IBM® i Network Install using Network File System

IBM® i Virtual Media
Rochester, Minnesota

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1   Introduction

1.1   What is IBM® i Network Install?

This document addresses capabilities and enablement for installing an IBM® i using the Network File System (NFS). This function gives you the ability to perform complete installations and upgrades of IBM® i partitions, in addition to loading PTFs or restoring data via a virtual optical image on an image server, all without having to manually FTP the data across the network to the individual partitions. This change allows for the install of Licensed Internal Code (LIC), operating system, licensed programs, and PTFs across IBM® i partitions from a single image source. This capability will be available through PTFs beginning in IBM® i 6.1. This document will cover the information needed to configure and initiate a network install of IBM® i. For basic steps on planning and installing IBM® i you should refer to Installing, upgrading, or deleting IBM® i and related software in the IBM→ i Knowledge Center. Refer to [Knowledge Center References](#) for the link.

1.2   Advantages

- Quick, Easy and Efficient.
- You can install multiple partitions at the same time from the same image server.
- You do not need to manually change the panel functions in the partition properties on the HMC.
- This is great for users that have large hardware configurations with multiple partitions that share physical DVD devices.
- Setup and configuration are simple.

1.3   Terminology

Image Server or the Source System - The Network File System (NFS) server which hosts the virtual optical images.
Client System or Target System - The IBM® i system that contain the virtual optical device and is being installed/upgraded.
Network upgrade - A version of network install used for upgrading that requires the system being installed to be at command entry. The STRNETINS command is used to initiate the upgrade.
Network new partition install - A version of network install used for installing new partitions. This version of network install uses a Hardware Management Console (HMC) CLI interface (chsysstate) to initiate the install of a new partition.
Trivial File Transfer Protocol (TFTP) - File transfer protocol, with the functionality of a very basic form of File Transfer Protocol (FTP).

2   IBM® i Network install Requirements

2.1   System requirements

To prepare and share virtual optical images with the Network File System (NFS) network, you need to ensure that the client system and server system meet specific requirements.

2.1.1   Source (Server) system requirements

To share virtual optical images through a network, the source system serves as the image server and must meet the following requirements:

1. If your server is older than IBM® i 7.2, then refer to Source (Server) PTF requirements for specific PTF requirements for the server.
2. The server must be able to share virtual optical images using version 3 or later of the Network File System (NFS).
3. The images to be served must exist in an image catalog which must have an image catalog path name that is limited to 127 characters. Path name characters are limited to A-Z, a-z, 0-9, and / (slash). Each image file name is limited to 127 characters.
4. A volume list (VOLUME_LIST) file containing the list of images to be loaded in the virtual optical device must exist in the image catalog directory. The VFYIMGCLG command is used to create the volume list file from the image catalog containing the images you want to share. If you are using some other option other than VFYIMGCLG to generate the volume list, refer to Volume List characteristics for specific details.

   Note: Changes to VOLUME_LIST file are not active until the next time the client device is varied off/on.

2.1.2   Target (Client) system requirements

The client system to be installed needs to access virtual optical images through a network and must meet the following requirements:

- Client to be upgraded must be at IBM® i 6.1 or greater.
- If your client is currently installed with a release older than IBM® i 7.2, then refer to Target (Client) PTF requirements for specific PTF requirements for the client.
- The install media must be IBM® i 6.1.1 or later.
- Client must be on POWER6 or later.
- If your client is on POWER6 or POWER7, refer to Target (Client) Hardware requirements for information on specific hardware requirements
- See Ethernet adapter requirements and restrictions for Ethernet adapter requirements and restrictions.

- The Client must meet the following requirements to support a 632B-003 optical device created using the Create Device Description Optical (CRTDEVOPT) command:
  - Either a service tools server or a LAN console connection must be configured
  - The Internet Protocol (IP) must be Version 4

3   Preparing for network install

This section will serve as a guide to the activities needed to prepare for a network install. To determine if you can use network install review the following requirements.

3.1   Planning for the install

Refer to Installing, upgrading, or deleting IBM® i and related software and complete your install planning. The link to the install documentation in the Knowledge Center can be found in Knowledge Center References.

Return here to setup your install device.

3.2   Setup virtual optical storage for installing IBM® i install

The virtual optical device support of IBM® i provides a method for using virtual optical images from a single image source that can be shared with other systems in a network.

A client partition with a virtual optical device type 632B model 003 can access images located on a server using the Network File System (NFS). In previous releases, it existed in a local system integrated file system directory. This device can be used to install Licensed Internal Code, operating system, licensed programs, and PTFs.

3.2.1   Setting up the source (server) system

The following directions assumes you will be using IBM supplied media and will demonstrate how to set up the server to share virtual optical image files with the client system for IBM® i network install. These steps are only for IBM® i. If you want to generate your own distribution media refer to the "Distributing software" topic in the IBM→ i Knowledge Center. Refer to Knowledge Center References for the links.

For more information on setting up and using optical image catalogs, see the "Storage Solutions" topic in the IBM→ i Knowledge Center. Refer to [Knowledge Center References](#) for the link.

Setting up the server to share virtual optical image files with the client system
To create virtual storage from physical media in an optical device or from images received from another system, take the following steps.

1) Create the image catalog:

        CRTIMGCLG IMGCLG(*catalog_name*) DIR('/*catalog_directory*') CRTDIR(*YES)

If you have downloaded your images into an image catalog directory, there is a fast way to add all the images at one time into your image catalog. There are two methods to do this.

   a) Use the CRTIMGCLG command from a system installed with IBM® i 7.2 or later:

        CRTIMGCLG IMGCLG(*catalog_name*) DIR(*catalog_directory*)
        ADDVRTVOL(*DIR) IMGTYPE(*ALL) TEXT(text-description)

   b) Use the QVOIFIMG API when the image catalog already exists

        CALL PGM(QVOIFIMG) PARM('*catalog-name*' '*ALL' 0)

       Note: This function was delivered as PTFs in IBM® i 6.1 (SI57013), IBM® i 7.1 (SI59835), and IBM® i 7.2 (SI60073).

2) Add the image from physical media or from image files received from another system. If you have multiple images to add, see the CRTIMGCLG command and the QVOIFIMG API, described above, to add all the images at the same time.

   a) To add images from physical media:

        ADDIMGCLGE IMGCLG(*catalog_name*) FROMDEV(*device_name*)
        TOFILE(*fromfile)

       *** Repeat for each optical disk ***

   b) To add images from image file:

        ADDIMGCLGE IMGCLG(*catalog_name*) FROMFILE(*file_name*) TOFILE(*fromfile)

       Note: Repeat this step for each file in your catalog directory. This step assumes your image is already in the image catalog directory.

3) Create the virtual device

CRTDEVOPT DEVD(*virtual_device_name*) RSRCNAME(*VRT)

4) Vary on the virtual device

   VRYCFG CFGOBJ(*virtual_device_name*) CFGTYPE(*DEV) STATUS(*ON)

5) Load the image catalog in the virtual device:

   LODIMGCLG IMGCLG(*catalog_name*) DEV(*virtual_device_name*)

The following directions show how to set up the server to share virtual optical image files with the client system. These steps are only for servers on IBM i OS®.

3.2.1.1 Preparing server image for a full upgrade (LIC, OS, LPPs)

The image catalog must contain images for Licensed Internal Code, base IBM® i (which includes libraries QSYS, QGPL and QUSRSYS), and any additional required LPPs.   The LIC image must be mounted, and all other images required for the upgrade must be loaded.

1) After the image catalog has been created and loaded, you'll need to verify the image catalog to create a volume list file (VOLUME_LIST) that will be used by the virtual optical device on the client system. The following command is an example of how to create the volume list file:

   VFYIMGCLG IMGCLG(*catalog_name*) TYPE(*UPGRADE) NFSSHR(*YES) SORT(*YES)

   Note: This command creates the volume list file and adds a new subdirectory called BOOTP in the image catalog directory. This subdirectory contains files required to run the IBM® i install.

2) Ensure that the NFS file servers are running. Enter either one of the following Start Network File System Server (STRNFSSVR) commands:

   Start all the servers with this command:

   STRNFSSVR *ALL

   Or, run all these commands on your servers:

   STRNFSSVR *RPC

   STRNFSSVR *SVR

   STRNFSSVR *MNT

3) Export the image catalog directory. This example restricts access by all NFS clients because it is read-only. Ensure that the exported directory is in the public directory and that it is a subdirectory of the NFSROOT path.

   CHGNFSEXP OPTIONS('-i -o ro') DIR('/*catalog_directory*')

By default, this will allow read access to all Service LAN adapters wanting to use this server image. If you wish to restrict access to a specific IP address, add as an option access=x.x.x.x, where x.x.x.x is the IP address of the clients Service LAN Adapter.

Links to additional information about the Network File System (NFS) can be found in [Knowledge Center References](#).

4) Specify the level of authority for the user id (UID), group id (GID), or *PUBLIC that owns or manages the image catalog directory and the image files. The minimum authority that is required is the following:

- Execute (*X) data authority for the exported directory and any subdirectories

- Read (*R) data authority for files in the exported directory and any subdirectories.

The following authority example is for *PUBLIC:

CHGAUT OBJ('/*catalog_directory*') USER(*PUBLIC) DTAAUT(*RWX) SUBTREE(*ALL)

5) Add the /catalog_directory/BOOTP directory as the TFTP alternate source directory by using CHGTFTPA command:

CHGTFTPA AUTOSTART(*YES) ALTSRCDIR*('/catalog_directory*/BOOTP')

TFTP is able to find the BOOTP images as long as they are somewhere within the subdirectory structure of the specified ALTSRCDIR directory. This makes it possible to serve up multiple install images at the same time without ending and re-starting the TFTP server. For example, you could specify '/installimages' for ALTSRCDIR, and the following image catalog directories could all be served up at the same time:

'/installimages/catalog1/BOOTP'

'/installimages/catalog2/BOOTP'

.

.

'/installimages/catalogN/BOOTP'

Note: Just make sure your image catalog directory is specified as '/installimages/catalog1', etc. when creating your image catalogs.

6) Ensure QTFTP has *RX authority to all install files located in the TFTP alternate source directory:

CHGAUT OBJ('/*catalog_directory*/BOOTP') USER(QTFTP) DTAAUT(*RX) SUBTREE(*ALL)

7) Ensure the TFTP servers are started and reflect changes made above by stopping/starting the servers:

   ENDTCPSVR *TFTP

   STRTCPSVR *TFTP

8) Refer to the [Tips and Techniques](#) section to verify that TFTP setup has been done correctly

Note: The fully exported image catalog directory name is limited to 127 characters. The directory path name may only contain characters A-Z, a-z, 0-9, and / (slash).

3.2.1.2 Preparing server image for IBM i OS®, LPPs, or PTFs (No LIC)

Ensure the first image is mounted, and all other images are loaded.

1) After the image catalog has been created and loaded, you'll need to verify the image catalog to create a volume list file (VOLUME_LIST) that will be used by the virtual optical device on the client system. The following command is an example of how to create the volume list file:

   VFYIMGCLG IMGCLG(*catalog_name*) TYPE(<Value>) NFSSHR(*YES) SORT(*YES)

   Note: <Value> would be *OPSYS for images containing IBM i OS®, *PTF for images containing just PTFs, and *OTHER for images containing just LPPs.

2) Ensure that the NFS file servers are running. Enter either one of the following Start Network File System Server (STRNFSSVR) commands:

   a. Start all the servers with this command:

      STRNFSSVR *ALL

      Or, run all these commands on your servers:

      STRNFSSVR *RPC

      STRNFSSVR *SVR

      STRNFSSVR *MNT

3) Export the image catalog directory. This example restricts access by all NFS clients because it is read-only. Ensure that the exported directory is in the public directory and that it is a subdirectory of the NFSROOT path.

   CHGNFSEXP OPTIONS('-i -o ro') DIR('/*catalog_directory*')

   By default, this will allow read access to all Service LAN adapters wanting to use this server image. If you wish to restrict access to a

specific IP address, add as an option access=x.x.x.x, where x.x.x.x is the IP address of the clients Service LAN Adapter.

Links to additional information about the Network File System (NFS) can be found in [Knowledge Center References](#).

4) Specify the level of authority for the user id (UID), group id (GID), or *PUBLIC that owns or manages the image catalog directory and the image files. The minimum authority that is required is the following:

- Execute (*X) data authority for the exported directory and any subdirectories

- Read (*R) data authority for files in the exported directory and any subdirectories

The following authority example is for *PUBLIC:

CHGAUT OBJ('/*catalog_directory*') USER(*PUBLIC) DTAAUT(*RWX) SUBTREE(*ALL)

3.2.2 Setting up the virtual optical device on the client system

If you have set up the Network File System server to share images, proceed with these steps to set up virtual optical device on the client.

To set up the virtual optical device type 632B-003 on the client, follow these steps.

1. Configure a service tools server for the virtual optical device to use. See [Preparing your console for software installation](#) for details. For more information about configuring the Service Tools Server refer to Knowledge Center [Configuring the service tools server for DST](#) or refer to section "[Configuring a service tools server](#)" in this document.
2. Vary on the virtual optical device. The virtual device name specified on the VRYCFG command should be the same as the name specified for DEVD on the CRTDEVOPT command.

3. Create a device description for the virtual optical device.

**CRTDEVOPT DEVD(*virtual_device_name*) RSRCNAME(*VRT)
LCLINTNETA(*SRVLAN)
RMTINTNETA('*X.X.XXX.XXX*')
NETIMGDIR('/*catalog_directory*')**

Note: (1) The RMTINTNETA is the remote internet address of the Network File system (NFS) server where this virtual optical device will look for virtual image files.
Note: (2) The NETIMGDIR parameter specifies the network path on the Network File System (NFS) server containing the virtual image files that were prepared for use with this device. The path is limited to 127 characters. The character set is limited to A-Z, a-z, 0-9, and / (slash).

Vary on the virtual optical device. The virtual device name specified on the VRYCFG command should be the same as the name specified for DEVD on the CRTDEVOPT command.

VRYCFG CFGOBJ(*virtual_device_name*) CFGTYPE(*DEV) STATUS(*ON)

Use the following command to verify the virtual device.

WRKIMGCLGE IMGCLG(*DEV) DEV(*virtual_device_name*)

The virtual optical device is now ready for use with the shared image files.

4   Performing the Install (Network upgrade)

This section is intended for upgrading using network install. If you are installing a new partition, then go to section "Performing the Install (New Partition)". To continue with the network installation, you need to ensure you have completed your install preparation. Refer to Installing, upgrading, or deleting IBM® i and related software and complete your install planning. The link to the install documentation for all the supported releases can be found in Knowledge Center References.

The network install is initiated with the STRNETINS command.
The requirements for this command are covered in the "Client system requirements" section in this document. You must pick one of the following sections for manual or automatic install to continue:

4.1   Automatic install

Complete your install by following instructions in the "Upgrading or replacing software using automatic installation" topic in the IBM® i Knowledge Center. The link to the "Upgrading or Replacing software using automatic installation" topic can be found in Knowledge Center References.

Once you are ready for the "Power down the system or logical partition to perform the upgrade" step of the install process uses the following command instead of the PWRDWNSYS command:

STRNETINS DEV(*virtual_device_name*) OPTION(*ALL) KEYLCKMOD(*NORMAL)

Note: We are specifying *ALL to perform a full install of the licensed internal code, operating system, options and licensed products that are available on the install media loaded in the specified network optical device. The KEYLOCK parameter indicates the system key lock mode to be used for the installation.

You will be prompted with a 'Confirm Power Down of System' screen.   To confirm power down, press F16 for the install to continue. Or press F12 to cancel.

The following screens that the user will see will be the familiar IBM→ i install screens.

4.2   Manual install

Complete your install by following instructions in the "Upgrading or replacing software using manual installation" topic in the IBM® i Knowledge Center. The links to the "Upgrading or Replacing software using manual installation" topic can be found in Knowledge Center References.

Once you are ready for the "Power down the system or logical partition" step of the install process uses the following command instead of the PWRDWNSYS command:

STRNETINS DEV(*virtual_device_name*) OPTION(*ALL) KEYLCKMOD(*MANUAL)

You will be prompted with a 'Confirm Power Down of System' screen.   To confirm power down, press F16 for the install to continue. Or press F12 to cancel.
The following screens that the user will see will be the familiar IBM→ i install screens - these may differ depending if you have selected *MANUAL mode.

5   Performing the Install (New partition)

This section is intended for using network install to install a new partition. If you are upgrading a partition then go to section "Performing the Install (Network Upgrade)". To continue with the network installation you need to ensure you have completed your install preparation. Complete your install planning by following the "Installing IBM® i and related software on a new system or logical partition" topic in the IBM® i Knowledge Center. The links to the "Installing IBM® i and related software on a new system or logical partition" topic can be found in Knowledge Center References.

The new partition network install requires the system is at standby and the partition to be installed is powered off. This install uses a 7.2 HMC command line to issue the CLI command chsysstate to install the partition.

The requirements for this command are covered in the "Client system requirements" section in this document.

5.1   New Partition install

Complete your install by following the "Installing IBM® i and related software on a new system or logical partition" topic in the IBM® i Knowledge Center. The link to the "Installing IBM® i and related software on a new system or logical partition" topic can be found in Knowledge Center References.

When you are ready for the "Installing Licensed Internal Code on the new logical partition" skip steps 5 through 7 and do the following steps:

From you HMC select the ethernet adapter to be used for the install as your alternate restart device. You may want to create a new profile based on you existing profile and change the new alternate restart device.

From the HMC command line:
chsysstate -o on -k manual -m *managed_system_name* **-n** *partition_name* **-f** *profile_name* **-r lpar -i d --ip** *x.x.x.x* **--netmask** *xxx.xxx.xxx.x* **--gateway** *x.x.x.x* **--serverip** *x.x.x.x* **--serverdir /***catalog_directory* **--duplex auto --mtu 1500**

Where –ip, --netmask, and –gateway pertain to the clients Service LAN Adapter
    Information and
    --serverip and –serverdir pertain to the server TCP/IP address and image
      catalog directory.

For command help use:
chsysstate --help

Continue your install the next step of "Installing Licensed Internal Code on the new logical partition".

6   Performing the Install (IBM i OS® only)

This section is intended for using network install to install only IBM i OS®. To continue with the network installation you need to ensure you have completed your install preparation. Refer to Installing, upgrading, or deleting IBM® i and related software and complete your install planning. The link to the install documentation for all the supported releases can be found in [Knowledge Center References](#).

Here are the steps to install IBM i OS®:

1. Do a manual 'B' mode IPL which should bring you to the "IPL or Install the System" panel
2. Take option 2 - Install the operating system
3. Take option 5 - Network device
4. On the Network Device - Configuration panel, type in your server IP address and the server path name
5. Press F10 to continue with the install.
6. Follow manual install options from that point on.

7   Installing LPPs or PTFs

This section is intended for using network install to install LPPs, Load/Apply PTFs, restore libraries, etc. Ensure the virtual device is varied on. That virtual device name can now be used as the optical device on RSTLICPGM, GO LICPGM, RSTLIB, GO PTF, etc to install or restore anything needed on the client.

8   Appendix

8.1   Source (Server) PTF requirements

- System must be at IBM® i 6.1 or greater.
- IBM® i 6.1 PTF's SI57013 and SI44484.
- IBM® i 7.1 PTF's SI59835

8.2   Target (Client) PTF requirements

- IBM® i 6.1 PTFs SI39400 (Lead PTF – this will cause the other PTFs to be ordered and installed), SI57013, SI44484, SI35747, MF50920, and MF47285
- IBM® i 7.1 PTF SI59835

8.3   Target (Client) Hardware requirements

- Only supported with Hardware Management Console (HMC) 7.2 or later
- Power 6 EFW Service Pack 3.5.5, 10/21/2010 or later
- Power 7 EFW 7.2 or EFW 7.1 with Service Pack 7.1.4, 09/22/2010 or later (Supports standalone PCI Ethernet adapters only)
- Power 7 EFW 7.3 with service pack 7.3.3, 09/14/2011 or later (Supports standalone PCI Ethernet adapters and virtual ethernet adapters)

8.4   Volume list characteristics

- Must be called VOLUME_LIST
- Each line is either an image file name or a comment
- ASCII format
- All entries are ended by the end of a line.
- All characters following the pound sign '#' are considered comments until the end of the line
- Comments can be added after # and must be followed by a EOL character
- Provides the order that the image files will be processed on the client system
- File names are limited to 127 characters
- Can be created with the Verify Image Catalog Entry (VFYIMGCLG) with the NFSSHR(*YES) parameter or manually by using a ASCII editor

- No tabs or line feeds can be used in the path name

8.5 Configuring a service tools server

The client system must be at R610 or above.

The type of system and configuration determines what type of setup is required to configure the Service Tools Server.

System Configuration	Tagging IOP/LAN Adapter	Configuration Setup
Operations Console with LAN Connectivity	Not required	Not required
Non-partitioned system	LAN adapter must be in specific location based on system model	SST
Partitioned 8xx model Not supported in IBM® i 7.1 or later	Tag the IOP the LAN adapter reports to as the console	SST

As indicated in the table above, if Operations Console with LAN Connectivity is configured, there is no additional setup required. If not, a LAN adapter or IOP must be tagged, depending on the model of your system. The table shows what is required to tag the IOP or LAN adapter.

The latest information regarding configuring the service tools server can be found in the Knowledge Center.
https://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzamh/rzamhsrvtoolsrvr.htm

One way to help determine whether your client system has a service tools server for DST configured, log on to SST, select option 8. 'Work with service tools user IDs and Devices', and press F5. A valid internet address needs to be specified. The display should look like the following screen if a service tools server is configured:

```
MCEAS9L3.ws                                                                    _ □ ✕
File  Edit  View  Communication  Actions  Window  Help
 ▣ ▣▣  ▣▣  ▣▣  ▣  ▣▣  ▣▣  ▣  ▣✦

                    Display LAN Adapter Configure On Dasd
                                                    System:    MCEAS9L3


     Adapter type  . . . . . . . :    181C
     Adapter serial number . . . :    YL1227221036

     Internet address  . . . . . :    9.155.34.198
     Primary router address  . . :    9.155.34.129
     Secondary router address  . :    0.0.0.0
     Subnet mask . . . . . . . . :    255.255.255.128
     Host name for service tools :    MCEAS9V3
     Node  . . . . . . . . . . . :    000000000000
     Duplex  . . . . . . . . . . :    AUTO
     Network speed . . . . . . . :    AUTO
     Ethernet standard . . . . . :    ETHV2




     F3=Exit           F12=Cancel

 MA    c                                                                      01/001
 ⟐ I902 - Session successfully started
```

8.6   Tips and Techniques:

- It is preferred that the user 'un-tag' or 'de-select' the alternate restart device on the client system before starting the install. This tip is for the cases where normally the alternate restart device is a tape or optical device, so you don't want those devices to be the alternate restart device (load source) which would override the network optical.
- The Network Optical Device is the Primary device when using STRNETINS
- The STRNETINS command issues an ENDSBS *ALL *IMMED and then issues the PWRDWNSYS *IMMED RESTART(*YES) IPLSRC(D) after you confirm the power down.
- Prior to beginning an upgrade, perform the following 2 steps to ensure the setup steps have been done correctly:

1-- From the client type in "WRKIMGCLGE *DEV < virtual_device_name >". This should display the "Work with Image Catalog Entries" panel showing a catalog of type *RMTCLG and showing all the volumes. If all the volumes are displayed, this means the prep work on the server consisting of ensuring NFS servers were running, exporting the correct directory, and proper authorizations of the catalog directory contents.

Note: If you are using the HMC command chsysstate instead of the IBM i command STRNETINS, then you will need to create < virtual_device_name > on the client (If it is up and running) or from another IBM i system if the client you are installing is de-activated.

2-- From a PC or aix or any other box that supports TFTP commands (IBM® i does not), enter in the following:

tftp <server_name> get /catalog_directory/bootp/netipl

If you see a message similar to "Transfer successful: 512 bytes in 1 second, 512 bytes/s", then the prep work of ensuring the ALTSRCDIR on the CHGTFTPA command was set properly, that the TFTP server was ended and restarted, and that the catalog contents for user QTFTP are properly authorized were done correctly.

When running the tftp when ALTSRCDIR was not set properly you'll see an error similar to the following:

   Error on server : Inaccessible path specified: /catalog_directory/bootp/netipl

When running the tftp without the proper authorizations set you'll see an error similar to the following:

   Error on server : Read access to /catalog_dir/bootp/netipl denied

When both of these work, the server has been prepped properly which more often than not will lead to a successful install.

8.7   *Problem Determination*

- If there's no volume mounted after the vary on of the virtual device, there should be an OPTxxxx message in the joblog showing the reason why. If for some reason there is no message, the use of HSM (Hardware service manager) may be useful. Instructions on how to do that:
  - Determine the resource name. You can do this while working with your device description for your network device and displaying the details. The resource name is one of those details.
  - Use SST or DST to bring up HSM (Hardware service manager). That will be option 7 from the Start a Service Tool panel
  - Take option 3 (Locate resource by resource name) from HSM panel

- Type in the resource name and press enter
- On the Logical Hardware Resources panel, take option 7 (Verify)
- You will see a panel called Removable Media Hardware Verification panel which has information on the device. One of those fields is called "Last non-0 NFS RC". For example, a 3409 may be there. Pressing F1 on that panel gives help text on what everything means.
- Do a DSPMSGD CPExxxx, where xxxx is that Last non-0 rc from the previous panel. (This will be done at a command line, not from DST/SST). For example, the 3409 would be an operation timeout.

The main reasons wrkimgclge fail are almost always setup issues with either no VOLUME_LIST in the image catalog directory, not authorizing the objects in the image catalog directory properly, NFS is not up and running correctly (with the exported path) on the server, or the clients service Lan adapter is not activated.

To check and see if NFS is up and running properly, do the following:

WRKACTJOB SBS(QSYSWRK) JOB(QNFS*)

If you see the following active, all is good:
QNFSMNTD QUSER BCH .0 SELW <=== *Mnt
QNFSNFSD QUSER BCH .0 TIMW <=== *SRV
QNFSNFSD QUSER BCH .0 DEQW <=== *SRV
QNFSRPCD QUSER BCH .0 SELW <=== *RPC

To verify the image catalog directory has been exported, do the following:
CALL QZNFRTVE and then press F10 to see messages.
CPIB41A - /catalog_directory currently exported. should be there

- Install failures with a B200 XXXX SRC indicate some kind of network related issue. Here are couple of issues that have been seen in the past that could be a cause.
  - o TFTP issues. Ensure all setup instructions regarding TFTP have been done.
  - o Based on hardware and configuration of your network card, the network speed may need to be changed from Auto to 100 when configuring the Lan Service Adapter.

8.8   Knowledge Center References:

All Knowledge Center references below are for IBM® i 7.4 documentation. The Knowledge Center makes it easy to switch to any other supported release by just clicking the down arrow next to the topic heading and selecting the release you want to work with.

• Installing, upgrading, or deleting IBM® i and related software link:

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzahc/rzahc1.htm

• Upgrading or replacing software using automatic installation link:

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzahc/autoins.htm

• Upgrading or replacing software using manual installation link:

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzahc/manual.htm

• Installing IBM® i and related software on a new system or logical partition:

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzahc/rzahcinstall.htm

• Distributing Software:

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzai4/rzai4distsw.htm

• Storage Solutions:

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzam4/rzam4overview.htm

• For more information about configuring the Service Tools Server refer to Knowledge Center Configuring the service tools server for DST

• For more information about NFS refer to PDF SC41-5714 i5/OS Network File System Support PDF

• For more information about the CHGNFSEXP command refer to Knowledge Center [CHGNFSEXP](#) command.

8.9 Ethernet adapter requirements and restrictions

8.9.1 Supported adapter port

Install is only supported on port 0 of native IBM® i adapters and virtual adapters. Virtual adapters could be a different port and appear as port 0 on the client.

8.9.2 Unsupported configurations

The following Ethernet IOA adapter CCINs are not supported:
- 2743
- 2760
- 5700
- 5701
- 573A
- 576A

8.9.3 Restrictions when using FC 5260 or FC 5899 CCIN 576F 4-port 1Gb Ethernet adapters

Network Install of IBM→ i 6.1 and IBM i→ 7.1 on POWER7 servers with FC 5260 or FC 5899 (CCIN 576F) 4-port 1Gb Ethernet adapters when operating in a 10/100Mb will result in failure to successfully install. Typical error codes are B2004158, B2003110, or B2006110.

NOTE: This symptom is for Network installs only and does not affect runtime function.

If possible, select a Network Install environment that operates at 1Gb ethernet speeds, If not available a 1Gb ethernet switch must be installed between the adapter and the
10/100Mb Ethernet switch. Other alternatives include:

1. Utilize DVD media to install OS image
2. If applicable, use a virtual ethernet adapter to partition OS images
3. Utilize a different ethernet adapter feature that Network install at 10/100Mb speeds

4. Update the adapter firmware per these PTF's or supersedes:
   a) IBM→ i 6.1.1 = MF57484
   b) IBM→ i 7.1 = MF55729, MF55400
   Note: You need to follow the adapter firmware update direction in the cover letter for MF57484 or MF55729.

8.9.4   IBM→ i network install using firmware level AL770_xxx using FCs 5899 or 5260 (CCIN of 576F) Ethernet adapters

Network Install of IBM→ i 6.1 and IBM→ i 7.1 on 8202-E4D, 8205-E6D, 8231-E1D, and 8231-E2D systems using the Feature Code (FC) #5899 or FC #5260 LAN adapters (CCIN 576F) may fail with an error code of B2006110.

NOTE: This symptom is for Network installs only and does not affect runtime function.

Alternatives include:
1. Utilize DVD media to install OS image
2. If applicable, use a virtual ethernet adapter to install partition OS images
3. Utilize a different ethernet adapter feature that supports Network install, such   as FC 5767 (UTP) or FC 5274 (FRU 46K6602) 5768 (Fiber)
4. When another IBM→ i partition is available, update the adapter firmware per these PTF's or supercedes:
   a) IBM→ i 6.1.1 = MF57484
   b) IBM→ I 7.1 = MF56683
   Note: You need to follow the adapter firmware update directions in the cover letters or you can refer to retain tip H207693.

8.10   Questions, Comments, and Feedback

If you have technical questions, comments, corrections, or other feedback related to this document please contact Brian Dassow (bjdassow@us.ibm.com) who is a part of the IBM® i Install and Virtual Media Development team.

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