

AIX VM with qemu

Introduction

What can it be used for?

- AIX Training and Practice
- Testing/Developing Environment for AIX
- Cybersecurity Lab for AIX
- Running AIX on your laptop for whatever you want to accomplish

Prerequisites:

1. [QEMU Install](#)
2. aix_7200-04-00-1937_1of2_112019.iso
3. Fedora 40 Linux Install (Recommended)

QEMU commands

PowerPC System Board-specific

```
qemu-system-ppc64 --machine help
```

```
cobra@fedora-vm:~$ qemu-system-ppc64 --version
```

```
QEMU emulator version 8.2.6 (qemu-8.2.6-3.fc40)
```

```
Copyright (c) 2003-2023 Fabrice Bellard and the QEMU Project developers
```

??? QEMU ????? ps, crontab, cron, java ?????

Install AIX from CD-ROM

Create a VM disk

```
mkdir aix72VM
cd aix72VM
qemu-img create -f qcow2 hdisk0.qcow2 20G
```

?: AIX ??? 7200-03-00 ????????

aix_7200-04-00-1937_1of2_112019.iso

```
cd aix72VM
mv aix_7200-04-00-1937_1of2_112019.iso AIX72.iso
```

Boot from cd-rom

```
cd aix72VM

qemu-system-ppc64 -cpu POWER8 \
-machine pseries -m 4096 -serial stdio \
-drive file=hdisk0.qcow2,if=none,id=drive-virtio-disk0 \
-device virtio-scsi-pci,id=scsi \
-device scsi-hd,drive=drive-virtio-disk0 \
-cdrom $PWD/AIX72.iso \
-prom-env "boot-command=boot cdrom:" \
-prom-env "input-device=/vdevice/vty@71000000" \
-prom-env "output-device=/vdevice/vty@71000000"
```

Type 1 and press Enter

```
***** 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.
Escribiu 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.
```

0c31

Press Enter

```
>>> 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 F4 Installation in deutscher Sprache 4 eingeben
       und 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]: █
```

Type 2

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 █
```

Type 4

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.....New and Complete Overwrite
  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 ALL data on the
                    | destination disk hdisk0.
>>> Choice [0]: 4
```

Type 5

```
1. Graphics Software..... Yes
2. System Management Client Software..... Yes
3. OpenSSH Client Software..... No
4. OpenSSH Server Software..... No
5. Enable System Backups to install any system..... Yes
   (Installs all devices)

>>> 6. Install More Software

    0 Install with the current settings listed above.

    88 Help ?
    99 Previous Menu

>>> Choice [6]: 5
```

Type 0

```

1. Graphics Software..... Yes
2. System Management Client Software..... Yes
3. OpenSSH Client Software..... No
4. OpenSSH Server Software..... No
5. Enable System Backups to install any system..... No
   (Installs all devices)

>>> 6. Install More Software

    0 Install with the current settings listed above.

    88 Help ?
    99 Previous Menu

>>> Choice [6]: 0

```

Press Enter to install AIX

```

Disks: hdisk0
Cultural Convention: en_US
Language: en_US
Keyboard: en_US
Graphics Software: Yes
System Management Client Software: Yes
OpenSSH Client Software: No
OpenSSH Server Software: No
Enable System Backups to install any system: No
Selected Edition: standard

Optional Software being installed:

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

```

????????? AIX ????????????

?? Ctrl + C ??

Please wait...

Approximate	Elapsed time
% tasks complete	(in minutes)

```
Set_Bootlist: Could not set the bootlist to:
hdisk0      .
The boot device must be set in the host KVM.
Press 1 to continue: █
```

Fix boot issue

Boot from cd-rom

```
cd aix72VM
```

```
qemu-system-ppc64 -cpu POWER8 \
-machine pseries -m 4096 -serial stdio \
-drive file=hdisk0.qcow2,if=none,id=drive-virtio-disk0 \
-device virtio-scsi-pci,id=scsi \
-device scsi-hd,drive=drive-virtio-disk0 \
-cdrom $PWD/AIX72.iso \
-prom-env "boot-command=boot cdrom:" \
-prom-env "input-device=/vdevice/vty@71000000" \
-prom-env "output-device=/vdevice/vty@71000000"
```

Type 1 and press Enter

```
***** 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 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.

```
0c31
```

Press Enter

```
>>> 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 F4 Installation in deutscher Sprache 4 eingeben
      und 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]:
```

Type 3

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]: 3

Type 0

If you choose to access a root volume group, you will not be able to return to the Base Operating System Installation menus without rebooting.

Type the number of your choice and press Enter.

- 0 Continue

- 88 Help ?
- >>> 99 Previous Menu

>>> Choice [99]: 0

Type 1

[illegible]

```
-----  
Volume Group ID 000000000000000000000000192375ffe21 includes the following  
logical volumes:  
  
      hd5          hd6        hd8           hd4         hd2       hd9var  
hd3            hd1     hd10opt   hd11admin lg_dumplv livedump  
  
-----
```

Type the number of your choice and press Enter.

- 1) Access this Volume Group and start a shell
- 2) Access this Volume Group and start a shell before mounting filesystems

99) Previous Menu

Choice [99]: 1 |

????????

```
Changed: ipl_blv
Changed: ipldevice
mergedev replaced 55 files in the hardfile /dev directory
Checking and mounting the /tmp filesystem.
```

```
The current volume is: /dev/hd3
Primary superblock is valid.
Checking and mounting the /var filesystem.
```

```
The current volume is: /dev/hd9var
Primary superblock is valid.
Checking and mounting the /opt filesystem.
```

```
The current volume is: /dev/hd10opt
Primary superblock is valid.
Filesystems mounted for maintenance work.
#
```

Fix boot issue

```
cd /sbin/helpers/jfs2
mv fsck64 fsck64.old
ln -s fsck fsck64

mv logredo64 logredo64.old
ln -s logredo logredo64

sync;sync;
halt
```

First boot from hdisk

```
cd aix72VM

qemu-system-ppc64 -cpu POWER8 \
-machine pseries -m 4096 -serial stdio \
-drive file=hdisk0.qcow2,if=none,id=drive-virtio-disk0 \
-device virtio-scsi-pci,id=scsi \
-device scsi-hd,drive=drive-virtio-disk0 \
-cdrom $PWD/AIX72.iso \
-prom-env "boot-command=boot hdisk:" \
```

```
-prom-env "input-device=/vdevice/vty@71000000" \  
-prom-env "output-device=/vdevice/vty@71000000"
```

Type vt100

```
Set Terminal Type  
The terminal is not properly initialized. Please enter a terminal type  
and press Enter. Some terminal types are not supported in  
non-English languages.  
  
ibm3101      tvi912      vt330      aixterm  
ibm3151      tvi920      vt340      dtterm  
ibm3161      tvi925      wyse30     xterm  
ibm3162      tvi950      wyse50     lft  
ibm3163      vs100      wyse60     sun  
ibm3164      vt100      wyse100  
ibmpc        vt320      wyse350  
  
+-----Messages-----  
| If the next screen is unreadable, press Break (Ctrl-c)  
| to return to this screen.  
|  
88  Help ?  
  
>>> Choice []: vt100
```

Select: Accept License Agreements

“ Tips: ?? Ctrl + C
??

Software License Agreements

Move cursor to desired item and press Enter.

Show Installed License Agreements

Accept License Agreements

F1=Helpssing

Esc+9=Shell

F2=Refresh

Esc+0=Exit

F3=Cancel

Enter=Do

Esc+8=Image

Select: Accept Software Maintenance Terms and Conditions

Software Maintenance Agreement

Move cursor to desired item and press Enter.

View Software Maintenance Terms and Conditions

Accept Software Maintenance Terms and Conditions

F1=Helpsing

Esc+9=Shell

F2=Refresh

Esc+0=Exit

F3=Cancel

Enter=Do

Esc+8=Image

Select: Set root Password

“ Tip: ????????????? Task Completed - Exit to
Login????????????????????????????????

Installation Assistant

Move cursor to desired item and press Enter.

Set Date and Time

Set root Password

Configure Network Communications

Install Software Applications

System Workload Partition Software Maintenance

Using SMIT (information only)

Tasks Completed - Exit to Login

F1=Helpsing

F2=Refresh

F3=Cancel

Esc+8=Image

Esc+9=Shell

Esc+0=Exit

Enter=Do

?????? root ????

AIX Version 7

Copyright IBM Corporation, 1982, 2019.

Console login:

Post-tasks

- Disable some problematic services

```
rmitab diagd  
rmitab rcnfs  
rmitab aso  
rmitab clcomd  
rmitab pfcdaemon  
stopsrc -s clcomd  
stopsrc -s pfcdaemon
```

- Network setup

On Linux)

net_tap.sh:

```
BRIDGE=virbr0  
NETWORK=192.168.99.0  
NETMASK=255.255.255.0  
GATEWAY=192.168.99.1  
DHCP RANGE=192.168.99.2,192.168.99.50  
TAP=tap0  
  
sudo ip link add $BRIDGE type bridge  
sudo ip link set dev $BRIDGE up  
sudo ip addr add dev $BRIDGE $GATEWAY/$NETMASK  
  
sudo ip tuntap add $TAP mode tap  
sudo ip link set $TAP master $BRIDGE  
sudo ip link set up dev $TAP  
  
# Uncomment the following lines to enable the DHCP server  
#dns_cmd=(  
#  dnsmasq  
#  --strict-order  
#  --except-interface=lo  
#  --interface=$BRIDGE  
#  --listen-address=$GATEWAY  
#  --bind-interfaces  
#  --dhcp-range=$DHCP RANGE
```

```
# --conf-file=""  
# --pid-file=/var/run/qemu-dnsmasq-$BRIDGE.pid  
# --dhcp-leasefile=/var/run/qemu-dnsmasq-$BRIDGE.leases  
# --dhcp-no-override  
#)  
#echo ${dns_cmd[@]} | sudo bash
```

Run net_tap.sh

```
bash net_tap.sh
```

Allow access to internet

```
sudo firewall-cmd --permanent --zone=public --add-interface=tap0  
sudo firewall-cmd --permanent --add-masquerade  
sudo firewall-cmd --reload
```

Boot with network interface tap0

```
qemu-system-ppc64 -cpu POWER8 \  
-machine pseries -m 4096 -serial mon:stdio \  
-drive file=hdisk0.qcow2,if=none,id=drive-virtio-disk0 \  
-device virtio-scsi-pci,id=scsi \  
-device scsi-hd,drive=drive-virtio-disk0 \  
-cdrom $PWD/AIX72.iso \  
-net nic -net tap,script=no,ifname=tap0 \  
-prom-env "boot-command=boot disk:" \  
-nographic
```

On AIX)

```
# Check the network interface  
lsdev -Cc if  
lsdev -Cc adapter  
  
# Set the ip  
chdev -l en0 -a netaddr=192.168.99.100 -a netmask=255.255.255.0 -a state=up  
route add 0 192.168.99.1  
# Alternatively, using the following command instead  
/usr/sbin/mkktcpip -h'aixvm' -a'192.168.99.100' -m'255.255.255.0' -i'en0' -g'192.168.99.1' -A'no' -t'N/A'
```



```
echo "nameserver 1.1.1.1" > /etc/resolv.conf
```

- Increase the filesystem size

```
lsdev -Cc disk
lscfg -vl hdisk0
chfs -a size=+1024M /home
chfs -a size=+2048M /opt
chfs -a size=+512M /tmp
chfs -a size=+2048M /usr
chfs -a size=+1024M /var
```

- Install OpenSSH

```
mount -v cdrfs -o ro /dev/cd0 /mnt
mkdir /tmp/ssh_install
cd /mnt/installp/ppc
cp openssh* /tmp/ssh_install
cd /tmp/ssh_install
installp -acgXYd . openssh.base openssh.license openssh.man.en_US openssh.msg.en_US
lssrc -s sshd
```

- Fix the RPM issue

“ error: cannot open Packages index using db4 - Invalid argument (22)
error: cannot open Packages database in /opt/freeware/packages
error: db4 error(22) from dbenv->open: Invalid argument

Solution: `fixrpm.sh`

```
#!/usr/bin/ksh

cd /opt/freeware
rm -f *.rpm.packages.tar
tar -chvf `date +%d%m%Y`.rpm.packages.tar packages
rm -f /opt/freeware/packages/_*
/usr/bin/rpm --rebuilddb

exit 0
```

Edit /etc/initab, insert the line after the rctcpip

```
rctcpip:23456789:wait:/etc/rc.tcpip > /dev/console 2>&1 # Start TCP/IP daemons  
fixrpm:23456789:once:/fixrpm.sh > /dev/null 2>&1 # Added by Alang
```

- Install AIX Toolbox

Download the files

- dnf_aixtoolbox.sh :
https://public.dhe.ibm.com/aix/freeSoftware/aixtoolbox/ezinstall/ppc/dnf_aixtoolbox.sh
- openssl-1.1.2.2000.tar.Z :
https://www.ibm.com/resources/mrs/assets?source=aixbp&S_PKG=openssl

```
cd /home/worktmp  
uncompress openssl-1.1.2.2000.tar.Z  
tar -xvf openssl-1.1.2.2000.tar  
cd openssl-1.1.2.2000  
installp -qaXFY -d . openssl.base openssl.license openssl.man.en_US  
openssl version
```

```
cd /home/worktmp  
rpm --rebuilddb  
ksh dnf_aixtoolbox.sh -y  
/opt/freeware/bin/dnf update  
/opt/freeware/bin/dnf install bash
```

- Optional tasks

> Custom the prompt, create the profile `/.profile`

```
PS1="``whoami` `hostname -s`:""${PWD##*/}> "
```

> Timezone

smitty > System Environments > Change/Show Date and Time > Change Time Zone Using System

```
echo $TZ
```

> The ordering of certain name resolution services

?? ping ??????????????

Edit: `/etc/netsvc.conf`

```
hosts = local, bind4
```

> Set the environment variables

Edit: `/etc/environment`

```
# Fix for not properly displaying with smitty on the tmux
TERM=xterm
```

??????

- ?? CD ISO ?

??qemu ??? -cdrom `/path/to/your-cd.iso`

```
qemu-system-ppc64 -cpu POWER8 \
-machine pseries -m 4096 -serial mon:stdio \
-drive file=hdisk0.qcow2,if=none,id=drive-virtio-disk0 \
-device virtio-scsi-pci,id=scsi \
-device scsi-hd,drive=drive-virtio-disk0 \
-cdrom $PWD/AIX72.iso \
-net nic -net tap,script=no,ifname=tap0 \
-prom-env "boot-command=boot disk:" \
-nographic
```

AIX ????

```
mount -v cdrfs -o ro /dev/cd0 /mnt
```

- ???2?????

? Linux ????? 5G ??? `hdisk1.qcow2`

```
cd aix72VM
qemu-img create -f qcow2 hdisk1.qcow2 5G
```

????????????

```
-drive file=hdisk1.qcow2,if=none,id=drive-virtio-disk1 \  
-device scsi-hd,drive=drive-virtio-disk1 \
```

??????

```
qemu-system-ppc64 -cpu POWER8 \  
-machine pseries -m 4096 -serial mon:stdio \  
-cdrom $PWD/AIX72.iso \  
-device virtio-scsi-pci,id=scsi \  
-drive file=hdisk0.qcow2,if=none,id=drive-virtio-disk0 \  
-device scsi-hd,drive=drive-virtio-disk0 \  
-drive file=hdisk1.qcow2,if=none,id=drive-virtio-disk1 \  
-device scsi-hd,drive=drive-virtio-disk1 \  
-net nic -net tap,script=no,ifname=tap0 \  
-prom-env "boot-command=boot disk:" \  
-nographic -smp 2
```

? AIX ??????? hdisk1

```
root@aixvm:> lspv  
hdisk0      00000000375ffb46      rootvg      active  
hdisk1      none                  None  
  
root@aixvm:> lsdev -Cc disk  
hdisk0 Available 00-10 MPIO Other Virtio SCSI Disk Drive  
hdisk1 Available 00-10 MPIO Other Virtio SCSI Disk Drive  
  
root@aixvm:> lscfg -vpl hdisk1  
hdisk1      qemu_virtio-scsi-pci:0000:00:02.0-LW_0  MPIO Other Virtio SCSI Disk Drive  
  
Manufacturer.....QEMU  
Machine Type and Model.....QEMU HARDDISK  
Part Number.....  
ROS Level and ID.....322E352B  
Serial Number.....  
EC Level.....  
FRU Number.....  
Device Specific.(Z0).....00000512FA000012
```

Device Specific.(Z1).....
Device Specific.(Z2).....
Device Specific.(Z3).....
Device Specific.(Z4).....
Device Specific.(Z5).....
Device Specific.(Z6).....

PLATFORM SPECIFIC

Name: disk
Node: disk
Device Type: block

- ?? vCPU

?? QEMU ?? 1 vCPU???? AIX ?????????????? vCPU?

qemu-system-ppc64 ??????

-nographic -smp 2,sockets=2,cores=1,threads=1

- ?????????

qemu-system-ppc64 ?????????????

-net nic \
-net nic \
-net tap,script=no,ifname=tap0 \

????? mac addr.

-net nic,macaddr=56:44:45:30:31:31 \
-net nic,macaddr=56:44:45:30:31:32 \
-net tap,script=no,ifname=tap0 \

References

- [AIX on qemu-system-ppc64](#)
- [Run AIX 7.2 on x86 with QEMU – Kwakou SysAdmin](#)

- [Qemu?????AIX 7.2 ?? - ????? - ??? \(cnblogs.com\)](#)
- [Run your AIX VM on x86 using KVM and QEMU \(ibm.com\)](#)
- [qemu7????aix72,?????????_aix 7.2??qcow2???????-CSDN??](#)
- [???? AIX 7.2 ??? QEMU VM](#)
- [AIX 7.2 ????? - ???{????????}??? \(jia.je\)](#)
- [AIX for System Administrators: DEVOPS - QEMU \(aix4admins.blogspot.com\)](#)
- YT: [AIX 7.2 installation in QEMU - YouTube](#)
- YT: [Install AIX on QEMU using virsh and virt-manager tools - YouTube](#)
- YT: [Updates on Install AIX and run PowerHA using virsh and virt-manager - YouTube](#)
- [libvirt: QEMU command-line passthrough](#)

Revision #105

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