May 4th 2017

Migrating your NIM Master to AIX 7.2 using the VIOS VML

On more than one occasion I've written articles and blogs on how to migrate AIX systems to a new version of the AIX operating system. You can find a list these articles (and others) here. Each of the NIM articles focuses on migrating AIX systems (which are configured as NIM clients). The approach is always the same; use a NIM master to migrate the NIM clients to the next release of AIX. What they don't discuss is how to migrate your NIM master to a new version of the OS. This is the very first step you should take before you consider migrating your clients. The NIM master should always be at the same or higher AIX level than the level you are migrating to on a client. So, in this latest article, I'll discuss, step by step, how to migrate your NIM master from AIX 7.1 to AIX 7.2 (the latest release of the AIX OS).

Using the Virtual Media Library (VML) on your Virtual I/O Server (VIOS), you can easily migrate your NIM master to AIX 7.2 (or any new release of AIX for that matter). If you're not familiar with the VIOS VML, please review the following documents:

How to configure a VIOS Media Repository/Virtual Media Library
http://www-01.ibm.com/support/docview.wss?uid=isg3T1013047

AIX Migration with File-Backed VIOS Devices.
http://gibsonnet.net/aix/AIX_Migration_with_File-Backed_VIOS_Devices.htm

Creating a bootable ISO image from mksysb images and installing it via VIOS File-Backed Devices.
http://gibsonnet.net/aix/bootable_iso_vios.htm

In the example that follows, we will migrate a NIM master from AIX 7.1 TL4 SP3 to AIX 7.2 TL1 SP1. Then we'll create the necessary NIM resources required to serve AIX 7.2 to our NIM clients.

The first step requires that you download the latest AIX 7.2 ISO images from the IBM Entitled Software Support (ESS) website (http://www-304.ibm.com/servers/eserver/ess/index.wss).

01.02.00	hide/show	☐	**2313: Base install AIX 7.2 (2313) v01.02.00,ENU,DVD**	6079
		☐	**tar.gz Download README**	1
		☐	**ISO, AIX v7.2 Base Install DVD 1 TL ...**	1910
		☐	**ISO, AIX v7.2 Base Install DVD 2 TL ...**	4168

Once the images have been successfully downloaded, copy them to the VML (/var/vio/VMLibrary) on one of your VIOS. If you haven't created the VML yet, do so now (before copying the images), using the **mkrep** command on the VIOS (refer to the articles referenced above for information on creating a VML).

```
$ ls -ltr /var/vio/VMLibrary
total 31777416
-r--r--r--    1 root     system   3378020352 Jan 18 21:10 AIX_v7.2_DVD_1.iso
-r--r--r--    1 root     system   4168876032 Jan 18 21:56 AIX_v7.2_DVD_2.iso

$ lsrep
Size(mb) Free(mb) Parent Pool         Parent Size      Parent Free
   25497     9979 rootvg                   279552           132096

Name                                                  File Size Optical
Access
AIX_v7.2_DVD_1.iso                                         3222 None            ro
AIX_v7.2_DVD_2.iso                                         3976 None            ro
```

With the AIX 7.2 ISO images now in place, we can now create a new virtual optical device and assign it to the NIM master logical partition (LPAR). In this example, the NIM master (nimmast) is hosted by the VIOS named vio1 and is mapped to the vhost4 adapter (as shown in the **kdb** output below). The **mkvdev –fbo** command on the VIOS is used to create the virtual optical device (vtopt4) and it is assigned to vhost4.

```
[root@nimmast]/ # echo cvai | kdb -script | grep vio
vscsi0     0x000007 0x0000000000 0x0               vio1->vhost4

$ hostname
vio1

$ mkvdev -fbo -vadapter vhost4
vtopt4 Available

$ lsmap -vadapter vhost4 | grep -p vtop
VTD                   vtopt4
Status                Available
LUN                   0x8100000000000000
Backing device
Physloc
Mirrored              N/A
```

Now we can load the first AIX 7.2 ISO image into the vtopt4 device on the VIOS.

```
$ loadopt -vtd vtopt4 -disk AIX_v7.2_DVD_1.iso
$ lsmap -vadapter vhost4 | grep -p vtop
VTD                   vtopt4
Status                Available
LUN                   0x8100000000000000
Backing device        /var/vio/VMLibrary/AIX_v7.2_DVD_1.iso
Physloc
Mirrored              N/A
```

From the NIM master LPAR, we now find a new cd0 device is available. You can verify that the cdrom device is working by simply mounting the /cdrom file system and viewing the contents of the AIX 7.2 installation media.

```
[root@nimmast]/ # lsdev -Cc cdrom
cd0 Available  Virtual SCSI Optical Served by VIO Server

[root@nimmast]/ # crfs -v cdrfs -p ro -d cd0  -m /cdrom  -Ano
[root@nimmast]/ # mount /cdrom
[root@nimmast]/ # cd /cdrom
[root@nimmast]/cdrom # ls -ltr
total 84
drwxr-xr-x    3 4000     4000           2048 Oct 10 2016  root
drwxr-xr-x    3 4000     4000           2048 Oct 10 2016  ppc
-rw-r--r--    1 4000     4000            901 Oct 10 2016  README.aix
drwxr-xr-x    2 4000     4000           2048 Oct 10 2016  7200-01
-rw-r--r--    1 4000     4000          15189 Oct 10 2016  image.data
-rw-r--r--    1 4000     4000           6442 Oct 10 2016  bosinst.data
-rw-r--r--    1 4000     4000             16 Oct 10 2016  OSLEVEL
drwxrwxr-x    4 4000     4000           2048 Oct 10 2016  RPMS
drwxr-xr-x   10 4000     4000           2048 Oct 10 2016  usr
drwxr-xr-x    4 4000     4000           2048 Oct 10 2016  installp
-rw-rw-r--    1 4000     4000             42 Oct 10 2016  .Version
[root@nimmast]/cdrom # cat OSLEVEL
OSLEVEL=7.2.0.0
```

Before you migrate your NIM master to AIX 7.2 you should first review the AIX 7.2 release notes and ensure that you have met all the prerequisites. For example, you should always ensure you have enough free disk space (PPs) in the root volume group. You can check this using the **lsvg** command (see below). Refer to the release notes for specific space (and other) requirements, before proceeding.

```
[root@nimmast]/ # lsvg rootvg
VOLUME GROUP:       rootvg                   VG IDENTIFIER:
00f603cd00004c000000013342a0f420
VG STATE:           active                   PP SIZE:         32 megabyte(s)
VG PERMISSION:      read/write               TOTAL PPs:       639 (20448 megabytes)
MAX LVs:            256                      FREE PPs:        58 (1856 megabytes)
LVs:                13                       USED PPs:        581 (18592 megabytes)
OPEN LVs:           12                       QUORUM:          2 (Enabled)
TOTAL PVs:          1                        VG DESCRIPTORS:  2
STALE PVs:          0                        STALE PPs:       0
ACTIVE PVs:         1                        AUTO ON:         yes
MAX PPs per VG:     32512
MAX PPs per PV:     1016                     MAX PVs:         32
LTG size (Dynamic): 256 kilobyte(s)          AUTO SYNC:       no
HOT SPARE:          no                       BB POLICY:       relocatable
PV RESTRICTION:     none                     INFINITE RETRY:  no
DISK BLOCK SIZE:    512                      CRITICAL VG:     no
FS SYNC OPTION:     no
```

The following technote from IBM provides some excellent advice in preparing for an AIX migration. I recommend reading it.

Preparing to Migrate in AIX
http://www-01.ibm.com/support/docview.wss?uid=isg3T1011431

And, from one of my older articles on the topic, I mention a couple of other things to consider.

https://www.ibm.com/developerworks/aix/library/au-migrate_nimadm/

- *I always take a copy of the /etc/sendmail.cf and /etc/motd files before an AIX migration. These files will be replaced during the migration and you will need to edit them again and add your modifications.*

- *Commit any applied filesets. You should also consider removing any ifixes that may hinder the migration.*

- *Prior to a migration, it is always a good idea to run the pre_migration script on the system to catch any issues that may prevent the migration from completing successfully. You can find this script on the AIX 6.1 installation media.*

- *Run this script, review the output (in /home/pre_migration), and correct any issues that it reports before migrating.*

It's always a good idea to take a backup of your system before you perform an AIX migration. I recommend you take a mksysb of your NIM master to another system (over NFS). I also highly recommend that you create an alternate (clone) disk image of the system before you start. This will allow you to back out from the migration, to the previous release of AIX, very easily. So, if the migration to AIX 7.2 was to fail, you could very quickly, reboot back into AIX 7.1.

You can create a clone of your rootvg using the **alt_disk_copy** command. In this example, I first ensure that the clone disk (hdisk3) is large enough to cater for a complete copy of my existing rootvg. I then execute the **alt_disk_copy** command with the **–B** flag. I used this flag specifically so that the bootlist is not changed, as I don't want to boot on the cloned disk (it will only be used if the migration were to fail).

```
[root@nimmast]/ # lspv
hdisk0          00f603cd42a0f354                    rootvg          active
hdisk1          00f603cd42eb8514                    nimvg           active
hdisk2          000cd7927edb991e                    nimvg           active
hdisk3          none                                None

[root@nimmast]/ # getconf DISK_SIZE /dev/hdisk3
51200

[root@nimmast]/ # alt_disk_copy -Bd hdisk3
Calling mkszfile to create new /image.data file.
Checking disk sizes.
Creating cloned rootvg volume group and associated logical volumes.
Creating logical volume alt_fixelv.
Creating logical volume alt_hd6.
Creating logical volume alt_hd8.
Creating logical volume alt_hd3.
Creating logical volume alt_hd1.
Creating logical volume alt_hd11admin.
Creating logical volume alt_lg_dumplv.
Creating logical volume alt_livedump.
Creating logical volume alt_bos_hd5.
Creating logical volume alt_bos_hd4.
Creating logical volume alt_bos_hd2.
Creating logical volume alt_bos_hd9var.
Creating logical volume alt_bos_hd10opt.
Creating /alt_inst/ file system.
Creating /alt_inst/admin file system.
```

```
Creating /alt_inst/fixes file system.
Creating /alt_inst/home file system.
Creating /alt_inst/opt file system.
Creating /alt_inst/tmp file system.
Creating /alt_inst/usr file system.
Creating /alt_inst/var file system.
Creating /alt_inst/var/adm/ras/livedump file system.
Generating a list of files
for backup and restore into the alternate file system...
Backing-up the rootvg files and restoring them to the alternate file system...
Modifying ODM on cloned disk.
Building boot image on cloned disk.
forced unmount of /alt_inst/var/adm/ras/livedump
forced unmount of /alt_inst/var/adm/ras/livedump
forced unmount of /alt_inst/var
forced unmount of /alt_inst/var
forced unmount of /alt_inst/usr
forced unmount of /alt_inst/usr
forced unmount of /alt_inst/tmp
forced unmount of /alt_inst/tmp
forced unmount of /alt_inst/opt
forced unmount of /alt_inst/opt
forced unmount of /alt_inst/home
forced unmount of /alt_inst/home
forced unmount of /alt_inst/fixes
forced unmount of /alt_inst/fixes
forced unmount of /alt_inst/admin
forced unmount of /alt_inst/admin
forced unmount of /alt_inst
forced unmount of /alt_inst
Changing logical volume names in volume group descriptor area.
Fixing LV control blocks...
Fixing file system superblocks...
```

The cloned rootvg is automatically named altinst_rootvg.

```
[root@nimmast]/ # lspv
hdisk0          00f603cd42a0f354                    rootvg          active
hdisk1          00f603cd42eb8514                    nimvg           active
hdisk2          000cd7927edb991e                    nimvg           active
hdisk3          00f603cdd683f13f                    altinst_rootvg
```

Note: If your NIM master and/or clients use the SDDPCM multi-pathing disk driver (with IBM SVC or other IBM disk), please don't forget that you'll need to update the SDDPCM fileset to correct version for AIX 7.2. The devices.sddpcm.**71**.rte fileset will need to be **removed** and devices.sddpcm.**72**.rte **installed**. IBM support have scripts to assist with this process when performing conventional migrations (i.e. from media and/or the VML) and with NIM/nimadm. You can obtain these scripts by opening a PMR with IBM support. There are several different scripts, depending on the type of migration you are performing. For example, if you are performing a conventional migration (just as we are in this article) then you can request the *"Procedures for migrating SDDPCM before AIX Operating Systems migration or Virtual I/O Server migration*" scripts (two scripts: migratePCMbeforeOSmigrate.sh and restorelvm.sh). If you are migrating a NIM client, using **nimadm**, then should request the *"Migrate SDDPCM along with the nimadm method of AIX OS migration via NIM for SAN boot or Non-SAN boot client"* scripts (four scripts: preSDDPCMOSmigration.sh, postSDDPCMOSmigration.sh, savelvm.sh and restorelvm.sh).

We're almost ready to start our migration but first we should take a backup of our NIM database, just in case something was to go wrong during the migration (very unlikely, better to be safe than sorry!). Copy the database backup file to another system other than the NIM master, just in case.

```
[root@nimmast]/ # smit nim_backup_db

   Backup the NIM Database

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

                                                      [Entry Fields]
* Filename/Device for the Backup
[/data/nimmast.nim.db.backup.Jan_27_2017] +


COMMAND STATUS

Command: OK            stdout: yes           stderr: no

Before command completion, additional instructions may appear below.

a ./etc/objrepos/nim_attr 48 blocks
a ./etc/objrepos/nim_attr.vc 80 blocks
a ./etc/objrepos/nim_object 8 blocks
a ./etc/objrepos/nim_object.vc 16 blocks
a ./etc/NIM.level 1 blocks
a ./etc/niminfo 1 blocks
a ./etc/NIM.primary.cpuid 1 blocks

[root@nimmast]/ # ls -ltr /data/nimmast*
-rw-r--r--    1 root     system        92160 Jan 27 14:08 nimmast.nim.db.backup.Jan_27_2017
```

The next step is reboot the NIM master from the virtual CD device. To achieve this, I first connect the Hardware Management Console (HMC) and open a console window on the NIM master LPAR. It is from here that I will reboot the LPAR and perform the migration.

```
hscroot@hmc1:~> source ezh
hscroot@hmc1:~> lparconsole nimmast

root@nimmast]/ # shutdown -Fr
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
```

- Select 'SMS Menu' (1).

```
          1 = SMS Menu                          5 = Default Boot List
          8 = Open Firmware Prompt              6 = Stored Boot List


     Memory      Keyboard     Network     SCSI     Speaker
```

- Enter the ‘Select Boot Options’ menu (5).

```
 PowerPC Firmware
 Version AL730_152
 SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
-------------------------------------------------------------------------------
 Main Menu
 1.   Select Language
 2.   Setup Remote IPL (Initial Program Load)
 3.   Change SCSI Settings
 4.   Select Console
 5.   Select Boot Options

-------------------------------------------------------------------------------
 Navigation Keys:

                                          X = eXit System Management Services
 -------------------------------------------------------------------------------
 Type menu item number and press Enter or select Navigation key:5
```

- Enter the ‘Select Install/Boot Devices’ menu (1).

```
  PowerPC Firmware
  Version AL730_152
  SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
 -------------------------------------------------------------------------------
  Multiboot
  1.   Select Install/Boot Device
  2.   Configure Boot Device Order
  3.   Multiboot Startup <OFF>
  4.   SAN Zoning Support

  -------------------------------------------------------------------------------
  Navigation keys:
  M = return to Main Menu
  ESC key = return to previous screen         X = eXit System Management Services
  -------------------------------------------------------------------------------
  Type menu item number and press Enter or select Navigation key:1
```

- Enter the ‘CD/DVD’ menu (3).

```
  PowerPC Firmware
   Version AL730_152
   SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
  -------------------------------------------------------------------------------
   Select Device Type
   1.   Diskette
   2.   Tape
   3.   CD/DVD
   4.   IDE
   5.   Hard Drive
   6.   Network
   7.   List all Devices

   -------------------------------------------------------------------------------
   Navigation keys:
   M = return to Main Menu
   ESC key = return to previous screen         X = eXit System Management Services
   -------------------------------------------------------------------------------
   Type menu item number and press Enter or select Navigation key:3
```

- Enter the ‘List All Devices’ menu (9).

```
PowerPC Firmware
Version AL730_152
SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
-------------------------------------------------------------------------------
Select Media Type
1.   SCSI
2.   SSA
3.   SAN
4.   SAS
5.   SATA
6.   USB
7.   IDE
8.   ISA
9.   List All Devices

-------------------------------------------------------------------------------
Navigation keys:
M = return to Main Menu
ESC key = return to previous screen         X = eXit System Management Services
-------------------------------------------------------------------------------
Type menu item number and press Enter or select Navigation key:9
```

- Select the ‘SCSI CD-ROM’ device.

```
PowerPC Firmware
Version AL730_152
SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
-------------------------------------------------------------------------------
Select Device
Device  Current  Device
Number  Position  Name
1.        -      Interpartition Logical LAN
                ( loc=U8233.E8B.1003CDP-V6-C10-T1 )
2.        1      SCSI 49 GB Harddisk, part=2 (AIX 7.1.0)
                ( loc=U8233.E8B.1003CDP-V6-C24-T1-L8500000000000000 )
3.        -      SCSI CD-ROM
                ( loc=U8233.E8B.1003CDP-V6-C24-T1-L8100000000000000 )
4.        -      SCSI 19 GB Harddisk, part=4 (AIX 7.1.0)
                ( loc=U8233.E8B.1003CDP-V6-C24-T1-L8200000000000000 )

-------------------------------------------------------------------------------
Navigation keys:
M = return to Main Menu
ESC key = return to previous screen         X = eXit System Management Services
-------------------------------------------------------------------------------
Type menu item number and press Enter or select Navigation key:3
```

- Select ‘Normal Mode Boot’ (2).

```
PowerPC Firmware
Version AL730_152
SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
-------------------------------------------------------------------------------
Select Task

SCSI CD-ROM
( loc=U8233.E8B.1003CDP-V6-C24-T1-L8100000000000000 )

1.   Information
2.   Normal Mode Boot
3.   Service Mode Boot

-------------------------------------------------------------------------------
Navigation keys:
M = return to Main Menu
ESC key = return to previous screen         X = eXit System Management Services
-------------------------------------------------------------------------------
Type menu item number and press Enter or select Navigation key:2
```

- Select ‘Yes’ (1).

```
PowerPC Firmware
Version AL730_152
SMS 1.7 (c) Copyright IBM Corp. 2000,2008 All rights reserved.
-------------------------------------------------------------------------------
Are you sure you want to exit System Management Services?
1.   Yes
2.   No

-------------------------------------------------------------------------------
Navigation Keys:

                                                        X = eXit System Management Services
-------------------------------------------------------------------------------
Type menu item number and press Enter or select Navigation key:1

-------------------------------------------------------------------------------------------
                                    Welcome to AIX.
                             boot image timestamp: 17:05:09 10/10/2016
                           The current time and date: 14:21:06 01/27/2017
                  processor count: 2;  memory size: 4096MB;  kernel size: 38215580
          boot device: /vdevice/v-scsi@30000018/disk@8100000000000000:\ppc\chrp\bootfile.exe
                                 kernel debugger setting: enabled
-------------------------------------------------------------------------------------------



AIX Version 7.2
Starting NODE#000 physical CPU#001 as logical CPU#001... done.
Starting NODE#000 physical CPU#002 as logical CPU#002... done.
Starting NODE#000 physical CPU#003 as logical CPU#003... done.
Starting NODE#000 physical CPU#004 as logical CPU#004... done.
Starting NODE#000 physical CPU#005 as logical CPU#005... done.
Starting NODE#000 physical CPU#006 as logical CPU#006... done.
Starting NODE#000 physical CPU#007 as logical CPU#007... done.
```

- Enter ‘1’.

```
******* Please define the System Console. *******

Type a 1 and press Enter to use this terminal as the
system console.
Pour definir ce terminal comme console systeme, appuyez
sur 1 puis sur Entree.
Taste 1 und anschliessend die Eingabetaste druecken, um
diese Datenstation als Systemkonsole zu verwenden.
Premere il tasto 1 ed Invio per usare questo terminal
come console.
Escriba 1 y pulse Intro para utilizar esta terminal como
consola del sistema.
Escriviu 1 1 i premeu Intro per utilitzar aquest
terminal com a consola del sistema.
Digite um 1 e pressione Enter para utilizar este terminal
como console do sistema.
```

- Enter ‘1’.

```
>>>  1 Type 1 and press Enter to have English during install.
     2 Entreu 2 i premeu Intro per veure la instal·lació en català.
     3 Entrez 3 pour effectuer l'installation en français.
     4 Für Installation in deutscher Sprache 4 eingebenund die Eingabetaste drücken.
     5 Immettere 5 e premere Invio per l'installazione in Italiano.
     6 Digite 6 e pressione Enter para usar Português na instalação.
     7 Escriba 7 y pulse Intro para la instalación en español.

88  Help ?

           >>> Choice [1]: 1
```

- Enter ‘Change/Show Installation Settings and Install’ menu (2).

```
                        Welcome to Base Operating System
                        Installation and Maintenance

Type the number of your choice and press Enter.  Choice is indicated by >>>.

    1 Start Install Now with Default Settings

>>> 2 Change/Show Installation Settings and Install

    3 Start Maintenance Mode for System Recovery

    4 Make Additional Disks Available

    5 Select Storage Adapters


    88  Help ?
    99  Previous Menu

>>> Choice [1]: 2
```

- Enter ‘System Settings’ menu (1).

```
                             Installation and Settings

Either type 0 and press Enter to install with current settings, or type the
number of the setting you want to change and press Enter.

    1  System Settings:
         Method of Installation.............Migration
         Disk Where You Want to Install.....hdisk0

    2  Primary Language Environment Settings (AFTER Install):
         Cultural Convention................English (United States)
         Language ..........................English (United States)
         Keyboard ..........................English (United States)
         Keyboard Type......................Default
    3  Security Model.......................Default
    4  More Options  (Software install options)
    5  Select Edition.......................standard
>>> 0  Install with the current settings listed above.

                       +-----------------------------------------------------
    88  Help ?         |    WARNING: Base Operating System Installation will
    99  Previous Menu  |    destroy or impair recovery of SOME data on the
                       |    destination disk hdisk0.
>>> Choice [0]:1
```

- Enter ‘Migration Install’ menu (3).

```
                                Change Method of Installation

            Type the number of the installation method and press Enter.

              1 New and Complete Overwrite
                Overwrites EVERYTHING on the disk selected for installation.
                Warning: Only use this method if the disk is totally empty or if there
                is nothing on the disk you want to preserve.

              2 Preservation Install
                Preserves SOME of the existing data on the disk selected for
                installation.  Warning: This method overwrites the usr (/usr),
                variable (/var), temporary (/tmp), and root (/) file systems.  Other
                product (applications) files and configuration data will be destroyed.

            >>> 3 Migration Install
                Upgrades the Base Operating System to the current release.
                Other product (applications) files and configuration data are saved.


                88  Help ?
                99  Previous Menu

            >>> Choice [3]: 3
```

Ensure the correct disks are shown. Both disks show as AIX 7.1. However, hdisk0 is the disk we wish to migrate to AIX 7.2. While hdisk3 is our cloned rootvg that we could use for back-out/recovery purposes if required.

```
                            Change Disks Where You Want to Install

            Type the number for the disks to be used for installation and press Enter.

                   Level    Disks In Rootvg       Location Code      Size(MB)

                 1 7.1      hdisk0                          none    20480
                 2 7.1      hdisk3                          none    51200


                77  Display More Disk Information
                88  Help ?
                99  Previous Menu

            >>> Choice []: 2
```

Entering 77 repeatedly will show you additional details for the disks. You can use this information to make sure the correct disk is targeted for migration. Enter 99 to go back to the main menu.

```
            >>> Choice [2]: 77

                            Change Disks Where You Want to Install

            Type the number for the disks to be used for installation and press Enter.

                   Level  Rootvg   Physical Volume Identifier
                          Disks
            >>>  1 7.1    hdisk0    00f603cd42a0f354
                 2 7.1    hdisk3    00f603cdd683f13f


                        Change Disks Where You Want to Install

Type the number for the disks to be used for installation and press Enter.

       Level  Rootvg   Device Adapter Connection Location
              Disks    or Physical Location Code
>>>  1 7.1   hdisk0    U8233.E8B.1003CDP-V6-C24-T1-L8200000000000000
     2 7.1   hdisk3    U8233.E8B.1003CDP-V6-C24-T1-L8500000000000000
```

At the main BOS menu, ensure that **Migration** is displayed for the 'Method of Installation'. **Important:** If you select anything other than Migration, you will overwrite your system either partially or completely! Press ENTER to continue with the migration.

```
                              Installation and Settings

       Either type 0 and press Enter to install with current settings, or type the
       number of the setting you want to change and press Enter.

           1  System Settings:
                Method of Installation.............Migration
                Disk Where You Want to Install.....hdisk0

           2  Primary Language Environment Settings (AFTER Install):
                Cultural Convention................English (United States)
                Language ..........................English (United States)
                Keyboard ..........................English (United States)
                Keyboard Type......................Default
           3  Security Model.....................Default
           4  More Options  (Software install options)
           5  Select Edition.....................standard
       >>> 0  Install with the current settings listed above.

                                +-----------------------------------------------------
           88  Help ?           |    WARNING: Base Operating System Installation will
           99  Previous Menu    |    destroy or impair recovery of SOME data on the
                                |    destination disk hdisk0.
       >>> Choice [0]: 0


                                   Migration Installation Summary

       Disks:  hdisk0
       Cultural Convention:  en_US
       Language:  en_US
       Keyboard:  en_US
       Import User Volume Groups:  Yes
       Enable System Backups to install any system:  Yes
       Remove Java Version 5 Software:  Yes
       Selected Edition:  enterprise

       >>> 1   Continue with Install
                                +-----------------------------------------------------
           88  Help ?           |    WARNING: Base Operating System Installation will
           99  Previous Menu    |    destroy or impair recovery of SOME data on the
                                |    destination disk hdisk3.
       >>> Choice [1]:


       Migration menu preparation in progress.
               Approximate     Elapsed time
            % tasks complete   (in minutes)


                     0              0

     % tasks complete   (in minutes)


          3              0      Preserving old data.
```

```
                                Migration Confirmation

  Either type 0 and press Enter to continue the installation, or type the
  number of your choice and press Enter.

    1  List the saved Base System configuration files which will not be
       merged into the system.  These files are saved in /tmp/bos.
    2  List the filesets which will be removed and not replaced.
    3  List directories which will have all current contents removed.
    4  Reboot without migrating.

    Acceptance of license agreements is required before using system.
    You will be prompted to accept after the system reboots.

>>> 0  Continue with the migration.
   88  Help ?

+-------------------------------------------------------------------------------
  WARNING: Selected files, directories, and filesets (installable options)
    from the Base System will be removed.  Choose 2 or 3 for more information.


>>> Choice[0]: 0

        Saving system configuration files in /tmp/bos...
Removing obsolete filesets, directories, and files...
                        Installing Base Operating System

        Please wait...


        Approximate     Elapsed time
     % tasks complete   (in minutes)

          4               2      Copying old files.


                        Installing Base Operating System

        Please wait...

        Approximate     Elapsed time
     % tasks complete   (in minutes)

          16              2      Merging.

...
installp: APPLYING software for:
        wio.vscsi 7.2.0.0
Filesets processed:  35 of 708
System Installation Time: 3 minutes       Tasks Complete: 21%

installp: APPLYING software for:
        invscout.msg.en_US.rte 2.1.0.2


. . . . . << Copyright notice for invscout.msg.en_US >> . . . . . .
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Filesets processed:  36 of 708
System Installation Time: 3 minutes       Tasks Complete: 21%

installp: APPLYING software for:
        infocenter.man.JA_JP.commands 7.2.1.0

...
```

You will be prompted to load the second volume of the AIX 7.2 installation media. This can be performed on the VIOS.

```
installp:  APPLYING software for:
        xlfrte.msg.en_US 15.1.2.0

installp:  Please insert volume 2 into device /dev/cd0 and press Enter
           to continue or enter "q" to quit.

;On the VIOS
$ loadopt -f -disk AIX_v7.2_DVD_2.iso -vtd vtopt4
```

Press enter now and the migration will continue.

```
installp:  APPLYING software for:
        infocenter.man.ZH_CN.commands 7.2.1.0


. . . . . << Copyright notice for infocenter.man.ZH_CN.commands >> . . . . . .
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```

When the migration has completed successfully, it will automatically reboot the LPAR, after which you will be able to login to the LPAR and verify it is running AIX 7.2.

```
Rebooting . . .

[root@nimmast]/ # oslevel -s
7200-01-01-1642

[root@nimmast]/ # lspv
hdisk0          00f603cd42a0f354                    rootvg
hdisk1          00f603cd42eb8514                    nimvg           active
hdisk2          000cd7927edb991e                    nimvg           active
hdisk3          00f603cdd683f13f                    altinst_rootvg   active
```

To quickly verify the NIM master and its database are intact, after the migration, run the **lsnim** command to view the NIM configuration. If nothing is returned then something has gone wrong during the migration or you did not perform a Migration Installation.

```
[root@nimmast]/ # lsnim -l master
master:
   class               = machines
   type                = master
   max_nimesis_threads = 20
   if_defined          = chrp.64.ent
   comments            = machine which controls the NIM environment
   validate_cpuid      = no
   ssl_support         = yes
   platform            = chrp
   netboot_kernel      = 64
   if1                 = 10_1_50 nimmast FAFAC3B1FF0B
   cable_type1         = N/A
   Cstate              = ready for a NIM operation
   prev_state          = ready for a NIM operation
   Mstate              = currently running
   serves              = 53gibbo-p8-mksysb
   serves              = 710lpp_res
   serves              = 750lpar9_mksysb710202-1316
   serves              = vio1_mksysb
   serves              = 750wpar2-savewpar-image
   serves              = AIX53TL12SP9_P8
   serves              = AIX71TL3SP3base
   serves              = AIX71TL3SP3baseSPOT
   serves              = aix710202
   serves              = aix710303
   serves              = aix712
   serves              = aix713
   serves              = boot
   serves              = db2blu_mksysb
   serves              = db2blubosinst
   serves              = hxaix44-image-data
```

```
   serves              = hxaix44-mksysb
   serves              = hxaix44-spot
   serves              = nim_script
   serves              = p8wpar1-rootvgWPAR-backup
   serves              = p8wpar2-backup
   serves              = p8wpar2-spec
   serves              = powerHA712
   master_port         = 1058
   registration_port   = 1059
   Cstate_result       = success
   reserved            = yes
```

At this point, your NIM master has been successfully migrated to AIX 7.2.

In order for your NIM master to support the installation and/or migration of AIX 7.2 on your NIM clients, you first need to configure a new Licensed Program Product (LPP) source and Shared Product Object Tree (SPOT) NIM resource.

We'll create a new AIX 7.2 TL1 SP1 LPP source on the master. I've created an empty file system for the new lpp_source resource.

```
[root@nimmast]/export/nim/lpp_source/AIX72TL1SP1 # ls -ltr
total 0
```

Mounting the both the AIX 7.2 ISO images on the master allows me to copy the contents of these images into the new LPP source file system. I've copied the ISO images to a file system on the NIM master in preparation for the resource creation.

```
[root@nimmast]/export/mksysb/cg # mkdir /mnt/v1 /mnt/v2

[root@nimmast]/export/mksysb/cg # loopmount -i AIX_v7.2_Base_Install_DVD_1_of_2_TL_7200-01-
00_112016.iso -o "-V cdrfs -o ro" -m /mnt/v1

[root@nimmast]/export/mksysb/cg # loopmount -i AIX_v7.2_Base_Install_DVD_2_of_2_TL_7200-01-
00_112016.iso -o "-V cdrfs -o ro" -m /mnt/v2

[root@nimmast]/export/mksysb/cg # df -g | grep mnt
/dev/loop0         3.15      0.00  100%  1649161   100% /mnt/v1
/dev/loop1         3.88      0.00  100%  2035313   100% /mnt/v2

root@nimmast]/export/mksysb/cg # ls -ltr /mnt/v1
total 84
drwxr-xr-x    3 4000     4000           2048 Oct 10 14:40 root
drwxr-xr-x    3 4000     4000           2048 Oct 10 14:40 ppc
-rw-r--r--    1 4000     4000            901 Oct 10 14:40 README.aix
drwxr-xr-x    2 4000     4000           2048 Oct 10 14:40 7200-01
-rw-r--r--    1 4000     4000          15189 Oct 10 14:40 image.data
-rw-r--r--    1 4000     4000           6442 Oct 10 14:40 bosinst.data
-rw-r--r--    1 4000     4000             16 Oct 10 14:40 OSLEVEL
drwxrwxr-x    4 4000     4000           2048 Oct 10 14:40 RPMS
drwxr-xr-x   10 4000     4000           2048 Oct 10 14:41 usr
drwxr-xr-x    4 4000     4000           2048 Oct 10 14:41 installp
-rw-rw-r--    1 4000     4000             42 Oct 10 14:41 .Version

[root@nimmast]/export/mksysb/cg # ls -ltr /mnt/v2
total 28
drwxrwxr-x    2 4000     4000           6144 Oct 10 14:42 license
drwxr-xr-x    3 4000     4000           2048 Oct 10 14:42 ismp
drwxrwxr-x    3 4000     4000           2048 Oct 10 14:44 usr
drwxrwxr-x    4 4000     4000           2048 Oct 10 14:44 installp
-rw-rw-r--    1 4000     4000             42 Oct 10 14:44 .Version
```

Using **bffcreate** I can copy the files into the desired location and create the .toc (table of contents) file.

```
# smitty bffcreate

Copy Software to Hard Disk for Future Installation

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

                                                      [Entry Fields]
* INPUT device / directory for software               /mnt/v1
* SOFTWARE package to copy                           [all]          +
* DIRECTORY for storing software package             [/export/nim/lpp_source/AIX72TL1SP1]
  DIRECTORY for temporary storage during copying     []
  EXTEND file systems if space needed?               yes            +
  Process multiple volumes?                          yes            +


Copy Software to Hard Disk for Future Installation

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

                                                      [Entry Fields]
* INPUT device / directory for software               /mnt/v2
* SOFTWARE package to copy                           [all]          +
* DIRECTORY for storing software package             [/export/nim/lpp_source/AIX72TL1SP1]
  DIRECTORY for temporary storage during copying     []
  EXTEND file systems if space needed?               yes            +
  Process multiple volumes?                          yes            +
```

Now I can create the AIX 7.2 lpp_source NIM resource.

```
[root@nimmast]/ # smit nim_mkres

lpp_source       = source device for optional product images

Define a Resource

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

                                                      [Entry Fields]
* Resource Name                                      [AIX72TL1SP1]
* Resource Type                                      lpp_source
* Server of Resource                                 [master] +
* Location of Resource                              [/export/nim/lpp_source/AIX72TL1SP1] /
...

COMMAND STATUS
Command: OK            stdout: yes           stderr: no
Before command completion, additional instructions may appear below.

Preparing to copy install images (this will take several minutes)...

Now checking for missing install images...
All required install images have been found. This lpp_source is now ready.


root@nimmast]/ # lsnim -t lpp_source | grep 72
AIX72TL1SP1              resources       lpp_source

[root@nimmast]/ # lsnim -l AIX72TL1SP1
AIX72TL1SP1:
   class       = resources
   type        = lpp_source
   arch        = power
   Rstate      = ready for use
   prev_state  = unavailable for use
   location    = /export/nim/lpp_source/AIX72TL1SP1
   simages     = yes
   alloc_count = 0
   server      = master
```

```
[root@nimmast]/ # nim -o showres AIX72TL1SP1 | grep bos.mp64
bos.mp64                   7.2.1.0                    I  b usr,root
bos.mp64                   7.2.1.2                    S  b usr,root

[root@nimmast]/ # umount /mnt/v1
[root@nimmast]/ # umount /mnt/v2
```

The AIX 7.2 SPOT resource is created next.

```
[root@nimmast]/ # smit nim_mkres

Define a Resource

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

                                                      [Entry Fields]
* Resource Name                                      [spotAIX72TL1SP1]
* Resource Type                                       spot
* Server of Resource                                 [master] +
  Source of Install Images                           [AIX72TL1SP1] +
* Location of Resource                               [/export/nim/spot] /


[root@nimmast]/ # smit nim_mkres

Restoring files from BOS image.  This may take several minutes ...


 Installing filesets ...

 Be sure to check the output from the SPOT installation
 to verify that all the expected software was successfully
 installed.  You can use the NIM "showlog" operation to
 view the installation log file for the SPOT.
...

[root@nimmast]/ # lsnim -t spot | grep 72
spotAIX72TL1SP1         resources       spot

[root@nimmast]/ # lsnim -l spotAIX72TL1SP1
spotAIX72TL1SP1:
   class         = resources
   type          = spot
   plat_defined  = chrp
   arch          = power
   bos_license   = yes
   Rstate        = ready for use
   prev_state    = verification is being performed
   location      = /export/nim/spot/spotAIX72TL1SP1/usr
   version       = 7
   release       = 2
   mod           = 1
   oslevel_r     = 7200-01
   oslevel_s     = 7200-01-01-1642
   alloc_count   = 0
   server        = master
   if_supported  = chrp.64 ent
   Rstate_result = success

[root@nimmast]/ # nim -o showres spotAIX72TL1SP1 | grep bos.mp64
bos.mp64                   7.2.1.2    A     F    Base Operating System 64-bit
```

If you've followed all the steps above, your NIM master has been migrated successfully to AIX 7.2 and it is ready to serve AIX 7.2 NIM resources to all your existing NIM clients. You can now start planning for the migration of your AIX systems (NIM clients) to AIX 7.2 using the NIM Alternate Disk Migration tool (nimadm).

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