

IBM AIX

AIX??IBM??UNIX??Advanced Interactive
executive????????????????????Advanced IBM Unix??"Advanced
Interactive eXecutive"?

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Migrate System Accounts to another Server

Cloning AIX users and groups between servers

```
# one-liner to generate the commands to clone groups
lsgroup -c -a id ALL | grep -v ^# | awk -F: '{print "mkgroup id=" $2, $1}'

# one-liner to generate the commands to clone users
lsuser -c -a id pgrp groups home shell gecos ALL | grep -v ^# | awk -F: '{print "useradd -m -u", $2, "-g", $3, "-G", $4, "-c \"" $7 "\" -d ", $5, $1}'
```

Copying AIX password hashes between servers

```
# grep -p root /etc/security/passwd
root:
password = 2zfymAdUyNdA.
lastupdate = 1360555127

echo 'root:2zfymAdUyNdA.' | chpasswd -ec
```

gen_reset_password.sh:

```
#!/usr/bin/ksh

for user in `lsuser -a ALL`; do
    [ -n "$1" -a "$user" != "$1" ] && continue
    if grep -p ^${user}: /etc/security/passwd | grep -q "password = "; then
        hash=`grep -p ^${user}: /etc/security/passwd | grep "password = " | awk -F: '{print $2}`
        echo "echo '${user}:${hash}' | chpasswd -ec"
    fi
done
```

```
# ./gen_reset_password.sh
echo 'root:2zfymAdUyNdA.' | chpasswd -ec
```

```
echo 'daemon:*' | chpasswd -ec
echo 'bin:*' | chpasswd -ec
echo 'sys:*' | chpasswd -ec
echo 'adm:*' | chpasswd -ec
echo 'uucp:*' | chpasswd -ec
echo 'guest:*' | chpasswd -ec
echo 'nobody:*' | chpasswd -ec
echo 'lpd:*' | chpasswd -ec
echo 'testusr1:MRGY5M7I56OTA' | chpasswd -ec
echo 'testusr2:skG.DjnbSmVaA' | chpasswd -ec
echo 'testusr3:EdRZo9SPb1Jig' | chpasswd -ec
echo 'testusr4:hk3qpcroid1qg' | chpasswd -ec
echo 'testusr5:1XaeSLhwCv19s' | chpasswd -ec
```

AIX ?????

Install package Isof

Where to download the Isof, bind, rsyslog, openssh, openssl, etc packages?

- URL:

https://www.ibm.com/resources/mrs/assets/packageList?source=aixbp&lang=en_US

Isof_4.892.tar

```
tar xf Isof_4.892.tar
cd Isof_4.892
installp -acgXYd . Isof.base Isof.license Isof.man.en_US
Isof -v
```

```
tar xf Isof_4.892.tar
cd Isof_4.892
smitty installp

# Install Software
# INPUT device / directory for software  [.] << Input a dot
# SOFTWARE to install                    [_all_latest] << Esc + 4, Esc + 7
# ACCEPT new license agreements?         yes
```

User & Group

```
# Create a new user
mkuser admin="false" pgrp="staff" gecos="Test User" test3
mkuser admin="false" pgrp="staff" groups="sshusers" gecos="Test User" test3

# Remove a user
rmuser -p <user-name>
```

Network

Check the interface

```
lsdev -Cc if
lsdev -Cc adapter
lscfg -vpl ent0
lsattr -El ent0
lsattr -El en0
```

Configure the network

```
# Set the ip/netmask/gateway
/usr/sbin/mktcpip -h'aixvm' -a'192.168.99.100' -m'255.255.255.0' -i'en0' -g'192.168.99.1' -A'no' -t'N/A'

# Set the DNS server addr
echo "nameserver 1.1.1.1" > /etc/resolv.conf
```

Check the port opened

```
netstat -Aan
```

??????

```
# Login Failed
who /etc/security/failedlogin | tail -50

# Check the number of previous unsuccessful logins for the account to confirm it is blocked
lsuser -a account_locked unsuccessful_login_count {ALL|user_name}

# To check with particular user's last password changed
pwdadm -q {user_name}
lssec -f /etc/security/passwd -a lastupdate -s {user_name}
lsuser -a lastupdate {user_name}

## Convert the EPOCH-TIME
perl -le 'print scalar localtime $ARGV[0]' {epochtime}

# Reset unsuccessful login counter
chsec -f /etc/security/lastlog -a unsuccessful_login_count=0 -s {user_name}

# Unlock the locked account
```

```
chuser account_locked=false {user_name}

# Lock account
chuser account_locked=true {user_name}

# List the locked accounts
lsuser ALL | sed -n '/account_locked=true/p' | sed '/sshd/d' | awk '{print $1}'
```

?????????

- ??????????
- ???retry ??????????????????????
- ????????????????

```
chuser loginretries=5 <username>
lsuser -a loginretries <username>
```

Mount CD-ROM & ISO

```
# Mount CD-ROM
mount -V cdrfs -o ro /dev/cd0 /mnt

# Mount/Umount ISO file
loopmount -i aix61_dvd.iso -o "-V cdrfs -o ro" -m /mnt
loopumount -l loop0 -m /mnt
```

?? HMC root

- [?? HMC8 ? HMC9 ? root ??](#)

Restrictd users to switch to root

```
# Create a group sysadm
mkgroup sysadm

# Add the user1 that is allowed to su to root into the group sysadm
chgrpmem -m + user1 sysadm
lsgroup sysadm

chsec -f /etc/security/user -s root -a sugroups=sysadm
# Reset to the default, sugroups=ALL
```

```
# Alternatively
smitty user

# Change / Show Characteristics of a User

# User Name                [root]

# SU GROUPS                 [sysadm]
```

Restricted Shell

???????????????? Shell ????????

???

- [How to Use a Restricted Shell](#)

Default Shell?

```
# Change the default shell for the user to the restricted shell such as rksh or Rsh.
chuser shell=/usr/bin/rksh <user-name>

# OR

chsh <user-name> /usr/bin/rksh
```

.profile?

```
# Add the commands that are allowd to run by the user into the directory.
mkdir /usr/bin/restricted
cd /usr/bin/restricted
ln -s /usr/bin/date date

# Create a .profile in the user's home directory and set the PATH environment variable to
# a directory containing all of the commands you want the user to be able to run
export PATH=/usr/bin/restricted
```

Core dump

```
# ☐ core file
dbx -C ./core

(dbx) corefile

(dbx) dump
```

```
(dbx) quit
```

System dump

errpt:

```
67145A39 0413095315  U  S  SYSDUMP  SYSTEM DUMP
```

Copy the dump from the dump device to a file using the `savecore` command:

```
savecore .
```

“ Yes, the period is necessary. It indicates you want the dump copied to your current directory

`savecore` will copy the dump to your current directory, and name it:

```
vmcore.0.BZ
```

Uncompress the dump using the `dmpuncompress` command:

```
dmpuncompress vmcore.0.BZ
```

Lastly, format the dump:

```
/usr/lib/ras/dmptns/dmpfmt -c vmcore.0
```

Reading a Dump

```
kdb vmcore.0 vmunix.0
```

????

Memory - svmon

```
# For a summary of the top 15 processes using memory on the system
svmon -Pt15 | perl -e 'while(<>){print if($.==2||$&&&!$s++);$s=0 if(/^-+$/)}'
```


Pid	Command	Inuse	Pin	Pgsp	Virtual	64-bit	Mthrd	16MB
18547096	db2sysc	3956861	12944	282407	4007901	Y	Y	N
19333470	db2sysc	690873	12944	26772	688572	Y	Y	N
19726694	db2sysc	271696	12944	6198	287133	Y	Y	N
13500914	db2sysc	263458	12943	18957	285159	Y	Y	N
1966448	shlap64	109377	12900	3432	122071	Y	N	N
13631924	db2vend	105589	12900	597	115784	Y	N	N
19005734	db2sysc	105082	12902	409	114965	Y	Y	N
20709798	db2sysc	105071	12900	409	114953	Y	N	N
20119938	db2sysc	105071	12900	409	114953	Y	N	N
20185458	db2sysc	105071	12900	408	114953	Y	N	N
15597848	db2vend	104222	12900	1771	115608	Y	N	N
21430722	db2sysc	103728	12900	1576	114777	Y	N	N
21037528	db2sysc	103724	12902	1576	114773	Y	Y	N
14025064	db2sysc	103696	12900	1608	114777	Y	N	N
18350424	db2sysc	103696	12900	1608	114777	Y	N	N

Sar

- [sar ?? - IBM ????](#)

🗨️ ??? sar: 0551-201 Cannot open /var/adm/sa/sa09??????? `sar -o /var/adm/sa/sa09 10`

```
# CPU
sar -u 2 10

# Mmemory
sar -r 2 10

# I/O
sar -b 2 10
```

iostat

```
iostat 2 10
```

Perl ??

??????????

```
perl -e "use LWP::UserAgent;"  
perl -e "use DBI;"
```

HTTP GET request

```
use LWP::UserAgent;  
  
my $ua = LWP::UserAgent->new;  
  
my $server_endpoint = "http://192.168.1.1:8000/service";  
  
# set custom HTTP request header fields  
my $req = HTTP::Request->new(GET => $server_endpoint);  
$req->header('content-type' => 'application/json');  
$req->header('x-auth-token' => 'kfksj48sdfj4jd9d');  
  
my $resp = $ua->request($req);  
if ($resp->is_success) {  
    my $message = $resp->decoded_content;  
    print "Received reply: $messagen";  
}  
else {  
    print "HTTP GET error code: ", $resp->code, "n";  
    print "HTTP GET error message: ", $resp->message, "n";  
}
```

HTTP POST request

```
use LWP::UserAgent;  
  
my $ua = LWP::UserAgent->new;  
  
my $server_endpoint = "http://192.168.1.1:8000/service";  
  
# set custom HTTP request header fields  
my $req = HTTP::Request->new(POST => $server_endpoint);  
$req->header('content-type' => 'application/json');  
$req->header('x-auth-token' => 'kfksj48sdfj4jd9d');
```

```
# add POST data to HTTP request body
my $post_data = '{ "name": "Dan", "address": "NY" }';
$req->content($post_data);

my $resp = $ua->request($req);
if ($resp->is_success) {
    my $message = $resp->decoded_content;
    print "Received reply: $messagen";
}
else {
    print "HTTP POST error code: ", $resp->code, "n";
    print "HTTP POST error message: ", $resp->message, "n";
}
```

NFS

```
# List NFS mount-points that were configured in /etc/filesystems
root@aixvm:> lsnsfsmnt -l
```

Name	Nodename	Mount Pt	VFS	Size	Options	Auto	Accounting
/dataVol/aix_nfs	fedoravm	/mnt/nfs	nfs	--	bg,hard,intr,retry=3,timeo=30,sec=sys	yes	no

????

bootinfo

```
# [ ] [ ] [ ] [ ] [ ]
bootinfo -v

# [ ] [ ] [ ] [ ] [ ]
bootinfo -b
```

bosboot

```
# [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
bosboot -ad hdisk0
```

bootlist

```
# [] normal/service [][][][]
```

```
bootlist -m normal -o
```

```
bootlist -m service -o
```

```
# [] normal/service [][][][]
```

```
bootlist -m normal hdisk0 hdisk1
```

```
bootlist -m service cd0 hdisk1
```

System Infomation

oslevel -s

7200-05-06-2320

prtconf

System Model: IBM pSeries (emulated by qemu)

Machine Serial Number: Not Available

Processor Type: PowerPC_POWER8

Processor Implementation Mode: POWER 8

Processor Version: PV_8_Compat

Number Of Processors: 2

Processor Clock Speed: 1000 MHz

CPU Type: 64-bit

Kernel Type: 64-bit

LPAR Info: 0 aix_on_kvm

Memory Size: 4096 MB

Good Memory Size: 4096 MB

Platform Firmware level: Not Available

Firmware Version: SLOF,HEAD

Console Login: enable

Auto Restart: true

Full Core: false

NX Crypto Acceleration: Not Capable

In-Core Crypto Acceleration: Capable, but not Enabled

...

INSTALLED RESOURCE LIST

The following resources are installed on the machine.

+/- = Added or deleted from Resource List.

* = Diagnostic support not available.

Model Architecture: chrp

Model Implementation: Uni-Processor, PCI bus

+ sys0	System Object
+ sysplanar0	System Planar
* vio0	Virtual I/O Bus
* ent0	Virtual I/O Ethernet Adapter (I-lan)
* vsa0	LPAR Virtual Serial Adapter
* vty0	Asynchronous Terminal
* pci0	PCI Bus
* scsi0	qemu_virtio-scsi-pci:0000:00:02.0 Virtio SCSI Client Adapter (f41a0800)
* hdisk4	qemu_virtio-scsi-pci:0000:00:02.0-LW_0 MPIO Other Virtio SCSI Disk Drive
* hdisk5	qemu_virtio-scsi-pci:0000:00:02.0-LW_0 MPIO Other Virtio SCSI Disk Drive
+ L2cache0	L2 Cache
+ mem0	Memory
+ proc0	Processor
+ proc1	Processor

lparstat -i

Node Name	: aixvm
Partition Name	: aix_on_kvm
Partition Number	: 0
Type	: Shared
Mode	: Capped
Entitled Capacity	: 2.00
Partition Group-ID	: 1
Shared Pool ID	: 1
Online Virtual CPUs	: 2
Maximum Virtual CPUs	: 2
Minimum Virtual CPUs	: 2
Online Memory	: 4096 MB
Maximum Memory	: 4096 MB
Minimum Memory	: 4096 MB
Variable Capacity Weight	: 128
Minimum Capacity	: 2.00

...

```
uname -L
```

```
0 aix_on_kvm
```

inittab ??

```
# List all items
lsitab -a

# Remove an item
rmitab nim
```

????

```
# List all services
lssrc -a
lssrc -a | grep active

# Check the service inetd
lssrc -s inetd
lssrc -ls inetd

# Start/Reload/Stop the service
startsrc -s xntpd
refresh -s xntpd
stopsrc -s xntpd
```

LPAR Check

```
# Lists details on the LPAR configuration
lparstat -i
```

UAK Check (Update Access Key)

```
# Check UAK (Update Access Key) Expiration
lparstat -u
```

UTF-8 locales

Check the current locale environment variables.

```
root@aixvm:> locale
LANG=en_US
LC_COLLATE="en_US"
LC_CTYPE="en_US"
LC_MONETARY="en_US"
LC_NUMERIC="en_US"
LC_TIME="en_US"
LC_MESSAGES="en_US"
LC_ALL=
```

```
root@aixvm:> locale -a
C
POSIX
en_US.8859-15
en_US.IBM-858
en_US.ISO8859-1
en_US
```

```
root@aixvm:> lspp -L bos.loc.*
Fileset          Level State Type Description (Uninstaller)
-----
bos.loc.iso.en_US 7.2.5.0 A  F  Base System Locale ISO Code
Set - U.S. English
```

Install the file set for en_US.UTF-8 from AIX Installer ISO

- file set: `bos.loc.utf.EN_US`

```
installp -qaXgY -d <path of install images> bos.loc.utf.EN_US
```

With smitty

```
smitty install_all
# Press F4 to select the INPUT device / directory for software
# Press F4 to select the SOFTWARE to install
# Use the "/" key to search for the fileset name
```

Applying the locale

```
root@aixvm:> locale -a
```

```
C
```

```
POSIX
```

```
EN_US.UTF-8
```

```
EN_US
```

```
en_US.8859-15
```

```
en_US.IBM-858
```

```
en_US.ISO8859-1
```

```
en_US.UTF-8
```

```
en_US
```

```
root@aixvm:> chlang -m EN_US.UTF-8 EN_US.UTF-8
```

```
# Relogin
```

```
root@aixvm:> locale
```

```
LANG=EN_US.UTF-8
```

```
LC_COLLATE="EN_US.UTF-8"
```

```
LC_CTYPE="EN_US.UTF-8"
```

```
LC_MONETARY="EN_US.UTF-8"
```

```
LC_NUMERIC="EN_US.UTF-8"
```

```
LC_TIME="EN_US.UTF-8"
```

```
LC_MESSAGES="EN_US.UTF-8"
```

```
LC_ALL=
```


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
- System/Database Recovery Exercise in compliance with ISO27001 (No Power Servers Required)

Prerequisites:

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

Updated by 2025/2/17: AIX 7200-04-00 ????? 7200-05-06-2320???????????????? 5 ??
10 ??

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.

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 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 ?      | +-----+
99 Previous Menu | | WARNING: Base Operating System Installation will
                | | 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 ?           |  +-----+
      99  Previous Menu   |  | WARNING: Base Operating System Installation will
                          |  | 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.  
Escriuiu 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.
```

```
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

Type 1

```
Volume Group ID 00000000000000000000192375ffe21 includes the following  
logical volumes:
```

hd5	hd6	hd8	hd4	hd2	hd9var
hd3	hd1	hd10opt	hd11admin	lg_dump1v	livedump

```
Volume Group ID 0000000000000000000000000192375ffe21 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.
```

1

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

[illegible]

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=Helpssing

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

lsitab -a
lssrc -a
```

- 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=$GATEWAY
# --bind-interfaces
# --dhcp-range=$DHCPRANGE
# --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/mktcpip -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/install/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
```

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

“ ?????????????? disk id ?????? AIX ?? hdisk ???????

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

? AIX ???????? hdisk1

```
root@aixvm:> lspv
hdisk0      00000000375ffb46      rootvg      active
hdisk1      00000000fdb40f0f      rootvg      active

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:> lsmpio -q
Device      Vendor Id  Product Id   Size    Volume Name
-----
hdisk0      QEMU      QEMU HARDDISK 20.00GiB -
hdisk1      QEMU      QEMU HARDDISK 20.00GiB -

root@aixvm:> lspv -u
hdisk0      00000000375ffb46      rootvg      active      33130drive-virtio-disk00DQEMU
HARDDISK04QEMUvrtscsi      8eca6bf6-b924-0872-c039-8cb2a62de21a
hdisk1      00000000fdb40f0f      rootvg      active      33130drive-virtio-disk10DQEMU
HARDDISK04QEMUvrtscsi      c618c61a-8c74-19e4-6cfa-beae464aaf14
```

- ????? 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 \
```

- ?? CPU ??

POWER 8

```
-cpu POWER8 -machine pseries
```

POWER 9

```
-cpu POWER9 -machine pseries,ic-mode=xics
```

- ???????

```
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,sockets=2,cores=1,threads=1
```

- NFS Share

- NFS Server: Fedora VM (192.168.99.1)

- NFS Client: AIX VM (192.168.99.100)

NFS Server on Fedora VM)

```
# Install the dependencies packages
[cobra@fedora-vm ~]$ rpm -qa | grep nfs
libnfsidmap-2.7.1-0.fc40.x86_64
sssd-nfs-idmap-2.9.5-1.fc40.x86_64
nfs-utils-2.7.1-0.fc40.x86_64

# Configure the firewall
sudo firewall-cmd --permanent --add-service=nfs
sudo firewall-cmd --permanent --add-service=mountd
sudo firewall-cmd --permanent --add-service=rpc-bind
sudo firewall-cmd --reload
```

Edit `/etc/exports.d/aix_nfs.exports`

```
/dataVol/aix_nfs 192.168.99.100(rw,sync,no_root_squash)
```

Startup the service

```
[cobra@fedora-vm ~]$ sudo systemctl enable nfs-server --now
```

NFS Client on AIX VM)

- IP: 192.168.99.1 ?? AIX ? Gateway??????? Fedora ? IP?

```
showmount -e 192.168.99.1
mkdir /mnt/nfs
mount 192.168.99.1:/dataVol/aix_nfs /mnt/nfs
```

????

????

1. AIX ?? : ? 7200-05-06-2320 ? 7200-05-08-2420?????? 8 GB??????? 2.5 ???
2. AIX ?? : ? 7200-04-00-0000 ? 7200-05-06-2320?????? 7.9GB??????? 5 ?? 10 ??

3. DB2 Server: ?? v11.1 ?? 51 ????? FP 7 ?? 1.5 ???

I/O ??

1. AIX ?? 4GB RAM ????? Fedora Linux ?? 12 GB?? RAM???? Fedora Linux ?? SWAP memory???? AIX ? I/O ???
2. ?? Fedora Linux ????? AIX VMs?Fedora Linux ?????????????
3. ?????? AIX ????????????? scp ?????????? Fedora Linux ?????? Fedora Linux ?????????????????????

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

- / : 1GB
- /usr : 5GB
- /var : 1.5GB
- /tmp : 1GB
- /opt : 7GB (For DB2 Server)

????? AIX ??

- [???? AIX 7.2 ??? QEMU VM](#)
- [AIX_QEMU_blog.pdf](#)

????

1. ?? `lspp -L` ?????????? `-l` ????? AIX VM ???
2. ?? DB2 Server 11.1 ????? FixPack ??? Instance ?????????? db2chgpath ?????
3. ?? AIX ?????????? VM disk hdisk0.qcow2 ?????????? AIX ?????????? hdisk0.qcow2 ??????????
 - ?????? AIX VM?? Host OS ??? `virt-sparsify hdisk0.qcow2 hdisk0-shrink.qcow2` ????? hdisk0-shrink.qcow2 ?? AIX VM disk?

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 ????? - ???{????????????}??? \(jia.je\)](#)
- [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](#)
- [Install AIX on x86 using QEMU](#)

Learning

Tutorials

- YT: [Aix administration - YouTube](#)
- YT: [online AIX training for beginners - YouTube](#)
- YT: [AIX in Focus - YouTube](#)
- YT: [IBM AIX - YouTube](#)
- [Chris's AIX Blog](#)

Open Source Packages

- [AIX Open Source Packages](#)

AIX VM with virt-manager

??

1. AIX???????? hdisk0 ?????????? SCSI ?????????????? `qemu-img create -f qcow2
hdisk0.qcow2 20G ??????????????`
2. ?? xml ?????? virt-manager ?????????????????????? `virsh edit <vm-name> ?`

XML

- ?? iso ???
- XML ?????? `<domain type=....> ? <qemu:comandline> </qemu:commandline>`

```
<domain type='qemu' xmlns:qemu='http://libvirt.org/schemas/domain/qemu/1.0'>
...
<devices>
...
</devices>
<qemu:commandline>
  <qemu:arg value='-prom-env'/>
  <qemu:arg value='boot-command=boot cdrom:'/>
  <qemu:arg value='-cdrom'/>
  <qemu:arg value='/home/cobra/aix72VM2/AIX72.iso'/>
</qemu:commandline>
</domain>
```

VM Configuration

- 概覽
- 系統訊息
- 性能
- CPU 數
- 記憶體
- 開機選項
- SCSI CDROM 1
- SCSI 磁碟 1
- NIC :9b:e4:d1
- 繪圖板
- 鍵盤
- 顯示協議 Spice
- 音效卡 ich6
- 串列埠 1
- Channel (qemu-ga)
- Channel (spice)
- 顯示卡 VGA
- 控制器 USB 0
- 控制器 PCI 0
- 控制器 VirtIO 串列埠 0
- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D)XML(X)

基本詳情

名稱(N) : AIX-VM

UUID : 53259c57-4ddd-4a57-8c9d-856a5c35e811

狀態 : 已關閉

標題(I) :

描述(E) :

虛擬機管理程式詳情

虛擬機管理程式 : QEMU TCG

架構 : ppc64

模擬器 : /usr/bin/qemu-system-ppc64

機器類型(T) : pseries-8.2

- 概覽
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- SCSI CDROM 1
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- NIC :9b:e4:d1
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- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

作業系統(T)

一般通用或未知的作業系統。不建議使用。

- 概覽
- 系統訊息
- 性能
- CPU 數
- 記憶體
- 開機選項
- SCSI CDROM 1
- SCSI 磁碟 1
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- 繪圖板
- 鍵盤
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- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

CPU 數

邏輯主機 CPU 數： 4

vCPU 分配(A)：

 - +

配置(R)

☐ 複製主機 CPU 配置(U)

型號(O)：

POWER8



☐ 啟用可用的 CPU 安全漏洞紓解措施

▶ 拓撲(P)

- 概覽
- 系統訊息
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- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

記憶體

總主機記憶體： 5917 MiB

目前分配(L)： 4096 — + MiB

最大分配(X)： 4096 — + MiB

☐ 啟用共用記憶體(M)

- 概覽
- 系統訊息
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- SCSI 磁碟 1
- NIC :9b:e4:d1
- 繪圖板
- 鍵盤
- 顯示協議 Spice
- 音效卡 ich6
- 串列埠 1
- Channel (qemu-ga)
- Channel (spice)
- 顯示卡 VGA
- 控制器 USB 0
- 控制器 PCI 0
- 控制器 VirtIO 串列埠 0
- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

自動啟動

☐ 主機開機時啟動虛擬機(U)

開機裝置順序

☐ 啟用開機選單(N)

☒ SCSI CDROM 1

☐ SCSI 磁碟 1

☐ NIC :9b:e4:d1

▶ 直接核心開機(E)

- 概覽
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- SCSI 磁碟 1
- NIC :9b:e4:d1
- 繪圖板
- 鍵盤
- 顯示協議 Spice
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- 控制器 PCI 0
- 控制器 VirtIO 串列埠 0
- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

```
<domain xmlns:qemu="http://libvirt.org/schemas/domain/qemu/1.0" type="qemu">
  <name>AIX-VM</name>
  <uuid>53259c57-4ddd-4a57-8c9d-856a5c35e811</uuid>
  <memory unit="KiB">4194304</memory>
  <currentMemory unit="KiB">4194304</currentMemory>
  <vcpu placement="static">2</vcpu>
  <os>
    <type arch="ppc64" machine="pseries-8.2">hvm</type>
  </os>
  <cpu mode="custom" match="exact" check="none">
    <model fallback="forbid">POWER8</model>
  </cpu>
  <clock offset="utc"/>
  <on_poweroff>destroy</on_poweroff>
  <on_reboot>restart</on_reboot>
  <on_crash>destroy</on_crash>
  <devices>
    <emulator>/usr/bin/qemu-system-ppc64</emulator>
    <disk type="file" device="cdrom">
      <driver name="qemu" type="raw"/>
      <source file="/home/cobra/aix72VM2/AIX72.iso"/>
      <target dev="sda" bus="scsi"/>
      <readonly/>
      <boot order="1"/>
      <address type="drive" controller="0" bus="0" target="0" unit="0"/>
    </disk>
    <disk type="file" device="disk">
      <driver name="qemu" type="qcow2"/>
      <source file="/home/cobra/aix72VM2/hdisk0.qcow2"/>
      <target dev="sdb" bus="scsi"/>
      <address type="drive" controller="0" bus="0" target="0" unit="1"/>
    </disk>
    <controller type="usb" index="0" model="qemu-xhci" ports="15">

```


- 概覽
- 系統訊息
- 性能
- CPU 數
- 記憶體
- 開機選項
- SCSI CDROM 1
- SCSI 磁碟 1
- NIC :9b:e4:d1
- 繪圖板
- 鍵盤
- 顯示協議 Spice
- 音效卡 ich6
- 串列埠 1
- Channel (qemu-ga)
- Channel (spice)
- 顯示卡 VGA
- 控制器 USB 0
- 控制器 PCI 0
- 控制器 VirtIO 串列埠 0
- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

虛擬磁碟

源路徑(P): /home/cobra/aix72VM2/AIX72.iso

裝置類型: SCSI CDROM 1

磁碟匯流排: SCSI

儲存大小: 3.50 GiB

▶ 進階選項(O)

- 概覽
- 系統訊息
- 性能
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- SCSI CDROM 1
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- 控制器 VirtIO 串列埠 0
- 控制器 VirtIO SCSI 0
- Panic 通知器

詳情(D) XML(X)

虛擬磁碟

源路徑(P) : /home/cobra/aix72VM2/hdisk0.qcow2

裝置類型 : SCSI 磁碟 1

磁碟匯流排 : SCSI

儲存大小 : 20.00 GiB

▶ 進階選項(O)

Update Fixpack & Interim Fix

Update 7200-04-00-0000 to 7200-05-06-2320

Update Fixpacks

Download

- Instruction: <https://www.ibm.com/support/pages/updating-new-technology-level-or-service-pack>
- Download: <https://www.ibm.com/support/fixcentral/aix/selectFixes?release=7.2&function=release>

???????

1. ?????????????????????????????????
2. ???? IBMid??????? Email ???
3. ??????
 1. HTTPS ??
 2. ??? ISO ?? (??? 7-8 GB)

Pre-Checks

1.System Backup

?? VG: rootvg ??????? PV?PV ???????? rootvg ????

```
# ?? VG: rootvg 0 hdisk1, 000 hdisk1 0000
alt_disk_copy -B -d hdisk1
```

NOTE: ?? VG: rootvg ??? PV ? Mirror??????????

```
# ?? rootvg 0 hdisk6
mkszfile
sed 's/COPIES= [2-3]/COPIES= 1/g' /image.data > /image.data.one_copy
```

```
nohup alt_disk_copy -B -i /image.data.one_copy -d hdisk6 > clonelog.log &
```

Optional: PV VG ??

```
exportvg hdisk6
```

2.Boot Image Verification

hd5

```
root@aixvm:> lslv -m hd5
```

```
hd5:N/A
```

LP	PP1	PV1	PP2	PV2	PP3	PV3
0001	0001	hdisk0				

3.Firmware

It is recommended to check and update the firmware level when a technology level update is being considered. In general, it's best to apply firmware updates before software updates, but that is not always the case.

4.Fileset Consistency

Ideally, it returns to the command line with no output. If you receive output and are unfamiliar with how to resolve it, call the support center for assistance before running your update.

```
lppchk -v
```

Install the fixpacks

H11072988.iso

```
mkdir /mnt/iso
```

```
loopmount -i H11072988.iso -o "-V cdrfs -o ro" -m /mnt/iso
```

1.???

installp

```
# Check if any EFI-X installed, if so, remove it before update.
```

```
lspp -e
```

```
emgr -r -L <EFI-X-Label>
```

```
# Using smitty
```

```
smitty install_latest
```

```
# Using CLI
```

```
installp -acd /mnt/iso bos.rte.install
```

```
# Check the version
```

```
lspp -L | grep bos.rte.install
```

- INPUT device / directory for software : [/mnt/iso]
- SOFTWARE to update : bos.rte.install
- PREVIEW only? (install operation will NOT occur) : no

2.PREVIEW: yes

```
smitty update_all
```

- INPUT device / directory for software : [/mnt/iso]
- SOFTWARE to update : _update_all
- PREVIEW only? (install operation will NOT occur) : yes
- COMMIT software updates? : no
- SAVE replaced files? : yes
- ...
- ACCEPT new license agreements? : yes

3.PREVIEW: no

- PREVIEW only? (install operation will NOT occur) : no

Post checks

Check the Technology Level (TL) and Service Pack (SP)

```
# Check TL
```

```
oslevel -r
```

```
# Check SP
```

```
oslevel -s
```

Check Fileset Consistency

```
# Ideally, it returns to the command line with no output.
```

```
lppchk -v
```

Interim Fix (APAR)

URL to check the APAR number

[https://www.ibm.com/support/pages/apar/\[apar number\]](https://www.ibm.com/support/pages/apar/[apar number])

Interim fix installation

```
# List all interim fixes on the system
```

```
emgr -l
```

```
emgr -l IJ50602m7a
```

```
# Preview & Install an interim fix package
```

```
emgr -p -e IJ50602m7a.240409.epkg.Z
```

```
emgr -X -e IJ50602m7a.240409.epkg.Z
```

FAQ

EFIX MANAGER LOCKS

“ EFIX MANAGER LOCKS

* * * ATTENTION * * *

The following selected filesets are locked by EFIX manager:

bos.rte.control

installp has halted this operation because one or more files in the filesets listed above are registered as having an EFIX. You must remove these EFIXES before performing operations on the given fileset.

To get a listing of all locked filesets and the locking EFI label, execute the following command:

```
# /usr/sbin/emgr -P
```

To remove the given EFI, execute the following command:

```
# /usr/sbin/emgr -r -L <EFI label>
```

For more information on EFI management please see the emgr man page and documentation.

Solution:

```
# List the EFI installed
```

```
emgr -l
```

```
# List the EFI locked
```

```
emgr -P
```

```
# Remove the EFI locked
```

```
emgr -r -L <EFI label>
```

Q & A

0516-1398 extendvg

“ 0516-1398 extendvg: The physical volume hdisk1, appears to belong to another volume group. Use the force option to add this physical volume to a volume group.

Solution:

```
extendvg -f rootvg hdisk1
```

File too large

“ ./H11072988.iso: File too large

Solution:

Edit: `/etc/security/limits`

```
root:  
    fsize = -1
```

Re-login then run the command

```
ulimit -a
```

vmount: Operation not permitted

???? NFS ??

“ mount: 1831-008 giving up on:
192.168.99.1:/dataVol/aix_nfs
vmount: Operation not permitted.

Solution:

```
# check nfs_use_reserved_ports if it is on 0 or 1
nfsso -a

# Change nfs_use_reserved_ports to 1 until nextboot
nfsso -o nfs_use_reserved_ports=1

# Make change to permanent value
nfsso -po nfs_use_reserved_ports=1
```

AIX LVM

PV

```
# Add a disk hdisk3 to a PV
## NOTE:  disk PV  lspv  pv-id
cfgmgr
chdev -l hdisk3 -a pv=yes
lspv

# Remove a PV from a disk hdisk3
## If done, the pv-id appears 'none'
chdev -l hdisk3 -a pv=clear
lspv

#  PV
lspv -M hdisk0

#  PV LVs
lspv -l hdisk0

# Check the hdisk VendorId/size
lsmpio -q
```

VG

```
# Create VG with 128M(PP size)
mkvg -y <vg-name> -s 128 hdisk1 hdisk2

# Add PVs hdisk3, hdisk4 to specific VG
extendvg <vg-name> hdisk3 hdisk4

# Remove a VG with PVs hdisk3, hdisk4
reducevg <vg-name> hdisk3 hdisk4
```

LV

```
# Create LV with 5G
## mklv -y <lv-name> -t jfs2 <vg-name> [LP-number|GB-size]
/usr/sbin/mklv -y'siview_lv' -tjfs2 smapvg 80
/usr/sbin/mklv -y'siview_lv' -tjfs2 smapvg 10G

# Remove a LV
rmlv <lv-name>
```

Filesystem

```
# Create a filesystem with /data
## -A: Whether the filesystem is mounted at each system restart.
## crfs -v jfs2 -A yes -d <lv-name> -m <mount-point> -a logname=INLINE
/usr/sbin/crfs -v 'jfs2' -A'yes' -d'siview_lv' -m'/home/siview' -a logname=INLINE
mount /home/siview

# Extend the size of 1024MB for specified filesystem
chfs -a size=+1024M /home
## Alternatively, resizing to specified number
chfs -a size=2048M /home

# Remove a filesystem
## Check if the mount-point has been closed/syncd
lslv -l <vg-name>
rmfs <mount-point>
```

?? Errpt

Sample #1

```
#!/usr/bin/env bash
#
# $0 = errptcheck_v3.sh
#
# Created: 05/16/2005 A-lang Hsu.
# Updated:
#   - v4, 11/19/2015 A-Lang
#   - v5, 11/17/2020 A-Lang
#
# This script will check the error log
# for new entries. Upon finding them, it will send an email to
# administrators containing a message indicating the change
# in errlog status, as well as the offending lines.
#
PATH=/bin:/sbin:/usr/bin:/usr/sbin:/usr/local/bin:/usr/es/sbin/cluster/utilities

tmpfile="errptcheck.$$"
trap "rm -f $tmpfile" EXIT

today="$(date +%Y-%m-%d)"
nowtime="$(date +%T)"

# Excluded identifier id
# 573790AA - The default log file has been changed.
# A3B02BE6 - sddsrv CAN'T WRITE ITS LOG FILE
#
#EXCLUDE_ID=" \
#573790AA \
#A3B02BE6 \
#"
EXCLUDE_ID=""
```

```

#
if $(which get_local_nodename >/dev/null 2>&1); then
    my_hostname=`hostname`#`get_local_nodename`
else
    my_hostname=`hostname`
fi

mail_subject="Warning:Hardware/Software error notification for host $my_hostname"
mail_to="alang@mycom.com"

#ec=`errpt -dH,S,U,O | grep -v "IDENTIFIER TIMESTAMP" | wc -l`
ERRGREP=""
n=0
for i in $EXCLUDE_ID;do
    n=$((n+1))
    if [ "$n" -eq 1 ];then
        ERRGREP="$i"
    else
        ERRGREP="$ERRGREP|$i"
    fi
done
if [ -z "$ERRGREP" ]; then
    ec=`errpt -dH,S,U,O | grep -v "IDENTIFIER TIMESTAMP" | wc -l`
else
    ec=`errpt -dH,S,U,O | grep -v "IDENTIFIER TIMESTAMP" | grep -vE "$ERRGREP" | wc -l`
fi

if [ "$ec" -ne "0" ] ; then
    ec=`echo $ec | bc`
    cat <<EOF > $tmpfile
#####
    This message was generated automatically by host ${my_hostname}.
    Please don't reply to this message.
#####

The checked time is ${today} ${nowtime}
${ec} new errors have been found on $my_hostname.
EOF

errlogl=`errpt -dH,S,U,O -a`

```

```
        cat <<EOF >> $tmpfile
Errlog details below:
${errlog!}
EOF
        mail -s "$mail_subject" "$mail_to" < $tmpfile;

        cat $tmpfile
fi
```

Sample #2

```
#!/bin/ksh
#
# $0 = errmon.sh
#
# Written 11/3/1998 Bill Verzal.
#
# This script will run every [interval] and check the error log
# for new entries. Upon finding them, it will send an email to
# administrators containing a message indicating the change
# in errlog status, as well as the offending lines.
#
if [ "$1" = "-v" ] ; then
    set -x
fi
lc="NULL"
tc="$lc"
# lc="last count"
# tc="this count"
#interval=900
interval=300
# Divide interval by 60 to get number of minutes.
me="$0 - Hardware error monitoring"
myname=`hostname`
args="$*"
#mailto="root"
mailto="alert"
true=0
false=1
boj=`date`
```

```
echo "$me started.\nThis message goes to $mailto." | mail -s "Errlog monitoring for $myname" $mailto
logger "$0 started"
```

```
while [ "$true" != "$false" ] ; do
    tc=`errpt -dH,S,U,O | wc -l`
    if [ "$lc" = "NULL" ] ; then
        lc="$tc"
    fi
    if [ "$lc" -ne "$tc" ] ; then
        foo=`echo "$tc-$lc"|bc`
        msg="$foo new errors have been found on $myname"
        page_msg="$foo new errors have been found on $myname"
        errlogl=`errpt -dH,S,U,O -a`
        if [ "$tc" -eq "0" ] ; then
            msg="$msg\n Errlog was cleared"
        else
            logger $msg
            msg=" $msg \n Errlog details below:\n $errlogl \n"
            echo "$msg" | mail -s "Errlog status change on host $myname" $mailto
        fi
    fi
    lc="$tc"
    sleep $interval
done
```

AIX Monitoring

Reference

- [nimon working with Prometheus](#)

AIX Toolbox

Tutorials

- [Configuring YUM and creating local repositories on IBM AIX - IBM Developer](#)
- [Tips for Installing Python or other AIX Toolbox for Open Source Software](#)
- [Get Started with the AIX Toolbox for Open Source Software](#)
- [Creating local repo with DNF and AIX Toolbox Media Image](#)

??

RPM

- [AIX Toolbox for Open Source Software : Downloads alpha \(ibm.com\)](#) (NOTE: ????)
500 ??? Refresh ??)
- [Index of /aix/freeSoftware/aixtoolbox](#)

ISO/Tar File

- [Download AIX ISO images from IBM](#)

<https://support.ibm.com> (NOTE: ?????????(SWMA)???)

1. -> Downloads
2. -> Entitled Systems Support (ESS)
3. -> Login
4. -> My Entitled Software
5. -> Software Downloads
6. -> AIXV7R3
7. -> Search Glass
8. -> AIX Enterprise Edition 7.2 and 7.3
9. -> 2259: AIX Toolbox for Linux APPS v06.01.00,ENU,DVD
10. -> I Agree
11. -> HTTPS method
12. -> ESD-Toolbox_for_Linux_Apps_Common_7.1-7.3_112023_LCD4107738.iso

????

?? ?AIX Toolbox ???

???????????????????? AIX Toolbox ????????

???????????? Build Host ???? *.ibm.com ????????????????

💡 Tip: ??? AIX-rpm ?????? AIX ISO ???????????????

```
rpm -qai | egrep "Name|Install Date|Build Date|Build Host"
```

Local DNF repository

?? AIX Toolbox ??????

???

1. ????????? AIX Toolbox ISO ? TGZ ?
2. ? AIX ????? ISO ????? TGZ ?????? /mnt/aixtoolbox
3. ?????????? /mnt/aixtoolbox/ezinstall/ppc/dnf_aixtoolbox_local.sh
4. ?????? /opt/freeware/etc/dnf/dnf.conf
5. ??????

Mount the ISO file

```
loopmount -i aix_linux_toolbox_*.iso -o "-V udfs -o ro" -m /mnt/iso
```

Create local repo.

- Usage: `dnf_aixtoolbox_local.sh <mount path or tar extraction path>`

```
/mnt/iso/ezinstall/ppc/dnf_aixtoolbox_local.sh /mnt/iso
```

???????? /opt/freeware/etc/dnf/dnf.conf :

```
[main]
cachedir=/var/cache/dnf
keepcache=1
debuglevel=2
logfile=/var/log/dnf.log
exactarch=1
gpgcheck=1
```

```
installonly_limit=3
clean_requirements_on_remove=True
best=True
```

```
plugins=1
```

```
[Local_AIX_Toolbox]
name=Local AIX generic repository
baseurl=file:///mnt/iso/RPMS/ppc/
enabled=1
gpgcheck=0
```

```
[Local_AIX_Toolbox_noarch]
name=Local AIX noarch repository
baseurl=file:///mnt/iso/RPMS/noarch/
enabled=1
gpgcheck=0
```

```
[Local_AIX_Toolbox_72]
name=Local AIX 7.2 specific repository
baseurl=file:///mnt/iso/RPMS/ppc-7.2/
enabled=1
gpgcheck=0
```

????

```
root@aixvm:worktmp> dnf repolist
repo id                repo name
Local_AIX_Toolbox      Local AIX generic repository
Local_AIX_Toolbox_72   Local AIX 7.2 specific repository
Local_AIX_Toolbox_noarch Local AIX noarch repository

root@aixvm:worktmp> dnf check-update
Local AIX generic repository      1.6 MB/s | 1.4 MB   00:00
Local AIX noarch repository       1.7 MB/s | 595 kB  00:00
Local AIX 7.2 specific repository 1.1 MB/s | 146 kB  00:00
Last metadata expiration check: 0:00:01 ago on Wed Mar  5 15:19:23 CST 2025.

ca-certificates.ppc          2024.2.66-1          Local_AIX_Toolbox
```

dnf.ppc	4.2.17-32_51	Local_AIX_Toolbox_72
dnf-automatic.ppc	4.2.17-32_51	Local_AIX_Toolbox_72
dnf-data.ppc	4.2.17-32_51	Local_AIX_Toolbox_72
expect.ppc	5.45.4-2	Local_AIX_Toolbox
libcomps.ppc	0.1.15-101	Local_AIX_Toolbox
libdnf.ppc	0.39.1-32_52	Local_AIX_Toolbox_72
libmodulemd.ppc	1.5.2-100	Local_AIX_Toolbox
librepo.ppc	1.11.0-103	Local_AIX_Toolbox
...		
...		

```
root@aixvm:worktmp> dnf update
```

Ksh

Korn shell - ksh

if-then

```
if [[ -e /usr/opt/rpm/bin/rpm ]]
then
    RPM_CMD="/usr/opt/rpm/bin/rpm"
else
    RPM_CMD="/usr/bin/rpm"
fi

# Check if we are running this as the root user.
if [[ "$( /usr/bin/id -u )" != "0" ]]
then
    echo "This script must be run as root."
    exit 1
fi
```

Check AIX Version

```
# First check the AIX version.
oslvl=`/usr/bin/oslevel`
aix_ver=$( /usr/bin/lslpp -qLc bos.rte | /usr/bin/awk -F':' '{print $3}' )
af1=$(echo $aix_ver | /usr/bin/cut -d"." -f1)
af2=$(echo $aix_ver | /usr/bin/cut -d"." -f2)
af3=$(echo $aix_ver | /usr/bin/cut -d"." -f3)
if [[ "$oslvl" = "7.1.0.0" ]]
then
    if [[ ( ! $af1 -ge 7 ) || ( ! $af2 -ge 1 ) || ( ! $af3 -ge 3 ) ]]
    then
        echo "dnf and dependencies can be installed on AIX 7.1.3 and higher versions."
        exit 1
    fi
else
    if [[ ( ! $af1 -ge 7 ) || ( ! $af2 -ge 1 ) ]]
```

```

then
    echo "dnf and dependencies can be installed on AIX 7.1.3 and higher versions."
    exit 1
fi
fi

```

Help

```

prog=${0##*/}
usage() {
    print >&2 "Usage: $prog <-d> <-y> <-n> -?"

    -d  Install and setup dnf if yum is not installed.
        yum command will not be available only dnf command can be used.
    -y  Installs dnf, and updates yum3 to dnf yum4 if yum3 is installed.
        If no yum3 is installed then dnf and yum4 will be installed.
        yum command will also be available along with dnf.
    -n  Install dnf where both yum and dnf can coexist if yum is installed already.
        This is not a recommended option."

    exit 1
}

if [[ $# -ne 1 ]]
then
    usage
    exit 1
fi

```

Check disk space for /tmp

```

oslvl=`/usr/bin/oslevel`
aix_730_plus=0
os_f1=$(echo $oslvl | /usr/bin/cut -d"." -f1)
os_f2=$(echo $oslvl | /usr/bin/cut -d"." -f2)
os_f3=$(echo $oslvl | /usr/bin/cut -d"." -f3)
os_f4=$(echo $oslvl | /usr/bin/cut -d"." -f4)
if [[ ( $os_f1 -ge 7 ) && ( $os_f2 -ge 3 ) && ( $os_f3 -ge 0 ) && ( $os_f4 -ge 0 ) ]]
then
    aix_730_plus=1
fi

```

```

aix_715_prior=0
oslvl_tl=`/usr/bin/lslpp -qLc bos.rte | /usr/bin/cut -d: -f3`
os_f1=$(echo $oslvl_tl | /usr/bin/cut -d"." -f1)
os_f2=$(echo $oslvl_tl | /usr/bin/cut -d"." -f2)
os_f3=$(echo $oslvl_tl | /usr/bin/cut -d"." -f3)
if [[ ( $os_f1 -eq 7 ) && ( $os_f2 -eq 1 ) && ( $os_f3 -lt 5 ) ]]
then
    aix_715_prior=1
fi

# Check if /tmp has enough space to download rpm.rte & dnf_bundle
# and size for extracting rpm packages.

if [[ $aix_730_plus -eq 1 ]]
then
    typeset -i total_req=`echo "(512)" | bc`
    tmp_free=`/usr/bin/df -m /tmp | /usr/bin/sed -e /Filesystem/d | /usr/bin/awk '{print $3}'`
    if [[ $tmp_free -le $total_req ]]
    then
        echo "Please make sure /tmp has around 512MB of free space to download and"
        echo "extract files from dnf_bundle."
        exit 1
    fi
else
    typeset -i total_req=`echo "(512)" | bc`
    tmp_free=`/usr/bin/df -m /tmp | /usr/bin/sed -e /Filesystem/d | /usr/bin/awk '{print $3}'`
    if [[ $tmp_free -le $total_req ]]
    then
        echo "Please make sure /tmp has around 512MB of free space to download and"
        echo "extract files from dnf_bundle."
        exit 1
    fi
fi
fi

```

Download with ftp and perl

```

if [[ $aix_715_prior -eq 1 ]]
then
    echo "Attempting download of dnf_bundle_aix_71_72.tar ..."

```

```
username="anonymous"
userpassword="anonymous"
```

```
/usr/bin/expect <<DNFEOF
log_user 0
set timeout -1
spawn ftp -s public.dhe.ibm.com
expect "Name (public.dhe.ibm.com:): "
send "$username\r"
expect "Password:"
send "$userpassword\r"
expect "ftp>"
send "lcd $tmppath\r"
expect "ftp>"
send "bin\r"
expect "ftp>"
send "passive\r"
expect "ftp>"
send "cd aix/freeSoftware/aixtoolbox/ezinstall/ppc\r"
expect "ftp>"
send "get dnf_bundle_aix_71_72.tar\r"
expect "ftp>"
send "bye\r"
expect eof
```

DNFEOF

```
if [[ ! -e dnf_bundle_aix_71_72.tar ]]
then
    echo "Failed to download dnf_bundle_aix_71_72.tar."
    cd - >/dev/null 2>&1
    rm -rf $tmppath
    exit 1
fi
elif [[ $aix_730_plus -eq 1 ]]
then
    echo "Attempting download of dnf_bundle_aix_73.tar ..."
    export PERL_LWP_SSL_VERIFY_HOSTNAME=0
    LDR_CNTRL=MAXDATA=0x80000000@DSA /usr/opt/perl5/bin/lwp-download
    https://public.dhe.ibm.com/aix/freeSoftware/aixtoolbox/ezinstall/ppc/dnf_bundle_aix_73.tar
    if [[ $? -ne 0 ]]
    then
```



```

    echo "Failed to download dnf_bundle_aix_73.tar"
    cd - >/dev/null 2>&1
    rm -rf $tmppath
    exit 1
fi

# Do this once rpm.rte for 730 is available on AIX Toolbox.
#/usr/opt/perl5/bin/lwp-download http://public.dhe.ibm.com/aix/freeSoftware/aixtoolbox/INSTALLP/ppc/rpm.rte
# if [[ $? -ne 0 ]]
# then
#     echo "Failed to download rpm.rte"
#     exit 1
# fi
else
    echo "Attempting download of dnf_bundle_aix_71_72.tar ..."
    LDR_CNTRL=MAXDATA=0x80000000@DSA /usr/opt/perl5/bin/lwp-download
https://public.dhe.ibm.com/aix/freeSoftware/aixtoolbox/ezinstall/ppc/dnf_bundle_aix_71_72.tar
    if [[ $? -ne 0 ]]
    then
        echo "Failed to download dnf_bundle_aix_71_72.tar"
        cd - >/dev/null 2>&1
        rm -rf $tmppath
        exit 1
    fi
    #/usr/opt/perl5/bin/lwp-download http://public.dhe.ibm.com/aix/freeSoftware/aixtoolbox/INSTALLP/ppc/rpm.rte
    # if [[ $? -ne 0 ]]
    # then
    #     echo "Failed to download rpm.rte"
    #     exit 1
    # elif [[ -e rpm.rte.txt ]]
    # then
    #     /usr/bin/mv rpm.rte.txt rpm.rte
    # fi
fi
#end of perl download

```

Check if running as root

```

# Check if we are running this as the root user.
if [[ "$( /usr/bin/id -u )" != "0" ]]

```

```
then
```

```
    echo "This script must be run as root."
```

```
    exit 1
```

```
fi
```