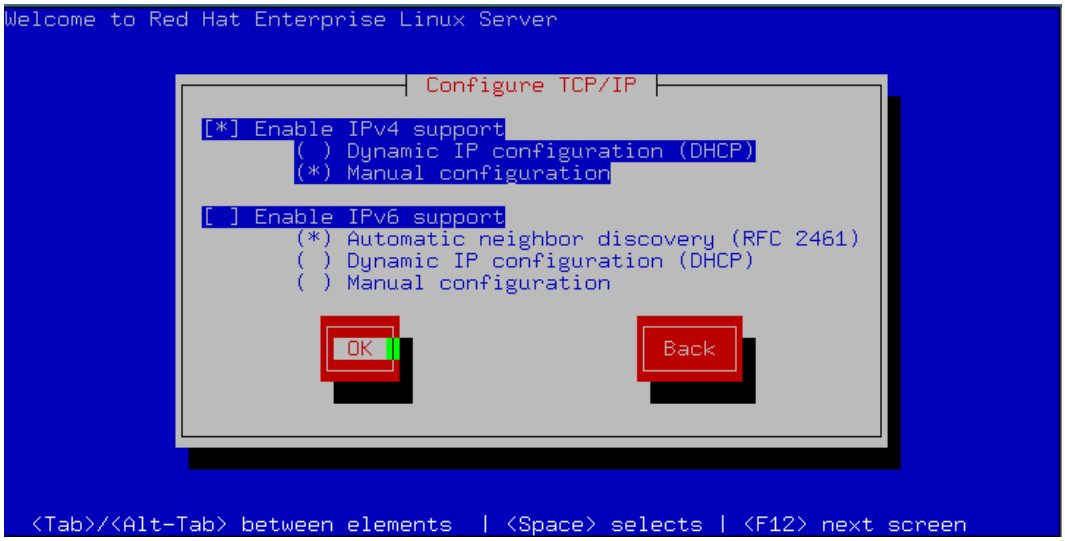
____8. Select "**NFS Image**" as your Installation Method and press "**Enter**" to install from the NIM server.



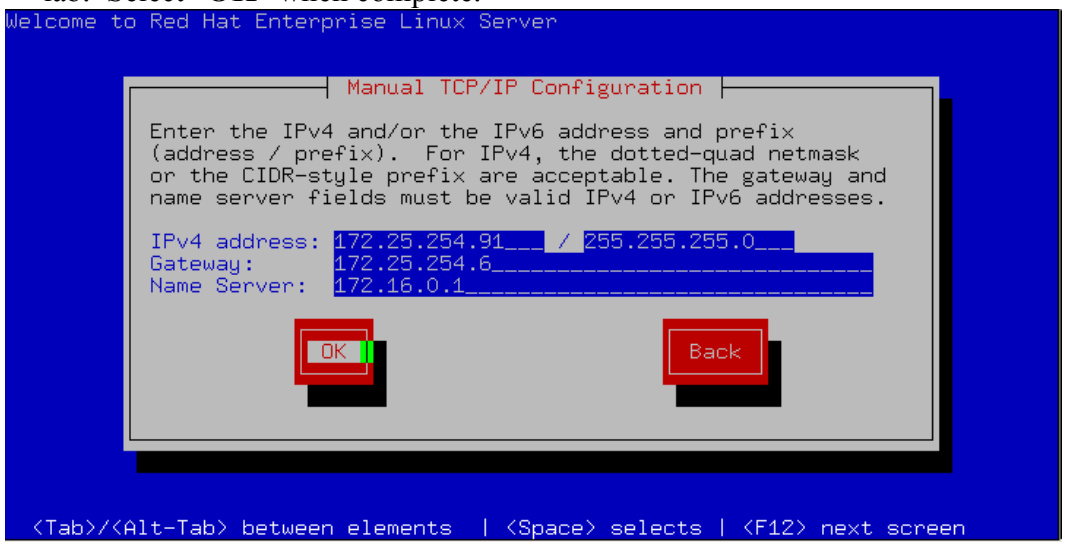
____9. If you have more than one networking device, choose it from the list and press "**Enter**" to setup the Ethernet port used in this lab.



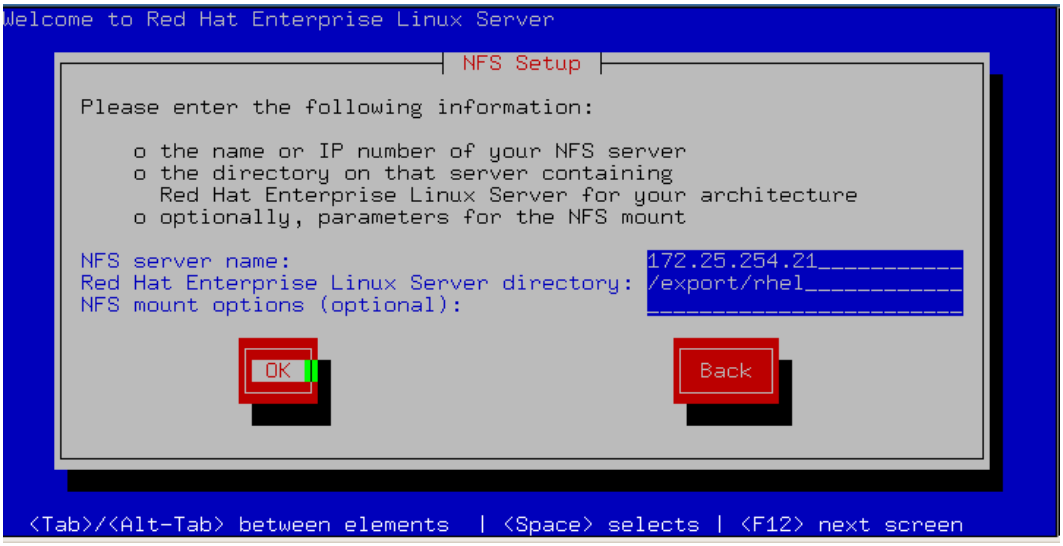
____10. Tab to the "**Manual configuration**" option and use the Spacebar to select it. Tab to the "**Enable IPv6 support**" option and use the Spacebar to deselect it. Select **OK** to continue.



____11. Tab to the appropriate fields and input the TCP/IP information provided to you for this lab. Select "**OK**" when complete.



____12. Enter the NFS server's **IP address** or **name** and the **directory** where the install packages are stored on that server.



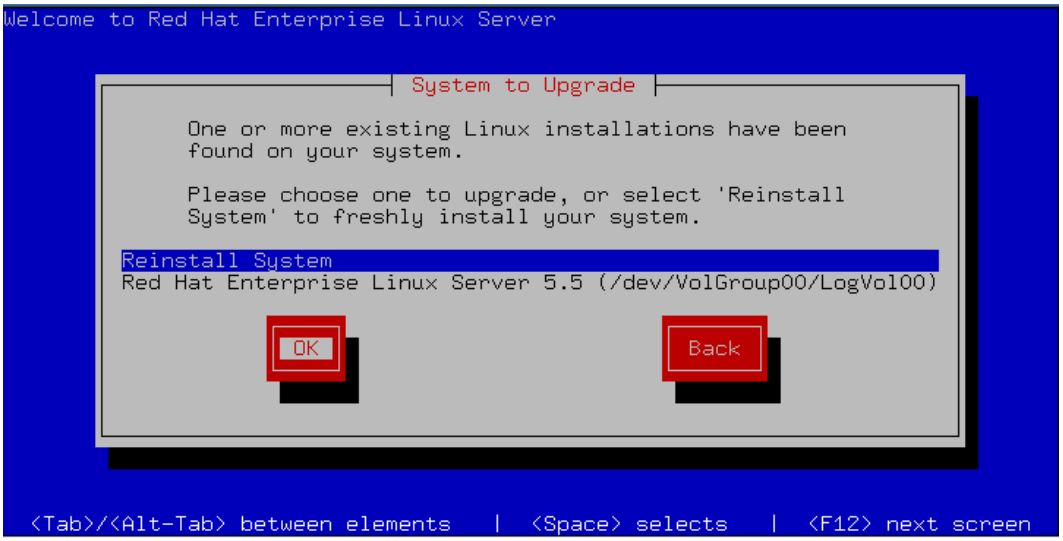
____13. Use text mode for this lab.

____14. Welcome to Red Hat Enterprise Linux Server! Select **OK** to continue the install.

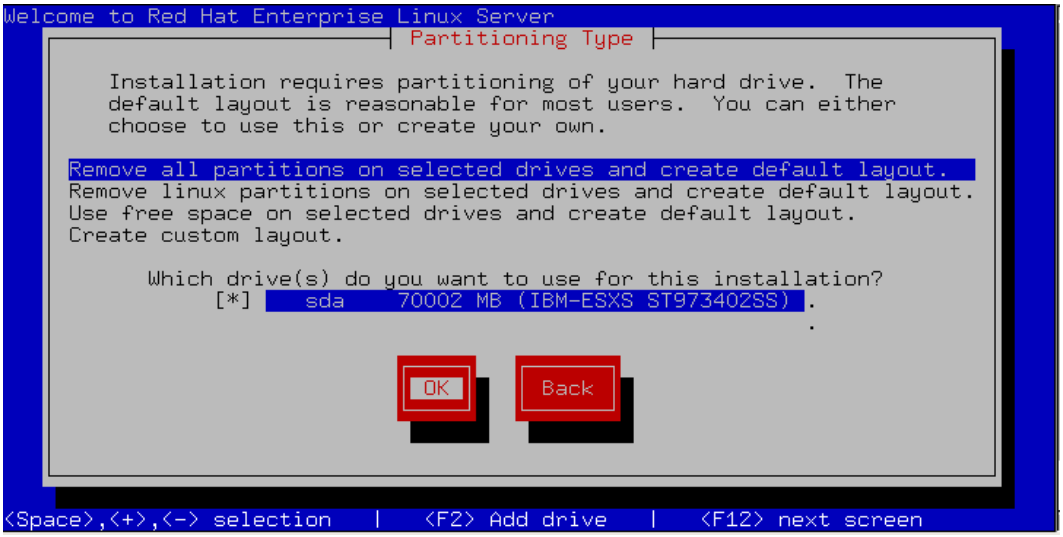
____15. As this is not a permanent install, select to "**Skip entering Installation Number**" and press "**Enter**".

____16. Confirm the "**Skip**" and press "**Enter**" to continue the installation.

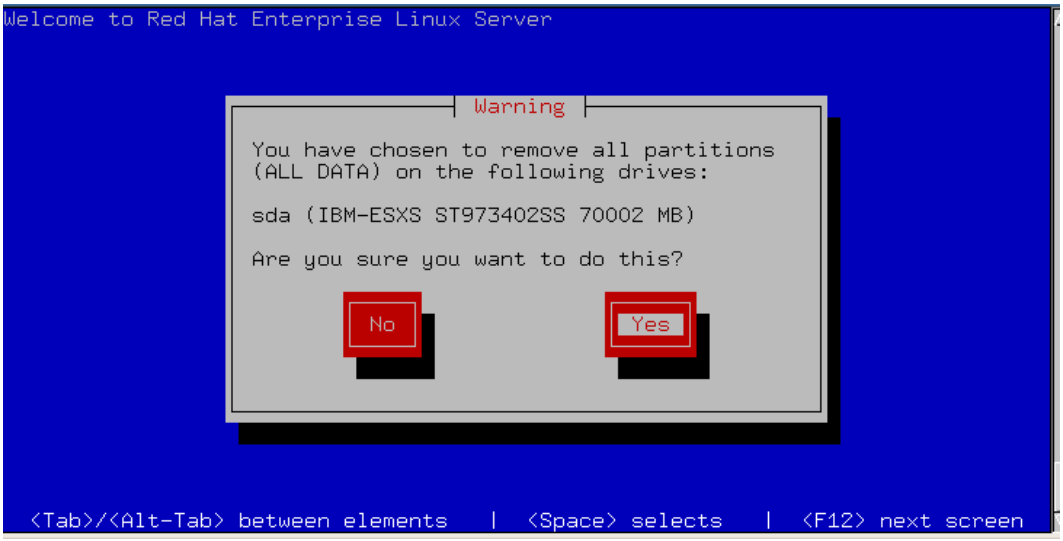
____17. You may see a screen for Initializing your disk or Upgrading an existing installation. Select to initialize the disk or to reinstall the system, **OK** and press enter to continue.



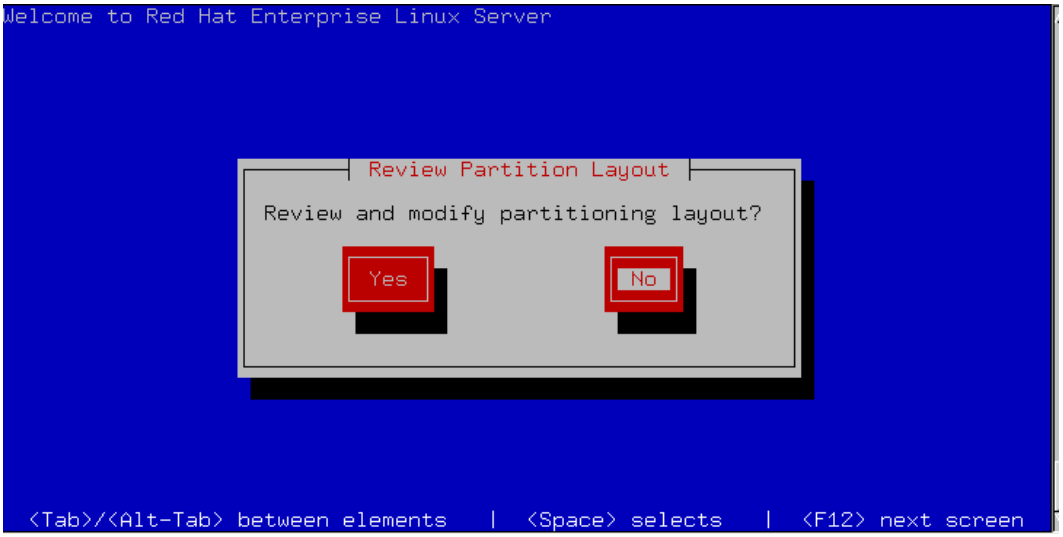
____18. Select to "**Remove all partitions on selected drives and create default layout**" on the disk drive for this installation.



____19. Select "**Yes**" to acknowledge the warning and press "**Enter**".

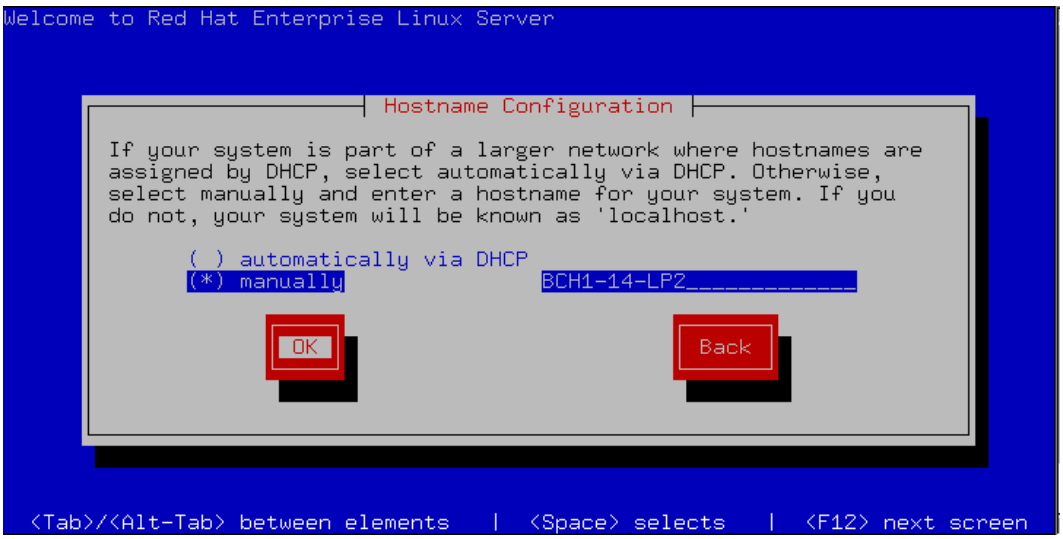


____20. Select "**No**" and press "**Enter**" to continue. Tuning the partition layout is not part of this course.



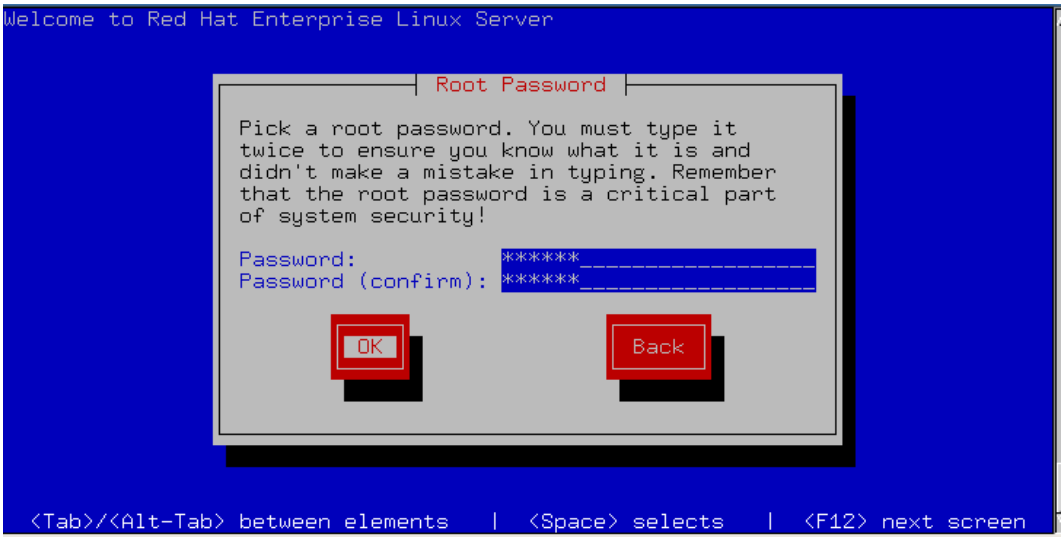
____21. Complete the network settings with the information provided for this lab.

____22. V**erify** the **hostname** is correct and press "**Enter**". **Note**: Linux will not allow the use of _ in the lab's hostname.

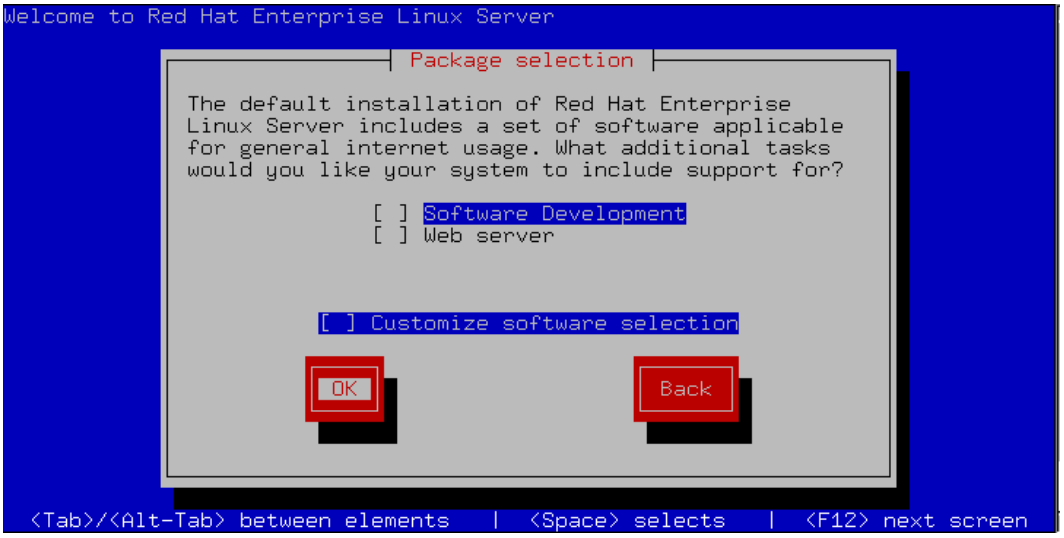


____23. Choose the **time zone** for your location and press "**Enter**".

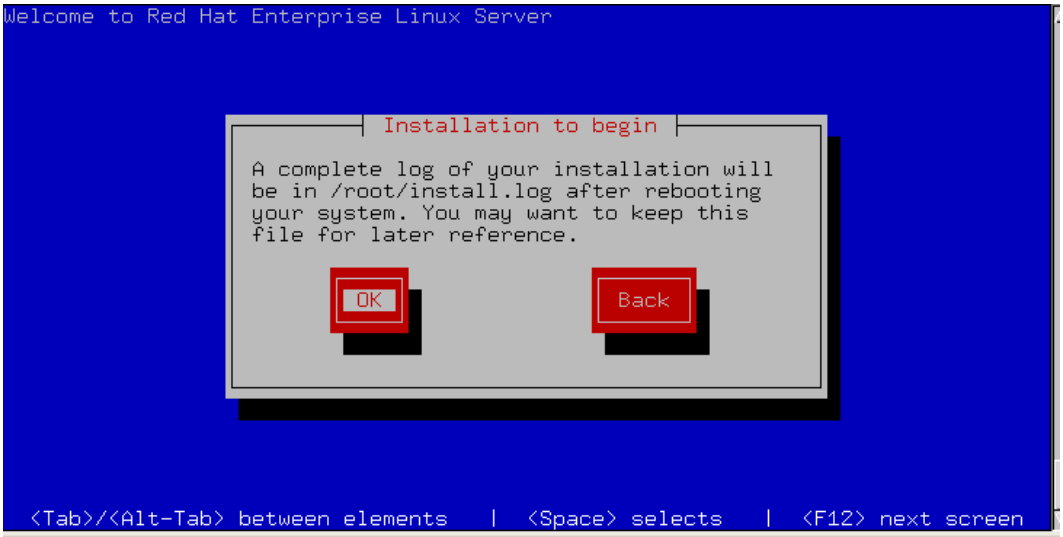
____24. Enter a root password. Please use PSTRAIN2 for this lab.



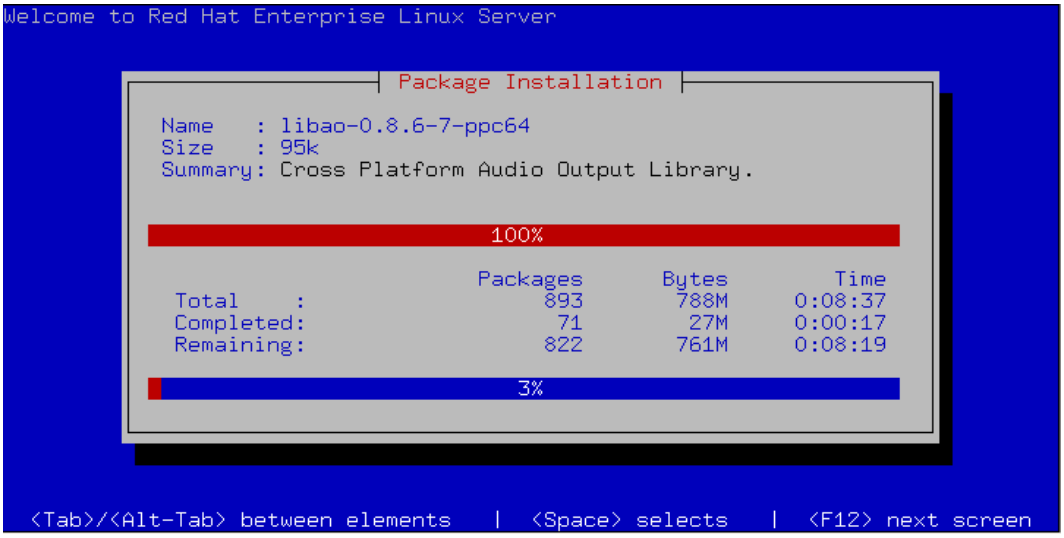
____25. For this lab, do not select additional packages, select **OK** and press "**Enter**" to continue.



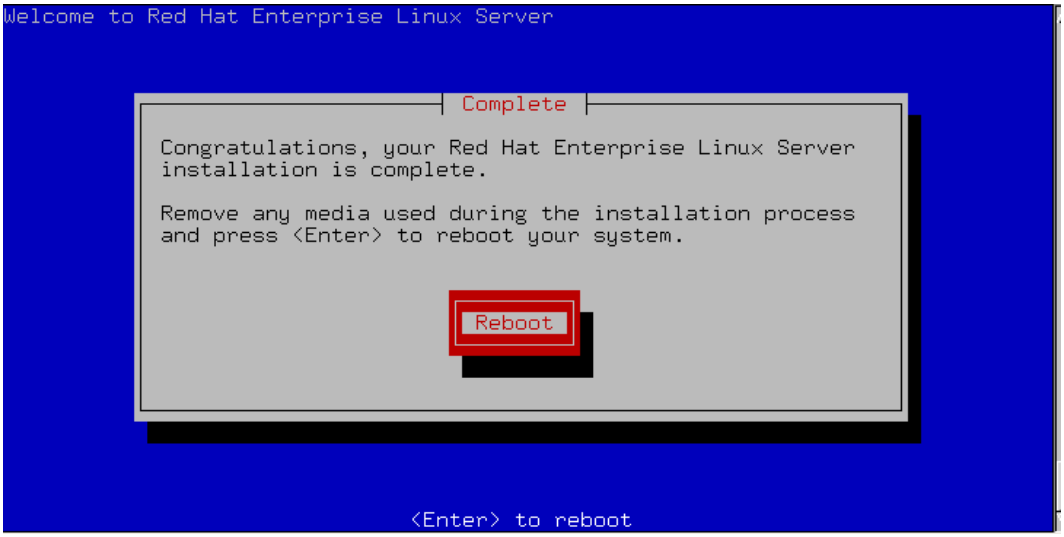
____26. An install package dependency check is run. Note the log location and press "**Enter**" to begin the installation.



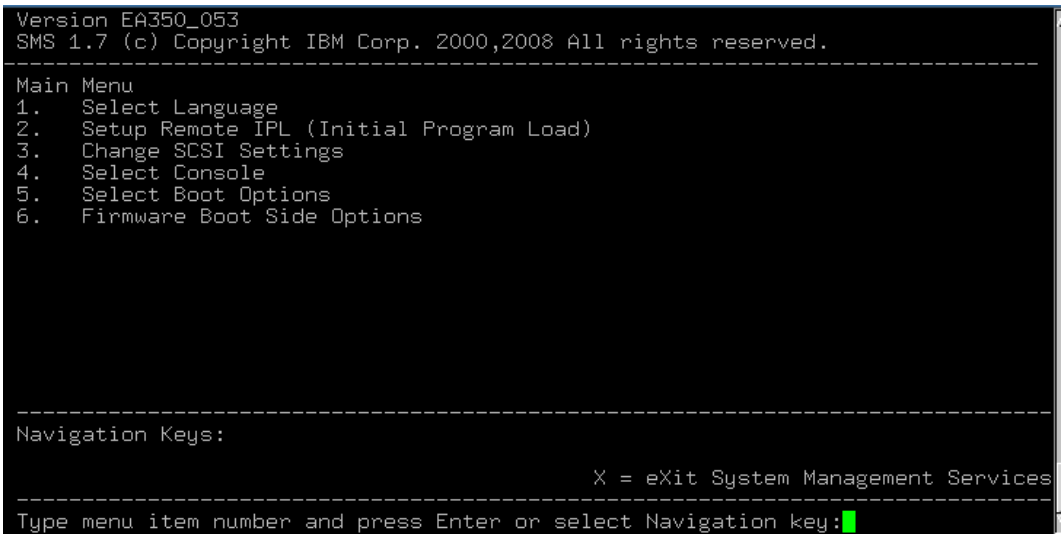
____27. The filesystems will now be formatted and the installation of the selected packages will begin. You can watch the progress of the individual package installations.



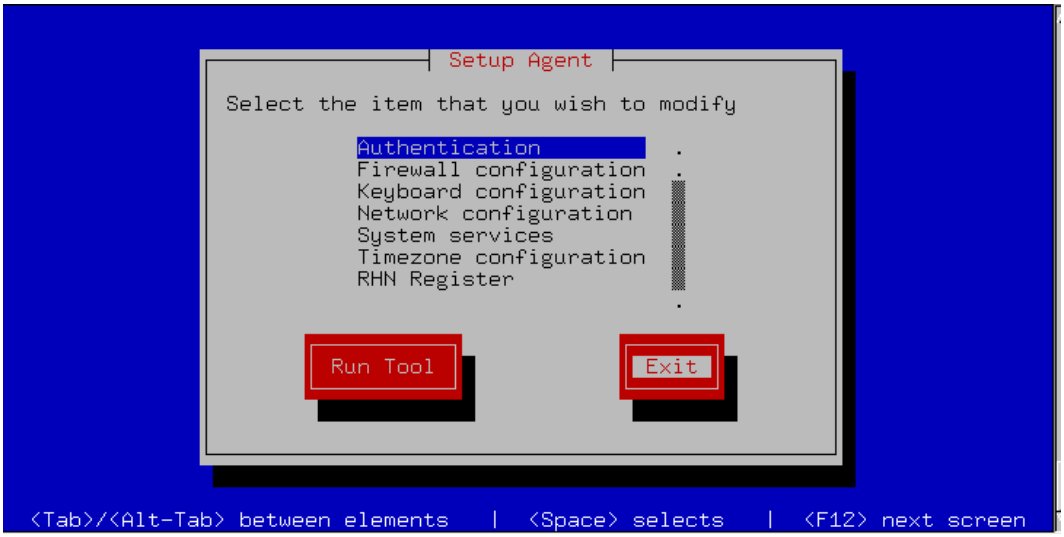
____28. Once the installation completes, press "**Enter**" to reboot the server.



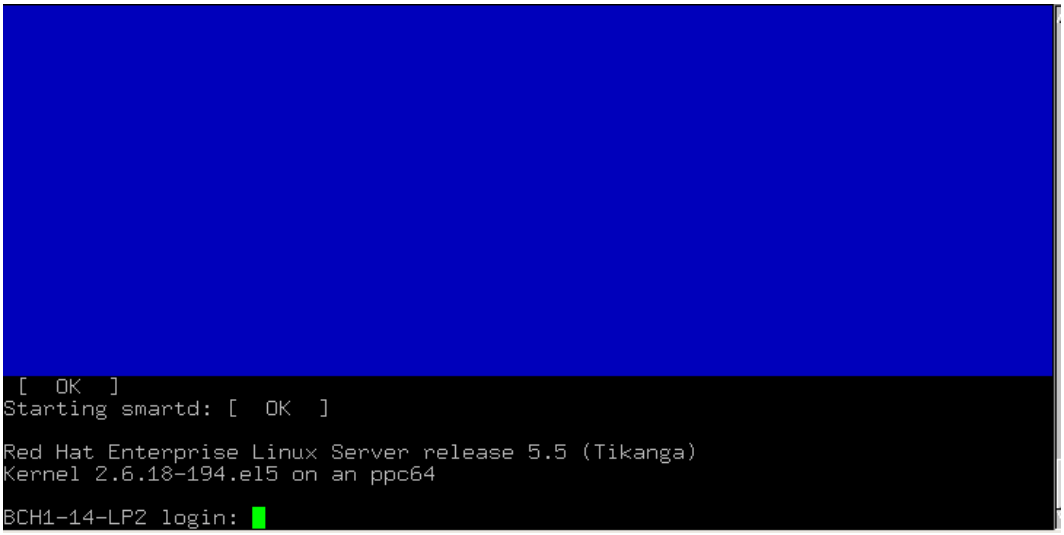
____29. You will need to press 1 and enter the SMS menus to select to boot from the disk. If you miss it, it will eventually come around again.



____30. For this lab, just select "**Exit**" and press "**Enter**".



____31. This completes the installation of the OS. Reboot the system and login as root to continue the setup at **Configuring Linux for LPM** in this lab document. Your password should have been set to PSTRAIN2 previously.



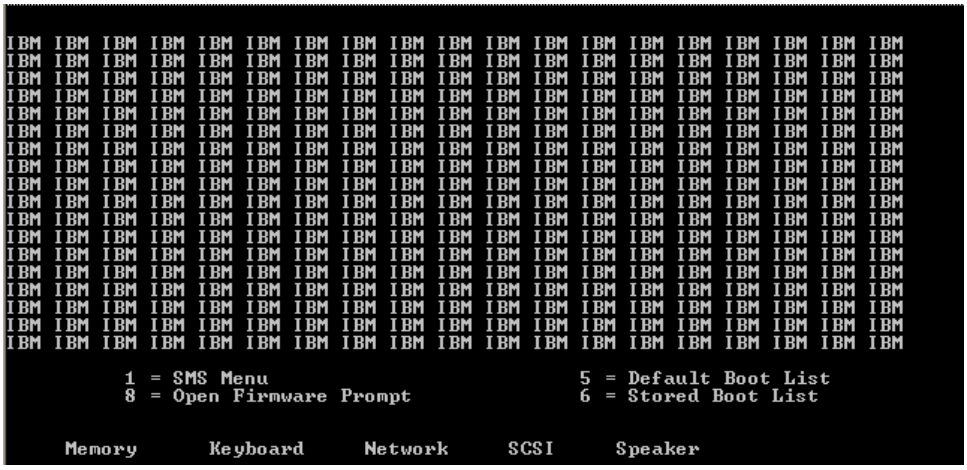
The following steps should be completed for SUSE install:

____1. Telnet using PUTTY (do not use Windows' telnet client) to the IVM on your blade. Enter the userid and password provided before the lab.

____2. To boot the logical partition, type "**chsysstate -o on -r lpar –id #**" (where # is the partition ID for your Linux install) and press "**Enter**" or use the web GUI interface.

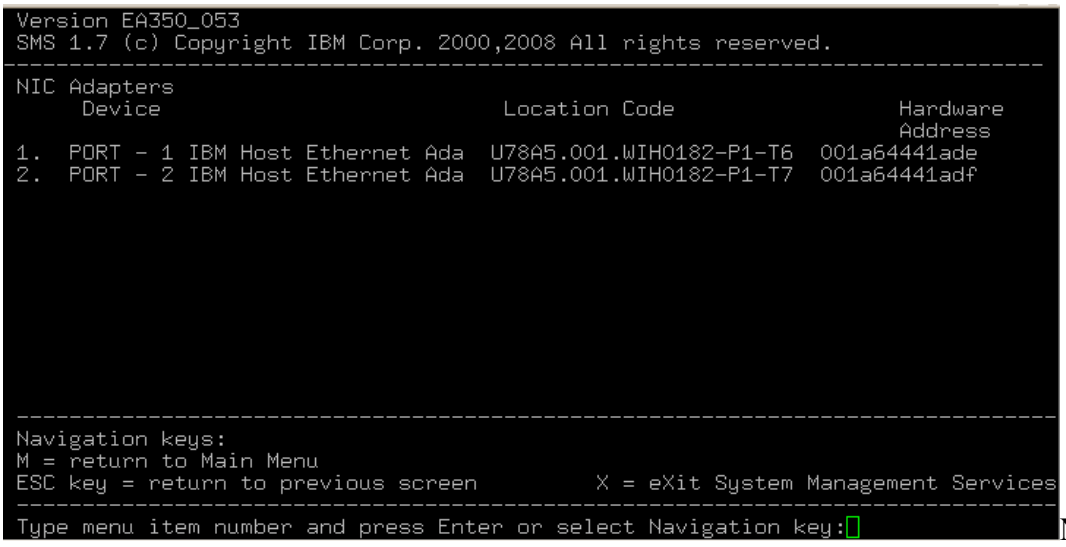
____3. Type "**mkvt -id #**" (where # is the partition ID for your Linux install) and press "**Enter**" to open a virtual terminal to your logical partition.

____4. Several lines will scroll up the screen. Press "**1**" on the keyboard when you see the word "**Keyboard**" and before the word "**Speaker**" to go to the SMS Menus.



____5. From the Main Menu, select 2 for "**Setup Remote IPL <Initial Program Load>**" and press "**Enter**".

____6. From the NIC Adapters menu, select 1 for "**Port – 1 IBM Host Ethernet Ada**" and press "**Enter**".



N

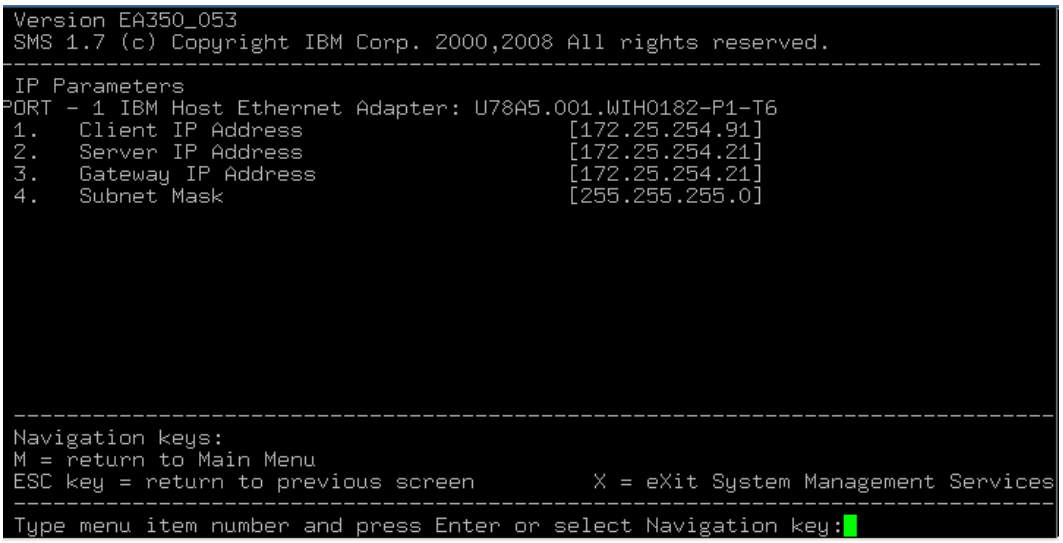
ote: If you select port 2 then you must have an Ethernet Switch Module in Bay 2 of the chassis.

____7. From the Select Internet Protocol menu, select 1 for "**IPv4**" and press "**Enter**".

____8. From the Select Network Service menu, select 1 for "**BOOTP**" and press "**Enter**".

____9. From the Network Parameters menu, select 1 for "**IP Parameters**" and press "**Enter**".

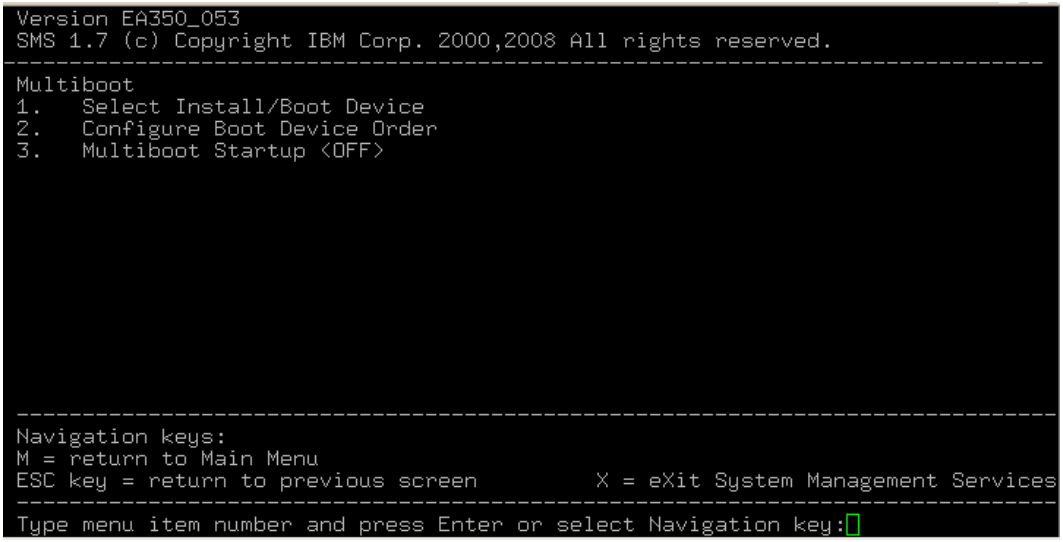
____10. At the IP Parameters menu, enter the Client IP Address, Server IP Address, Gateway IP Address, and the Subnet Mask.



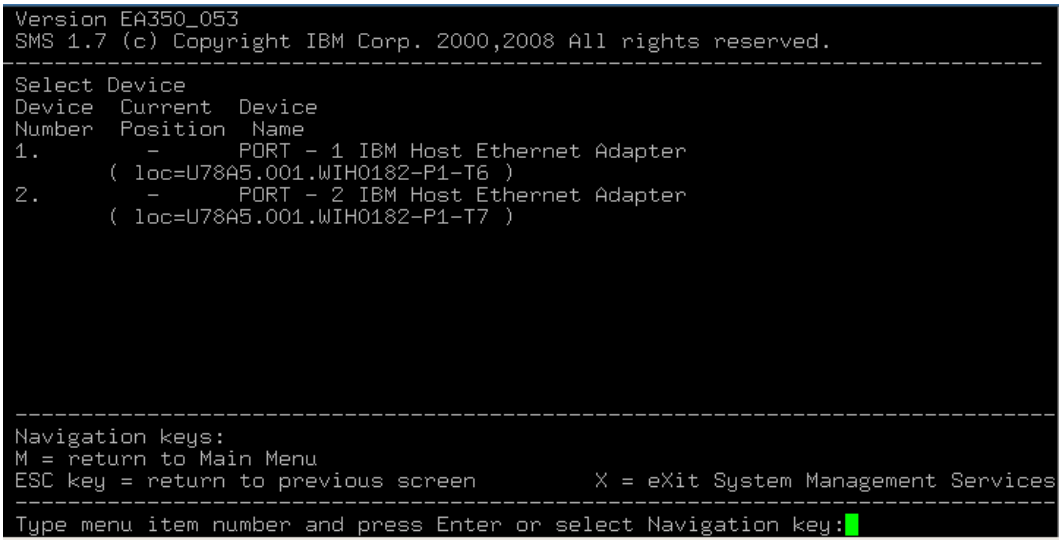
____11. Press the "**ESC**" key to go back to the Network Parameters menu and select 3 for "**Ping Test**" and press "**Enter**". Now, select 1 to "**Execute Ping Test**" and press "**Enter**".

____12. Press any key to exit from this menu. Type "**M**" to return to the Main Menu. From the Main menu, select 5 "**Select Boot Options**" and press "**Enter**".

____13. From the Multiboot menu, select 1 "**Select Install/Boot Device**" and press "**Enter**".

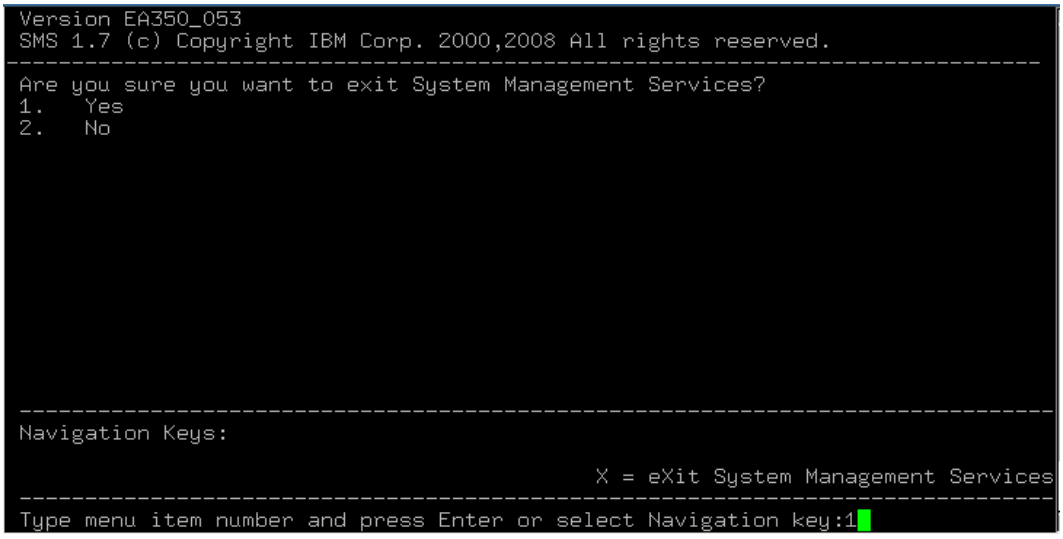


____14. From the Select Device Type menu, select 6 "**Network**" and press "**Enter**".
____15. From the Select Network Service menu, select 1 "**BOOTP**" and press "**Enter**".
____16. From the Select Device menu, select 1 "**Port – 1 IBM Host Ethernet Adapter <loc=U78A5.001.WIH0182-P1-T6>**" and press "**Enter**".



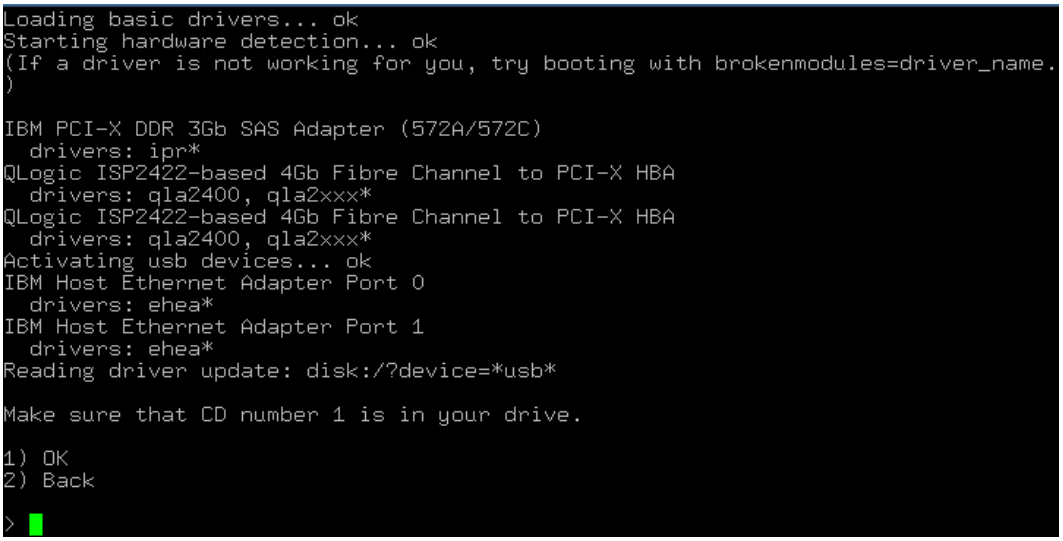
____17. From the Select Task menu, select 2 for "**Normal Mode Boot**" and press "**Enter**".

____18. At the next menu, select 1 for "**Yes**" to exit the SMS menu and install the OS on your blade.

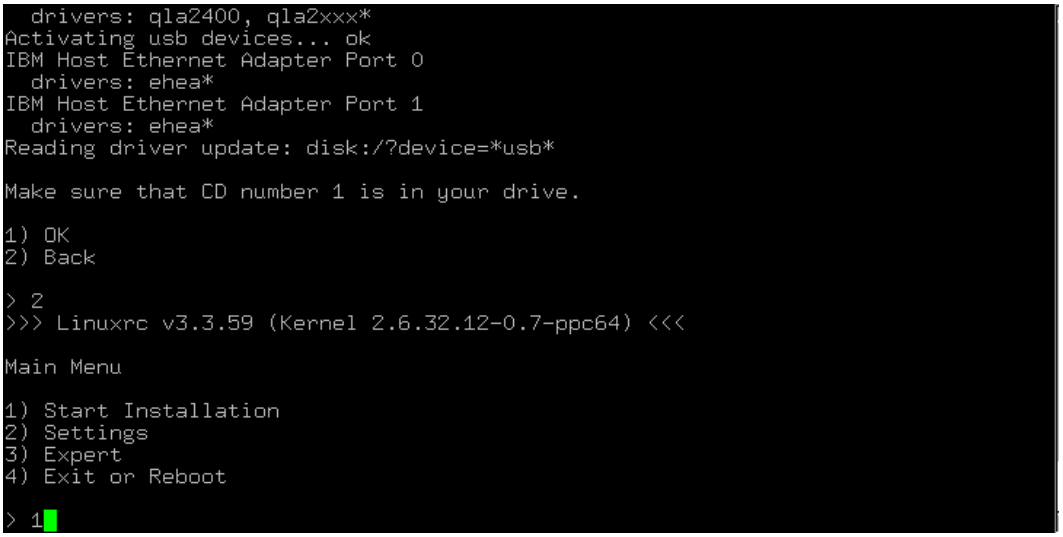


The bootp process begins and the boot image is downloaded to the blade.

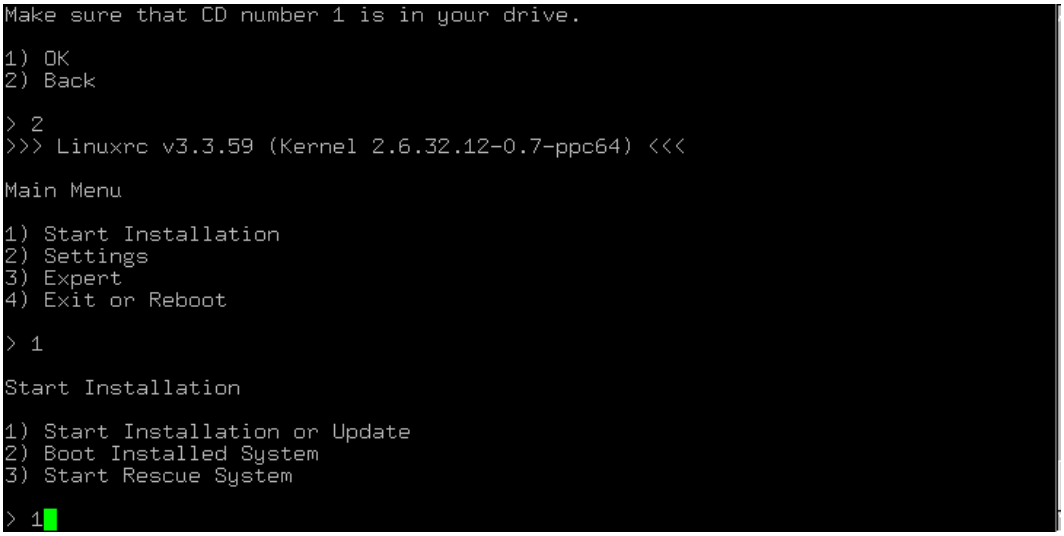
____19. After the drivers have loaded, you will be prompted to ready the CD for install. Since this lab will use the network installation method, select **2** to go back.



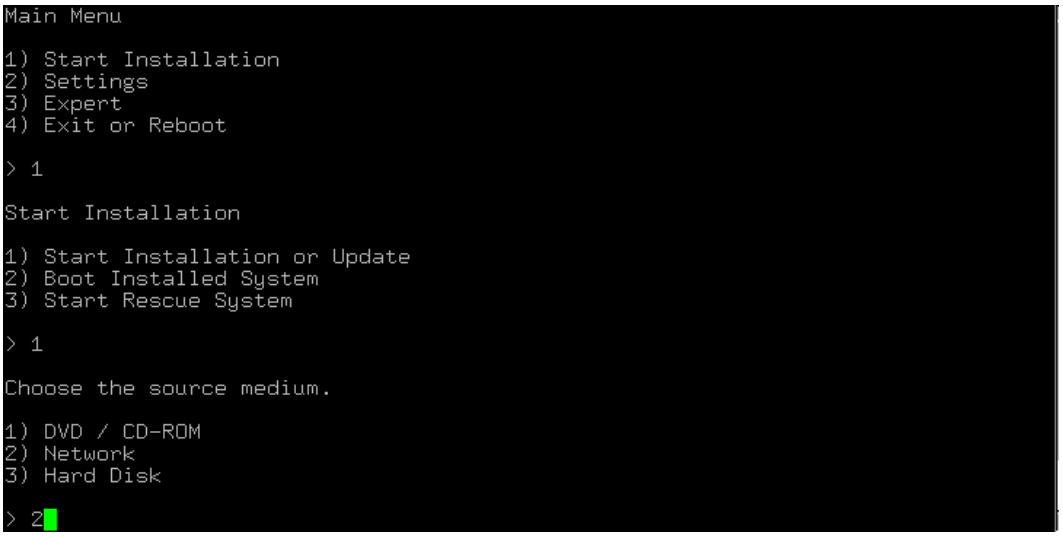
____20. Select **1) Start Installation** and press **Enter**.



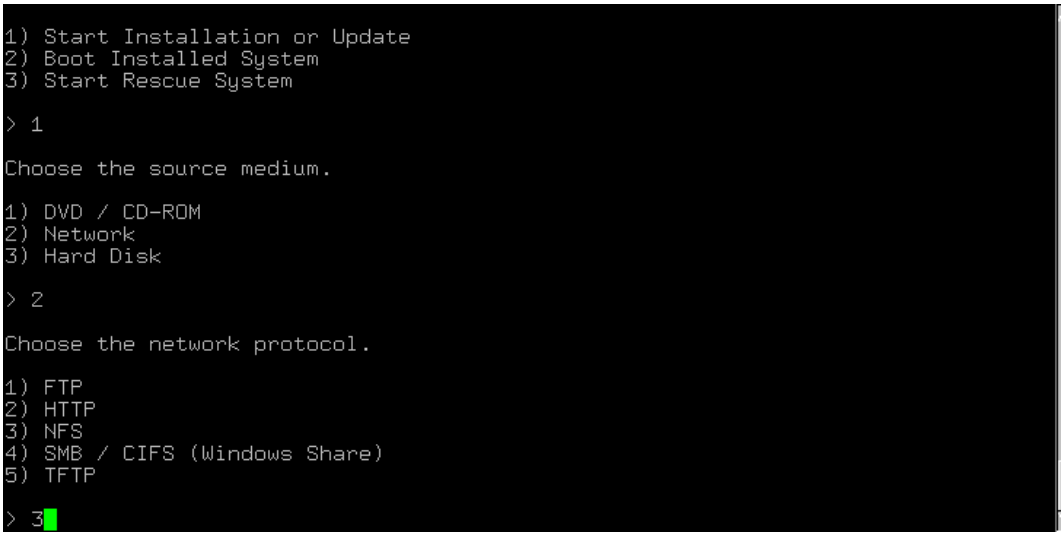
____21. Select **1) Start Installation or Update** and press **Enter**.



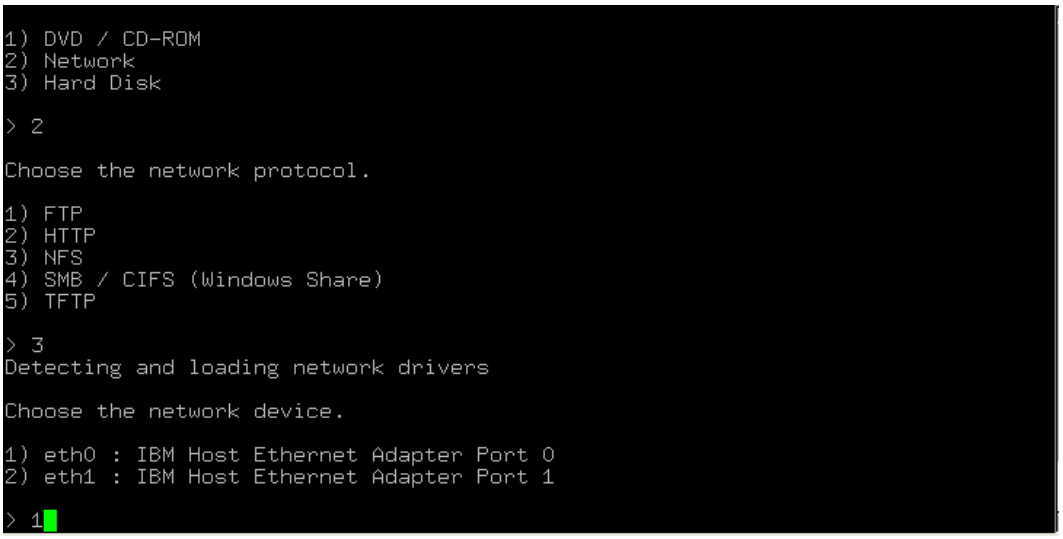
____22. Select **2) Network** as your source and press **Enter**.



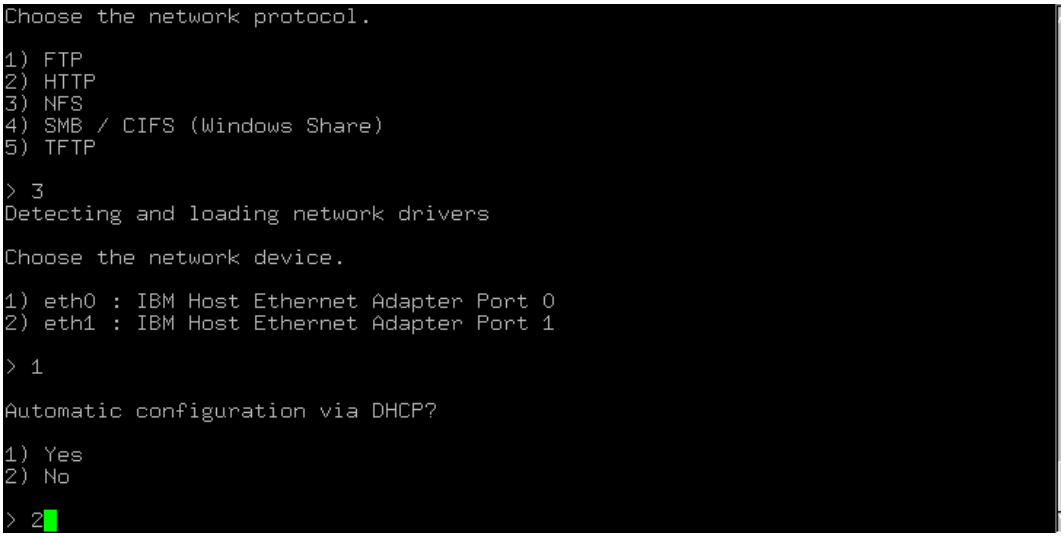
____23. Select **3) NFS** for the network protocol and press **Enter**.



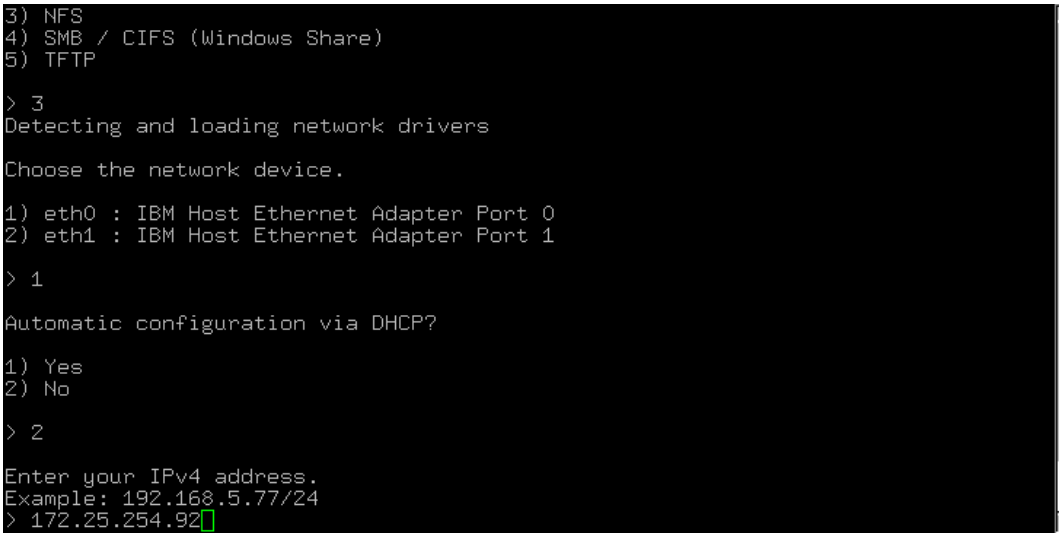
____24. If prompted, select the network device and press **Enter**.



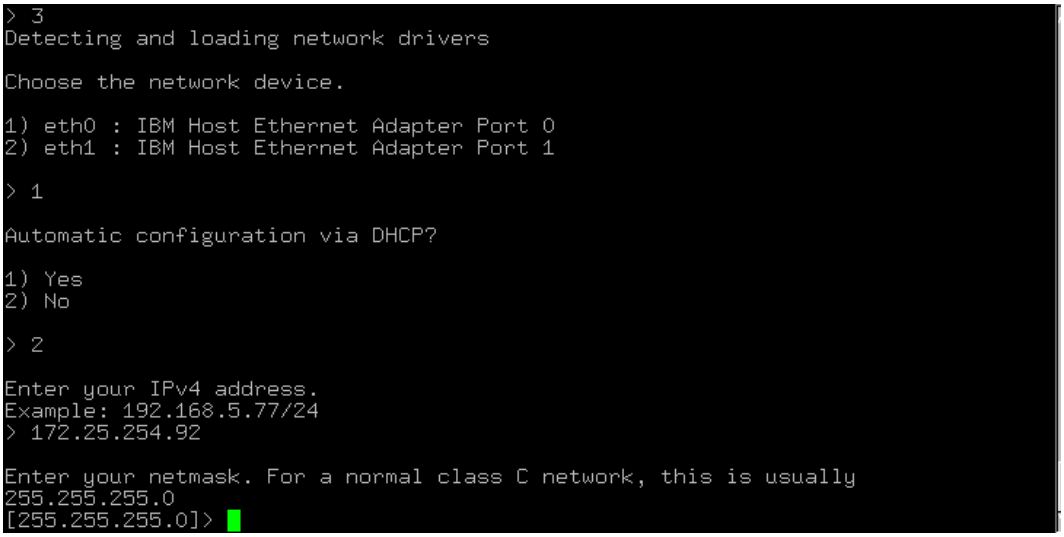
____25. Select **2) No** to hard-code the IP address and press **Enter**.



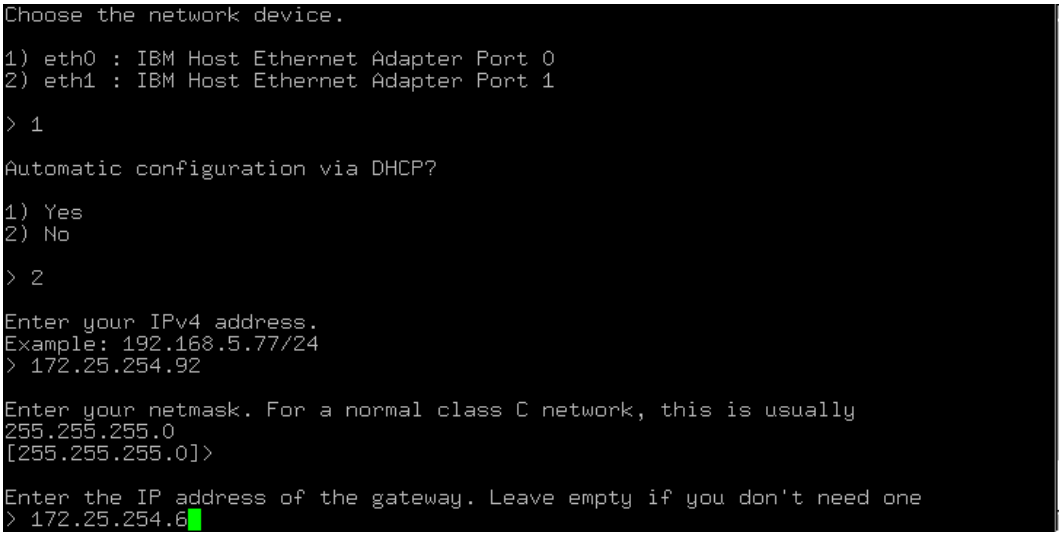
____26. Enter the IP address provided for this lab and press **Enter**.



____27. Press **Enter** to use the default netmask.



____28. Enter the Gateway IP address provided for this lab and press **Enter**.



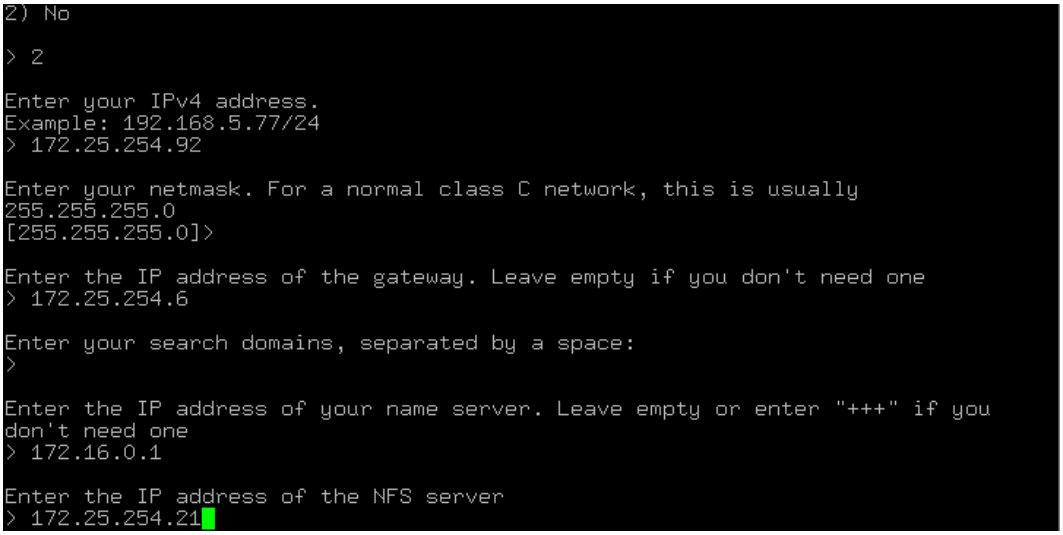
____29. Press **Enter** to leave the search domain empty.

```
2) eth1 : IBM Host Ethernet Adapter Port 1

> 1

Automatic configuration via DHCP?

1) Yes
2) No

> 2

Enter your IPv4 address.
Example: 192.168.5.77/24
> 172.25.254.92

Enter your netmask. For a normal class C network, this is usually
255.255.255.0
[255.255.255.0]>

Enter the IP address of the gateway. Leave empty if you don't need one
> 172.25.254.6

Enter your search domains, separated by a space:
>
```

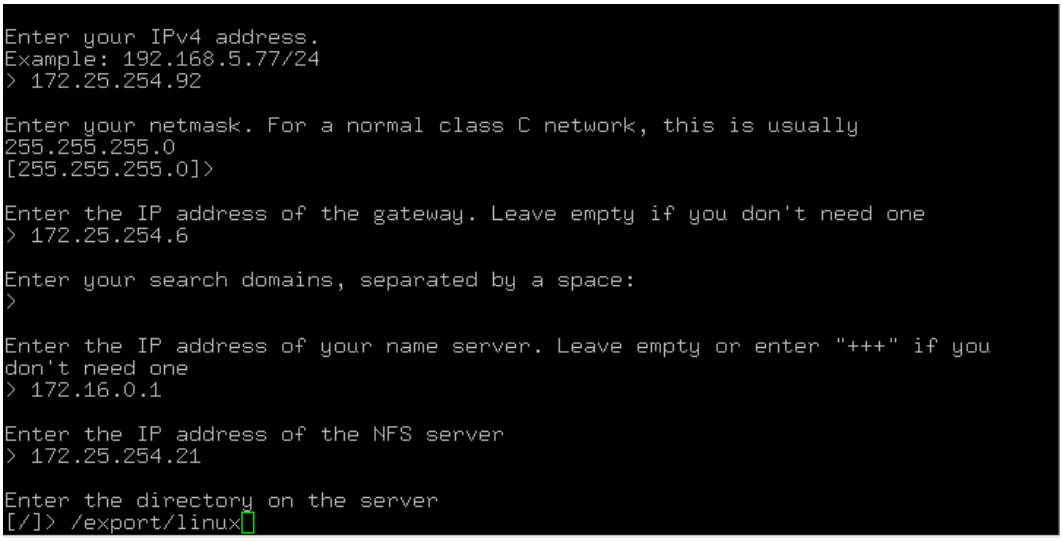
____30. Input the IP address provided for your name server and press **Enter**.

```
Automatic configuration via DHCP?

1) Yes
2) No

> 2

Enter your IPv4 address.
Example: 192.168.5.77/24
> 172.25.254.92

Enter your netmask. For a normal class C network, this is usually
255.255.255.0
[255.255.255.0]>

Enter the IP address of the gateway. Leave empty if you don't need one
> 172.25.254.6

Enter your search domains, separated by a space:
>

Enter the IP address of your name server. Leave empty or enter "+++" if you
don't need one
> 172.16.0.1
```

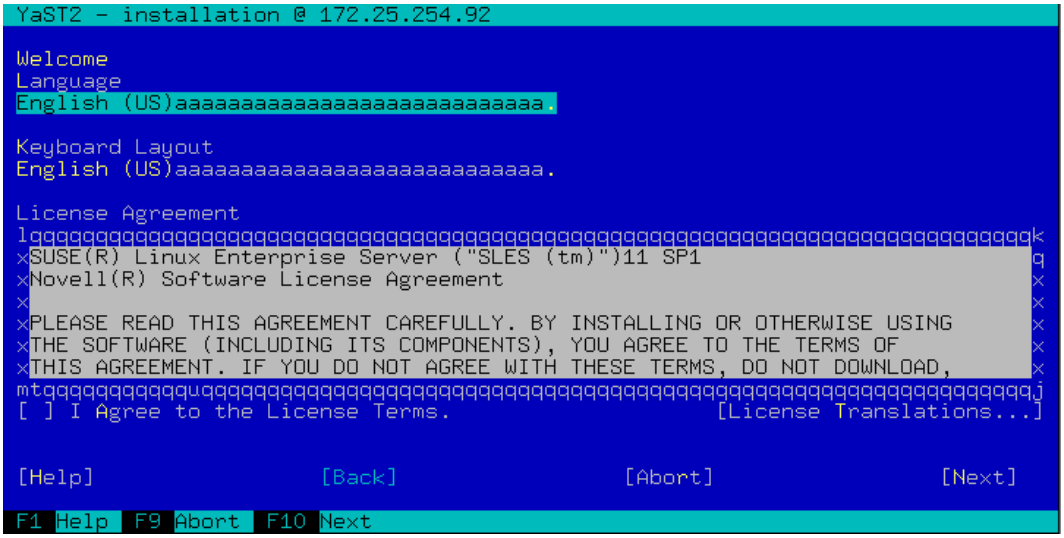
____31. Input the NFS server's IP address and press **Enter**.



____32. Input the /export/linux directory used to serve the install files and press **Enter**.

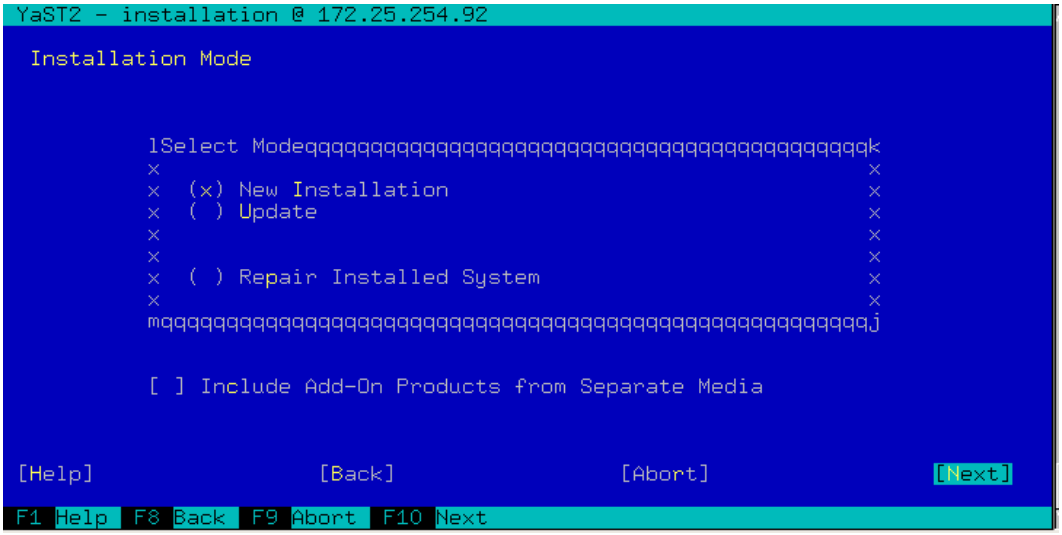


____33. The YaST installer code is loaded and the installation will begin. Tab to the **I agree to the License Terms** box, use the space bar to select it, then tab to the **Next** option and press **Enter**.

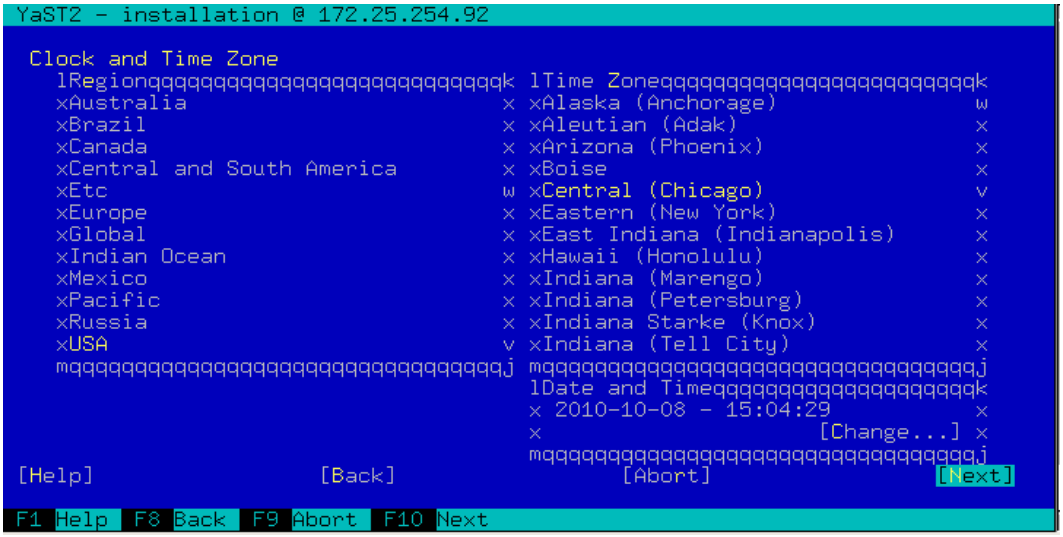


____34. Select **OK** and press **Enter** to activate any device drivers installed on the system.

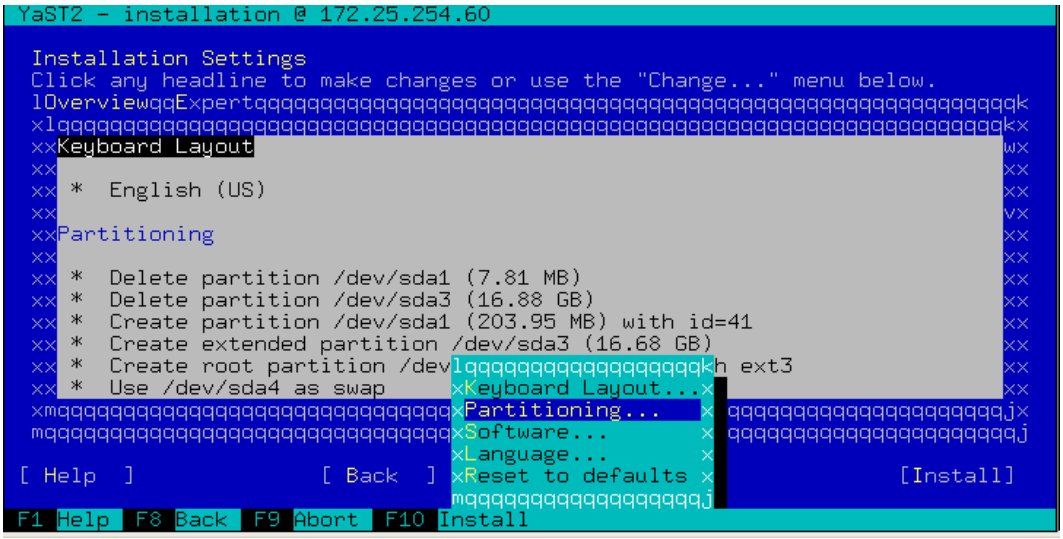
____35. Select **New Installation** and **Next**, then press **Enter**.



____36. Select your **Region** and **Time Zone** by tabbing between fields and using the arrow keys to scroll the lists. Change the **Date and Time** if necessary and tab to **Next**. Press **Enter** to input your options.

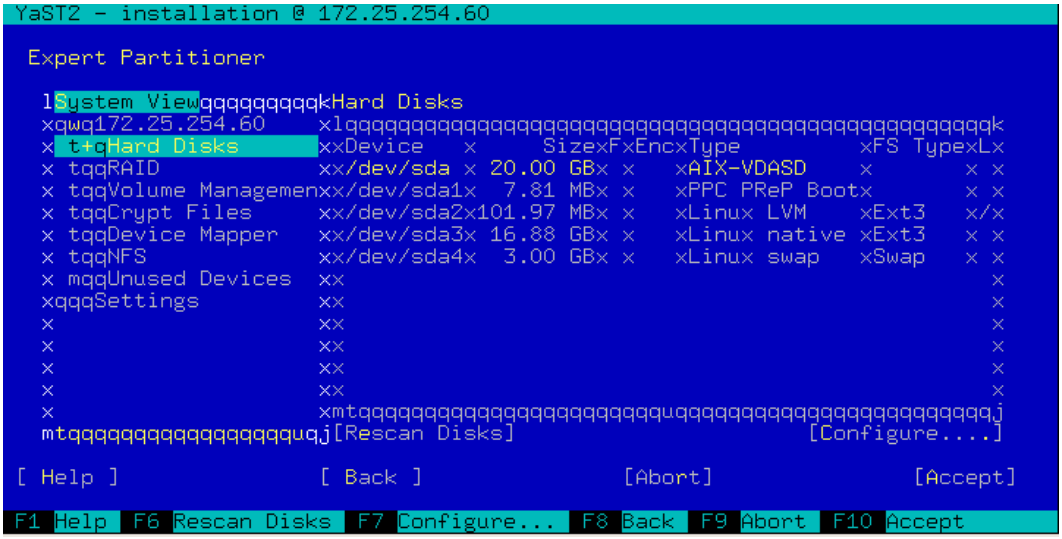


____37. At the **Installation Settings** menu, you need to tab to the **Change...** option and press "**Enter**". Scroll down the list that appears, select **Partitioning...** and press "**Enter**".



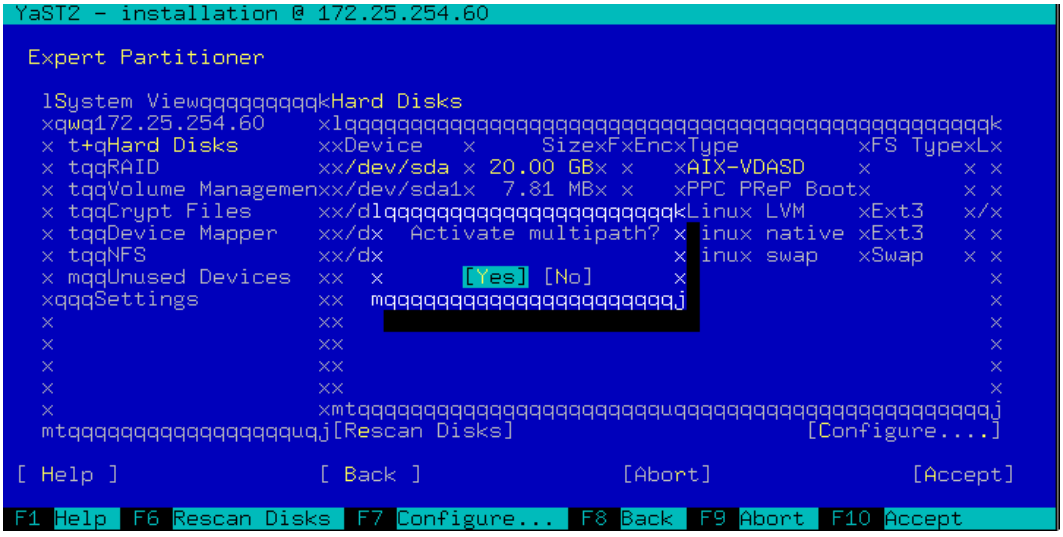
____38. Select **Custom Partitioning (for experts)**, **Next** and press "**Enter**".

____39. Tab to the System View area, scroll down to Hard Disks and press "Enter".

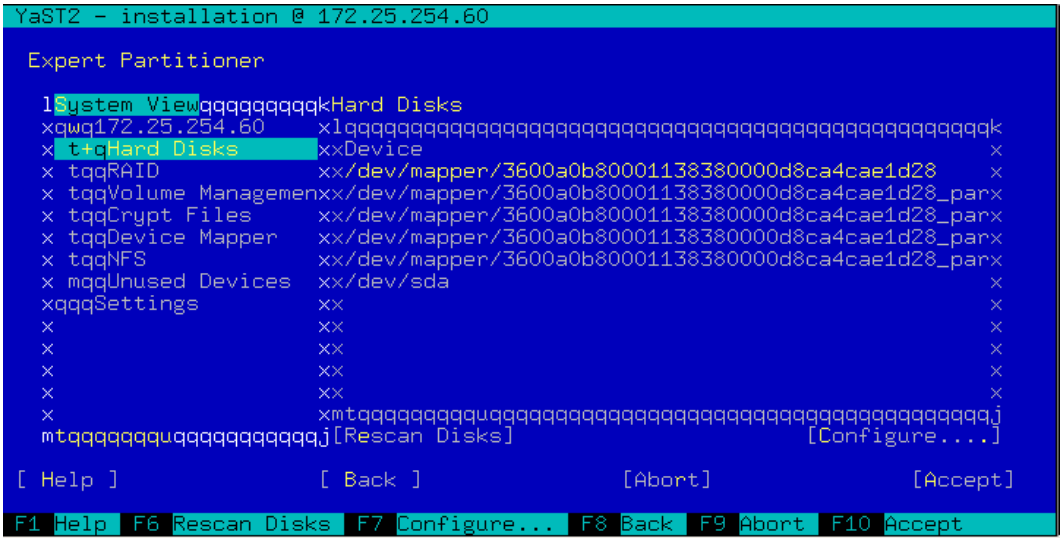


____40. Tab to **Configure...** under the list of disks an press "**Enter**". Select **Configure Multipath...** and press "**Enter**".

____41. Select **Yes** and press"**Enter**" to activate multipath.



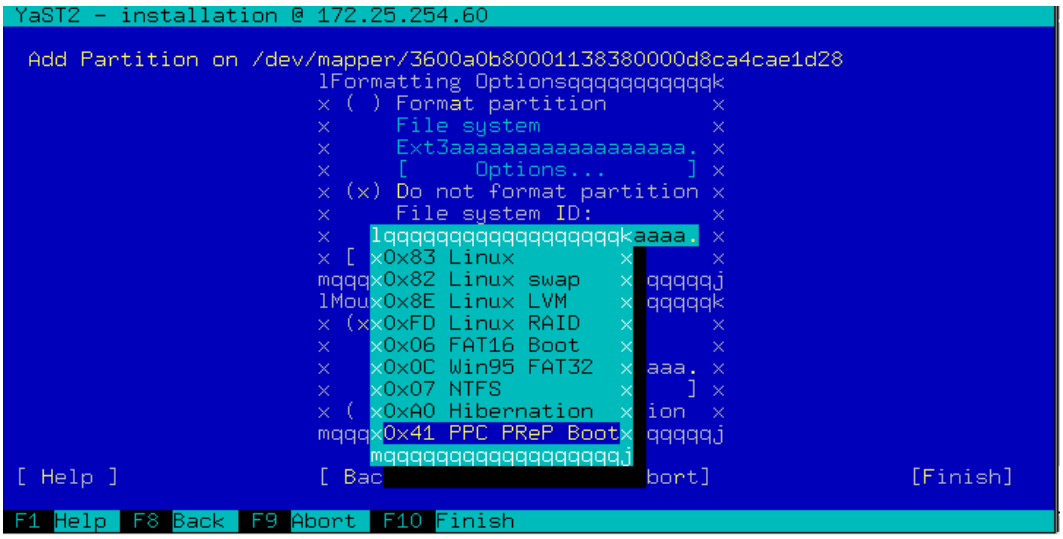
____42. The disks are rescanned and new mapper devices will appear in the Hard Disks list.



____43. Since the condition of the disks is unknown at this point, it is safest to simply delete all existing partitions and rebuild a simple environment. Tab to the Device section, scroll to the individual partition entry and press “Enter” to select it, tab to Delete, and so on until you've removed all partitions.

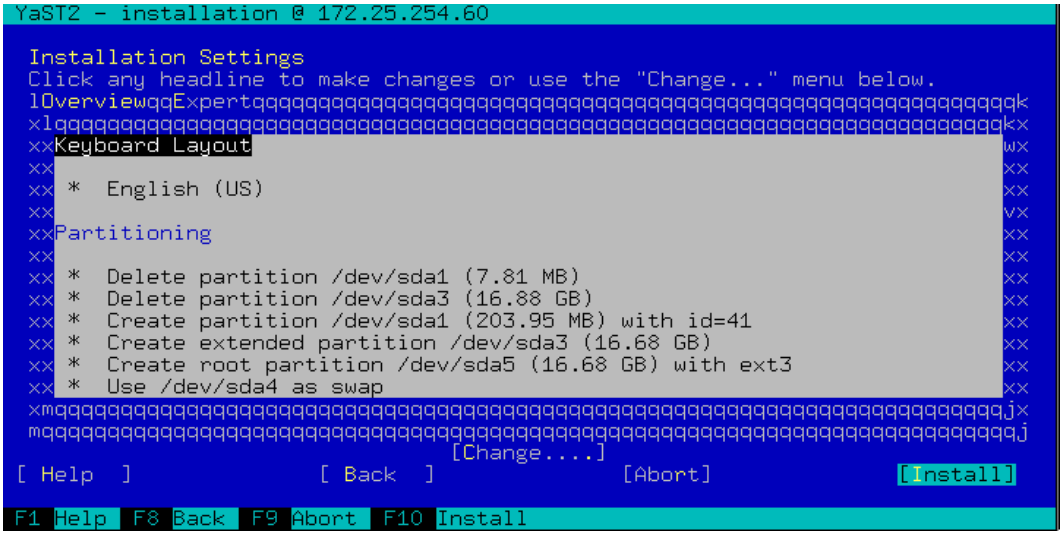
____44. Now you must build the minimum partitions needed for this lab. Select the Add... function under the list of disks, and create the following primary partitions on the screens that appear.

Type	Format?	Size	Mount?
PPC PReP Boot	No	9 MB	No
Swap	Yes	1 GB	Yes - swap
Linux	Yes	Remainder of disk	Yes - /



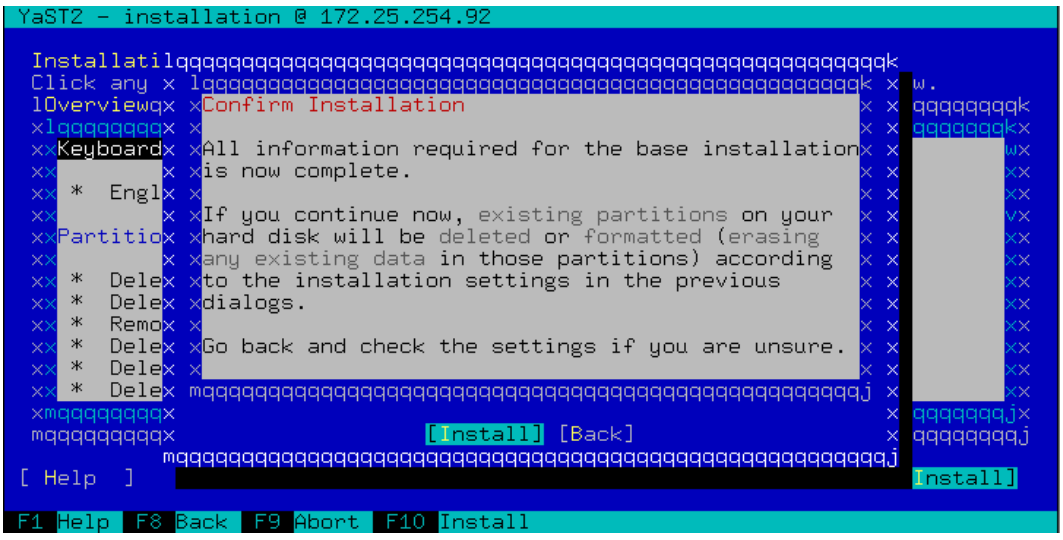
____45. When finished with the partitioning, tab to **Accept** and press "**Enter**".

____46. Tab to **Install** and press "**Enter**" to continue.

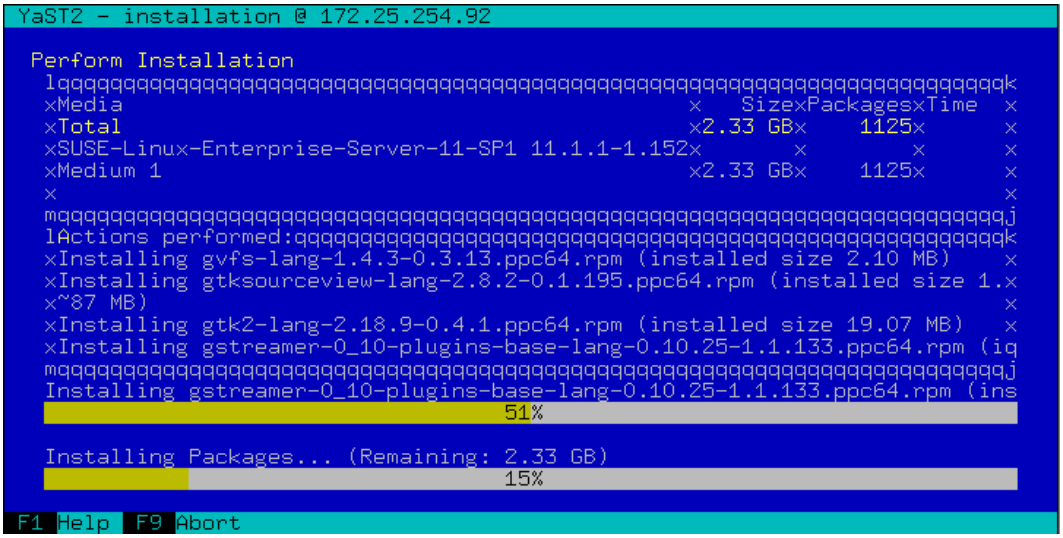


____47. Agree to the **License Agreement** for the Agfa font package and press **Enter**.

____48. Confirm you're ready to begin the **Install** and press **Enter**.

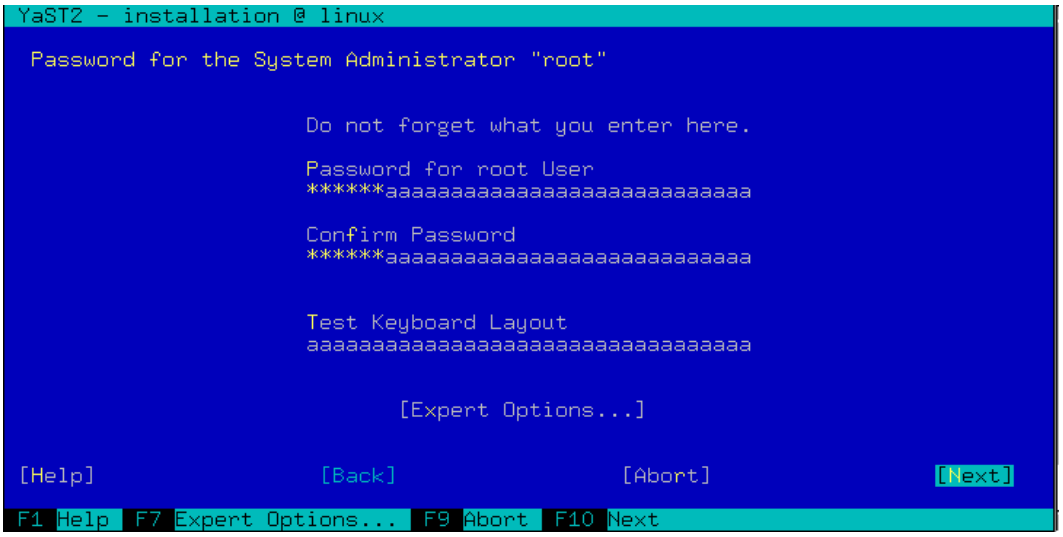


____49. The disks will be partitioned and formatted and the selected packages will then be installed.



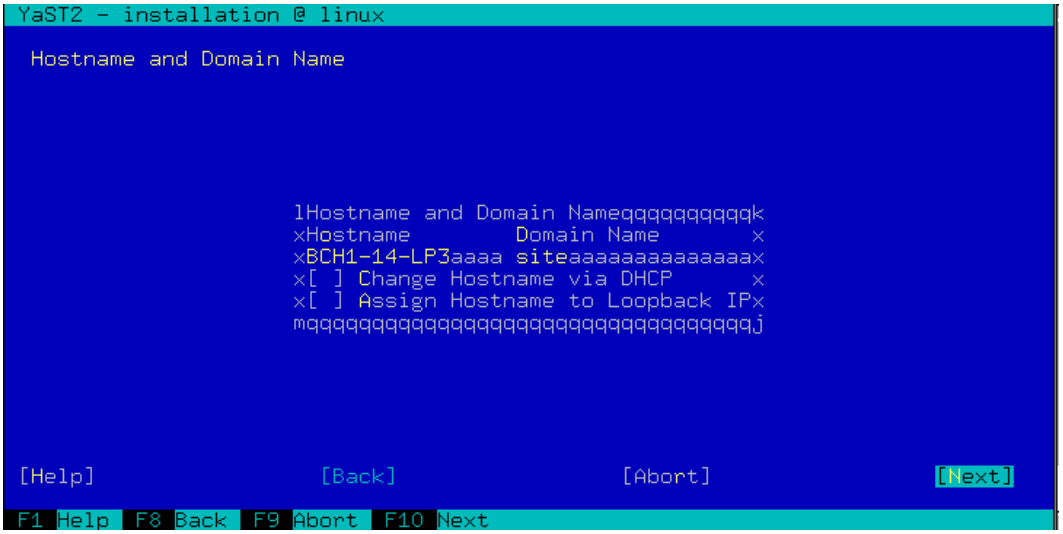
____50. Once the installation is complete, the system will automatically reboot.

____51. If you system stops at the SMS menu, select the disk as the boot device. Once the system has completed booting, enter and confirm a password (**PSTRAIN2**) for the root user, tab to **Next** and press **Enter**.

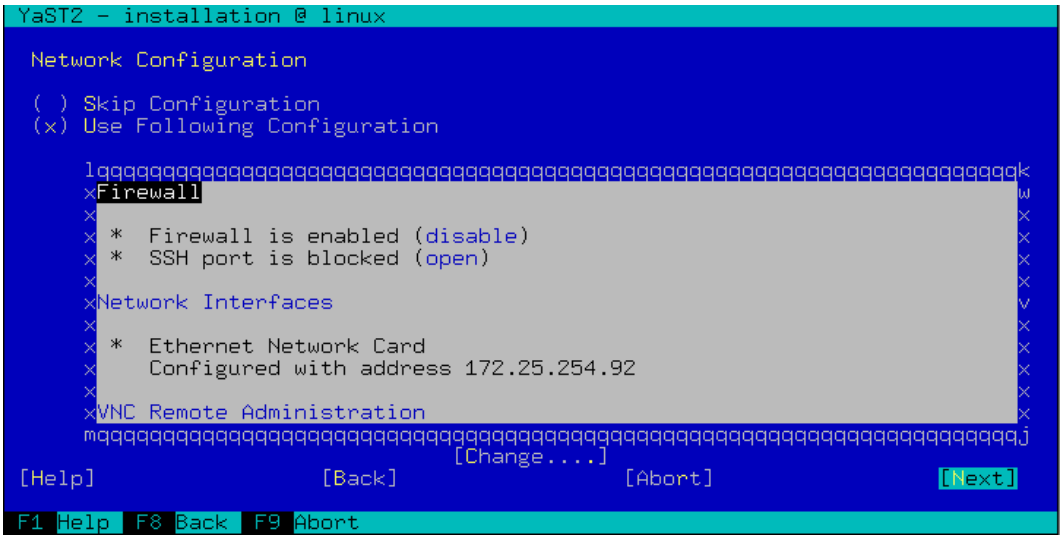


____52. Press **Enter** to **Continue** with the Network Card detection.

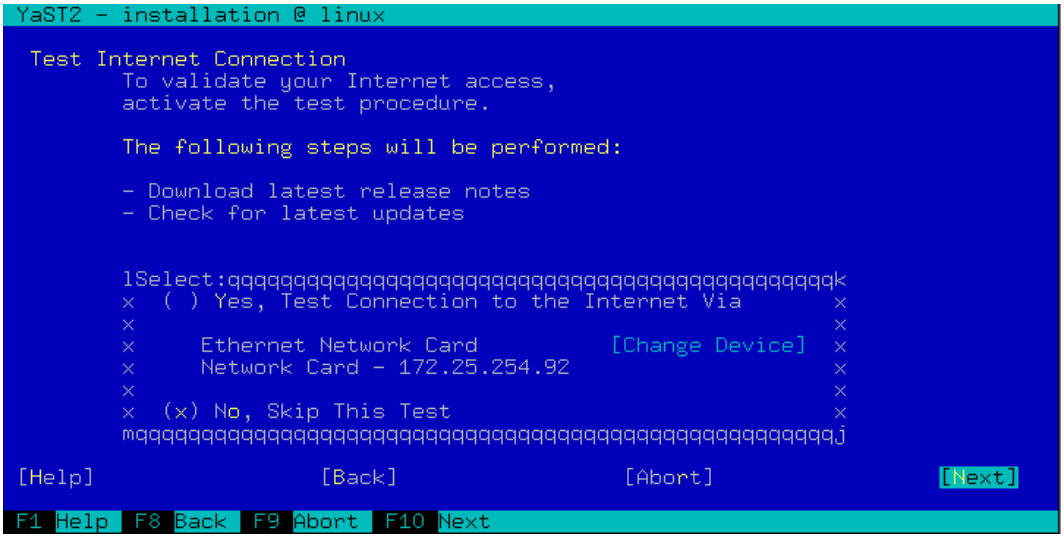
____53. Set the **hostname** to be used for your installation, uncheck the **Change Hostname via DHCP** box since it isn't used in the lab environment, tab to **Next** and press **Enter**.



____54. Press **Enter** to use the default configuration for the remainder of the network settings.



____55. Select **No** to skip the Internet connection test, tab to **Next** and press **Enter**.

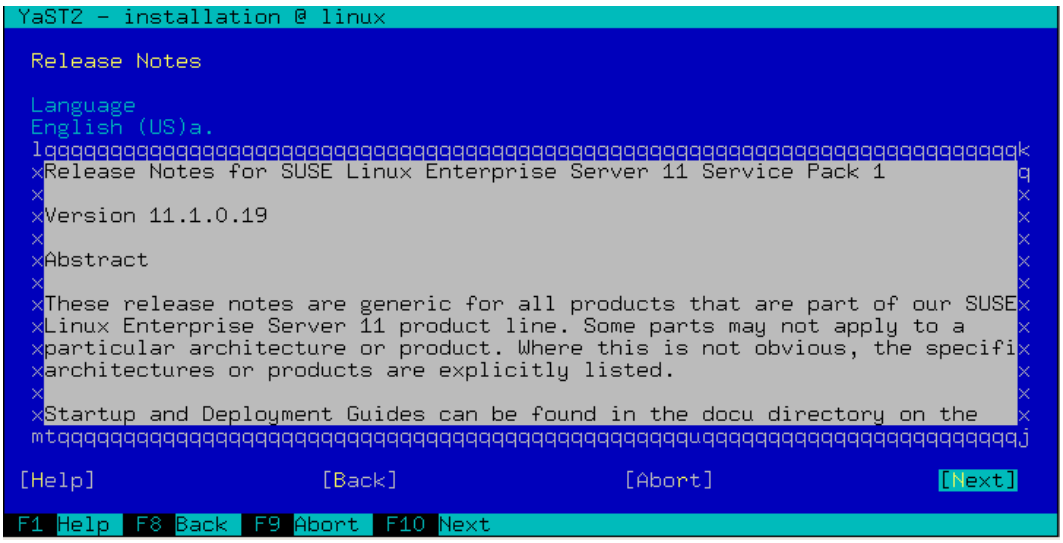


____56. Select **Next** and press **Enter** to configure the Certificate Authority.

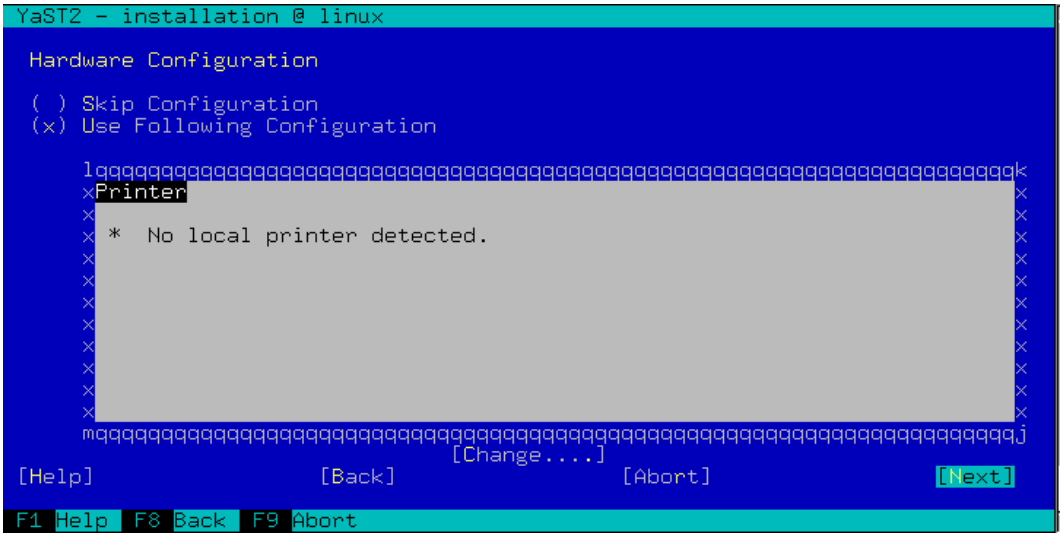
____57. Select **Local** authentication, tab to **Next** and press **Enter**.

____58. Create a local **user** ID (pstrain2) and **password** (pstrain2), tab to **Next** and press **Enter**.

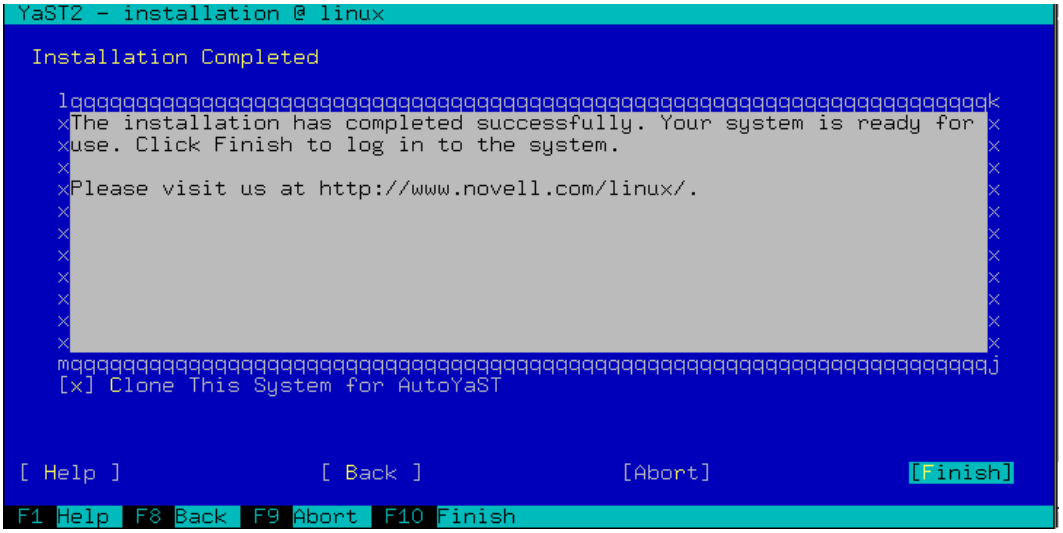
____59. Your configuration choices will then be written to disk and appropriate processes and daemons started. You may review the Release Notes, then tab to **Next** and press **Enter** to continue.



____60. Peripheral hardware is then detected and configured. Tab to **Next** and press **Enter** when complete.



____61. Uncheck the **Clone This System for AutoYaST** box as you won't be needing it here. Tab to **Finish** and press **Enter**.



____62. The system will complete the boot process and you will be able to login. This completes the OS installation. Reboot the system and login as root to continue the setup with the **Configuring Linux for LPM** section of this lab. Your password should have been set to PSTRAIN2 previously.

VI. Installing IBM i on a Power7 Blade

Introduction

In this section of the lab, you will use IVM to complete the necessary VIOS setup for installing IBM i on the blade. You will also create a LAN console connection on your workstation. You will then activate the IBM i partition and install the Licensed Internal Code (LIC). See Section B: Creating a Logical Partition (specify IBM i as your environment and see screen shots below for any updates). NOTE: Some of the settings below may already be setup depending on what other parts of the labs have been completed.

Lab Tasks

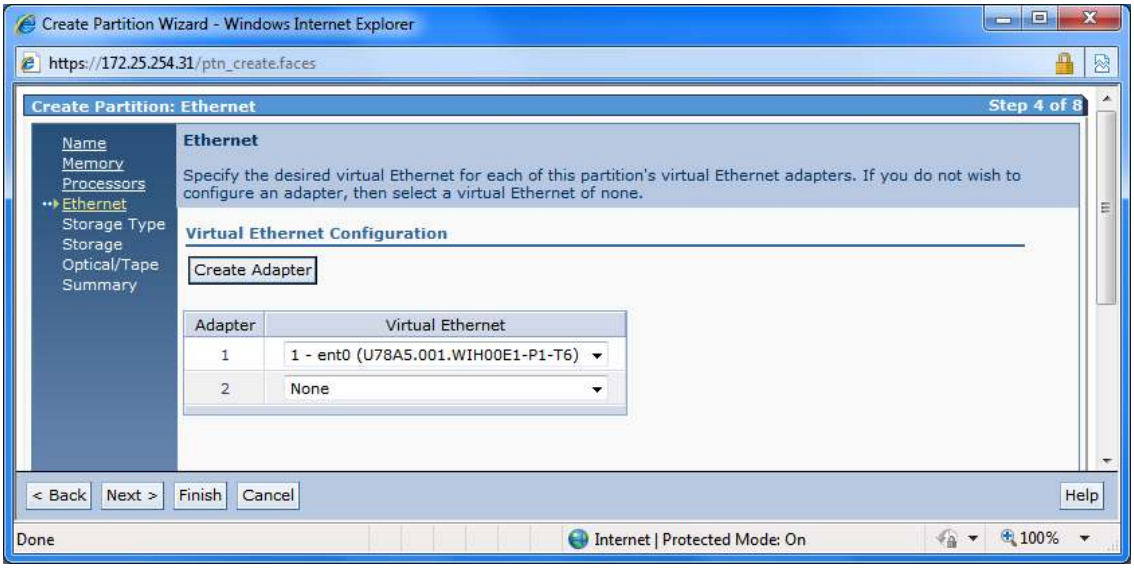
1. Enable virtual Ethernet bridging on the first embedded Ethernet port.
2. Verify IBM i is on VLAN1.
3. Bridge the first embedded Ethernet port to virtual Ethernet LAN (VLAN) 1.
4. Verify the IBM i install images are available in the media library.
5. Mount the LIC image on the virtual optical device in the IBM i partition.
6. Create and start a LAN console connection on your workstation.
7. Activate the IBM i partition and install LIC.

Detailed Instructions

____1. **Enable virtual Ethernet bridging on the first embedded Ethernet port.**
__ In IVM, click **View/Modify Host Ethernet Adapters**.
__ Select the first embedded Ethernet port **(T6)** and click **Properties**.
__ Click the checkbox after **Allow virtual Ethernet bridging**, then click **OK**.

____2. **Verify IBM i is on VLAN1.**
__ Click **View/Modify Virtual Ethernet**.
__ Verify that the IBM i partition has a checkmark under **Virtual Ethernet 1**.

____3. **Bridge the first embedded Ethernet port to virtual Ethernet LAN (VLAN) 1.**
__ Click the **Virtual Ethernet Bridge** tab.
__ In the row for virtual Ethernet 1, use the drop-down menu to select the first embedded Ethernet port **(T6)**. Click **Apply**.



____4. **Verify the IBM i install images are present in the media library.**

__ Click **View/Modify Virtual Storage**.

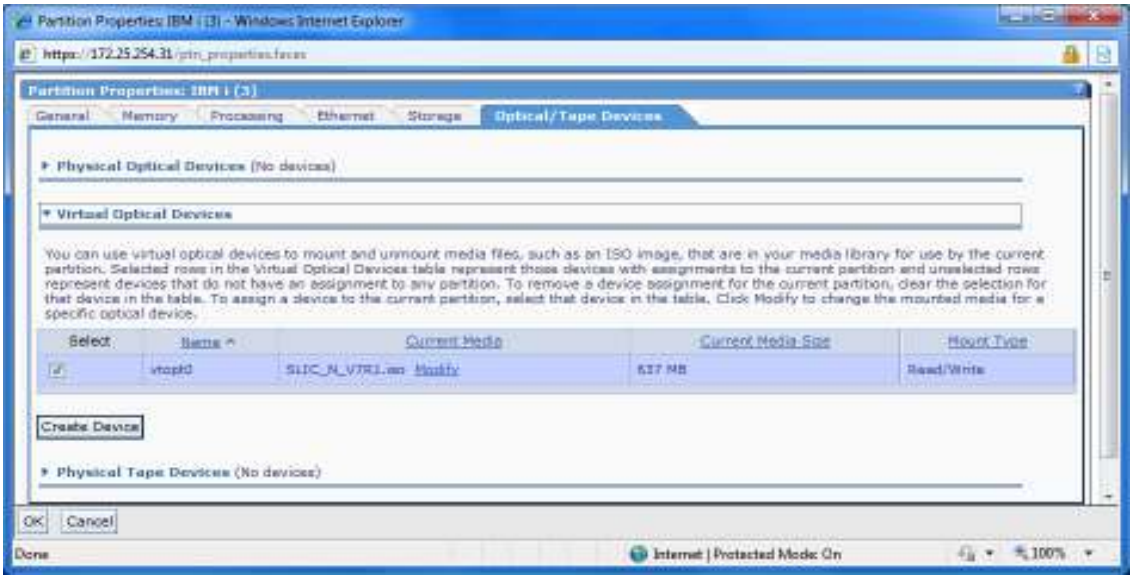
__ Click the **Optical Devices** tab.

__ Verify that the IBM i install images per are present under **Virtual Optical Media**.

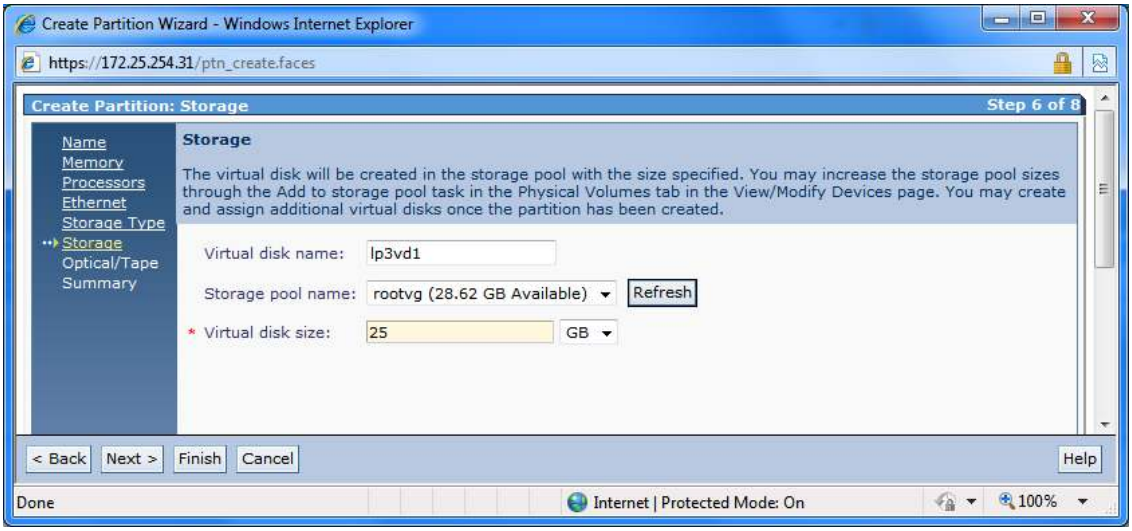
____5. **Mount the LIC image on the virtual optical device in the IBM i partition.**

__ Select the LIC virtual optical image and click **Modify partition assignment**.

__ Click the checkbox for your IBM i partition and then click **OK**. The IBM i partition should now appear as the **Assigned Partition** for that image.



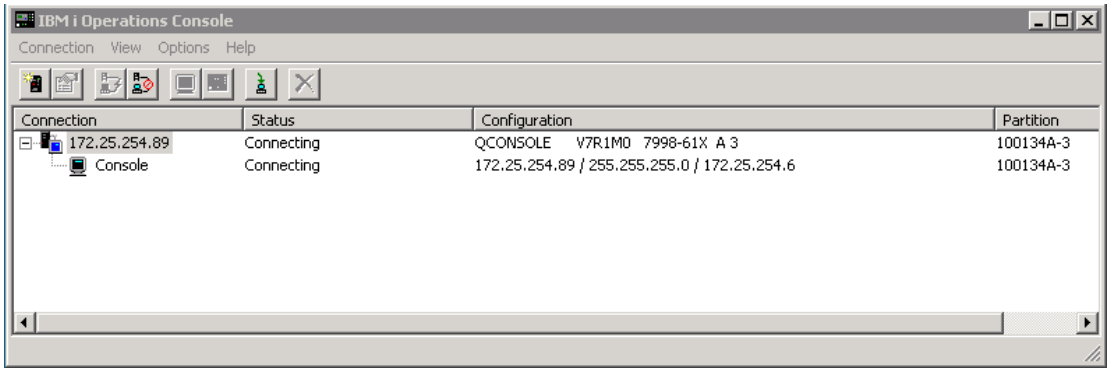
NOTE: In this part of the lab we will use the internal SAS disk on the blade to install IBM i (Don't create larger than 25GB or it will take even longer to format !!)

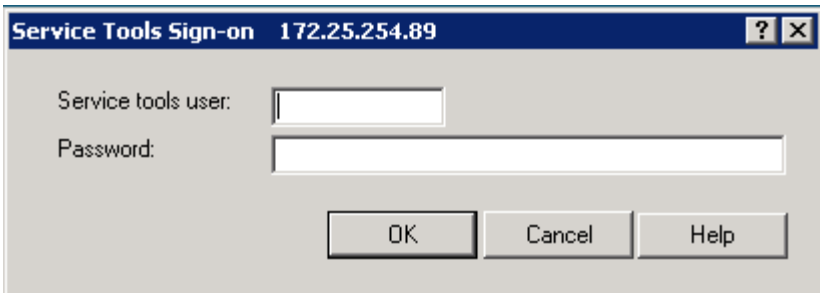


____6. **Create and start a LAN console connection on your workstation.**

NOTE: if you don't have IBM i Access for Windows installed on your workstation, we will help you get this code on your workstation via a DVD installation.

__ On your workstation's desktop, open **Operations Console**.
__ Click the **New** button.
__ Click **Next**.
__ Verify that **Local console on a network (LAN)** is selected, then click **Next**.
__ Enter the IBM i partition hostname from your token for **Service host name**.
__ Enter the IBM i partition IP address from your token for **Service TCP/IP Address**. Click **Next**. This IP address will be assigned to IBM i when the LAN console connection is first established.
__ Enter the IBM i subnet mask and gateway from your team info above. Do not click **Next** yet.
__ In IVM, click View/Modify System Properties and record the blade's serial number.
__ Back in Operations Console, enter the blade's serial number.
__ Enter **2** for Target partition, then click **Next**.
__ Leave QCONSOLE as the service tools device ID and click **Next**.
__ Click **Finish**.
__ Right-click the new console connection and select **Connect**. The connection status will remain **Connecting…** until the IBM i partition has started and attempted to establish a LAN console connection.





____7. **Activate the IBM i partition and install LIC.**

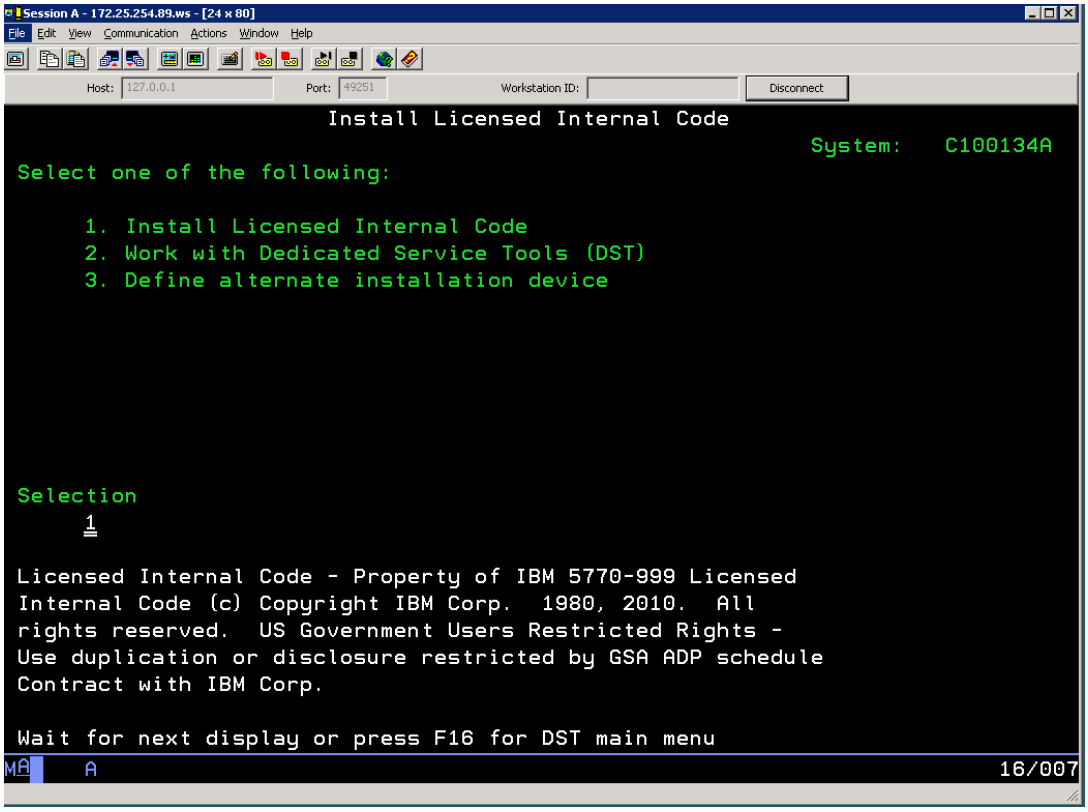
__ In IVM, click **View/Modify Partitions**.

__ Select the IBM i partition and click **Activate**. Click **OK** to confirm.

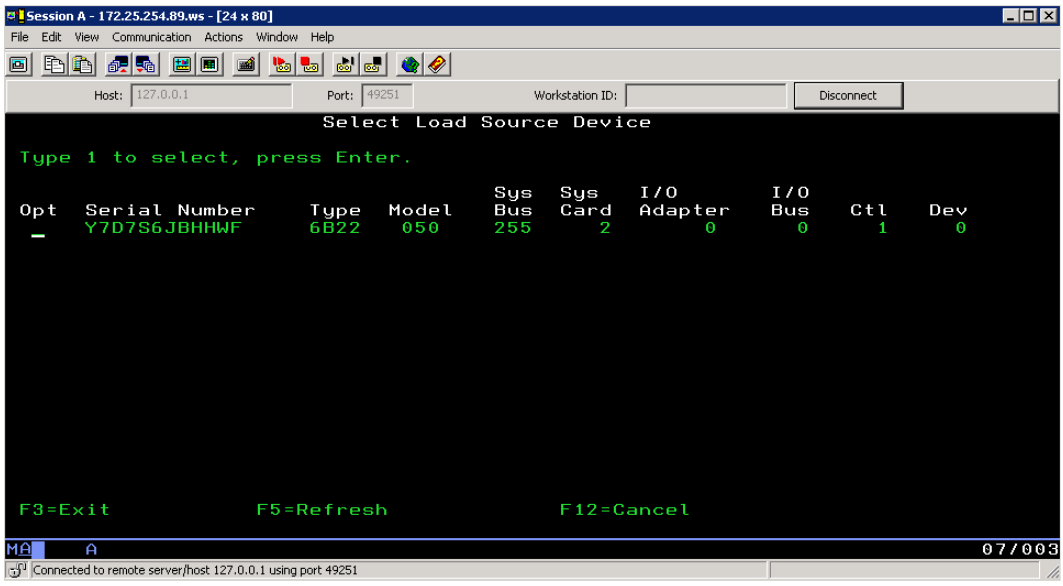
__ When the LAN console connection has been established, a sign-on dialog box will appear on your workstation. Use 11111111 for both userid and password.

__ Once the IBM i installation starts, press **Enter** enough times to reach the **Install Licensed Internal Code** screen.

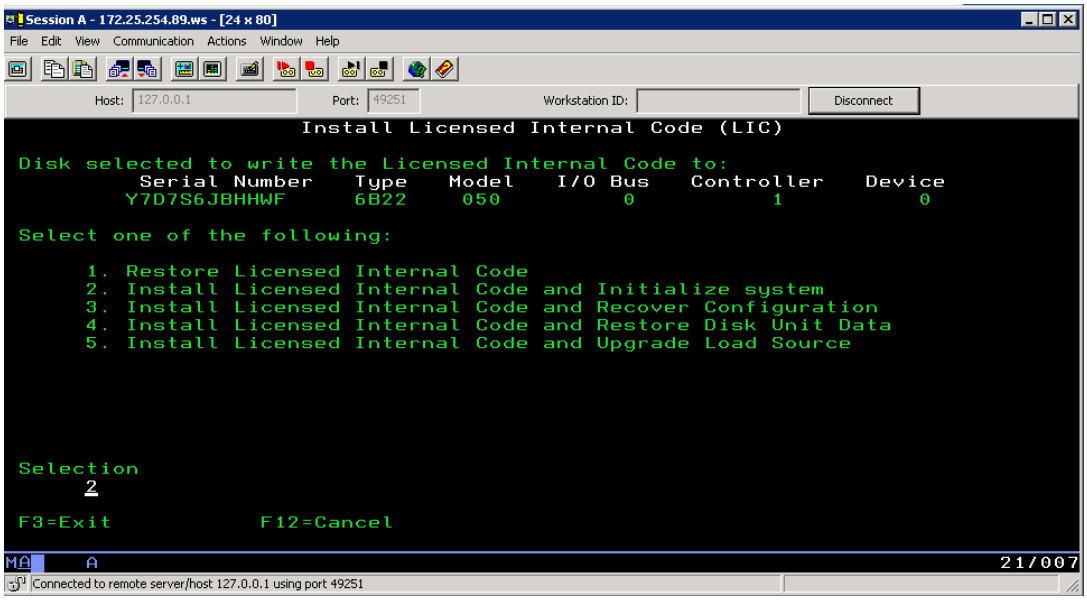
__ Choose option 1, **Install Licensed Internal Code**.



__ On the **Work with Optical Devices Screen**, enter **1** next to **OPT01** (it should be the only device listed) and press **Enter**.
__ On the **Select Load Source Device** screen, enter **1** next to the first virtual disk listed.

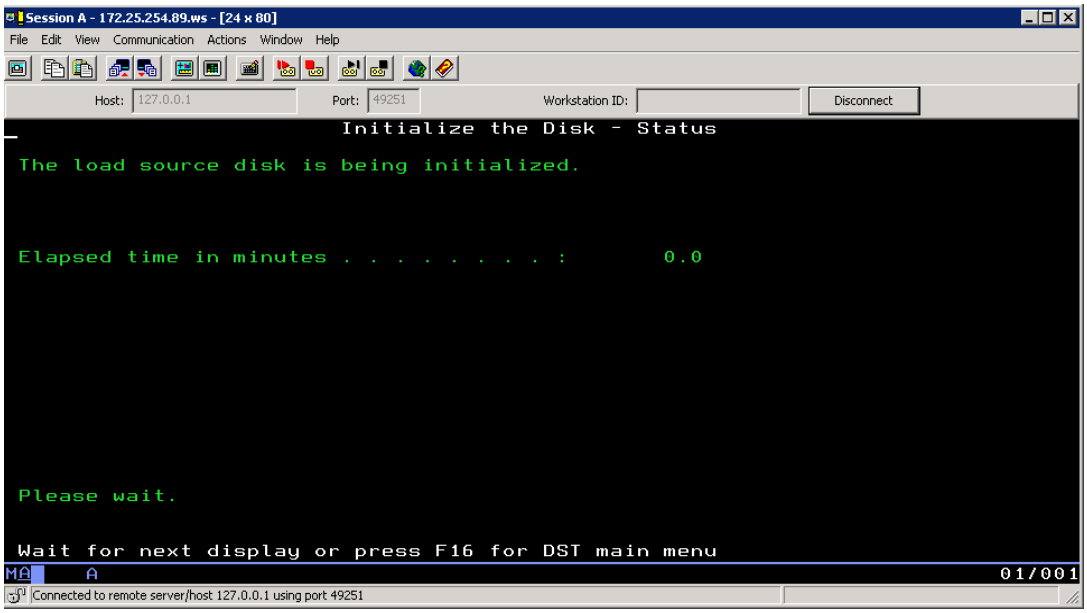


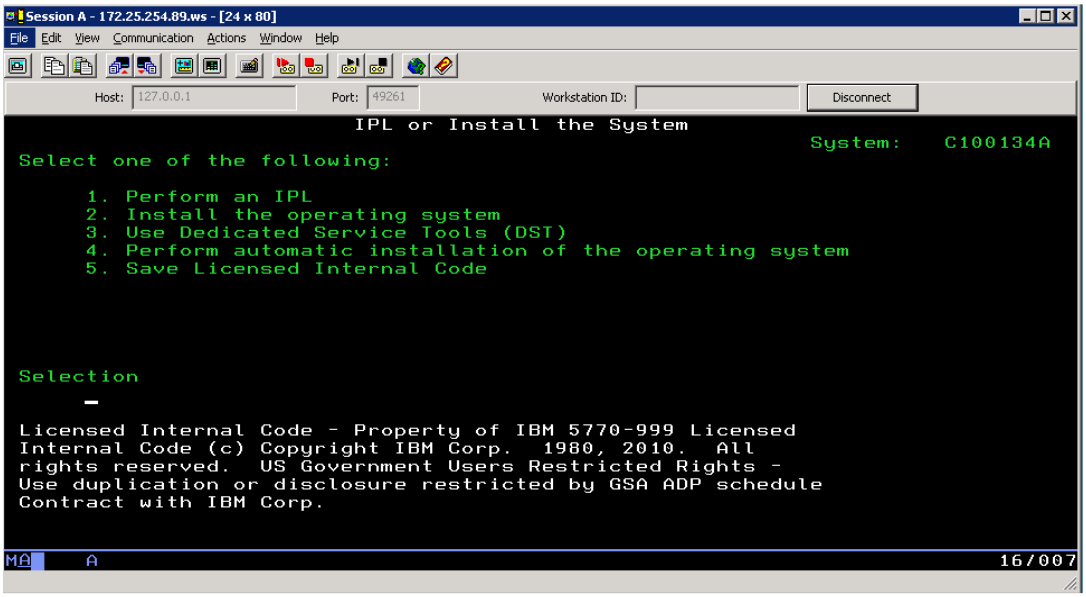
__ Press **F10** to confirm.
__ On the **Install Licensed Internal Code (LIC)** screen, choose option 2, **Install Licensed Internal Code and Initialize System**.



__ Press **F10** to confirm.

Note: This can take over an hour depending on the size of your load source object.





Once LIC is installed, the IBM i partition will reboot. This lab will not install the operating system. As you have probably noticed, once the LAN console connection is established, installing IBM i on the blade is very similar to installing it on any other system that supports it.

If you really want to install IBM i OS the BOSS images are in the VIOS Virtual Library and can be used.

Addendum

"How To" Tips

The Addendum contains "How to Tips" which will be instrumental in working with the Power Processor-based Blades and the BladeCenter.

A. Configuring NIB/LA in AIX

The following steps will configure NIB/LA on the POWER blade:

1. This step should only be performed if the adapter interfaces are configured. To remove any pre-existing IP interface configurations type the following commands:
   Type "**ifconfig en0 detach**" and press "**Enter**"
   Type "**rmdev –dl en0**" and press "**Enter**"

   Type "**ifconfig en1 detach**" and press "**Enter**"
   Type "**rmdev –dl en1**" and press "**Enter**"

   Type "**ifconfig et0 detach**" and press "**Enter**"
   Type "**rmdev –dl et0**" and press "**Enter**"

   Type "**ifconfig et1 detach**" and press "**Enter**"
   Type "**rmdev –dl et1**" and press "**Enter**"

   Note: The above commands can also be executed in smit from the fast path "**smitty tcpip**".

2. Verify the network interfaces have been removed:
   Type "**netstat –in**" and press "**Enter**"
   (You should only see the loopback interface)

3. Create the ent2 pseudo-device:
   a. Type the fast path "**smitty etherchannel**" and press "**Enter**"
   b. Select "**Add an EtherChannel / Link Aggregation**" and press "**Enter**"
   c. Select "**ent0**" as the primary adapter and "**ent1**" as the backup adapter
   d. The **Perform Lossless Failover After Ping Failure** defaults to **yes** but should be changed to **no** depending on the switch configuration. For more information refer to http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.aix.commadmn/doc/commadmndita/lossless_failovr.htm.
   e. Enter the default gateway as the "**Internet Address to Ping**"

```
                    Add an EtherChannel / Link Aggregation

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  EtherChannel / Link Aggregation Adapters             ent0                +
  Enable Alternate Address                             no                  +
  Alternate Address                                   []                   +
  Enable Gigabit Ethernet Jumbo Frames                 no                  +
  Mode                                                 standard            +
  IEEE 802.3ad Interval                                long                +
  Hash Mode                                            default             +
  Backup Adapter                                                           +
       Automatically Recover to Main Channel           yes                 +
       Perform Lossless Failover After Ping Failure    yes                 +
  Internet Address to Ping                            []
  Number of Retries                                   []                  +#
  Retry Timeout (sec)                                 []                  +#


F1=Help             F2=Refresh          F3=Cancel           F4=List
Esc+5=Reset         F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Note: The *Automatically Recover to Main Channel* feature is ignored if failover has occurred due to ping test. If the BladeCenter is configured in a dual core architecture (two external core switches) the *Lossless Failover After Ping Failure* feature should be turned off.

4. Configure the IP Address for the pseudo-device ent2:
   a. Type the fast path "**smitty chinet**" and press "**Enter**"
   b. Select "**en2**" interface and press "**Enter**"

```
                Change / Show a Standard Ethernet Interface

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  Network Interface Name                               en2
  INTERNET ADDRESS (dotted decimal)                   [172.25.254.64]
  Network MASK (hexadecimal or dotted decimal)        [255.255.255.0]
  Current STATE                                        up                 +
  Use Address Resolution Protocol (ARP)?               yes                +
  BROADCAST ADDRESS (dotted decimal)[17C[]
  Interface Specific Network Options
    ('NULL' will unset the option)
    rfc1323                                           []
    tcp_mssdflt                                       []
    tcp_nodelay                                       []
    tcp_recvspace                                     []
    tcp_sendspace                                     []
  Apply change to DATABASE only                        no                 +

Esc+1=Help          Esc+2=Refresh       Esc+3=Cancel        Esc+4=List
Esc+5=Reset         F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

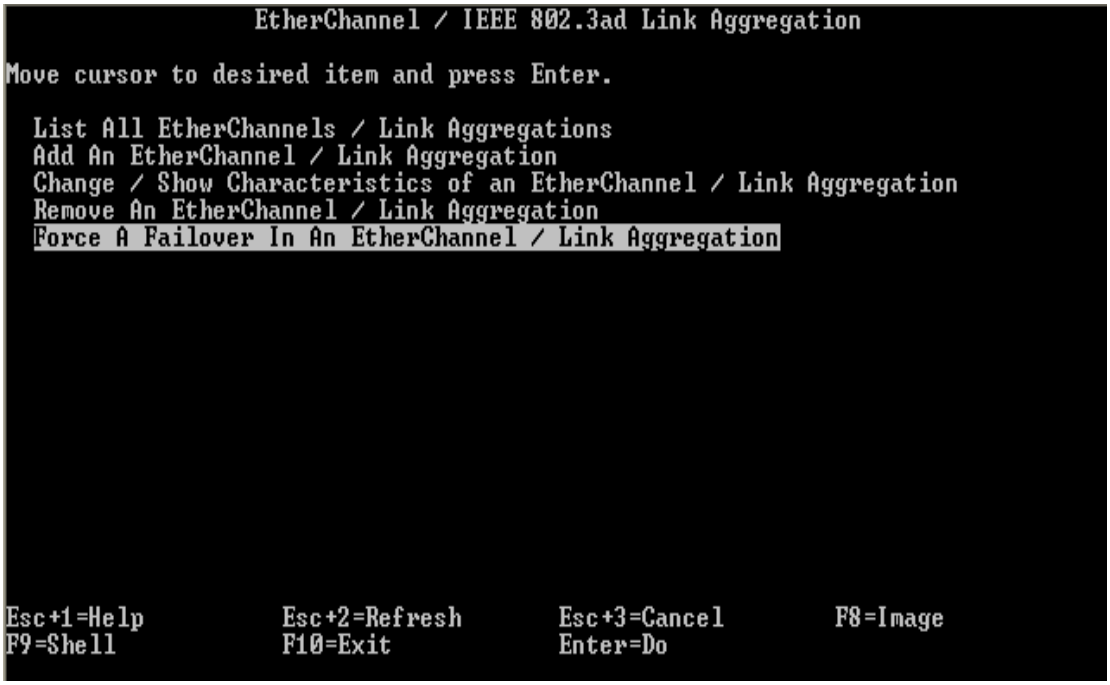
5. Enter the "**IP/Address, Network Mask**", change the "**Current STATE**" to "**up**" and press "**Enter**"

Adapter failover can also be configured in Linux. For more information on configuring this EtherChannel Bonding from Red Hat go to http://www.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/5/html/Deployment_Guide/s2-networkscripts-interfaces-chan.html and to configure from SLES go to http://www.novell.com/support/php/search.do?cmd=displayKC&docType=ex&bbid=TSEBB_122270747 9531&url=&stateId=0 0 34017274&dialogID=34013800&docTypeID=DT_TID_1_1&externalId=3929220&sliceId=2&rfId=

B. Testing Adapter Failover from AIX

To Test Adapter Failover from AIX do the following:

1. Type the fast path "**smitty etherchannel**" and press "**Enter**".
2. Select "**Force a Failover In An EtherChannel / Link Aggregation**" and press "**Enter**".



3. Select "**ent2**" adapter and press "**Enter**".
4. Press "**Enter**" on the pop-up menu confirming your action.
5. To determine which adapter is active type: "**netstat –v | grep Active**" and press "**Enter**".

To verify adapter failover check the error report for an error message (ECH_PING_FAIL_PRMRY) indicating the primary EtherChannel failed and the backup adapter has taken over.

```
LABEL:          ECH_PING_FAIL_PRMRY
IDENTIFIER:     9F7B0FA6

Date/Time:       Fri Jan 30 19:05:08 EST 2009
Sequence Number: 47
Machine Id:      0000354AD400
Node Id:         nfsclient
Class:           H
Type:            INFO
Resource Name:   ent6
Resource Class:  adapter
Resource Type:   ibm_ech
Location:

Description
PING TO REMOTE HOST FAILED

Probable Causes
CABLE
SWITCH
ADAPTER

Failure Causes
CABLES AND CONNECTIONS

        Recommended Actions
        CHECK CABLE AND ITS CONNECTIONS
        IF ERROR PERSISTS, REPLACE ADAPTER CARD.

Detail Data
FAILING ADAPTER
PRIMARY
SWITCHING TO ADAPTER
ent1
Unable to reach remote host through primary adapter: switching over to backup a
apter
```

If you repeat the above steps and check the error report again, an error message (ECH_PING_FAIL_BCKUP) indicates the primary adapter has been recovered.

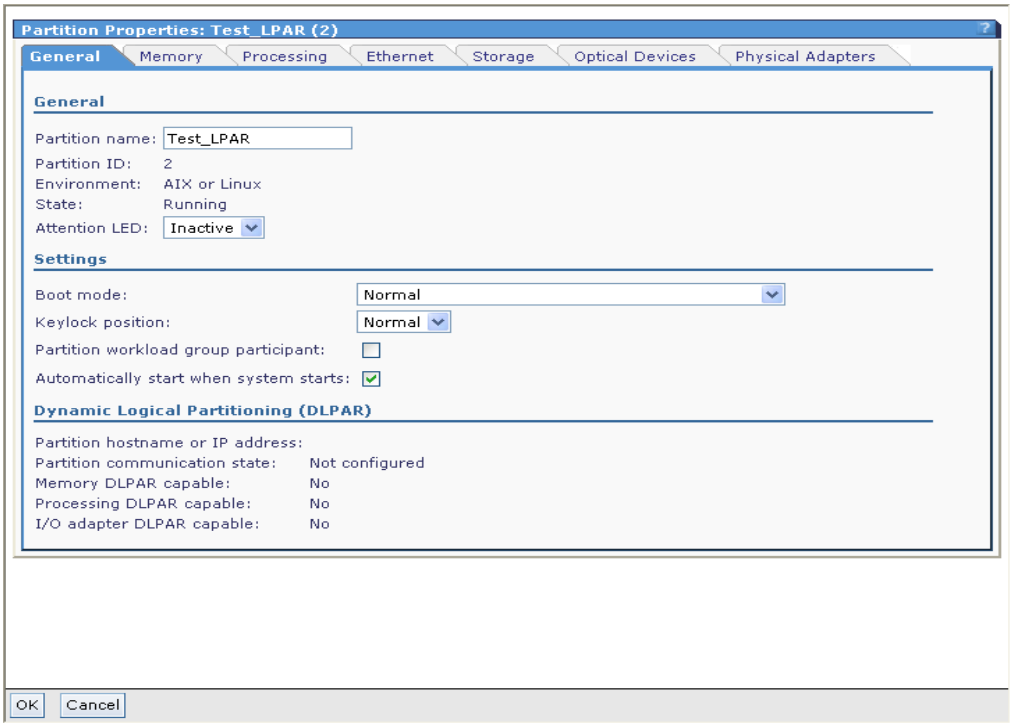
```
LABEL:          ECH_PING_FAIL_BCKP
IDENTIFIER:     5FC2DD4B

Date/Time:       Fri Jan 30 19:01:44 EST 2009
Sequence Number: 46
Machine Id:      0000354AD400
Node Id:         nfsclient
Class:           H
Type:            INFO
Resource Name:   ent6
Resource Class:  adapter
Resource Type:   ibm_ech
Location:

Description
PING TO REMOTE HOST FAILED

Probable Causes
CABLE
SWITCH
ADAPTER

Failure Causes
CABLES AND CONNECTIONS

        Recommended Actions
        CHECK CABLE AND ITS CONNECTIONS
        IF ERROR PERSISTS, REPLACE ADAPTER CARD.

Detail Data
FAILING ADAPTER
ent1
SWITCHING TO ADAPTER
PRIMARY
Unable to reach remote host through backup adapter: switching over to primary ad
apter
```

To determine whether the Primary or the backup adapter is active from the AIX command type "**netstat –v | grep Active**" and press "**Enter**".

Note: Regardless of which adapter is active, ent0 will always be the primary and ent1 will always be the backup adapter.

C. Troubleshooting the RMC Daemon

If the "**Partition communication state**" under the DLPAR section shows "**Not configured**" then the RMC daemon is not active which will cause the validation and the migration process to fail.



The Partition communication state field indicates whether there is an active RMC connection between this logical partition and the management partition. You can change the resource amounts on a logical partition only if there is an active RMC connection between the logical partition and the management partition. Possible values are Active, Inactive, and Not configured.

If this field contains "**Not configured**" or "**Inactive**", check the following:

- Ensure that the logical partition is activated.
- Verify that the logical partition can ping or access the Virtual I/O Server management partition over a TCP connection.
- Ensure that there is no firewall blocking port 657 on the logical partition.
- If the logical partition has Linux installed, verify that the logical partition has the Dynamic Reconfiguration Tools package installed. To download this package, access the

Service and productivity tools website:
https://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html

- Ensure that the partition communication IP address is set correctly on the General tab of the View / Modify TCP/IP Settings page. Unless more than one network interface is configured on the management partition, use the default partition communication IP address.

For more information on configuring the RMC daemon on an AIX or Linux refer to the following:

Diagnosing Problems with RMC
http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.help.csm.doc/csm_books/csm_admin/am7ad130147.html

Understanding RMC
http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.help.rsct.doc/rsct_books/rsct_admin_guide/bl5adm1138.html

RSCT for Linux Technical Reference
http://publib.boulder.ibm.com/infocenter/clresctr/vxrx/index.jsp?topic=/com.ibm.cluster.rsct.doc/rsct_linux151/bl5trl1028.html