



iVirtualization
IBM i Host and Client LPARs Easy Install Guide

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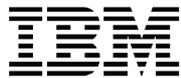


Document History

Revision History

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#21	05-05-2014	Added info on VPM managed Linux Client LPARs and now both SLES11 and RHEL65 are addressed in this guide	



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Technical Environment

Preface

This document describes how to leverage iVirtualization to create a Client partition (IBM i or Linux) on a POWER6 (or newer) system running IBM i 6.1 or higher. This is NOT an official IBM guide – but a step-by-step guide for creating a test environment.

References to the official documentation can be found under **Detailed description** below. Performance is out of scope in this Guide, you should use the official documentation for that.

Detailed description

The following official resources were used:

- IBM i Virtualization and Open Storage Read-me First- Available in PDF format posted at: <http://www.ibm.com/systems/i/os/index.html>
- Power Systems Logical partitioning in IBM Systems Hardware Information Center and
- Installing, upgrading, or deleting IBM® i and related software – linked via: <http://publib.boulder.ibm.com/eserver/>
- Redbook: IBM i 7.1 Technical Overview SG24-7858
- Redpaper: Creating IBM i Client Partitions Using Virtual Partition Manager REDP-4806
- IBM i Technology Refresh: <http://www.ibm.com/systems/support/i/planning/techrefresh/index.html>

Hardware Requirements

POWER6 or newer system **plus Hardware Management Console** when running IBM i V6R1, V7R1, V7R1-TR1 or V7R1-TR2

or

POWER6 or newer system running IBM i V7R1-TR3 or higher in order to use **Virtual Partition Manager** and configure **Ethernet layer-2 bridging**

System Software Requirements

PowerVM Standard Edition or PowerVM Enterprise Edition

IBM i 6.1 or newer in Host partition, IBM i **V7R1-TR3 required** or newer in order to use **Virtual Partition Manager**

Comments/Questions

Comments and/or questions are welcome

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1. IBM i Host & Client partitions – The Big Picture

The creation of a Client partition leveraging iVirtualization consists of 2 main phases:

- Creating the Client partition (IBM i or Linux) including its connection to physical hardware
- Creating the objects in the hosting IBM i partition and activating the IBM i or Linux Client partition

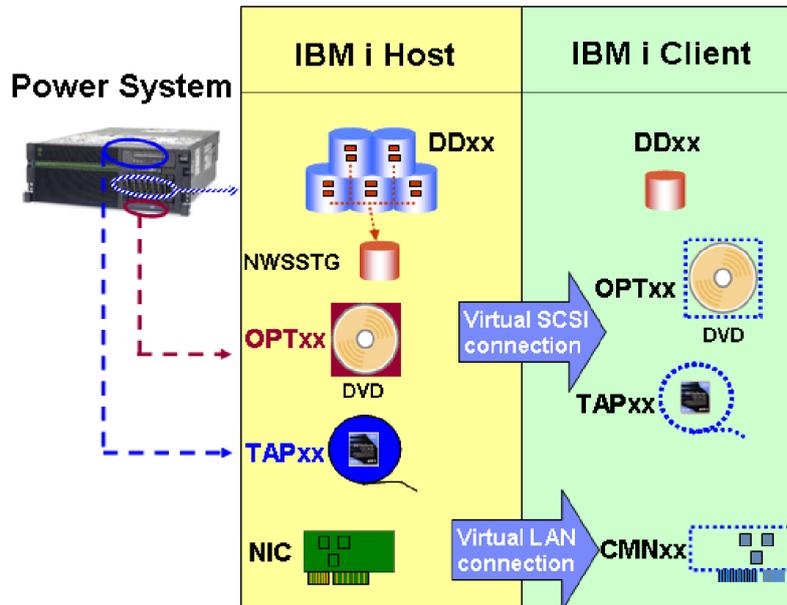


Figure 1-1

The picture shows that the IBM i Client partition leverages **native attached storage** available in the IBM i Host partition through the use of a NWSSTG object residing in the IBM i Host partition. This concept has been used to leverage single level storage within an IBM i environment for use by an integrated Windows server, Linux on i and AIX on i.

Native attached storage is storage that can be used/seen directly by the IBM i operating, without the need for VIOS to virtualize the disks. All internal disks are native attached, but starting with V7R1-TR6 you can also attach the V3700/V7000 natively (without the need for VIOS). Check IBM i External Storage Support Matrix <http://www.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS4563> for details.

Following the GA of IBM i 7.1, IBM i point / modification releases have been replaced by a new release delivery mechanism called a Technology Refresh. Technology Refreshes are also used to deliver new capabilities for iVirtualization (IBM i Host / IBM i Client partition concept).

TR1: Support for embedded media changers (enabling unattended installs of IBM i Client partitions)

TR2: IBM i to IBM i virtual tape device support (info APAR II14615 lists supported devices and required fixes)

TR3: Ethernet layer-2 bridging and Virtual Partition Manager enhancement to create IBM i partitions

TR4: Performance enhancement for zeroing virtual disk

Detailed information on Technology Refreshes **including newer levels** can be found via

<http://www.ibm.com/systems/support/i/planning/techrefresh/index.html>

Once you have created and installed IBM i in the first NWSSTG-object, you can copy that NWSSTG to create extra virtual disks for different testing/demo environments. This only makes sense if the so called GOLDENCODE you are creating has a sensible size. Remember that you can always copy the NWSSTG to a new larger one with the contents included.

2. Logical partitioning tools: IVM, HMC or VPM

You must use tools to create logical partitions on your servers. The tool that you use to create logical partitions on each server depends upon the server model and the operating systems and features that you want to use on the server. The Integrated Virtualization Manager (IVM) is a browser-based system management interface for the Virtual I/O Server (VIOS) and therefore not addressed in this guide. VIOS provides virtualization for different OS's (AIX, IBM i, Linux) on the Power platform. The VIOS also facilitates Live Partition Mobility (LPM), LPAR Suspend and Resume, and Active Memory Sharing (AMS).

iVirtualization is available to customers running IBM i on Power Systems, and uses virtualization features available within IBM i. Therefore current skills can be used to manage your virtual server infrastructure.

2.1 Hardware Management Console (HMC)

The Hardware Management Console (HMC) is a hardware appliance that you can use to configure and control one or more managed systems. The HMC also provides terminal emulation for the logical partitions on your managed system. You can connect to logical partitions from the HMC itself, or you can set up the HMC so that you can connect to logical partitions remotely through the HMC.

When **managed by an HMC** your **Client partition can also leverage physical resources** like an Ethernet card and/or tape library/drive.

2.2 Virtual Partition Manager (VPM) – IBM i V7R1-TR3 or newer

Beginning with IBM i 7.1 Technology Refresh 3 (IBM i 7.1-TR3) the Virtual Partition Manager (VPM) was enhanced to allow you to create IBM i Client partitions without the requirement for an HMC.

The Virtual Partition Manager is a feature of IBM i that allows you to create and manage one IBM i host logical partition and up to four client logical partitions on a single server. You can use the Virtual Partition Manager to create logical partitions on a server that does not require a Hardware Management Console (HMC).

To use the Virtual Partition Manager, you must first install IBM i V7R1-TR3 or newer on a non-partitioned server. After you install IBM i, you can initiate a console session on IBM i and use Service Tools (SST or DST) to create and configure Client logical partitions. IBM i controls the resource allocations of the logical partitions on the server.

When you use the Virtual Partition Manager to create logical partitions on a server, Service Tools is the only tool that you can use to create and manage the logical partitions. You cannot use IBM i Navigator to create or manage logical partitions on a server. However, the console session that you use to access Service Tools can be initiated using Operations Console LAN.

When managed by **VPM** your **Client partition can only leverage virtual resources**:

- **Ethernet layer-2 bridging (configured in the Host partition) for LAN console and network access.** Any Ethernet resource that supports line speeds of 1Gbps or greater is supported except for Host Ethernet Adapter (HEA) resources. **The HEA adapter is not supported.**

- **For backup purposes, a supported physical tape drive in the Host partition is virtualized to the IBM i Client partition** (info APAR II14615 lists supported devices and required fixes)

Because the IBM i Client partition uses a virtual LAN connection to the IBM i host partition, you will need to setup/configure Ethernet Layer-2 bridging in the host partition: the actual configuration for the Ethernet Layer-2 bridging is available via IBM i Support: Software Technical Document: 622246891. You can also leverage Ethernet Layer-2 bridging for a Linux Client partition.

In the IBM i Client partitions you can install IBM i 7.1 or IBM i 6.1 with either 6.1 or 6.1.1 machine code, depending on the requirement of the Power Server hardware.

3. Using the Virtual Partition Manager (VPM) to create your virtual server

This chapter will guide you through the steps needed for creating a Client partition (IBM i and or Linux) using the Virtual Partition Manager on your Power Server running IBM i 7.1-TR3. It uses the concept of virtual SCSI, but without the need of creating the vSCSI host-client pairs. This is done automatically. You will use a Layer-2 bridge capable LAN adapter in the Host partition for console and network traffic to/from your IBM i client Partition.

You will need to perform a system IPL in order to remove CPU and memory resources from the Host partition and have CPU and memory available to a client partition.

3.1 Starting the Virtual Partition Manager (VPM) and set your system to partitioned state

The Virtual Partition Manager (VPM) is invoked through System Service Tools (SST) or Dedicated Service Tools (DST). In this guide STRSST was used to access VPM.

Type **STRSST** and sign-on with a service tool user profile (e.g. user QSECOFR) with the needed authorities. Within System Service Tools (SST), select **option 5. Work with system partitions**.

Only the first time this option is selected, you will get an information screen as shown in Figure 3.1-1.

```

Logical Partitioning Environment Supported
                                                    System:
Virtual Partition Manager is supported. The system is in a
state that does allow this operating system to partition the
server. Refer to the Virtual Partition Manager documentation
for more information.
Press ENTER to confirm using Virtual Partition Manager to
Partition the server.
  
```

Figure 3.1-1

Press **ENTER** to advance to the Work with System Partitions screen shown in Figure 3.1-2.

```

                                Work with System Partitions
                                                    System:
Attention: Incorrect use of this utility can cause damage
to data in this system. See service documentation.

Number of partitions . . . . . : 1
Partition release . . . . . : V7R1M0

Partition identifier . . . . . : 1
Partition name . . . . . : 06-xxxxx *

Select one of the following:

    2. Work with partition status
    3. Work with partition configuration
    4. Clear configuration data
    5. Create a new partition

Selection
    3

F3=Exit  F12=Cancel
  
```

Figure 3.1-2



Select **option 3. Work with partition configuration** so you can change to configuration of your IBM i Host partition and free up resources (CPU and memory) for use by the IBM i Client partition(s). The Work with Partition Configuration screen for your non-partitioned system will look like Figure 3.1-3

```
Work with Partition Configuration                               System:
Available processor units . . . . . :    0.00
Available memory (MB) . . . . . :    256
Memory region size (MB) . . . . . :    256

Type option, press Enter.
  1=Display  2=Change  9=Delete

      Partition      -----Processor-----      Memory      Virtual
Opt  ID  Name      Total  Units  Uncap  Weight      (MB)  WLM  1  2  3  4
  2   1  06-xxxxx      4    4.00   2    None    63232   2   2  2  2  2

F3=Exit  F5=Refresh  F11=Work with partition status  F12=Cancel
```

Figure 3.1-3

As you can see in Figure 3.1-3 there are no processor units nor memory available. In order to make those resources available for use you will need to change your host partition. This is done by selecting **option 2=Change** in front of your host partition. This will bring you to the Change Partition Configuration screen as shown in Figure 3.1-4

```
Change Partition Configuration                               System:
Type changes, press Enter.

Partition identifier and name . . . . . 1  06-xxxxx

Number of available system processors . . . : 0
Number of partition processors . . . . . 4
Minimum / maximum number of processors . . . 1 / 4
Use shared processor pool . . . . . 2  1=Yes, 2=No
Size of available memory (MB) . . . . . : 0
Size of partition memory (MB) . . . . . 63232
Minimum / maximum size of memory (MB) . . . 512 / 65536
Enable workload management . . . . . 2  1=Yes, 2=No
Virtual Ethernet Identifiers (1=Yes, 2=No)
  1  2  3  4
  2  2  2  2

F3=Exit  F12=Cancel
```

Figure 3.1-4

Figure 3.1-4 shows you the defaults for your hosting partition before any changes were made. It is a good idea to change it to a more useful name (e.g. IBMiHost). In addition you will need to decrease the number of processors and the size of partition memory in order to make them unallocated and available for use to an IBM i Client partition. The changed values used for this guide are shown in Figure 3.1-5 on the next page.



```

Change Partition Configuration
System:
Verify information, press Enter.

Partition identifier and name . . . . . : 1      IBMIHOST

Number of partition processors . . . . . : 1
Minimum / maximum number of processors . . . : 1 / 4
Use shared processor pool . . . . . : 1 1=Yes, 2=No
Shared processor pool units . . . . . : 1.00
Minimum / maximum processor pool units . . . : 1.00 / 4.00
Uncapped processing . . . . . : Yes
Uncapped processing weight . . . . . : High
Size of partition memory (MB) . . . . . : 33280
Minimum / maximum size of memory (MB) . . . : 512 / 65536
Enable workload management . . . . . : No

Virtual Ethernet Identifiers (1=Yes, 2=No)
  1  2  3  4
1  2  2  2

```

Figure 3.1-5

As you can see, the **Use shared processor pool** was set to **1=Yes** resulting in extra fields in which to specify the Shared processor pool units, min/max and even Uncapped processing value. The values shown reflect the default values. Please make adjustments, so that the total number of processors assigned to Host and Client(s) is compliant with the number of IBM i licenses acquired.

Make sure that you set a **Virtual Ethernet Identifier** to **1=Yes** in order to be able to configure your client partition's LAN console and Virtual Ethernet. This will create an Virtual Ethernet Port with a resource type 268C in the IBM i Host partition.

Note that you can press F1 to bring up the help text for this screen.

Press **ENTER** to confirm your changes and return to the Work with Partition Configuration screen shown in Figure 3.1-6

```

Work with Partition Configuration
System:

Available processor units . . . . . : 3.00
Available memory (MB) . . . . . : 30208
Memory region size (MB) . . . . . : 256

Type option, press Enter.
  1=Display 2=Change 9=Delete

Partition -----Processor----- Memory Virtual
Opt ID Name Total Units Uncap Weight (MB) WLM Ethernet ID
  1 IBMIHOST 1 1.00 1 High 33280 2 1 2 2 2 <

< Indicates partition IPL may be required.
F3=Exit F5=Refresh F10=Display change status
F11=Work with partition status F12=Cancel

```

Figure 3.1-6

Now is a good time to exit System Service Tools and to issue a **PWRDWN SYS RESTART(*YES)** to IPL your IBM i 7.1-TR3 hosting partition. Please make sure that your system is in restricted state when using the option F10=IPL system to activate changes within SST!

3.2 Create an IBM i Client partition using VPM

After you have completed the steps in Chapter 3.1 Starting the Virtual Partition Manager (VPM) and set your system to partitioned state it is time to create an IBM i Client partition.

Type **STRSST** and sign on with a service tool user profile that has the needed authorities (e.g. the default user QSECOFR). Within System Service Tools (SST), select **option 5. Work with system partitions**.

You will get the Work with System Partitions screen shown in Figure 3.2-1

```
Work with System Partitions                                     System:
Attention: Incorrect use of this utility can cause damage
to data in this system. See service documentation.

Number of partitions . . . . . : 1
Partition release . . . . . : V7R1M0

Partition identifier . . . . . : 1
Partition name . . . . . : IBMIHOST *

Select one of the following:

2. Work with partition status
3. Work with partition configuration
4. Clear configuration data
5. Create a new partition

Selection
5

F3=Exit F10=IPL system to activate changes F12=Cancel
System IPL may be required to activate changes.
```

Figure 3.2-1

Select **option 5. Create a new partition**. This will advance you to the Select Operating Environment screen shown in Figure 3.2-2.

```
Select Operating Environment                                     System:
Select one of the following:

1. OS/400
2. Guest

Selection
1

F3=Exit F12=Cancel
```

Figure 3.2-2

You need to select **option 1. OS/400** in this screen in order to create an IBM i Client partition and to advance to the Create New Partition screen shown in Figure 3.2-3 on the next page.

(FYI: the Guest option is used for the creation of an AIX Client or Linux Client partition)

```

                                Create New Partition
                                System:
Complete blanks, press Enter.

Partition identifier and name . . . . . 2    CLPAR1

Number of available system processors . . . : 3
Number of partition processors . . . . . 1
Minimum / maximum number of processors . . . 1 / 4
Use shared processor pool . . . . . 1 1=Yes, 2=No
  Shared processor pool units . . . . . 0 . 5
  Minimum / maximum processor pool units . . . 0 . 1 / 4 . 0
Uncapped processing . . . . . 1 1=Yes, 2=No
  Uncapped processing weight . . . . . 128 0, 64, 128, 255
Size of available memory (MB) . . . . . : 30208
Size of partition memory (MB) . . . . . 16384
Minimum / maximum size of memory (MB) . . . . 512 / 24576
Enable workload management . . . . . 2 1=Yes, 2=No
Virtual Ethernet Identifiers (1=Yes, 2=No)
  1 2 3 4
  3 2 2 2

```

Figure 3.2-3

Figure 3.2-3 shows the values used in this case. Select a meaningful Partition name and complete your settings for Processors and Memory. Special attention is needed for Virtual Ethernet. You have 4 Virtual Ethernet Identifiers (adapters) available and they are activated by 1=Yes or deactivated by 2=No.

In order to select it as the console device you have to set a Virtual Ethernet Identifier to '3'.

The selection of the Virtual Ethernet Identifier should match the Identifier chosen in the IBM i Host partition (check Figure 3.1-5).

The actual configuration for the Ethernet Layer-2 bridging can be found on the Internet via IBM i Support: Software Technical Document: 622246891

After your selections press **ENTER** and confirm with **ENTER**.

You will return to the Work with System Partitions screen with a confirmation message at the bottom:

```

Partition 2 create was successful.

```

You will need to identify the automatically created Virtual SCSI adapter in the IBM i Host partition in order to specify that resource in your Network Server Description (NWSD).

Return to the System Service Tools (SST) screen and select **option 1. Start a service tool**, select **option 7. Hardware service manager** and select **option 1. Packaging hardware resources**.

```

                                Packaging Hardware Resources
                                Local system type . . . . . : 8202
                                Local system serial number: 06-xxxxx

Type options, press Enter.
  2=Change detail    3=Concurrent maintenance    4=Remove    5=Display detail
  8=Associated logical resource(s)    9=Hardware contained within package

Opt Description          Type-          Unit ID          Resource
                          Model          Name
System                   8202-E4B      U8202.E4B.06xxxxx  SYS01
  System Unit            +             78AA-001 U78AA.001.WZSH90Y  FR01
  9 Virtual Backplane    + <          268C-001 U8202.E4B.06xxxxx  P35

F3=Exit    F5=Refresh    F6=Print    F8=Exclude non-reporting resources

```

Figure 3.2-4



Select **option 9=Hardware contained within package** in front of Virtual Backplane. This will display the details for the Virtual Backplane including the Virtual SCSI adapter you are looking for. You can find the resource using the location column. Page down until you find the first resource with 3 digits after V1-C.

In this guide the location code is V1-C230 as shown in Figure 3.2-5. The first digit reflects the LPAR ID ('2' in this case) and the second and third digit represent the vSCSI identifier (30, 31 and 32).

```

                                Packaging Hardware Resources
                                Unit ID: U8202.E4B.
Type options, press Enter.
  2=Change detail    3=Concurrent maintenance    4=Remove    5=Display detail
  8=Associated logical resource(s)    9=Hardware contained within package

Opt Description          Type-   Resource
                        Model   Name    Location
Virtual Backplane      < 268C-001 P35    V1
Virtual Comm IOA       6B03-001 P37    V1-C0
  Virtual Comm Port    6B03-001 P38    V1-C0-T1
Virtual Comm IOA       6B03-001 P36    V1-C1
  Virtual Comm Port    6B03-001 P39    V1-C1-T1
Virtual Comm IOA       6B20-001 P58    V1-C2
Virtual Comm IOA       6B04-001 P59    V1-C3
  Virtual Comm Port    6B04-001 P60    V1-C3-T1
8 Virtual Comm IOA    290B-001 P63    V1-C230
Virtual Comm IOA       290B-001 P62    V1-C231
Virtual Comm IOA       290B-001 P61    V1-C232
                                More...

F3=Exit F5=Refresh F6=Print F7=Include empty positions and not owned positions
```

Figure 3.2-5

Select **option 8=Associated logical resource(s)** in front of the Virtual Comm IOA you have identified before. The Logical Resources Associated with a Packaging Resource screen will be displayed, as shown in Figure 3.2-6.

```

                                Logical Resources Associated with a Packaging Resource

Packaging resource:
                                Type-Model   Resource Name
  Virtual Comm IOA             290B-001   P63

Type options, press Enter.
  2=Change detail    4=Remove    5=Display detail    6=I/O debug
  7=Verify           8=Associated packaging resource(s)

Opt Description          Type-Model   Resource Name   Status
Virtual Comm IOA      290B-001   CTL04          Operational
Virtual IOP              290B-001   CMB11          Operational

F3=Exit    F5=Refresh    F6=Print    F12=Cancel
```

Figure 3.2-6

This means that the hardware resource that needs to be specified in the NWSD, is **CTL04**.

Continue with Chapter 5 and create the objects needed in the IBM i Host partition.

3.3 Create a Linux Client partition using VPM

After you have completed the steps in Chapter 3.1 Starting the Virtual Partition Manager (VPM) and set your system to partitioned state it is time to create a Linux Client partition.

Type **STRSST** and sign on with a service tool user profile that has the needed authorities (e.g. the default user QSECOFR). Within System Service Tools (SST), select **option 5. Work with system partitions**.

You will get the Work with System Partitions screen shown in Figure 3.3-1

```
Work with System Partitions                                     System:
Attention: Incorrect use of this utility can cause damage
to data in this system. See service documentation.

Number of partitions . . . . . : 1
Partition release . . . . . : V7R1M0

Partition identifier . . . . . : 1
Partition name . . . . . : IBMIHOST *

Select one of the following:

2. Work with partition status
3. Work with partition configuration
4. Clear configuration data
5. Create a new partition

Selection
5

F3=Exit F10=IPL system to activate changes F12=Cancel
System IPL may be required to activate changes.
```

Figure 3.3-1

Select **option 5. Create a new partition**. This will advance you to the Select Operating Environment screen shown in Figure 3.3-2.

```
Select Operating Environment                                     System:

Select one of the following:

1. OS/400
2. Guest

Selection
2

F3=Exit F12=Cancel
```

Figure 3.3-2

You need to select **option 2. Guest** in this screen in order to create a Linux Client partition and to advance to the Create New Partition screen shown in Figure 3.3-3 on the next page.

(FYI: the Guest option is used for the creation of an AIX Client or Linux Client partition)

```

                                Create New Partition
                                System:
Complete blanks, press Enter.

Partition identifier and name . . . . . 2   LNXCINT1

Number of available system processors . . . : 3
Number of partition processors . . . . . 1
Minimum / maximum number of processors . . . 1 / 4
Use shared processor pool . . . . . 1 1=Yes, 2=No
  Shared processor pool units . . . . . 0 . 5
  Minimum / maximum processor pool units . . . 0 . 1 / 4 . 0
Uncapped processing . . . . . 2 1=Yes, 2=No
  Uncapped processing weight . . . . . 128 0, 64, 128, 255
Size of available memory (MB) . . . . . : 30208
Size of partition memory (MB) . . . . . 3072
Minimum / maximum size of memory (MB) . . . 512 / 24576
Enable workload management . . . . . 2 1=Yes, 2=No
Virtual Ethernet Identifiers (1=Yes, 2=No)
  1 2 3 4
  1 2 2 2

```

Figure 3.3-3

Figure 3.3-3 shows the values used in this case. Select a meaningful Partition name and complete your settings for Processors and Memory. Special attention is needed for Virtual Ethernet. You have 4 Virtual Ethernet Identifiers (adapters) available and they are activated by 1=Yes or deactivated by 2=No.

The selection of the Virtual Ethernet Identifier should match the Identifier chosen in the IBM i Host partition (check Figure 3.1-5).

The actual configuration for the Ethernet Layer-2 bridging can be found on the Internet via IBM i Support: Software Technical Document: 622246891

After your selections press **ENTER** and confirm with **ENTER**.

You will return to the Work with System Partitions screen with a confirmation message at the bottom:

```

Partition 2 create was successful.

```

You will need to identify the automatically created Virtual SCSI adapter in the IBM i Host partition in order to specify that resource in your Network Server Description (NWSD).

Return to the System Service Tools (SST) screen and select **option 1. Start a service tool**, select **option 7. Hardware service manager** and select **option 1. Packaging hardware resources**.

```

                                Packaging Hardware Resources
                                Local system type . . . . . : 8202
                                Local system serial number: 06-xxxxx

Type options, press Enter.
  2=Change detail    3=Concurrent maintenance    4=Remove    5=Display detail
  8=Associated logical resource(s)    9=Hardware contained within package

Opt Description          Type-          Resource
                          Model    Unit ID      Name
System                   8202-E4B U8202.E4B.06xxxxx  SYS01
System Unit              +    78AA-001 U78AA.001.WZSH90Y  FR01
9 Virtual Backplane    + < 268C-001 U8202.E4B.06xxxxx  P35

F3=Exit    F5=Refresh    F6=Print    F8=Exclude non-reporting resources

```

Figure 3.3-4

Select **option 9=Hardware contained within package** in front of Virtual Backplane. This will display the details for the Virtual Backplane including the Virtual SCSI adapter you are looking for. You can find the resource using the location column. Page down until you find the first resource with 3 digits after V1-C.



In this guide the location code is V1-C230 as shown in Figure 3.3-5. The first digit reflects the LPAR ID ('2' in this case) and the second and third digit represent the vSCSI identifier (30, 31 and 32).

```

                                Packaging Hardware Resources
                                Unit ID: U8202.E4B.
Type options, press Enter.
  2=Change detail   3=Concurrent maintenance   4=Remove   5=Display detail
  8=Associated logical resource(s)   9=Hardware contained within package

Opt Description                                Type-   Resource
                                Model   Name    Location
Virtual Backplane                        < 268C-001 P35      V1
Virtual Comm IOA                          6B03-001 P37      V1-C0
Virtual Comm Port                         6B03-001 P38      V1-C0-T1
Virtual Comm IOA                          6B03-001 P36      V1-C1
Virtual Comm Port                         6B03-001 P39      V1-C1-T1
Virtual Comm IOA                          6B20-001 P58      V1-C2
Virtual Comm IOA                          6B04-001 P59      V1-C3
Virtual Comm Port                         6B04-001 P60      V1-C3-T1
8 Virtual Comm IOA                       290B-001 P63      V1-C230
Virtual Comm IOA                          290B-001 P62      V1-C231
Virtual Comm IOA                          290B-001 P61      V1-C232
                                More...

F3=Exit F5=Refresh F6=Print F7=Include empty positions and not owned positions

```

Figure 3.3-5

Select **option 8=Associated logical resource(s)** in front of the Virtual Comm IOA you have identified before. The Logical Resources Associated with a Packaging Resource screen will be displayed, as shown in Figure 3.3-6.

```

                                Logical Resources Associated with a Packaging Resource

Packaging resource:
                                Type-Model   Resource Name
Virtual Comm IOA                290B-001   P63

Type options, press Enter.
  2=Change detail   4=Remove   5=Display detail   6=I/O debug
  7=Verify          8=Associated packaging resource(s)

Opt Description                                Type-Model   Resource Name   Status
Virtual Comm IOA                            290B-001     CTL04          Operational
Virtual IOP                                290B-001     CMB11           Operational

F3=Exit   F5=Refresh   F6=Print   F12=Cancel

```

Figure 3.3-6

This means that the hardware resource that needs to be specified in the NWSD, is **CTL04**. Continue with Chapter 5 and create the objects needed in the IBM i Host partition.

4. Using the Hardware Management Console (HMC) to create your virtual server

This chapter will guide you through the steps needed for creating a Client partition and making the connection to the IBM i Host partition for the virtual disk. This is done through the concept we call virtual SCSI. The IBM i Host partition needs a virtual SCSI Server adapter which connects to a virtual SCSI Client adapter in the Client partition.

All these steps can be done dynamically without rebooting your system.

4.1 Dynamically add the virtual SCSI Server adapter to the IBM i Host partition

In the HMC navigate to Systems Management – Servers and select the IBM i Host partition. Now Select Dynamic Logical Partitioning and click Virtual Adapters.

A new window will open called Virtual Adapters.

In this window **Select Actions – Create – SCSI Adapter...**



Figure 4.1-1

Figure 4.1-1 shows the values that were used for this guide. Because this will be the IBM i Host partition, the *Type of adapter* needs to be set to **Server**.

Click **OK** and return to the Virtual Adapters window – Click **OK** again.



Using a 5250 screen in the IBM i Host partition, you can identify which IBM i hardware resource is created for the Virtual SCSI Server adapter. These steps are here for reference – the creation of the actual objects is done in Chapter 5.1.1 Create Virtual Server (NWSD object).

The way to do this is by using **WRKHDWRSC *CMM**

This will result in a screen like shown in Figure 4.1-2

```
Work with Communication Resources                                System:
Type options, press Enter.
  5=Work with configuration descriptions  7=Display resource detail

Opt  Resource      Type  Status      Text
-----
   CMB02          6B03  Operational  Comm Processor
     LIN01          6B03  Operational  Comm Adapter
       CMN02          6B03  Operational  Comm Port
   CMB02          6B03  Operational  Comm Processor
     LIN02          6B03  Operational  Comm Adapter
       CMN01          6B03  Operational  Comm Port
   CMB08          5706  Operational  Comm Processor
     LIN03          5706  Operational  LAN Adapter
       CMN03          5706  Operational  Ethernet Port
       CMN04          5706  Operational  Ethernet Port
   CMB10          290B  Operational  Comm Processor
  7  CCTL04        290B  Operational  Comm Adapter

F3=Exit  F5=Refresh  F6=Print  F12=Cancel

Bottom
```

Figure 4.1-2

In the screen use **option 7=Display resource detail** in front of a CTLxx resource with a Type 290B.

The Display Resource Detail screen will display the location and check the last digits – in this case it shows xxxxx –**V3-C2** (where **V = virtual** and the 2 reflects the **slot number 2** chosen in Figure 4.1-1)

```
Display Resource Detail                                System:

Resource name . . . . . :  CTL04
Text . . . . . :  Comm Adapter
Type-model . . . . . :  290B-001
Serial number . . . . . :  00-00000
Part number . . . . . :

Location :  U8203.E4A.xxxxx-V3-C2

Logical address:
  SPD bus:
    System bus                255
    System board              128

More...

Press Enter to continue.
```

Figure 4.1-3

This means that the hardware resource that needs to be specified in the NWSD, is **CTL04**.

Please make sure you also add the Virtual SCSI Server adapter to the partition profile – so it will stay available after re-activation of the partition. On your IBM i Host partition you should use Configuration – Manage Profiles and add the Virtual SCSI Server adapter for the same slot – in a later stage you can change the connecting partition. This is shown in Figure 4.1-4 on the next page.

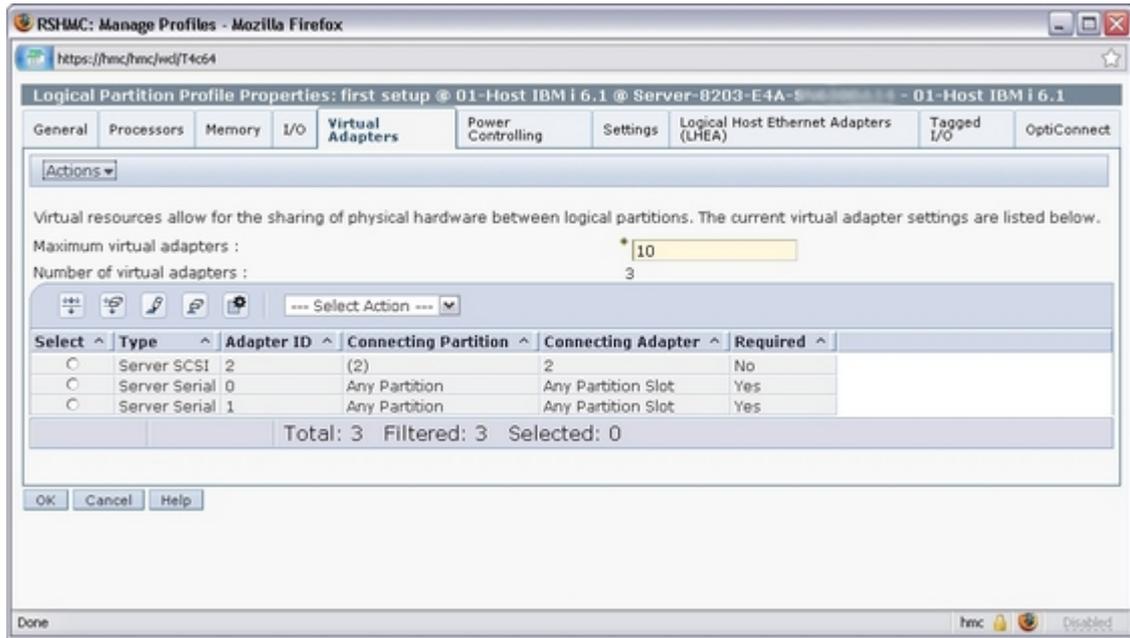


Figure 4.1-4

Figure 4.1-4 shows the Virtual SCSI Server adapter added to the Partition Profile.

4.2 Create an IBM i Client partition using the HMC

Next is to create an IBM i Client partition – this is done using the HMC using the following steps.

In the HMC navigate to Systems Management – Servers and select the System on which you want to create the IBM i Client partition. Click Configuration – Create Logical Partition – Click IBM i.

This will start the Create Logical Partition wizard:

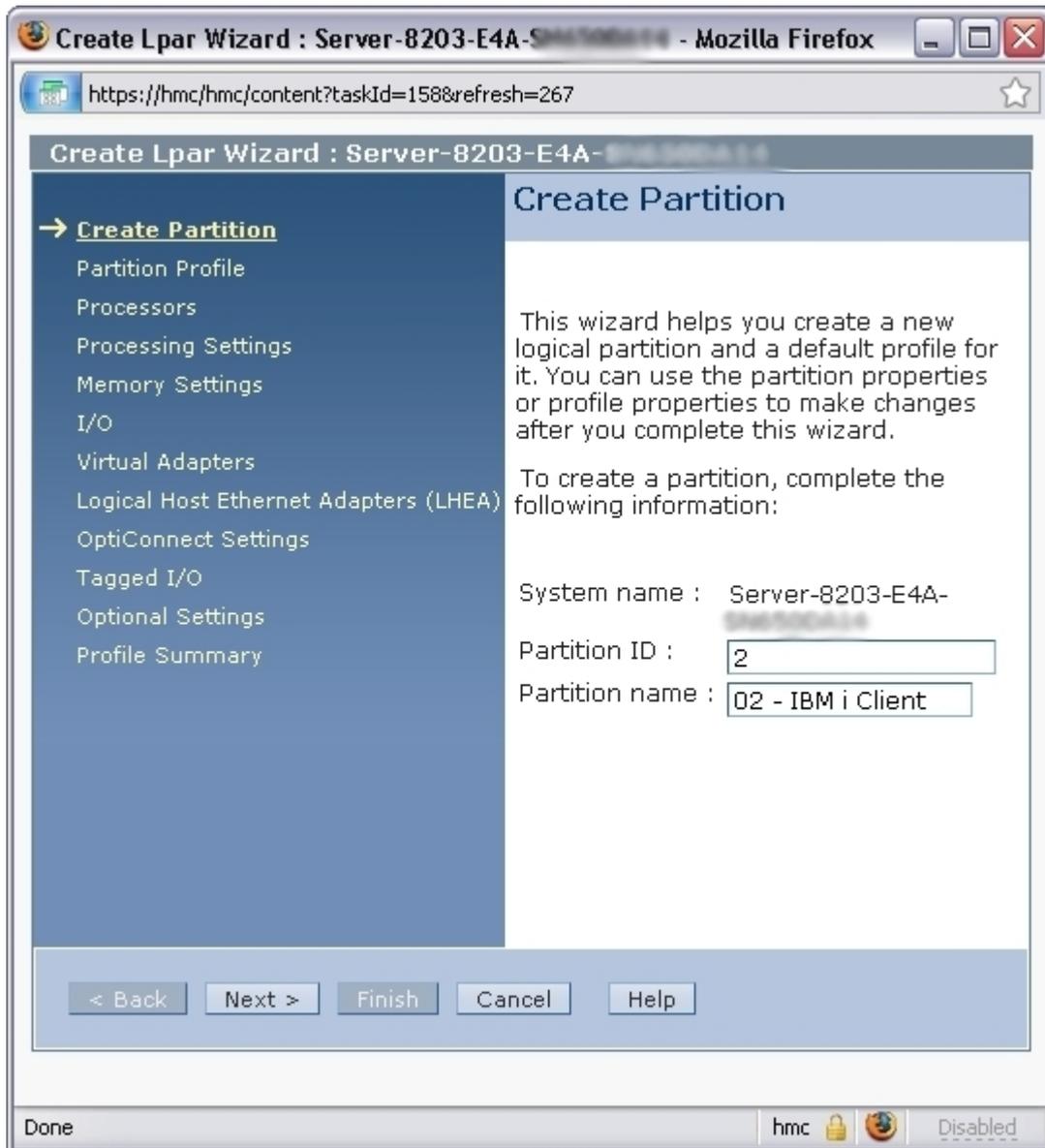


Figure 4.2-1

Specify a **Partition ID** and **Partition name** and click **Next**

Next is the Partition Profile window:



Figure 4.2-2

Specify a **Profile name** and click **Next**

Next is the Processors window:

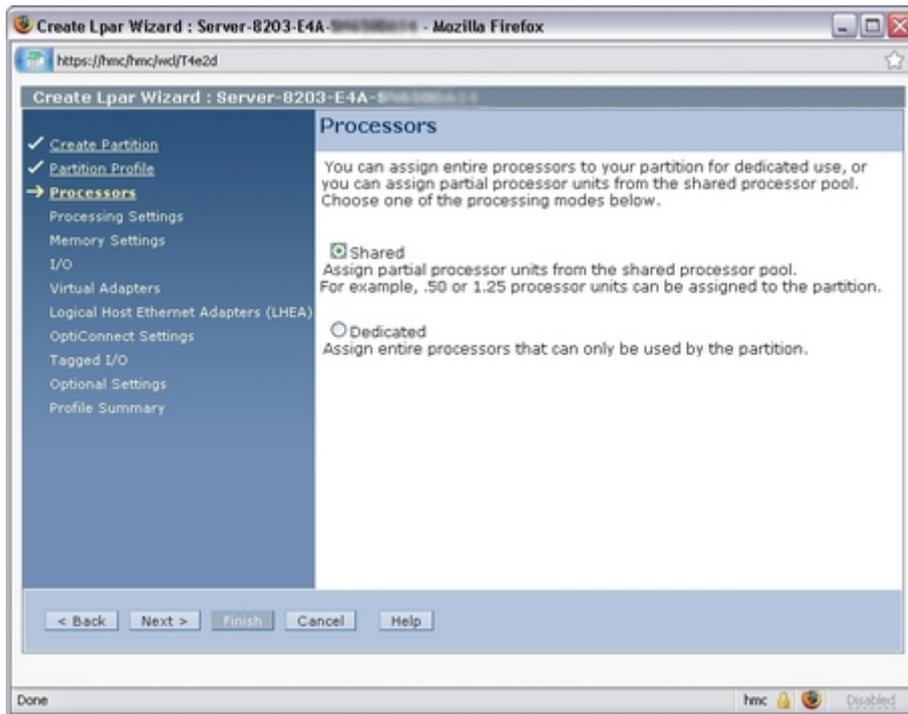


Figure 4.2-3

For this guide **Shared** was selected. Click **Next** to advance to the Processing Settings window:

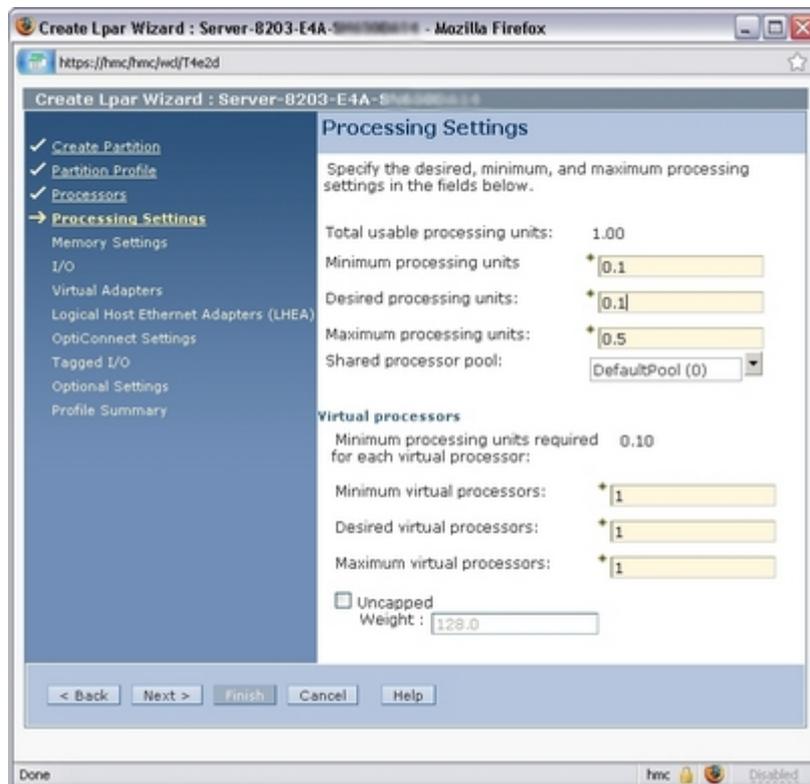


Figure 4.2-4

Complete the entry fields and click **Next**

Next is the Memory Settings window:

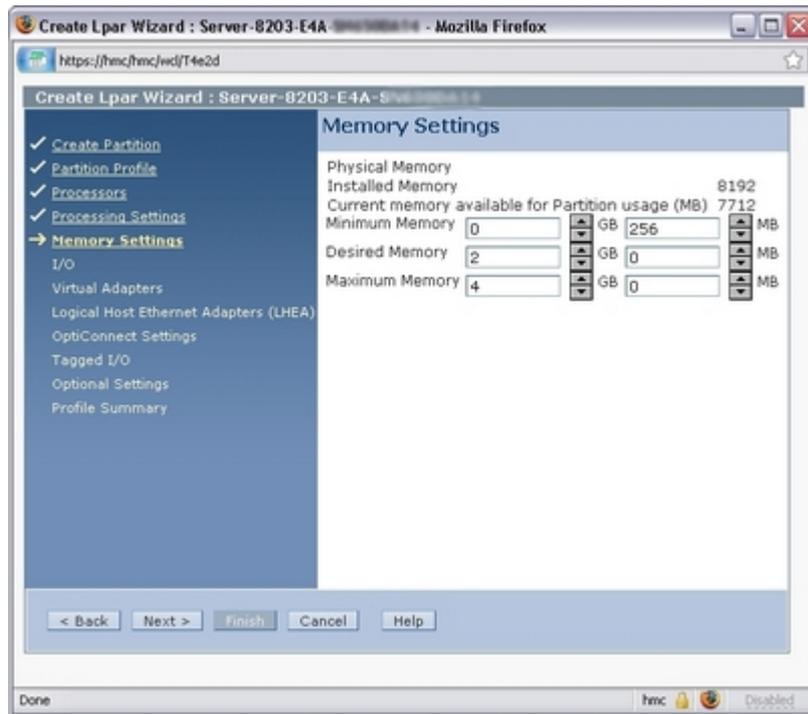


Figure 4.2-5

Complete the entry fields and click **Next**. You will advance to the I/O window:

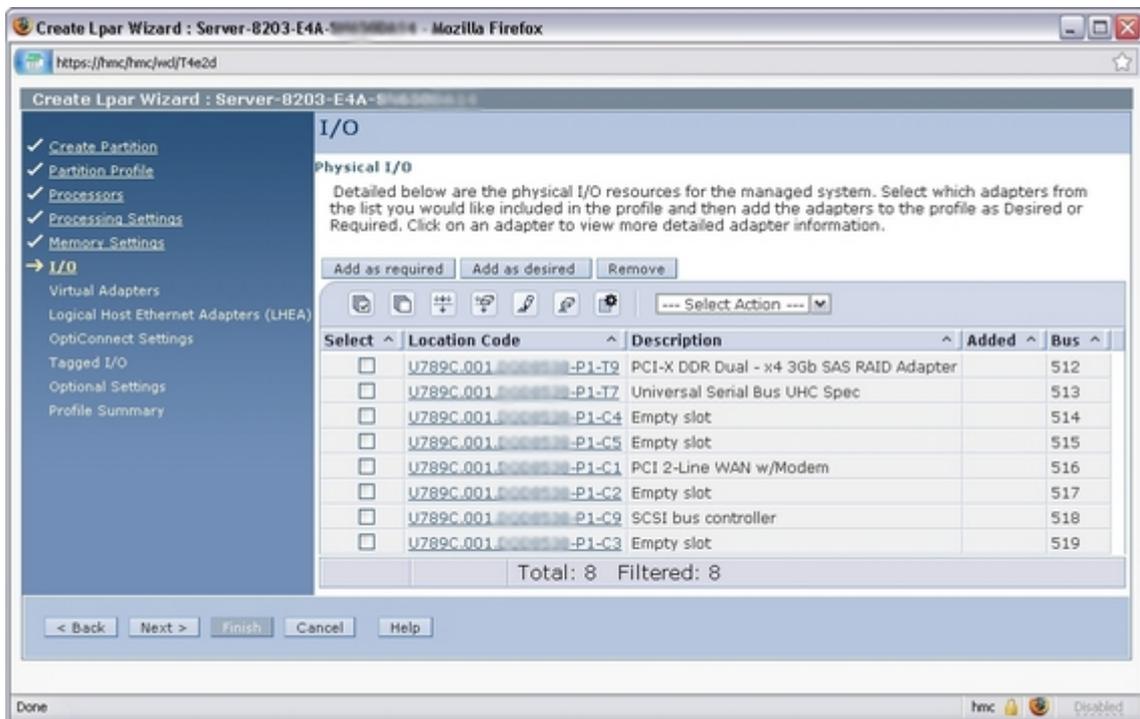


Figure 4.2-6

If you only have 1 physical NIC in your system (and no HEA installed), you will need to use Virtual Ethernet adapters and configure IP forwarding or NAT. When the IBM i Host partition is running V7R1-TR3 you can leverage Ethernet Layer-2 bridging - check IBM i Support: Software Technical Document: 622246891 and 469464744

Make your selections and click **Next** (For this guide no Physical I/O was selected).

Please note that if your IBM i Host partition providing the virtual storage is NOT running from the embedded disk adapter in the CEC, you will need to add/select your external DVD player.

You will advance to the Virtual Adapters window:

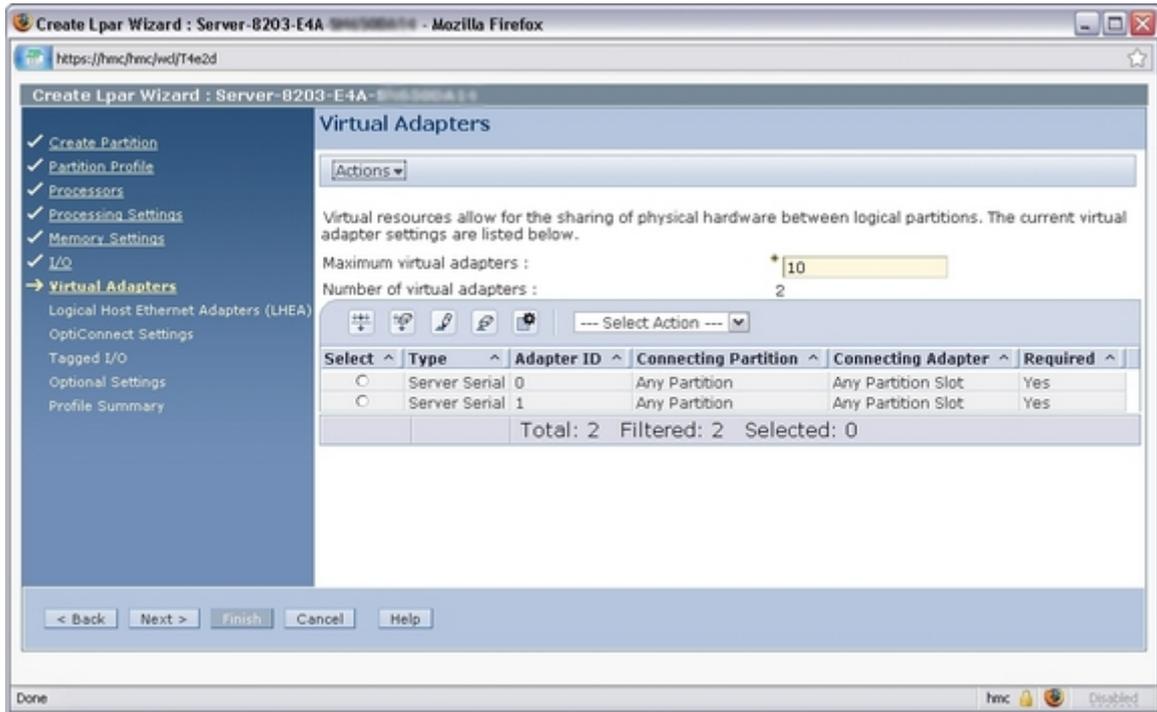


Figure 4.2-7

Using the *Actions* drop down you must **create the Virtual SCSI Client adapter** which is shown in Figure 4.2-8

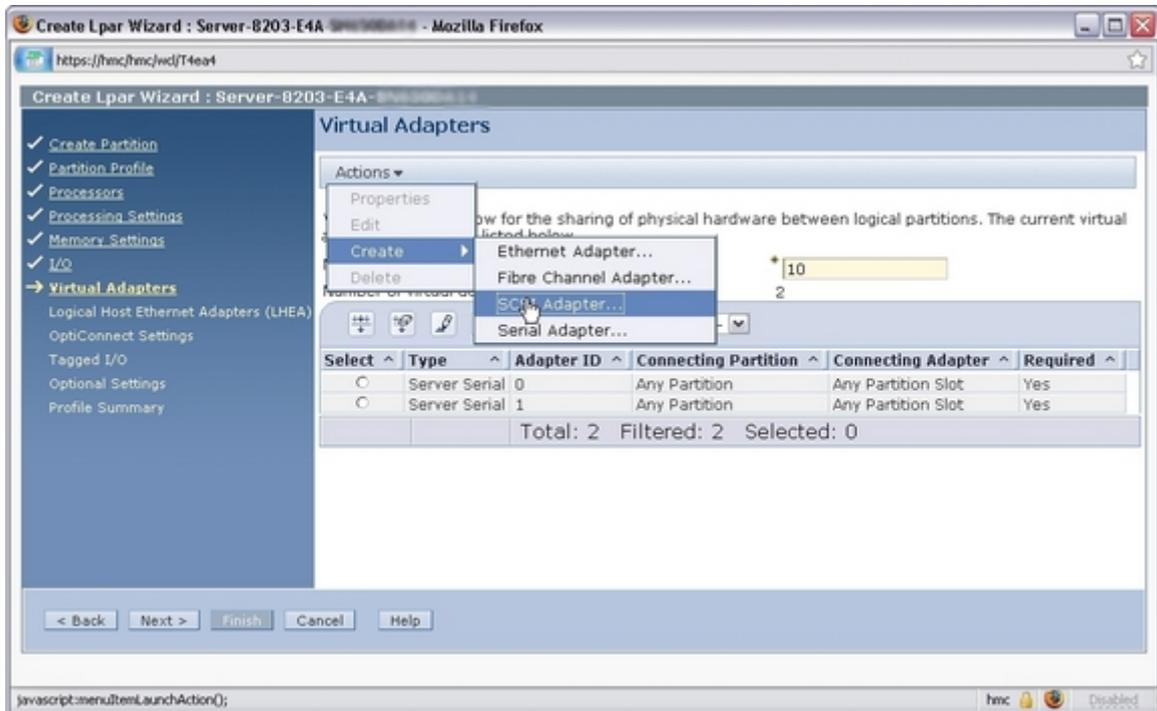


Figure 4.2-8

This will open a new window:

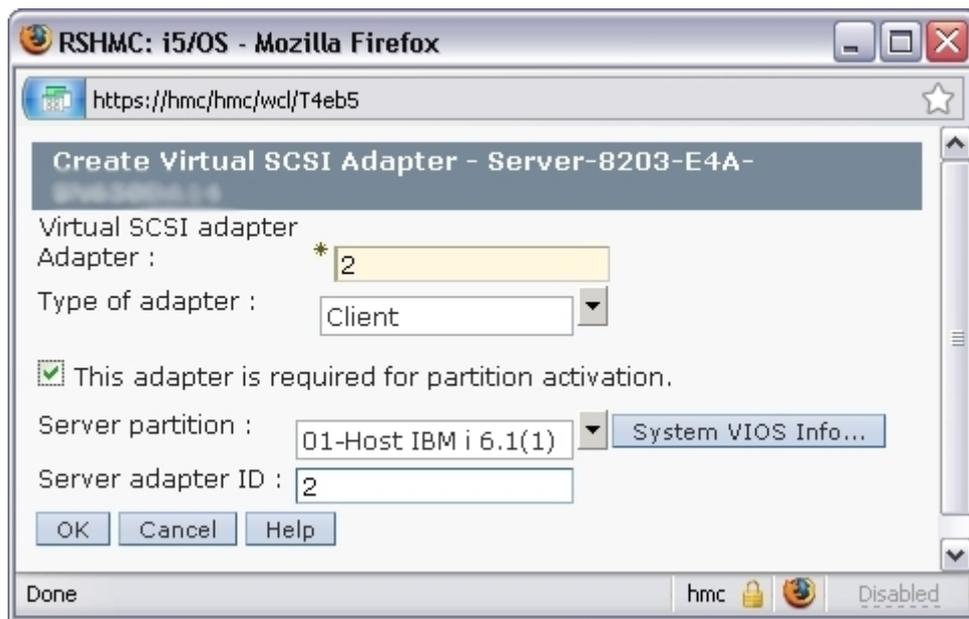


Figure 4.2-9

Set the Type of adapter to **Client** and **mark checkbox** for This adapter is required for partition activation.

For **Server partition** select the name for the IBM i Host partition in which you have created the Virtual SCSI Server adapter. The value in Server adapter ID should match the Virtual SCSI adapter number selected in Chapter 4.1 Dynamically add the virtual SCSI Server adapter to the IBM i Host partition

And click **OK**.

(In this guide the Virtual SCSI server adapter was in slot 2 – see Figure 4.1-1)

You will return to the Virtual Adapters window, and the Client SCSI adapter should be listed there:

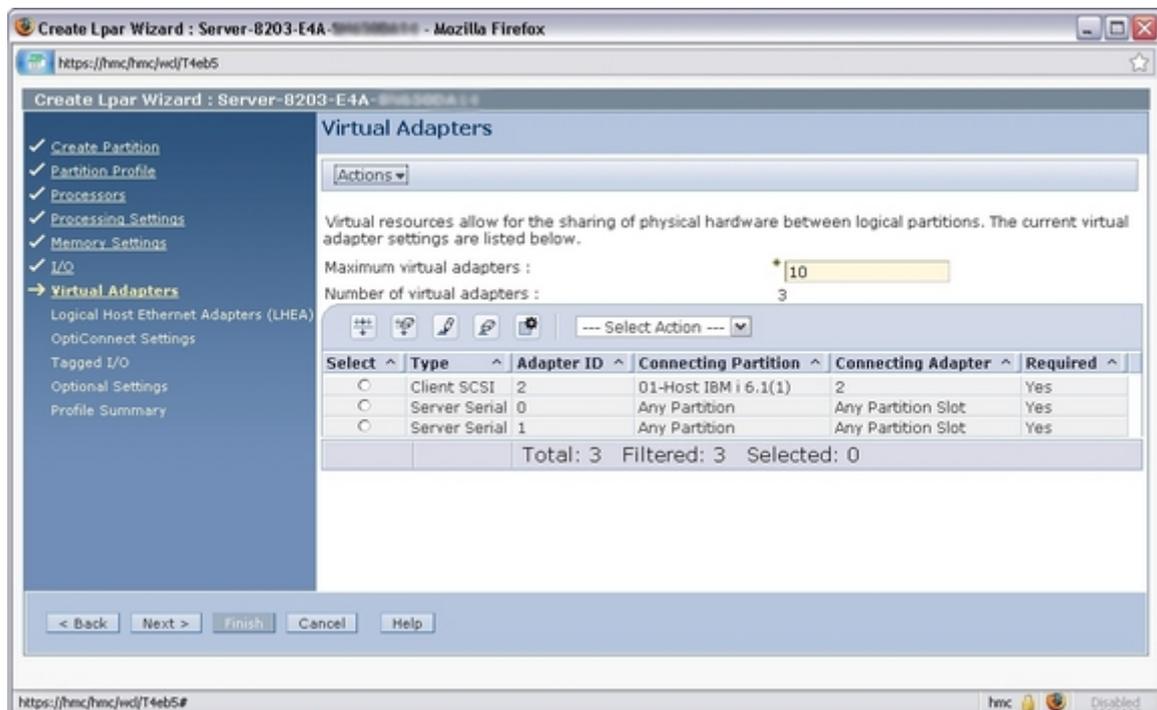


Figure 4.2-10

Click **Next** to advance to the Logical Host Ethernet Adapters (LHEA) window as shown on the next page.

Depending on your machine type and model of the Power System, the system was equipped with a Host Ethernet Adapter :

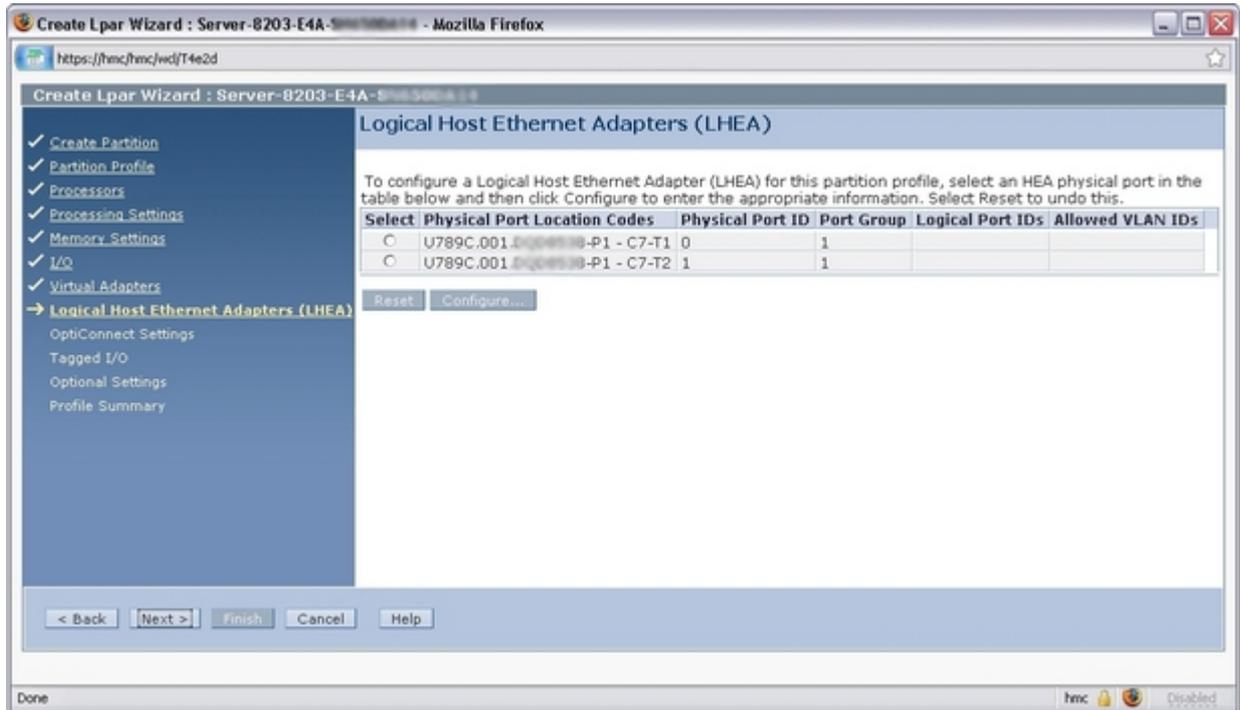


Figure 4.2-11

If applicable, **Add the preferred physical port** in order to have an Ethernet adapter available in your client partition. If you do not have any dedicated NIC available for the client partition you can use layer-2 bridging (see page 19).

Click **Next** to advance to the OptiConnect Settings window:

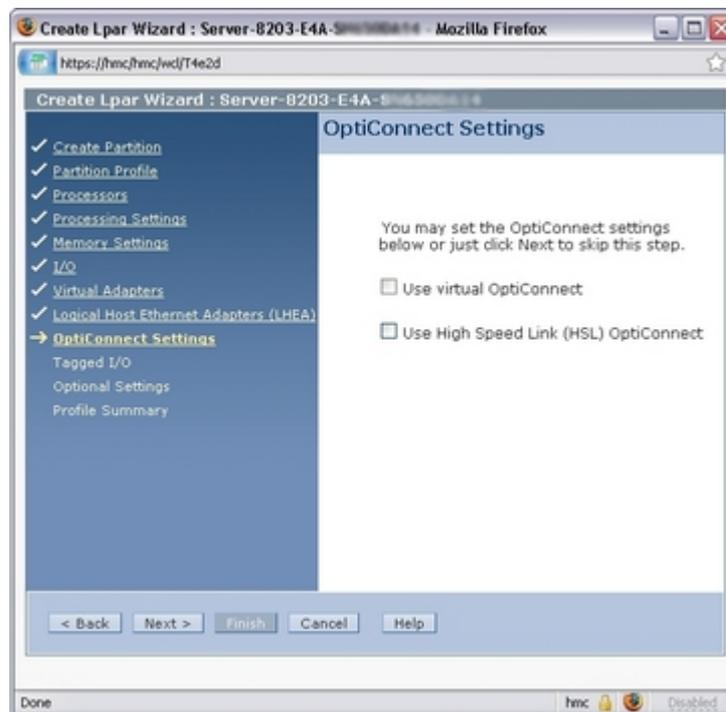


Figure 4.2-12

Click **Next** to advance to the Tagged I/O window as shown on the next page.



Figure 4.2-13

This is where you specify the *Load source*, *Alternate restart device* and *Console*.

For Load source select the Client SCSI Slot defined in Figure 4.2-9. When your IBM i Host partition runs on the disks in the CEC, you can select the same Client SCSI Slot for Alternate restart device – this will make the internal DVD available too (because it is attached to the same adapter as your disks).

When your IBM i Host partition is not running on the embedded disk adapter, there are 2 options:

- 1) Select the adapter that has an external DVD attached if you have one.
- 2) Virtualize the internal DVD in the CEC through an additional virtual SCSI host / client adapter combination (between IBM i Host partition using the embedded controller in the CEC and a second Client SCSI slot in your Client partition). The redbook IBM i 7.1 Technical Overview has a chapter called “Virtualizing an optical device to IBM i client partitions”.

For Console select Hardware Management Console.

Click **Next**

You will advance to the Optional Settings window:

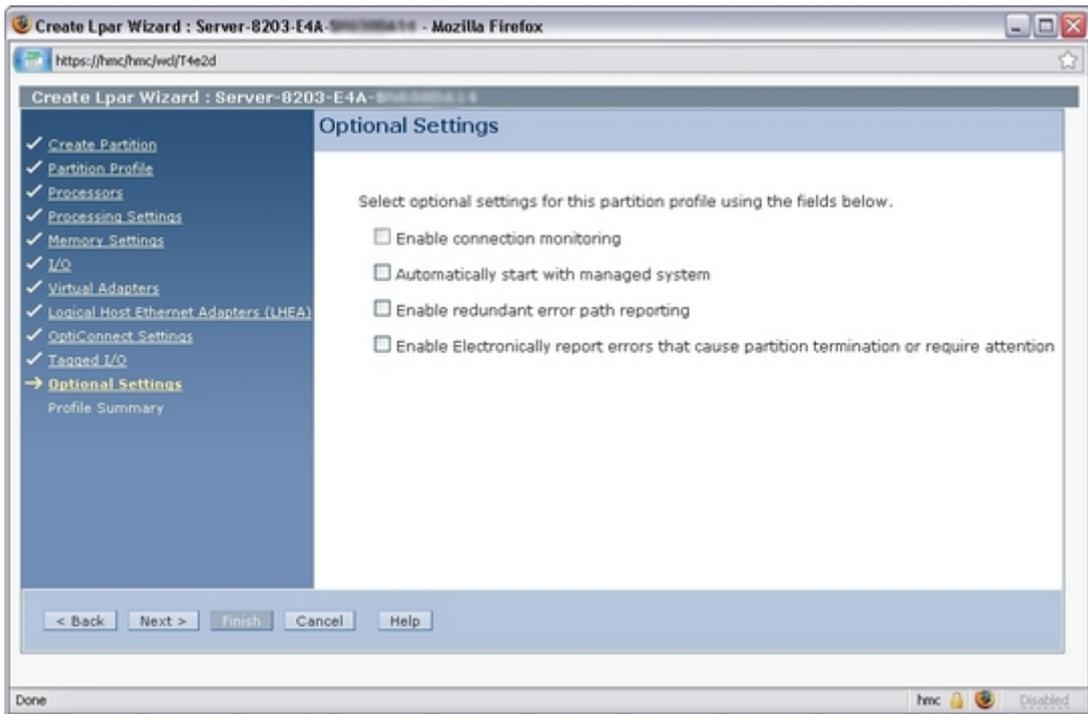


Figure 4.2-14

Click **Next** to advance to the Profile Summary window:

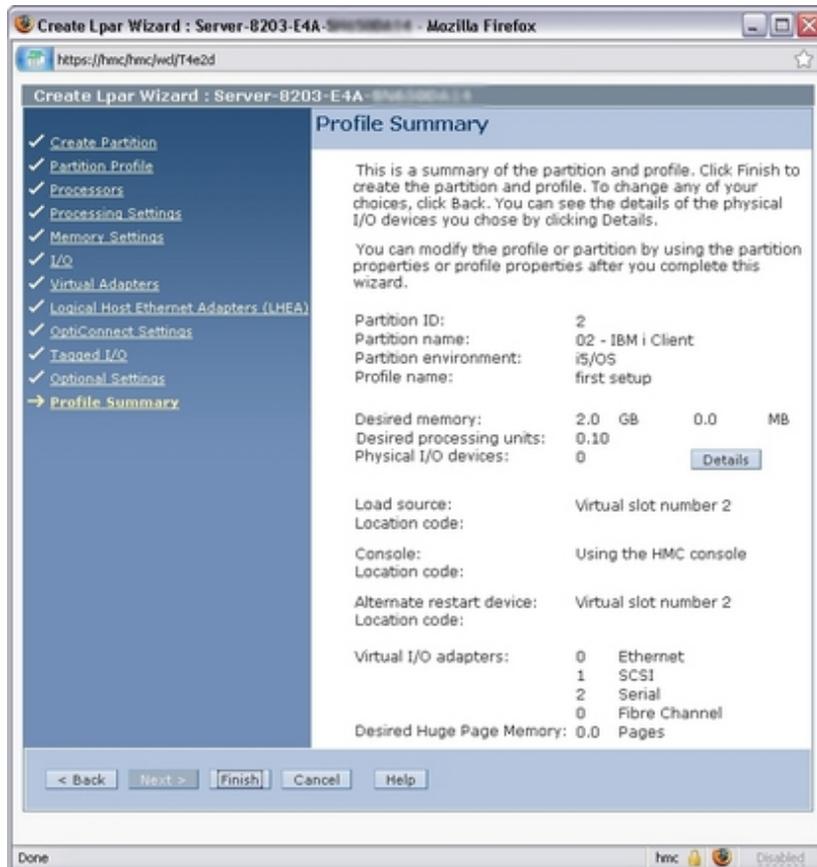


Figure 4.2-15

Click **Finish** on the Profile Summary window and this will create your IBM i Client partition.

Once the partition is created you will return to the Systems Management screen on the HMC:

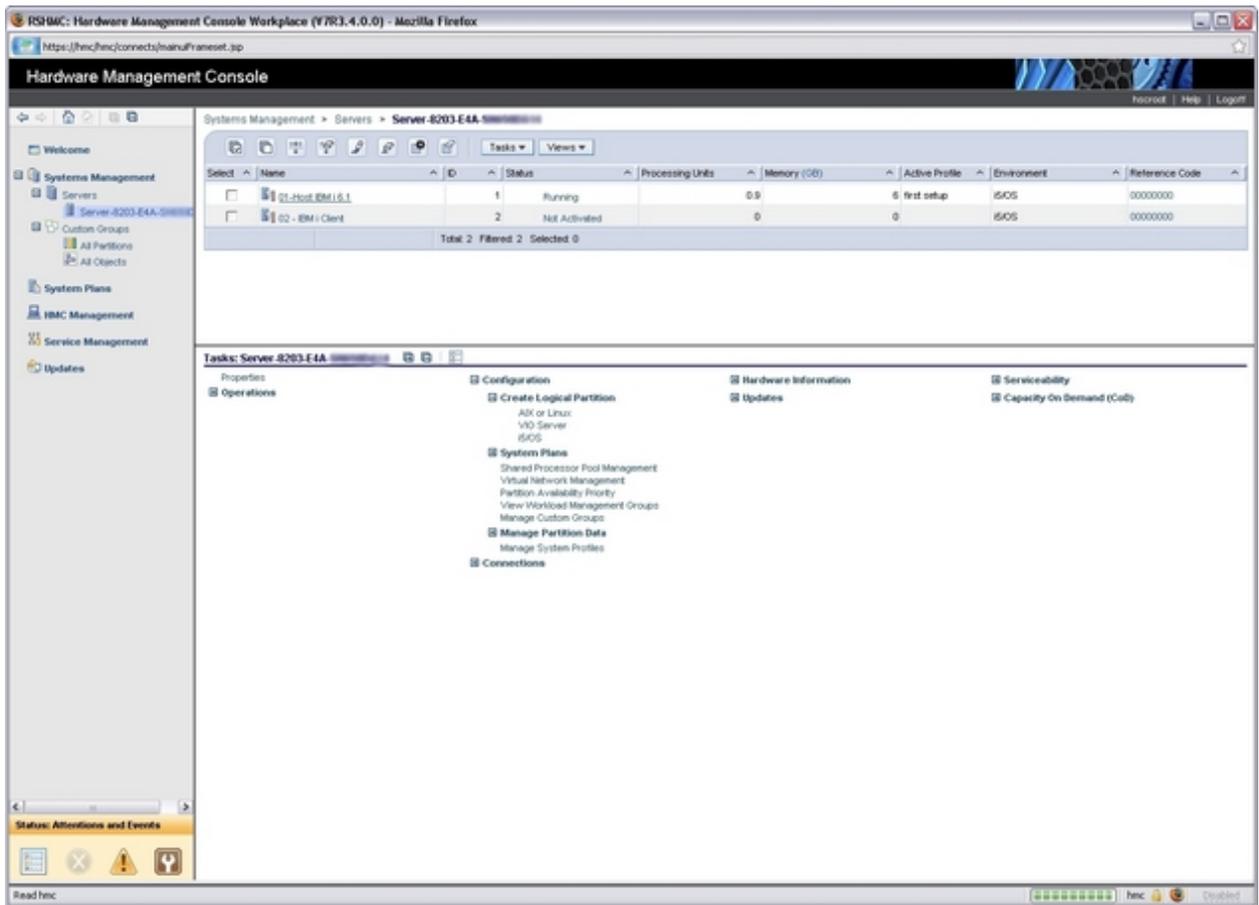


Figure 4.2-16

Now is a good time to check the Virtual SCSI Server adapter again in the Partition Profile for the IBM i Host partition. Please do so and check that this Server SCSI adapter matches with the SCSI Client adapter in the IBM i Client partition.

4.3 Create a Linux Client partition using the HMC

Next is to create a Linux Client partition – this is done using the HMC using the following steps.

In the HMC navigate to *Systems Management – Servers* and select the System on which you want to create the Linux Client partition. Click *Configuration – Create Logical Partition – Click AIX or Linux*.

This will start the Create Logical Partition wizard:

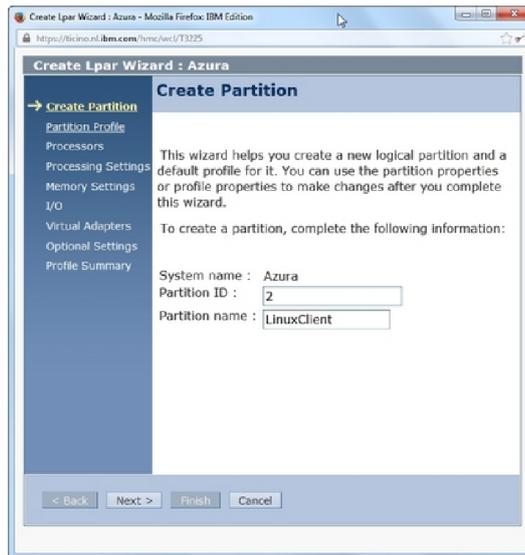


Figure 4.3-1

Specify a **Partition ID** and **Partition name** and click **Next**



Figure 4.3-2

Specify a **Profile name** click **Next**

Next is the Processors window:

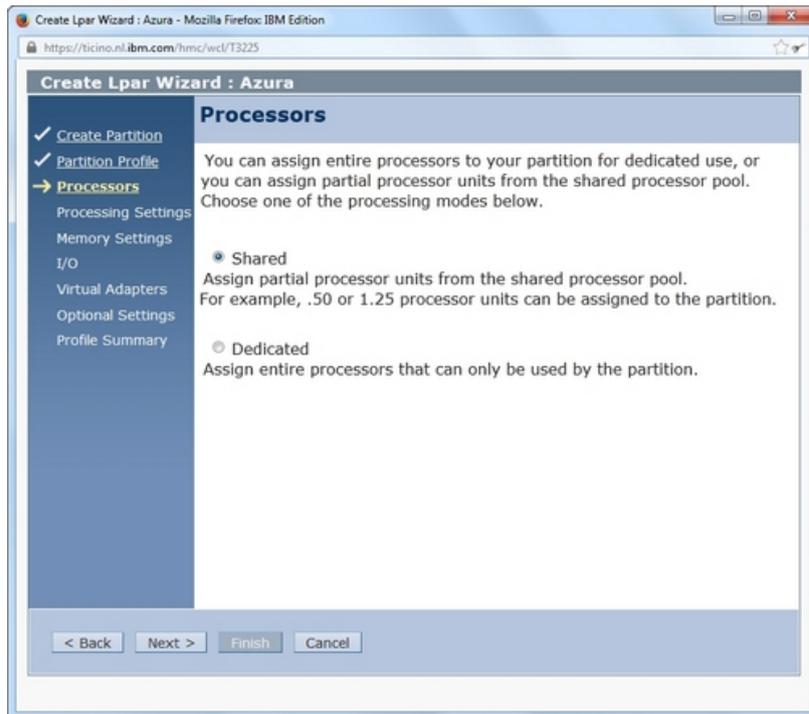


Figure 4.3-3

For this guide **Shared** was selected. Click **Next** to advance to the Processing Settings window:

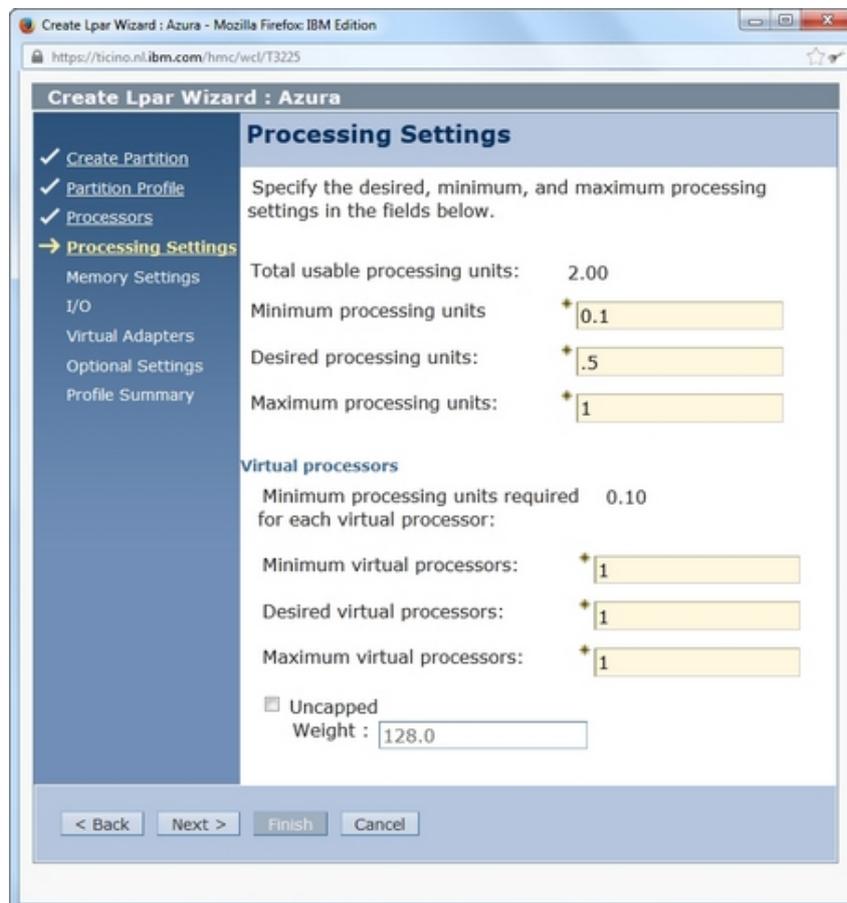


Figure 4.3-4

Complete the entry fields and click Next

Next is the Memory Settings window:

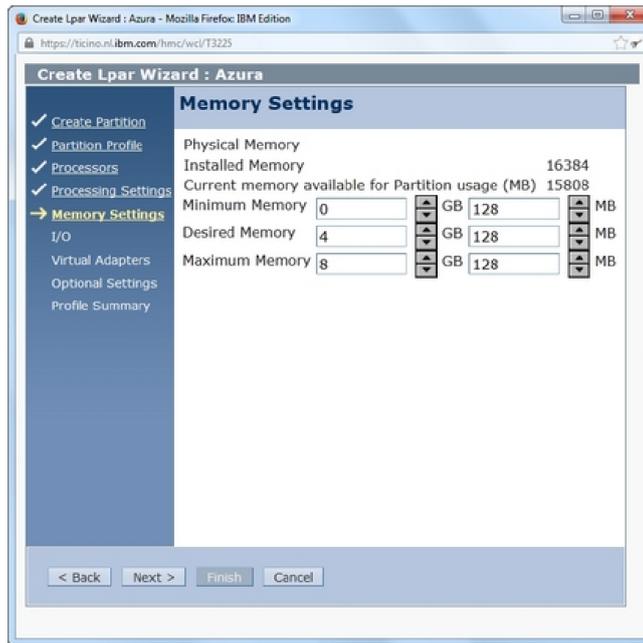


Figure 4.3-5

Complete the entry fields and Click Next. You will advance to the I/O window:

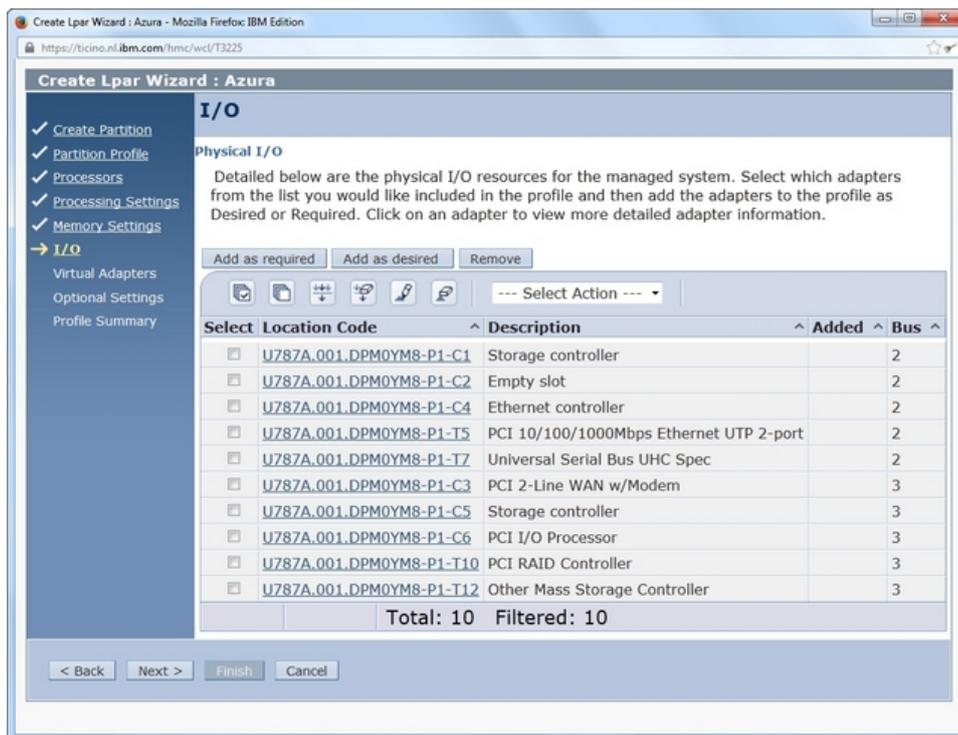


Figure 4.3-6

If you only have 1 physical NIC in your system (and no HEA installed), you will need to use Virtual Ethernet adapters and configure IP forwarding or NAT. When the IBM i Host partition is running V7R1-TR3 you can leverage Ethernet Layer-2 bridging - check IBM i Support: Software Technical Document: 622246891 and 469464744

Make your selections and click Next (For this guide no Physical I/O was selected).

Please note that if your IBM i Host partition providing the virtual storage is NOT running from the embedded disk adapter in the CEC, you will need to add/select your external DVD player. Another option is to leverage Virtual Media installed in your IBM i Host partition.

You will advance to the Virtual Adapters window:

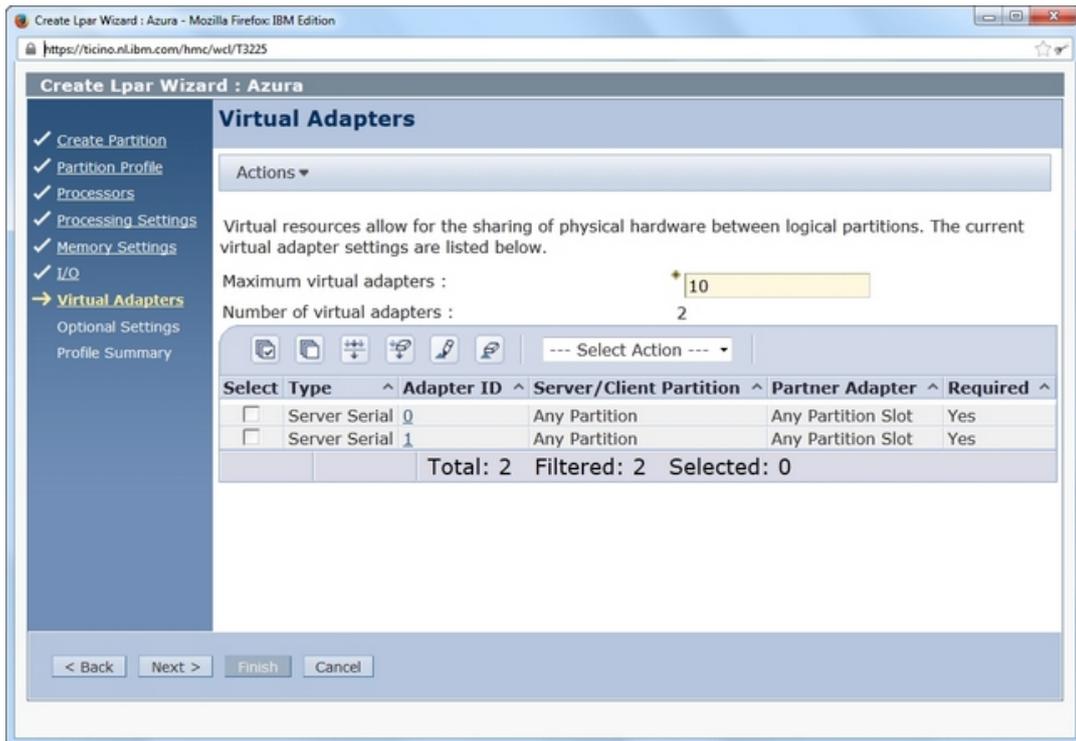


Figure 4.3-7

Using the *Actions* drop down you must create the **Virtual SCSI Client adapter** which is shown in Figure 4.3-8

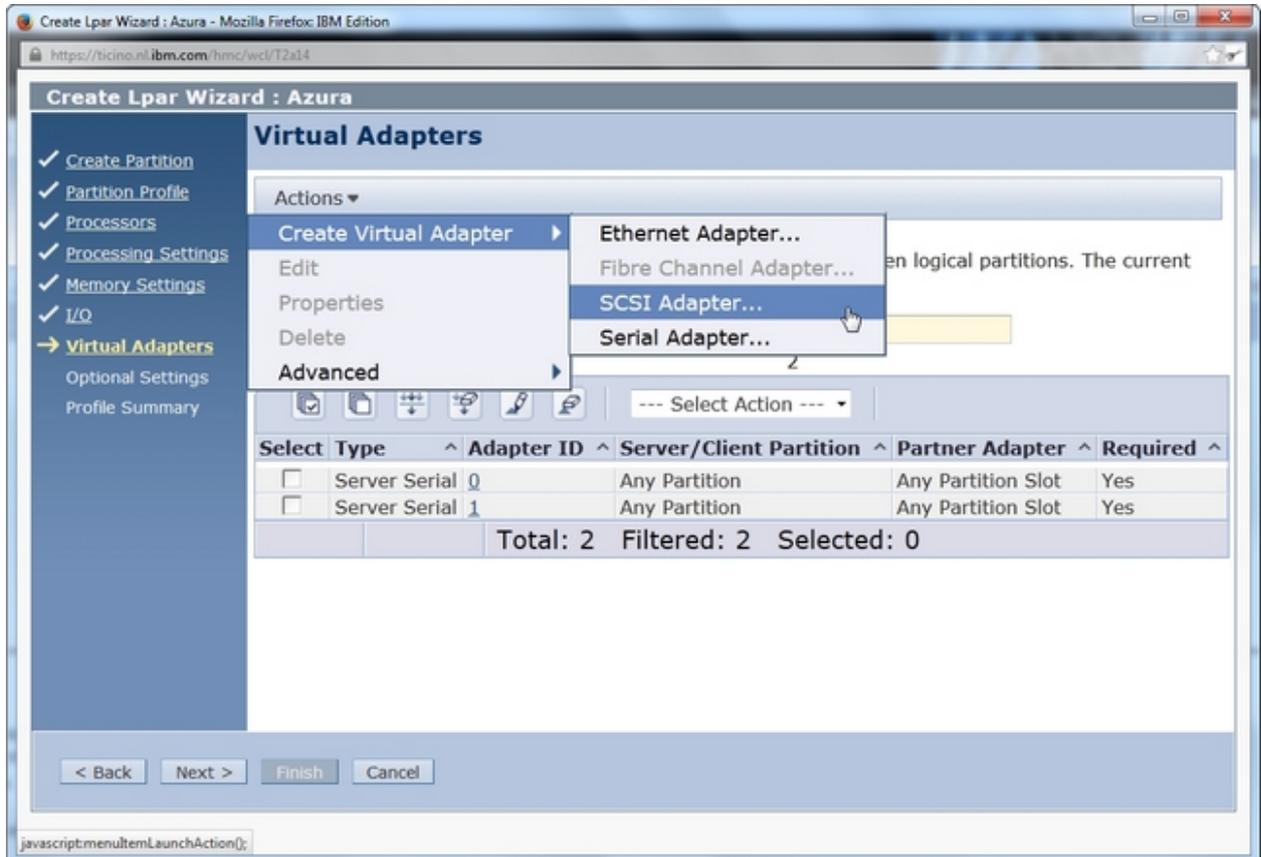


Figure 4.3-8

This will open a new window:

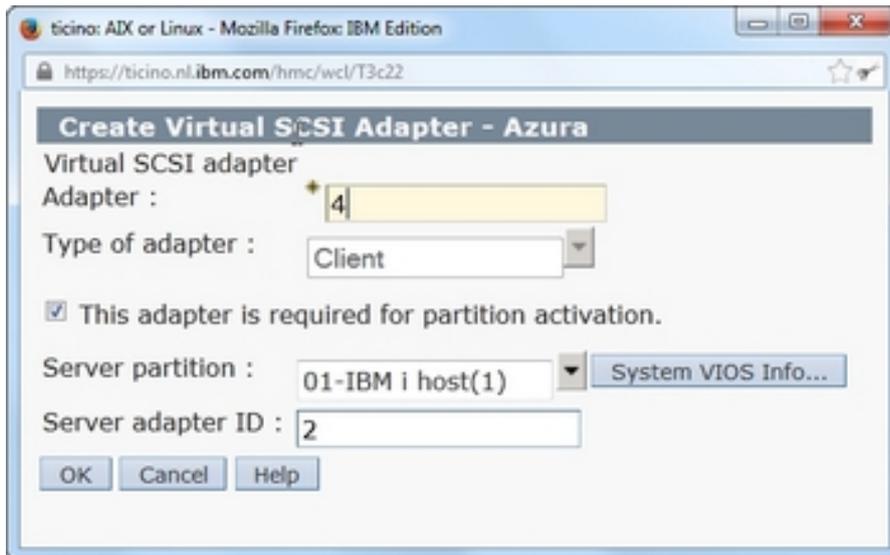


Figure 4.3-9

Set the Type of adapter to **Client** and **mark checkbox** for This adapter is required for partition activation. For **Server partition** select the name for the IBM i Host partition in which you have created the Virtual SCSI Server adapter. The value in Server adapter ID should match the Virtual SCSI adapter number selected in Chapter 4.1 Dynamically add the virtual SCSI Server adapter to the IBM i Host partition And click **OK**.

(In this guide the Virtual SCSI server adapter was in slot 2 – see Figure 4.1-1)

You will return to the Virtual Adapters window, and the Client SCSI adapter should be listed there:

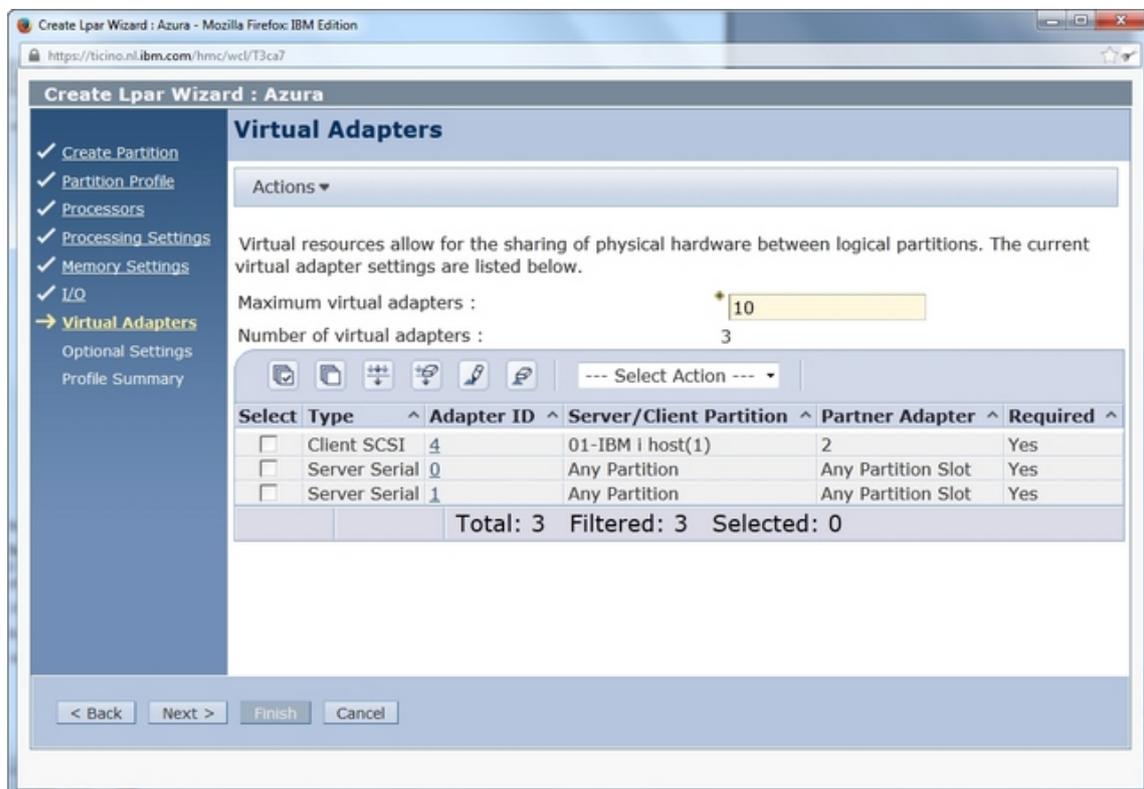


Figure 4.3-10

Use the *Actions* drop down again to **create a Virtual Ethernet Adapter** which is shown in Figure 4.3-11 on the next page

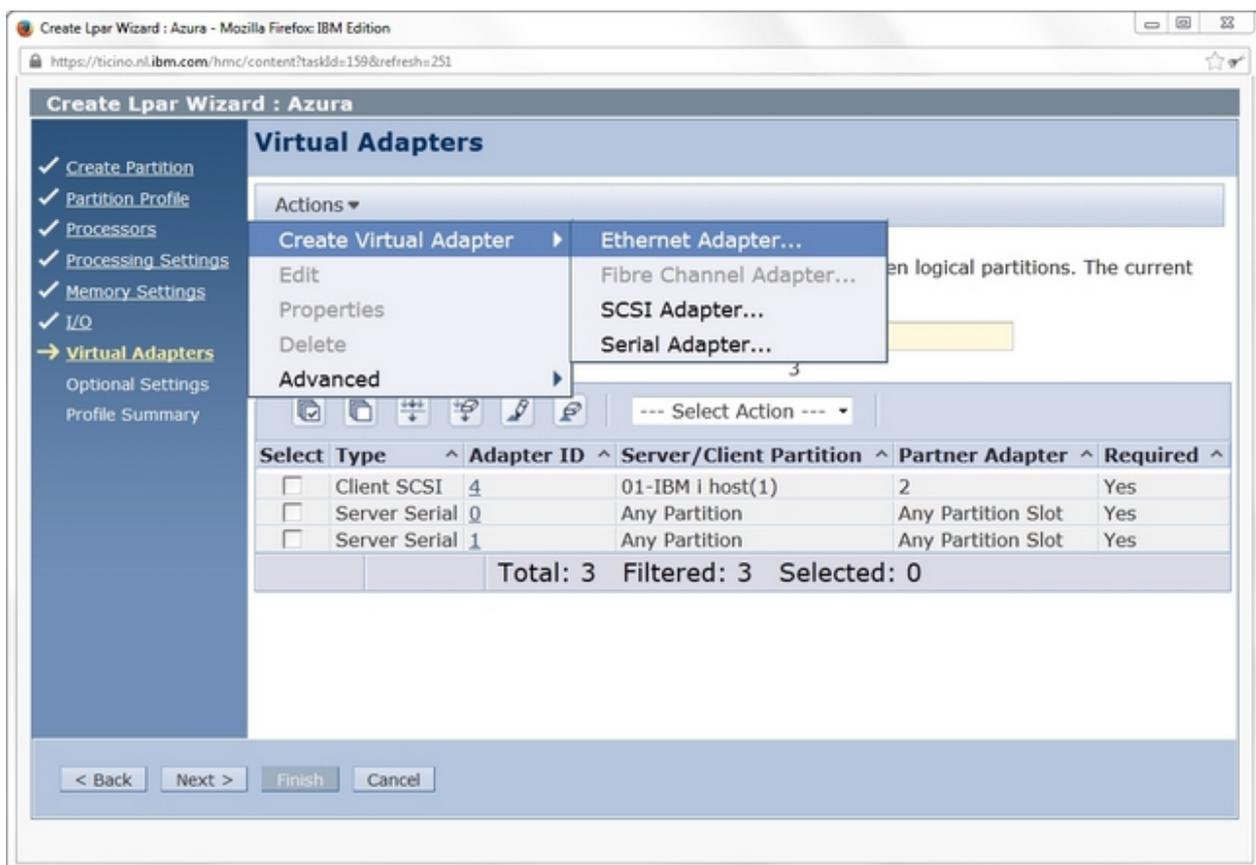


Figure 4.3-11

This will open a new window:

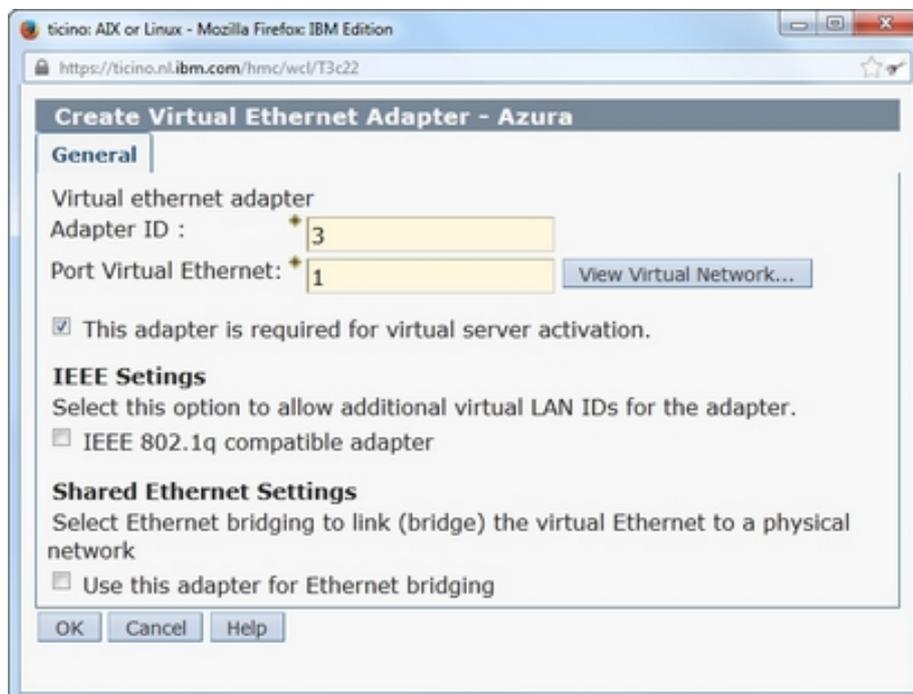


Figure 4.3-12

Select a free slot for the Virtual Ethernet adapter id and **match** the Port Virtual Ethernet value with the one you are using in your IBM i host partition (to have a VLAN between your partitions) and **mark checkbox** for This adapter is required for virtual server activation.

And click **OK**.

You will return to the Virtual Adapter window as shown in Figure 4.3-13.

Check that it shows the adapters you have added in the previous steps and that **Yes** is shown in the **Required** column

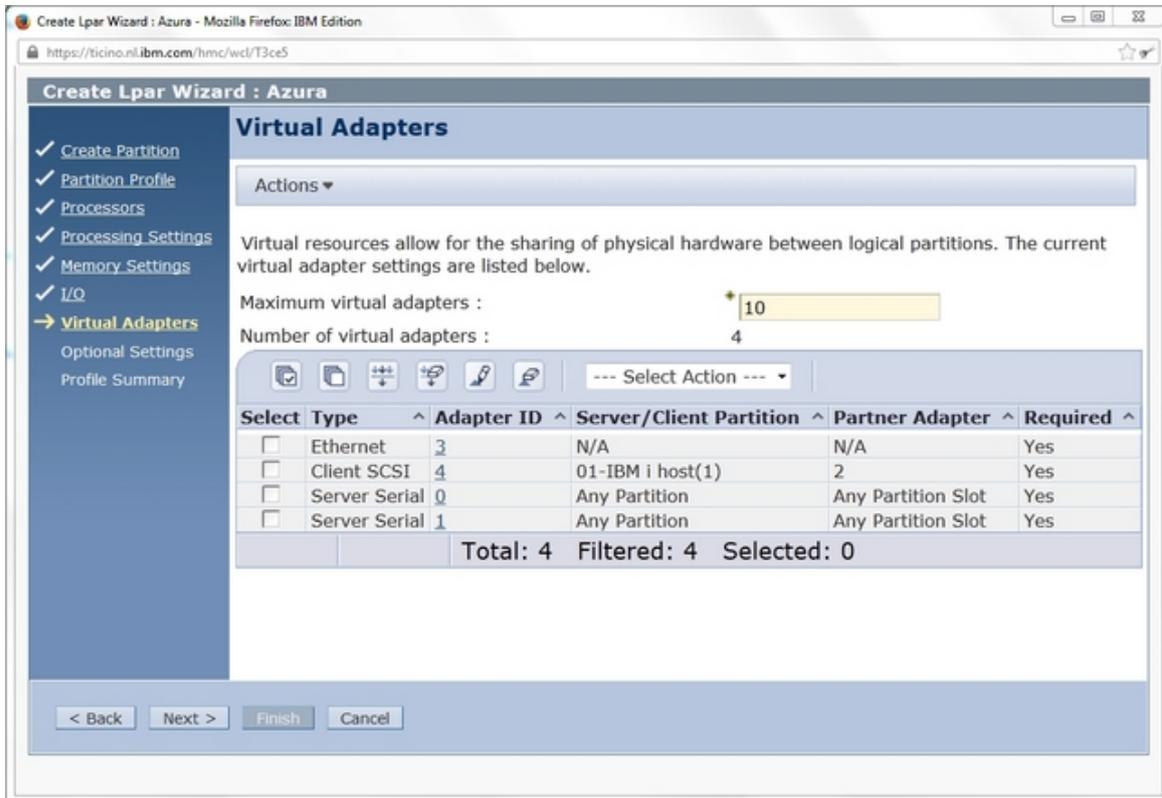


Figure 4.3-13

Click **Next** to advance to the Optional Settings window:

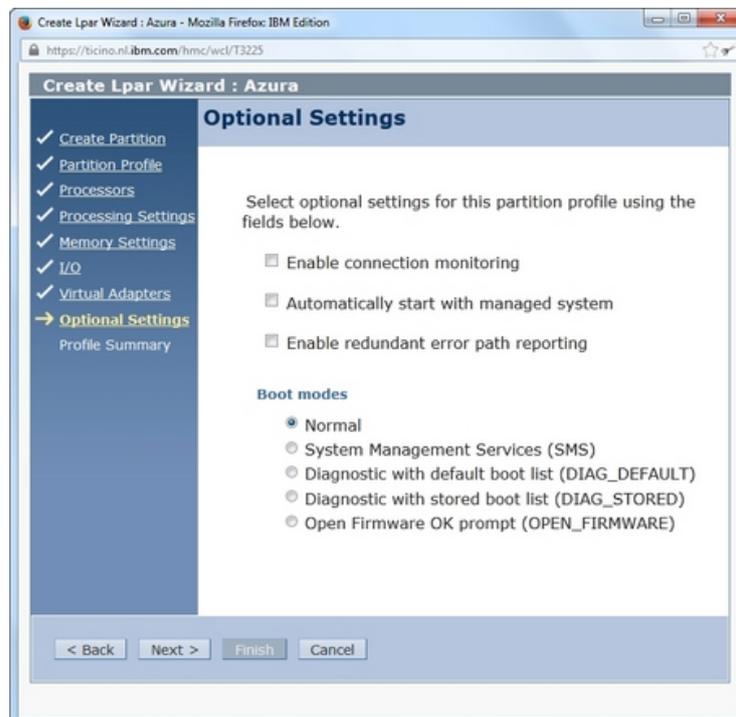


Figure 4.3-14

Click **Next** to advance to the Profile Summary window shown in Figure 4.3-15 on the next page.

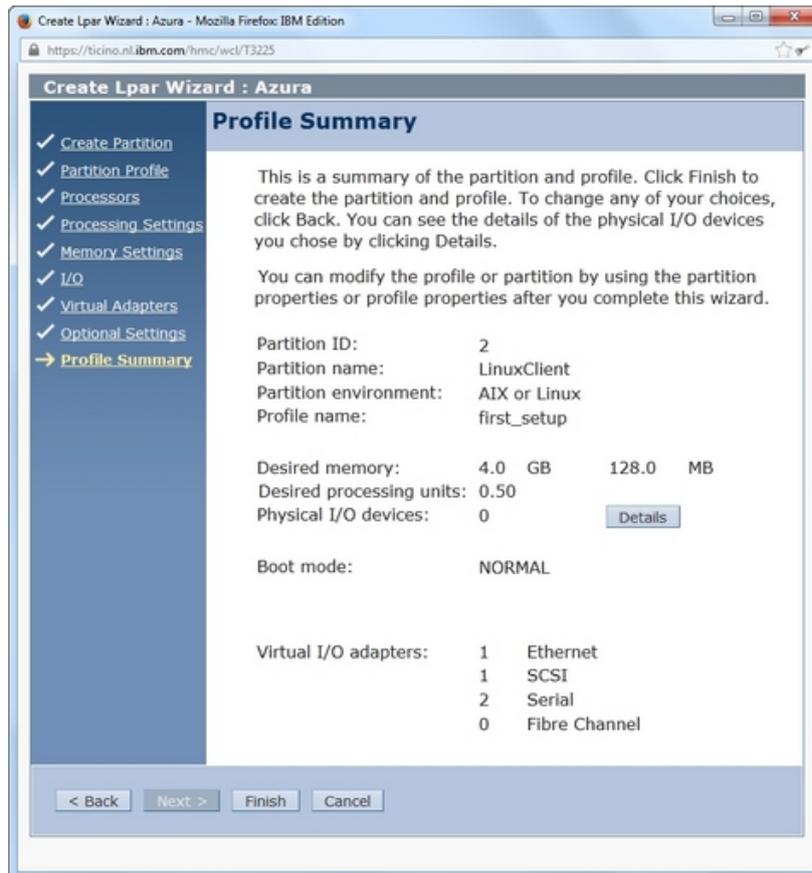


Figure 4.3-15

Click **Finish** on the Profile Summary window and this will create your Linux Client partition.

Once the partition is created you will return to the Systems Management screen on the HMC as shown in Figure 4.3-16:

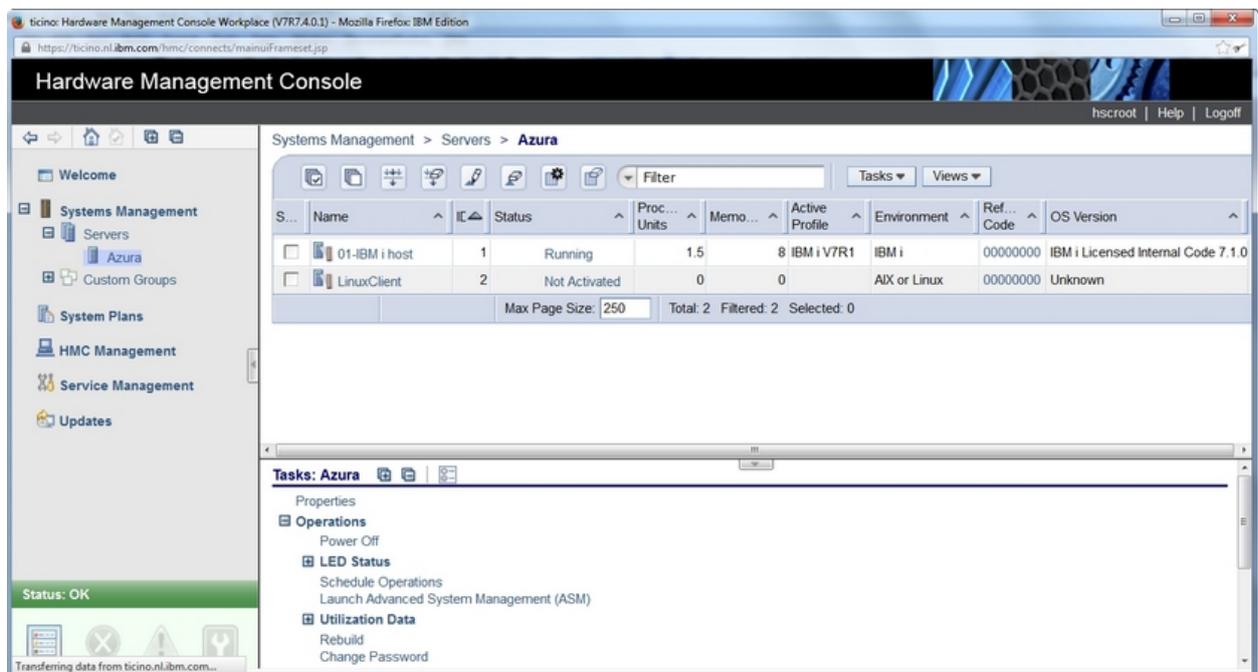


Figure 4.3-16

Check that the Server SCSI adapter you created in your IBM i host partition matches the virtual Client SCSI adapter in your Linux Client partition.

5. Create objects needed in the IBM i Host partition

This section explains how to create the objects needed in the IBM i Host partition that will be used by the Client partition (IBM i or Linux). The steps need to be done from within the IBM i Host partition and are independent of the virtualization configuration interface used (VPM or HMC).

You will create 2 objects in the IBM i Host partition:

- A Network Server Description – describing the client LPAR and the Operating System it will run (IBM i or Linux).
- A Network Server Storage Space – this will be the (virtual) disk to the Client partition.

The Network Server Administration (NWSADM) menu can guide you to the various network server tasks. These tasks include working with network server storage spaces, and configuring, starting, and stopping a network server. When you type **GO NWSADM** you will get the menu as shown in Figure 5-1.

```
NWSADM                                Network Server Administration                                System:
Select one of the following:
    1. Configure a network server
    2. Start a network server
    3. Stop a network server
    4. Work with network server storage spaces
    10. Change network server attributes
    11. Change network server user attributes
    12. Work with network server user enrollment
    20. Work with network server status
    30. Submit a network server command
More...
Selection or command
===>
F3=Exit   F4=Prompt   F9=Retrieve   F12=Cancel   F13=Information Assistant
```

Figure 5-1

5.1 Which Operating System will run on the Virtual Server (NWSD)

Several parameters in the Virtual Server object are specific to the Operating System it will run.

This means that you will need to set those Network Server type parameters accordingly. Use one of the following Chapters (5.1.1 or 5.1.2) in order to create the correct NWSD for IBM i or Linux.

5.1.1 Create Virtual Server (NWS D object) for an IBM i Client LPAR

Using a 5250 screen in the IBM i Host partition, issue the following command:

CRTNWS D – followed by function key **F4**

Complete the parameters from the screenshots (Figure 5.1.1-1 – Figure 5.1.1-4) that show the **>** sign. Depending on whether VPM (Virtual Partition Manager) or the HMC was used, the value to specify for the RSRRCNAME parameter:

- VPM: the virtual SCSI server adapter was created automatically – the resource was created and identified in Chapter 3.2 Create an IBM i Client partition using VPM (Figure 3.2-6)
- HMC: the virtual SCSI server adapter was added to the Host partition (and identified) in Chapter 4.1 Dynamically add the virtual SCSI Server adapter to the IBM i Host partition (Figure 4.1-3)

```

Create Network Server Desc (CRTNWS D)

Type choices, press Enter.

Network server description . . . NWS D                > ICLIENT1
Resource name . . . . . RSRRCNAME                > CTL04
Network server type:
  Server connection . . . . .                    > *GUEST
  Server operating system . . . . .                > *OPSYS
Online at IPL . . . . . ONLINE                    *YES
Vary on wait . . . . . VRYWAIT                    *NOWAIT
Shutdown timeout . . . . . SHUTDTIMO                *TYPE
Partition . . . . . PARTITION                      *NONE

Partition number . . . . . PTNNBR                > 2
Code page . . . . . CODEPAGE                      *LNGVER
Server message queue . . . . . MSGQ                *JOBLOG
  Library . . . . .
Pool identifier . . . . . POOL                      *BASE

More...
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
  
```

Figure 5.1.1-1

```

Create Network Server Desc (CRTNWS D)

Type choices, press Enter.

TCP/IP port configuration:      TCPPORTCFG
  Port . . . . .                               *NONE
  Internet address . . . . .
  Subnet mask . . . . .
  Maximum transmission unit . .
  Gateway address . . . . .
  + for more values
TCP/IP route configuration:    TCPRTE
  Route destination . . . . .                *NONE
  Subnet mask . . . . .
  Next hop . . . . .
  + for more values
TCP/IP local host name . . . . . TCPHOSTNAM      *NWS D

More...
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
  
```

Figure 5.1.1-2



```
                Create Network Server Desc (CRTNWS D)

Type choices, press Enter.

TCP/IP local domain name . . . . TCPDMNNAME      *SYS

TCP/IP name server system . . . . TCPNAMSVR      *SYS
+ for more values
Restricted device resources . . . . RSTDDEVRSC   *NONE
+ for more values
IPL source . . . . . IPLSRC                    > *PANEL
IPL stream file . . . . . IPLSTMF              *NONE

IPL parameters . . . . . IPLPARM              *NONE

Power control . . . . . PWRCTL                 > *NO
Serviceability options . . . . . SRVOPT       *NONE

                                                    More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 5.1.1-3

```
                Create Network Server Desc (CRTNWS D)

Type choices, press Enter.

Authority . . . . . AUT                        *CHANGE
Text 'description' . . . . . TEXT              > 'IBM i Client partition using
LPAR ID2'

                                                    Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
```

Figure 5.1.1-4

When the NWSD-object is created, the next step is to create a NWSSTG-object. This will be the virtual hard disk for the IBM i Client partition.

5.1.2 Create Virtual Server (NWSO object) for a Linux Client LPAR

Using a 5250 screen in the IBM i Host partition, issue the following command:

CRTNWSO – followed by function key **F4**

Complete the parameters from the screenshots (Figure 5.1.2-1 – Figure 5.1.2-4) that show the **>** sign. Depending on whether VPM (Virtual Partition Manager) or the HMC was used, the value to specify for the RSRRCNAME parameter:

- VPM: the virtual SCSI server adapter was created automatically – the resource was created and identified in Chapter 3.3 Create a Linux Client partition using VPM (Figure 3.3-6)
- HMC: the virtual SCSI server adapter was added to the Host partition (and identified) in Chapter 4.1 Dynamically add the virtual SCSI Server adapter to the IBM i Host partition (Figure 4.1-3)

```

                                Create Network Server Desc (CRTNWSO)

Type choices, press Enter.

Network server description . . . NWSO                > LNXCLN1
Resource name . . . . . RSRRCNAME                > CTL04
Network server type:
  Server connection . . . . . TYPE                > *GUEST
  Server operating system . . . . .                > *LINUXPPC
Online at IPL . . . . . ONLINE                    *YES
Vary on wait . . . . . VRYWAIT                    *NOWAIT
Shutdown timeout . . . . . SHUTDTIMO              *TYPE
Partition . . . . . PARTITION                     *NONE

Partition number . . . . . PTNNBR                > 2
Code page . . . . . CODEPAGE                      *LNGVER
Server message queue . . . . . MSGQ               *JOBLOG
T1 Library . . . . .
Pool identifier . . . . . POOL                    *BASE

                                                                More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  
```

Figure 5.1.2-1

```

                                Create Network Server Desc (CRTNWSO)

Type choices, press Enter.

TCP/IP port configuration:      TCPPORTCFG
  Port . . . . .                                *NONE
  Internet address . . . . .
  Subnet mask . . . . .
  Maximum transmission unit . .
  Gateway address . . . . .
                                + for more values
TCP/IP route configuration:    TCPRTE
  Route destination . . . . .                    *NONE
  Subnet mask . . . . .
  Next hop . . . . .
                                + for more values
TCP/IP local host name . . . . . TCPHOSTNAM      *NWSO

                                                                More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  
```

Figure 5.1.2-2

```

Create Network Server Desc (CRTNWS D)

Type choices, press Enter.

TCP/IP local domain name . . . . TCPDMNNAME      *SYS

TCP/IP name server system . . . . TCPNAMSVR      *SYS
+ for more values
Restricted device resources . . . RSTDDEVRSC    *NONE
+ for more values
IPL source . . . . . IPLSRC                    > *PANEL
IPL stream file . . . . . IPLSTMF              *NONE

IPL parameters . . . . . IPLPARM              *NONE

Power control . . . . . PWRCTL                 > *NO
Serviceability options . . . . . SRVOPT       *NONE

More...
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys

```

Figure 5.1.2-3

```

Create Network Server Desc (CRTNWS D)

Type choices, press Enter.

Authority . . . . . AUT                        *CHANGE
Text 'description' . . . . . TEXT              > 'Linux Client partition using
LPAR ID2'

Bottom

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display

```

Figure 5.1.2-4

When the NWSD-object is created, the next step is to create a NWSSTG-object. This will be the virtual hard disk for the Linux Client partition.

5.2 Create a Virtual Disk (NWSSTG object) for a Client partition

Please plan the size for this NWSSTG object carefully – performance is out of scope in this Quick Install Guide. Use the documentation referenced under heading *Detailed Description* on page 4.

The size for the NWSSTG object will impact the %-used in your IBM i Host partition. Another important thing is that when you try to keep its size close to the amount needed, it will give more options to create extra copy/copies. You should check the IBM i Information Center item called “Licensed program releases and sizes” to estimate the size you will need.

*When installing IBM i 6.1, together with the following common set Licensed Program Products (5761-SS1 opt.3, 5761-SS1 opt.12, 5761-SS1 opt.30, 5761-SS1 opt.33, 5761-SS1 opt.34, 5761-DG1, 5761-JC1, 5761-JV1 *base, 5761-JV1 opt.8, 5761-JV1 opt.11, 5761-TC1 and 5761-XW1 *base) the total storage needed for these parts sums up to about 11000MB. This is also the amount when installing IBM i 7.1 together with the V7R1 versions of the above LPPs.*

With temporary PTFs applied this will be more – so please PLAN.

Use the following command: **CRTNWSSTG** – followed by function key **F4**

Figure 3-6 shows you the values that were used for this guide (IBM i 6.1.1 client)

Please note that the NWSSIZE parm was set to 25600 (25GB), so that when you install the previous mentioned IBM i 6.1 LPPs (incl. the fixes), the percentage used in the Client partition will be around 70%.

```

                                Create NWS Storage Space (CRTNWSSTG)

Type choices, press Enter.

Network server storage space . . NWSSTG           > GOLDEN611
Size . . . . . NWSSIZE           > 25600
From storage space . . . . . FROMNWSSTG         *NONE
Format . . . . . FORMAT           > *OPEN
Data offset . . . . . OFFSET         *FORMAT
Auxiliary storage pool ID . . . ASP             1
ASP device . . . . . ASPDEV
Text 'description' . . . . . TEXT             Virtual disk with IBM i 6.1.1

                                                                    Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys

```

Figure 5.2

When this has finished you can look for a directory with the same name as your NWSSTG-name under the /QFPNWSSTG file system.

You can check this by using the command: **WRKLNK DSPORT(*ALL)** and navigate to /QFPNWSSTG etc.

5.3 Attach the Virtual Disk to the Server Description and make it available

When the NWSSTG object is created you will need to attach it to the NWSD object. This is done via WRKNWSSTG command. This will list all the Network Server Storage Spaces in the IBM i Host partition.

Type **WRKNWSSTG** and press **ENTER**.

The Work with Network Server Storage Spaces screen will be shown – see Figure 5.3-1

```

Work with Network Server Storage Spaces
System:
Type options, press Enter.
  1=Create  2=Change  3=Copy  4=Delete  5=Display  6=Print  10=Add link
  11=Remove link

Opt  Name      Server  Seq  Link  Access  Stg
     Name      Server  Seq  Type  Access  Path

10   GOLDEN611

Parameters or command
===>
F3=Exit  F4=Prompt  F5=Refresh  F6=Print list  F9=Retrieve
F11=Display disk status  F12=Cancel  F17=Position to
    
```

Figure 5.3-1

Use **option 10=Add link** in front of the storage space you have just created – this will prompt the ADDNWSSTGL command :

```

Add Server Storage Link (ADDNWSSTGL)
Type choices, press Enter.
Network server storage space . . NWSSTG      > GOLDEN611
Network server description . . . NWSD        > ICLIENT1
Dynamic storage link . . . . . DYNAMIC      *NO
Access . . . . . ACCESS                    *UPDATE
Drive sequence number . . . . . DRVSEQNBR   *CALC
Storage path number . . . . . STGPTHNBR     *DFTSTGPTH

Parameters or command
===>
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys
    
```

Figure 5.3-2

Specify the NWSD (Virtual Server) created earlier (ICLIENT1 or LNXCLNT1) - matching the Operating System / Partition you plan to install/run.

The following screenshots do show an IBM i Client partition, but the commands and steps can also be used for a Linux Client partition



When the command completes, you will return to the Work with Network Server Storage Spaces screen, and it should list the name of the virtual server to which the Storage Space is linked to:

```
Work with Network Server Storage Spaces                               System:
Type options, press Enter.
 1=Create  2=Change  3=Copy  4=Delete  5=Display  6=Print  10=Add link
 11=Remove link

Opt  Name          Server      Seq  Link      Stg
     Type          Access    Type
-----
    GOLDEN611     ICLIENT1   1   *DYN     *UPDATE

Bottom

Parameters or command
===>
F3=Exit  F4=Prompt      F5=Refresh  F6=Print list  F9=Retrieve
F11=Display disk status  F12=Cancel  F17=Position to
Network server storage space link added.
```

Figure 5.3-3

Next is to use the **WRKCFGSTS *NWS** command:

```
Work with Configuration Status                                     mm/dd/yy  hh:mm:ss
Position to . . . . . Starting characters

Type options, press Enter.
 1=Vary on  2=Vary off  5=Work with job  8=Work with description
 9=Display mode status  13=Work with APPN status...

Opt  Description      Status      -----Job-----
 1   ICLIENT1         VARIED OFF

Bottom

Parameters or command
===>
F3=Exit  F4=Promot  F12=Cancel  F23=More options  F24=More kevs
```

Figure 5.3-4

Use **option 1=Vary on** in front of the Network Server and press **ENTER** to make the objects available (virtual server and its attached virtual disk).

The status should change from VARIED OFF to ACTIVE:

```
Work with Configuration Status                                     mm/dd/yy  hh:mm:ss
Position to . . . . . Starting characters

Type options, press Enter.
 1=Vary on  2=Vary off  5=Work with job  8=Work with description
 9=Display mode status  13=Work with APPN status...

Opt  Description      Status      -----Job-----
     ICLIENT1         ACTIVE

Bottom

Parameters or command
===>
F3=Exit  F4=Promot  F12=Cancel  F23=More options  F24=More kevs
```

Figure 5.3-5

Now the virtual storage for your Client partition is ready for use and it is time to start/activate your Client partition. Continue with Chapter 6 for an IBM i Client partition or jump to Chapter 10 Starting the Linux Client partition

6. Starting the IBM i Client partition and install IBM i

Starting a partition depends on the virtualization configuration interface (VPM or HMC) that was used. The installation of IBM i in the Client partition is the same for both VPM and HMC and documented in Chapter 6.3 Installing IBM i in a Client Partition.

The easiest method for installing is to use physical media (CD/DVD), but you can also use an IMGCLG in the IBM i Host partition. Make sure that you have installed the CD/DVD labelled “I_BASE_01 Licensed Machine Code” in the DVD drive in the system unit before moving to the next step.

6.1 Using the Virtual Partition Manager (VPM) to start the IBM i Client partition

Before you start the IBM i Client partition make sure that you have set up your virtual LAN and configured the Ethernet Layer-2 bridged network. Refer to IBM i Support: Software Technical Document : 622246891 or IBM REDP4806.

Type **STRSST** and sign on with a service tool user profile that has the needed authorities (e.g. the default user QSECOFR). Within System Service Tools (SST), select **option 5. Work with system partitions**. In the Work with System Partitions screen select **option 2. Work with partition status**.

```

Work with Partition Status
System:
Type options, press Enter.
1=Power on      3=IPL restart  7=Delayed power off  8=Immediate power off
9=Mode normal  10=Mode manual
A=Source A     B=Source B    C=Source C          D=Source D

  Partition
Opt  Identifier  Name      IPL      IPL      State      Reference
     1          IBMIHOST  B        Normal   On         Codes
1   2          CLPAR1   D       Manual  Off

F3=Exit  F5=Refresh          F10=Monitor partition status
F11=Work with partition configuration  F12=Cancel  F23=More options

```

Figure 6.1-1

Check for **IPL Source ‘D’** and **IPL Mode Manual** and select **option 1=Power on** for the Client LPAR (CLPAR1 in this case). When the partition is starting, the DVD device should flash occasionally due to the reading of the CD/DVD.

Pressing **F10=Monitor partition status** will automatically refresh the Reference Codes column which should be advancing to SRC C6xx xxxx

```

Monitor Partition Status
System:
Partition
Identifier  Name      IPL      IPL      State      Sys IPL  Reference
              Name      Source  Mode     Action     Codes
1           IBMIHOST  B        Normal   On
2           CLPAR1   D        Manual   On         C600 4031

F3=Exit  F9=Include reference code detail  F12=Cancel

```

Figure 6.1-2

Start your Operations Console LAN and connect to the IBM i Client LPAR. (Note: When configuring LAN console, the Target partition value reflects the Partition Identifier value.)

Advance to Chapter 6.3 Installing IBM i in a Client Partition.

6.2 Using the Hardware Management Console (HMC) to start the IBM i Client partition

When a new IBM i partition is created the default settings for the boot mode are D-manual. You should check this by selecting your new IBM i partition on the HMC and select Properties. The Settings tab on the Partition Properties window should look like the following screen:

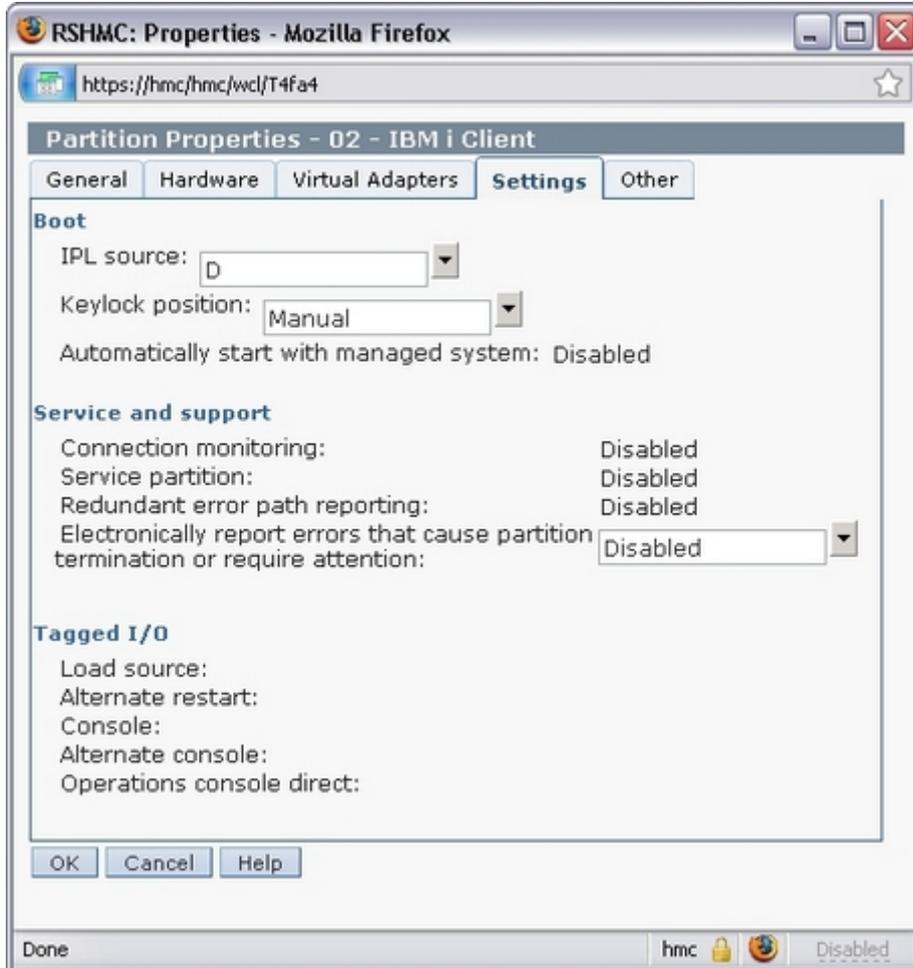


Figure 6.2-1

The Tagged I/O selection during the Create Logical Partition wizard designates the DVD drive you should use (Figure 4.2-13 on page 23).

Make sure that you have installed the CD/DVD labelled “I_BASE_01 Licensed Machine Code” in the DVD drive in the system unit or external DVD before moving to the next step.



When you have installed the CD/DVD labelled “I_BASE_01 Licensed Machine Code” you can start/activate the IBM i Client partition using the HMC:

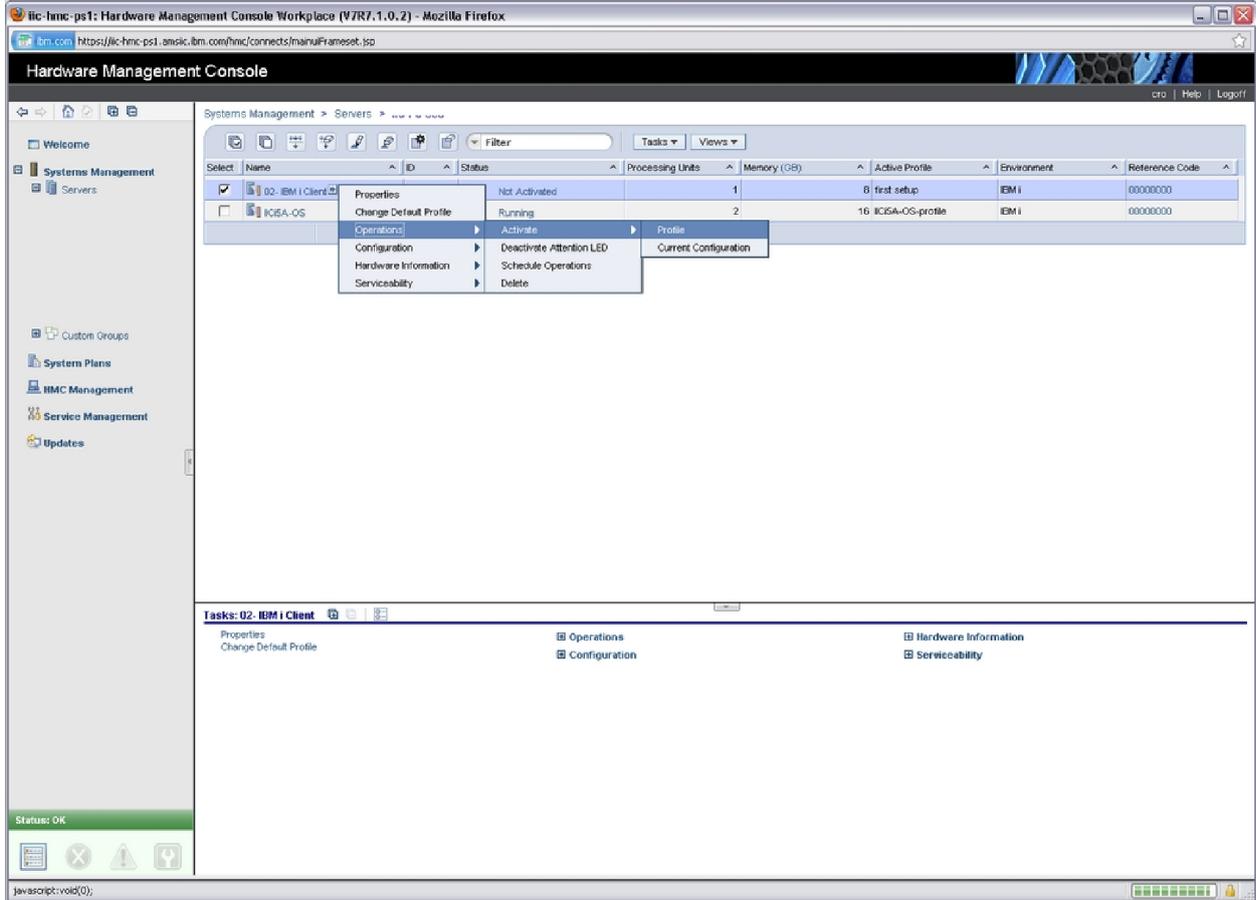


Figure 6.2-2

When the partition is starting, the DVD player should flash occasionally due to the reading of the CD/DVD.

You can also check on the HMC for the Reference Codes advancing to **SRC C6xx xxxx**.

Start a 5250 Console for the IBM i Client partition through the HMC and wait for the following screen to select the preferred language:



Figure 6.2-3

6.3 Installing IBM i in a Client Partition

After selecting the Language Feature wait for the system to advance to the Install Licensed Internal Code menu:

```

                                Install Licensed Internal Code

                                System:

Select one of the following:

    1. Install Licensed Internal Code
    2. Work with Dedicated Service Tools (DST)
    3. Define alternate installation device

Selection
  1

Licensed Internal Code - Property of IBM 5761-999 Licensed
Internal Code (c) Copyright IBM Corp. 1980, 2007. All
rights reserved. US Government Users Restricted Rights -
  
```

Figure 6.3-1

Select option 1. Install Licensed Internal Code, and wait for the Select Load Source Device screen:

```

                                Select Load Source Device

Type 1 to select, press Enter.

Opt  Serial number      Type  Model  Sys  Sys  I/O  I/O
   1  YLG5S3GGG687      6B22  050   255   2    0    0
                                Bus  Card Adapter  Bus  Ctl  Dev
                                0    0    0    0    0
  
```

Figure 6.3-2

In the **Select Load Source Device** screen type a "1" in front of the Type 6B22 Model 050 device. This is how the virtual disk (NWSSTG object) shows up in the IBM i Client partition. And press Enter, and in the confirmation screen press F10. When you have confirmed the Load Source Device, the system will advance to the following screen:

```

                                Install Licensed Internal Code (LIC)

Disk selected to write the Licensed Internal Code to:
   Serial Number      Type  Model  I/O Bus  Controller  Device
   YLG5S3GGG687      6B22  050    0    0          0
Select one of the following:

    1. Restore Licensed Internal Code
    2. Install Licensed Internal Code and Initialize system
    3. Install Licensed Internal Code and Recover Configuration
    4. Install Licensed Internal Code and Restore Disk Unit Data
    5. Install Licensed Internal Code and Upgrade Load Source

Selection
  2
F3=Exit          F12=Cancel
  
```

Figure 6.3-3

Select option 2. Install Licensed Internal Code and Initialize system followed by Enter and confirm with F10.

Wait for the console to return with the following screen:

```

Disk configuration Attention Report

Type option, press Enter.
 5=Display Detailed Report

Press F10 to accept all the following problems and continue.
The system will attempt to correct them.

Opt  Problem
    New disk configuration

F3= Exit   F10=Accept the problem and continue   F12=Cancel

```

Figure 6.3-7

Press **F10** to accept the 'problems' and continue.

After a short delay you will advance to the following screen:

```

IPL or Install the System
System:

Select one of the following:

1. Perform an IPL
2. Install the operating system
3. Use Dedicated Service Tools (DST)
4. Perform automatic installation of the operating system
5. Save Licensed Internal Code

Selection
 3

Licensed Internal Code - Property of IBM 5761-999 Licensed
Internal Code (c) Copyright IBM Corp. 1980, 2007. All
rights reserved. US Government Users Restricted Rights -

```

Figure 6.3-8

Select option **3. Use Dedicated Service Tools (DST)** and use the default Service Tools user id QSECOFR with default password QSECOFR (Uppercase !).

After changing the expired default password, you can check for the Configured disk unit status:

```

Display Disk Configuration Status

ASP Unit   Serial          Resource
Number     Type Model Name  Status
1          1 YLG5S3GGG687  6B22 050 DD001  Unprotected
                               Configured

Press Enter to continue.

F3=Exit      F5=Refresh      F9=Display disk unit details
F11=Disk configuration capacity  F12=Cancel

```

Figure 6.3-9



Please note that the virtual disk(s) created in an IBM i Host partition, will 'inherit' the storage protection used in the IBM i Host partition even though the status column on the IBM i Client partition shows Unprotected.

Next is to return to the IPL or Install the System menu and install the Operating System.

Use the IBM i and System i Information Centre (<http://publib.boulder.ibm.com/eserver/>) for instructions: Search for a PDF with number SC41-5120.

The title for the document is *Installing, upgrading, or deleting i5/OS and related software*.

(FYI: for this Chapter the V6R1-version was used)

Please note that before you start installing fixes, as part of completing the IBM i installation, you must **set** the **Keylock position** to **NORMAL** for your IBM i Client partition:

When using Virtual Partition Manager – go to Work with Partition Status screen and use option 9=Mode normal in front of the IBM i Client partition

When using Hardware Management Console - go to the Settings TAB in Partition Properties on HMC.

Figure 6.3-10 shows the installed set of IBM i 6.1 Operating System options and LPPs. It matches the list of common IBM i options and LPPs.

Maybe you want some additional LPPs installed in your Golden Code – or even a specific version of an application if you are an ISV.

The screenshot was taken after **GO LICPGM – option 10. Display installed licensed programs**

```
Display Installed Licensed Programs
System:  ICLIENT
Licensed  Installed
Program   Status      Description
5761SS1   *COMPATIBLE Library QGPL
5761SS1   *COMPATIBLE Library QUSRSYS
5761SS1   *COMPATIBLE i5/OS
5761SS1   *COMPATIBLE Extended Base Support
5761SS1   *COMPATIBLE Online Information
5761SS1   *COMPATIBLE Extended Base Directory Support
5761SS1   *COMPATIBLE Host Servers
5761SS1   *COMPATIBLE Qshell
5761SS1   *COMPATIBLE Portable App Solutions Environment
5761SS1   *COMPATIBLE Digital Certificate Manager
5761DG1   *COMPATIBLE IBM HTTP Server for i5/OS
5761JC1   *COMPATIBLE IBM Toolbox for Java
5761JV1   *COMPATIBLE IBM Developer Kit for Java
5761JV1   *COMPATIBLE J2SE 5.0 32 bit
5761JV1   *COMPATIBLE Java SE 6 32 bit
5761TC1   *COMPATIBLE IBM TCP/IP Connectivity Utilities for i5/OS
5761XW1   *COMPATIBLE IBM System i Access Family

Bottom

Press Enter to continue.
```

Figure 6.3-10

7. Upgrading your NWSSTG to a new release

With the availability of new IBM i release it makes sense to create an extra virtual disk in order to start testing with that new release in a client partition. This Chapter will show you how create a copy of an IBM i 6.1.1 Goldencode and upgrade that copy to IBM i 7.1 using an image catalog in the IBM i Host partition.

As an alternative you can also build a new IBM i v7.x Goldencode from scratch by repeating the steps in Chapter 5.2 Create the Virtual Disk (NWSSTG object) through Chapter 6. Starting the IBM i Client partition and install IBM i.

FYI: All these steps were done remotely through a VPN without the need to have physical access to the HMC and/or system.

7.1 Creating a copy of the IBM i 6.1.1 Goldencode NWSSTG

IMPORTANT NOTE: In order to perform the next steps, your Golden611 can not be used by an active IBM i Client partition. Please check.

In the next steps you will create a copy of the IBM i 6.1.1 Goldencode NWSSTG and use that copy to perform the upgrade to IBM i 7.1.

Type **WRKNWSSTG** and press ENTER. The Work with Network Server Storage Spaces screen will be shown:

```

Work with Network Server Storage Spaces
System:
Type options, press Enter.
 1=Create  2=Change  3=Copy  4=Delete  5=Display  6=Print  10=Add link
 11=Remove link

Opt  Name          Server  Seq  Link  Stg
     Name          Server  Seq  Type Access Path

 3   GOLDEN611

Parameters or command
====>
F3=Exit  F4=Prompt  F5=Refresh  F6=Print list  F9=Retrieve
F11=Display disk status  F12=Cancel  F17=Position to

Bottom

```

Figure 7.1-1

Use **option 3=Copy** in front of the storage space – this will prompt the CRTNWSSTG command as shown below

```

Create NWS Storage Space (CRTNWSSTG)
Type choices, press Enter.
Network server storage space . . . NWSSTG          GOLDEN71
Size . . . . . NWSSIZE          > 25603
From storage space . . . . . FROMNWSSTG          > GOLDEN611
Data offset . . . . . OFFSET          *FORMAT
Auxiliary storage pool ID . . . ASP          > 1
ASP device . . . . . ASPDEV
Text 'description' . . . . . TEXT          Golden Code IBM I 7.1

Bottom
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display

```

Figure 7.1-2



Give the new NWSSTG object a meaningful name – e.g. GOLDEN71 – and change any of the other parameters if you want to. When you press **ENTER** you will get the message on the bottom of your screen giving you the status of the creation. When this is finished you will return to the Work with Network Storage Spaces screen.

Next is to attach this copied NWSSTG to a NWSD so we can start using this new (copied) virtual disk.

7.2 Attaching your copied NWSSTG to the Server Description and make it available

By copying the IBM i 6.1.1 Goldencode you have created a clone of that virtual disk, which can be used as a starting point for the upgrade to IBM i 7.1.

The steps in this Chapter are very similar to those in Chapter 5.3 Attach the Virtual Disk to the Server Description and make it available. Except this time you have the copied NWSSTG object to work with.

If you are not in the Work with Network Server Storage Spaces screen, type **WRKNWSSTG** and press **ENTER**.

The Work with Network Server Storage Spaces screen will be shown as seen below

```
Work with Network Server Storage Spaces                               System:
Type options, press Enter.
 1=Create  2=Change  3=Copy   4=Delete  5=Display  6=Print  10=Add link
11=Remove link

Opt  Name          Server  Seq  Link  Stg
     Name          Server  Seq  Type Access Path

10   GOLDEN611
     GOLDEN71

Parameters or command
====>
F3=Exit   F4=Prompt   F5=Refresh  F6=Print list  F9=Retrieve
F11=Display disk status  F12=Cancel   F17=Position to

Bottom
```

Figure 7.2-1

Use **option 10=Add link** in front of the newly copied storage space – this will prompt the ADDNWSSTGL command – type the name of the NWSD (Virtual Server) you will be using and press **ENTER**:

```
Add Server Storage Link (ADDNWSSTGL)
Type choices, press Enter.
Network server storage space . . NWSSTG          > GOLDEN71
Network server description . . . NWSD            > ICLIENT1
Dynamic storage link . . . . . DYNAMIC          *NO
Access . . . . . ACCESS                       *UPDATE
Drive sequence number . . . . . DRVSEQNBR      *CALC
Storage path number . . . . . STGPTHNBR        *DFTSTGPTH

Bottom
F3=Exit   F4=Prompt   F5=Refresh  F12=Cancel   F13=How to use this display
F24=More kevs
```

Figure 7.2-2

When the command completes you will return to the Work with Network Server Storage Spaces screen, and it should list the name of the server with its linked Storage Space as shown in Figure 7.2-3 on the next page.

```

Work with Network Server Storage Spaces
System:
Type options, press Enter.
 1=Create  2=Change  3=Copy  4=Delete  5=Display  6=Print  10=Add link
 11=Remove link

Opt  Name          Server  Seq  Link  Stg
     Name          Server  Seq  Type Access Path

     GOLDEN611
     GOLDEN71  ICLIENT1  1  *DYN *UPDATE

Parameters or command
===>
F3=Exit  F4=Prompt  F5=Refresh  F6=Print list  F9=Retrieve
F11=Display disk status  F12=Cancel  F17=Position to
Network server storage space link added
Bottom

```

Figure 7.2-3

Next is to use the **WRKCFGSTS *NWS** command:

```

Work with Configuration Status
04/05/12 hh:mm:ss
Position to . . . . . Starting characters

Type options, press Enter.
 1=Vary on  2=Vary off  5=Work with job  8=Work with description
 9=Display mode status  13=Work with APPN status...

Opt  Description          Status          -----Job-----
1  ICLIENT1              VARIED OFF

Parameters or command
===>
F3=Exit  F4=Prompt  F12=Cancel  F23=More options  F24=More keys
Bottom

```

Figure 7.2-4

Use **option 1=Vary on** in front of the Network Server and press **ENTER** to make the objects available (virtual server and its attached virtual disk).

This should change the status from VARIED OFF to ACTIVE:

```

Work with Configuration Status
04/05/12 hh:mm:ss
Position to . . . . . Starting characters

Type options, press Enter.
 1=Vary on  2=Vary off  5=Work with job  8=Work with description
 9=Display mode status  13=Work with APPN status...

Opt  Description          Status          -----Job-----
     ICLIENT1              ACTIVE

Parameters or command
===>
F3=Exit  F4=Prompt  F12=Cancel  F23=More options  F24=More keys
Bottom

```

Figure 7.2-5

Next is to start your IBM i Client partition which will be using the newly copied virtual disk. Perform a so called Normal IPL from the B-side.



7.3 Upgrading using Image Catalogs in the IBM i Host Partition

This is not a replacement for the official upgrade documentation which can be found in the IBM i Information Center.

The IBM i and System i Information Center is available via: <http://publib.boulder.ibm.com/eserver/>

Instead of working with physical IBM i distribution media (DVDs), this guide will show you on how you can take advantage of a new way of working using electronic software distribution.

All the IBM i install media is available in an Image Catalog in the IBM i Host partition. How you can do that is also explained in the IBM i Information Center and not addressed in this guide.

An Image Catalog is accessible from within the IBM i Host partition through a virtual optical library (OPTVRTxx) in that IBM i Host partition. In the IBM i Client partition this will show up as a optical device TYPE 632C.

After signing on to the Console-session of your IBM i Client partition, type **GO LICPGM** and **select option 5. Prepare for Install** as shown below.

```
LICPGM                                Work with Licensed Programs                                System:  ICLIENT
Select one of the following:

Manual Install
  1. Install all

Preparation
  5. Prepare for install

Licensed Programs
  10. Display installed licensed programs
  11. Install licensed programs
  12. Delete licensed programs
  13. Save licensed programs

Selection or command
====> 5

F3=Exit   F4=Prompt   F9=Retrieve   F12=Cancel   F13=Information Assistant
F16=System Main menu
(C) COPYRIGHT IBM CORP. 1980, 2009.

More...
```

Figure 7.3-1

You will advance to the Prepare for Install tasks items screen:

```
Prepare for Install                                System:  ICLIENT
Type option, press Enter.
  1=Select

Opt   Description
  1   Work with licensed programs for target release
      Work with licensed programs to delete
      List licensed programs not found on media
      Display licensed programs for target release
      Work with software agreements
      Work with user profiles
      Verify system objects
      Estimate storage requirements for system ASP
      Allocate additional space for LIC
      Keep disk configuration

F3=Exit   F9=Command line   F10=Display job log   F12=Cancel

Bottom
```

Figure 7.3-2

Use **1=Select** in front of the **Work with licensed programs for target release** item and press **ENTER**. You will advance to the Work with Licensed Programs for Target Release details screen:

```

Work with Licensed Programs for Target Release
System: ICLIENT
Type choices, press Enter.
Generate list from      1          1=Distribution media
                               2=Merge with additional distribution
                               media
                               3=Modify previously generated list
Optical device . . .   OPT02      *NONE, Name
Target Release . . .   V7R1M0     VxRxMx
F3=Exit   F12=Cancel

```

Figure 7.3-3

Complete the parameters.

Please note that in this guide the Image Catalog in the IBM i Host partition showed up as OPT02 in the IBM i Client partition. Press **ENTER** to start.

After a short delay you can expect a message for QSYSOPR on the bottom of your screen:

```

Waiting for reply to message on message queue QSYSOPR.

```

When you examine the details you will find that the optical device is empty. This is correct because we did not load the Image Catalog containing the IBM i 7.1 images into the virtual optical in the IBM i Host partition.

Sign on to the IBM i Host partition and type **WRKIMGCLG** followed by **ENTER**.

```

Work with Image Catalogs
System:
Type options, press Enter.
 1=Create  2=Change  4=Delete  8=Load  9=Unload  10=Verify
12=Work with entries

```

Opt	Image Catalog	Status	Type	ASP Threshold	Device	Device Status
12	IBMI7.1	Not ready	Optical	*CALC		
	SF99710	Not ready	Optical	*CALC		
	GROUPPTFS	Not ready	Optical	*CALC		

```

F3=Exit   F5=Refresh   F11=View descriptions   F12=Cancel
Bottom

```

Figure 7.3-4

When you use **option 12=Work with entries** you will get a screen similar to Figure 7.3-5 on the next page.

```

Work with Image Catalog Entries

Catalog . . . :  IBMI7.1                Status . . . :  System:
Type . . . . :  Optical                Device . . . :  Not ready
Directory . . :  /images/ibmi7.1

Type options, press Enter.
 1=Add   2=Change   4=Remove   6=Mount   8=Load   9=Unload
10=Initialize volume  12=Work with volume

Opt  Index  Status      Image File Name
*AVAIL
   1  Mounted  I_BASE_01
   2  Loaded   B_GROUP1_01
   3  Loaded   B_GROUP1_02
   4  Loaded   B_GROUP1_03
   5  Loaded   B_GROUP1_04
   6  Loaded   B_GROUP1_05

F3=Exit   F5=Refresh   F6=Load/Unload image catalog   F7=Verify image catalog
F8=Reorder by index   F12=Cancel   F24=More keys
Bottom

```

Figure 7.3-5

Make sure that you have **I_BASE_01** with a status **Mounted** as shown above – use **6=Mount**
 Use F12 to get back to the Work with Image Catalogs screen and use **option 8=Load** in front of the Image Catalog with your IBM i 7.1 images. For this guide it was called IBMI7.1:

```

Work with Image Catalogs

Type options, press Enter.
 1=Create  2=Change  4=Delete  8=Load  9=Unload  10=Verify
12=Work with entries

Image
Opt  Catalog      Status      Type      ASP      Device      Device
      Status
8  IBMI7.1        Not ready   Optical   *CALC
      SF99710      Not ready   Optical   *CALC
      GROUPPTFS   Not ready   Optical   *CALC

F3=Exit   F5=Refresh   F11=View descriptions   F12=Cancel
Bottom

```

Figure 7.3-6

When you press ENTER you will be prompted with the LODIMGCLG command:

```

Load or Unload Image Catalog (LODIMGCLG)

Type choices, press Enter.

Image catalog . . . . . > IBMI7.1      Name
Option . . . . . > *LOAD             *LOAD, *UNLOAD
Virtual device . . . . . optvrt01     Name
Write protect . . . . . *DFT         *DFT, *ALL, *NONE
Library mode . . . . . *NO           *NO, *YES

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
Bottom

```

Figure 7.3-7

For this guide OPTVRT01 was being used.



When the command completes, you will return to the following screen, where you can verify that everything is ready now on the IBM i Host partition so that the IBM i Client partition can access the images in your Image Catalog. Your screen should look similar to the one below.

```
Work with Image Catalogs                                     System:
Type options, press Enter.
  1=Create   2=Change   4=Delete   8=Load   9=Unload   10=Verify
  12=Work with entries

  Image
Opt  Catalog      Status      Type      ASP      Device      Device
      Catalog      Status      Type      Threshold Device      Status
      IBMI7.1      Ready     Optical   *CALC     OPTVRT01    Active
      SF99710     Not ready  Optical   *CALC
      GROUPTFS    Not ready  Optical   *CALC

F3=Exit   F5=Refresh   F11=View descriptions   F12=Cancel
Image catalog IBMI7.1 loaded.                                Bottom
```

Figure 7.3-8

Now you can switch to the Console of your IBM i Client partition and again have a look at the messages. There should be a message stating that Volume I_BASE_01 was added to the optical device. Now you can continue the preparation by replying with a 'G'. After a short delay you can receive a message again stating to Load the next volume.

This depends on the **IBM i version** used in the **Hosting partition**: prior to **IBM i V7R1-TR2** the Image Catalog in the IBM i Host partition was virtualized as a device and not as a library. So, if your IBM i host partition is not running IBM i V7R1-TR2 or higher, you will need to mount the next image(s) yourself :

```
Additional Message Information

Message ID . . . . . : CPA3DDE
Date sent . . . . . : dd/mm/yy      Time sent . . . . . : hh:mm:ss

Message . . . . . : Load the next volume in optical device OPT02. (X G)

Cause . . . . . : Another volume is needed to continue processing.
Recovery . . . . . : Only volumes containing licensed programs are valid for
this process. Check the media label to determine if the volume contains
licensed programs. Software distribution media containing licensed programs
can be labeled in one of the following ways:
-- Volume Identifier of B29xx_yy.
-- Volume Identifier of L29xx_yy.
-- Volume Identifier of F29xx_yy.
-- Licensed Programs shipped on a single set.
The 29xx indicates the primary language of the system and yy can be any
More...

Type reply below, then press Enter.
Reply . . . . . G
```

Figure 7.3-9

In order to load the next volume, you will need to switch to the session on the IBM i Host partition and mount the next entry in the Image Catalog. You can do this by navigating to your Image Catalog and use **option 6=Mount** in front of the next entry (for reference you can use Figure 7.3-5).

When the status shows Mounted for the next Image file, you can return to the Console of the IBM i Client partition and you should see a message for QSYSOPR stating that corresponding volume is added to optical device

Repeat the mounting of the images (in the IBM i Host partition) and replying with 'G' on the IBM i Client partition for all images in the Image Catalog using the previous instructions.

After you have mounted the last image (B_GROUP1_05) and are done processing it on the IBM i Client partition, you can reply with 'x' on the next message stating to load the next volume. This will present a screen similar to Figure 7.3-10 on the next page.

```

Work with Licensed Programs for Target Release
System: ICLIENT
Target release . . . . . : V7R1M0
Estimated additional storage for selections (M) . . . : 692.07

Type options, press Enter.
  1=Select  5=Display release-to-release mapping

Licensed Product
Opt Program Option Description
  1 5770999 *BASE Licensed Internal Code
  1 5770SS1 *BASE i5/OS
  1 5770SS1 Library QGPL
  1 5770SS1 Library QUSRSYS
  1 5770SS1 1 Extended Base Support
  5770SS1 2 Online Information
  1 5770SS1 3 Extended Base Directory Support
  5770SS1 5 System/36 Environment
  5770SS1 6 System/38 Environment

More...

F3=Exit F11=Display additional storage F12=Cancel
F19=Display trademarks

```

Figure 7.3-10

After making your selections, the Prepare for install task is ready and you will return to the following screen:

```

Prepare for Install
System: ICLIENT

Type option, press Enter.
  1=Select

Opt Description
Work with licensed programs for target release
Work with licensed programs to delete
List licensed programs not found on media
Display licensed programs for target release
Work with software agreements
Work with user profiles
Verify system objects
Estimate storage requirements for system ASP
Allocate additional space for LIC
Keep disk configuration

Bottom

F3=Exit F9=Command line F10=Display job log F12=Cancel
Task to prepare for install successfully completed

```

Figure 7.3-11

Next is to accept the software agreements for the licensed programs that will be installed. Use **1=Select** in front of the item **“Work with software agreements”**.

Make your selections and use **5=Display** in front of every item and use **F15=Accept All** for the items you want.

Now you are almost there to start the upgrade. First you will need to make sure that the correct image file has a status of mounted on the IBM i Host partition. So switch to the IBM i Host partition screen and make sure that **I_BASE_01** is **Mounted** – it should look like Figure 7.3-5 and after that you can check for a QSYSOPR message on your IBM i Client partition stating that **I_BASE_01** is added to optical device.



Start the automatic installation on the IBM i Client partition by using the following command:

```
Power Down System (PWRDWN SYS)

Type choices, press Enter.

How to end . . . . . OPTION          *IMMED
Controlled end delay time . . . DELAY    3600
Restart options:
  Restart after power down . . .      *YES
  Restart type . . . . .              *IPLA
IPL source . . . . . IPLSRC          D

Bottom
F3=Exit   F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
F13=How to use this display   F24=More keys
```

Figure 7.3-12

After a couple of minutes, the 5250 Console on the IBM i Client partition will return with the following screen:

```
Install Licensed Internal Code - Status

Install of the Licensed Internal Code in progress.

+-----+
Percent | ██████████ 35% |
complete +-----+

Elapsed time in minutes . . . . . : 0.5
Please wait.
```

Figure 7.3-13

When the Licensed Internal Code install step completes, the install continues. Depending on the IBM i version used in the Hosting partition you will get a message CPA2055 which instructs you to load the next volume: prior to IBM i V7R1-TR2 the Image Catalog in the IBM i Host partition was virtualized as a device and not as a library. So, if your IBM i host partition is not running IBM i V7R1-TR2 or higher, you will need to mount the next image(s) yourself. This is done on the IBM i Host partition by mounting the next image in your Image Catalog. Continue the upgrade of the Operating System and Licensed Programs and mount the correct image when instructed to do so.

8. Backup and Recovery

This section explains how you can backup and recover an IBM i Client partition

It addresses 2 options - Disaster Recovery and object-based backup/restore - which you can use to save and restore the contents of the IBM i Client partition.

8.1 Disaster Recovery backup and restore

Because the virtual disk is a NWSSTG object in the IBM i Host partition, the simplest way of saving the entire disk space is to save it from the IBM i Host partition. This creates a so called image backup of the entire IBM i Client partition and is ideal for Disaster Recovery.

Important: This requires the IBM i Client partition being shutdown and the NWSD in VARIED OFF state before you can save the virtual disk. Otherwise the object is in use and you will be unable to save it.

The IBM i Host partition treats the NWSSTG as a single object, so you do not have an easy option of restoring individual files from within the disk space directly.

You can use the following command to save a specific NWSSTG object:

```
SAV DEV('/QSYS.LIB/TAP0x.DEVD') OBJ('/QFPNWSSTG/virtual_disk_name'))
```

The accompanying restore command to restore a specific NWSSTG object is:

```
RST DEV('/QSYS.LIB/TAP0x.DEVD') OBJ('/QFPNWSSTG/virtual_disk_name'))
```

Please change the TAP0x to the tape device name you are using and the *virtual_disk_name* in the command to the name of your virtual disk you created in Chapter 5.2 Create the Virtual Disk (NWSSTG object). In this guide it was GOLDEN611.

TIP: In order to view the files created under /QFPNWSSTG using the WRKLNK command you should use the following options:

```
WRKLNK DSPOPT(*ALL)
```

Of course you can also use iNav or Systems Director Navigator for i to browse the IFS.

Please note that whenever you do a backup of your IFS (e.g. GO SAVE – option 21, SAV-cmd, etc) you will need to make sure that your IBM i Client partition is in a state so it can be backed up.

8.2 Saving and restoring objects from/to an IBM i Client partition

The options for saving and restoring objects from within an IBM i Client partition, depends on the use of VPM or HMC and on the level of IBM i used in the hosting partition:

Only with a HMC you can switch a supported physical tape unit/library into an IBM i Client partition and use it. You can not assign a physical tape device when using VPM.

If the IBM i Host partition is running IBM i V7R1-TR2 or newer (when VPM was used, you run V7R1-TR3 or newer) you can access a supported tape unit (InfoAPAR I14615) through the virtual SCSI connection (this means that you do not have Tape-library functionality). Check IBM i Support: Software Technical Document: 605169131 for a list supported devices and required PTFs. You will need to vary off the device in the Host partition in order for the IBM i Client partition to use it.

9. Automating the start of your IBM i Client partition

This chapter explains how you can automate the start of your IBM i Client partition by just varying its associated NWSD.

- For VPM managed systems this is done by setting the ONLINEat IPL parameter to *YES in the NWSD.
- For an HMC managed system you will need to make some changes to the NWSD **and** the partition profile as shown in the next steps:

Before you can make the changes, make sure you have issued a PWRDWNSYS on your IBM i Client partition and that you have Varied Off the corresponding NWSD.

First you will need to edit the NWSD and set/change the following 2 parameters:

PWRCTL *YES and IPLSOURCE *PANEL

```

Change Network Server Desc (CHGNWSD)

Type choices, press Enter.

Restricted device resources . . . RSTDDEVRSC      *SAME
                               + for more values
Network server configuration:  NWSCFG
  Remote system name . . . . . *SAME
  Connection security name . . .
Virtual Ethernet control port . VRTETHCTLP      *SAME
Synchronize date and time . . . SYNCTIME        *SAME
Disable user profiles . . . . . DSBUSRPRF       *SAME
IPL source . . . . . IPLSRC                     *PANEL
IPL stream file . . . . . IPLSTMF               *SAME

IPL parameters . . . . . IPLPARM                *SAME

Power control . . . . . PWRCTL                  *YES

F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
More...

```

Figure 9-1

Next is to add the Power Controlling partition to the partition profile of the IBM i Client partition.

Navigate to the IBM i Client partition profile on the HMC and select edit – this is shown in Figure 9-2

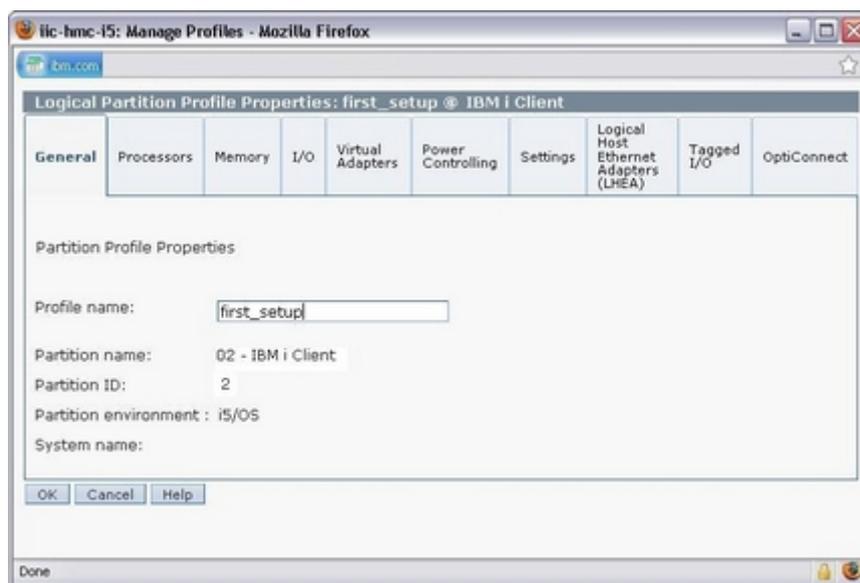


Figure 9-2

Next is to select the Power Controlling tab as shown in Figure 9-3 on the next page.

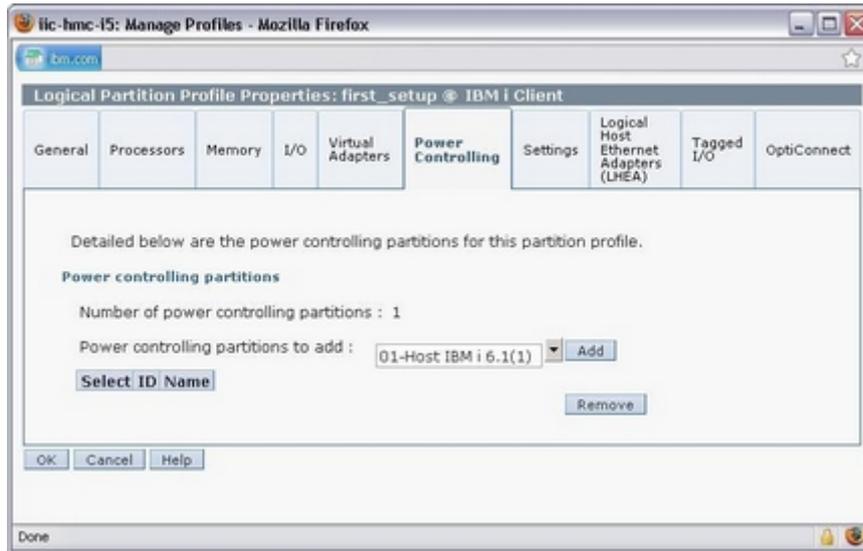


Figure 9-3

From the drop down list, select the partition that is your IBM i Host partition and click Add. This guide used 01-Host IBM i 6.1.

Once you have added the Power controlling partition the panel should look similar to Figure 9-4.



Figure 9-4

After completing these steps you can start the IBM i Client partition by just varying on the NWSD.

NOTE: At the moment it is not possible to shutdown the partition by varying off the NWSD.

The sequence to shutdown your IBM i Client partition is as follows:

- 1) On the IBM i Client partition issue a PWRDWN SYS
- 2) Use the HMC to monitor the progressing D6xx SRCs and wait until the IBM i Client partition shows 'Not Activated' for its status.
- 3) When you want vary off the NWSD, you will need to prompt the vary off command using <F4> and set the parameter FRCVRYOFF *YES.

10. Starting the Linux Client partition and install Linux

Starting a partition depends on the virtualization configuration interface (VPM or HMC) that was used. The installation of Linux in the Client partition is the same for both VPM and HMC and documented in Chapter 10.3 Installing Linux in a Client Partition.

The simplest method for installing is to use physical media (CD/DVD), but you can also use an IMGCLG in the IBM i Host partition. Make sure that you have installed the Linux distribution media in the DVD drive in the system unit before moving to the next step.

10.1 Using the Virtual Partition Manager (VPM) to start the Linux Client partition and the Virtual Console

After a Linux partition is created and your NWSD is varied on, the first activation needs to be in what is called SMS mode and you will need to access the Virtual console. This Virtual Console is a special console option which can be used at initial installation (where TCP/IP configuration has not yet been done on the Linux partition) or for trouble shooting when your Linux partition becomes inaccessible to the LAN.

10.1.1 Virtual Console

The Virtual Console is served by the IBM i Host partition's Telnet server and through Service Tools. Before you start you should create a **new Service Tools Userid** with User Privilege **System partitions – operations** set to **Granted**.

Perform the following steps in order to start and connect the Virtual Console. From a Telnet client log in to the IBM i Host partition (I am using PuTTY in this guide) using **port 2301** (instead of default port 23)

Figure 10.1.1-1

You will get a screen similar to the one below

```

Enter the console partition number:
Guest Partition Consoles
    2: LNXCLNT1 (V1-C4/V2-C0)

Enter the console partition number:
2
    
```

Figure 10.1.1-2

Select the right partition number and press Enter in order to advance to service tools userid and password prompt in order to validate credentials

```

LNXCLNT1: Enter service tools userid:
virtcons
LNXCLNT1: Enter service tools password:
LNXCLNT1: Console connecting...
LNXCLNT1: Console connected.
    
```

Figure 10.1.1-3



When the screen says Console connected you can start the Linux Client partition using VPM.

Remember: before you start the Linux Client partition make sure that you have set up your virtual LAN and configured the Ethernet Layer-2 bridged network. Refer to IBM i Support: Software Technical Document : 622246891 or IBM REDP4806.

Type **STRSST** and sign on with a service tool user profile that has the needed authorities (e.g. the default user QSECOFR). Within System Service Tools (SST), select **option 5. Work with system partitions**. In the Work with System Partitions screen select **option 2. Work with partition status**.

```
Work with Partition Status

Type options, press Enter.
1=Power on      3=IPL restart  7=Delayed power off  8=Immediate power off
9=Mode normal  10=Mode manual
A=Source A      B=Source B     C=Source C           D=Source D

Partition      IPL      IPL      Reference
Opt Identifier  Name     Source   Mode     State    Codes
1              1        IBMIHOST B        Normal  On
1           2        LNXCLNT1 D        Manual Off

F3=Exit  F5=Refresh  F10=Monitor partition status
F11=Work with partition configuration  F12=Cancel  F23=More options
```

Figure 10.1.1-4

Check for **IPL Mode Manual** and select **option 1=Power on** for the Client LPAR (LNXCLNT1 in this case). When the partition is starting, the DVD device should flash occasionally due to the reading of the CD/DVD.

Pressing **F10=Monitor partition status** will automatically refresh the Reference Codes column which should be advancing to SRC AA00 E1A9

```
Monitor Partition Status

Partition      IPL      IPL      Sys IPL  Reference
Identifier  Name     Source   Mode     State    Action  Codes
1              1        IBMIHOST B        Normal  On
2              2        LNXCLNT1 D        Manual  On      AA00 E1A9

F3=Exit  F9=Include reference code detail  F12=Cancel
```

Figure 10.1.1-5

Continue with Chapter 10.3 to navigate through the correct SMS options and start the installation.

10.2 Using the Hardware Management Console (HMC) to start the Linux Client partition and the Virtual Console

After a Linux partition is created, the first activation needs to be in what is called SMS mode – this is done using the HMC using the following steps.

In the HMC navigate to Systems Management – Servers and select your Linux Client partition. Click Operations – Activate – Profile.

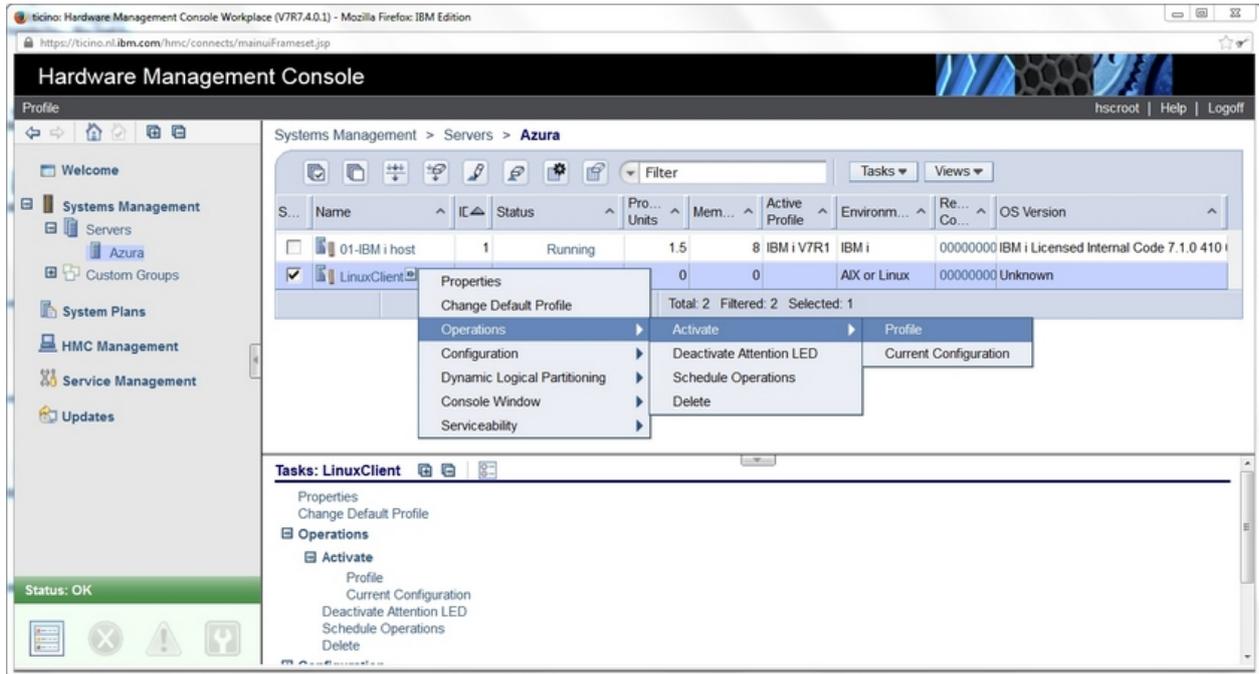


Figure 10.2-1

A new window called Activate Logical Partition will appear as shown in Figure 10.2-2

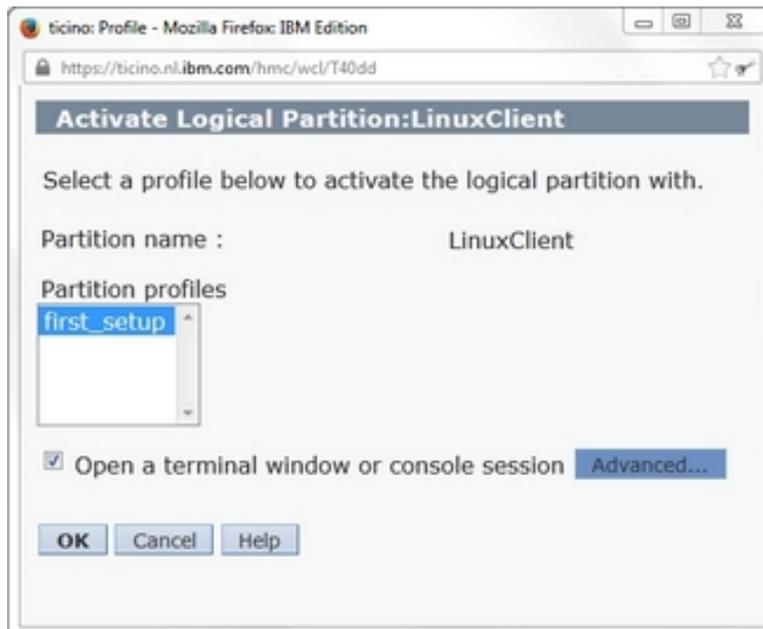


Figure 10.2-2

Mark checkbox Open a terminal window or console session and click **Advanced.**

This will open the Activate Logical Partition – Advanced panel, where you can override the Boot mode:

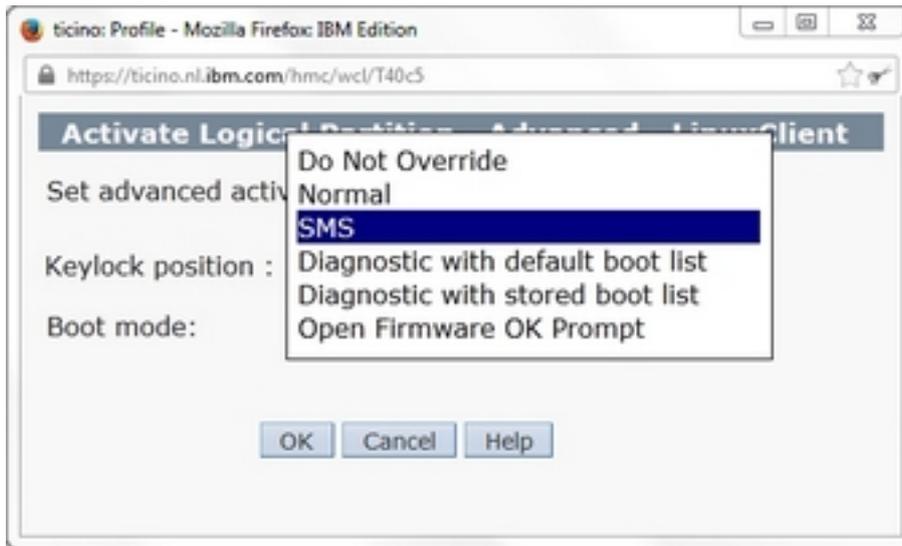


Figure 10.2-3

Select **SMS** from the drop down and **Click** OK to return to Activate Logical Partition panel. Click **OK** again to activate the partition and open a java based terminal window which is your Virtual Console

10.3 Navigating through SMS and boot your Linux Client partition using the Virtual Console

Once you have started your Linux Client partition in either of the previous chapters (VPM managed or HMC managed), the Linux Client partition will boot and halt in the SMS menu in your Virtual Console window:

```
Version SF240_417
SMS 1.6 (c) Copyright IBM Corp. 2000,2005 All rights reserved.
-----
Main Menu
1.  Select Language
2.  Setup Remote IPL (Initial Program Load)
3.  Change SCSI Settings
4.  Select Console
5.  Select Boot Options
-----
Navigation Keys:
                                     X = eXit System Management Services
-----
Type menu item number and press Enter or select Navigation key:5
```

Figure 10.3-1

Type **5 (Select Boot Options)** and press **Enter**.

You will advance to the Multiboot menu – Type **1 (Select Install/Boot Device)** and press **Enter**

You will advance to the Select Device Type menu – Type **7 (List all Devices)** and press **Enter**

Select the Device **Number** for the boot device of your choice and press **Enter** (Note that if you use Virtual Media mounted in the IBM i host LPAR this will also show up as a SCSI CD-ROM).

On the next menu select **2 (Normal Mode Boot)** and press **Enter**

Next is the question ‘Are you sure you want to exit System Management Services?’

select **1 (Yes)** and press **Enter**.

The partition will boot from the media selected and will show a screen similar to Figure 10.3-2 on the next page.



```

IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM           STARTING SOFTWARE           IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM           PLEASE WAIT...           IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM           IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
-
Elapsed time since release of system processors: 1443032 mins 48

```

Figure 10.3-2

Eventually the system will halt at a boot/install prompt - the follow on steps are dependent on the Linux distribution you are installing.

Continue with Chapter 10.4 Installing SLES11 or Chapter 10.5 Installing RHEL65

10.4 Installing SLES11

And it will wait for input on the following screen:

```

yaboot starting: loaded at 00040000 000676d8 (0/0/00c39a68; sp: 018dff0)
Config file 'yaboot.cnf' read, 285 bytes

Welcome to SuSE Linux Enterprise 11!

Type "install"  to start the YaST installer on this CD/DVD
Type "slp"      to start the YaST install via network
Type "rescue"   to start the rescue system on this CD/DVD

Welcome to yaboot version r22.8-r1190.SuSE
booted from '/vdevice/v-
scsi@30000004/disk@8120000000000000:1,\suseboot\yaboot.i
bm'
running with firmware 'IBM,SF240_417' on model 'IBM,9406-520', serial
'IBM,0210F
7BCE', partition 'LinuxClient'
Enter "help" to get some basic usage information
boot:

```

Figure 10.4-1

In order to install SLES11 in an easy graphical way, you can use VNC. Download and install a VNC viewer onto your workstation. Type the following in the Virtual Console at boot prompt: **install vnc=1 vncpassword=some_password** and press **Enter**. This is shown in Figure 10.4-2 on the next page

```
yaboot starting: loaded at 00040000 000676d8 (0/0/00c39a68; sp: 018dff0)
Config file 'yaboot.cnf' read, 285 bytes

Welcome to SuSE Linux Enterprise 11!

Type "install" to start the YaST installer on this CD/DVD
Type "slp"      to start the YaST install via network
Type "rescue"  to start the rescue system on this CD/DVD

Welcome to yaboot version r22.8-r1190.SuSE
booted from '/vdevice/v-
scsi@30000004/disk@812000000000000:1,\suseboot\yaboot.i
bm'
running with firmware 'IBM,SF240_417' on model 'IBM,9406-520', serial
'IBM,0210F
7BCE', partition 'LinuxClient'
Enter "help" to get some basic usage information
boot: install vnc=1 vncpassword=thisiseasy
```

Figure 10.4-2

After this the SLES 11 Linux partition will boot and ask for Automatic configuration via DHCP Yes or No:

```
mount: /parts/01_usr: we need a loop device
mount: using /dev/loop1
>>> SUSE Linux Enterprise Server 11 installation program v3.3.91 (c) 1996-
2010 S
USE Linux Products GmbH <<<
Starting udev... ok
Loading basic drivers... ok
Starting hardware detection... ok
(If a driver is not working for you, try booting with
brokenmodules=driver_name.
)
IBM Virtual SCSI 0
  drivers: ibmvscsic*
IBM Virtual Ethernet card 0
  drivers: ibmveth*

Automatic configuration via DHCP?
1) Yes
2) No

> 1
```

Figure 10.4-3

After selecting 1 (Yes) the Linux server continues to boot and waits in the following screen as shown in Figure 10.4-4 on the next page.

```
Found a Linux console terminal on /dev/console (80 columns x 24 lines).
0

starting VNC server...
A log file will be written to: /var/log/YaST2/vncserver.log ...

***
***           You can connect to <host>, display :1 now with vncviewer
***           Or use a Java capable browser on http://<host>:5801/
***

(When YaST2 is finished, close your VNC viewer and return to this window.)

Active interfaces:

eth0      Link encap:Ethernet  HWaddr EA:67:D0:00:20:03
          inet addr:w.xxx.yyy.zz  Bcast:a.bbb.cc.ddd  Mask:255.255.255.128
--
lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0

*** Starting YaST2 ***
```

Figure 10.4-4

You can now connect to the server using a VNC viewer using your info provided in the above screen:
The host ip-address is listed under eth0 (**w.xxx.yyy.zz** in the above example).

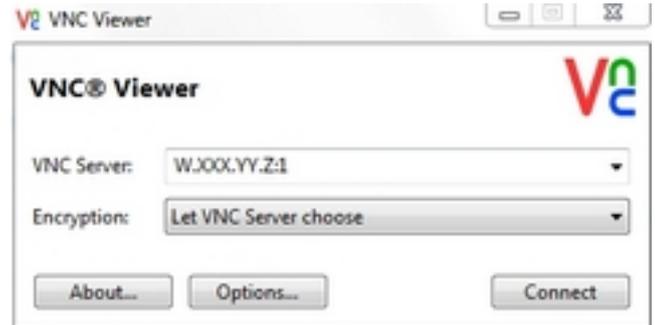


Figure 10.4-5

Click Connect and supply your password (if you specified to use a vnc password) to connect and see the Linux Server Welcome screen as shown in Figure 10.4-6 on the next page.

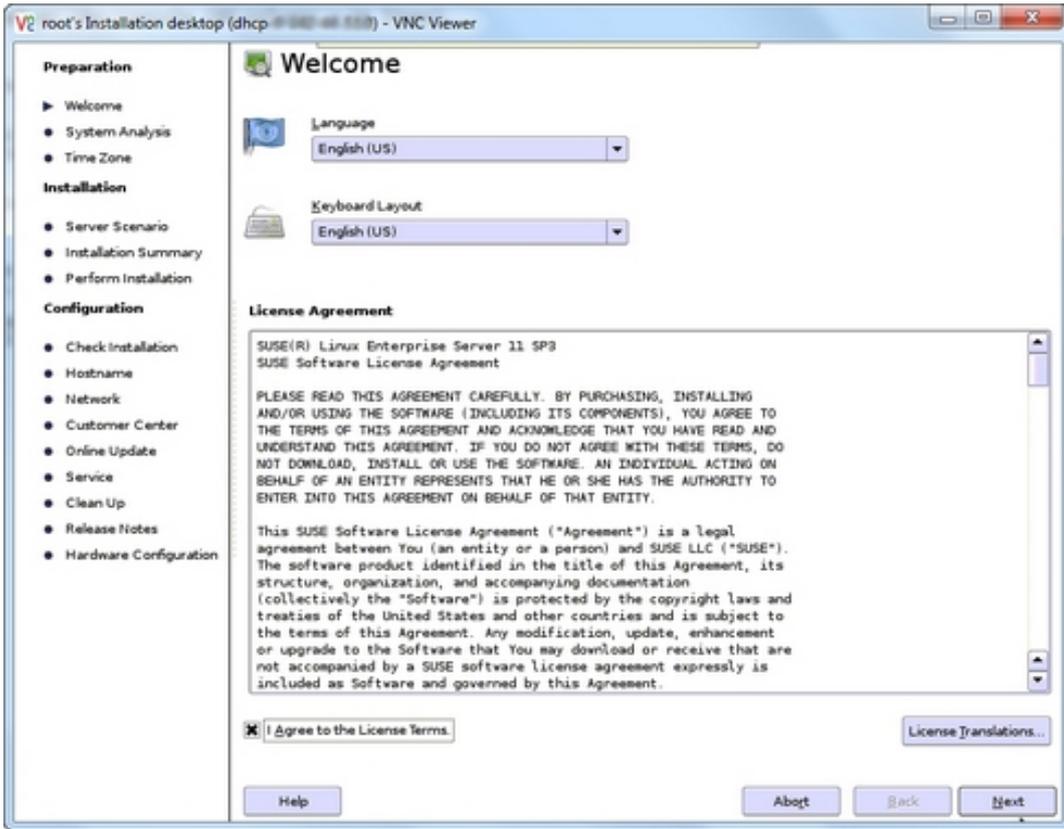


Figure 10.4-6

When you have agreed to the License Terms you can **Click Next**.

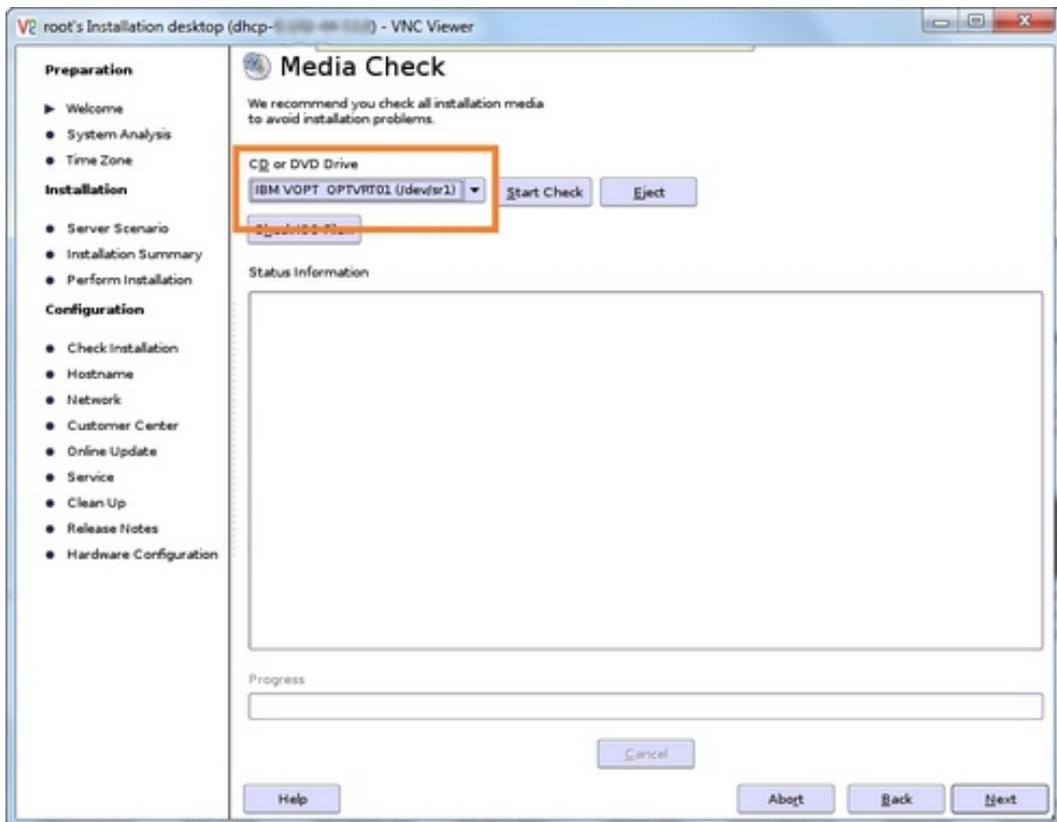


Figure 10.4-7

Check that the CD or DVD matches the media you are using in your IBM i Host partition (OPTVRT or OPT) and click **Next** to continue.

You will advance to the Installation Mode screen:

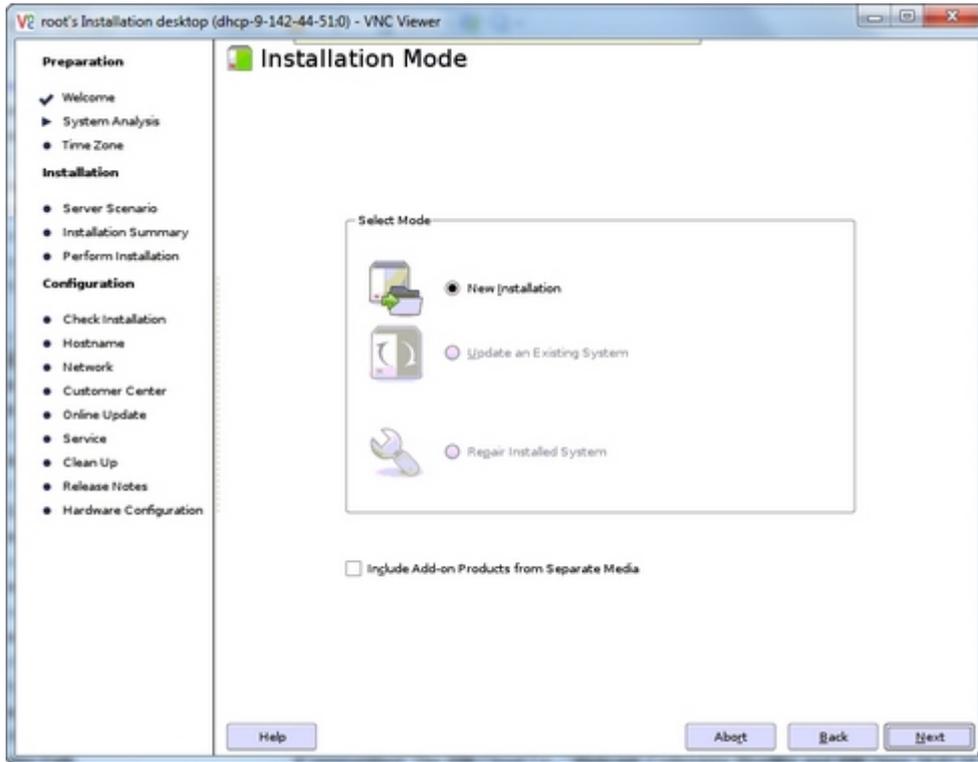


Figure 10.4-8

Click **Next** to continue.

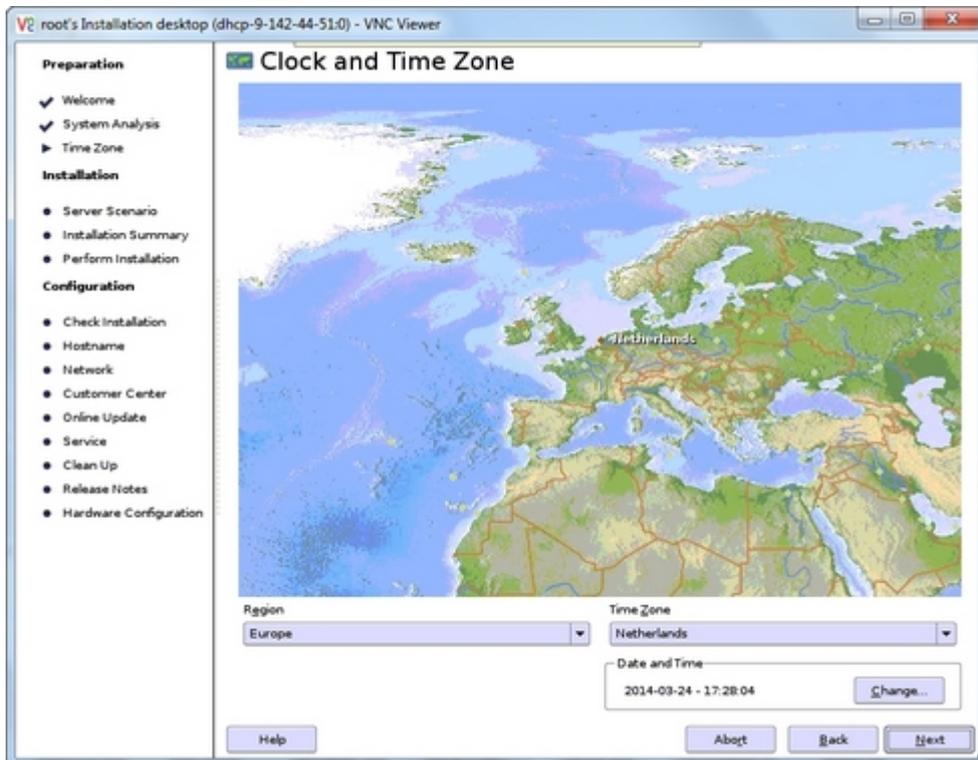


Figure 10.4-9

Select your values and click **Next** to continue. You will get the Installation Settings screen, and if you want to be able to use VNC to manage your Linux Server after it is installed, you will need to Change the Default runlevel.

This is shown in Figure 10.4-10 on the next page.

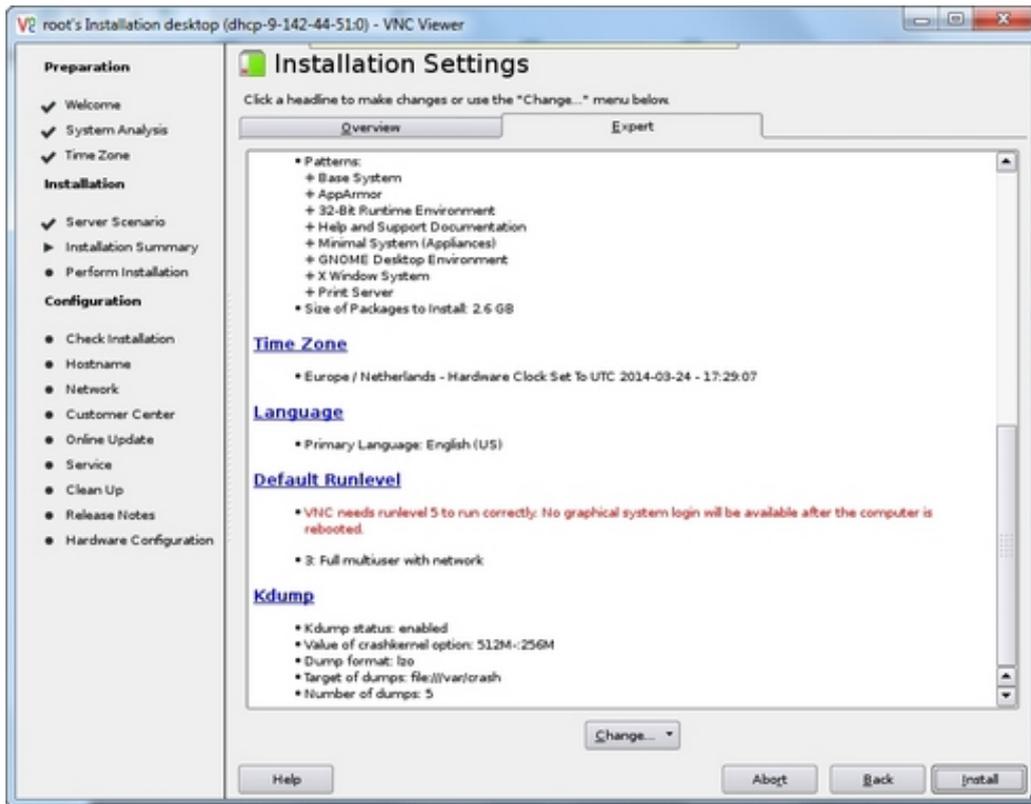


Figure 10.4-10

As you can see by the message in **red**, Linux warns you that you need to change the Default Runlevel in order to keep using VNC after your Linux server is rebooted.

Click on [Default Runlevel](#) and set the radio-button to 5. Full Multiuser with network and display manager. This is shown in Figure 10.4-11

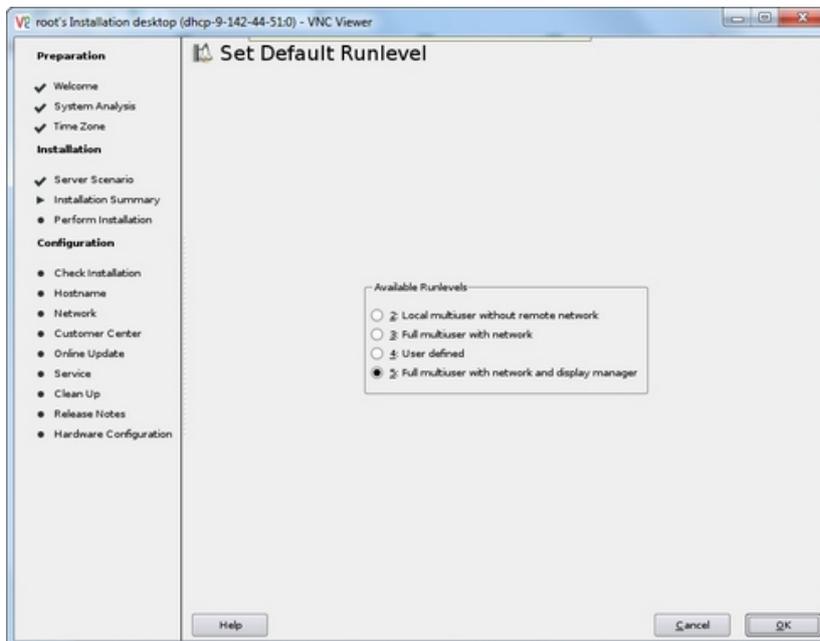


Figure 10.4-11

Click OK to return to the Installation Settings panel and **Click Install** to continue as shown in Figure 10.4-10

Your Linux Server will now Perform the installation and you can monitor the progress on your VNC viewer. When this so called Basic Installation is finished the Linux server will automatically reboot.

As you can see in Figure 10.4-12 you are informed about this.

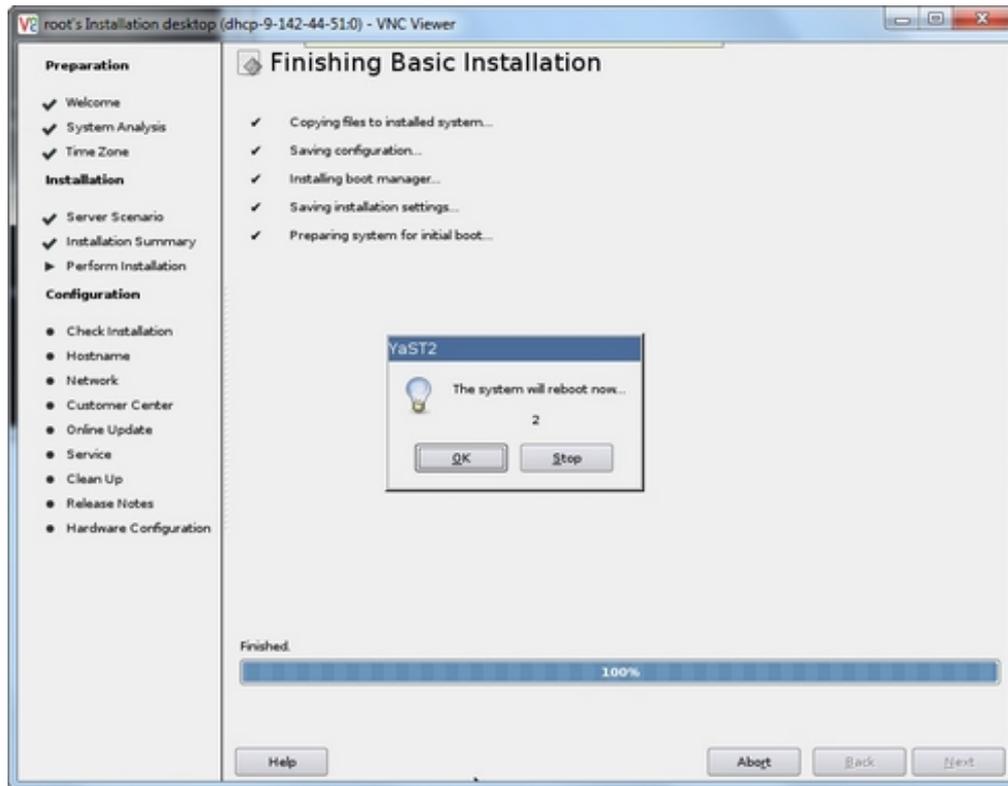


Figure 10.4-12

Your VNC connection will close automatically and you will notice the restart with messages on your Virtual Console window:

```
Elapsed time since release of system processors: 1445672 mins 32 secs
yaboot starting: loaded at 00040000 000676d8 (0/0/00c39a68; sp: 018fffd0)
Config file '/etc/yaboot.conf' read, 4096 bytes

Welcome to yaboot version r22.8-r1190.SuSE
booted from '/vdevice/v-scsi@30000004/disk@8000000000000000'
running with firmware 'IBM,SF240_417' on model 'IBM,9406-520', serial
'IBM,0210F7BCE', partition 'LinuxClient'
Enter "help" to get some basic usage information
boot: SLES11_SP3
Using 004fb584 bytes for initrd buffer
Please wait, loading kernel...
Allocated 01400000 bytes for kernel @ 01c00000
Elf64 kernel loaded...
Loading ramdisk...
ramdisk loaded 004fc000 @ 03000000
OF stdout device is: /vdevice/vty@30000000
```

Figure 10.4-13

When your SLES 11 Linux server is ready for you to perform the Configuration steps, it will wait again at a screen similar to Figure 10.4-4.

Start VNC again and use the info provided in the java console to connect to your server.

From here, the regular Linux documentation can be used in order to complete the Configuration and after another restart your server is ready for you:

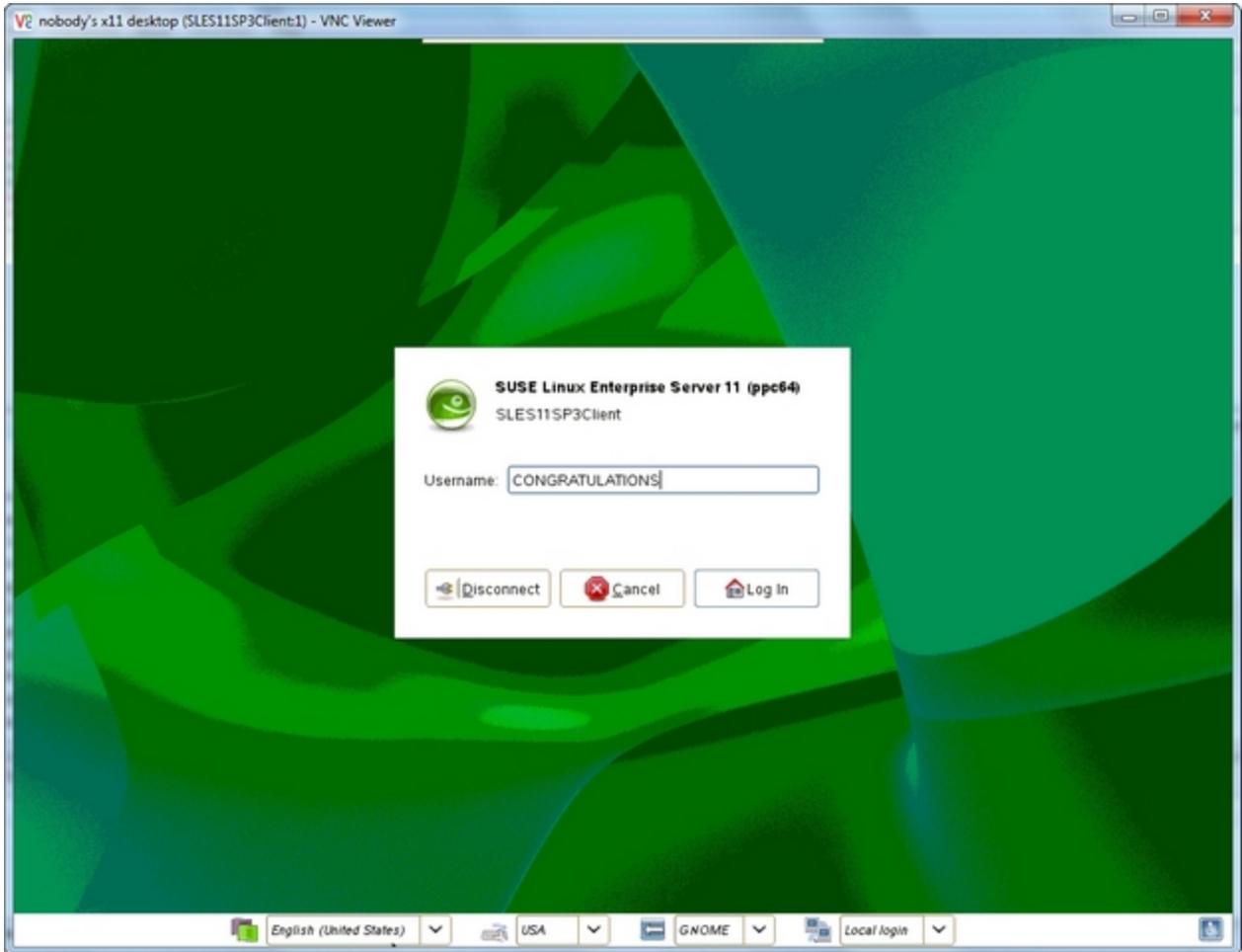


Figure 10.4-14

10.5 Installing RHEL 6.5

And it will wait for input on the following screen:

```
Welcome to the 64-bit Red Hat Enterprise Linux 6.5 installer!
Hit <TAB> for boot options.

Welcome to yaboot version 1.3.14 (Red Hat 1.3.14-43.el6)
Enter "help" to get some basic usage information
boot:
```

Figure 10.5-1

In order to install RHEL65 in an easy graphical way, you can use VNC.

Download and install a VNC viewer onto your workstation.

Type the following in the Virtual Console at *boot prompt*: **linux vnc**

and press **Enter**. This is shown in Figure 10.5-2

```
Welcome to the 64-bit Red Hat Enterprise Linux 6.5 installer!
Hit <TAB> for boot options.

Welcome to yaboot version 1.3.14 (Red Hat 1.3.14-43.el6)
Enter "help" to get some basic usage information
boot: linux vnc
```

Figure 10.5-2

The RHEL65 client partition continues the boot process with messages similar as shown in Figure 10.5-2

```
Please wait, loading kernel...
  Elf64 kernel loaded...
Loading ramdisk...
ramdisk loaded at 03200000, size: 27544 Kbytes
OF stdout device is: /vdevice/vty@30000000
Preparing to boot Linux version 2.6.32-431.el6.ppc64 (mockbuild@ppc-
003.build.bos.redhat.com) (gcc version 4.4.7 20120313 (Red Hat 4.4.7-4)
(GCC) ) #1 SMP Sun Nov 10 22:17:43 EST 2013
Max number of cores passed to firmware: 0x0000000000000200
Calling ibm,client-architecture-support... not implemented
command line: ro vnc
memory layout at init:
  memory_limit : 0000000000000000 (16 MB aligned)
  alloc_bottom : 0000000004cf0000
  alloc_top    : 0000000008000000
  alloc_top_hi : 00000000c0000000
  rmo_top      : 0000000008000000
  ram_top      : 00000000c0000000
instantiating rtas at 0x00000000076a0000... done
```

Figure 10.5-2

The partition will halt at the media verification screen.

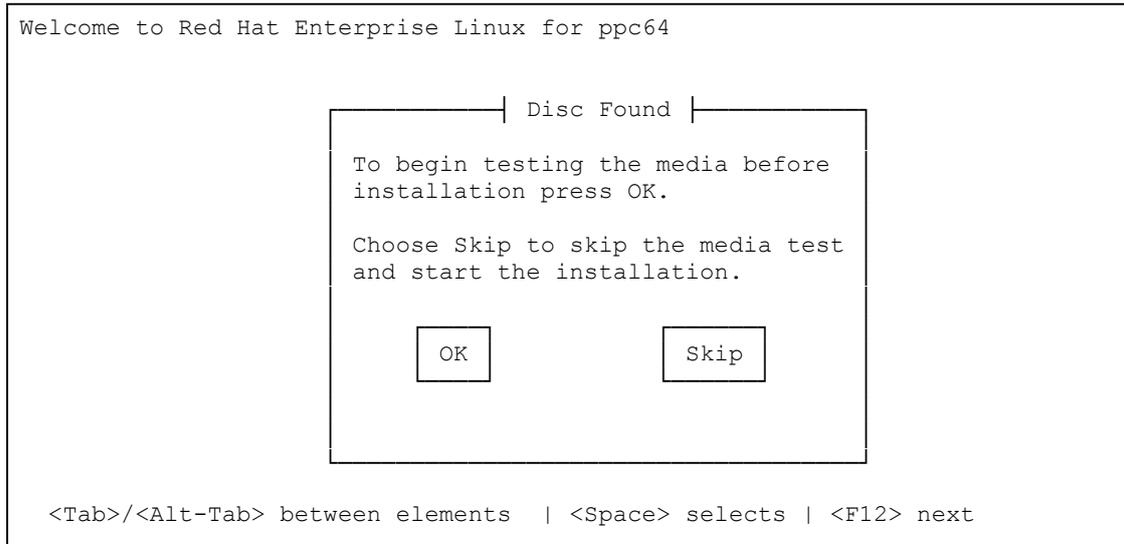


Figure 10.5-3

After selecting Skip to skip the media test and start the installation, the Linux server continues to boot and waits in the following screen as shown in Figure 10.5-4.

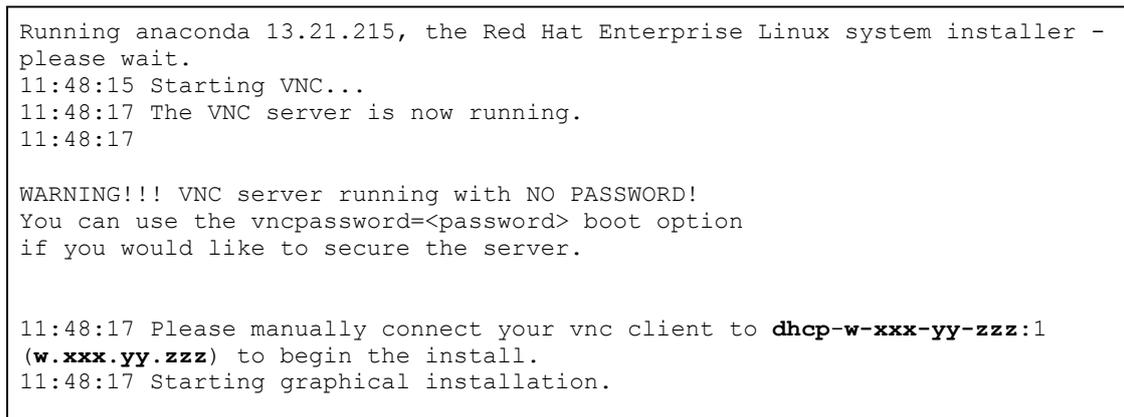


Figure 10.5-4

You can now connect to the server using a VNC viewer using your info provided in the above screen: The host ip-address is listed under eth0 (**w.xxx.yyy.zz** in the above example).

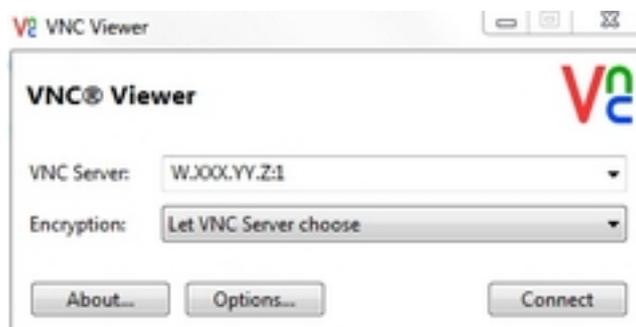


Figure 10.5-5

Click Connect and supply your password (if you specified to use a vnc password) to connect and see the RED HAT ENTERPRISE LINUX 6 Welcome screen as shown in Figure 10.5-6 on the next page.

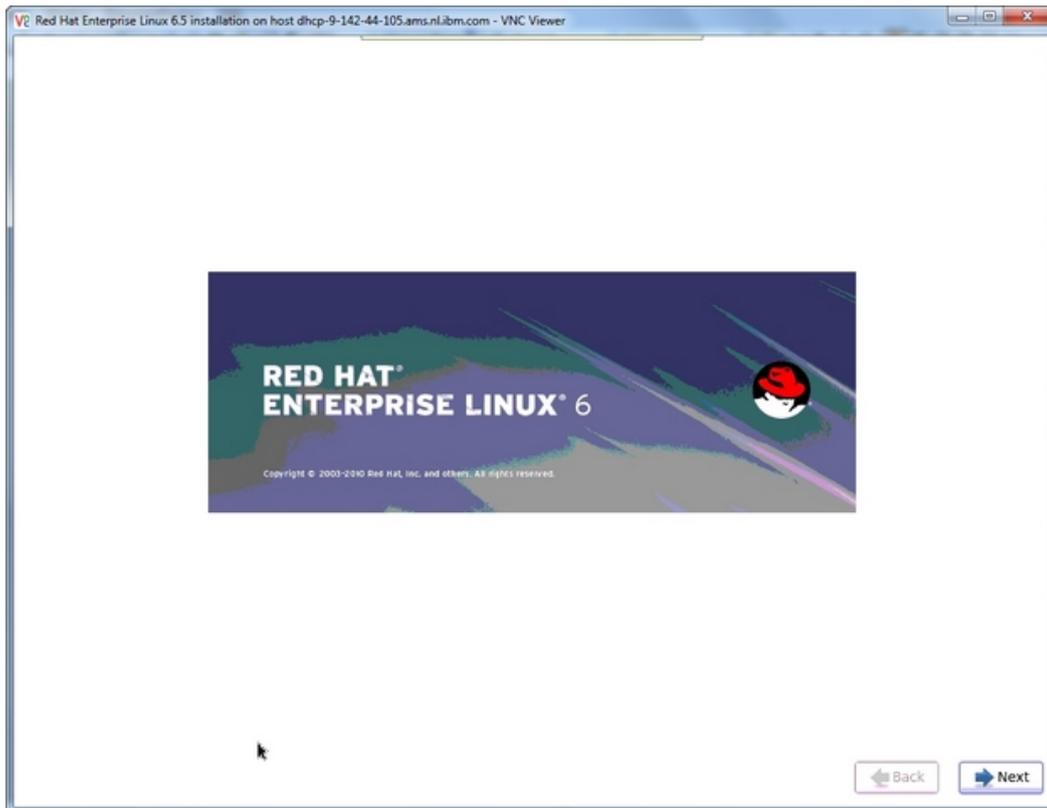


Figure 10.5-6

Just **Click Next** to advance to the next screen.

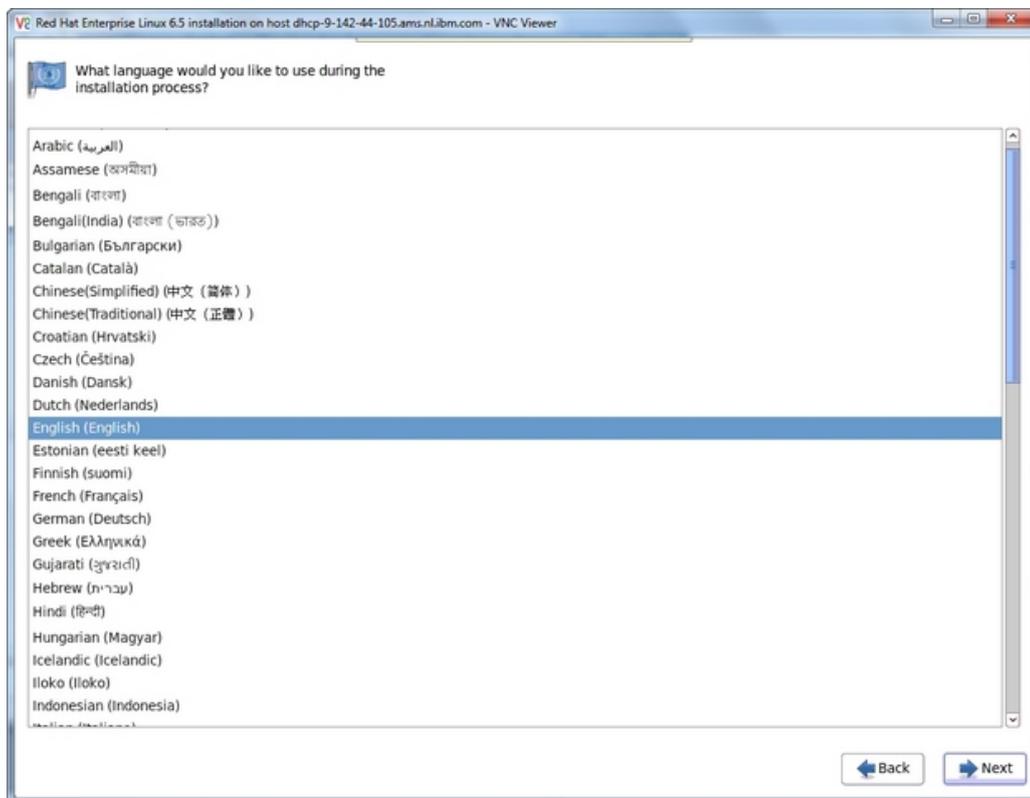


Figure 10.5-7

Select your language and click **Next** to continue

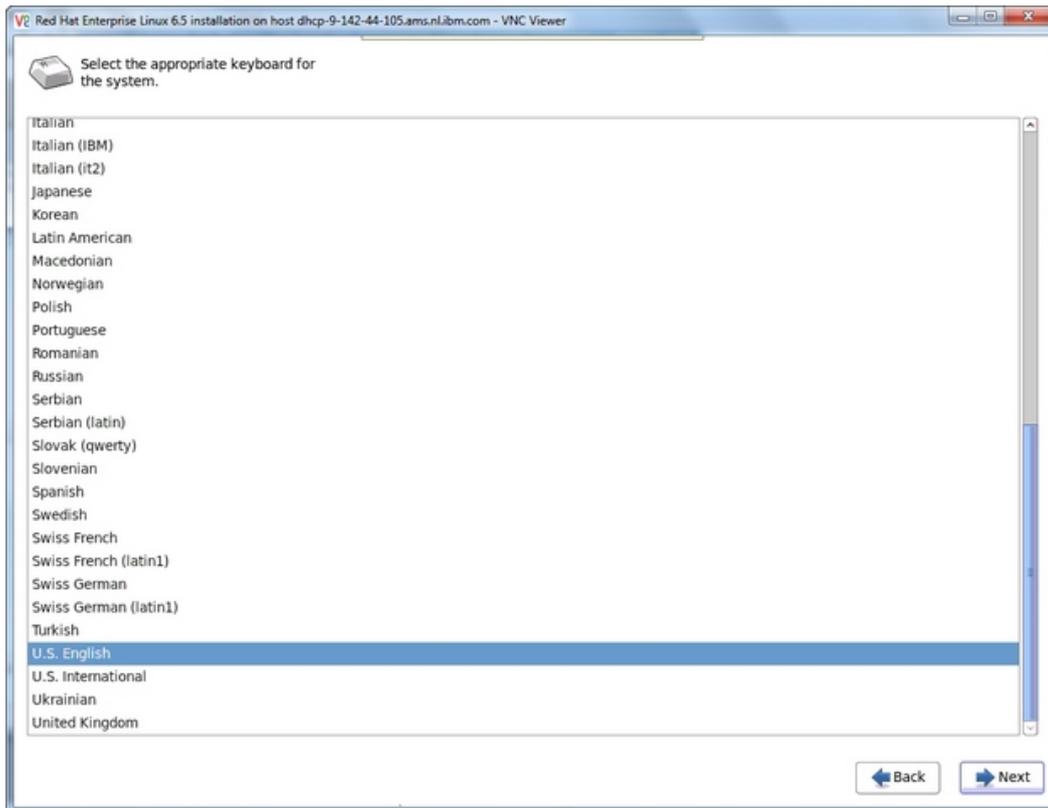


Figure 10.5-8

Select your keyboard layout and click **Next** to continue

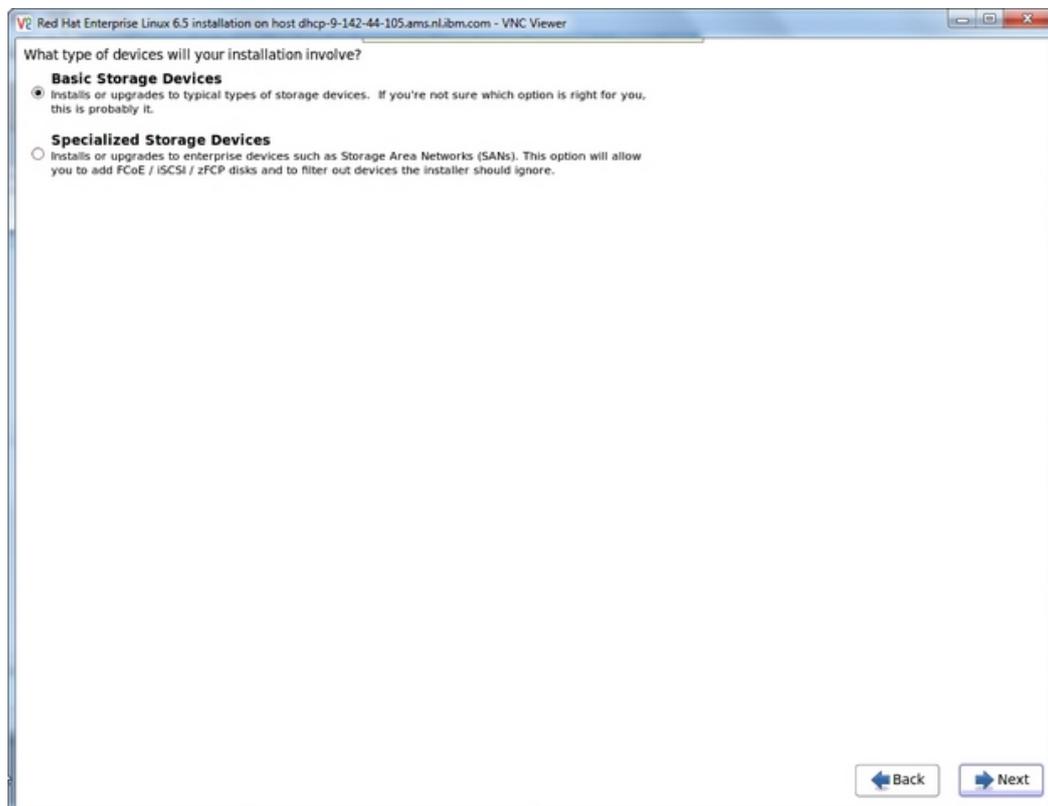


Figure 10.5-9

Select **Basic Storage Device** and click **Next** to continue

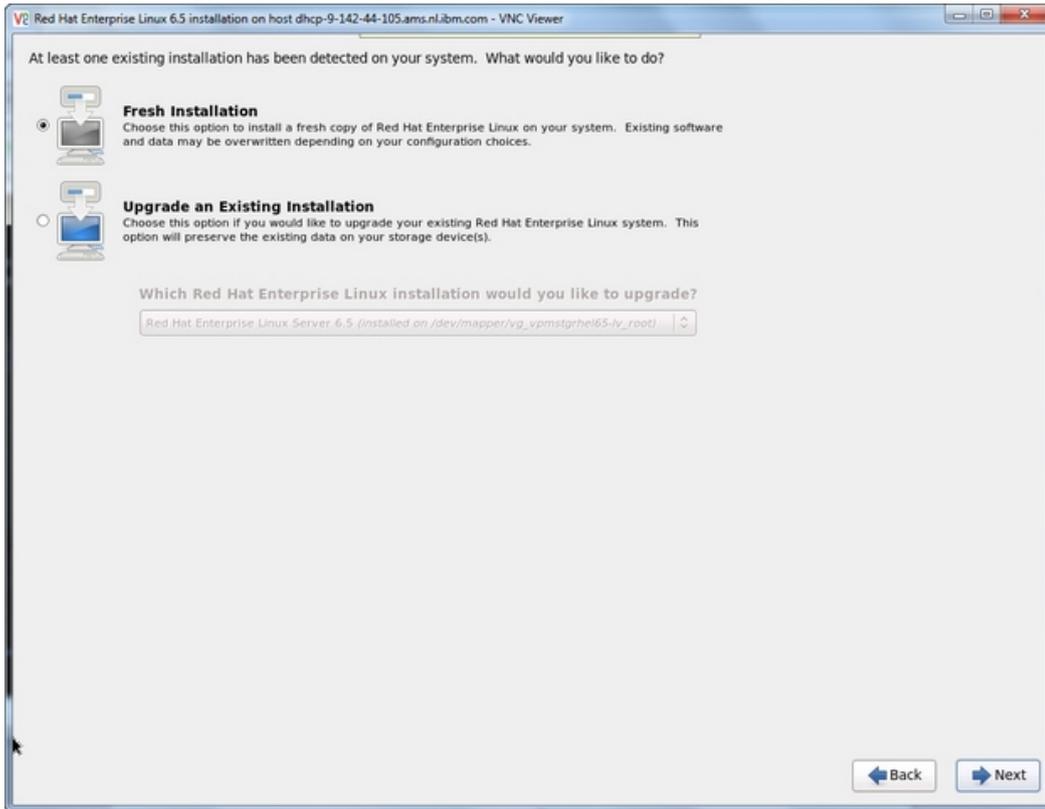


Figure 10.5-10

Select **Fresh Installation** and click **Next** to continue

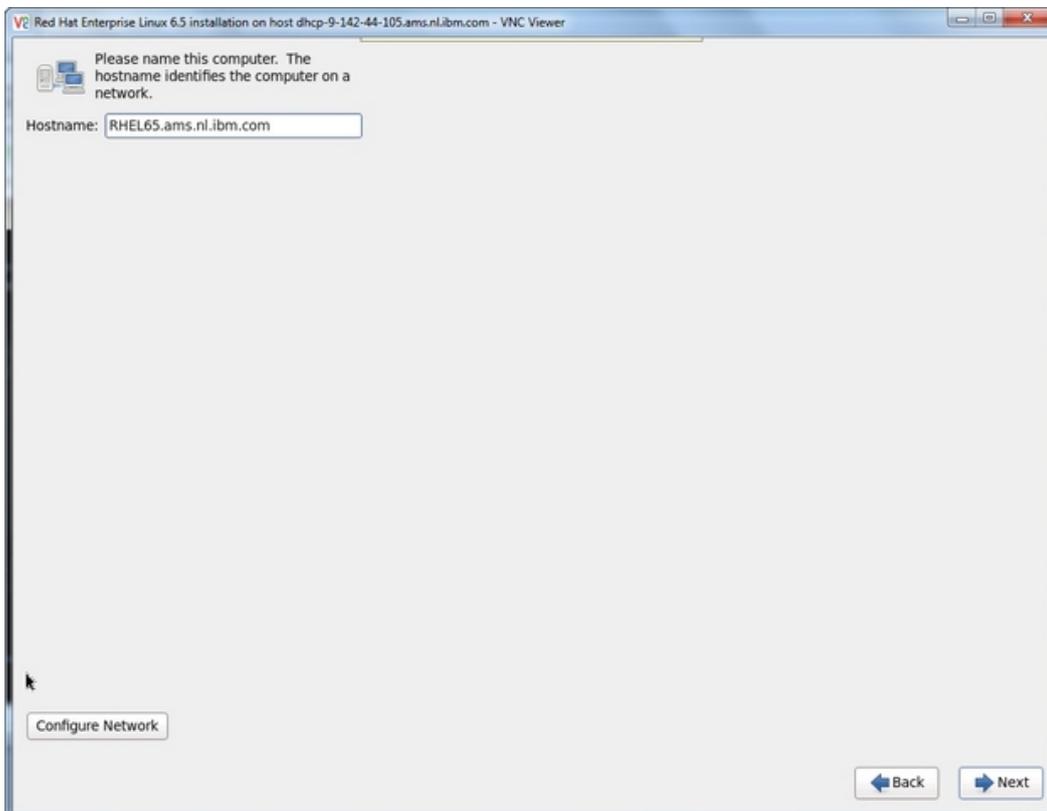


Figure 10.5-11

Select a **hostname** and click **Next** to continue

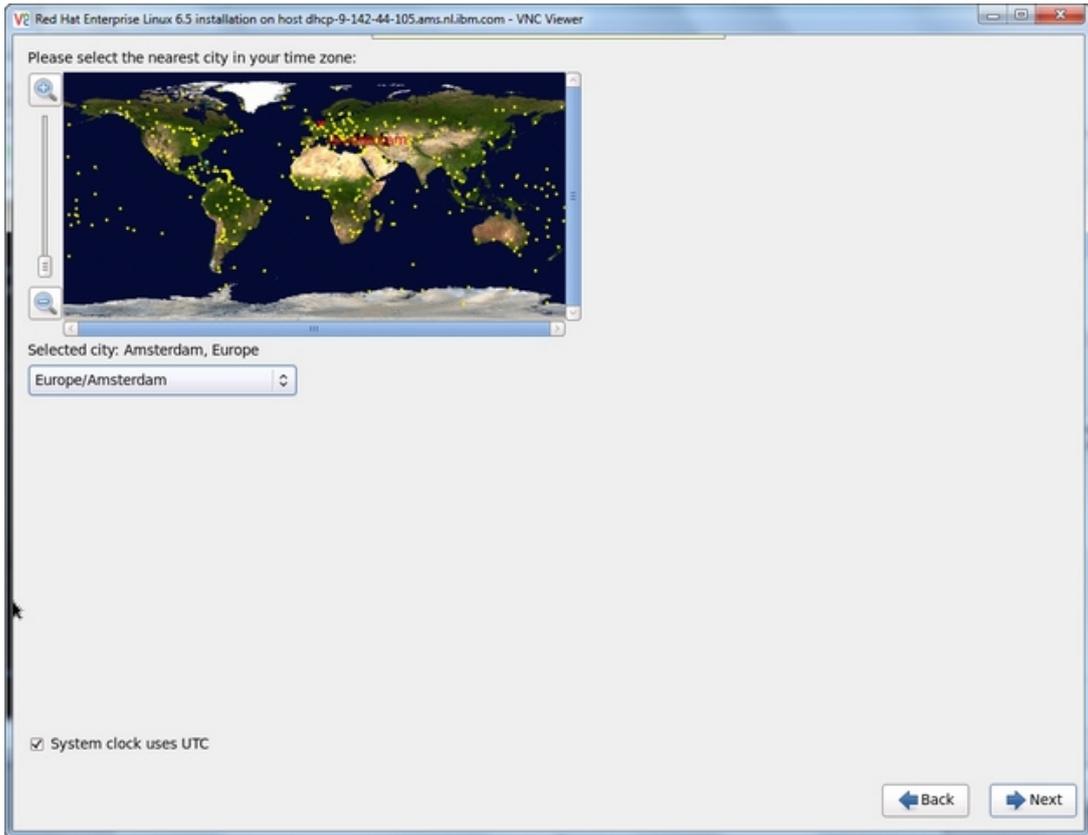


Figure 10.5-12

Select your timezone and click **Next** to continue

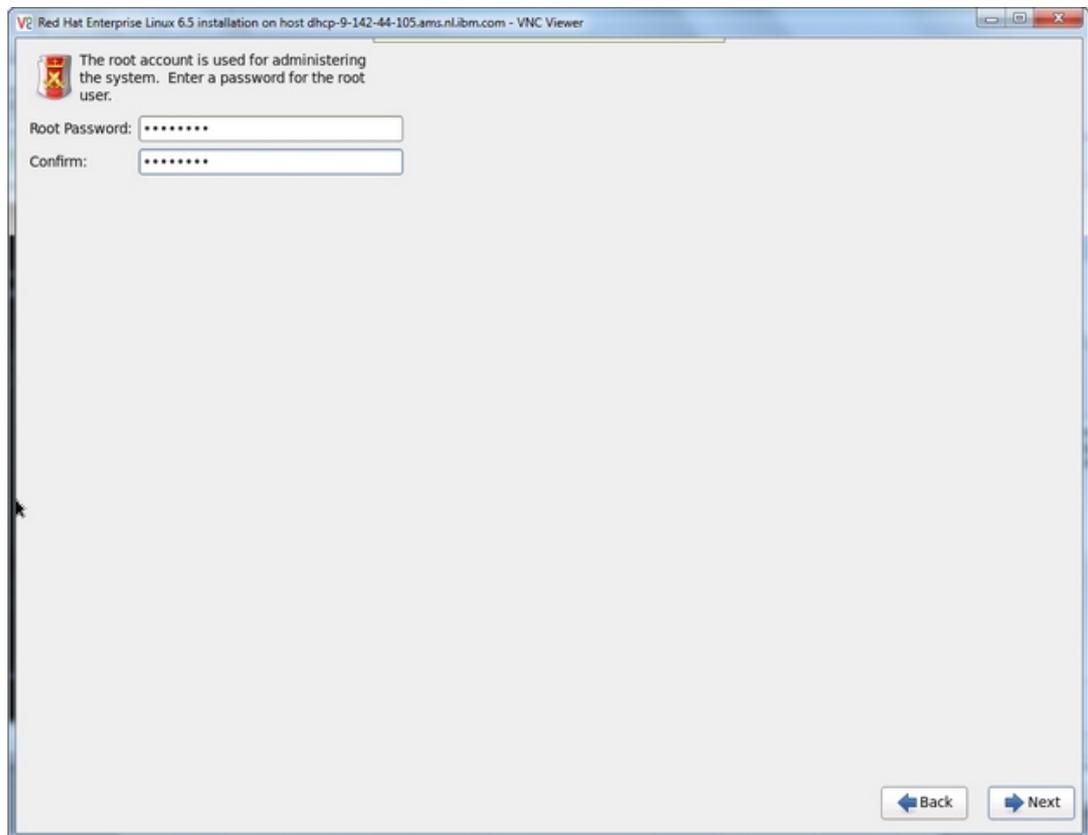


Figure 10.5-13

Select **Root Password** and click **Next** to continue

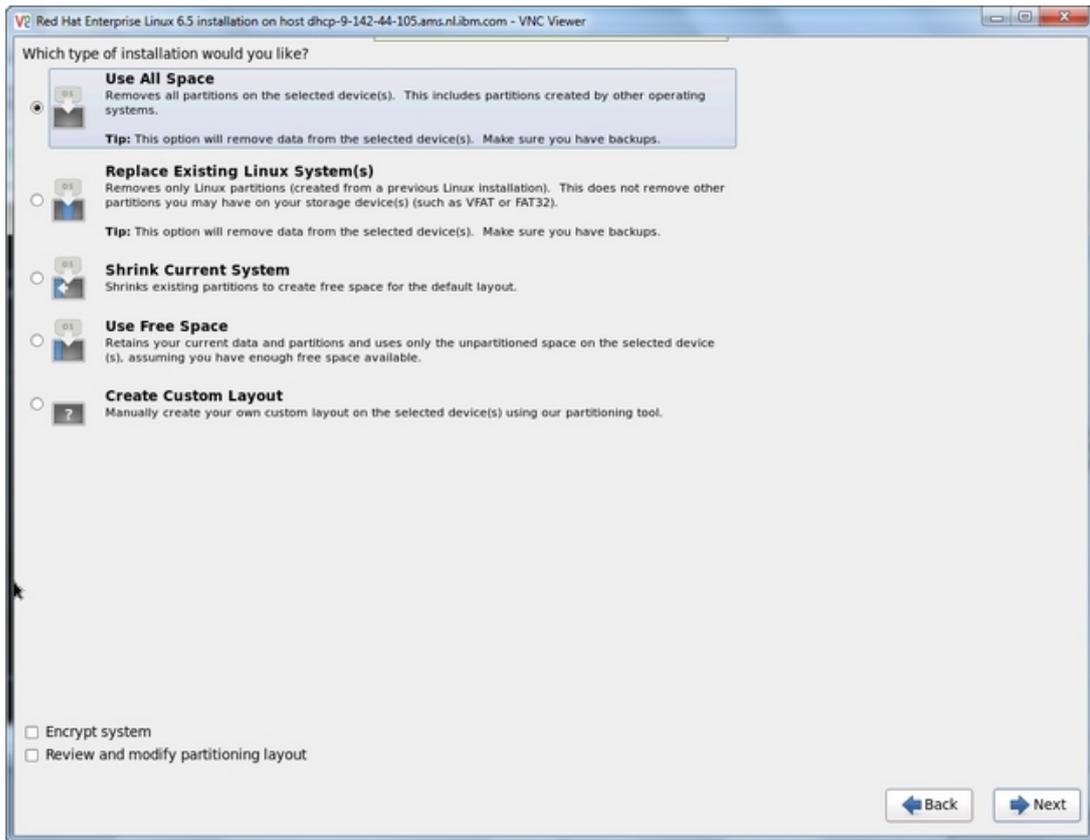


Figure 10.5-14

Select the **type of installation** and click **Next** to continue. This will be followed by a confirmation screen as shown in Figure 10.5-15

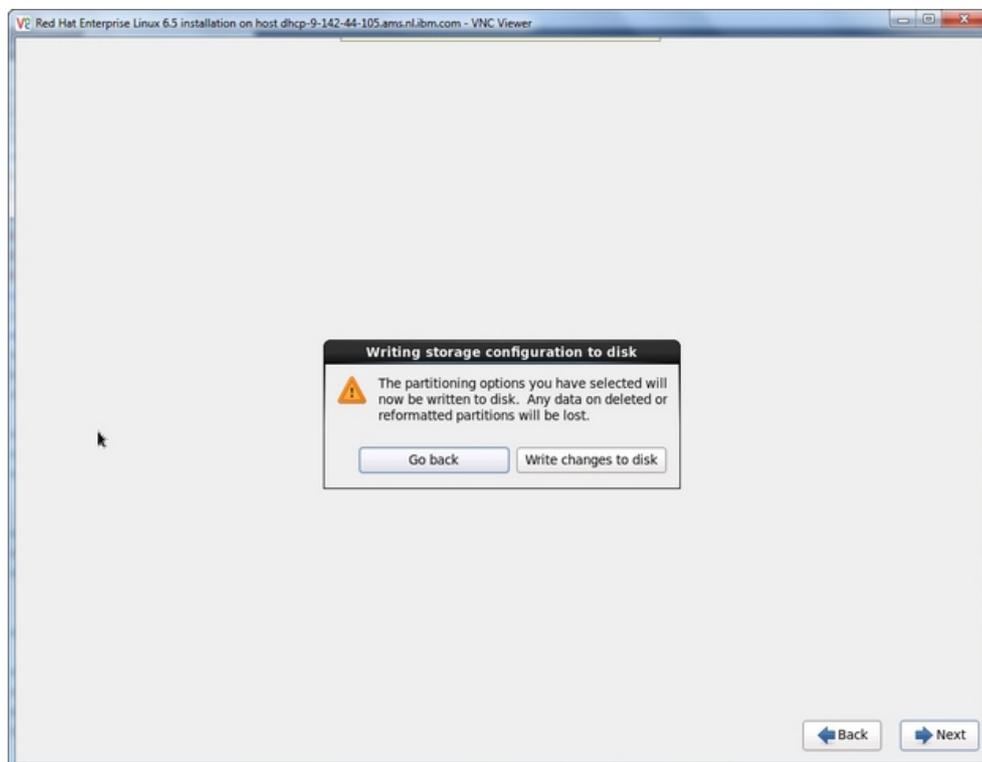


Figure 10.5-15

Make your selection

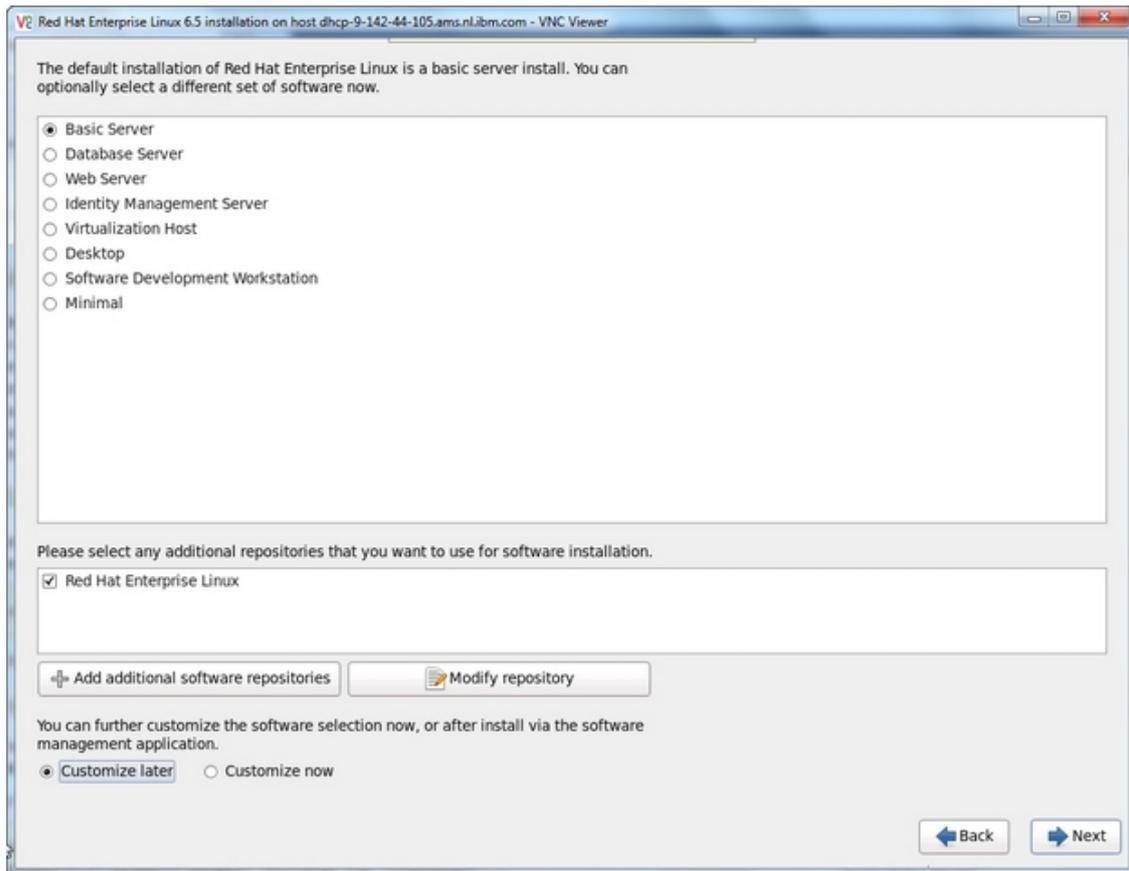


Figure 10.5-16

Select the type of Server and click Next to continue

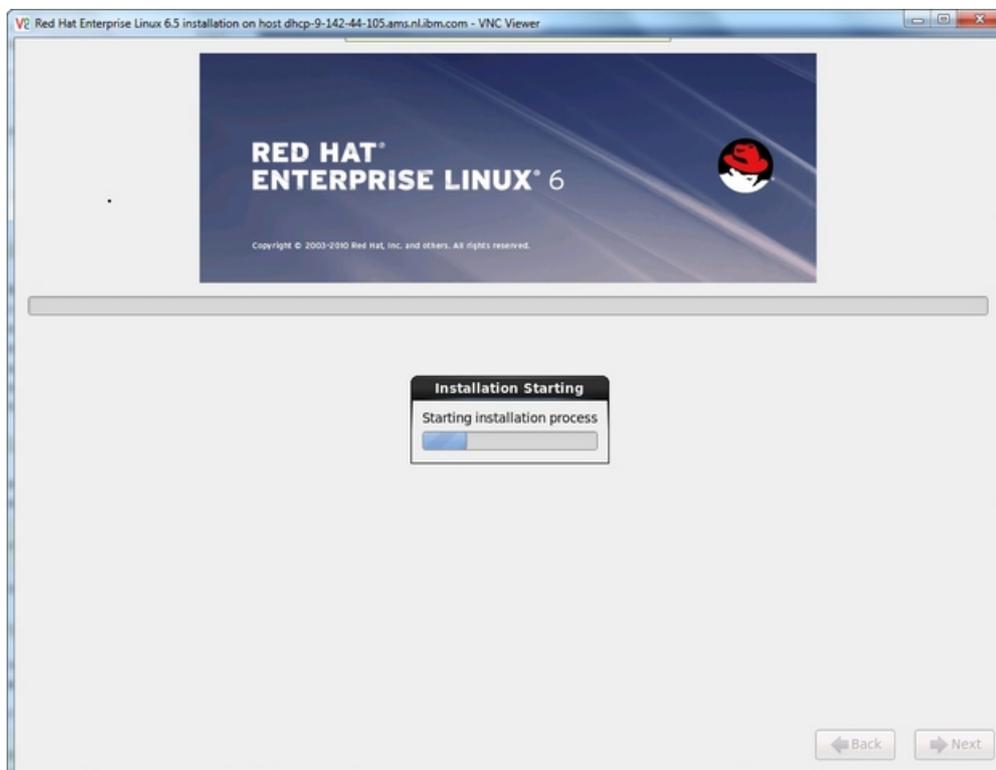


Figure 10.5-17

Your installation starts and the installation bar informs you about the install process

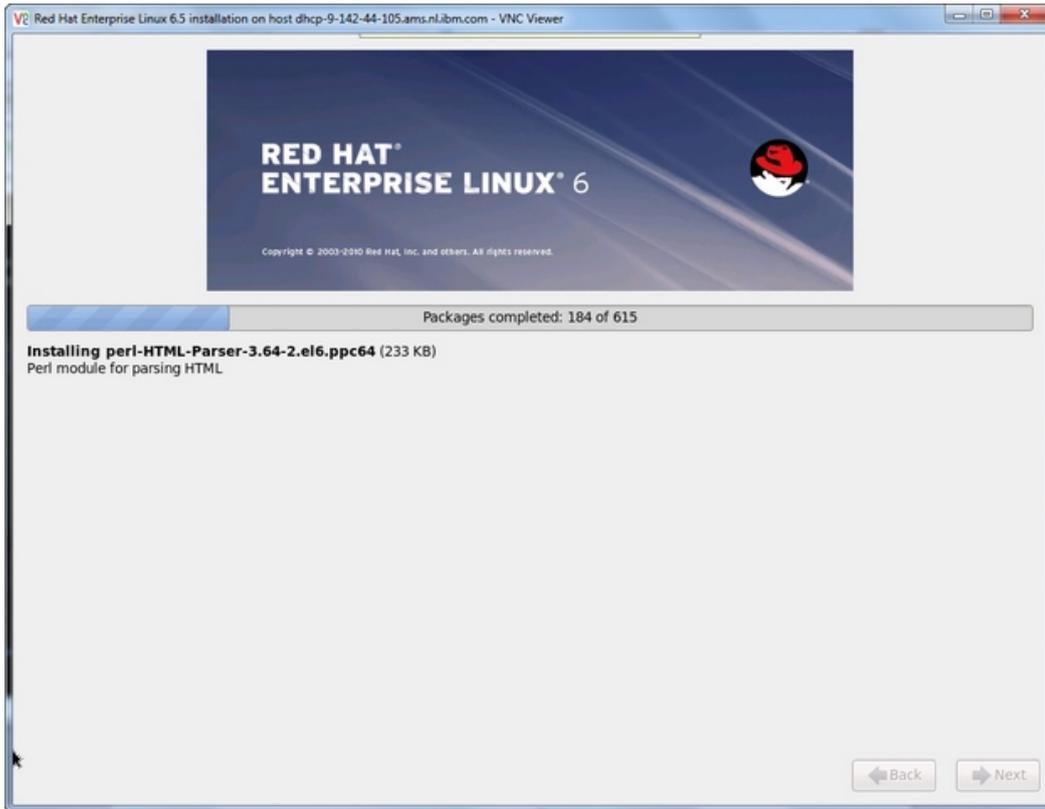


Figure 10.5-18

Just wait for the install process to complete. At the end it will inform you

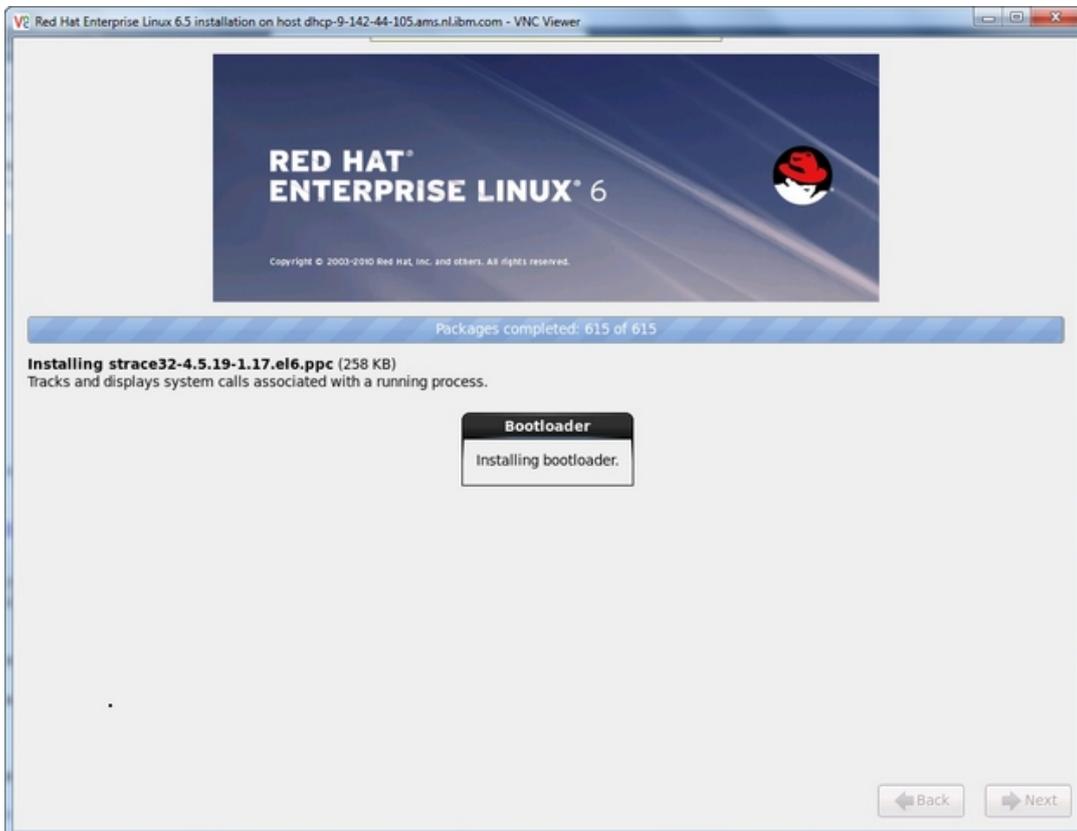


Figure 10.5-19

A pop up will inform you about the installation of the boot loader. Which will be followed by the Congratulations screen shown in Figure 10.5-20 on the next page

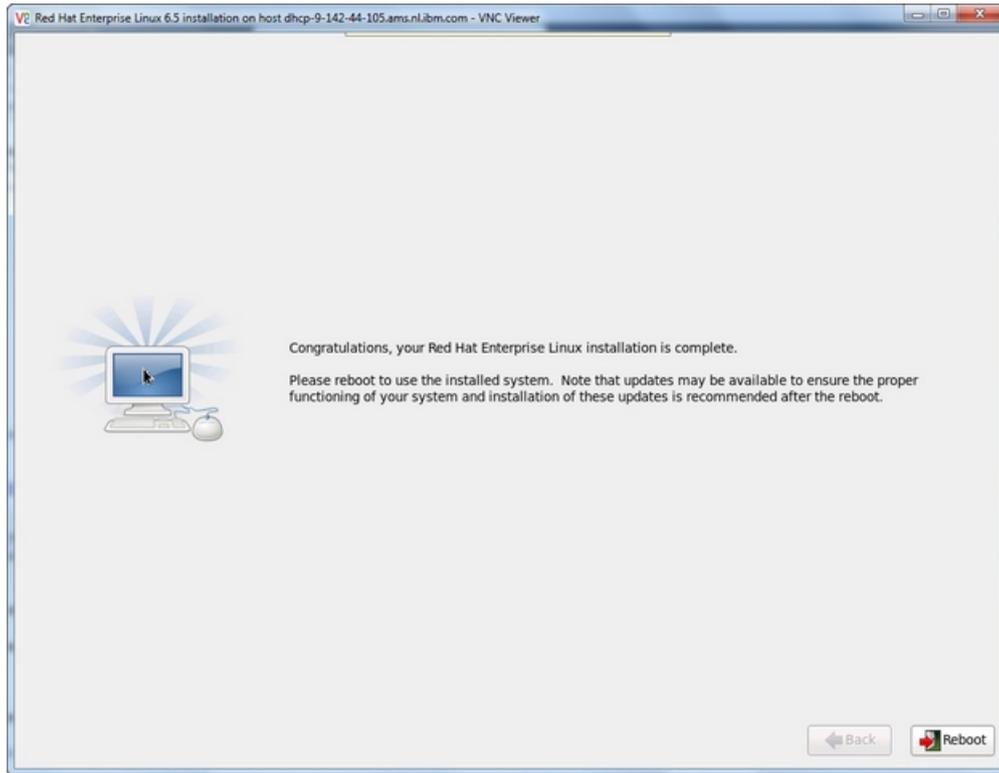


Figure 10.5-20

Click Reboot in order to restart the server and complete the installation.

Because the bootlist in the SMS menu is still set to boot from DVD, you will need to use the Virtual Console again to change the setting to boot from Hard Disk (use Chapter 10.3 as a reference)

```

Version SF240_417
SMS 1.6 (c) Copyright IBM Corp. 2000,2005 All rights reserved.
-----
Main Menu
1.  Select Language
2.  Setup Remote IPL (Initial Program Load)
3.  Change SCSI Settings
4.  Select Console
5.  Select Boot Options
-----
Navigation Keys:
                                     X = eXit System Management Services
-----
Type menu item number and press Enter or select Navigation key:5
    
```

Figure 10.5-21

Type **5 (Select Boot Options)** and press **Enter**.

You will advance to the Multiboot menu – Type **1 (Select Install/Boot Device)** and press **Enter**

You will advance to the Select Device Type menu – Type **5 (Hard Drive)** and press **Enter**

Select the Device **Number** for the boot device of your choice and press **Enter**.

On the next menu select **2 (Normal Mode Boot)** and press **Enter**

Next is the question ‘Are you sure you want to exit System Management Services?’

select **1 (Yes)** and press **Enter**.

10.6 Installing IBM Service and productivity tools for Power servers

In order to get the most out of your Power Platform running Linux, you are advised to install the Service and productivity tools.

It is available for download via <http://www.ibm.com/systems/power/software/linux/>

Select the Resource tab and expand (+ sign) Tools and Downloads.

Detailed install instructions are provided too.

When you have installed it, you will notice that the OS level is now also reporting back into the HMC

S...	Name	I	Status	Proc... Units	Memo...	Active Profile	Environment	Refere... Code	OS Version
<input type="checkbox"/>	01-IBM i host	1	Running	1.5	8	IBM i V7R1	IBM i	00000000	IBM i Licensed Internal Code 7.1.0 410 0
<input checked="" type="checkbox"/>	LinuxClient	2	Running	0.5	4.125	first_setup	AIX or Linux	SUSE Linux	Linux/SuSE 3.0.76-0.11-ppc64 11

Max Page Size: 250 Total: 2 Filtered: 2 Selected: 1