



Installing AIX 5L V5.2 (ML4) on the IBM @server BladeCenter JS20

White Paper

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I. Introduction

This white paper explains how to install AIX 5L™ V5.2 (ML4) onto an IBM @server® BladeCenter™ JS20 using the following install procedures:

- Manual installation from CD-ROM
- NIM Installation Using SMS Menus
- Automatic Installation from Network

It also covers how to install the prerequisite firmware level required to install AIX 5L as well as how to backup the JS20.

Prerequisites

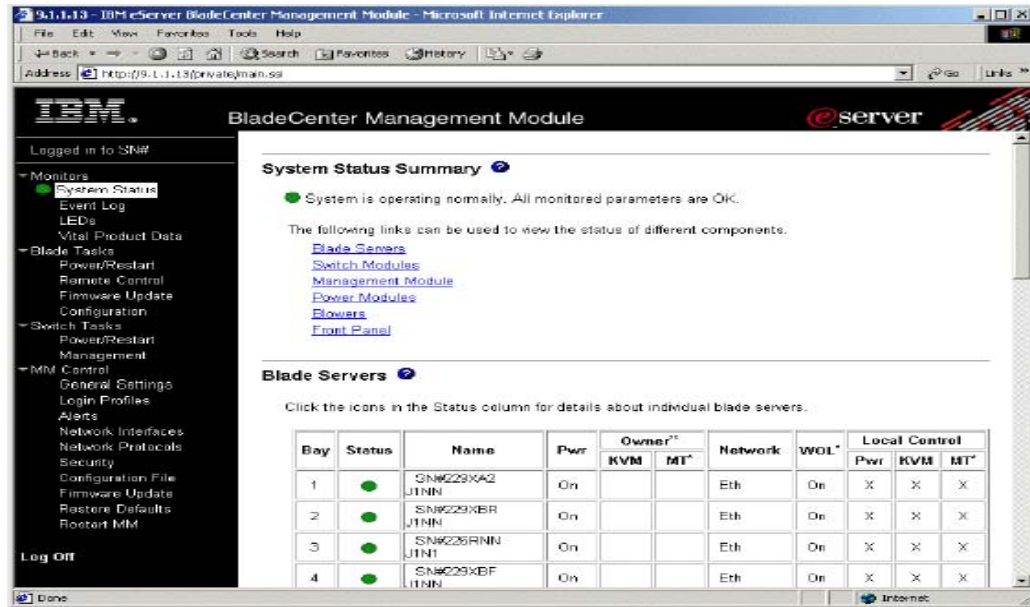
The following prerequisites are necessary to install AIX 5L on the JS20:

- The latest JS20 BladeCenter firmware
- AIX 5L Version 5.2 with the 5200-04 Recommended Maintenance package, or later
- BladeCenter with at least 2 Ethernet Switch Modules (ESM) for Serial Over LAN (SOL) support (there must be an ESM in slot 1 that supports SOL)

This document assumes the Serial Over LAN (SOL) feature is already setup on the BladeCenter. *The BladeCenter JS20 Type 8842 Installation and User's Guide* describes how to setup the components needed for SOL functionality. There is also a whitepaper on JS20 SOL setup called *Enabling and Configuring SOL (Serial Over LAN) on an 8842 BladeServer*. These documents can be found at <http://www-307.ibm.com/pc/support/site.wss/product.do?template=/productpage/landingpages/productPageLandingPage.vm&brandind=8&familyind=157722&machineind=158427&modelind=0&partnumberind=0&subcategoryind=0&doctypeind=8&doccategoryind=0&operatingsystemind=49977&validate=true> and on the pSeries® Power Blades Web site at <http://w3-1.ibm.com/support/americas/pseries/pb2.html>.

Starting the Management Module's Web interface

The BladeCenter Management Module (MM) Web interface provides the central point of control for the BladeCenter components. To log into the MM Web interface, start a browser and point it to the IP address or name of the MM (e.g. 192.168.70.125 – default IP address for external interface). Enter the userid/password, the default is USERID/PASSWORD (note: all upper case, with a zero). This is usually done from a ThinkPad®, or whatever system happens to be available. Make sure to select a reasonable timeout value otherwise your session will expire from inactivity. Now click on Continue to see the MM.



II. Required Firmware Levels

The minimum JS20 firmware level that supports AIX 5L is FW04310120 (or higher). Older firmware levels must be updated before installing AIX 5L. Version 1.0 BQ8T16A of the Integrated Systems Management Processor (ISMP) firmware is the minimum supported level for use with system firmware level FW04310120. Unpredictable results may be experienced if an older version of ISMP code is installed. This version of ISMP firmware must be installed before updating the system firmware.

If you have firmware level bFW0419000 or lower, AIX 5L is not supported. If you have Linux® installed, you can update the firmware using the update_flash command. **If you do not have Linux installed, then you will need to install it before you can update your firmware and load AIX 5L.** This should only affect clients that originally ordered Linux with their JS20 but now want to install AIX 5L. Clients that order AIX 5L with their JS20 will not have this problem because the firmware will be automatically loaded by IBM. These clients will be able to install AIX 5L without having to install Linux first.

This firmware can be downloaded via the support Web site at: <http://www-307.ibm.com/pc/support/site.wss/document.do?lndocid=MIGR-55553> or the pSeries® Power Blade Web site at: <http://w3.ibm.com/support/america/pseries/pb2.html>. Please refer to the IBM Support Web site at <http://www.ibm.com/pc/support/> for the current version of the *JS20 Installation and User's Guide, the Hardware Maintenance Manual and Troubleshooting Guide*.

III. Starting a Serial Over LAN Session

In the BladeCenter environment, the integrated system management processor (ISMP) and network interface controller (NIC) on each blade server route the serial data from the blade server serial communications port to the network infrastructure of the BladeCenter unit, including an Ethernet compatible I/O module that supports SOL communication. Configuration of BladeCenter components for SOL operation is done through the BladeCenter management.

For more information on setting up Serial Over LAN, refer to the *BladeCenter JS20 Type 8842 Installation and User' Guide* or a white paper describing JS20 SOL setup, *Enabling and Configuring SOL (Serial Over LAN) on an 8842 Blade Server white paper*, IBM @server BladeCenter, BladeCenter JS20.

To start a SOL session telnet (using windows telnet client or PUTTY [Windows SSH Client Program]) to the MM, and provide the userid/password, the default is USERID/PASSWORD (note: all upper case, with a zero). To bring up a console for a blade, enter this command at the prompt: “*console -T blade[x]*” where x is a number 1-14, indicating which blade in the chassis to select. The SOL session buffers up to 8KB of data, so when the session is started, any buffered data will scroll past.

To set the “environment”, so all commands are directed to a specific blade, enter: “*env -T system:blade[x]*”, where x is a number 1-14. Then one just needs to enter: “*console*”, to start an SOL session on blade x. To terminate an SOL session, press ESC, then shift-9 (a left parenthesis).

Telnet sessions with the BladeCenter Management Module have a default timeout value of 120 seconds (2 minutes). If there is no telnet or SOL traffic within the timeout interval, the telnet session and any SOL session associated with this telnet session will terminate. To change this value telnet to the MM and type the following at the system prompt “*system>*”:

<code>telnetcfg -T system:mm [x]</code>	Displays the current value
<code>env -T system:mm [x]</code>	Sets MM as command target for current session
<code>telnetcfg -t 0</code>	Set telnet timeout to no timeout

Refer to the *IBM @server BladeCenter Management Module Command-Line Interface Reference Guide* for information.

IV. JS20 Firmware Upgrade Process

Use one of the following procedures to upgrade the firmware on the JS20:

Firmware Upgrade Using CD-ROM

The JS20 firmware must be upgraded before installing AIX 5L unless it's a new system. Use the following procedure to upgrade the JS20 firmware.

1. Connect to the console on the target blade using SOL via the Management Module (MM).
 - Enable SOL for the BladeCenter.
 - Enable SOL for the target blade.
 - Establish an SOL connection to the target blade.
2. Boot the target blade from the CD-ROM via the MM.
 - Assign the media tray to the target blade.
 - Select the CD-ROM as the boot device for the target blade.
 - Insert the JS20 Firmware Update CD-ROM into the media tray.
 - Power on the target blade.
3. Update the flash.
 - The flash program will start automatically.
 - Press "y" when asked if you want to update the flash.
 - Press "n" when asked if you want to promote the flash.
 - Press any key to reboot the blade.

Sample output:

```
*****
* IBM FLASH UPDATE UTILITY *
* JS20BLADE FIRMWARE ONLY *
*****

CUR FIRMWARE: Tue Mar 23 11:00:14 2004

NEW FIRMWARE: Thu Jun 17 13:09:44 2004

DO YOU WANT TO UPDATE FLASH (y/n): <-- press "y" here

BEGIN FLASH UPDATE
Calculate CRC
Erase bank 1
Update FW
GPUL flash update success

FLASH UPDATE SUCCESS

DO YOU WANT TO PROMOTE FLASH (y/n): <-- press "n" here

PRESS ANY KEY TO REBOOT SYSTEM <-- press any key here
```

4. Promote the new firmware.

- The flash program will start automatically after reboot.
- Verify the system has booted from the new firmware by verifying that the current firmware (CUR) date matches the NEW firmware date.
- Press "n" when asked if you want to update the flash.
- Press "y" when asked if you want to promote the flash.
- Power off the target blade.

Sample output:

```
*****
* IBM FLASH UPDATE UTILITY *
* JS20BLADE FIRMWARE ONLY *
*****

CUR FIRMWARE:  Thu Jun 17 13:09:44 2004
NEW FIRMWARE:  Thu Jun 17 13:09:44 2004

DO YOU WANT TO UPDATE FLASH (y/n) : <-- press "n" here

DO YOU WANT TO PROMOTE FLASH (y/n) : <-- press "y" here

BEGIN FLASH PROMOTE

Erase bank 2
Flashing-
Verifying/
Flash copy success

FLASH PROMOTE SUCCESS

PRESS ANY KEY TO REBOOT SYSTEM <-- power off here
```

5. Your system firmware has been successfully updated to a version that supports AIX 5L. You may now install AIX 5L.

Firmware Upgrade using Network

1. Connect to the console on the target blade using SOL via the Management Module (MM). See the JS20 documentation for instructions on how to setup SOL if necessary.

- Enable SOL for the BladeCenter.
- Enable SOL for the target blade.
- Establish an SOL connection to the target blade.

2. Power on the blade and stop at the Open Firmware prompt (0 >).

- To stop at the Open Firmware prompt, watch for progress code D5BB and press "8" on the keyboard. (Note: you only have 5 seconds to press 8).

```
.
.
.
D099
D5BB 5 <-- press "8" here
0 >
```

3. Set the blade to network boot from eth1.

- If on the same subnet, enter the following command:
boot /pci@8000000f8000000/pci@0/ethernet@1,1
- If on a different subnet, enter the following command:
boot /pci@8000000f8000000/pci@0/ethernet@1,1:<server ip
addr>,,<client ip addr>,<gateway ip addr>

Example:

```
boot /pci@8000000f8000000/pci@0/ethernet@1,1:192.168.0.3,,192.168.0.2,
0.0.0.0
```

You will see the following:

```
BOOTP: chosen-network-type = ethernet, auto, none, auto
BOOTP: server IP = 0.0.0.0
BOOTP: requested filename =
BOOTP: client IP = 0.0.0.0
BOOTP: client HW addr = 0 d 60 1e 9 1d
BOOTP: gateway IP = 0.0.0.0
BOOTP: device /pci@8000000f8000000/pci@0/ethernet@1,1
BOOTP: loc-code U1234.123.1234567-P1-T7
```

```
BOOTP R = 1
FILE: js20-flash
Load Addr=0x00000000000004000, Max Size=0x0000000000bfc000
FINAL Packet Count = 4235
FINAL File Size = 2167840 bytes.
load-base=0x4000
real-base=0xc00000
```

Elapsed time since release of system processors: 0 mins 50 secs

4. Flash program will start and prompt you if you want to flash, enter “y”

```
*****
* IBM FLASH UPDATE UTILITY *
* JS20BLADE FIRMWARE ONLY *
*****
```

CUR FIRMWARE: Tue Mar 23 11:00:14 2004

NEW FIRMWARE: Thu Jun 17 13:09:44 2004

DO YOU WANT TO UPDATE FLASH (y/n): <-- press “y” here

```
BEGIN FLASH UPDATE
Calculate CRC
Erase bank 1
Update FW
GPUL flash update success
```

FLASH UPDATE SUCCESS

5. Reboot the system to ensure your firmware will successfully boot.

The program will ask you if you want to promote the firmware, enter “n”

```
DO YOU WANT TO PROMOTE FLASH (y/n): <-- press "n" here
```

```
PRESS ANY KEY TO REBOOT SYSTEM <-- press any key here and the system
will reboot.
```

6. Stop at the Open Firmware prompt and net boot from eth1 again (repeat steps 2 and 3).

To stop at OF prompt, watch for progress code D5BB and press 8 (Note: you only have 5 seconds to press 8

```
D099
D5BB 5 <-- press "8" here
0 >
0 > boot /pci@8000000f8000000/pci@0/ethernet@1,1 <-- boot from
eth1
```

7. Verify system booted from new firmware by verifying that Current firmware (CUR) matches the NEW firmware version. Enter n to the update flash question.

```
*****
* IBM FLASH UPDATE UTILITY *
* JS20BLADE FIRMWARE ONLY *
*****
```

```
CUR FIRMWARE: Thu Jun 17 13:09:44 2004
```

```
NEW FIRMWARE: Thu Jun 17 13:09:44 2004
```

```
DO YOU WANT TO UPDATE FLASH (y/n): <-- press "n" here
```

8. Promote the firmware

```
DO YOU WANT TO PROMOTE FLASH (y/n): <-- press "y" here
```

```
BEGIN FLASH PROMOTE
```

```
Erase bank 2
Flashing-
Verifying/
Flash copy success
```

```
FLASH PROMOTE SUCCESS
```

```
PRESS ANY KEY TO REBOOT SYSTEM
```

Your system firmware has been successfully updated to a version that supports AIX.

Verify Updated Firmware

To display firmware version information, perform the following AIX 5L commands and steps:

1. From the root directory, determine the directory path of the command `dmpdt_chrp` which dumps the device tree. Enter the following command:

```
find . -name dmpdt_chrp -print
```

As an example, the system may return `./usr/lib/boot/bin`

2. Display the device tree and copy it to a file, for example `dmpdt_chrp_out`. Enter the following command:

```
(directory path)/dmpdt_chrp | tee dmpdt_chrp_out
```

3. Open the file with an editor (e.g. `vi`) and search for "openprom".

As an example, this will return:

```
/openprom
name
 6f70656e 70726f6d 00          [openprom.....]
ibm, fw-vernum_encoded
 46573034 33313031 323000      [FW04310120.....]
.....
ibm, fw-bank
 5400                          [T.....]
ibm, fw-temp-bank
 46573034 33313031 32302c20 31373a31  [FW04310120, 17:1]
 363a3039 2c203037 2f32362f 32303034  [6:09, 07/26/2004]
 00                             [.....]
ibm, fw-perm-bank
 46573034 33313031 32302c20 31373a31  [bFW0416000, 12:1]
 363a3039 2c203037 2f32362f 32303034  [1:11, 04/13/2004]
```

In this example, `ibm, fw-vernum_encoded` value `[FW04310120.....]` indicate that `FW04310120` is the version of firmware that is being executed by the system.

The value for `ibm, fw-bank` indicates what side you booted from (T for TEMP, P for PERM).

The value for `ibm, fw-temp-bank` indicates the firmware version, date and time stamp of firmware on the TEMP side.

The value for `ibm, fw-perm-bank` identifies the firmware version, date and time stamp of firmware on the PERM side.

V. AIX 5L Installation

There are several ways to install AIX 5L on the JS20. These methods include a manual installation from CD-ROM, installing using the SMS Menu or performing a network installation using Network Installation Manager. General information for AIX 5L installation is available in the [AIX 5L Version 5.2 Installation Guide and Reference](#).

Installation from CD-ROM

Start the MM Web interface (as described in the Introduction). Give the target install blade sole access to the CD-ROM drive by pressing the CD button on the top/front of the blade. This can also be done remotely in the MM Web interface, under “Blade Tasks”, select “Remote Control”, then “Start Remote Control” and select the blade from the “Change media tray owner” pull down. Now complete the following steps:

1. Ensure that the JS20 blade's boot list is set to install from the CD-ROM in the MM Web interface by selecting “Blade Tasks” then “Configuration” and scroll down to Boot Sequence section or just select “Boot Sequence”.
2. Click the JS20 blade that you are installing and ensure the first device listed is CD-ROM then click Save.
3. Insert volume 1 of the AIX 5L V5.2 (ML4) installation CD into the media tray's CD-ROM drive.
4. Power on the JS20 blade from the MM Web interface by selecting “Blade Tasks” then “Power/Restart”.
5. Select the JS20 blade that you are installing and click “Power On Blade” or “Restart Blade”.
6. Open a SOL session in order to perform the manual installation steps for installing AIX 5L. Telnet to MM and run the console command. For example, if the JS20 blade is in slot 3, you would run the following command:

```
console -T blade[3]
```

On the SOL console, you should see the bring-up codes scrolling past while the JS20 initializes.

7. Follow the AIX 5L installation instructions for a New and Complete Overwrite Installation in the [AIX 5L Version 5.2 Installation Guide and Reference](#).

Note: When installing AIX 5L from a CD-ROM, the installation appears to hang after installing filesets from Volume 1. At this point, the installation is verifying the installed filesets, which can take approximately 50 minutes. This is due to the speed of the CD-ROM in the media tray. The last thing that appears on the screen is:

```
Validating RPM packages selections . . .
```

```
Cdrecord #####
```

NIM Installation via the SMS Menus

To install your JS20 from the SMS Menu make sure your JS20 is set to the correct boot sequence. From the MM select “Blade Tasks” then “Configuration” then select “Boot Sequence” or just scroll down to the “Boot Sequence” section. Select the JS20 Server onto which you want to install the operating systems. For the 1st device, change the boot sequence to “Network – BOOTP” then click Save.

To reboot the JS20 from the MM select “Blade Tasks” then “Power/Restart”. Check the box for the blade you wish to start installing and power it on by selecting “Power On Blade” or “Restart Blade”. Next, start an SOL session as described previously (e.g. *console -T blade[x]*). On the SOL console, you should see the bring-up codes scrolling past while the JS20 initializes. When “E1F1” appears, press 1 to bring up the SMS Menu.

Note: This installation method requires a second Ethernet switch module in slot 2 of the BladeCenter chassis.

```

Telnet 192.168.70.125
D012
D00E
E170
E172 U88-42 .21X .9999999-P1
E151 U88-42 .21X .9999999-P1
E152 U88-42 .21X .9999999-P1
E153 U88-42 .21X .9999999-P1
E152 U88-42 .21X .9999999-P1
E153 U88-42 .21X .9999999-P1
E172 U88-42 .21X .9999999-P1
E001 U88-42 .21X .9999999-P1
E152 U88-42 .21X .9999999-P1-T6
E153 U88-42 .21X .9999999-P1-T6
E152 U88-42 .21X .9999999-P1-T7
E153 U88-42 .21X .9999999-P1-T7
E001 U88-42 .21X .9999999-P1
E172 U88-42 .21X .9999999-P1
E001 U88-42 .21X .9999999-P1
E152 U88-42 .21X .9999999-P1
E153 U88-42 .21X .9999999-P1
E152 U88-42 .21X .9999999-P1
E001 U88-42 .21X .9999999-P1
E172 U88-42 .21X .9999999-P1
E001 U88-42 .21X .9999999-P1-C5
D001
D003
D004
E139
E140
D008
E1F0
E1F1

```

The SMS Menu appears.

```
pSeries Firmware
Version FW04251120
SMS 1.3 (c) Copyright IBM Corp. 2000,2004 All rights reserved.
-----
Main Menu
1. Select Language
2. Password Utilities NOT available in LPAR mode
3. View Error Log
4. Setup Remote IPL <Initial Program Load>
5. Change SCSI Settings
6. Select Console NOT available in LPAR mode
7. Select Boot Options
-----
Navigation Keys:
X = eXit System Management Services
-----
Type the number of the menu item and press Enter or select Navigation Key:
```

To install AIX 5L from the SMS menu do the following:

1. Select 4 for “Setup Remote IPL <Initial Program Load>” and press the enter key.
2. At the NIC Adapter Menu select the second network adapter and press the enter key.
3. At the Network Parameters Menu select 1 for “IP Parameters” and press the enter key.
4. At the IP Parameters menu add the Client IP Address, Server IP Address, Gateway IP Address and the Subnet Mask. Now press the ESC key to return to the previous menu.
5. Select 3 for “Ping Test” and press the enter key. Now select 1 to “Execute Ping Test” and press the enter key.
6. Type “X” to exit the SMS menu and start your AIX 5L Installation.
7. Follow the AIX 5L installation instructions for a New and Complete Overwrite Installation in the [AIX 5L Version 5.2 Installation Guide and Reference](#).

Network Installation of a JS20 Blade

Using this scenario, you can install AIX 5L for the first time or overwrite an existing version of the operating system onto a JS20 blade. In this scenario, you will do the following:

- Gather the required TCP/IP information for your JS20 blade.
- Prepare your Network Installation Management (NIM) environment.
- Configure a NIM master.
- Create NIM installation resources.
- Define your JS20 blade as a NIM client.
- Prepare your JS20 blade for a network installation.
- Boot the JS20 blade off the network using a directed bootp or broadcast bootp method.

To perform a network install, you will need to configure a NIM master if you do not already have one configured. For instructions on how to create a NIM master, see [Configuring the NIM Master and Creating Basic Installation Resources](#).

Note: This procedure requires shutting down and reinstalling the base operating system. When you reinstall any operating system, schedule your downtime when it least impacts your workload to protect yourself from a possible loss of data or functionality. Before you perform a new and complete overwrite installation, ensure you have reliable backups of your data and any customized applications or volume groups. This procedure also requires a second Ethernet switch module in slot 2 of the BladeCenter chassis.

A. Broadcast bootp Network Installation

To perform a broadcast bootp, ensure that the NIM server is on the same subnet as the JS20 blade that you are installing. During a broadcast bootp, the JS20 blade sends a broadcast bootp packet to its subnet. The NIM server receives and responds to this packet. The JS20 blade NIM client definition on your NIM master must include the MAC address of the JS20 blade's network adapter used during the installation, or the NIM server will not respond to a broadcast bootp. If your NIM master is on a different subnet, and you want to perform a broadcast bootp, you must set up another system on the client's subnet to forward broadcast bootp packets.

To set up a bootp to forward broadcast bootp packets, complete the following steps:

1. Add the IP address of your NIM server to the `/etc/dhcpd.conf` file on the bootp forwarder machine. For example, if your NIM server's IP address is 192.24.24.1, add `server 192.24.24.1` to `/etc/dhcpd.conf`
2. Run `startsrc -s dhcpd`.

This machine will now forward broadcast bootp packets to your NIM server that is on a different subnet. You must also install the latest Firmware version onto your client for the client to correctly handle the bootp response from the bootp that is forwarding broadcast bootp packets.

Step 1: Prepare Your NIM Server

Performing a broadcast bootp is similar to a directed bootp. The steps are the same, except you must obtain the MAC address of the JS20 blade's network adapter that you will use to perform this network install.

1. Obtain the MAC address from the MM Web interface by completing the following steps:
 - a. Select Monitors -> Hardware VPD.
 - b. Scroll down to BladeCenter Server MAC Addresses.

- c. Find the JS20 blade that you plan to install and the MAC address that corresponds to the adapter you will use to perform the installation. Write this MAC address down.
2. Specify the MAC Address when you define the JS20 blade as a NIM client. If you are using the smitty nim_mkmac command, specify the MAC address on the Network Adapter Hardware Address SMIT screen. Do not include the colons (":") when you are specifying the MAC address. If the client is already defined, you can change the MAC address with the smitty nim_chmac command.
3. Set up your NIM master to install the JS20 blade, by completing the following steps:
 - a. Run the smitty nim_bosinst command.
 - b. Select the JS20 blade that is defined as your target .
 - c. Select the type of install that you want to perform and select the installation resources that you want to use to install the JS20 blade.

You can also prepare the JS20 blade to install using the bos_inst NIM operation on the command line. For more information on using the bos_inst operation, see [bos_inst](#).

4. Power off the JS20 blade. If you do not want the JS20 blade to reboot automatically, set *“Initiate reboot and installation now?”* to no in the SMIT screen and press Enter.

Step 2: Initiate the Installation from the Management Module

NIM uses the bootp protocol when performing a network installation. The bootp protocol allows you to install through a directed bootp or broadcast bootp request.

1. Ensure that the JS20 blade's boot list is set to install from the network in the MM Web interface by selecting “Blade Tasks” then “Configuration” and scroll down to “Boot Sequence”.
2. Click the JS20 blade that you are installing and ensure the first device listed is “Network - BOOTP”. When the JS20 blade boots, it will install from the first network adapter that receives a bootp response.

Note: You should not have a Serial Over LAN connection open to the JS20 blade that you are attempting to install when you power on the JS20 blade.

3. Click save.
 4. Power on the JS20 blade from the MM Web interface by selecting “Blade Tasks” then “Power/Restart”.
 5. Select the JS20 blade that you are installing and click “Power On Blade”.

If you do not have a Serial Over LAN connection to the JS20 blade, you can view the status of the installation by running the following command from your NIM master:

```
lsnim -l js20_nim_name
```

For example, if the JS20 blade was defined as JS20blade1, run the following command:

```
lsnim -l JS20blade1
```

Note: If you run the AIX 5L bootlist command to set the IP parameters for a network adapter and reboot the system, the IP parameters will be stored in NVRAM. When you reboot the JS20 blade from the MM with the boot sequence set to “Network-BOOTP”, the JS20 blade attempts to use the IP parameters stored in NVRAM instead of performing a broadcast bootp. To perform a broadcast bootp, run the bootlist command specifying 0.0.0.0 for each IP parameter and reboot from AIX 5L using the shutdown -Fr command. For example, to perform a broadcast bootp over ent1, run the following commands.

```
# bootlist -m normal ent1 client=0.0.0.0 bserver=0.0.0.0 gateway=0.0.0.0 hdisk0  
# shutdown -Fr
```

If you are unable to log into the AIX 5L system, then follow the instructions for performing a directed bootp via the Open Firmware prompt, but specify "0.0.0.0" for each IP address. Once the JS20 blade installs successfully, the boot IP parameters are reset to "0.0.0.0".

B. Directed bootp Network Installation

A directed bootp can be used to install a JS20 blade from a NIM server and does not require the NIM server to be on the same subnet as the JS20 blade. This option does not require that you have the MAC address of the network adapter on the JS20 blade. To perform a directed bootp, you need a Serial over LAN connection to the blade so that you can specify the IP parameters to Open Firmware. Currently you must have 2 network adapters to perform a NIM installation if you are using Serial Over LAN. You cannot install AIX 5L over the same adapter that is using Serial Over LAN.

Step 1: Prepare Your NIM Server

1. Create a SPOT, lpp_source, and any other resources that you will need at the level of AIX 5L that you want to install on your NIM server. Your NIM server is usually the NIM master, but you can also set up a NIM client as a NIM server. For instructions on how to create NIM resources, see [Configuring the NIM Master and Creating Basic Installation Resources](#).
2. Ensure that you have the information in the following worksheet for your JS20 blade before proceeding with the installation:

Network Attribute	Value
Network Interface	(For example: ent1)
Host Name	

Table 2. Network Configuration Information Worksheet

Network Attribute	Value
IP Address	_____ . _____ . _____ . _____
Network Mask	_____ . _____ . _____ . _____
Name server	_____ . _____ . _____ . _____
Domain Name	
Gateway	_____ . _____ . _____ . _____

3. Define the JS20 blade as a NIM client on your NIM master by running the smitty nim_mkmac command on the NIM master. This command creates a client definition for your JS20 blade. You can also define the JS20 blade using the define NIM operation on the command line.
4. If you want to set the JS20 blade's name server and domain name after the installation, use a resolv_conf resource. For more information on creating a resolv_conf resource, see [resolv_conf Resource](#).
5. Set up your NIM master to install the JS20 blade, by running the smitty nim_bosinst command. Select the JS20 blade that you defined earlier as your target. Then select the type of install that you want to perform and select the installation resources that you want to use to install the JS20 blade. You can also prepare the JS20 blade to install using the bos_inst NIM operation on the command line.

Notes:

- a. If the JS20 blade is powered off or has never been installed, set Initiate reboot and installation now? to no and press enter in the SMIT interface.
- b. If the JS20 blade is powered on and running AIX 5L, set Initiate reboot and installation now? to yes in the SMIT interface. If you choose this option, a directed bootp is initiated by default and you can skip step 2. Before you run this command, ensure that the JS20 blade is a registered NIM client. To do this, run smitty niminit on the JS20 blade. Then specify the hostname of your NIM master and the interface you want to use for the installation. You can also initialize the JS20 blade using the niminit command on the command line.

Step 2: Specify a Directed bootp from the JS20 blade

1. Open a Web interface to the MM by navigating to the IP address or hostname of the MM using a Web browser.
2. Enable Serial over LAN to the JS20 blade from the MM Web interface by selecting “Blade Tasks” then “Serial Over LAN”.
3. Select the JS20 blade that you are installing and click “Enable Serial Over LAN”.
4. Power on the JS20 blade from the MM Web interface by selecting “Blade Tasks” then “Power/Restart”.

5. Select the JS20 blade that you are installing and click “Power On Blade”.
6. Open a Serial Over LAN connection to the JS20 blade by telnetting into the MM and running the console command. For example, if the JS20 blade is in slot 3, you would run the following command:

```
console -T blade[3]
```

The Serial Over LAN connection shows a series of LED numbers.

7. Press 8 on the keyboard when you see EIF1 to go to the Open Firmware prompt.
8. Run boot net:bootp,server_ip,,client_ip,gateway_ip to boot from the network.
 - o If you are using a net type boot, you would run a command similar to the following:

```
boot net:bootp,192.168.2.10,,192.168.1.11,192.168.1.1
```

- o If you are using ent1, then you would run a command similar to the following:

```
boot
/pci@8000000f8000000/pci@0/ethernet@1,1:bootp,192.168.2.10,
,192.168.1.11,192.168.1.1
```

Note: You must specify the full device path name with this command. To determine the full path to your device, list the device tree by running the “ls” command at the Open Firmware prompt. This command displays output similar to the following:

```
0 > ls
000000c87f18: /ibm,serial
000000c88840: /chosen
000000c88a98: /packages

...
000000d31488: /vdevice
000000d327a8: /vty@0
000000d32f88: /IBM,sp@4000
000000d33f10: /rtc@4001
000000d34a18: /pci@8000000f8000000
000000d384d0: /pci@0
000000d4bbd0: /ethernet@1
000000d5af50: /ethernet@1,1
000000d3be00: /pci@3
000000d6a350: /usb@0
000000d845f8: /hub@1
000000d854b8: /usb@0,1
000000d9f760: /hub@1
000000d3f798: /pci@1f
000000d45ed8: /ide@4,1
000000d47b10: /disk@0
```

The highlighted items are the path to the second ethernet adapter. You would pass this information to the boot command to initiate a network boot from the second ethernet adapter

9. After you run the boot command, the network installation begins. Output similar to the following is displayed on the Serial over LAN connection:

```
BOOTP: chosen-network-type =
ethernet,auto,none,auto
BOOTP: server IP = 192.168.2.10
BOOTP: requested filename =
BOOTP: client IP = 192.168.1.11
BOOTP: client HW addr = 0 d 60 1e c cb
BOOTP: gateway IP = 192.168.1.1
BOOTP: device
/pci@8000000f8000000/pci@0/ethernet@1,1
BOOTP: loc-code U8842.P1Z.23A0984-P1-T7

BOOTP R = 1
FILE: /tftpboot/js20bladel1.austin.ibm.com
Load Addr=0x0000000000004000, Max
Size=0x0000000000bfc000
FINAL Packet Count = 21131
FINAL File Size = 10818623 bytes.
load-base=0x4000
real-base=0xc00000

Elapsed time since release of system
processors: 2 mins 28 secs
```

VI. Limitations

SOL Restrictions

SOL uses the first (Planar Ethernet 1) network interface of the 8842 Blade Server to communicate. When this network interface attempts to use bootp, the network interface is reset. This causes any current SOL session to be dropped and become “Not Ready”. Therefore, you must not attempt to configure or use bootp on the first (Planar Ethernet 1) network interface. If you require bootp, you must use the second (Planar Ethernet 2) network interface. In order for the second network interface of the 8842 Blade Server to function, you must also install a supported ESM (Ethernet Switch Module) in I/O Module Bay 2.

In order for the second network interface of the JS20 Blade Server to function, a supported ESM (Ethernet Switch Module) must be installed in I/O Module Bay 2. The first network interface is dedicated for SOL by default, if any attempt is made to configure it, perform a NIM install or to run on the network, an AIX 5L error will be returned. By this technical limitation, the SOL and the first network interface are mutually exclusive. The sol_running ODM attribute is user modifiable to override the SOL default and enable (Planar Ethernet 1) network interface 1 to use Ethernet but as

described above. Refer to the **Installing Fixes** section of this document for more information.

Media Tray

AIX 5L will not automatically detect the CD-ROM from the media tray when you assign it to another blade. For example, if you have the CD-ROM from the media tray assigned to blade #1 then you decide to use it on blade #2, the new blade shows cd0 is in a defined state. The original blade (blade #1) still shows cd0 as available. You should be able to run “*cfgmgr*” to make cd0 available on blade #2. It will also still show available on blade #1. You can run “*rmdev -l cd0*” to make the device unavailable on blade #1.

Cisco Switch Module

The Cisco Ethernet Switch Module does not support SOL on JS20 blades with AIX . Therefore, it cannot be used in Slot 1 of the BladeCenter without an efix. Refer to the **Installing Fixes** section of this document for more information.

VII. Installing Fixes

SOL and Ethernet on ent0

The current driver for AIX 5L V5.2 (ML4) places a restriction on SOL usage. This means you cannot have SOL and Ethernet traffic on ent0. There is an APAR (IY60627) available which corrects this problem. After applying this APAR there should be no problem in configuring SOL and ethernet traffic over ent0. This APAR can be obtained via the normal support channels.

SOL support for Cisco Switch Module

There is an AIX 5L V5.2 (ML4) device driver efix for JS20 to support Cisco Ethernet Switch Module in Slot 1 of the BladeCenter chassis. This efix can be obtained through the regular support channels.

VIII. Backing Up the JS20

The Media tray on the chassis does not come with a CD RW or tape drive for the JS20. Therefore, in order to backup your JS20, you have to do an mksysb to a file. The backup can then be installed via NIM.

The following script was written by Steve Knudson (pSeries Advanced Technical Support Group) which totally automates the mksysb process using NIM. This script should be executed from the NIM master. It gets the mksysb from client in “machine list (-m flag)”. If no machinelist, it gets the mksysb from all known clients. It manages

generations of client mksysb. The `-r` flag removes the old mksysb before creating a new one.

```
#!/bin/ksh
#
# get_mksysb [-r] [-n] [-m 'machines to get mksysb from']
#
# get mksysb from each client machine specified with -m. If no
# machines specified, get mksysb from ALL machines. -r flag says
# remove oldest existing mksysb for the machines being backed up.
# use -n no_make flag with -r to remove a generation of mksysb,
# without creating a new one.

remove_old=
machine_list=
no_make=

while getopts rnm: option
do
  case $option in
    r) remove_old=1;;
    m) machine_list="$OPTARG";;
    n) no_make=1;;
    esac
  done
# if machine_list is null at this point, set it to ALL clients
if [ -z "$machine_list" ]; then
  machine_list=`lsnim -c machines | grep -v master | awk '{print
$1}'`
fi

echo machine list is $machine_list
cd /export/mksysb
for m in $machine_list
do

  if [ ! -z "$remove_old" ]; then
    echo removing old file / nim resource $(ls -lt $m* | tail -
1 | awk '{print
$9}')
    nim -o remove $(ls -lt $m* | tail -1 | awk '{print $9}')
    rm $(ls -lt $m* | tail -1 | awk '{print $9}')
  fi
# if no_make is null, go ahead and make the mksysb
if [ -z "$no_make" ]; then
  filename="$m" `date +%Y%m%d%H%M`
  echo new file / nim resource is $filename
echo machine to backup is $m
  nim -o define -t mksysb -aserver=master -amk_image=yes \
-alocation=/export/mksysb/$filename \
-asource=$m $filename
fi
done
```

IX. References

The following documents are listed on the pSeries Power Blades Web site (<http://w3.ibm.com/support/americas/pseries/pb2.html>) as well as the IBM PC support Web site (<http://www-307.ibm.com/pc/support/site.wss/product.do?template=/productpage/landingpages/productPageLandingPage.vm&brandind=8&familyind=157722&machineind=158427&modelind=0&partnumberind=0&subcategoryind=0&doctypeind=8&doccategoryind=0&operatingsystemind=49977&validate=true>):

1. BladeCenter JS20 Type 8842 Installation and User's Guide
2. IBM @server BladeCenter – Management Module User's Guide
3. IBM @server BladeCenter – Planning and Installation Guide
4. Enabling and Configuring SOL (Serial Over LAN) on an 8842 Blade Server white paper, IBM @server BladeCenter JS20, by Mike Noterieke



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