Using an AIX NIM Server to install/Rescue a Linux server

The following document shows how to configure the NIM Server to install Red Hat 7 and 8; Configure the LPAR for net boot and optionally use your lpp source as a repository on the Linux LPAR.

Contents

I use the following variables in the examples below:

client_ip	IP of the Server being installed
client_mac	MAC address of client (without colons)
client_host	Client hostname (in /etc/hosts)
en_name	Name of network adapter
nim_ip:	IP of NIM Server
NIM OS	AIX 720402 + NIM Server code
gateway	Network gateway
net_mask	Network mask

Install Red Hat 7

The following steps describe how to load the Red Hat packages onto the NIM Server (to share via NFS for the install) and to configure bootp.

1. loop mount the Red Hat 7 iso image and extract the contents in a directory of your choice. I put below my NIM lpp_source for consistency.

```
mkdir /export/lpp_source/rhel_7
loopmount -i RHEL-7.3-20161019.0-Server-ppc64le-dvd1.iso -o "-V cdrfs -o ro" -m /mnt
cd /mnt
cp -pr . /export/lpp_source/rhel_7
```

2. Link the /export/lpp_source/rhel_7/boot directory to /boot.

```
ln -s /export/lpp_source/rhel_7/boot /boot
```

3. Create a directory with your Linux distribution under /tftpboot and then copy linux, core.elf and initrd to it (I recommend making /tftpboot a separate file system).

```
mkdir /tftpboot/rhel_7
cp -pr /export/lpp_source/rhel_7/ppc /tftpboot/rhel_7
cp -pr /export/lpp_source/rhel_7/boot/grub/powerpc-ieee1275/core.elf /tftpboot/rhel_7
```

4. Check that you have the following entries in /etc/tftpaccess.ctl.

```
allow:/tftpboot
allow:/boot
```

5. Add following menuentry in /boot/grub.cfg

```
menuentry "Net install Red Hat Enterprise Linux 7.3 (64-bit kernel)" --class fedora --class
```

```
gnu-linux --class gnu --class os {
      linux /tftpboot/rhel_7/ppc/ppc64/vmlinuz ip=[client_ip]::[net_mask]:[client_host]:
[en_name]:none inst.repo=nfs://[nim_ip]:/export/lpp_source/rhel_7 ro
      initrd /tftpboot/rhel_7/ppc/ppc64/initrd.img
}
```

Note	This is a basic configuration example. This can be modified based on specific needs such as adding autoyast and using http protocol instead of nfs.

6. Add the following entry in /etc/exports

```
/export/lpp_source/rhel_7 -vers=3:4,public,sec=sys:krb5p:krb5i:krb5:dh,ro
```

7. Export directory /export/lpp_soursce/rhel_7

```
exportfs -a
```

8. Add the following entry in /etc/bootptab

```
[client_host]:bf=/tftpboot/rhel_7/
core.elf:ip=[client_ip]:ht=ethernet:ha=[client_mac]:sa=[nim_ip]:gw=[client_ip]:sm=[net_mask
]:
```

Now you are ready to boot your LPAR from the NIM Server.

Install Red Hat 8

The following steps describe how to load the Red Hat packages onto the NIM Server (to share via NFS for the install) and to configure bootp.

1. loop mount the red Hat 8.2 iso image and extract the contents in a directory of your choice.

```
mkdir /export/lpp_source/rhel_8
loopmount -i rhel-8.2-ppc64le-dvd.iso -o "-V cdrfs -o ro" -m /mnt
cd /mnt
cp -pr . /export/lpp_source/rhel_8
```

2. Link the /export/lpp_source/rhel_8/boot directory to /boot.

```
ln -s /export/lpp_source/rhel_8/boot /boot
```

3. Create a directory with your Linux distribution under /tftpboot and then copy linux, core.elf and initrd to it (I recommend making /tftpboot a separate file system).

```
mkdir /tftpboot/rhel_8
cp -pr /export/lpp_source/rhel_8/ppc /tftpboot/rhel_8
cp -pr /export/lpp_source/rhel_8/boot/grub/powerpc-ieee1275/core.elf /tftpboot/rhel_8
```

4. Check that you have the following entries in /etc/tftpaccess.ctl.

```
allow:/tftpboot
allow:/boot
```

5. Add following menuentry in /boot/grub.cfg

```
menuentry "Net install Red Hat Enterprise Linux 8.3 (64-bit kernel)" --class fedora --class
gnu-linux --class gnu --class os {
      linux /tftpboot/rhel_8/ppc/ppc64/vmlinuz ip=[client_ip]::[net_mask]:[client_host]:
[en_name]:none inst.repo=nfs::[nim_ip]:/export/lpp_source/rhel_8 ro
      initrd /tftpboot/rhel_8/ppc/ppc64/initrd.img
}
```

Note This is a basic configuration example. This can be modified based on specific needs such as adding autoyast and using http protocol instead of nfs.

6. Add the following entry in /etc/exports

```
/export/lpp_source/rhel_8 -vers=3:4,public,sec=sys:krb5p:krb5i:krb5:dh,ro
```

7. Export directory /export/lpp_soursce/rhel_8

```
exportfs -a
```

8. Add the following entry in /etc/bootptab

```
[client_host]:bf=/tftpboot/rhel_8/
core.elf:ip=[client_ip]:ht=ethernet:ha=[client_mac]:sa=[nim_ip]:gw=[client_ip]:sm=[net_mask
]:
```

Now you are ready to boot your LPAR from the NIM Server.

Configure the LPAR for network boot

To get the LPAR ready to boot from the NIM Sever over the network, you will need to configure the network adapter (IP details) and then boot from the adapter as follows:

```
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
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IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM IBM
          1 = SMS Menu                          5 = Default Boot List
          9 = Restricted Open Firmware Prompt   6 = Stored Boot List

    Memory       Keyboard     Network    Speaker
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
---------------------------------------------------------------------------------
 Main Menu
 1.   Select Language
 2.   Setup Remote IPL (Initial Program Load)
 3.   I/O Device Information
```

```
 4.   Select Console
 5.   Select Boot Options



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

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

Select [2] to setup IPL

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
---------------------------------------------------------------------------------
 NIC Adapters
      Device                         Location Code                   Hardware
                                                                     Address
 1.  Interpartition Logical LAN     U9009.22A.788CF90-V6-C2-T1    fa1a5b853e20
 2.  Interpartition Logical LAN     U9009.22A.788CF90-V6-C2-T2    269dc635066a



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

Select your adapter that is on the NIM Network

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
---------------------------------------------------------------------------------
 Select Internet Protocol Version.
 1.   IPv4 – Address Format 123.321.111.222
 2.   IPv6 – Address Format 1234:5678:90ab:cdef:1234:5678:90ab:cdef


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

I use [1] - IPv4

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
---------------------------------------------------------------------------------
 Select Network Service.
 1.   Bootp
 2.   ISCSI



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

I use [1] - bootp

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
---------------------------------------------------------------------------------
 Network Parameters
Interpartition Logical LAN: U9009.22A.788CF90-V6-C2-T1
 1. IP Parameters
 2. Adapter Configuration
 3. Ping Test
 4. Advanced Setup: BOOTP

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

Setup the IP parameters for your Linux LPAR to communicate with the NIM Server

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
---------------------------------------------------------------------------------
 IP Parameters
Interpartition Logical LAN: U9009.22A.788CF90-V6-C2-T1
 1.  Client IP Address                      [client_ip]
 2.  Server IP Address                      [nim_ip]
 3.  Gateway IP Address                     [gateway]
 4.  Subnet Mask                            [net_mask]



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

When completed, [ESC] to the previous screen and select item [3] – ping test.
Check the correct settings are displayed and press [1] to execute. You should see a success message, if not you will need to check the IP parameter configuration was correct.

```
                           .------------------.
                           |  Ping  Success.  |
                           .------------------.


 Press any key to continue.............
```

[ESC] back to the Main Menu and select item [5] – Boot options

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
--------------------------------------------------------------------------------
 Mulitboot
 1.   Select Install/Boot Device
 2.   Configure Boot Device Order
 3.   Multiboot Starting <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 and press Enter or select Navigation key:
```

Select item [1] – install/boot device

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
--------------------------------------------------------------------------------
 Select Device Type
 1. Tape
 2. CD/DVD
 3. Hard Drive
 4. Network
 5. List all Devices



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

Select item [4] - Network, then item [1] - BOOTP

```
PowerPC Firmware
Version FW940.02 (VL940_041)
SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
-------------------------------------------------------------------------------
Select Device
Device  Current  Device
Number  Position  Name
1.      -         Interpartition Logical LAN
       ( loc=U9009.22A.788CF90-V6-C2-T1 )
2.      -         Interpartition Logical LAN
       ( loc=U9009.22A.788CF90-V6-C2-T2 )




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

Select the adapter you configured above

```
 PowerPC Firmware
 Version FW940.02 (VL940_041)
 SMS(c) Copyright IBM Corp. 2000,2019 All rights reserved.
-------------------------------------------------------------------------------
 Select Task
Interpartition Logical LAN
       ( loc=U9009.22A.788CF90-V6-C2-T1 )

 1.      Information
 2.      Norman 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 and press Enter or select Navigation key:
```

Select item [2] – normal boot mode, and then item [1] - you are sure you want to leave SMS

You will then see packet transfer, and eventually the Red Hat installation Menu.

Using LPP Source as a repository

One advantage of setting up the lpp source on the NIM Server is it can now be used a a repository for your Linux LPAR. I also copy the IBM Linux tools into a directory under the lpp source. For ease of use, I configured the automount daemon to mount the repositories as required.

Entry in /etc/auto.master

```
/ext   /etc/auto.repo
```

Example of /etc/auto.repo

```
rhel_8   -fstype=nfs,rw,soft,vers=3     ibmpc1:/export/lpp_source/rhel_8
```

Example of /etc/yum.repos.d/myrepo.repo.

```
RHEL8.2_Server]
name=RedHat Enterprise Linux Server 8.2
baseurl=file:///ext/rhel_8/BaseOS
enabled=0
gpgcheck=0

[RHEL8_IBM_tools]
name=IBM tools for RedHat Enterprise Linux Server 8
baseurl=file:///ext/rhel_8/ibm_tools
enabled=0
gpgcheck=0
```

I hope this helps, please let me know if you have any questions / suggestions or corrections.

Antony Steel
Belisama