

Power Systems Virtualisation from IBM - Technical Webinar User Group

IBM

Today

Virtual Partition Manager for IBM i
Starting at 10:00 am UK time by Janus Hertz



**Series details, registration and replays of previous webinars from
<http://tinyurl.com/UK-PowerVM-VUG>**

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Upcoming sessions

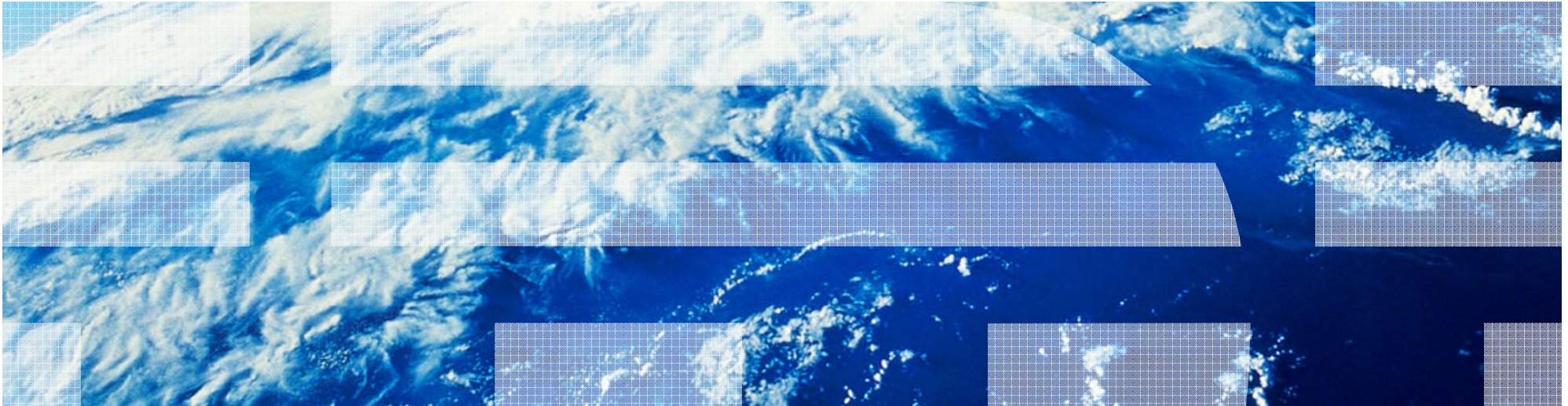
**Session 17: Updating Power Systems, I/O and HMC
on 3rd October 2012, 10:00 - 11:00 BST (UK time)**

Virtual Partition Manager (VPM) for IBM i

Janus Hertz

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Agenda



- Overview iVirtualization
- New enhancements
- VPM based setup
- Things to consider

Virtual Partition Manager (VPM)

- Virtual Partition Manager (VPM) is a partition management tool that supports the creation of partitions that use only virtual I/O and does not require the HMC, SDMC or IVM.
- In addition to being able to manage Linux guest partitions, the VPM now supports creation and management of IBM i client partitions.
- VPM function is available on POWER6® and POWER7™ Express Servers™ that do not have an external management console (HMC or SDMC)
- **Requirement IBM i 7.1 TR3 in the IBM i host partition**

Where Do I Start with Installing IBM I hosting clients on Power system?

VPM based



Matias Centeno Lozada
Hernando Bedoya

Creating IBM i Client Partitions Using Virtual Partition Manager

Introduction

This IBM® Redpaper™ provides steps, considerations, limitations, and links to information regarding the creation of IBM i Client Partitions using the third generation of Virtual Partition Manager (VPM).

Beginning with IBM i 7.1, the Virtual Partition Manager was enhanced and now allows you to create and manage Linux partitions and IBM i partitions without the use of the Hardware Management Console (HMC), Systems Director Management Console (SDMC), or Integrated Virtualization Manager (IVM). It involves the use of VPM and the new support for Ethernet layer-2 bridging between a physical Ethernet adapter and a virtual Ethernet adapter that provides the ability for an IBM i partition to share a physical Ethernet connection with other partitions in the same system.

The intended audience for this Redpaper publication is advanced system administrators.

Virtual Partition Manager Enhancements to Create IBM i Partitions

The Virtual Partition Manager (VPM) is a partition management tool that supports the creation of partitions that use only virtual input/output (I/O) and does not require the Hardware Management Console, Systems Director Management Console, or Integrated Virtualization Manager. In addition to being able to manage Linux guest partitions, the VPM now supports creation and management of IBM i partitions.

This enhanced VPM function is available on IBM POWER6® and IBM POWER7™ IBM Express Servers™ that do not have an external management console. With this enhancement to IBM i 7.1, the ability to create up to four IBM i partitions are enabled in VPM. Client IBM i partitions, which are created with VPM, use virtual I/O to connect back to the IBM i I/O server partition to access the physical disk and network. VPM in the IBM i I/O server

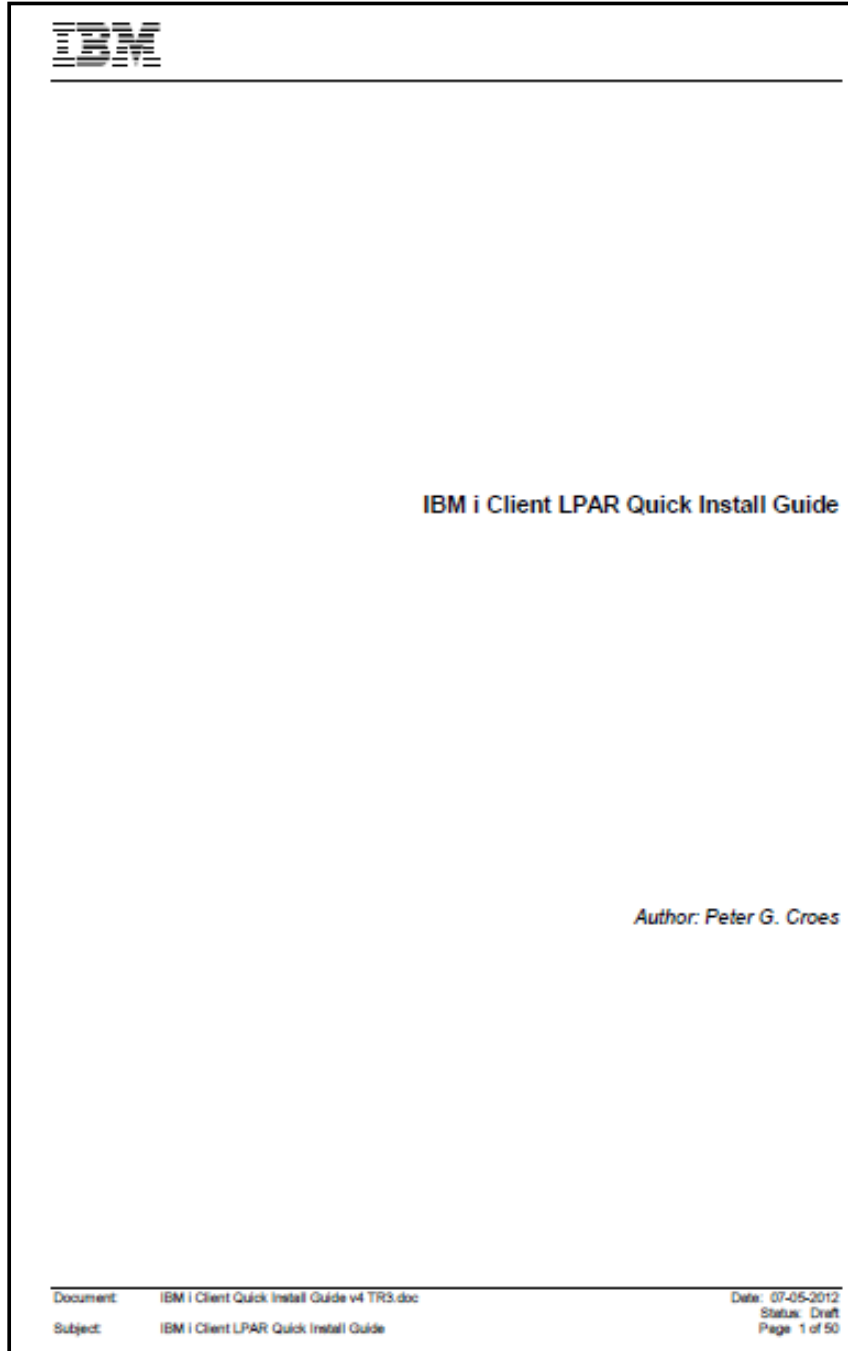
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<http://www.redbooks.ibm.com/redpieces/abstracts/redp4806.html?Open>

IBM i Client LPAR Quick Install Guide

Cover both
VPM & HMC
based
Setups.

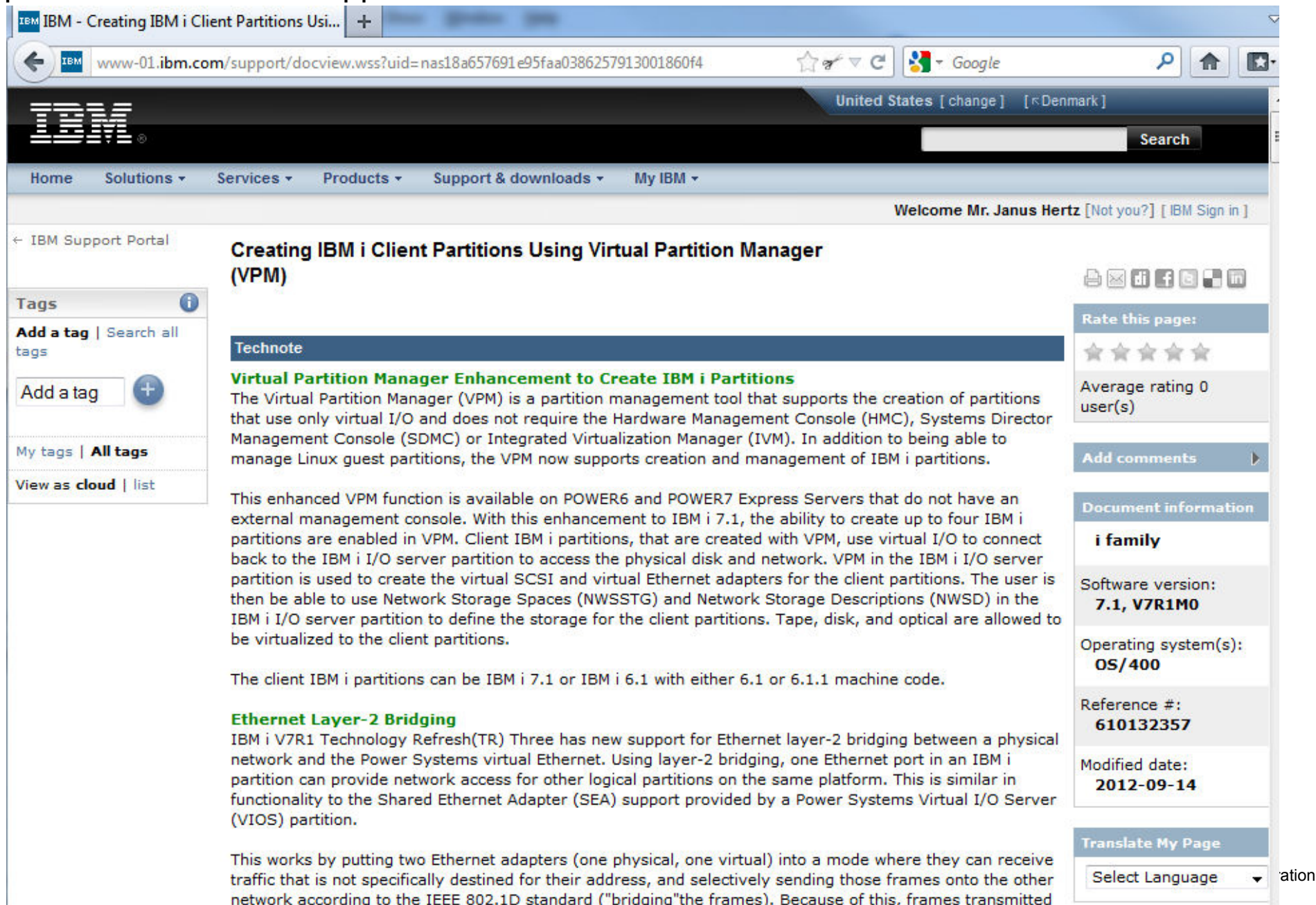
To get copy
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Peter Croes



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Peter G. Croes
IBM Nederland
peter_g_croes@nl.ibm.com

TechNote: Creating IBM i Client Partitions Using Virtual Partition Manager (VPM)

- <http://www-01.ibm.com/support/docview.wss?uid=nas18a657691e95faa0386257913001860f4>



IBM - Creating IBM i Client Partitions Usi... +

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Creating IBM i Client Partitions Using Virtual Partition Manager (VPM)

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Technote

Virtual Partition Manager Enhancement to Create IBM i Partitions

The Virtual Partition Manager (VPM) is a partition management tool that supports the creation of partitions that use only virtual I/O and does not require the Hardware Management Console (HMC), Systems Director Management Console (SDMC) or Integrated Virtualization Manager (IVM). In addition to being able to manage Linux guest partitions, the VPM now supports creation and management of IBM i partitions.

This enhanced VPM function is available on POWER6 and POWER7 Express Servers that do not have an external management console. With this enhancement to IBM i 7.1, the ability to create up to four IBM i partitions are enabled in VPM. Client IBM i partitions, that are created with VPM, use virtual I/O to connect back to the IBM i I/O server partition to access the physical disk and network. VPM in the IBM i I/O server partition is used to create the virtual SCSI and virtual Ethernet adapters for the client partitions. The user is then be able to use Network Storage Spaces (NWSSTG) and Network Storage Descriptions (NWS D) in the IBM i I/O server partition to define the storage for the client partitions. Tape, disk, and optical are allowed to be virtualized to the client partitions.

The client IBM i partitions can be IBM i 7.1 or IBM i 6.1 with either 6.1 or 6.1.1 machine code.

Ethernet Layer-2 Bridging

IBM i V7R1 Technology Refresh(TR) Three has new support for Ethernet layer-2 bridging between a physical network and the Power Systems virtual Ethernet. Using layer-2 bridging, one Ethernet port in an IBM i partition can provide network access for other logical partitions on the same platform. This is similar in functionality to the Shared Ethernet Adapter (SEA) support provided by a Power Systems Virtual I/O Server (VIOS) partition.

This works by putting two Ethernet adapters (one physical, one virtual) into a mode where they can receive traffic that is not specifically destined for their address, and selectively sending those frames onto the other network according to the IEEE 802.1D standard ("bridging"the frames). Because of this, frames transmitted

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Document information

i family

Software version:
7.1, V7R1M0

Operating system(s):
OS/400

Reference #:
610132357

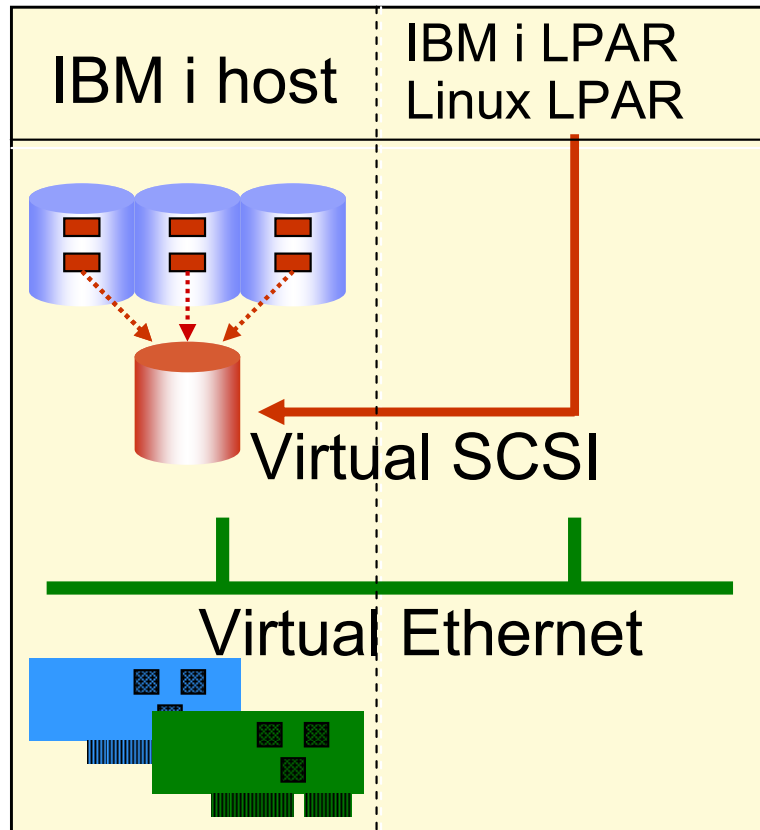
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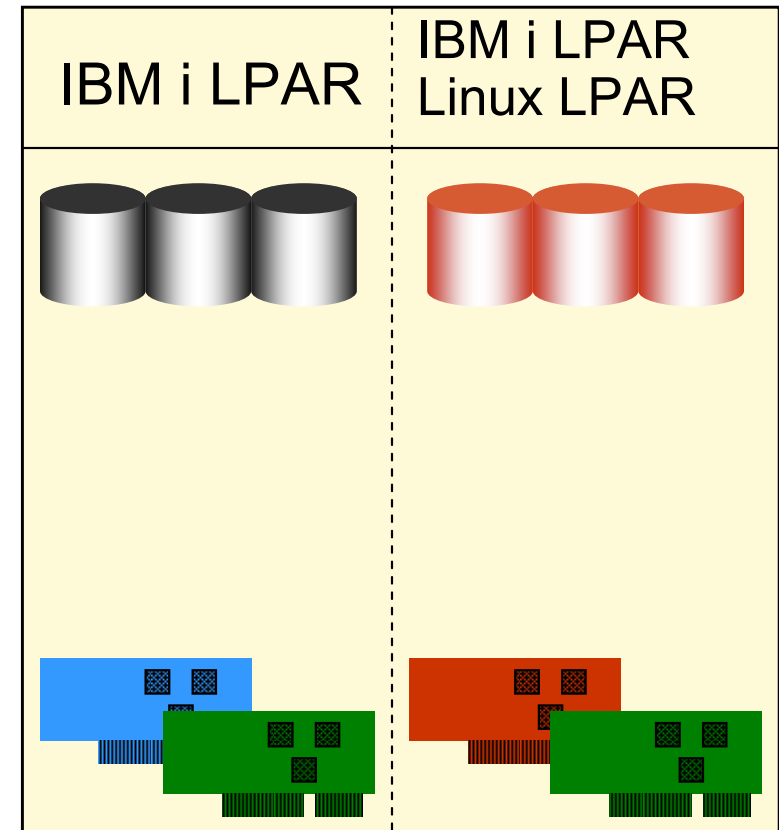
Virtual versus Physic Hardware Resources

Virtual I/O



- IBM i host ASP function as SAN

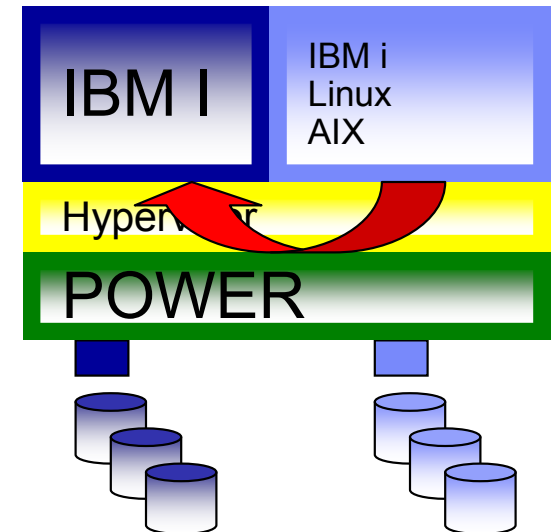
Physic I/O



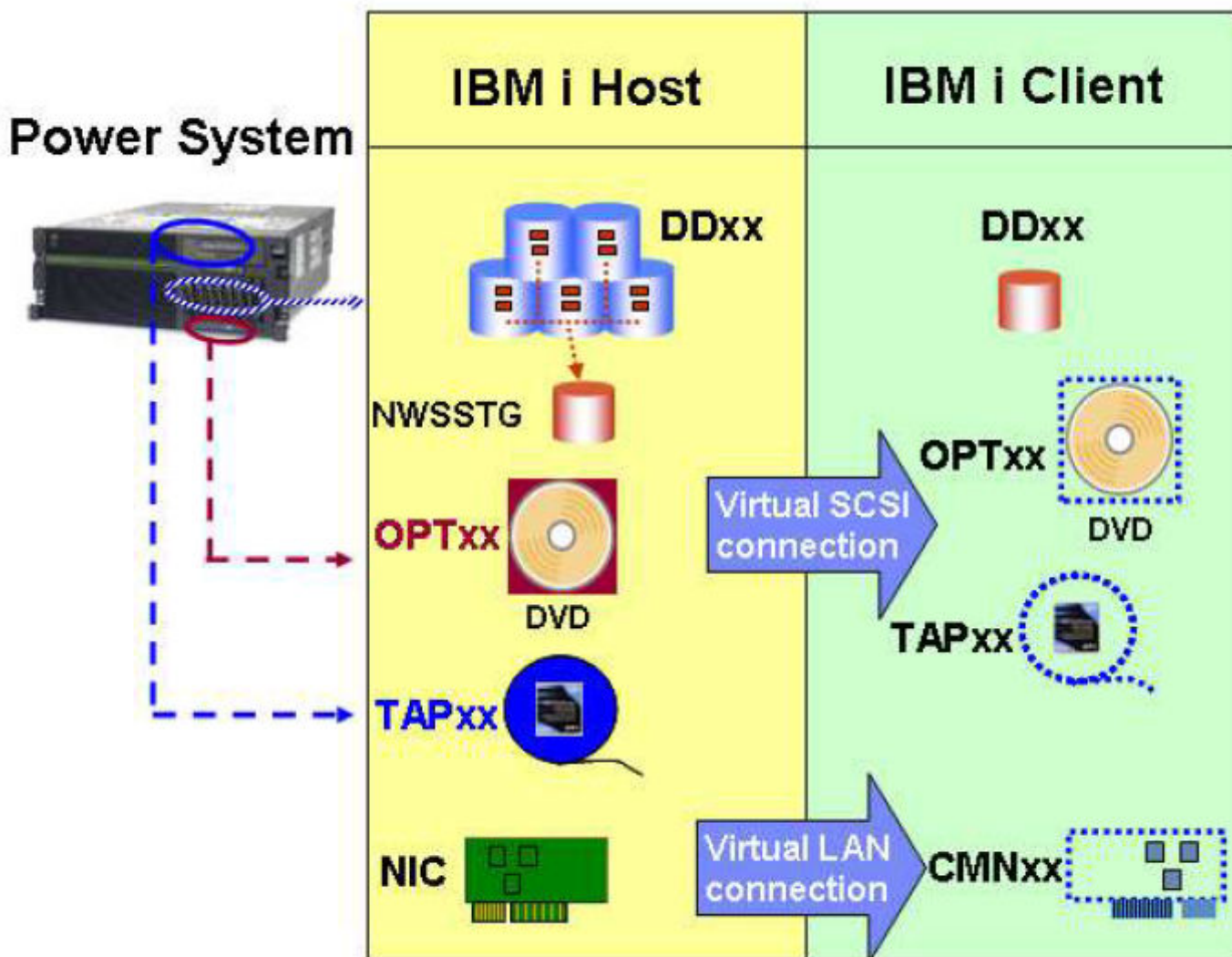
- Each partition owns I/O
- IBM i/AIX/Linux managed hardware
- IBM i/AIX/Linux independend from other partitions

IBM i Virtual Client Partitions

- IBM i-based Virtualization
 - IBM i partition uses I/O resources from another IBM i partition
 - Eliminates requirement to buy adapters and disk drives for each IBM i partition
 - Supports simple creation of additional partitions e.g., for test and development
 - Requires POWER6 (or later) systems with IBM i 6.1
 - Requires *PowerVM standard edition*
 - Can mix virtual and direct I/O in client
 - **VPM based only virtual!**
- Platform support
 - All POWER6 (and later) System models (NOT PowerBlades)
- Storage support
 - Determined by host IBM i partition (SAN, EXP24, integrated disk)
- LPAR management
 - HMC, (SDMC)
 - **VPM (virtual partition manager) with IBM i 7.1 TR3 (new in oct.2011)**



IBM i Host and Client Partitions: Overview



- Requirements
 - POWER6/7 hardware
 - IBM I 6.1 (or later) on host and client
 - PowerVM standard edition required,
- DASD
 - Hardware assigned to host LPAR in HMC/SDMC
 - DASD can be integrated or SAN
 - DASD virtualized as NWSSTG objects
- Optical
 - DVD drive in host LPAR virtualized directly (OPTxx)
- Networking
 - Network adapter (such as IVE) and Virtual Ethernet adapter in host LPAR
 - Virtual Ethernet adapter in client LPAR
- Tape virtualization
 - new from 7.1 TR2

Virtualization Enhancements

1. IBM i 6.1 partition can host

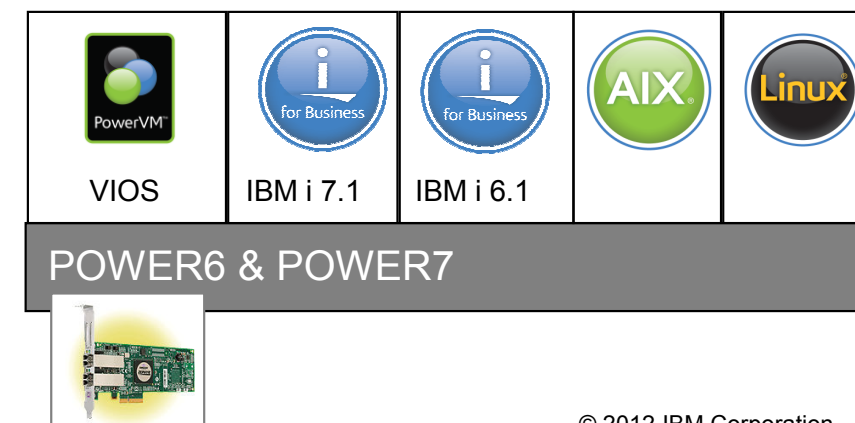
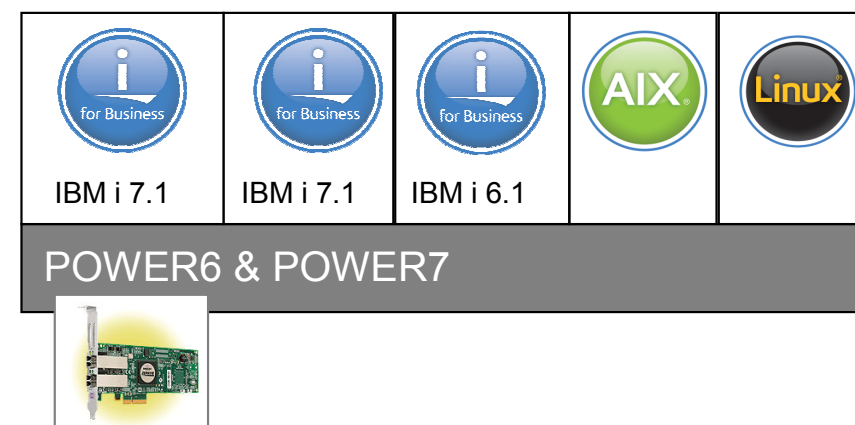
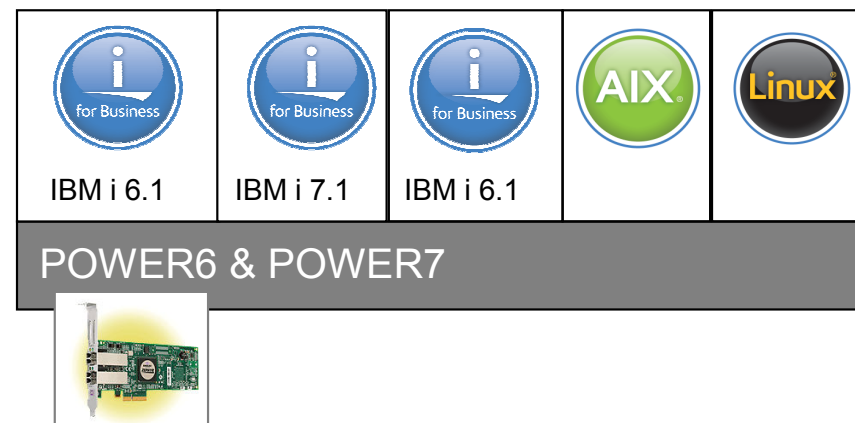
- IBM i 7.1 and 6.1 partitions
- AIX and Linux partitions (SLES & RHEL)
- iSCSI attached System x and BladeCenter

2. IBM i 7.1 partition can host

- IBM i 7.1 and 6.1 partitions (SLES & RHEL)
- AIX and Linux partitions
- iSCSI attached System x and BladeCenter

3. PowerVM VIOS can host

- IBM i 7.1 and IBM i 6.1 partitions
- AIX and Linux partitions (SLES & RHEL)
- VIOS supports advanced virtualization technologies including Active Memory Sharing and NPIV



iVirtualization Enhancements in IBM i 7.1 Technology Refreshes

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 support (info APAR II14615 lists supported devices and required PTFs)
- **TR3:** Ethernet layer-2 bridging and Virtual Partition Manager enhancement to create IBM i partitions

Detailed information on Technology Refreshes can be found via

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

IBM i host to IBM i Client Virtual Tape Summary

- **Allows IBM i client partitions to use tape devices attached to IBM i server partitions**
 - Client partition utilizes existing support for VIOS-hosted tape devices
 - Server partition utilizes existing support for Linux & Windows virtual tape clients
 - Error recovery & serviceability improvements
- **Only a subset of tape drives are supported for virtualization**
 - Physical tape drives only, no support for exporting tape image catalogs to IBM i clients
 - LTO3/LTO4/LTO5
 - DAT72/DAT160/DAT320
 - IOPlless attachment only, IOP attached tape drives are not supported by the IBM i client
 - **Tape library drives can only be virtualized when configured as a stand-alone device, they are not supported while in library mode**

System Requirements (as of 04/2011)

▪ Server Partition Software

- IBM i 7.1 with Technology Refresh 2

▪ Client Partition Software

- IBM i 7.1 with TR2 + MF52103
 - OR --
- IBM i 7.1 + client support PTFs
 - OR --
- IBM i 6.1.1 + client support PTFs.

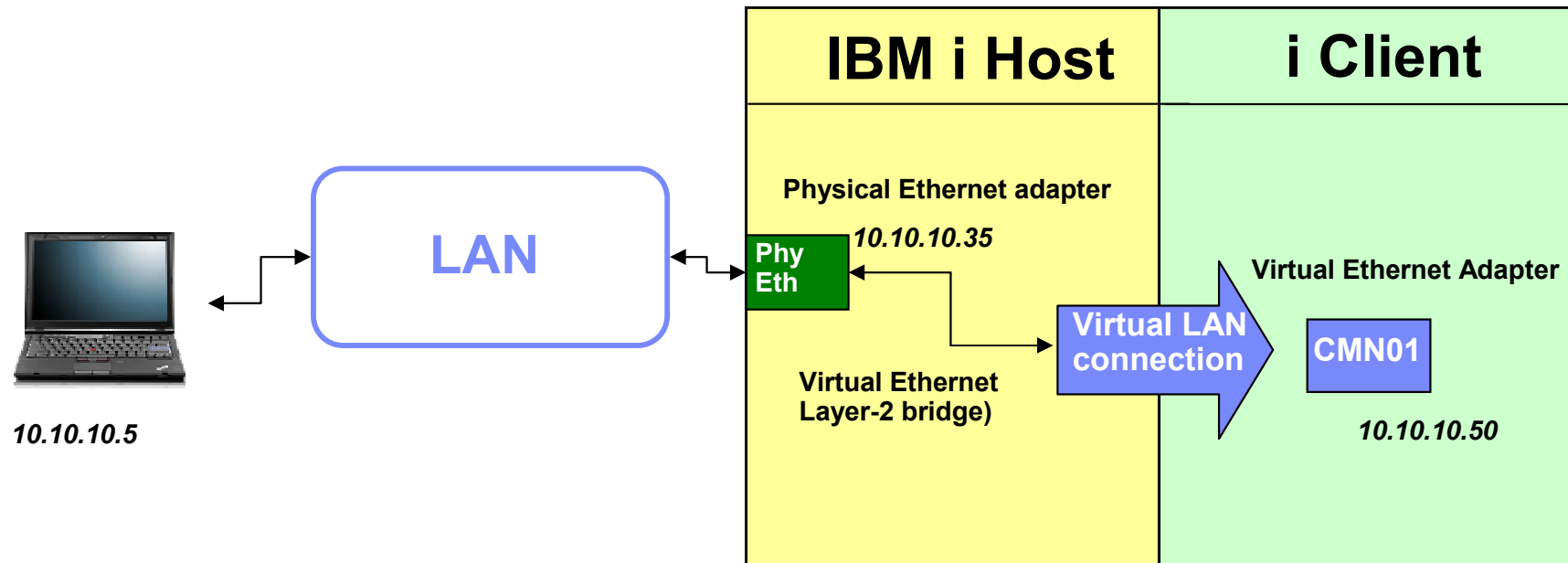
▪ Tape Device Hardware

- TS2230 HH-LTO3 SCSI drive
- TS2240 HH-LTO4 SAS
- TS23240 LTO4 SAS
- FC 5746 HH-LTO4 SAS
- TS2250 HH-LTO5 SAS
- TS2350 LTO5 SAS
- FC 5638 HH-LTO5 SAS
- TS2900 in sequential mode with LTO4 or LTO5 SAS drives
- TS3100 in sequential mode with LTO3, LTO4 or LTO5 SAS/FC drives
- TS3200 in sequential mode with LTO3, LTO4 or LTO5 SAS/FC drives
- FC 5907 DAT72 SAS
- FC 5619 DAT160 SAS
- FC 5661 DAT320 SAS
- 7206 Model 336 external SCSI DAT72 drive.

▪ Info APAR: "II14615 - SUPPORT OF CLIENT VIRTUAL TAPE DEVICES ON SYSTEM I"

- <https://www-304.ibm.com/support/docview.wss?uid=nas2e654bc8dc47fcbed8625781e0041eb64>

Network Virtualization with an IBM i Bridged Ethernet Adapter



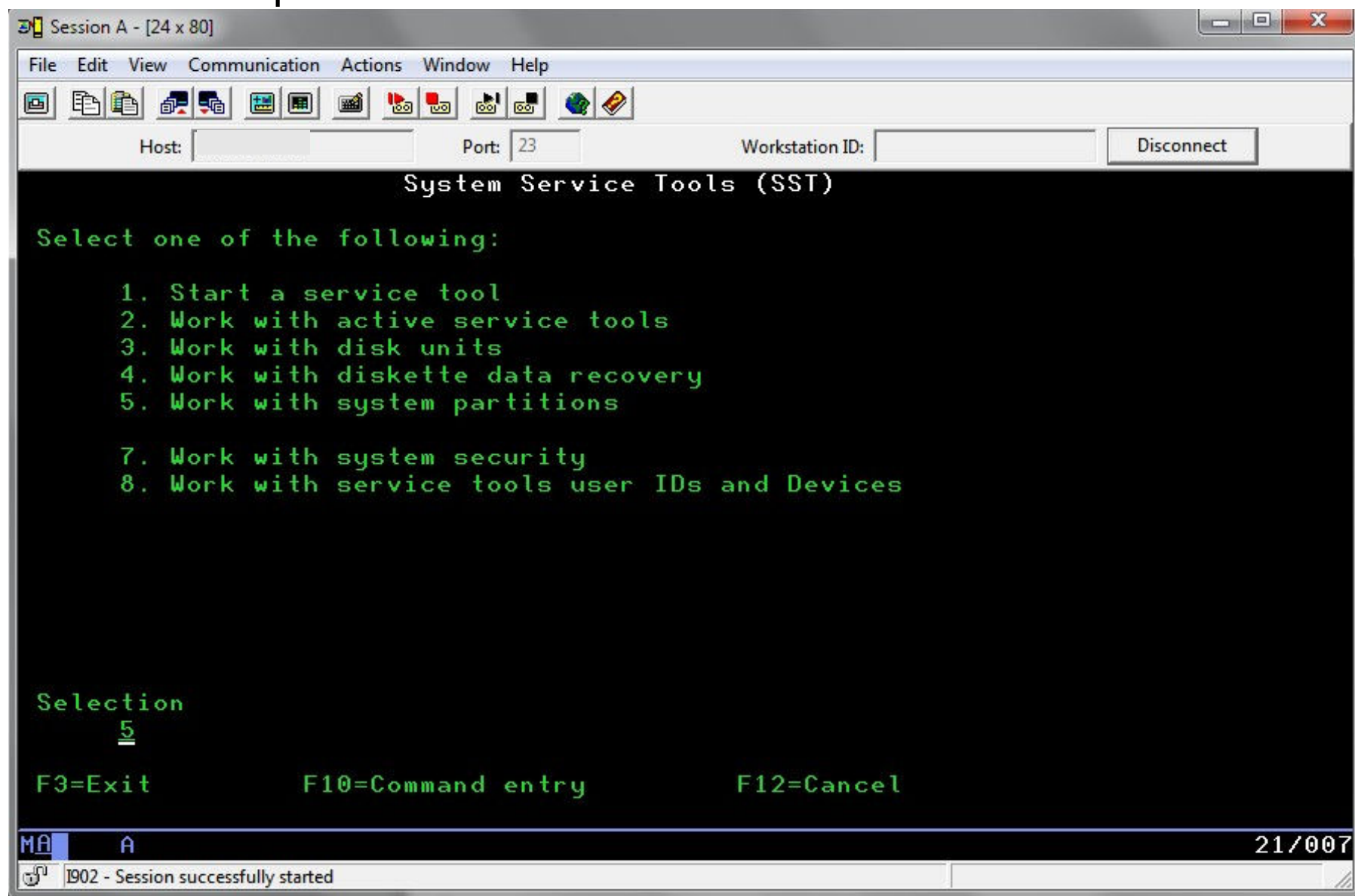
- IBM i now provides the capability to share a physical network adapter by creating a Layer-2 Virtual Ethernet bridge
 - Bridges an internal VLAN switched managed by the POWER Hypervisor to the external LAN through a physical Ethernet adapter.
- Virtual Ethernet adapters in client IBM i partitions get direct access to outside network.
- Done though an option on the Hardware Management Console (HMC) **or automatically via VPM**

Comparison of hosting options

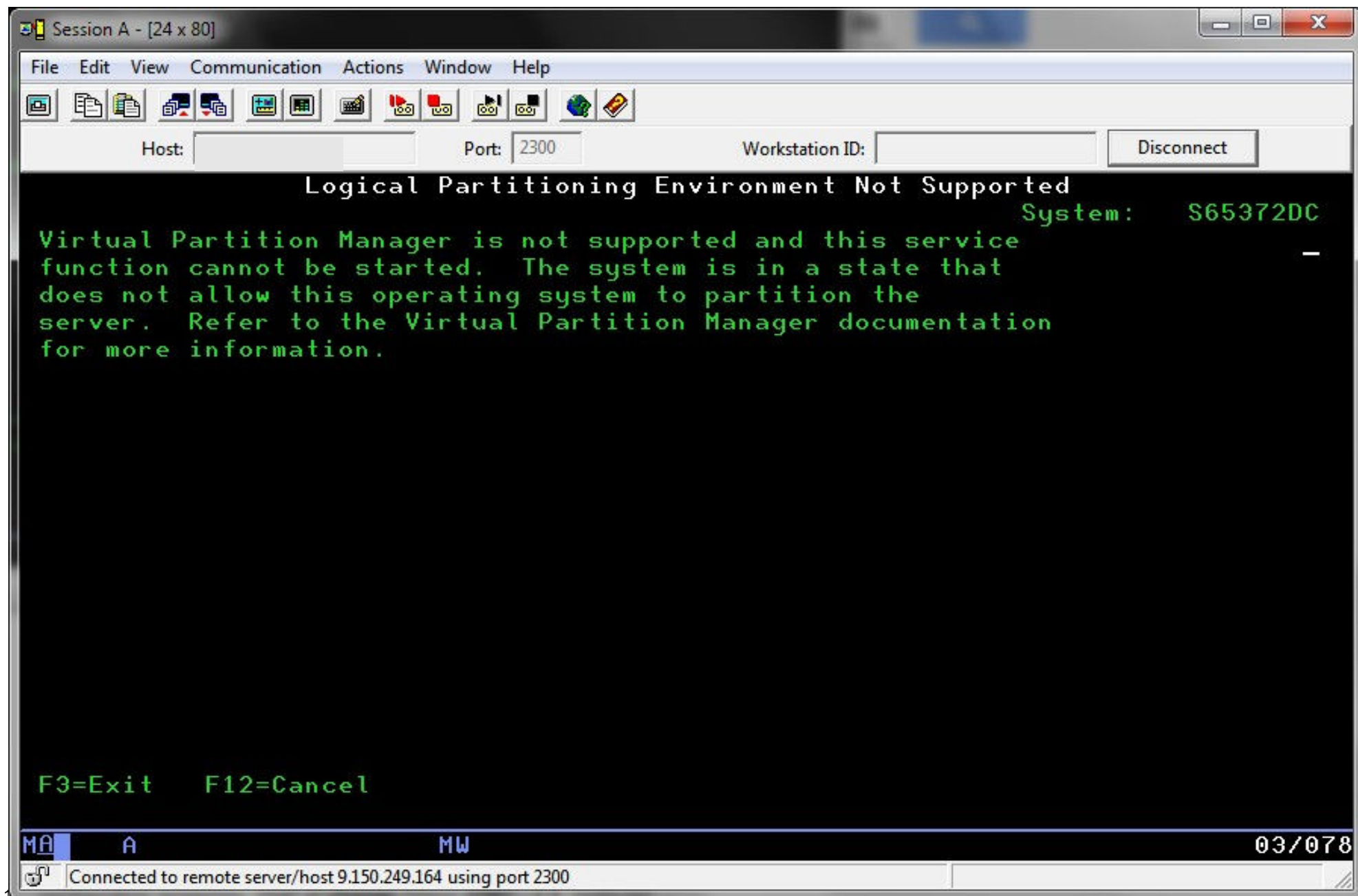
	VIOS on POWER6/7 server	VIOS on POWER6/7 blade	IBM i hosting a client partition
Minimum IBM i level required?	i 6.1	i 6.1	i 6.1 for IBM i client partition
Skills required	VIOS, IBM i	VIOS, IBM i BladeCenter	IBM i
Management interface	HMC/SDMC or IVM* * certain models	IVM or SDMC* * certain models	HMC/SDMC or VPM* * req. 7.1 TR3
Console used IBM i	HMC or IVM* * mkvt	LAN console	HMC or VPM: LAN console
Storage options	Integrated / FC / FCoE	FC / SAS	NWSSTG
Physical adapter ownership	Optional	No	HMC: Optional VPM: No!

Partitioning - Getting Started

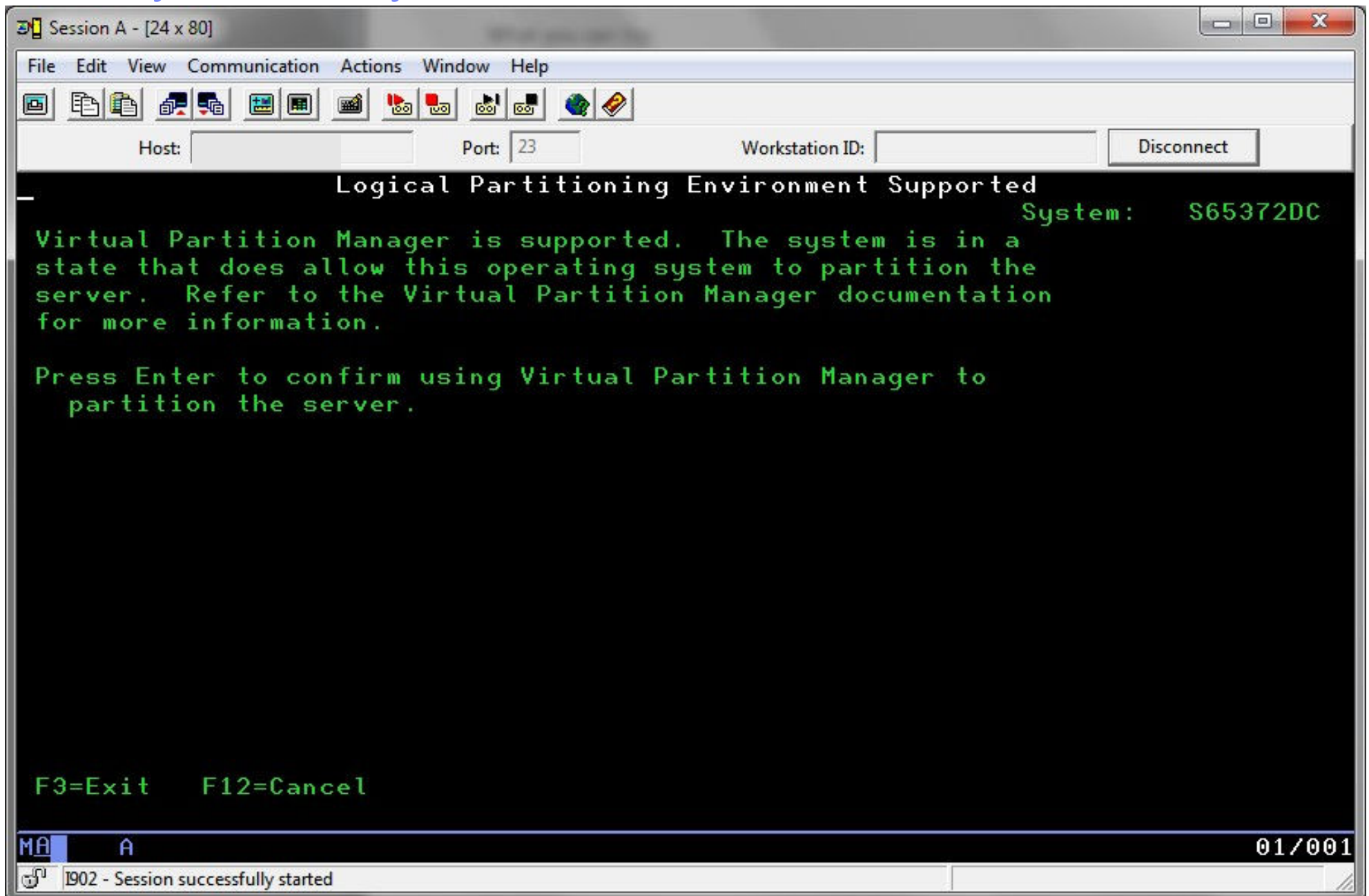
- Logon to DST or SST (strsst)
- Select option 5



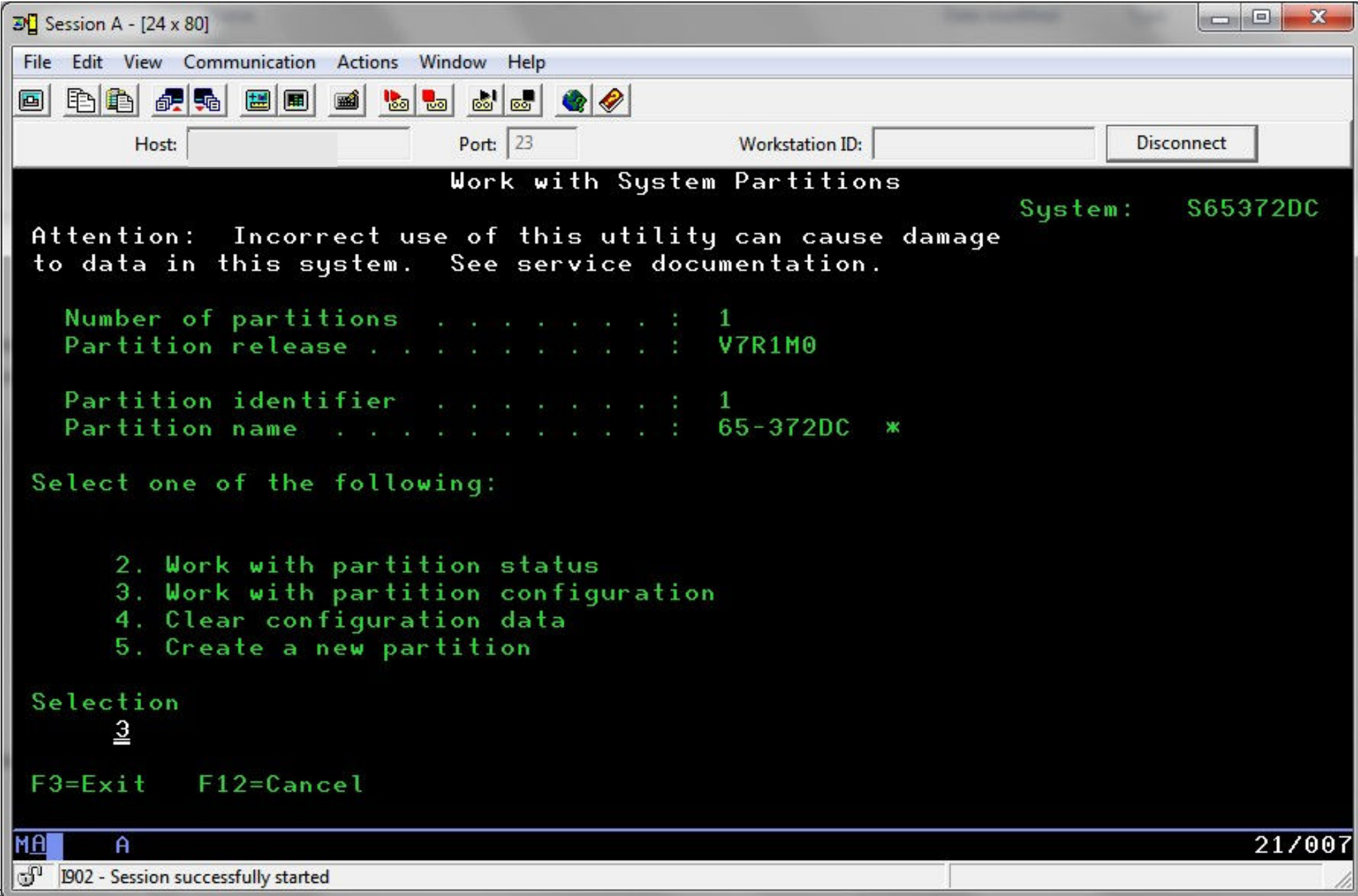
Is the System Ready? Ups – HMC controlled...



Is the System Ready? YES – not HMC.



Free some CPU and Memory - Option 3 Work with partition configuration



```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
Host: Port: 23 Workstation ID: Disconnect
Work with System Partitions
System: S65372DC
Attention: Incorrect use of this utility can cause damage
to data in this system. See service documentation.
Number of partitions . . . . . : 1
Partition release . . . . . : V7R1M0
Partition identifier . . . . . : 1
Partition name . . . . . : 65-372DC *
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
MA A 21/007
1902 - Session successfully started
```

Free some CPU and Memory

Session A - [24 x 80]

File Edit View Communication Actions Window Help

Host: Port: 23 Workstation ID: Disconnect

Work with Partition Configuration

System: S65372DC

Available processor units : 0.00
 Available memory (MB) : 0
 Memory region size (MB) : 128

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

Opt	Partition		-----Processor-----				Memory (MB)	WLM	Virtual Ethernet ID			
	ID	Name	Total	Units	Uncap	Weight			1	2	3	4
<u>2</u>	1	65-372DC	4	4.00	2	None	23552	2	2	2	2	2

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

MA A 13/003

1902 - Session successfully started

Free some CPU and Memory

Session A - [24 x 80]

File Edit View Communication Actions Window Help

Host: Port: 23 Workstation ID: Disconnect

System: S65372DC

Change Partition Configuration

Type changes, press Enter.

Partition identifier and name	1	<u>IBMI71H</u>
Number of available system processors	0	
Number of partition processors	<u>1</u>	
Minimum / maximum number of processors	<u>1</u> / <u>4</u>	
Use shared processor pool	<u>1</u>	1=Yes, 2=No
Shared processor pool units	<u>1</u>	<u>00</u>
Minimum / maximum processor pool units	<u>0</u> / <u>10</u> / <u>4</u>	<u>00</u>
Uncapped processing	<u>1</u>	1=Yes, 2=No
Uncapped processing weight	<u>255</u>	0, 64, 128, 255
Size of available memory (MB)	0	
Size of partition memory (MB)	<u>10240</u>	
Minimum / maximum size of memory (MB)	<u>4096</u> / <u>20480</u>	
Enable workload management	<u>2</u>	1=Yes, 2=No
Virtual Ethernet Identifiers (1=Yes, 2=No)		
1 2 3 4		
<u>1</u> <u>2</u> <u>2</u> <u>2</u>		

F3=Exit F12=Cancel

MA A 05/057

1902 - Session successfully started

Free some CPU and Memory

Session A - [24 x 80]

File Edit View Communication Actions Window Help

Host: Port: 23 Workstation ID: Disconnect

Confirm Changed Partition

System: S65372DC

Verify information, press Enter.

```

Partition identifier and name . . . . . : 1      IBMI71H
Number of partition processors . . . . . : 1
Minimum / maximum number of processors . . . . . : 1 / 4
Use shared processor pool . . . . . : Yes
  Shared processor pool units . . . . . : 1.00
  Minimum / maximum processor pool units . . . . . : 0.10 / 4.00
Uncapped processing . . . . . : Yes
  Uncapped processing weight . . . . . : High
Size of partition memory (MB) . . . . . : 10240
Minimum / maximum size of memory (MB) . . . . . : 4096 / 20480
Enable workload management . . . . . : No

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

F12=Cancel

MA A 01/001

1902 - Session successfully started

Free some CPU and Memory

Session A - [24 x 80]

File Edit View Communication Actions Window Help

Host: Port: 23 Workstation ID: Disconnect

Work with Partition Configuration System: S65372DC

Available processor units : 3.00
 Available memory (MB) : 13312
 Memory region size (MB) : 128

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

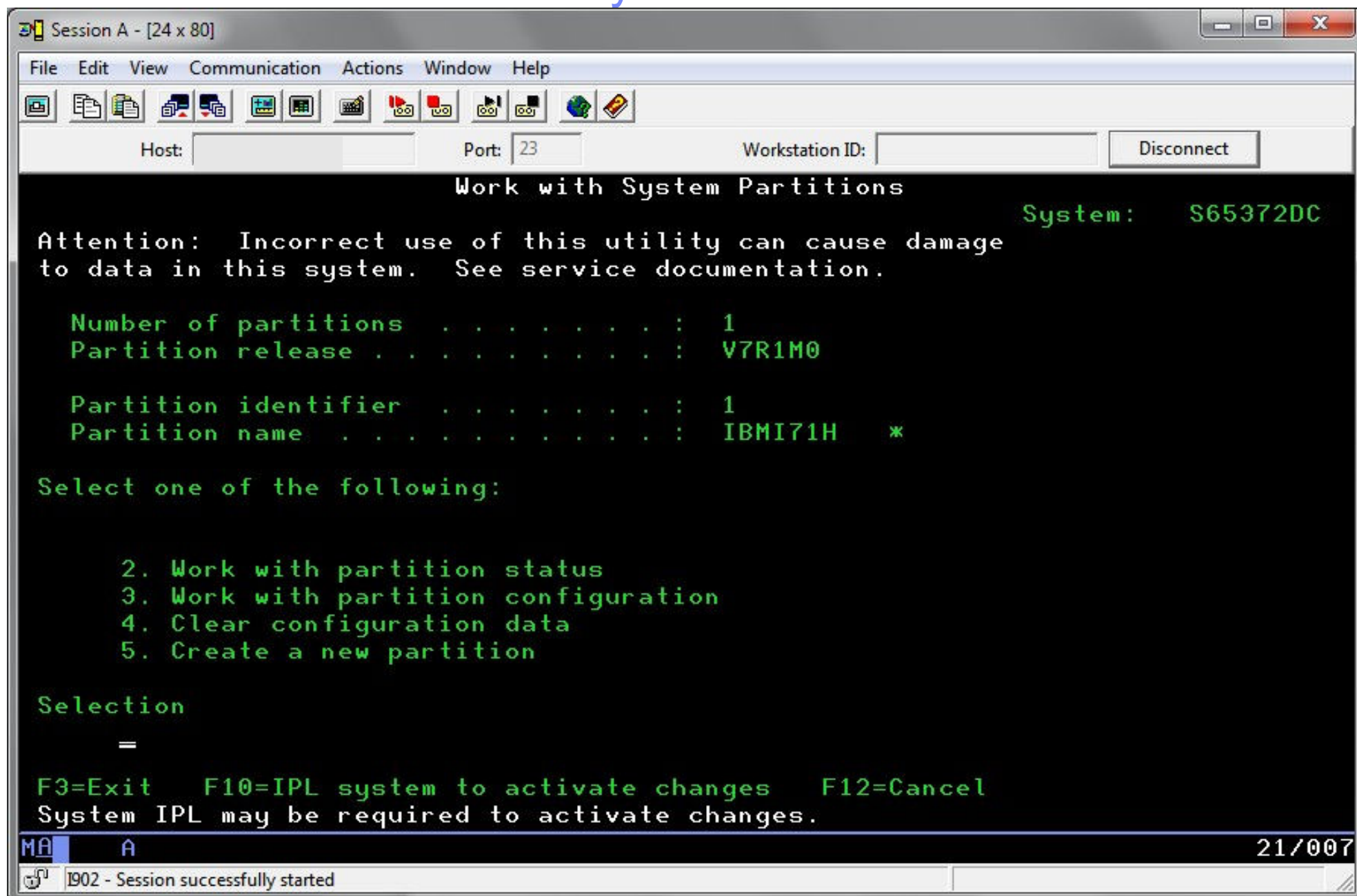
Opt	Partition		-----Processor-----				Memory (MB)	WLM	Virtual Ethernet ID				
	ID	Name	Total	Units	Uncap	Weight			1	2	3	4	
=	1	IBMI71H	1	1.00	1	High	10240	2	1	2	2	2	<

< Indicates partition IPL may be required.
 F3=Exit F5=Refresh F10=Display change status
 F11=Work with partition status F12=Cancel
 Partition 1 change was successful.

MA A 13/003

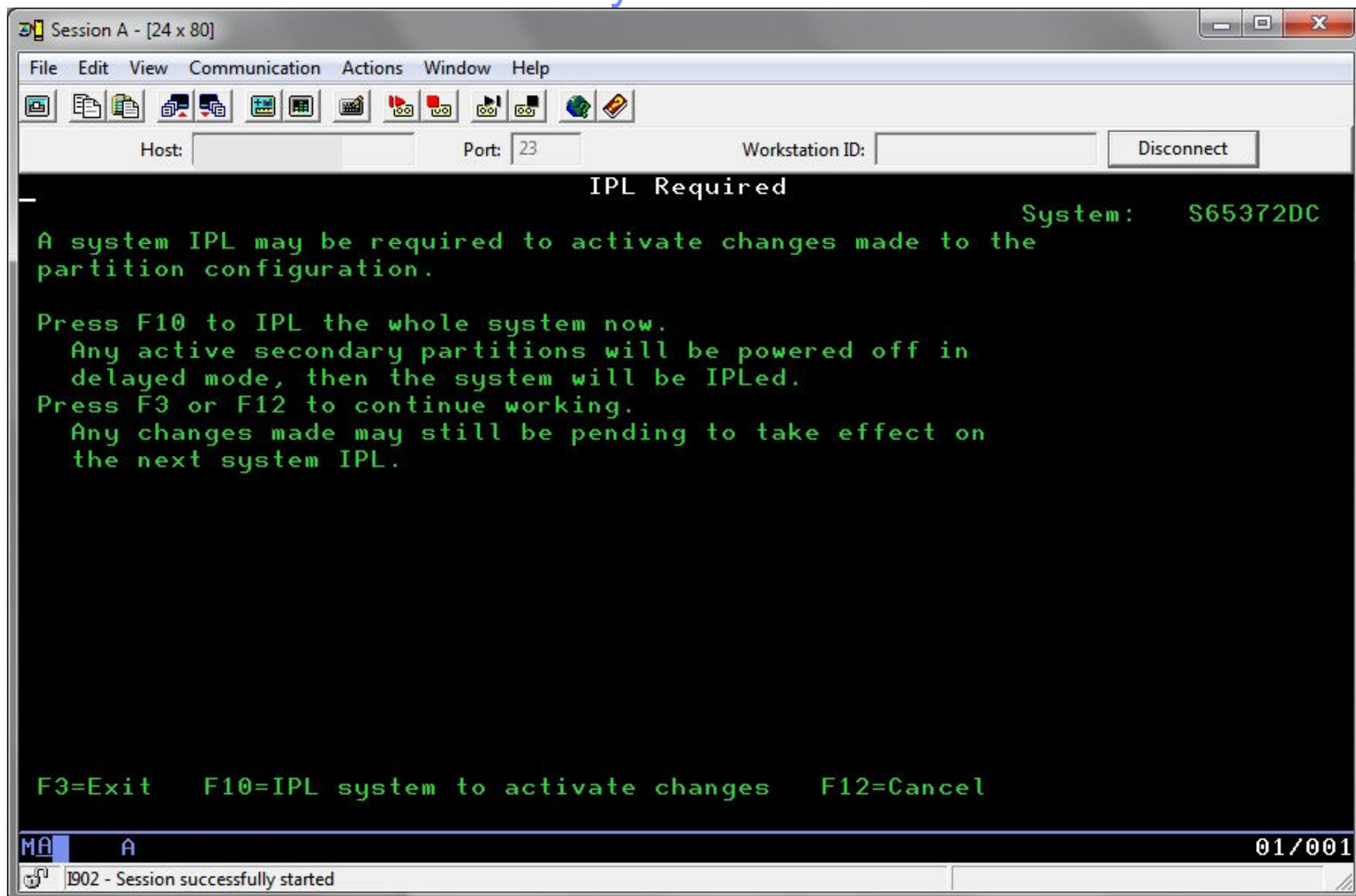
1902 - Session successfully started

Free some CPU and Memory

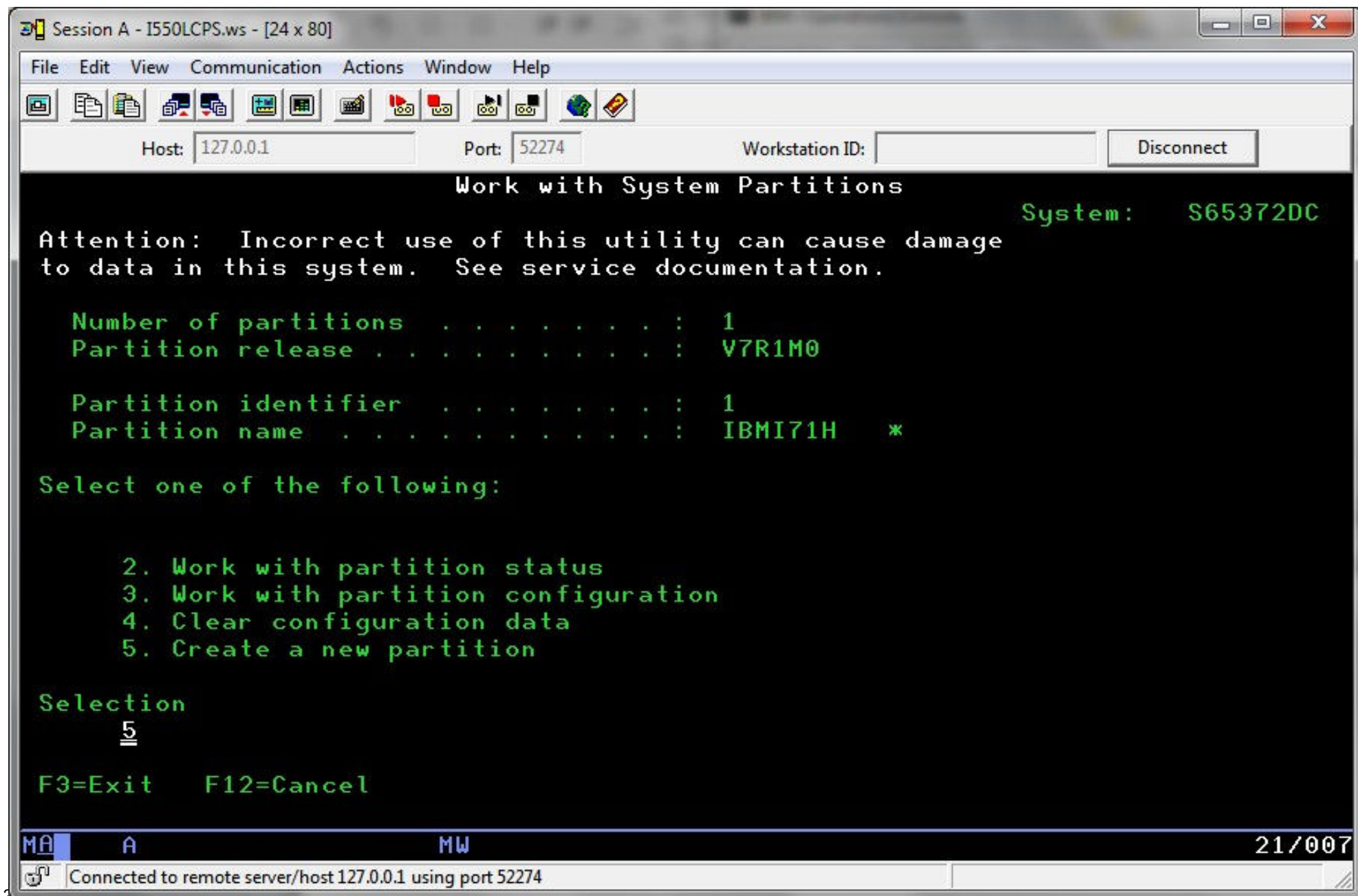


```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
Host: Port: 23 Workstation ID: Disconnect
Work with System Partitions
System: S65372DC
Attention: Incorrect use of this utility can cause damage
to data in this system. See service documentation.
Number of partitions . . . . . : 1
Partition release . . . . . : V7R1M0
Partition identifier . . . . . : 1
Partition name . . . . . : IBMI71H *
Select one of the following:
1. Work with partition configuration
2. Work with partition status
3. Work with partition configuration
4. Clear configuration data
5. Create a new partition
Selection
=
F3=Exit F10=IPL system to activate changes F12=Cancel
System IPL may be required to activate changes.
MA A 21/007
1902 - Session successfully started
```

Free some CPU and Memory – IPL but take care



Creating an IBM i Client partition => STRSST again



```
Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Host: 127.0.0.1 Port: 52274 Workstation ID: Disconnect

Work with System Partitions
System: S65372DC
Attention: Incorrect use of this utility can cause damage
to data in this system. See service documentation.

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

Partition identifier . . . . . : 1
Partition name . . . . . : IBMI71H *

Select one of the following:

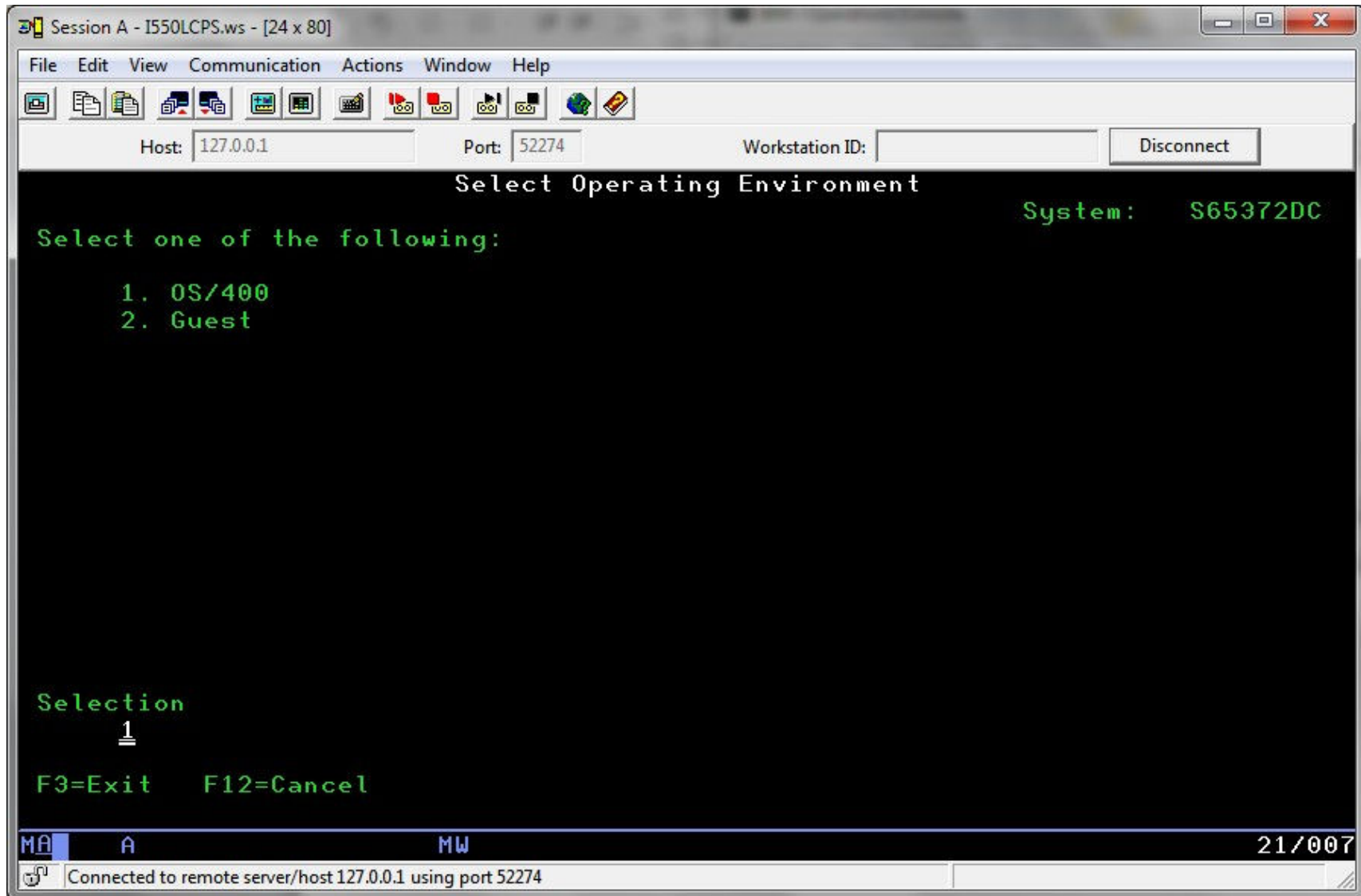
2. Work with partition status
3. Work with partition configuration
4. Clear configuration data
5. Create a new partition

Selection
5

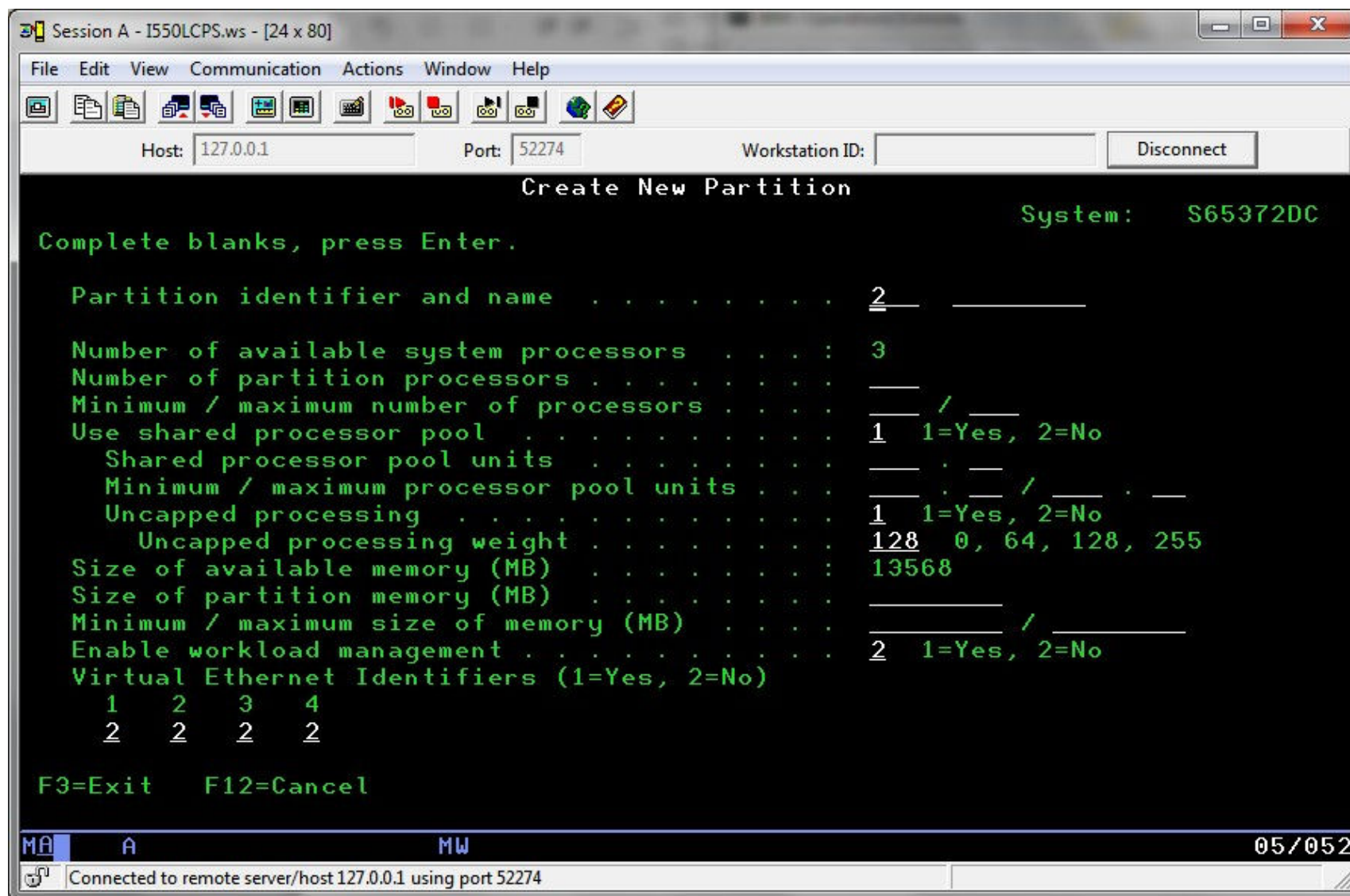
F3=Exit F12=Cancel

MA A MW 21/007
Connected to remote server/host 127.0.0.1 using port 52274
```

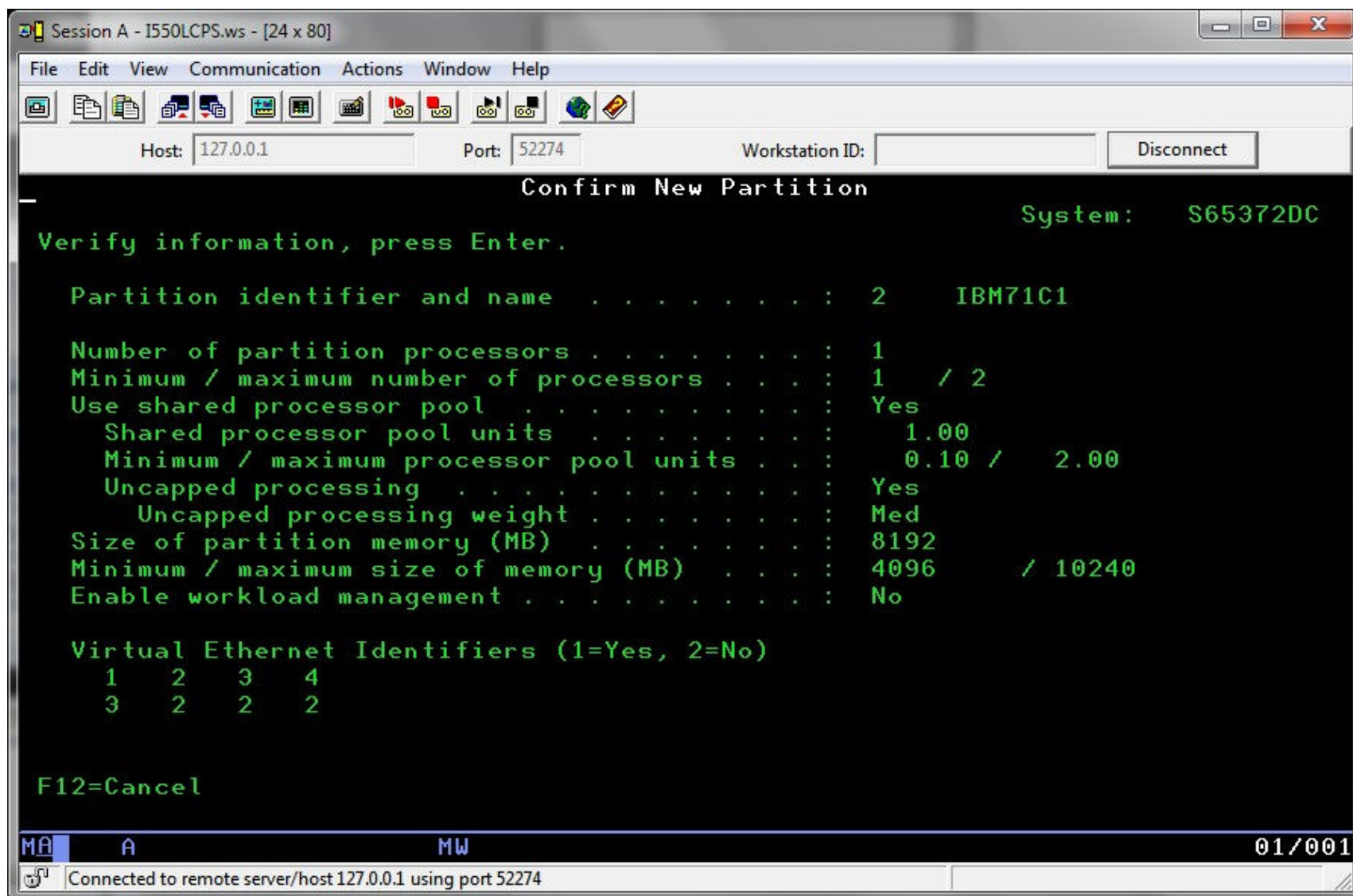
Creating an IBM i Client partition – Select Operating Environment



Creating an IBM i Client partition – Create New Partition



Creating an IBM i Client partition - confirm



In order to select Virtual Ethernet as the console device you have to set a Virtual Ethernet Identifier to '3', Instead of '1'.

Creating an IBM i Client partition – IPL required ‘<‘

```

Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Host: 127.0.0.1 Port: 52274 Workstation ID: Disconnect

Work with Partition Configuration
System: S65372DC

Available processor units . . . . . : 1.00
Available memory (MB) . . . . . : 1024
Memory region size (MB) . . . . . : 128

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

-----
Opt  Partition -----Processor----- Memory Virtual
  ID  Name      Total  Units  Uncap  Weight (MB)  WLM  Ethernet ID
-----
 1  IBMI71H    1     1.00   1     High  10240  2    1  2  2  2  <
 2  IBMI71C    1     1.00   1     Med   8192   2    3  2  2  2  <
 3  LINUX      1     1.00   1     Med   4096   2    1  2  2  2  <

< Indicates partition IPL may be required.
F3=Exit  F5=Refresh  F10=Display change status
F11=Work with partition status  F12=Cancel
Partition 2 change was successful.

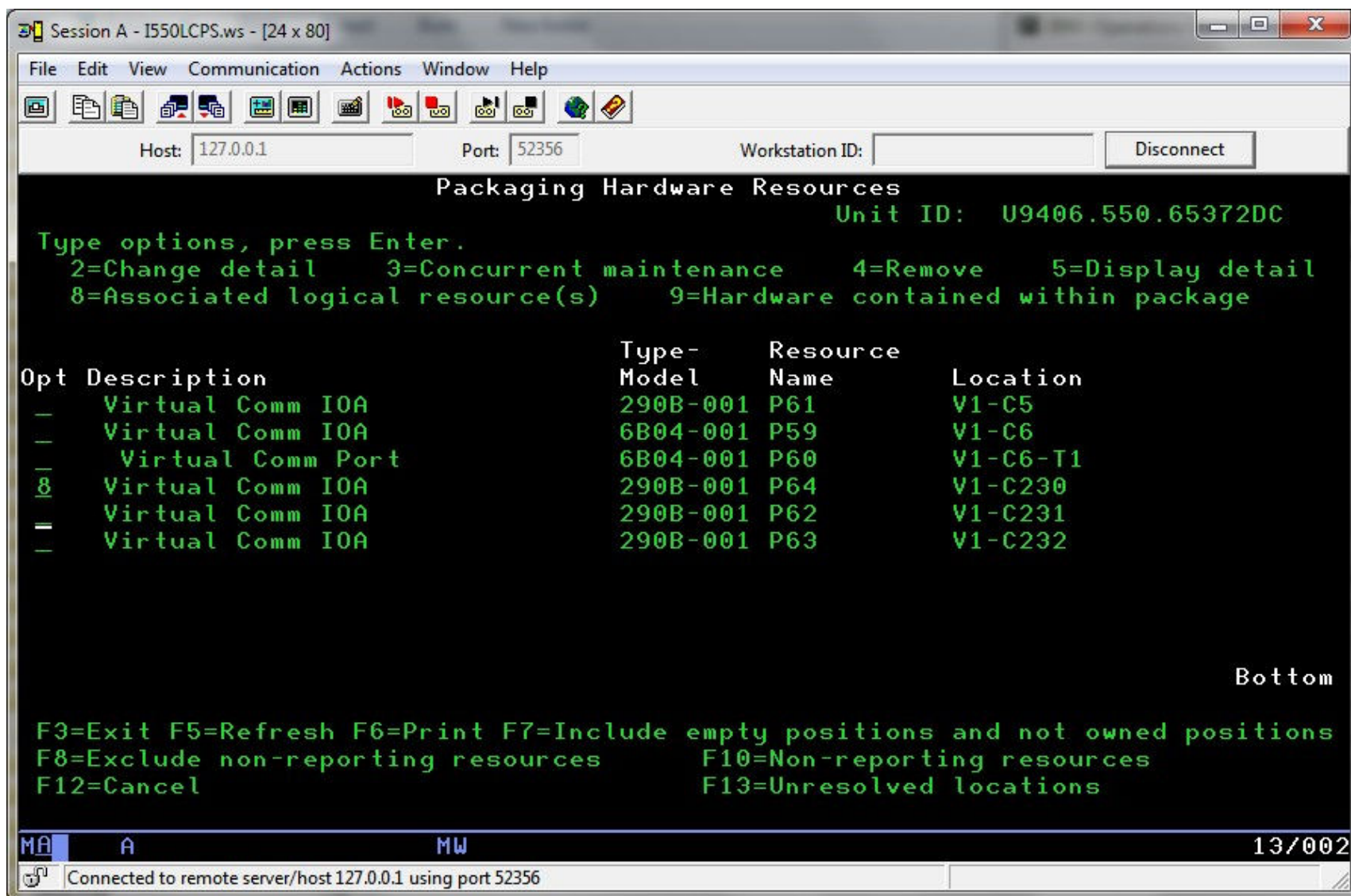
MA A MW 14/003
Connected to remote server/host 127.0.0.1 using port 52274
    
```

Identify virtual SCSI resource

```
Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Host: 127.0.0.1 Port: 52356 Workstation ID: Disconnect
Hardware Service Manager
Attention: This utility is provided for service representative use only.
System unit . . . . . : 9406-550 65-372DC
Release . . . . . : V7R1M0
Select one of the following:
1. Packaging hardware resources (systems, frames, cards,...)
2. Logical hardware resources (buses, IOPs, controllers,...)
3. Locate resource by resource name
4. Failed and non-reporting hardware resources
5. System power control network (SPCN)
6. Work with service action log
7. Display label location work sheet
8. Device Concurrent Maintenance
9. Work with resources containing cache battery packs
More...
Selection
  1_
F3=Exit      F6=Print configuration      F9=Display card gap information
F10=Display resources requiring attention      F12=Cancel
MA A MW 20/007
Connected to remote server/host 127.0.0.1 using port 52356
```


Identify virtual SCSI resource

– Look for "290B" with location ending Cx30



Session A - I550LCPS.ws - [24 x 80]

File Edit View Communication Actions Window Help

Host: 127.0.0.1 Port: 52356 Workstation ID: Disconnect

Packaging Hardware Resources
Unit ID: U9406.550.65372DC

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

Opt	Description	Type-Model	Resource Name	Location
—	Virtual Comm IOA	290B-001	P61	V1-C5
—	Virtual Comm IOA	6B04-001	P59	V1-C6
—	Virtual Comm Port	6B04-001	P60	V1-C6-T1
<u>8</u>	Virtual Comm IOA	290B-001	P64	V1-C230
—	Virtual Comm IOA	290B-001	P62	V1-C231
—	Virtual Comm IOA	290B-001	P63	V1-C232

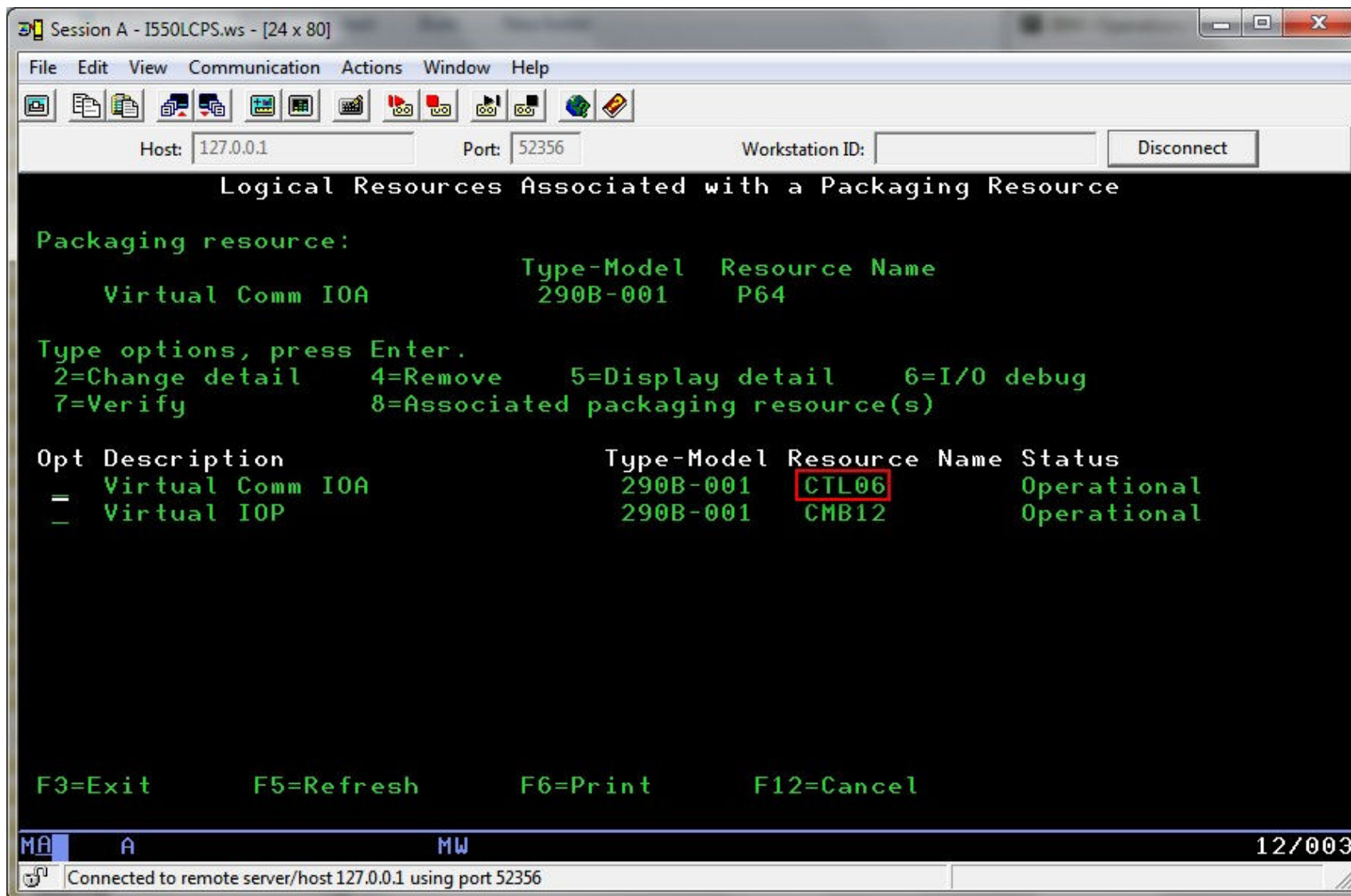
Bottom

F3=Exit F5=Refresh F6=Print F7=Include empty positions and not owned positions
F8=Exclude non-reporting resources F10=Non-reporting resources
F12=Cancel F13=Unresolved locations

MA A MW 13/002

Connected to remote server/host 127.0.0.1 using port 52356

Identify virtual SCSI resource



```

Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Host: 127.0.0.1 Port: 52356 Workstation ID: Disconnect

Logical Resources Associated with a Packaging Resource

Packaging resource:
      Type-Model  Resource Name
Virtual Comm IOA      290B-001      P64

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    CTL06          Operational
- Virtual IOP         290B-001    CMB12          Operational

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

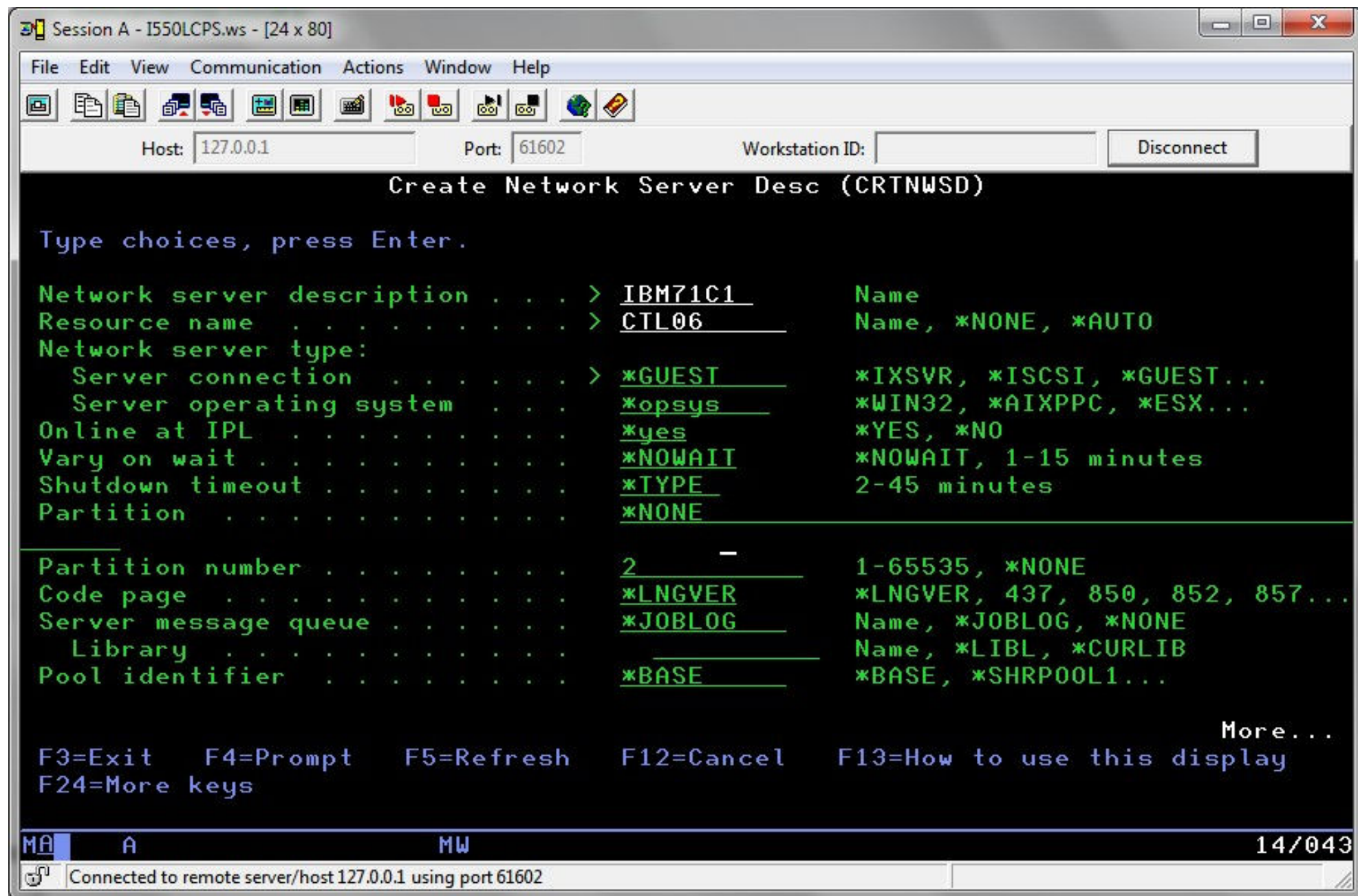
MA A MW 12/003
Connected to remote server/host 127.0.0.1 using port 52356

```

Setting up IBM i Virtual I/O Resources

- **Create Network Server Description (NWSD)**
- **Create Network Storage Space (aka Virtual Disk)**
- **Linking the virtual disks to the NWSD**
- **Optionally create a Virtual Image Catalog**

Network Server Description: CRTNWSD



Session A - I550LCPS.ws - [24 x 80]

File Edit View Communication Actions Window Help

Host: 127.0.0.1 Port: 61602 Workstation ID: Disconnect

Create Network Server Desc (CRTNWSD)

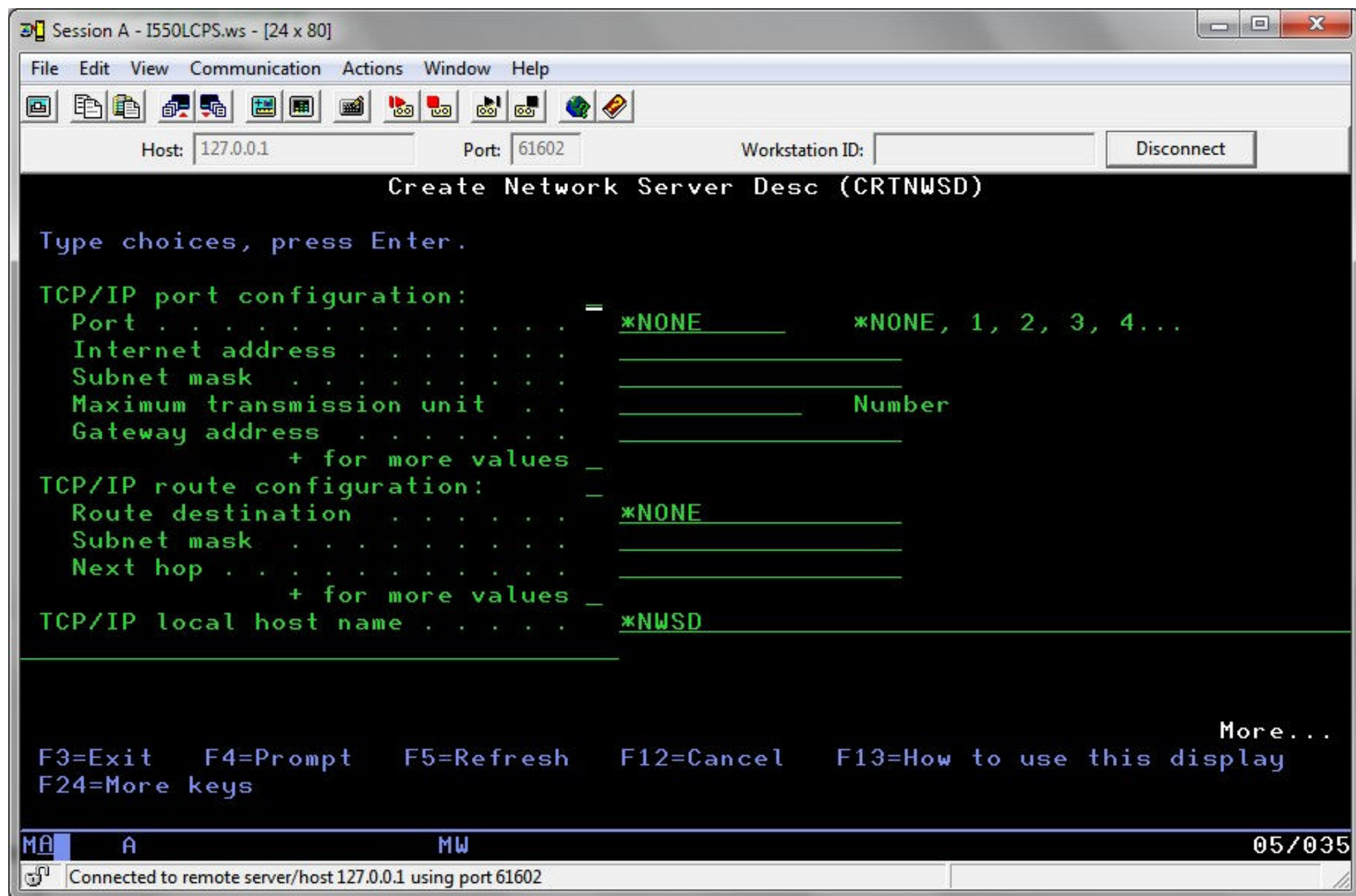
Type choices, press Enter.

Network server description	> <u>IBM71C1</u>	Name
Resource name	> <u>CTL06</u>	Name, *NONE, *AUTO
Network server type:		
Server connection	> <u>*GUEST</u>	*IXSVR, *ISCSI, *GUEST...
Server operating system	<u>*opsys</u>	*WIN32, *AIXPPC, *ESX...
Online at IPL	<u>*yes</u>	*YES, *NO
Vary on wait	<u>*NOWAIT</u>	*NOWAIT, 1-15 minutes
Shutdown timeout	<u>*TYPE</u>	2-45 minutes
Partition	<u>*NONE</u>	
<hr/>		
Partition number	<u>2</u>	1-65535, *NONE
Code page	<u>*LNGVER</u>	*LNGVER, 437, 850, 852, 857...
Server message queue	<u>*JOBLOG</u>	Name, *JOBLOG, *NONE
Library		Name, *LIBL, *CURLIB
Pool identifier	<u>*BASE</u>	*BASE, *SHRPOOL1...
<hr/>		
		More...
F3=Exit	F4=Prompt	F5=Refresh
F24=More keys	F12=Cancel	F13=How to use this display

MA A MW 14/043

Connected to remote server/host 127.0.0.1 using port 61602

Network Server Description: CRTNWS D page 2



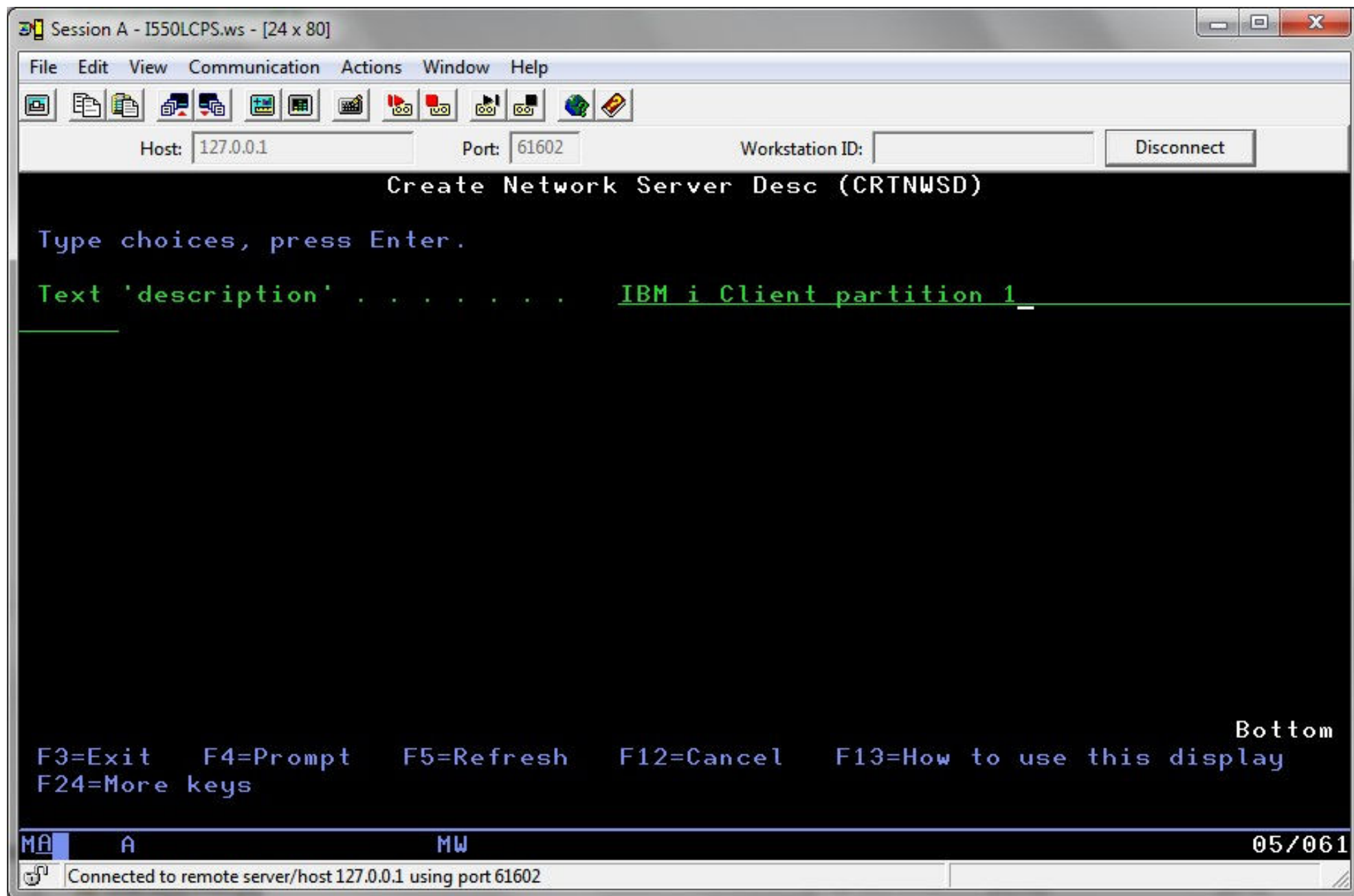
Network Server Description: CRTNWS D page 3

```

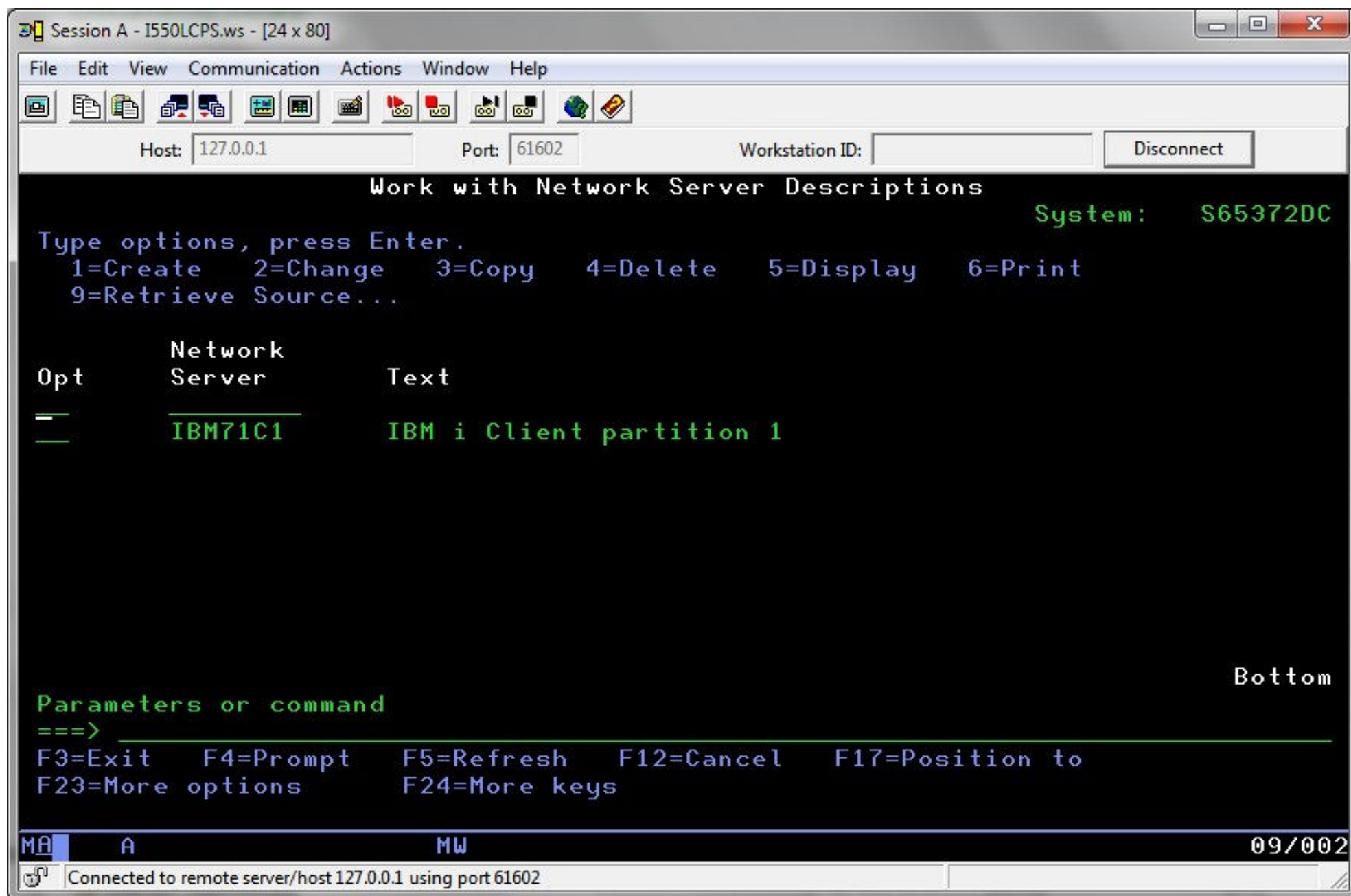
Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Host: 127.0.0.1 Port: 61602 Workstation ID: Disconnect
Create Network Server Desc (CRTNWS D)
Type choices, press Enter.
TCP/IP local domain name . . . . *SYS
TCP/IP name server system . . . . *SYS
      + for more values
Restricted device resources . . . *NONE      Name, *NONE, *ALL...
      + for more values
IPL source . . . . . *panel      *NWSSTG, *PANEL, *STMF, A...
IPL stream file . . . . . *NONE
IPL parameters . . . . . *NONE
Power control . . . . . *no_      *YES, *NO
Serviceability options . . . . . *NONE
Authority . . . . . *CHANGE      Name, *CHANGE, *ALL, *USE...
More...
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys
MA A MW 17/040
Connected to remote server/host 127.0.0.1 using port 61602

```

Network Server Description: CRTNWS D page 4



Network Server Description: WRKNWSD



Session A - I550LCPS.ws - [24 x 80]

File Edit View Communication Actions Window Help

Host: 127.0.0.1 Port: 61602 Workstation ID: Disconnect

Work with Network Server Descriptions

System: S65372DC

Type options, press Enter.

1=Create 2=Change 3=Copy 4>Delete 5=Display 6=Print
9=Retrieve Source...

Opt	Network Server	Text
—	IBM71C1	IBM i Client partition 1

Bottom

Parameters or command
==>

F3=Exit F4=Prompt F5=Refresh F12=Cancel F17=Position to
F23=More options F24=More keys

MA A MW 09/002

Connected to remote server/host 127.0.0.1 using port 61602

Network Storage Space: CRTNWSSTG

Session A - I550LCPS.ws - [24 x 80]

File Edit View Communication Actions Window Help

Host: 127.0.0.1 Port: 61602 Workstation ID: Disconnect

Create NWS Storage Space (CRTNWSSTG)

Type choices, press Enter.

Network server storage space . . .	> <u>IBM71C1D01</u>	Name
Size	> <u>30000</u>	*CALC, 1-1024000 megabytes
From storage space	> <u>*NONE</u>	Name, *NONE
Format	> <u>*OPEN</u>	*NTFS, *FAT, *FAT32, *OPEN...
Data offset	> <u>*FORMAT</u>	*FORMAT, *ALIGNLGLPTN...
Auxiliary storage pool ID	> <u>1</u>	1-255
ASP device		Name
Text 'description'		<u>IBM71C1 Virtual disk 1</u>

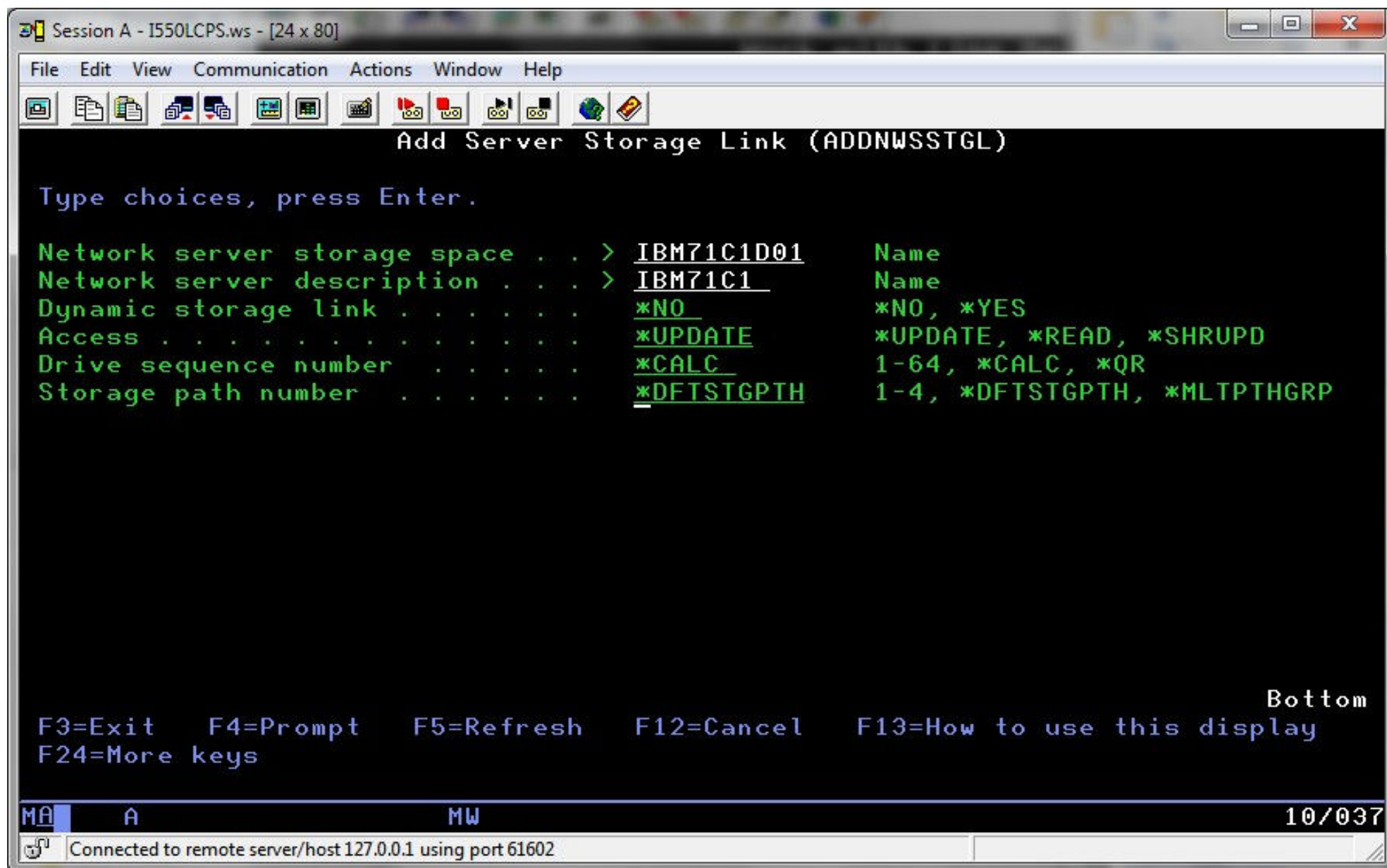
Bottom

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

MA A MW 06/038

Connected to remote server/host 127.0.0.1 using port 61602

Network Storage Space: ADDNWSSTGL



```

Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Add Server Storage Link (ADDNWSSTGL)

Type choices, press Enter.

Network server storage space . . . > IBM71C1D01      Name
Network server description . . . > IBM71C1          Name
Dynamic storage link . . . . . *NO                *NO, *YES
Access . . . . . *UPDATE          *UPDATE, *READ, *SHRUPD
Drive sequence number . . . . . *CALC          1-64, *CALC, *QR
Storage path number . . . . . *DFTSTGPTH      1-4, *DFTSTGPTH, *MLTPTHGRP

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

MA      A      MW      10/037
Connected to remote server/host 127.0.0.1 using port 61602

```

Network Storage Space: WRKNWSSTG

```

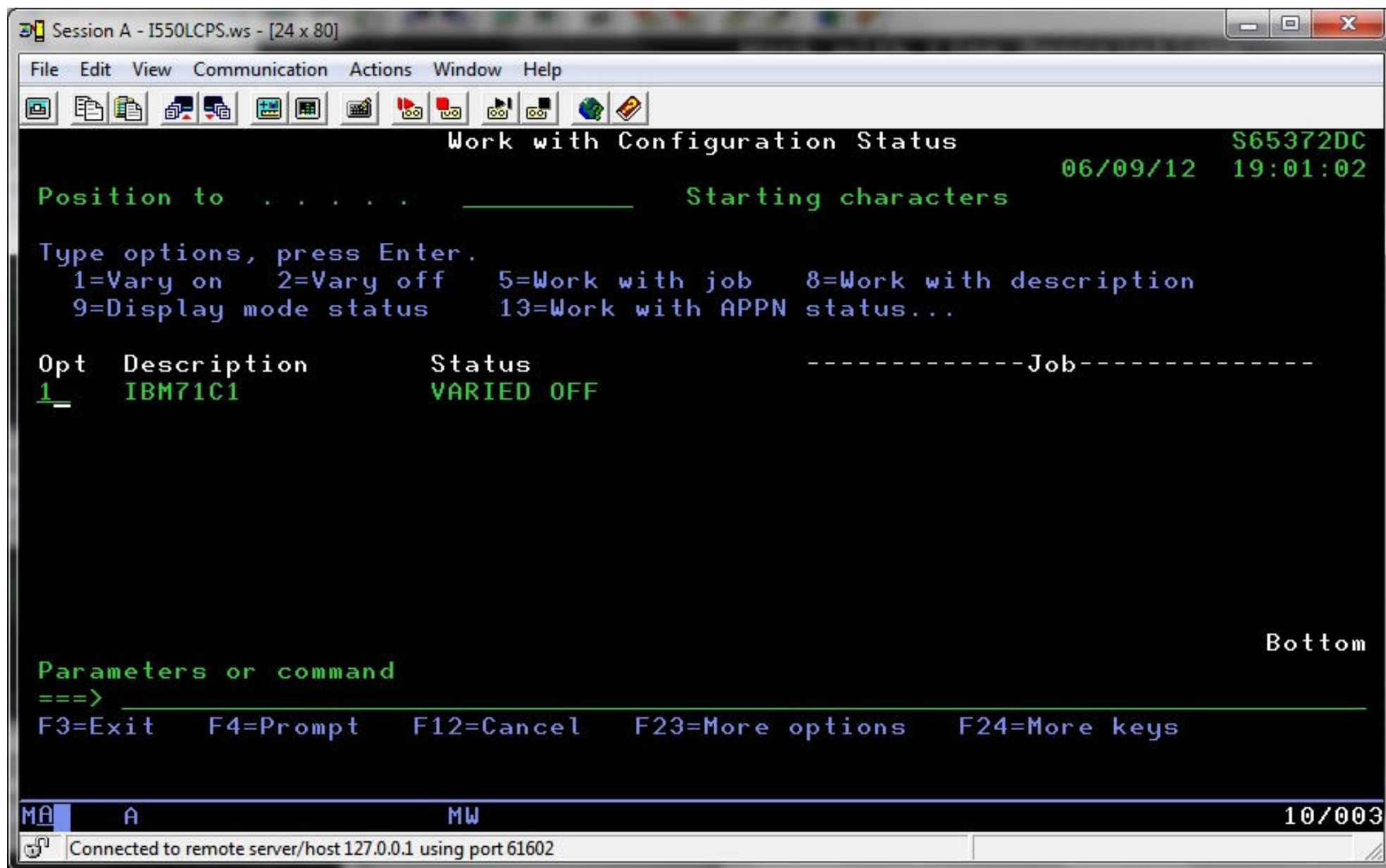
Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Work with Network Server Storage Spaces
System: S65372DC
Type options, press Enter.
  1=Create  2=Change  3=Copy  4=Delete  5=Display  6=Print  10=Add link
 11=Remove link

Opt  Name          Server   Seq  Link  Access  Stg
    Name          Server   Seq  Type  Access Path
---  ---          ---     ---  ---   ---    ---
    IBM71C1D01    IBM71C1   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.
MA  A  MW  21/007
Connected to remote server/host 127.0.0.1 using port 61602
  
```

Network Server Description – Vary On



```

Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Work with Configuration Status                                S65372DC
                                                                06/09/12 19:01:02
Position to . . . . . Starting characters
Type options, press Enter.
  1=Vary on   2=Vary off   5=Work with job   8=Work with description
  9=Display mode status 13=Work with APPN status...

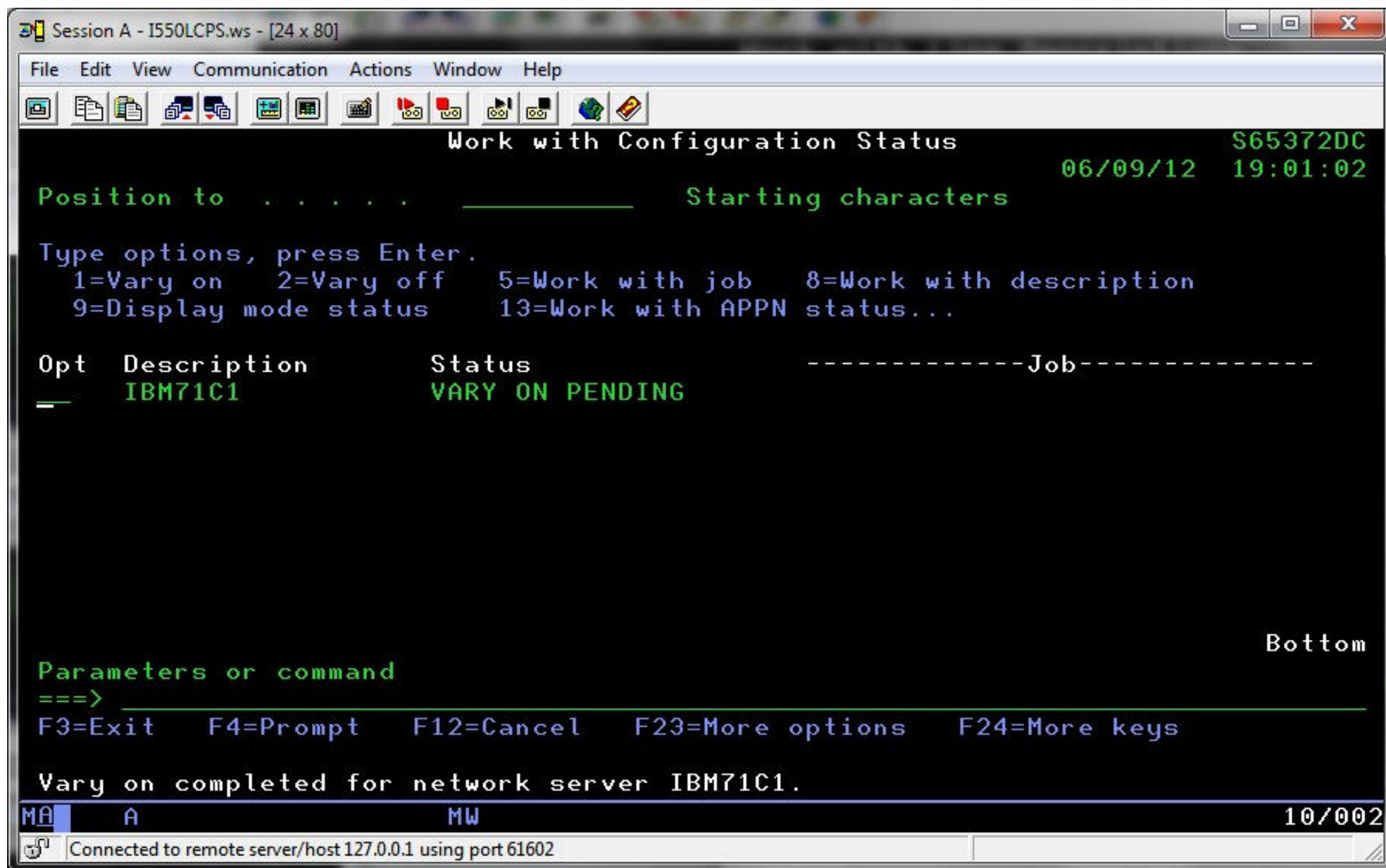
Opt  Description          Status          -----Job-----
  1_  IBM71C1              VARIED OFF

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

MA  A  MW  10/003
Connected to remote server/host 127.0.0.1 using port 61602

```

Network Server Description – Vary On



```

Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Work with Configuration Status                                S65372DC
                                                           06/09/12 19:01:02
Position to . . . . . Starting characters
Type options, press Enter.
 1=Vary on    2=Vary off    5=Work with job    8=Work with description
 9=Display mode status 13=Work with APPN status...

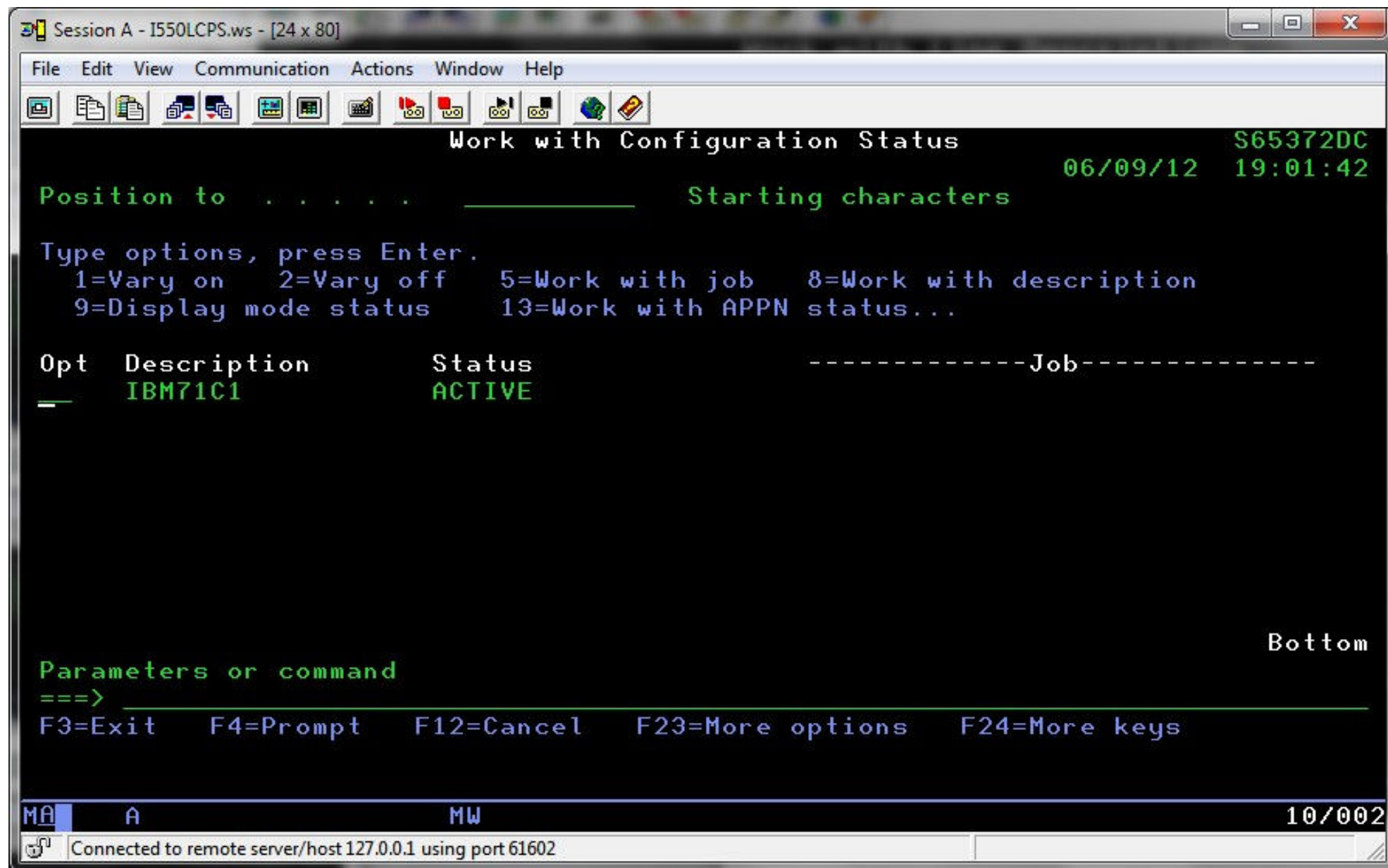
Opt  Description          Status          -----Job-----
--  IBM71C1              VARY ON PENDING

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

Vary on completed for network server IBM71C1.
MA  A                               MW                                10/002
Connected to remote server/host 127.0.0.1 using port 61602

```

Network Server Description – Vary On



```

Session A - I550LCPS.ws - [24 x 80]
File Edit View Communication Actions Window Help
Work with Configuration Status                                S65372DC
                                                                06/09/12 19:01:42
Position to . . . . . Starting characters
Type options, press Enter.
 1=Vary on   2=Vary off   5=Work with job   8=Work with description
 9=Display mode status 13=Work with APPN status...

Opt  Description          Status          -----Job-----
--  IBM71C1              ACTIVE

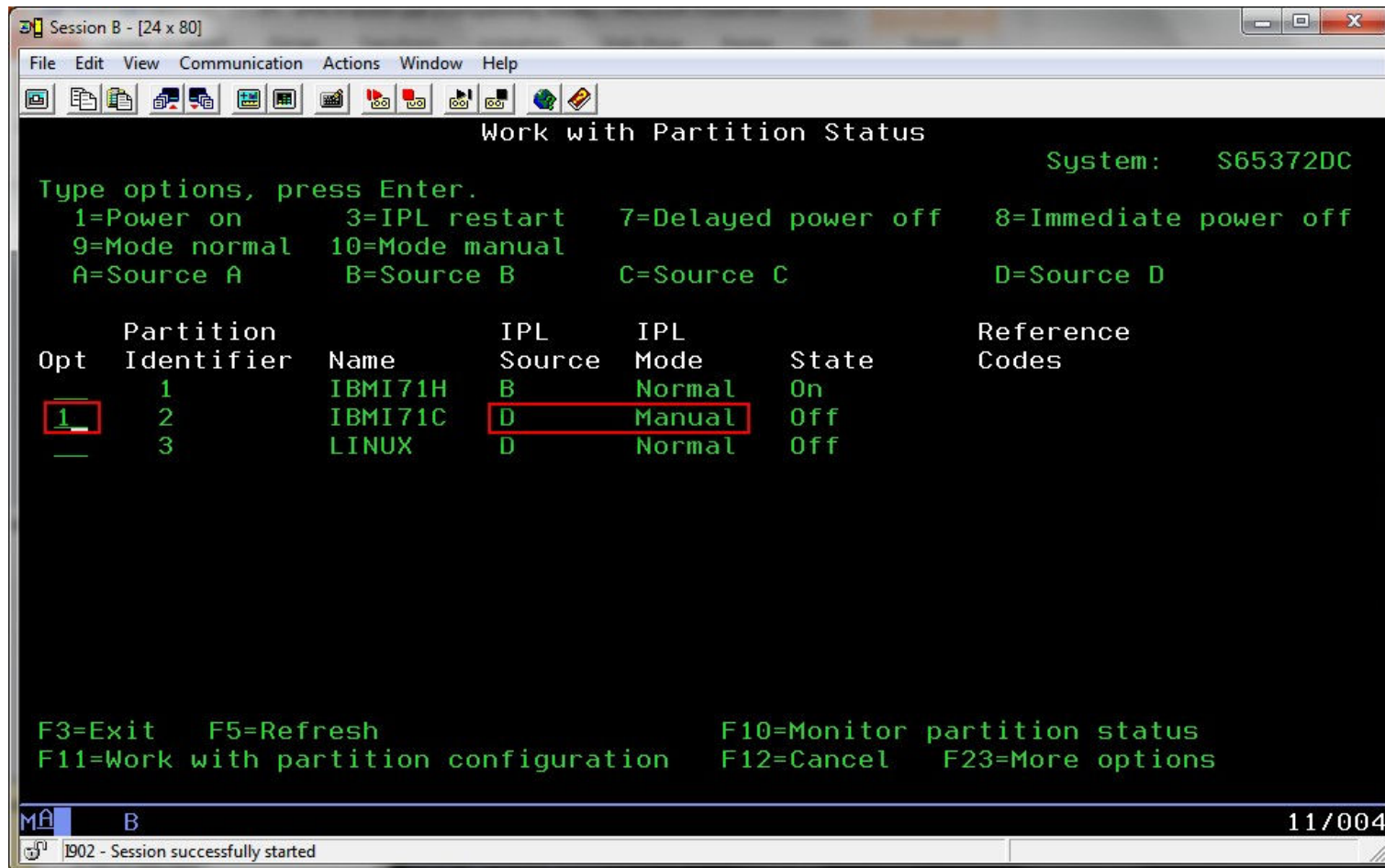
Parameters or command
===>
F3=Exit   F4=Prompt   F12=Cancel   F23=More options   F24=More keys

MA  A  MW  10/002
Connected to remote server/host 127.0.0.1 using port 61602

```

Next you need to activate the partition

- From the SST go to VPM:
 - 5. Work with system partitions
 - 2. Work with partition status
 - Verify IPL source: D
 - Verify IPL Mode: Manual
 - Option 1 to activate



```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
Work with Partition Status
System: S65372DC
Type options, press Enter.
1=Power on      3=IPL restart  7=Delayed power off  8=Immediate power off
9=Mode normal  10=Mode manual
A=Source A     B=Source B    C=Source C          D=Source D

Opt  Partition  Name      IPL      IPL      State      Reference
    Identifier Name      Source   Mode     State     Codes
---  ---        ---      ---      ---      ---      ---
  1   1         IBMI71H   B        Normal   On
  2   2         IBMI71C   D        Manual   Off
  3   3         LINUX     D        Normal   Off

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

MA B
11/004
1902 - Session successfully started
  
```

Next you need to activate the partition (2)

- The partition will begin initialization. The hosting partition will present the virtual optical device or devices and if a real optical drive is assigned to the hosting partition it will be presented as well.
- The client partition will locate a valid install or bootable media from any of the optical devices it finds on the VSCSI connection.
 - The rest of the install proceeds as normal, client partition will prompt for 'next media'. Go to the host partition and 'mount' the next media or virtual media image.
- 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.)

Install IBM i using virtual optical or real media

- The client partition will see all optical devices presented by the server partition.
- This includes any physical or virtual optical devices owned by the IBM i server partition.
- The client will not see any difference between virtual or physical.

Backups for IBM i Clients

- For full-system backup, the client storage spaces can be saved on the host IBM i partition
 - Similar to AIX, Linux client partitions and iSCSI integrated servers with Windows or Vmware => ideal for disaster recovery
 - File-level backup is not supported
 - Storage spaces can be restored on another IBM i host
 - Storage spaces can be located in IASP, Flash Copy can be used on IASP

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

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

The accompanying restore command to restore a specific NWSSTG-obj is:

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

Things to consider

- Client Virtual Tape
 - Tape library drives can only be virtualized when configured as a stand-alone device, they are not supported while in library mode
- Considerations on number of storage spaces (virtual disks)
 - Apprx. 4-12, leaving room for growth upto 16
 - Storage spaces should be same size for performance reasons
- IBM i host vs. VIOS
 - External storage
 - Skills
 - New virtualization enhancements like Active Memory Sharing, Suspend/Resume
- VPM limitations vs. HMC
 - Only virtual IO
 - No dynamic movement of resources
 - Maximum 4 client lpars

Performance Capabilities Reference Guide

IBM Power Systems Performance Capabilities Reference IBM i operating system 7.1

April 2012



This document is intended for use by qualified performance related programmers or analysts from IBM, IBM Business Partners and IBM customers using the IBM Power™ Systems platform running IBM i operating system. Information in this document may be readily shared with IBM i customers to understand the performance and tuning factors in IBM i operating system 7.1 and earlier where applicable. **For the latest updates and for the latest on IBM i performance information, please refer to the Performance Management Website:**

<http://www.ibm.com/systems/power/software/i/management/performance/index.html>

Requests for use of performance information by the technical trade press or consultants should be directed to STG Cross Platform Systems Performance Department.

IBM i 7.1 Performance Capabilities Reference - April 2012

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IBM i Performance Capabilities Reference

1

<http://www-03.ibm.com/systems/i/advantages/perfmgmt/resource.html>

Where Do I Start with Installing IBM I hosting clients on Power system?

HMC based



Same guide
Describes VIOS
hosting IBM i clients

- Latest version at:

http://www.ibm.com/systems/resources/systems_i_Virtualization_Open_Storage.pdf

