

iVirtualization

## IBM i Host and Client LPARs Easy Install Guide

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## **Document History**

## **Revision History**

Date of this revision: 06-05-2014

Date of next revision (date)

Revision	Revision	Summary of Changes	Changes
Number	Date		marked
#1	18-03-2009	update Figure 10	(N)
#2	18-03-2009	update Figure 27 – changed size to 20480 to exceed the minimal	
		size defined for an IBM i 6.1 load source	
#3	01-10-2009	Started Version 2: updated all 5250 screen prints and resized the	
#4	21-10-2009	graphics outside of Word to make document smaller.	
#5	23-10-2009	Chapters on automating and backup/recovery added	
#6	25-06-2010	Started Version 3: added Chapter on upgrading to IBM i 7.1	
#7	16-07-2010	Created PDF version of document	
#8	15-10-2010	Changed weblink to reference doc	
#9	23-01-2011	Edited for ITSMP-Written Communication	
#10	04-04-2012	Started Version 4: major update to include IBM i 7.1-TR3 Virtual	
		Partition Manager and changed 5250 screenshots to text-based	
#11	14-05-2012	Finalized Version 4 and renamed the title of the document	
#12	29-05-2012	Minor updates	
#13	27-06-2012	Changed default LPPs to install	
#14	01-11-2012	Added information to Chapter 4.2 (using HMC) to clarify networking options	
#15	26-02-2013	Additional info on Client LPAR tape support	
#16	26-03-2013	Updated Figure 6.3-10	
#17	19-08-2013	Added and edited information for Chapter 9	
#18	16-10-2013	Added info for LHEA being unsupported when using VPM for	
		partitioning	
#19	18-10-2013	Added info on Native Attached Storwize support for use with IBM i	
		Client partitions	
#20	25-03-2014	Added info on HMC managed Linux Client LPARs	
#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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Docum	ent: iVirtualization - IBM iHost and Client LPAR Easy Install Guide v5.03 TR7.doc	Date: 06-05-2014
Subject	t: iVirtualization IBM i Host and Client LPARs Easy Install Guide	Status: Draft Page 3 of 87



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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 stepby-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

Peter G. Croes: peter\_g\_croes at nl.ibm.com (use the @-symbol instead of the text)



## 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 is 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 <a href="http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS4563">http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS4563</a> 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 ii 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 identifier . . . . . . . 1 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



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
 Yurtual

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

 Partition
 ------Processor---- 

 Memory
 Memory

 Opt
 ID

 Name
 Total

 Yurtual
 (MB)

 WLM
 1
 2
 3

 Yurtual
 (MB)
 WILM
 1
 2
 3

 Yurtual
 (MB)
 WILM
 1
 2
 3
 4

 Yurtual
 (MB)
 Yurtual
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2
 2

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 . . . / 4 1 Use shared processor pool  $\ldots \ldots \ldots \ldots$ 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) 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 / 4 Minimum / maximum number of processors . . . : 1 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 Virtual Memory Partition-----Processor-----MemoryEtnernet IDOpt ID NameTotal Units Uncap Weight(MB) WLM 1 2 3 41 IBMIHOST1 1.00 1 High33280 2 1 2 2 2 Ethernet ID < < 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 **PWRDWNSYS 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 \ldots \ldots \ldots
                                        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
         F10=IPL system to activate changes
                                             F12=Cancel
F3=Exit
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	Suctor.
Select one of the following:	System.
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. CLPAR1 Partition identifier and name . . . . . . . 2 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 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 Ent 2=Change detail 3= 8=Associated logical	er. Concurrent maintenance 4=Remove 5=Display detail resource(s) <b>9=Hardware contained within package</b>
Opt Description System System Unit 9 Virtual Backplane	Type-         Resource           Model         Unit ID         Name           8202-E4B         U8202.E4B.06xxxxx         SYS01           +         78AA-001         U78AA.001.WZSH90Y         FR01           +         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).



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 290B-001 CMB11 Virtual IOP Operational F12=Cancel F3=Exit F5=Refresh F6=Print

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 \ldots \ldots \ldots
                                        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
         F10=IPL system to activate changes
                                             F12=Cancel
F3=Exit
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	Suctor.
Select one of the following:	System.
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. LNXCLNT1 Partition identifier and name . . . . . . . 2 Number of available system processors . . . : 3 Number of partition processors . . . . . . . 1 Minimum / maximum number of processors . . . 1 / 4 Use shared processor pool  $\ldots \ldots \ldots \ldots$ 1 1=Yes, 2=No Shared processor pool units . . . . . . 0 . 5 Minimum / maximum processor pool units . . . 0 . 1 / 4 . 0 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**.

P	ackaging Hardware Resources
	Local system type : 8202 Local system serial number: 06-xxxxx
Type options, press Ente 2=Change detail 3=C 8=Associated logical r	r. oncurrent maintenance 4=Remove 5=Display detail esource(s) <b>9=Hardware contained within package</b>
Opt Description System System Unit <b>9</b> Virtual Backplane	Type-         Resource           Model         Unit ID         Name           8202-E4B         U8202.E4B.06xxxxx         SYS01           +         78AA-001         U78AA.001.WZSH90Y         FR01           +         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).

Packagi	ng H	lardware l	Resources	D. 110202 E4D
Type options, press Enter. 2=Change detail 3=Concurre 8=Associated logical resource	nt m (s)	naintenano 9=Haro	ce 4=Rem dware conta	D: 08202.E4B. Nove 5=Display detail Lined within package
Opt Description Virtual Backplane Virtual Comm IOA Virtual Comm Port Virtual Comm IOA Virtual Comm IOA Virtual Comm IOA Virtual Comm Port <b>8 Virtual Comm IOA</b> Virtual Comm IOA Virtual Comm IOA	<	Type- Model 268C-001 6B03-001 6B03-001 6B03-001 6B03-001 6B04-001 6B04-001 <b>290B-001</b> 290B-001 290B-001	Resource Name P35 P37 P38 P36 P39 P58 P59 P60 <b>P63</b> P62 P61	Location V1 V1-C0 V1-C0-T1 V1-C1 V1-C1-T1 V1-C2 V1-C3 V1-C3-T1 <b>V1-C230</b> V1-C231 V1-C232
F3=Exit F5=Refresh F6=Print F7=	Incl	ude empt	y positions	More

### 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 detail4=Remove5=Display detail6=7=Verify8=Associated packaging resource(s) 6=I/O debug Opt Description Type-Model Resource Name Status 290B-001 CTL04 Operational Virtual Comm IOA 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...

😻 RSHMC: Virtual Adapters - Mozilla	Firefox	
https://hmc/hmc/wcl/T4b43 Create Virtual SCSI Adapter: Virtual SCSI adapter	01-Host I	☆ BM i 6.1
Adapter : * 2		
Type of adapter :       Server         Any client partition can connect         Only selected client partition can connect         Client partition :         O1-Host IBN         Client adapter ID :         OK	n connect	
Done	hmc 🔒 🧕	Disabled

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 Communic	ation Resources	
				System:	
Туре	options,	press Enter.			
5=	Work with	configuratio	n descriptions	7=Display resource detail	
Opt	Resource	avT	Status	Text	
-	CMB02	6B03	Operational	Comm Processor	
	LIN01	6B03	Operational	Comm Adapter	
	CMN02	2 6в03	Operational	Comm Port	
	CMB02	6B03	Operational	Comm Processor	
	LIN02	6B03	Operational	Comm Adapter	
	CMN01	L 6B03	Operational	Comm Port	
	CMB08	5706	Operational	Comm Processor	
	LIN03	5706	Operational	LAN Adapter	
	CMN03	3 5706	Operational	Ethernet Port	
	CMN04	1 5706	Operational	Ethernet Port	
	CMB10	290B	Operational	Comm Processor	
7	CTL04	290B	Operational	Comm Adapter	
					Bottom
F3=E	lxit F5=F	Refresh F6=	Print F12=Ca	ncel	



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)

Displa	ay Resource Detail	
Resource name	<b>CTL04</b> Comm Adapter 290B-001 00-00000	System:
Location : U8203.E4A.xxxx- <b>V</b> 3-0	C <b>2</b>	
Logical address: SPD bus: System bus System board	255 128	
Press Enter to continue.		More

### 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.



Lugical	Partition P	rofile Pro	perties:	first setup @	01-Host I	BM i 6.1 @ Ser	ver-820	03-E4A-S	- 61.04	01-Host II	3M i 6.1
Seneral	Processors	Memory	1/0 X	irtual dapters	Power Controlling	g Settings	Logical (LHEA)	Host Ethernet A	dapters	Tagged I/O	OptiConnec
Actions	Ŧ										
intual re	acources allo	w for the	charing o	d obvical bardy	vare hetwo	en Ingical nartiti	one The	current virtual	adanter s	attings are	listed helow
laximun	n virtual ada	oters :	sharing c	in prinjancar maran	raie beche	* 10	ons. me		auapter s	records are	insced below.
lumber	of virtual ad	apters :				3					
***	91	e 🕈	Sel	ect Action 💌	]						
Select 4	Type	^ Adapt	ter ID ^	Connecting P	artition ^	Connecting Ad	apter ^	Required ^			
0	Server SC	SI 2		(2)		2		No			
0	Server Se	rial 0		Any Partition		Any Partition SI	ot	Yes			
0	Server Se	rial 1		Any Partition		Any Partition SI	ot	Yes			
			Total	: 3 Filtered	1:3 Sel	ected: 0					
~ 0	an and a state	1									
K C	ancel Help										

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:

🥹 Create Lpar Wizard : Server-8203-E4	A-Sector - Mozilla Firefox 🛛 🗖 🗖 🔀
(     https://hmc/content?taskId=158&refre:	sh=267 🏠
Create Lpar Wizard : Server-820	3-E4A-
<ul> <li>→ Create Partition</li> <li>Partition Profile</li> <li>Processors</li> <li>Processing Settings</li> <li>Memory Settings</li> <li>I/O</li> <li>Virtual Adapters</li> <li>Logical Host Ethernet Adapters (LHEA)</li> <li>OptiConnect Settings</li> <li>Tagged I/O</li> <li>Optional Settings</li> <li>Profile Summary</li> </ul>	Create Partition This wizard helps you create a new logical partition and a default profile for it. You can use the partition properties or profile properties to make changes after you complete this wizard. To create a partition, complete the following information: System name : Server-8203-E4A- Partition ID : 2 Partition name : 02 - IBM i Client
< Back Next > Finish Ca	ncel Help
Done	hmc 🔒 😻 Disabled

Figure 4.2-1

Specify a Partition ID and Partition name and click Next



Next is the Partition Profile window:

🥹 Create Lpar Wizard : Server-8203-E4	A-See Mo	zilla Firefox 🛛 🗖 🔼
https://hmc/hmc/wcl/T4e2d		
Create Lpar Wizard : Server-820	3-E4A-	124
✓ Create Partition	Partition Pro	file
$\rightarrow \frac{1}{Partition Profile}$		
Processors Processing Settings Memory Settings I/O	A profile specifies processors, how which I/O devices allocated to the p	s how many much memory, and and slots are to be partition.
Virtual Adapters Logical Host Ethernet Adapters (LHEA) OptiConnect Settings	Every partition n To create the def following informat	eeds a default profile. ault profile, specify the tion :
Tagged I/O Optional Settings	System name:	Server-8203-E4A-
Profile Summary	Partition name:	02 - IBM i Client
	Partition ID:	2
	Profile name:	first setup
	This profile can a to the partition of partition. Click Ne specify the resou partition. Select t then click Next if to have all the re	ssign specific resources r all resources to the ext if you want to rces used in the he option below and you want the partition sources in the system.
	🔲 Use all the res	ources in the system.
< Back Next > Finish Ca	ncel Help	
Done		hmc 🔒 🧐 Disabled

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:

🖲 Create Lpar Wizard : Server-8203-E4	A-See Mozilla Firefox	_ 🗆 🛛
https://hmc/hmc/wd/T4e2d		☆
Create Lpar Wizard : Server-820	3-E4A-S	
Create Lpar Wizard : Server-820  Create Partition Profile Processors Processing Settings I/O Virtual Adapters Logical Host Ethernet Adapters (LHEA) OptiConnect Settings Tagged I/O Optional Settings Profile Summary Ceback Next > Cinish Cd	Processing Settings  Specify the desired, minimum, a settings in the fields below.  Total usable processing units:  Minimum processing units:  Maximum processing units: Shared processor pool:  Virtual processors  Minimum processing units requ for each virtual processors:  Minimum virtual processors:  Maximum virtual processor:  Maximum virtual processo	Ind maximum processing 1.00 *[0.1] *[0.5] DefaultPool (0) * wired 0.10 *[1] *
Done		hmc 🔒 🚳 Disabled

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:

🖲 Create Lpar Wizard : Server-8203-E4	A-Mozilla Firefox	
https://hmc/hmc/wd/T4e2d		☆
Create Lpar Wizard : Server-820	3-E4A-8	
Create Partition     Partition Profile     Processors     Processing Settings	I/O Physical I/O Detailed below are the physical I/O resources for the managed system. Select whi the list you would like included in the profile and then add the adapters to the prof Required. Click on a dapter to view more detailed adapter information.	ich adapters from file as Desired or
✓ <u>Memory Settings</u> → I/O Virtual Adapters Logical Host Ethernet Adapters (LHEA)	Add as required Add as desired Remove	
OptiConnect Settings	Select ^ Location Code ^ Description ^	Added ^ Bus ^
Tagged I/O	U789C.001 PI-T9 PCI-X DDR Dual - x4 3Gb SAS RAID Adapter	512
Optional Settings	U789C.001 U789C.001 Universal Serial Bus UHC Spec	513
Profile Summary	U789C.001. P1-C4 Empty slot	514
	U789C.001.0000538-P1-C5 Empty slot	515
	U789C.001.5 001-P1-C1 PCI 2-Line WAN w/Modem	516
	U789C.001.0004539-P1-C2 Empty slot	517
	U789C.001 PCC P1-C9 SCSI bus controller	518
	U789C.001. 001-P1-C3 Empty slot	519
	Total: 8 Filtered: 8	
< Back Next > Finish Co	ncel Help	
Done		hm: 🔒 😻 Disabled

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.

Document: iVirtualization - IBM iHost and Client LPAR Easy Install Guide v5.03 TR7.doc



You will advance to the Virtual Adapters window:

😻 Create Lpar Wizard : Server-8203-E4	A mession - Mozilla F	irefox				🛛
https://hmc/hmc/wcl/T4e2d						
Create Lpar Wizard : Server-820	3-E4A-1					
Create Lpar Wizard : Server-820  Create Partition Profile Processors Memory Settings Logical Host Ethernet Adapters (LHEA) OptiConnect Settings Tagged I/O Optional Settings Profile Summary	Virtual Adapters  Actions  Actions  Virtual resources allow adapter settings are lis  Maximum virtual adapto  Number of virtual adapto  P  Select ^ Type ^  Select ^ Type ^  Server Seria	for the sharing ted below. ers : ters : Adapter ID il 0 il 1 Total: 2	of physical hard Select Action o <b>Connecting P</b> Any Partition Any Partition Filtered: 2	ware between lo *[10 2 Partition ^ Conr Any I Selected: 0	gical partitions. The meeting Adapter ^ Partition Slot Partition Slot	current virtual Required  Yes Yes
< Back Next > Finish Ca	ancel Help					
Done					hmc	🔒 🥶 Disabled

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

Integrithme/Ind/wd/Iffeed     Create Lyor Wizard : Server-B203-E4A     Create Lyor Wizard : Server-B203-E4A     Create Partition     Participation Profile     Procession Settings     Properties     public terms     Actions     Memory Settings     Properties     public terms     Create Partition     Properties     public terms     Adapters     Logical Host Ethernet Adapters     Logical Host Ethernet Adapters     Logical Host Ethernet Adapters     Create Settings     Tagged I/O     Optional Settings     Profile Summary     Create Server Serial 0     Any Partition Any Partition Slot Yes     Total: 2 Filtered: 2 Selected: 0     Create: Help	🖲 Create Lpar Wizard : Server-8203-E4	A SHOTODATH - Moz	zilla Firefox			
Create Lpar Wizard : Server-8203-E4A-            Create Partition             Protestion Profile             Processing             Processing             Processing             Processing                 Processing                     Processing	https://hmc/hmc/wd/T4ea4					☆
Create Partition     Partition Profile     Processions Sattings     Memory Settings     Logical Host Ethernet Adapters     Logical Host Ethernet Adapters     Logical Host Ethernet Adapters     Logical Host Ethernet Settings     Tagged L/0     Optional Settings     Profile Summary     Select ~ Type ~ Adapter ID ~ Connecting Partition Any Partition Slot Yes     Server Serial 1 Any Partition Any Partition Slot Yes     Total: 2 Filtered: 2 Selected: 0	Create Lpar Wizard : Server-820	3-E4A-	14			
Total: 2 Filtered: 2 Selected: 0       < Back       Next > Finish       Cancel	Create Lpar Wizard : Server-820  Create Partition Profile Processors Processing Settings Memory Settings V/Q Virtual Adapters Logical Host Ethernet Adapters (LHEA) OptiConnect Settings Tagged I/0 Optional Settings Profile Summary	B=E4A= Virtual Adapt Actions ← Properties Edit Create Delete Hamee of Hamee Edit Select ^ Type O Server O Server	ers  w for the sharin Ethernet Ada Fibre Channel Scrit Adapter Senal Adapter Adapter ID Serial 0 Serial 1	o of physical hardware oter Adapter Adapter Connecting Partiti Any Partition Any Partition	between logical partitions. The second secon	he current virtual
	< Back Next > Finish Co	encel Help	Total: 2	Filtered: 2 Sel	ected: 0	

Figure 4.2-8



This will open a new window:

🕲 RSHMC: i5/OS - Mozilla Firefox	- 🗆 🛛
https://hmc/wcl/T4eb5	☆
Create Virtual SCSI Adapter - Server-8203-E4A-	
Virtual SCSI adapter Adapter : * 2	
Type of adapter : Client	=
This adapter is required for partition activation.	
Server partition : 01-Host IBM i 6.1(1) System VIOS Inf	0
Server adapter ID : 2	
OK Cancel Help	~
Done hmc 🔒 🥹	Disabled

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:

😻 Create Lpar Wizard : Server-8203-E4	A-SHETHERIT - Moz	zilla Firefox			Z
https://hmc/hmc/wcl/T4eb5					☆
Create Lpar Wizard : Server-820	3-E4A-	14			
<ul> <li>✓ Create Partition</li> <li>✓ Partition Profile</li> <li>✓ Processors</li> <li>✓ Processing Settings</li> <li>✓ Memory Settings</li> <li>✓ Memory Settings</li> <li>✓ Memory Settings</li> <li>✓ LOQ</li> <li>→ Virtual Adapters</li> <li>Logical Host Ethernet Adapters (LHEA)</li> <li>OptiConnect Settings</li> <li>Tagged I/O</li> <li>Optional Settings</li> </ul>	Virtual Adapt Actions * Virtual resources adapter settings a Maximum virtual a Number of virtual ## 19 \$ Select ^ Type C Client	allow for the sharing o are listed below. adapters : adapters :	f physical hardware betwee * 10 3 ect Action M Connecting Partition ^	connecting Adapter	current virtual
< Back Next > Finish Co	C Server C Server	Serial 0 Serial 1 Total: 3 F	Any Partition Any Partition Any Partition	Any Partition Slot Any Partition Slot	Yes Yes
https://hmc/hmc/vid/T4eb5#				hmc	🔒 😻 Disabled

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.



😻 Create Lpar Wizard : Server-8203-E4	A-Section - Mozilla Firefox 💷 🖂
https://hmc/hmc/wcl/T4e2d	<u>☆</u>
Create Lpar Wizard : Server-820	3-E4A
<ul> <li>✓ Sreate Partition</li> <li>✓ Partition Profile</li> <li>✓ Processors</li> <li>✓ Processing Settings</li> <li>✓ Memory Settings</li> <li>✓ 1/Q</li> <li>✓ Virtual Adapters</li> <li>✓ Logical Host Ethernet Adapters (LHEA)</li> <li>✓ OptiConnect Settings</li> <li>→ Tagged 1/Q</li> <li>Optional Settings</li> <li>Profile Summary</li> </ul>	Tagged I/O Tagged I/O devices for this partition profile are detailed below. Load source Client SCSI Slot 2 * Alternate restart device Client SCSI Slot 2 * Console Hardware Management Console * Alternate console None * Operations Console None *
< Back Next > Finish Co	incel Help
Rear -	1 (1) (1) (1)
Done	hmc 🏭 🤓 Disabled

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:

https://hmc/hmc/wd/T4e2d					
Create Lpar Wizard : Server-820	3-E4A-BN60004				
Create Partition     Partition Profile     Processors     Processing Settings     Memory Settings     I/Q     Virtual Adapters     Logical Host Ethernet Adapters (LHEA)     OptiCennext Settings     Tagged I/Q     Optide Settings     Profile Settings	Profile Summary This is a summary of the part create the partition and profi- chaices, click Back. You can si I/O devices you chose by click You can modify the profile or properties or profile propertie wizard. Partition ID: Partition name: Partition environment: Profile name:	tition le. To ee thi king D parti es aft 2 02 - i5/0 first	and profil change a e details o Details. tion by us er you cor IBM i Clier S setup	e. Click Fi ny of you if the phy ing the p nplete th	inish tu ir vsical artitio is
	Desired memory: Desired processing units: Physical I/O devices: Load source: Location code: Console:	2.0 0.10 0 Virtu Usin	GB al slot nur	0.0 Details mber 2	MB
	Location code: Alternate restart device: Location code:	Virtu	al slot nur	mber 2	
	Virtual I/O adapters:	0 1 2 0	Ethernet SCSI Serial Fibre Ch	annel	
< Back Next > Finish Ca	Desired Huge Page Memory: ncel Help	0.0	Pages		

### 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:



BRSHMC: Hardware Managemen	t Console Workplace	(¥7R3.4.0.0) - M	iozilla Firefox						
Mtps://hmc/hmc/connects/mainu#n	ameset.jsp								会
Hardware Managemen	t Console								Logeff
\$ \$ \$ \$ \$ \$ <b>8</b>	Systems Manageme	nt > Servers > Se	erver-8203-E4A-5					1000000 10000 1	
D Welcome		919	P P Tasks	Views +					
0 () Systems Management	Select ^ Name		^   D ^   Stat	us ^  Process	ing Units    Memory (08)	^ Active Profile	<ul> <li>Environment</li> </ul>	A Reference Code	~
G Servers	E 51 01-210	of IDM   6.1	1	Running	0.9	6 first setup	605	00000000	
Custon Groups	□ <b>61</b> 02-8	IM i Client	2	Not Activated	0	0	605	00000000	
Al Partitions			Total 2 Fillered 2	Selected: 0					
R. Santara Blance									
B INC Measured									
XI Service Management									
A Dedates	Tasks: Server-8203	E4A INNERSES	8818						_
Co opones	Properties El Omerationes		E Configu	ration	B Hardware Information		E Serviceability		
	a operations		E Crea	te Logical Partition UK or Linux	Si Updates		El Capacity On Berr	hand (Coll)	
				h0 Server SIOS					
			El Syst	ern Plans nd Processor Doci Management					
			Vitu Parts	al Network Management on Availability Priority					
			View	Workload Management Groups ge Custon Groups					
			S Man	age Partition Data					
			E Connect	lone					
Status: Attentions and Events									
Read http:							(	iiiii hnc 🎒 📵 🛛	balded

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:

💈 Create Lpar Wizard : Azura - M	ozilla Firefox IBM Edition
https://ticino.nl.ibm.com/hm	ic/wcl/T3225
Create Lpar Wiza	ard : Azura
Create Partition     Partition Frolle     Processing Settings     Wrenory Settings     I/O     Virtual Adapters     Optional Settings     Profile Summary	Create Partition This wizard helps you create a new logical partition and a default profile for it. You can use the partition properties or profile properties to make changes after you complete this wizard. To create a partition, complete the following information: System name : Azura Partition ID : 2 Partition name : LinuxClient
< Back Next >	Finish Cancel



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:

Create Lpar Wizard : Azura - Moz	cilla Firefox: IBM Edition					
https://ticino.nl.ibm.com/hmc/	https://ticino.nl.ibm.com/hmc/wcl/T3225					
Create Lpar Wizard : Azura						
✓ Create Partition	Processing Settings					
<ul> <li>Partition Profile</li> <li>Processors</li> </ul>	Specify the desired, minimum, and maximum processing settings in the fields below.					
→ <u>Processing Settings</u> Memory Settings	Total usable processing units: 2.00					
I/O Virtual Adapters	Minimum processing units * 0.1					
Optional Settings	Desired processing units: +.5					
Profile Summary	Maximum processing units: 1					
	Virtual processors Minimum processing units required 0.10 for each virtual processors: *1 Desired virtual processors: *1 Maximum virtual processors: *1 Uncapped Weight : 128.0					
< Back Next >	Finish Cancel					

Figure 4.3-4

### Complete the entry fields and click Next



### Next is the Memory Settings window:

Create Lpar Wizard : Azura  Memory Settings  Create Partition  Profile Physical Memory Installed Memory Inst
<ul> <li>✓ Processing Settings</li> <li>→ Memory Settings</li> <li>i/O</li> <li>Virtual Adapters</li> <li>Optional Settings</li> <li>Profile Summary</li> </ul>
< Back Next > Finish Cancel

Figure 4.3-5

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

Create Lpar Wizard : Azura - Mozilla	Firefox IB	M Edition						- 0 - X
https://ticino.nl.ibm.com/hmc/wc	:I/T3225							<b>合</b> 9
Create Lpar Wizard	: Azu	ra						
✓ <u>Create Partition</u>	(/0							
✓ Partition Profile Physical I/O								
<ul> <li>Processors</li> <li>Processing Settings</li> <li>Memory Settings</li> </ul>	Detailed below are the physical I/O resources for the managed system. Select which adapters from the list you would like included in the profile and then add the adapters to the profile as Desired or Required. Click on an adapter to view more detailed adapter information.							
$\rightarrow 1/0$	Add as	required	Add a	s desired	Re	move		
Virtual Adapters Optional Settings			**	1		Select Action		
Profile Summary	Select	Locatio	on Code		^	Description ^	Added ^	Bus ^
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>C1</u>	Storage controller		2
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>C2</u>	Empty slot		2
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>C4</u>	Ethernet controller		2
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>T5</u>	PCI 10/100/1000Mbps Ethernet UTP 2-port		2
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>T7</u>	Universal Serial Bus UHC Spec		2
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>C3</u>	PCI 2-Line WAN w/Modem		3
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>C5</u>	Storage controller		3
		<u>U787A.</u>	001.DPM	0YM8-P1-	<u>C6</u>	PCI I/O Processor		3
		<u>U787A.</u>	001.DPM	0YM8-P1-	T10	PCI RAID Controller		3
		<u>U787A.</u>	001.DPM	0YM8-P1-	T12	Other Mass Storage Controller		3
				Total:	10	Filtered: 10		
< Back Next >	Finish	Canc	el					

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:

😻 Create Lpar Wizard : Azura - Moz	ozilla Firefox: IBM Edition	×
https://ticino.nl.ibm.com/hmc/	c/wcl/T3225	Ċ₹
Create Lpar Wiza	ard : Azura	
<u>Create Partition</u> <u>Partition Profile</u>	Virtual Adapters Actions •	
Processing Settings     Memory Settings     1/Q	Virtual resources allow for the sharing of physical hardware between logical partitions. The current virtual adapter settings are listed below.	
→ <u>Virtual Adapters</u>	Maximum virtual adapters : 10	
Optional Settings Profile Summary	Number of virtual adapters :     2       Image: Construction of the second secon	
	Select Type ^ Adapter ID ^ Server/Client Partition ^ Partner Adapter ^ Required	^
	Server Serial Q Any Partition Any Partition Slot Yes	
	Server Serial 1 Any Partition Any Partition Slot Yes	
	Total: 2 Filtered: 2 Selected: 0	
< Back Next >	Finish Cancel	

Figure 4.3-7

Using the *Actions* drop drown 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:

🖲 ticino: AIX or Linux - Mozilla Firefox: IBM Edition
A https://ticino.nl.ibm.com/hmc/wcl/T3c22
Create Virtual S©SI Adapter - Azura
Virtual SCSI adapter
Adapter : 4
Type of adapter : Client
This adapter is required for partition activation.
Server partition : 01-IBM i host(1) System VIOS Info
Server adapter ID : 2
OK Cancel Help

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:

Create Lpar Wizard : Azura - Mos	zilla Firefox: IBM Edition			×		
https://ticino.nl.ibm.com/hmc	/wcl/T3ca7			্রন		
Create Lpar Wiza	rd : Azura					
✓ Create Partition	Virtual Adapters					
Partition Profile     Processors	Actions -					
<ul> <li>Processing Settings</li> <li>Memory Settings</li> </ul>	Virtual resources allow for the sharing of physical hardware between logical partitions. The current virtual adapter settings are listed below.					
✓ I/Q → Virtual Adapters	Maximum virtual adapters : Number of virtual adapters :	* 10				
Optional Settings Profile Summary		Select Action •				
	Select Type ^ Adapter ID	^ Server/Client Partition	^ Partner Adapter ^	Required ^		
	Client SCSI 4	01-IBM i host(1)	2	Yes		
	Server Serial 0	Any Partition	Any Partition Slot	Yes		
	Server Serial 1	Any Partition	Any Partition Slot	Yes		
	Total: 3	3 Filtered: 3 Selected	d: 0			
< Back Next >	Finish Cancel					

### Figure 4.3-10

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

Document: iVirtualization - IBM iHost and Client LPAR Easy Install Guide v5.03 TR7.doc



	Virtual Adapters			
Create Partition Partition Profile	Actions -			
Processors	Create Virtual Adapter	Ethernet Adapter		
Processing Settings	Edit	Fibre Channel Adapter	en logical partitions.	The current
Memory Settings	Properties	SCSI Adapter		
Virtual Adaptors	Delete	Serial Adapter		
Ontional Settings	Advanced	3	1	
Profile Summary		P Select Action •		
	Select Type Adapter	ID A Server / Client Partition	Dartner Adapter	Pequired
	Client SCSI 4	01-IBM i host(1)	2	Yes
	Server Serial 0	Any Partition	Any Partition Slot	Yes
	Server Serial 1	Any Partition	Any Partition Slot	Yes
	Total	: 3 Filtered: 3 Selected	1: 0	

Figure 4.3-11

### This will open a new window:

ticino: AIX or Linux - Mozilla Firefox: IBM Edition					
https://ticino.nl.ibm.com/hmc/wcl/T3c22	<b>∆</b> *				
Create Virtual Ethernet Adapter - Azura					
General					
Virtual ethernet adapter					
Adapter ID : 3					
Port Virtual Ethernet: * 1 View	Virtual Network				
This adapter is required for virtual server activati	on.				
IEEE Setings					
Select this option to allow additional virtual LAN IDs	for the adapter.				
IEEE 802.1q compatible adapter					
Shared Ethernet Settings					
Select Ethernet bridging to link (bridge) the virtual Ethernet to a physical network					
Use this adapter for Ethernet bridging					
OK Cancel Help					

### 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 <u>This adapter is required for virtual server activation</u>.

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

📵 Create Lpar Wizard : Azura - Mo:	zilla Firefox: IBM Edition					
https://ticino.nl.ibm.com/hmc	/wcl/T3ce5			ුරු		
Create Lpar Wiza	rd : Azura					
✓ Create Partition	Virtual Adapters					
<ul> <li>Partition Profile</li> <li>Processors</li> </ul>	Actions 👻					
<ul> <li>Processing Settings</li> <li>Memory Settings</li> </ul>	Virtual resources allow for the sharing of physical hardware between logical partitions. The current virtual adapter settings are listed below.					
✓ 1/0	Maximum virtual adapters	:	* 10			
Virtual Adapters	Number of virtual adapters	:	4			
Profile Summary	00#9	🖉 🧟 Select Act	tion •			
	Select Type ^ Ada	pter ID ^ Server/Client	Partition ^ Partner Adapter	^ Required ^		
	Ethernet 3	N/A	N/A	Yes		
	Client SCSI 4	01-IBM i host(1	1) 2	Yes		
	Server Serial 0	Any Partition	Any Partition Slot	Yes		
	Server Serial 1	Any Partition	Any Partition Slot	Yes		
	T	otal: 4 Filtered: 4	Selected: 0			
< Back Next >	Finish Cancel					
	Cance					

Figure 4.3-13

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





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


Create Lpar Wizard : Azura - Mozilla Firefox: IBM Edition						
https://ticino.nl.ibm.com/hmc/wcl/T3225						
Create Lpar Wiza	ard : Azura					
✓ Create Partition	Profile Summary					
<ul> <li>Partition Profile</li> <li>Processors</li> <li>Processing Settings</li> <li>Memory Settings</li> </ul>	This is a summary of the partition and profile. Click Finish to create the partition and profile. To change any of your choices, click Back. You can see the details of the physical I/O devices you chose by clicking Details.					
✓ 1/O ✓ Virtual Adapters	You can modify the profile properties or profile prope	ou can modify the profile or partition by using the partition roperties or profile properties after you complete this wizard.				
✓ Optional Settings → Profile Summary	Partition ID: Partition name: Partition environment: Profile name:	2 LinuxClient AIX or Linux first_setup				
	Desired memory: Desired processing units: Physical I/O devices:	4.0 GB 128.0 0.50 0 Detail	MB			
	Boot mode:	NORMAL				
	Virtual I/O adapters:	1 Ethernet 1 SCSI 2 Serial 0 Fibre Channel				
< Back Next > Finish Cancel						

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:

🔋 ticino: Hardware Management Console Workplace (V7R7.4.0.1) - Mozilla Firefox: 18M Edition								
A https://ticino.nl.ibm.com/hmc/connects/main	Ahtps://ticino.nl.kom.com/hmc/connects/mainuiFameset.jsp							
Hardware Managemer	nt Console						/)ŏ	bscraat L Help L Lagaff
40 00 00	Systems Management > 5	Servers > A	ura					nennen 1 nete 1 engen
Welcome	00 # 9	1	•	Filter		Tasks 🔻 Views 🕯	•	
Systems Management	S Name ^	IE ▲ Status	^	Proc ^ Memo	Active ^ Profile ^	Environment ^	Ref ^ Code	OS Version ^
Azura	🔲 📓 01-IBM i host	1	Running	1.5	8 IBM i V7R1	IBM i	00000000	IBM i Licensed Internal Code 7.1.0
🖽 🔁 Custom Groups	LinuxClient	2	Not Activated	0	0	AIX or Linux	00000000	Unknown
🖍 System Plans		Max	Page Size: 250	Total: 2 Filtere	d: 2 Selected: 0			
HMC Management								
🗱 Service Management								
🔂 Updates								
	•							•
	Tasks: Azura 🖽 🖼 🛛	-						^
	Properties							
	□ Operations =							
	Power on Piller Status							
	Schedule Operations							
Status: OK	Launch Advanced System Management (ASM)							
	🗄 Utilization Data							
	Rebuild Change Password							
Transferring data from ticino.nl.ibm.com	Griange Password							•

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 Administr	ation
Select	one of the following:	System:
1. 2. 3. 4.	Configure a network server Start a network server Stop a network server Work with network server storage spaces	
10. 11. 12.	Change network server attributes Change network server user attributes Work with network server user enrollmen	t
20.	Work with network server status	
30.	Submit a network server command	
Selecti ===>	on or command	More
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 (NWSD object) for an IBM i Client LPAR

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

CRTNWSD - 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 RSRCNAME 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 (CRTNWSD)
Type choices, press Enter.	
Network server description NWS Resource name	D > ICLIENT1 CNAME > CTL04 E
Server connection	<pre>&gt; *GUEST &gt; *OPSYS INE *YES WAIT *NOWAIT TDTIMO *TYPE TITION *NONE</pre>
Partition number PTN Code page COD Server message queue MSG Library POO Pool identifier	NBR > 2 EPAGE *LNGVER Q *JOBLOG L *BASE
F3=Exit F4=Prompt F5=Refresh F	More 12=Cancel F13=How to use this display

Figure 5.1.1-1

Create Network Server Desc	(CRTNWSD)
Type choices, press Enter.	
TCP/IP port configuration: TCPPORTCFG Port	*NONE
TCP/IP route configuration: TCPRTE Route destination Subnet mask Next hop	*NONE
TCP/IP local host name TCPHOSTNAM	*NWSD
F3=Exit F4=Prompt F5=Refresh F12=Cancel	More F13=How to use this display





Create Network Server Desc (CRTNWSD) Type choices, press Enter. TCP/IP local domain name . . . . TCPDMNNAME \*SYS TCP/IP name server system . . . TCPNAMSVR + for more values \*SYS Restricted device resources . . RSTDDEVRSC  $\ \ +$  for more values \*NONE IPL source . . . . . . . . . . . IPLSRC > \*PANEL \*NONE IPL stream file . . . . . . . IPLSTMF IPL parameters . . . . . . . . IPLPARM \*NONE Power control . . . . . . . . PWRCTL > \*NO Serviceability options . . . . SRVOPT \*NONE More... F5=Refresh F12=Cancel F13=How to use this display F3=Exit F4=Prompt F24=More keys



Create Network Server Desc	: (CRTNWSD)
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 (NWSD object) for a Linux Client LPAR

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

CRTNWSD - 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 RSRCNAME 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 Serve:	r Desc (CRTNWSD)
Type choices, press Enter.	
Network server description NWSD Resource name RSRCNAME Network server type: TYPE	> LNXCLN1 > CTL04
Server connection Server operating system Online at IPL ONLINE Vary on wait VRYWAIT Shutdown timeout SHUTDTIMU Partition PARTITION	<pre>&gt; *GUEST &gt; *LINUXPPC *YES *NOWAIT &gt; *TYPE N *NONE</pre>
Partition number PTNNBR Code page CODEPAGE Server message queue MSGQ T1 Library Pool identifier POOL	> 2 *LNGVER *JOBLOG *BASE
F3=Exit F4=Prompt F5=Refresh F12=Ca	More ncel F13=How to use this display

Figure 5.1.2-1

Create Network Server Desc	(CRTNWSD)
Type choices, press Enter.	
TCP/IP port configuration: TCPPORTCFG Port	*NONE
<pre>TCP/IP route configuration: TCPRTE Route destination Subnet mask Next hop</pre>	*NONE
TCP/IP local host name TCPHOSTNAM	*NWSD
F3=Exit F4=Prompt F5=Refresh F12=Cancel	More F13=How to use this display





Create Network Server Desc (CRTNWSD) 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



		Create Netwo	rk Server Des	c (CRTNWSD)	
Type choi	ces, press E	inter.			
Authority			AUT	*CHANGE	
Text 'des	cription' .		TEXT 2	> 'Linux Client partition using	J
LPAR ID2'					
				Botto	om
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 > \*OPEN Format . . . . . . . . . . . . . FORMAT 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 F12=Cancel F13=How to use this display F3=Exit F4=Prompt F5=Refresh 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 DSPOPT(\*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 11=Remove link	r. 3=Copy 4=De	lete 5=Display	6=Print	10=Add link	
Opt Name Server	Link Seq Type	Stg Access Path			
10 GOLDEN611					
				Bottom	
===>					
F3=Exit F4=Prompt F11=Display disk status	F5=Refresh F12=Cancel	F6=Print list F17=Position to	F9=Retrieve		

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 Network server description NWSD Dynamic storage link DYNAMIC Access ACCESS Drive sequence number DRVSEQNBR Storage path number STGPTHNBR	<pre>&gt; GOLDEN611 &gt; ICLIENT1  *N0  *UPDATE  *CALC  *DFTSTGPTH</pre>
F3=Exit F4=Prompt F5=Refresh F12=Cancel F24=More keys	Bottom F13=How to use this display



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 Link Stg Opt Name Type Access Server Path Seq GOLDEN611 ICLIENT1 1 \*DYN \*UPDATE Bottom Parameters or command rs=Exit F4=Prompt F5=Refresh F6=Print list F9=Retrieve F11=Display disk status F12=Cancel F17-Positi 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 1 ICLIENT1 VARIED OFF -----Job-----ICLIENT1 Bottom Parameters or command ===> F3=Exit F4=Prompt 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 P Position to Starting characters	hh:mm:ss			
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 StatusJobJobJobJobJob	Bottom			
Parameters or command ===>				
F3=Exit F4=Prompt 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**.



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



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.

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# 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:

🕲 RSHMC: Propertie	s - Mozilla Firefox							
https://hmc/hmc/w	ttps://hmc/hmc/wcl/T4fa4							
Partition Proper	ties - 02 - IBM i C	lient						
General Hardward	e Virtual Adapters	Settings	Other					
Boot								
IPL source: D	•							
Keylock position:	Manual	-						
Automatically sta	rt with managed sy	stem: Disa	abled					
Service and suppo	et.							
Connection moni	torina:		Disabled					
Service partition:			Disabled					
Redundant error	path reporting: ort errors that caus	e nartition	Disabled					
termination or rec	uire attention:	e paradon	Disabled					
Tagged I/O								
Load source: Alternate restart								
Console:								
Alternate console	): alo diroct:							
Operations const	he direct.							
OK Cancel H	eln							
Done			hmc 🔒 🧐	Disabled				

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.



Г

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:

🥹 iic-hmc-ps1: Hardware Manag	ement Console Workplace	(V7R7.1.0.2) - Mozilla Fire	fox				-	
m.com https://ic-hmc-ps1.amsic.il	bm.com/hmc/connects/mainuiFram	eset.isp						ŵ
Hardware Managemen	t Console							Legoff
수수 🟠 🖓 🕒 🖯	Systems Management > S	Servers >						Cogon
T Welcome	00#9		ilter )	Tasks 🔻 Views 🔻				
🗄 📕 Systems Management	Select Name	D Status	A Pro	cessing Units ^ Memory (GB	) ^ Active Profile ^	Environment	A Reference Code	~
Servers	🔽 📓 02- IBM i Client 🗷	Properties	Not Activated	1	8 first setup	IBM i	00000000	
	🗆 📓 KISA-OS	Change Default Profile	Running	2	16 ICISA=OS-profile	EMI	00000000	
		Operations •	Activate 🕨	Profile				
		Configuration	Deactivate Attention LED	Current Configuration				
		Hardware Information	Schedule Operations					
		der viceokinky	L/GIBLG					
🗃 🍄 Custom Groups								
System Plans								
HMC Management								
91								
A0 Service Management								
😳 Updates								
4								
	Tasks: 02- IBM i Client 🖽							
	Properties Change Default Profile		Operations		Hardware Infor	mation		
			H Configuration		El Serviceability			
Status: OK								
javascript:void(0);								A

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:

LANGUAGE FEATURE ===>	2924	

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 1	Serial number YLG5S3GGG687	Туре 6В22	Model 050	Sys Bus 255	Sys Card 2	I/O Adapter 0	I/O Bus O	Ctl 0	Dev O	

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.



Next is the "Initialize the Disk – status" screen:

```
Initialize the Disk - Status
The load source disk is being initialized.
Estimated time to initialize in minutes : 180
Elapsed time in minutes . . . . . . . . . 0.0
Please wait.
Wait for the next display or press F16 for DST main menu
```

Figure 6.3-4

This will only take a couple of minutes instead of the estimated 180 minutes.

The system will quickly continue to the Install Licensed Internal Code – Status screen:

Install Licensed Internal Code - Status							
Install of the Licensed Internal Code in progress.							
+ Percent   15% complete +	+   +						
Elapsed time in minutes 0.5							
Please wait.							
Wait for the next display or press F16 for DST main menu							

Figure 6.3-5

This will only take a couple of minutes :

Install Licensed Internal Code - Status						
Install of the Licensed Internal Code in progress.						
Percent   <b>100%</b> 100%						
Elapsed time in minutes						
Please wait.						
Wait for the next display or press F16 for DST main menu						

#### Figure 6.3-6

When it completes to 100%, the IBM i Client partition will reboot/re-IPL – you can check from the virtualization configuration interface used (VPM or HMC) that the Reference Codes are advancing.



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						
	Serial			Resource			
ASP Unit	Number	Туре М	Model	Name	Status		
1	VI CEODOCCO 7	(D))	0 5 0	DD001	Unprotected		
Ţ	ITC223CCC000\	0BZZ	050	DDUUI	configured		
Press Ent	er to continue.						
F3=Exit F11=Disk	F5=Refresh configuration ca	n apacity	F9=1 F12=	Display d =Cancel	isk unit details		

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 (<u>http://publib.boulder.ibm.com/eserver/</u>) 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

	D	isplay Installed Licensed Programs	TCLIENT
Licensed	Installed	5y5ccm.	TOTIONI
Program	Status	Description	
5761551	*COMPATIBLE	Library OGPL	
5761SS1	*COMPATIBLE	Library OUSRSYS	
5761881	*COMPATIBLE	i5/0S	
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 Ent	er to continu	<u>م</u>	200000
LTCCC DILC	er co concrita		

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						
Type options, press Ente 1=Create 2=Change 11=Remove link	r. 3=Copy 4=Del	lete 5=Display	6=Print 1	0=Add link		
Opt Name Server	Link Seq Type	Stg Access Path				
3 GOLDEN611						
				Bottom		
Parameters or command						
F3=Exit F4=Prompt F11=Displav disk status	F5=Refresh F12=Cancel	F6=Print list F17=Position to	F9=Retrieve			

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 E	nter.	
Network server storag Size From storage space . Data offset Auxiliary storage poo ASP device Text 'description' .	e space NWSSTG NWSSIZE FROMNWSSTG OFFSET 1 ID ASP ASPDEV TEXT	GOLDEN71 > 25603 > GOLDEN611 *FORMAT > 1 Golden Code IBM I 7.1
F3=Exit F4=Prompt	F5=Refresh F12=Cancel	Bottom 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 11=Remove link	:. B=Copy 4=Del	ete 5=Display	6=Print 10=Ad	d link				
Opt Name Server	Link Seq Type	Stg Access Path						
GOLDEN611 10 GOLDEN71								
				Bottom				
Parameters or command ===>								
F3=Exit F4=Prompt F11=Display disk status	F5=Refresh F12=Cancel	F6=Print list F17=Position to	F9=Retrieve					

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	<pre>&gt; GOLDEN71</pre>
Network server description NWSD	> ICLIENT1
Dynamic storage link DYNAMIC	*NO
Access ACCESS	*UPDATE
Drive sequence number DRVSEQNBR	*CALC
Storage path number STGPTHNBR	*DFTSTGPTH
F3=Exit F4=Prompt F5=Refresh F12=Cancel	Bottom
F24=More kevs	F13=How to use this display



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.

Document: iVirtualization - IBM iHost and Client LPAR Easy Install Guide v5.03 TR7.doc



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 Link Stg Opt Name Server Seq Type Access Path GOLDEN611 GOLDEN71 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 7.2-3
```

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

Work with Configuration Status					
04/05/12 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 StatusJobJobJobJobJob	- ttom				
Parameters or command ===>	ccom				
F3=Exit F4=Prompt F12=Cancel F23=More options F24=More keys					

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:

Wo	rk with Configuration Status		
Position to	Starting characters	U4/U5/12 hh	:mm:ss
Type options, press Enter. 1=Vary on 2=Vary off 9=Display mode status	5=Work with job 8=Work with 13=Work with APPN status	description	
Opt Description Sta ICLIENT1 ACT	tus I <b>VE</b>	-Job	 Bottom
Parameters or command ===>			200000
F3=Exit F4=Prompt F12=	Cancel F23=More options F24	=More keys	
	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 though 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 L	icensed Progra	ams	
Select one of the follo	wing:		Syst	em: ICLIENT
Manual Install 1. Install all				
Preparation 5. Prepare for ins	tall			
Licensed Programs 10. Display install 11. Install license 12. Delete licensed 13. Save licensed p	ed licensed d programs d programs programs	programs		
Selection or command ===> 5				More
F3=Exit F4=Prompt F F16=System Main menu (C) COPYRIGHT IBM CORP.	9=Retrieve 1980, 2009.	F12=Cancel	F13=Information	Assistant

Figure 7.3-1

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

Prepare for Install		
Type option, press Enter. 1=Select	System:	ICLIENT
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=Cance	el	Bottom



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.
      1 =Distribution media

      Generate list from
      1 =Distribution media

      2=Merge with additional distribution media
      3=Modify previously generated list

      Optical device . . OPT02
      *NONE, Name

      Target Release . . V7R1M0
      VxRxMx
```

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.

		V	Vork with	Image Catalog	S		
						System:	
Type 1= 12	options, pr Create 2=0 =Work with e	ress Enter. Change 4=De entries	elete 8=	Load 9=Unlo	ad 10=V6	erify	
	Image			ASP		Device	
Opt	Catalog	Status	Туре	Threshold D	evice	Status	
12	IBMI7.1 SF99710 GROUPPTFS	Not ready Not ready Not ready	Optical Optical Optical	*CALC *CALC *CALC			
F3=E	xit F5=Rei	fresh F11=V	/iew descr	riptions 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 : Not ready Type : Optical Device : 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_02
5 Loaded B GROUP1 04
6 Loaded B_GROUP1_05
Bottom F3=Exit F5=Refresh F6=Load/Unload image catalog F7=Verify image catalog F8=Reorder by index F12=Cancel F24=More keys

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:

		V	Work with	Image Catalogs	System:	
Type 1= 12	options, particular control options, particular control option of the control option option of the control option	ress Enter. Change 4=De entries	elete 8=	Load 9=Unload	10=Verify	
	Image			ASP	Device	
Opt	Catalog	Status	Туре	Threshold Devic	ce Status	
8	IBMI7.1	Not ready	Optical	*CALC		
	SF99710	Not ready	Optical	*CALC		
	GROUPPTFS	Not ready	Optical	*CALC		
						Bottom
F3=E	xit F5=Re	fresh F11=\	/iew descr	riptions F12=Car	ncel	

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  $\ldots$   $\ldots$   $\ldots$   $\ldots$  IBMI7.1 Name \*LOAD, \*UNLOAD Option . . . . . . . . . . . . > \*LOADoptvrt01 \*DFT Virtual device . . . . . . . . Name \*DFT, \*ALL, \*NONE Write protect  $\ldots$ Library mode . . . . . . . . . \*NO \*NO, \*YES Bottom F12=Cancel F13=How to use this display F3=Exit F4=Prompt F5=Refresh F24=More keys

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.

Type 1= 12	options, pr Create 2=0 =Work with e	vess Enter. Change 4=De entries	Nork with	Image Catal Load 9=Un	ogs load 10=V	System: Terify	
Opt	Image Catalog	Status	Туре	ASP Threshold	Device	Device Status	
	IBMI7.1 SF99710 GROUPPTFS	<b>Ready</b> Not ready Not ready	Optical Optical Optical	*CALC *CALC *CALC	OPTVRT01	Active	
F3=E Image	xit F5=Ref catalog IBM	fresh F11=V MI7.1 loaded	/iew descr	iptions F	12=Cancel		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 CPA3DDE Message ID . . . . . : 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. Replv . . . 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 w Target release Estimated additional st	ith Licensed Programs for Target Release System: 	ICLIENT
Type options, press En 1=Select 5=Display	ter. release-to-release mapping	
Licensed Product Opt Program Option 1 5770999 *BASE 1 5770SS1 *BASE 1 5770SS1 1 5770SS1 1 5770SS1 1 5770SS1 2 1 5770SS1 2 1 5770SS1 3 5770SS1 5 5770SS1 5 5770SS1 5 5770SS1 5	Description Licensed Internal Code i5/OS Library QGPL Library QUSRSYS Extended Base Support Online Information Extended Base Directory Support System/36 Environment System/38 Environment	
F3=Exit F11=Display a F19=Display trademarks	additional storage F12=Cancel	More

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 (PWRDWNSYS)	
Type choices, press Enter.		
How to end OP Controlled end delay time DE Restart options: RE Restart after power down Restart type IPL source IP	TION * IMMED LAY 3600 START *YES *IPLA LSRC D	
F3=Exit F4=Prompt F5=Refresh F13=How to use this display	F10=Additional parameters F24=More keys	Bottom F12=Cancel



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 diskspace 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 diskspace 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 II14615) 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 + for more values Network server configuration: NWSCFG	*SAME
Remote system name	*SAME
Virtual Ethernet control port . VRTETHCTLP Synchronize date and time SYNCTIME Disable user profiles DSBUSRPRF IPL source IPLSRC IPL stream file IPLSTMF	*SAME *SAME *SAME <b>*PANEL</b> *SAME
IPL parameters IPLPARM	*SAME
Power control PWRCTL	*YES
F3=Exit F4=Prompt F5=Refresh F12=Cancel F24=More keys	More F13=How to use this display

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

🥑 iic-hmc-i	5: Manage Pr	ofiles - Mo	zilla F	irefox					_ 🗆 🛛
🐨 bm.com									会
Logical I	Partition Pr	ofile Prop	ertie	s: first_se	tup @ IBM i	i Client			
General	Processors	Memory	1/0	Virtual Adapters	Power Controlling	Settings	Logical Host Ethernet Adapters (LHEA)	Tagged I/O	OptiConnect
Partition	Profile Prope	rties							
Prome na	me:	first_se	tup						
Partition	name:	02 - IBM	i Clier	nt					
Partition	ID:	2							
Partition	environment	: i5/05							
System n	ame:								
OK Ca	ncel Help	]							
Done									â 🔮



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

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 Subject:
 iVirtualization IBM i Host and Client LPARs Easy Install Guide



iic-hmc-	15: Manage P	Profiles - M	ozilla	Firefox					
🕈 km.com									Û
Logical	Partition P	rofile Pro	perti	es: first_s	etup @ IBM i	Client			
General	Processors	Memory	1/0	Virtual Adapters	Power Controlling	Settings	Logical Host Ethernet Adapters (LHEA)	Tagged I/O	OptiConnect
Powe Nu Po	er controlling Imber of pow wer controlling elect ID Nar	g partition ver control ng partitio ne	is ling pa ins to	artitions : 1 add : 01	-Host IBM i 6.1	(1) × A	dd		
ок с	ancel Help					R	emove		
ne									<b>a</b> (

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.

谢 iic-hmc-	i5: Manag	e Profiles - M	ozilla	Firefox					_ 🗆 🖂
🐨 ibm.com									☆
Logical	Partitio	n Profile Pro	pertie	es: first_s	etup @ IBM i	Client			
General	Processo	ors Memory	I/O	Virtual Adapters	Power Controlling	Settings	Logical Host Ethernet Adapters (LHEA)	Tagged I/O	OptiConnect
Det Powe Nu Po	ailed belo er control imber of p wer control	iw are the po lling partition power control rolling partitio	wer co s ing pa ns to a	ontrolling pa artitions : add :	artitions for thi	s partition	profile.		Add
Se	lect ID	Name							
	1	01-Host IBM	16.1(	1)					Remove
окс	ancel	telp							
Done									🔒 🖲

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 PWRDWNSYS
- 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: INXCLNT1 (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
INXCLNT1: Enter service tools password:
INXCLNT1: Console connecting
INXCINT1: 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**.

Type options, press Enter.													
1=Power on 3=IPL restart 7=Delayed power off 8=Immediate power of													
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													
111													
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 Identifier	Name IBMIHOST	IPL Source B	IPL Mode Normal	State On	Sys II Actior	System: PL Reference Codes									
2	LNXCLNT1	D	Manual	On		AA00 E1A9									
F3=Exit	F9=Include	reference	e code de	tail	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.

Sticino: Hardware Management Console Workplace (V7R7.4.0.1) - Mozilla	Firefox: IBM Edition												
A https://ticino.nl.ibm.com/hmc/connects/mainuiFrameset.jsp	🔒 https://ticino.nli <b>bm.com</b> /hms/connects/mainuiFrameset.jop												
Hardware Management Console													
Profile		hscroot   Help   Logoff											
🗘 💠 🟠 🕑 🖼 🖬 🖬 Systems Manage	ement > Servers > Azura												
T Welcome	** *? \$ \$ P * C • Filter	Tasks ▼ Views ▼											
Systems Management S Name	^ IE ▲ Status ^ Pro ^ Mem ^ Active Profile	Environm ^ Re ^ OS Version ^											
Azura	I i host 1 Running 1.5 8 IBM i V7R	1 IBM i 00000000 IBM i Licensed Internal Code 7.1.0 410											
🖼 🔁 Custom Groups 🔽 🖺 LinuxC	Client Properties 0 0	AIX or Linux 00000000 Unknown											
B. a. a. B.	Change Default Profile Total: 2 Filtered: 2 Select	ed: 1											
Un System Plans	Operations Activate	Profile											
HMC Management	Configuration Deactivate Attention LED	Current Configuration											
XX Service Management	Dynamic Logical Partitioning Schedule Operations												
and service management	Console Window Delete												
🔂 Updates	Serviceability												
Tasks: LinuxCli	ient 🕀 🖻 🔚	*											
Properties													
Change Defau	ult Profile												
⊟ Operations		1											
E Activate													
Status: OK Curre	e ent Configuration												
Deactivate	e Attention LED												
Schedule Delete	Operations												
		*											

Figure 10.2-1

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

😻 ticino: Profile - Mozilla Firefox: IBM Edition	- 0	23
Attps://ticino.nl.ibm.com/hmc/wcl/T40dd		1 m
Activate Logical Partition:LinuxClient		
Select a profile below to activate the logical partition	on with.	
Partition name : LinuxClient		
Partition profiles		
Open a terminal window or console session Ad	vanced	
OK Cancel Help		



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:

📵 ticino: Profile - Mozilla Firef	۵	22	
https://ticino.nl.ibm.com		1 m	
Activate Logica Set advanced activ Keylock position : Boot mode:	Do Not Override Normal SMS Diagnostic with default boot list Diagnostic with stored boot list Open Firmware OK Prompt	 lien	It
	OK Cancel Help		

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:



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.

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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		STAR	RTINC	G SOE	TWAR	RΕ		IBM	IBM	IBM	IBM	IBM	IBM
IBM	IBM	IBM	IBM	IBM	IBM		Ι	PLEAS	SE WA	AIT.	•		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
-																		
Elap	bsed	time	e sir	nce i	relea	ase d	of sy	yster	n pro	ocess	sors	: 144	13032	2 mir	ns 48	3		

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: 018dffd0)
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@812000000000001,\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: 018dffd0) Config file 'yaboot.cnf' read, 285 bytes Welcome to SuSE Linux Enterprise 11! Туре "install" to start the YaST installer on this CD/DVD Туре "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/vscsi@30000004/disk@81200000000000000:1,\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
          Link encap:Local Loopback
10
          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).

VNC® Vie	wer	VS
VNC Server:	W.300X.YY.Z:1	•
Encryption:	Let VNC Server choose	-

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.



Preparation	Nelcome	
Welcome     System Analysis     Time Zone Installation     Server Scenario     Installation Summary     Perform Installation Configuration	Language English (US)	
<ul> <li>Check Installation</li> <li>Hostname</li> <li>Network</li> <li>Customer Center</li> <li>Online Update</li> <li>Service</li> <li>Clean Up</li> <li>Release Notes</li> <li>Hardware Configuration</li> </ul>	SUSE(R) Linux Enterprise Server 11 SP3 SUSE Software License Agreement PLEASE READ THIS AGREEMENT CAREFULLY. BY PURCHASING, INSTALLING AND/OR USING THE SOFTWARE (INCLUDING ITS COMPONENTS), YOU AGREE TO THE TERMS OF THIS AGREEMENT AND ACKNOMLEDGE THAT YOU HAVE READ AND UNDERSTRATAD THIS AGREEMENT AND ACKNOMLEDGE THAT YOU HAVE READ AND NOT DOMLOAD, INSTALL OR USE THE SOFTWARE. AN INDIVIDUAL ACTING ON BEHALF OF AN ENTITY REPRESENTS THAT HE OR SHE HAS THE AUTHORITY TO ENTER INTO THIS AGREEMENT ON BEHALF OF THAT ENTITY. This SUSE Software License Agreement ("Agreement") is a legal agreement between You (an entity or a person) and SUSE LLC ("SUSE"). The software product identified in the title of this Agreement, its structure, organization, and accompanying documentation (collectively the "Software") is protected by the copyright laws and treaties of the United States and other countries and is subject to the terms of this Agreement. Any modification, update, enhancement or upgrade to the Software that You may download or receive that are not accompanied by a SUSE software License Agreement. If Agree to the License Terms.	License Translations.

Figure 10.4-6

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

2 root's Installation desktop (	dhcp- ) - VNC Viewer	
Preparation  Welcome  System Analysis  Time Zone Installation  Server Scenario Installation Summary Perform Installation Configuration  Check Installation Configuration  Check Installation  Hostname Network Customer Center Online Update Service Clean Up Release Notes Hardware Configuration	Media Check We recommend you check all installation media to avoid installation problems.      CQ: or DVD Drive     IBM VOPT OPTVRT01 (idevise)     Start Check Eject      Status Information	
	Progress	
	Help Abott	Back 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





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.



Preparation	📒 Installation Setting	s		
✔ Welcome	Click a headline to make changes or use the	"Change" menu below		
<ul> <li>System Analysis</li> </ul>	Qverview	Expert		
✓ Time Zone	Patterne:			
Installation	+ Base System + AppArmor			
Server Scenario	+ 32-Bit Runtime Environment + Help and Support Documentatio	n		
Installation Summary	+ Minimal System (Appliances)			
Perform Installation	+ GNOME Descop Environment + X Window System			
Configuration	+ Print Server • Size of Packages to Instalt 2.6 GB			
Check Installation	Time Zone			
Hostname	• Europe / Netherlands - Mardware /	Clock Set To LITC 2014-03-24 - 17	29.07	
Network	* E brope / Nechenands - Marcinare (	CIDER SEC IS UTC 2014-03-24 - 17.	23.07	
Customer Center	Language			
Online Update	Primary Language: English (US)			
Service	Defeate Durational			
Clean Up	Derault Runlevel			
Release Notes	<ul> <li>VNC needs runlevel 5 to run corrected.</li> </ul>	ctly: No graphical system login wil	be available after the compute	r is
Aardware Conguration	3. Full multiuser with network			110
	Kdump			
	Kdump status: enabled			
	Value of crashkernel option: 512M	256M		
	Dump format: Izo			-
	Number of dumps: 5			Ð
		Change *		

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

V2 root's Installation desktop	(dhcp-9-142-44-51:0) - VNC Viewer	
Preparation	🕼 Set Default Runlevel	
<ul> <li>✓ System Analysis</li> <li>✓ Time Zone</li> <li>Installation</li> </ul>		
<ul> <li>Server Scenario</li> <li>Installation Summary</li> <li>Perform Installation</li> <li>Configuration</li> </ul>		
Check Installation Hostname Network Customer Center Online Update Service Clean Up Release Notes Hardware Configuration	Available Runlevels 2: Local multiuser without remote network 3: Full multiuser with network 4: User defined 2: Full multiuser with network and display manager	
	Help	el <u>o</u> k

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.

V? root's Installation desktop	(dhcp-9-142-44-51:0) - VNC Viewer
Preparation Velocme System Analysis Time Zone Installation Vinstallation Vinstallation Summary Perform Installation Configuration Configuration Configuration Configuration Configuration Configuration Customer Center Customer Center Customer Center Clean Up Release Notes Hardware Configuration	<ul> <li>Finishing Basic Installation</li> <li>Copying files to installed system</li> <li>Saving configuration</li> <li>Installing boot manager</li> <li>Saving installation settings</li> <li>Preparing system for initial boot</li> </ul>
	Finished.
	Help Abot Beck Next

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@80000000000000'
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: 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 to 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:

V2 nobody's x11 desktop (SLES11SP3Client1) - VNC Viewer			
	SUSE Linux Enterprise Server 11 (ppc64) SLES11SP3Client Username: CONGRATULATIONS		
	€ Disconnect Octancel Disconnect		
English (United States)	🗸 😹 🖍 🔚 GNOME 🖍 📲	Local login 🗸	

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
Calling ibm, client-architecture-support... not implemented
command line: ro vnc
memory layout at init:
 memory_limit : 00000000000000 (16 MB aligned)
 alloc_bottom : 000000004cf0000
             : 000000008000000
 alloc top
 alloc_top_hi : 000000000000000
          : 000000008000000
 rmo top
 ram top
             : 0000000c000000
instantiating rtas at 0x0000000076a0000... done
```

Figure 10.5-2



The partition will halt at the media verification screen.

Welcome to Red Hat Ent	erprise Linux for ppc64
[	Disc Found
	To begin testing the media before installation press OK.
	Choose Skip to skip the media test and start the installation.
	OK Skip
<tab>/<alt-tab> betw</alt-tab></tab>	veen elements   <space> selects   <f12> next</f12></space>

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.

```
Running anaconda 13.21.215, the Red Hat Enterprise Linux system installer -
please wait.
11:48:15 Starting VNC...
11:48:17 The VNC server is now running.
11:48:17
WARNING!!! VNC server running with NO PASSWORD!
You can use the vncpassword=<password> boot option
if you would like to secure the server.
11:48:17 Please manually connect your vnc client to dhcp-w-xxx-yy-zzz:1
(w.xxx.yy.zzz) to begin the install.
11:48:17 Starting graphical installation.
```

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).

VNC® Vie	wer	VS
VNC Server:	W.300X.YY.Z:1	•
Encryption:	Let VNC Server choose	-



**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.

Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer           What language would you like to use during the           installation process?	
Arabic (العربية) Assamese (अञ्जीसा) Bengali (गारण)	
Bengali(India) (বাংলা (ভারত)) Bulgarian (Български) Statana (Català)	
Jacasan (Catala) Shinese(Simplified) (中文(鍋体)) Chinese(Traditional) (中文(正體))	
Croatian (Hrvatski) Czech (Čeština)	
Janish (Dansk) Jutch (Nederlands)	
English (English)	
Estonian (eesti keel)	
Innish (suomi)	
Serman (Deutsch)	
Greek (Eλληνικά)	
Sujarati (ayvaid)	
Hebrew (עברית)	
tindi (हिन्दी)	
Hungarian (Magyar)	
celandic (Icelandic)	
loko (lloko)	
Indonesian (Indonesia)	
and no danal no b	

Figure 10.5-7

## Select your language and click Next to continue



Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
Select the appropriate keyboard for the system.	
Italian	A
Italian (IBM)	
Italian (it2)	
Japanese	
Korean	
Latin American	
Macedonian	
Norwegian	
Polish	
Portuguese	
Romanian	
Russian	
Serbian	
Serbian (latin)	
Slovak (qwerty)	
Slovenian	
Spanish	
Swedish	
Swiss French	
Swiss French (latin1)	
Swiss German	1
Swiss German (latin1)	
Turkish	
U.S. English	
U.S. International	
Ukrainian	
United Kingdom	v
	A Park
	The pack Next

Figure 10.5-8

## Select your keyboard layout and click Next to continue

Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105ams.nl.ibm.com - VNC Viewer	
that type of devices will your installation involve?	
Basic Storage Devices	
Installs or upgrades to typical types of storage devices. If you're not sure which option is right for you, this is probably it.	
Considered Street Project	
Specialized Storage Devices Installs or upgrades to enterprise devices such as Storage Area Networks (SANs). This option will allow when the add SCOP (ISCN I) SCO disks and to filter and devices the installer should impose	
you to add note / tactor / and / and to main our denices the installer should grade.	
	🜪 Back 📄 Ne

## Figure 10.5-9

## Select Basic Storage Device and click Next to continue



V2 Red Hat Enterp	rise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
At least one of	existing installation has been detected on your system. What would you like to do?	
•	Fresh Installation Choose this option to install a fresh copy of Red Hat Enterprise Linux on your system. Existing software and data may be overwritten depending on your configuration choices.	
•	Upgrade an Existing Installation Choose this option if you would like to upgrade your existing Red Hat Enterprise Linux system. This option will preserve the existing data on your storage device(s).	
	Which Red Hat Enterprise Linux installation would you like to upgrade?	
	Red Hat Enterprise Linux Server 6.5 (installed on /dev/mapper/vg_vpmstgrhel65-/v_root)	
<b>k</b>		
	•	Back Next

Figure 10.5-10

Select Fresh Installation and click Next to continue

Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
Please name this computer. The hostname identifies the computer on a network.	
Hostname: RHEL65.ams.nl.ibm.com	
Configure Network	
	🗬 Back 📄 Nex

Figure 10.5-11

# Select a hostname and click Next to continue



V2 Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
Please select the nearest city in your time zone:	
Selected city: Amsterdam, Europe	
*	
☑ System clock uses UTC	Back Next

Figure 10.5-12

# Select your timezone and click Next to continue

The root the syste user.	account is used for administering m. Enter a password for the root	
Root Password:	•••••	
Confirm:	•••••	

Figure 10.5-13

Select Root Pasword 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



### Make your selection

Figure 10.5-15



Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
The default installation of Red Hat Enterprise Linux is a basic server install. You can optionally select a different set of software now.	
Basic Server	
<ul> <li>Database Server</li> </ul>	
O Web Server	
Identity Management Server	
<ul> <li>Virtualization Host</li> </ul>	
O Desktop	
<ul> <li>Software Development Workstation</li> </ul>	
O Minimal	
Please select any additional repositories that you want to use for software installation.	
Red Hat Enterprise Linux	
A del additional activana anaritarian	
ele Add additional software repositories	
You can further customize the software selection now, or after install via the software	
management application.	
Customize later     Customize now	
	🔶 Back 📫 Next

Figure 10.5-16

# Select the type of Server and click Next to continue

V2 Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
RED HAT <sup>®</sup> ENTERPRISE LINUX <sup>®</sup> 6	
Installation Starting Starting installation process	
	Back
	- Dack

## 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

V2 Red Hat Enterprise Linux 6.5 installation on host dhcp-9-142-44-105.ams.nl.ibm.com - VNC Viewer	
RED HAT* ENTERPRISE LINUX* 6	
Packages completed: 615 of 615	
Installing strace32-4.5.19-1.17.el6.ppc (258 KB) Tracks and displays system calls associated with a running process.	
Bootloader. Installing bootloader.	
A Back	Next

#### Figure 10.5-19

A pop up will inform you about the installation of the bootloader. 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)
  Change SCSI Settings
3.
   Select Console
4.
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 <a href="http://www.ibm.com/systems/power/software/linux/">http://www.ibm.com/systems/power/software/linux/</a>

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

Syst	Systems Management > Servers > Azura														
	🕞 🖺 👯 🥰 🖉 🗭 🚰 🔽 Filter 🛛 Tasks 💌 Views 💌														
S	Name	^	IC 🗠	Status		^	Proc Units	^	Merno ^	Active Profile	^	Environment ^	Refere	OS Version	
	01-IBM i host		1		Running	)		1.5	8	IBM i V7	R1	IBM i	00000000	IBM i Licensed Internal Code 7.1.0 410 0	
$\checkmark$	LinuxClient		2	2	Running	)		0.5	4.125	first_set	up	AIX or Linux	SUSE Linux	Linux/SuSE 3.0.76-0.11-ppc64 11	
	Max Page Size: 250 Total: 2 Filtered: 2 Selected: 1														