xCAT2 AIX on JS blade - Howto

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1. Introduction

xCAT already has a cookbook xCAT2bladecenter.pdf for Blade Center management, and has four cookbooks xCAT2onAIX.pdf, xCAT2onAIXmksysb.pdf, xCAT2onAIXDiskless.pdf and xCAT2onAIXinstall.pdf for AIX installation management. All of these documents can be found here: https://xcat.svn.sourceforge.net/svnroot/xcat/xcat-core/trunk/xCAT-client/share/doc/.

The document '**xCAT2 AIX on JS blade – Howto'** focuses on the step by step installation introduction for AIX on JS blade center specific scenario. If you have any concern about the operation detail in this document, please refer to the documents mentioned above.

*Note: Regarding the chapter2,3, if you want to know more detail information, please refer to the part '**Install an AIX Management Node with xCAT**' of **xCAT2top.pdf**.*

2. Prepare the installation source

2.1. Prepare the installation CD or iso file of AIX

2.1.1 If you have an installation CD of AIX operating system

Put the CD into the CDROM of the management node, and figure out which CDROM device that the CD just put in. If you just have one CDROM, the device name should be '/dev/cd0'.

In the command mknimimage which make the NIM image, you can use the '/dev/cd0' as the source directory.

If you like, you also can mount the /dev/cd0 to a directory

```
mount -rv cdrfs /dev/cd0 /mnt
```

And use the /mnt as the source directory of the mknimimage command.

2.1.2 If you have an installation iso file of the AIX

Since AIX does not support mount an iso file to a directory, you need to copy this iso file to a Linux server and mount it to a directory, then copy all the directories and files to a real directory. At last, export the real directory out to the management node.

On the Linux server:

```
mount -o loop dvd.GOLD_SP1_61D.v1.iso /mnt
cp -r /mnt/* /export_cd/*
export the /export_cd directory out to the management node
```

On the management node:

```
mount Linux_server:/export_cd /mnt
```

2.2. Download the xCAT and dependency packages

OpenSSH:

http://sourceforge.net/projects/openssh-aix

For example: you download the openssl pakcage: openssl.9.8.801.tar.Z

OpenSSL:

https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=aixbp

For example: you download the openssh pakcage openssh-5.0_aix61.tar.Z

Get the latest version of xCAT core packages and xCAT dependency packages:

```
dep-aix-*.tar.gz
```

core-aix-*.tar.gz

http://xcat.sourceforge.net/aix/download.html

3. Install the xCAT and related packages

3.1. Install the dependency packages

Change directory into the directory that store the openssh and openssl you just downloaded.

3.1.1 Install the openssl

```
gunzip openssl.9.8.801.tar.Z
tar xvf openssl.9.8.801.tar
cd openssl.9.8.801
installp -a -Y -d . openssl
```

3.1.2 Install the openssh

```
gunzip openssh-5.0_aix61.tar.Z
tar xvf openssh-5.0_aix61.tar
installp -a -Y -d . openssh
```

3.1.3 Update the packages information installed by installp into the rpm database

```
/usr/sbin/updtvpkg
```

3.2. Install the xcat on the AIX

3.2.1 Install the dependency packages of xCAT

```
gunzip dep-aix-*.tar.gz
tar xvf dep-aix-*.tar
./instoss
```

3.2.2 Install the core packages of xCAT

```
gunzip core-aix-2.1.1.tar.gz
tar xvf core-aix-2.1.1.tar
./instxcat
```

Note: If you want that the file path of xCAT are added into $PATH immediately, please logout current shell and relogin again.

3.3. Verify the installation

Run the "`lsdef -h`" to check if the xCAT daemon is working.

Check to see if the initial xCAT definitions have been created.

```
lsdef -t site -l
```

4. Setup the services for the management node

4.1. Setup the services

Refer to the part **'Overview of xCAT support for AIX'** of **xCAT2onAIX.pdf** to setup the following services on the management node:

```
Syslog setup
DNS setup
Remote shell setup
NTP setup
```

4.2. Verify following xCAT required services are in active status

```
lssrc -s inetd
lssrc -g nfs
```

If certain services is inoperative or need to be updated, use the following command to restart the service:

```
stopsrc -s <service>
startsrc -s <service>
```

5. An example of the cluster

In order to simplify the introduction of the xCAT management process, an example will be used.

In this example, the cluster has one management node and three compute nodes. One compute nodes will be installed by rte method, one will be installed by mksysb method and the last one will be booted in stateless.

Management node

Name: mgt_node

IP: 192.168.0.1

Compute nodes

Name: blade_rte – This node will be installed by rte method

IP: 192.168.0.10

Name: blade_mksysb - This node will be installed by mksysb method

IP: 192.168.0.20

Name: blade_stateless - This node will be booted in stateless model

IP: 192.168.0.30

Note: There three compute nodes can be managed by different management module, or located in different blade centers.

Management module

Name: mm_js – The management module which will manage all the three

compute nodes.

IP: 192.168.0.100

Group of management module

Name: grp_mm – this group includes all the management modules that you want to manage.

Group of blade

Name: grp_blade – this group contains all the compute nodes that you want to manage.

Name: grp_rte – this group contains all the compute nodes that will be installed by rte method.

Name: grp_mksysb – this group contains all the compute nodes that will be installed by mksysb method.

Name: grp_stateless – this group contains all the compute nodes that will be booted in stateless model.

Note: Regarding the concept of group, in fact, you can create as many groups as you like to classify the objects of the xCAT. Please refer to the concept of the group in manpage.

6. Create the NIM image

The xCAT *osimage* definition contains information that can be used to install a kind of AIX operating system. You can create different kind of osimages for different requirements.

mknimimage command can be used to create the xCAT osimage that defined the required NIM installation resources

6.1. For rte method installation

You can use following command to create a default osimage for rte method installation.

```
mknimimage -V -s /mnt 610image
```

*Note: you can refer to the **xCAT2onAIXinstall.pdf** to customize the osimage for rte method installation.*

6.2. For mksysb method installation

You can use following two kinds of sources to create the mksysb image:

1. A node installed by rte method and that it has been updated and configured as desired.
2. A backup image that created by mksysb command.

In the example, the node which installed by rte method will be used as the source to create the mksysb image. Since an rte method installed node is needed, the detail of creating NIM image will be introduced in the section 'Initialize the AIX/NIM nodes' of this document.

*Note: you can refer to the part **'Create an operating system image'** of **xCAT2onAIXmksysb.pdf** to get more detail information.*

6.3. For stateless installation

You can use following command to create a default osimage for stateless installation.

```
mknimimage -V -t diskless -s /mnt 61cosi
```

*Note: you can refer to the part **'Create an operating system image'** of **xCAT2onAIXDiskless.pdf** to customize the osimage for stateless installation.*

7. Setup the attributes for the cluster

7.1. Define the AMM obect

AMM is the management module of the Blade Center, it's the hardware control point of the blade nodes to be managed for rpower, rcons, rscan, rbootseq funtions.

In this section, the AMM will be defined as an xCAT node object, then you can use this object in the xCAT commands like rspconfig. In addition, all the management modules will be added into one or multiple group to simplify the operation against multiple management module objects.

7.1.1 Define AMMs as Nodes

Add an AMM named mm_js as a node object and add it into the management module group grp_mm.

```
nodeadd mm_js groups=all,grp_mm
```

7.1.2 Define the hardware control type for the management modules

Define all the management modules in the grp_mm group use the **blade** as their's management model.

```
chdef -t node -o grp_mm mgt=blade
```

7.1.3 Define the mpa (Hardware control attribute) for the management modules

For the management module object, set the mpa attribute as itself.

```
chdef -t node -o mm_js mpa=mm_js
```

7.1.4 Define the ip and hostname of mamagement modules

```
chdef -t node -o mm_js ip=192.168.0.100
makehosts
```

7.2. Setup the AMMs

Note: Only the AMM is supported. If your blade center just has MM, you need to replace it with AMM to complete the management process.

7.2.1 Enable the snmp and ssh services

Enable the snmp and ssh services for all management modules in the group **grp_mm**.

```
rspconfig grp_mm snmpcfg=enable sshcfg=enable
rspconfig grp_mm pd1=redwoperf pd2=redwoperf
```

7.2.2 Update the firmware of AMM

If you get this message "SSH supported on AMM with minimum firmware BPET32", that means the firmware needs to be upgraded.

Download it from IBM web site, and unpackage it to the /tftpboot

From the AMM, run the command: update -i ip_of_src -l cnetrgus.pkt -v -T mm[1]; reset -T mm[1]

7.3. Create the xcat networks

Specify which network will be used for the installation process.

You need to specify a name for the network and values for the following attributes.

net The network address.

mask The network mask.

gateway The network gateway.

```
mkdef -t network -o xcat_ent1 net=192.168.0.0 mask=255.255.255.0
gateway=192.168.0.1
```

Note: If your cluster has multiple subnets for compute nodes, then corresponding xCAT and NIM network need to be created.

7.4. Set Up the Password Table

Add the needed passwords to the passwd table for installation.

The “system” password will be the password assigned to the root account of new installed node. The “blade” password will be used for communicating with the management module.

```
chtab key=system passwd.username=root passwd.password=cluster
chtab key=blade passwd.username=USERID passwd.password=PASSW0RD
```

Note: In above examples, the values of the username and password are for example, you should set them depend on your specific situation.

8. Define the compute node

8.1. Define the nodes of blade by rscan

Use the rscan command to scan all the blades which managed by the management modules in the group grp_mm.

```
rscan grp_mm -z > bld.stanza
```

All the blades definition have been written into the bld.stanza. You can remove the definition of the

blades that will not be managed from the bld.stanza. And then perform the following command to define the blade nodes.

```
cat bld.stanza | mkdef -z
lsdef blade
```

After this step, you can find all the blade nodes blade_rte, blade_mksysb and blade_stateless which managed by grp_mm have been defined in the management node.

8.2. Add the nodes into the group grp_blade

```
chdef -t node -o  blade_rte groups=grp_blade,grp_rte,blade,all
chdef -t node -o  blade_mksysb groups=grp_blade,grp_mksysb,blade,all
chdef -t node -o  blade_sateless groups=grp_blade,grp_stateless,blade,all
```

8.3. Setup the attributes of the node

8.3.1 Set the IP and hostname of the node

```
chdef -t node -o blade_rte ip=192.168.0.10
chdef -t node -o blade_mksysb ip=192.168.0.20
chdef -t node -o blade_stateless ip=192.168.0.30

makehosts
```

8.3.2 Set Up the nodehm table

Specify that the Blade Center management module should be used for hardware management.

```
chdef -t node -o grp_blade mgt=blade cons=blade
```

8.3.3 setup the noderes table

You need to specify the **installnic** of the compute nodes before the installation.

```
chdef -t node -o grp_blade installnic=eth0 primarynic=eth0
```

Note: The attribute installnic is the network adapter on the node that will be used for OS deployment. The attribute primarynic is the network adapter on the node that will be used for xCAT management.

8.4. getmacs

Get the mac address of the all the compute nodes and write them into the mac table.

```
getmacs  grp_blade
```

Note: After the executing of the command, check whether the mac of compute nodes have been written into the mac table.

9. Initialize the AIX/NIM nodes

9.1. For rte method installation

Create the NIM client definition:

```
xcat2nim -t node grp_rte
```

Initialize the AIX/NIM nodes:

```
nimnodeset -i 610image grp_rte
```

9.2. For mksysb method installation

The mksysb method described here relay on the node blade_rte witch installed by rte method.

*Note:Please make sure the node **blade_rte** has been installed successfully by rte method before starting this step.*

[Prerequisite]: Change the entry 'fsize = 2097151' to 'fsize = -1' in the default section of /etc/security/limits file on the source node blade_rte to make sure it has enough file size to store the mksysb file.

Create the mksysb image

```
mknimimage -m mksysb -n blade_rte 610sysb spot=610image
```

Create the NIM client definition:

```
xcat2nim -t node  grp_mksysb
```

Initialize the AIX/NIM nodes:

```
nimnodeset -i 610sysb grp_mksysb
```

9.3. For stateless installation

Define and initialize the NIM machines which contained in the grp_stateless

```
mkdsklsnode -i 61cosi  grp_stateless
```

After his step, you can use the 'lsnim -l' to display the NIM machines which have been defined.

10. Setup the console

10.1. Setup the conserver

Configure the conserver and start it:

```
makeconservercf
```

10.2. [rte/mksysb] Set the console parameter

Set the CONSOLE to /dev/vty0, so that you can get the console output from the rcons command in the installation process.

```
vi /install/nim/bosinst_data/610image_bosinst_data
Modify the attribute CONSOLE from:
          CONSOLE = Default
to
          CONSOLE =/dev/vty0
```

10.3. Open a console to monitor the installation process

```
rcons  blade_rte
```

11. Install the nodes

11.1. Set the boot sequence

Set the network as the first boot sequence, the hard disk as the next boot sequence.

```
rbootseq grp_blade net,hd
```

11.2. Start the installation

Use the rpower command to restart the nodes in the grp_blade group, and then all nodes will boot up from network to start the installation.

```
rpower grp_blade reset
```

12. Advanced management

To get following advanced management functions, please refer to the xCAT2onAIXmksysb.pdf, xCAT2onAIXDiskless.pdf and xCAT2onAIXinstall.pdf.

Install additional software

Add or modify files

Using other NIM resources

Booting a "dataless" node

Specifying additional values for the NIM node initialization

Updating AIX diskless nodes using xCAT

Removing NIM machine definitions

Removing NIM resources

13. troubleshooting tips

13.1. Check /etc/bootptab to make sure an entry exists for the node.

13.2. Check that the information in /tftpboot/<node>.info is correct.

13.3. Stop and restart inetd:

stopsrc -s inetd

startsrc -s inetd

13.4. Stop and restart tftpd:

stopsrc -s tftpd

startsrc -s tftpd