IBM AIX

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

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 commnads 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:MRGY5M7l56OTA' | 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 fileset from ISO

```
# □□□ DVD ISO file □ /mnt/iso
# □□: □□ devices.scsi.disk
root@aixvm:ppc> ls -l /mnt/iso/installp/ppc/devices.scsi.disk
-rw-r--r--    2 4000     4000        1445888 Oct 28 2022
/mnt/iso/installp/ppc/devices.scsi.disk

root@aixvm:ppc> cd /mnt/iso/installp/ppc/

root@aixvm:ppc> installp -acgXYd . devices.scsi.disk
```

Install lsof

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

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

lsof_4.892.tar

```
tar xf lsof_4.892.tar
cd lsof_4.892
installp -acgXYd . lsof.base lsof.license lsof.man.en_US
lsof -v
```

```
tar xf lsof_4.892.tar
cd lsof_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 unsucessful 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 unsucessful 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>
```

??????

????????: `/etc/security/login.cfg`?????? pwd_algorithm ???AIX ?? crypt ??????????????????: Traditional password crypt function

```
usw:
□□□shells = /bin/sh,/bin/bsh,/bin/csh,/bin/ksh,/bin/tsh,/bin/ksh93
□□□maxlogins = 32767
□□□logintimeout = 60
□□□maxroles = 8
□□□auth_type = STD_AUTH
```

```
□□□pwd_algorithm = ssha256
```

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

- ????: `/etc/security/pwdalg.cfg`???? smd5, ssha1, ssha256, ssha512 ????

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

```
chsec -f /etc/security/login.cfg -s usw -a pwd_algorithm=ssha512
```

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

Defaul 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/dmprtns/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($.==2||$&&&!$s++);$.=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

# Mmeory
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:> lsnfsmnt -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

```
# 目前開機磁區
bootinfo -v

# 目前開機磁碟
bootinfo -b
```

bosboot

```
# 建立可開機的映像檔
bosboot -ad hdisk0
```

bootlist

```
# 檢視 normal/service 模式的開機清單
bootlist -m normal -o
bootlist -m service -o

# 設定 normal/service 模式的開機清單
```

```
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 (l-
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:> lslpp -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)

Video Tutorials

- Odysee: https://odysee.com/@Linuxfans:d/IBM_AIX_running_on_x86_64:5
- YT: https://www.youtube.com/watch?v=tU94v-vr_J0

Prerequisities:

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 ?????????

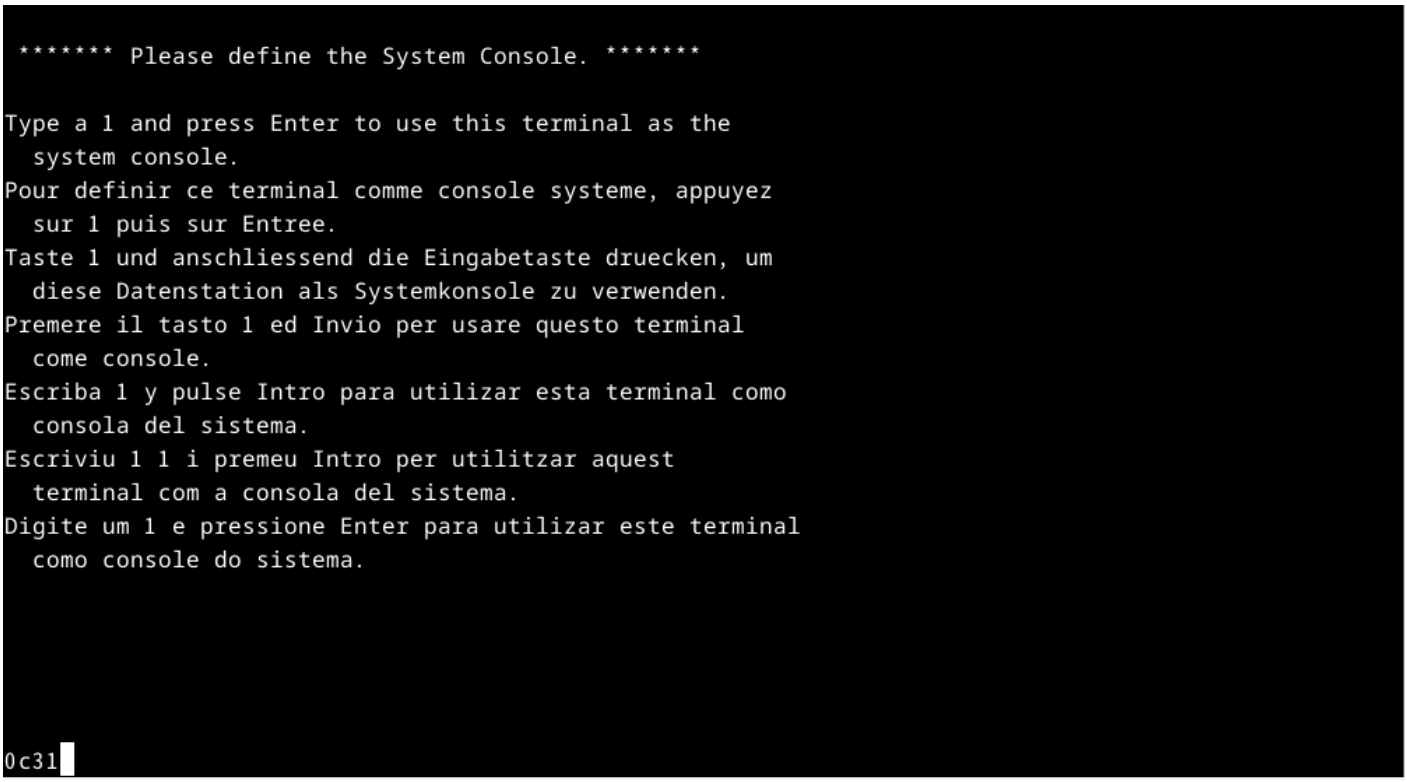
aix_7200-04-00-1937_1of2_112019.iso

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

Boot from cd-rom

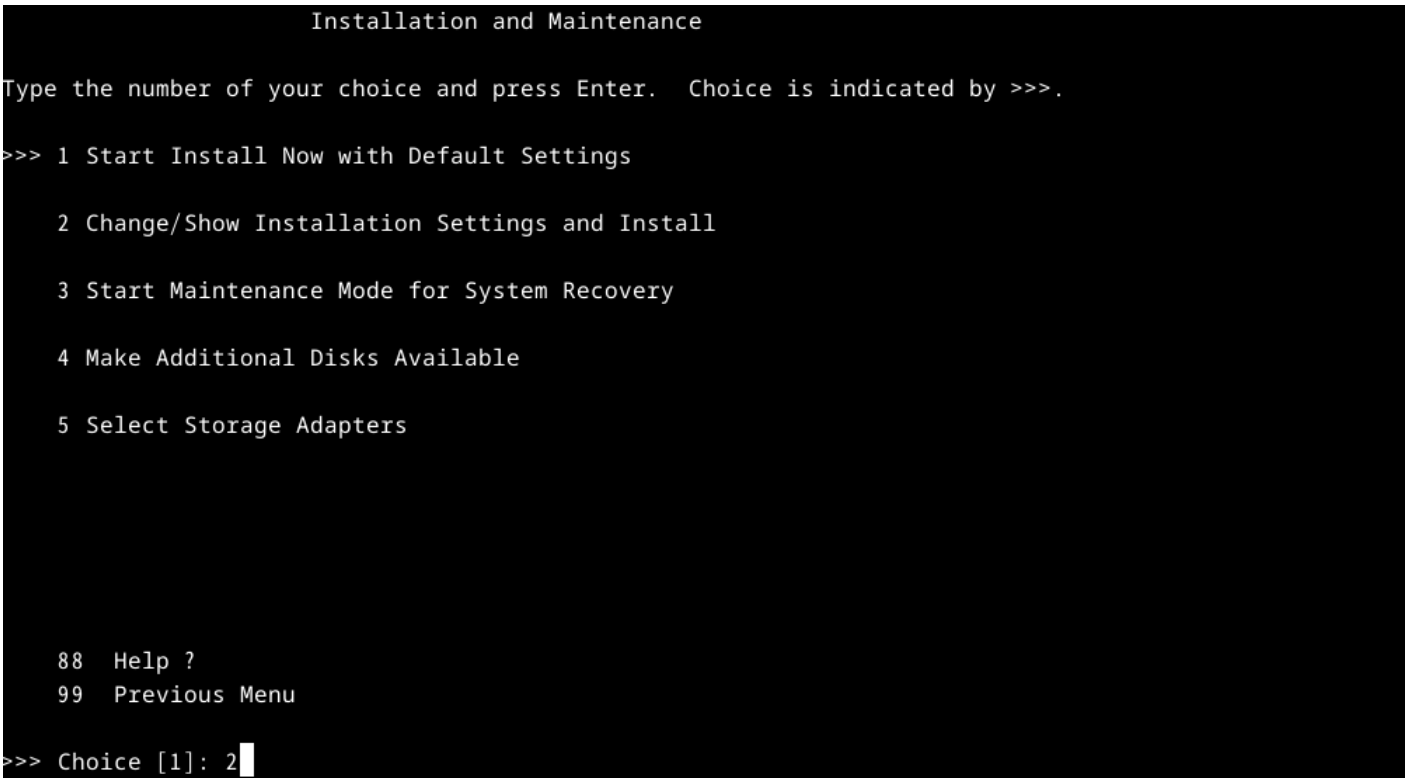
```
cd aix72VM


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

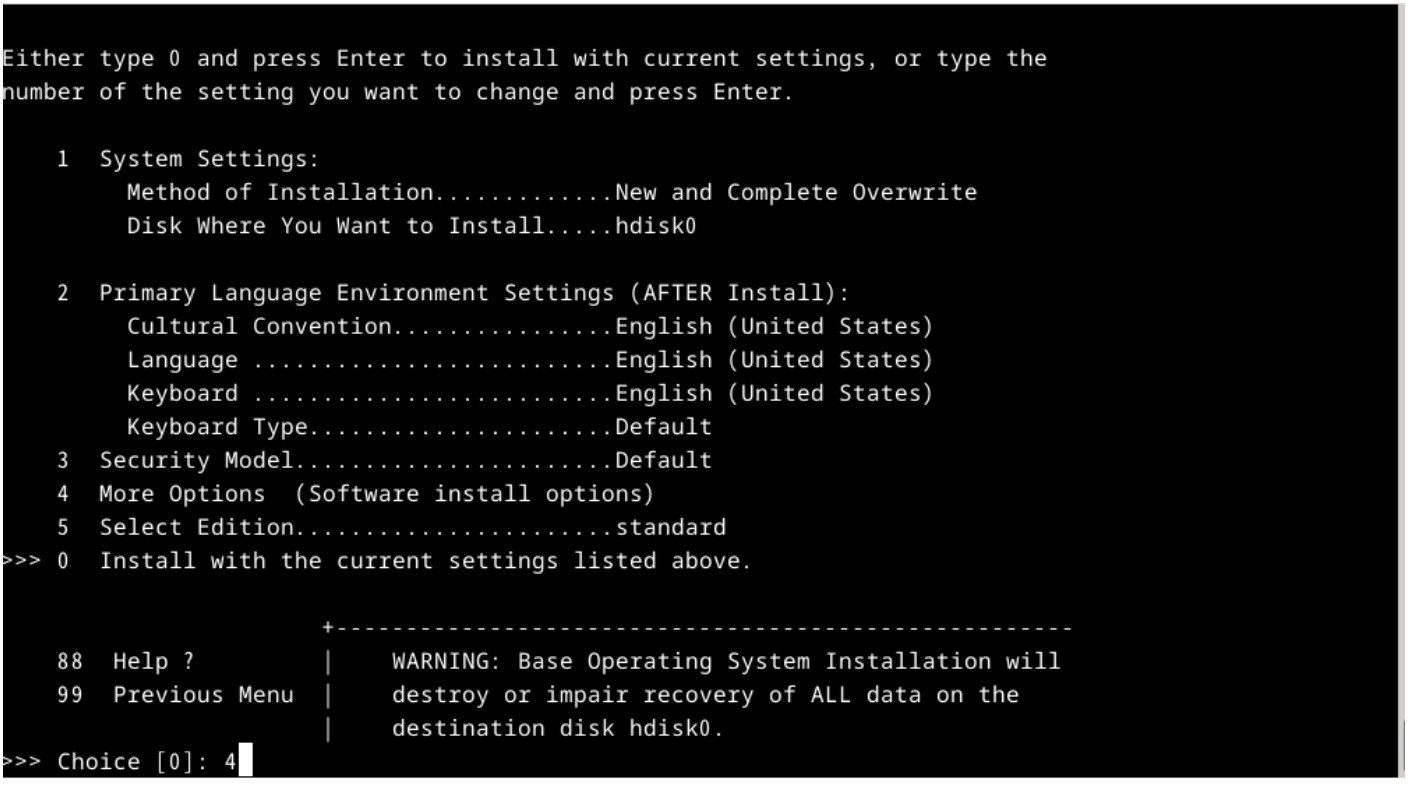


Press Enter

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 ?        |    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 ??

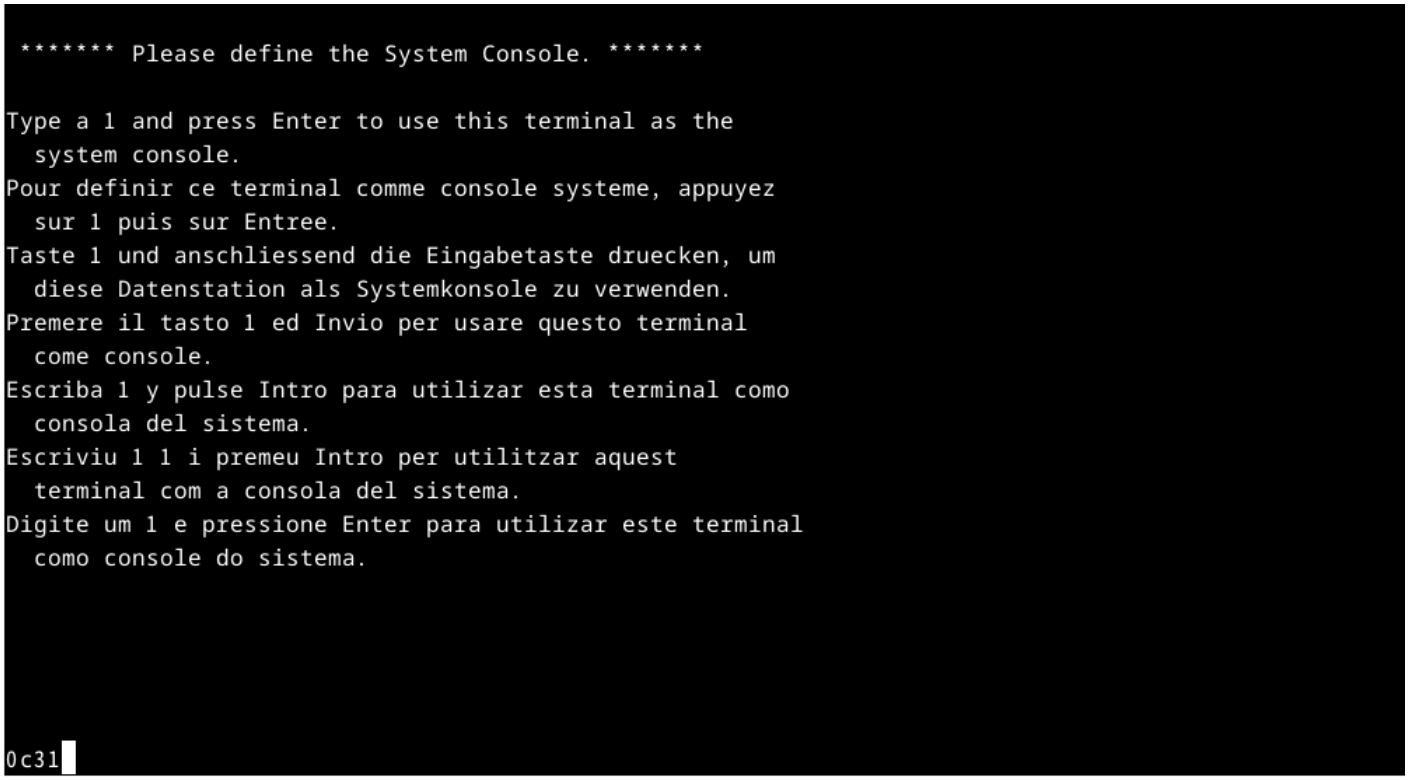
```
       Please wait...









       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"
```

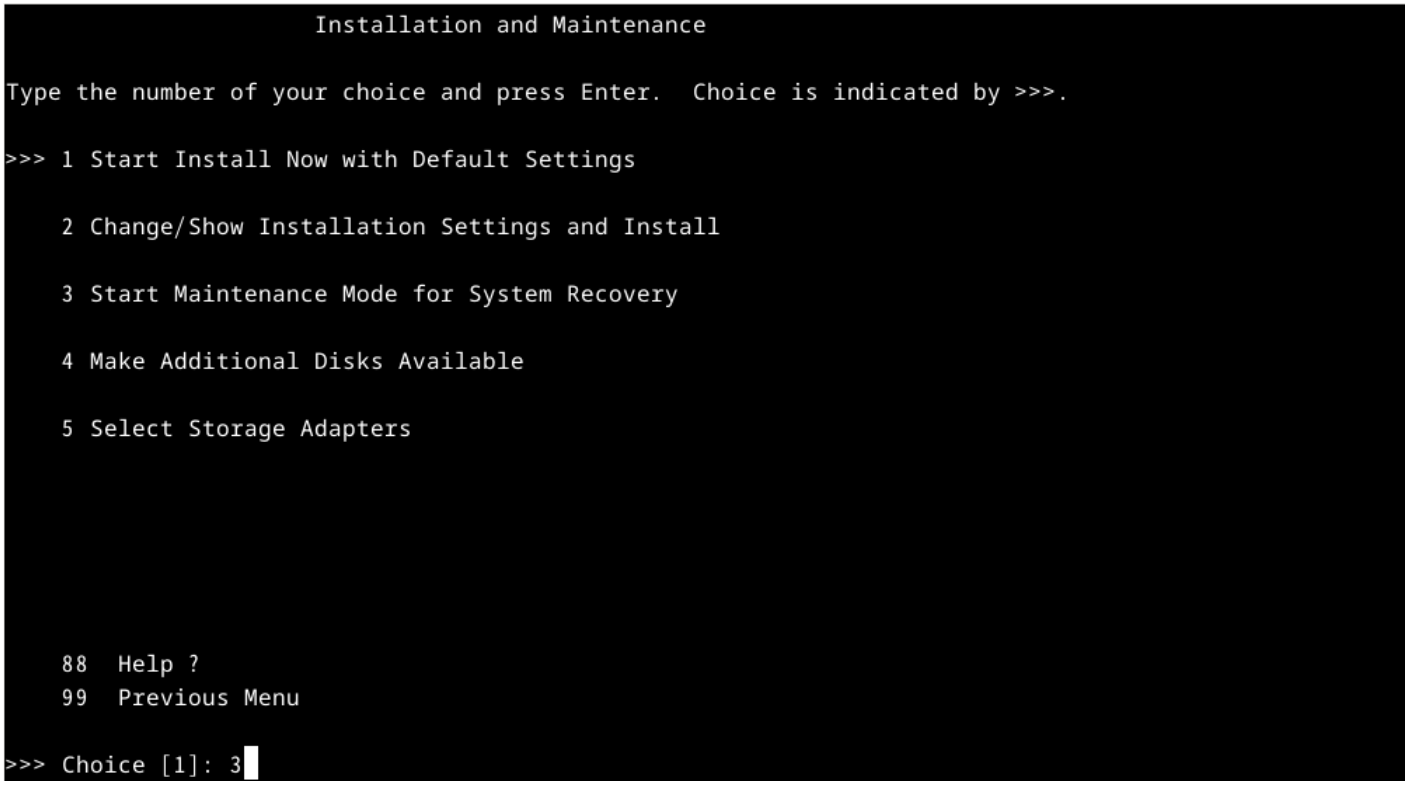
Type 1 and press Enter



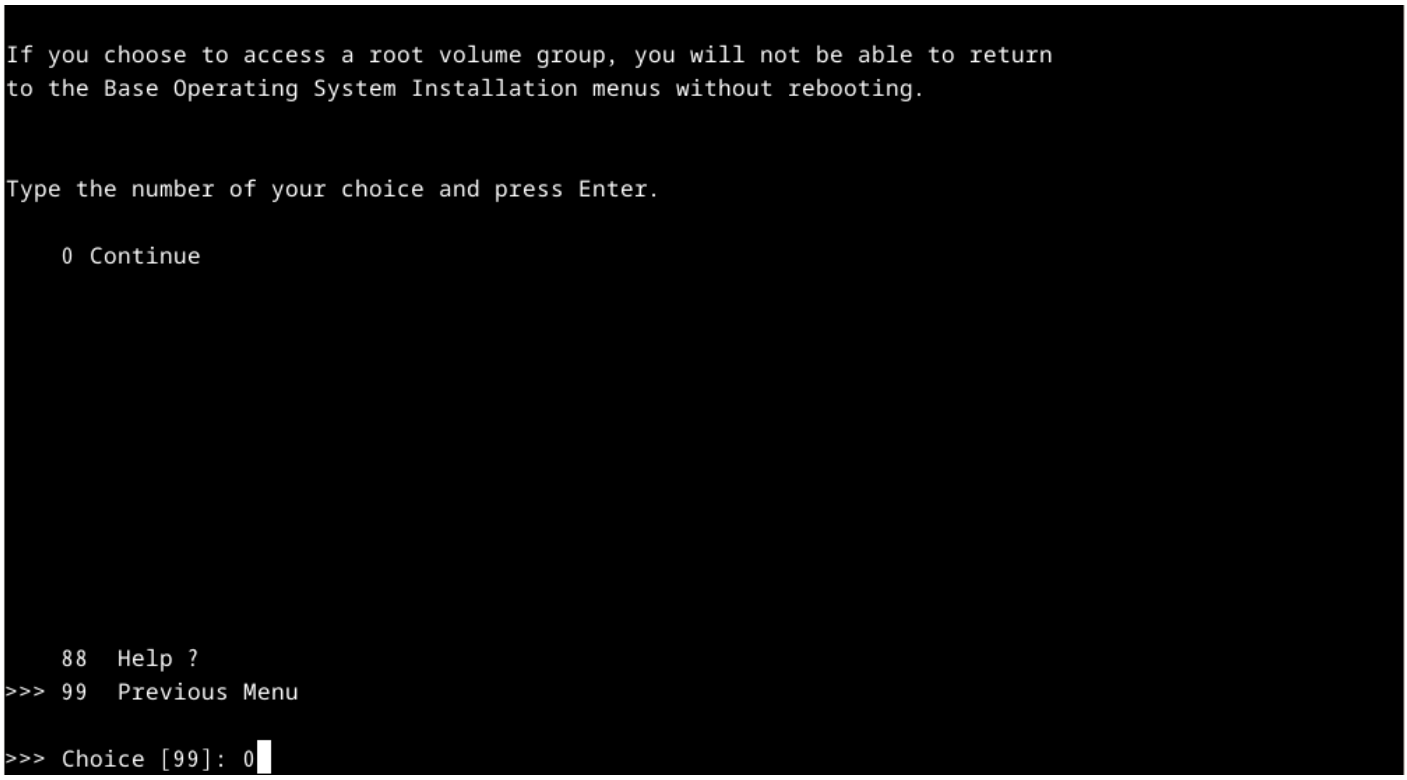
Press Enter


>>> 1 Type 1 and press Enter to have English during install.
2 Entreu 2 i premeu Intro per veure la instal
aci en catal
3 Entrez 3 pour effectuer l'installation en fran ais.
4 F r Installation in deutscher Sprache 4 eingeben
und die Eingabetaste dr cken.
5 Immettere 5 e premere Invio per l'installazione in Italiano.
6 Digite 6 e pressione Enter para usar Portugu s na instala .
7 Escriba 7 y pulse Intro para la instalaci n en espa ol.
88 Help ?
>>> Choice [1]:

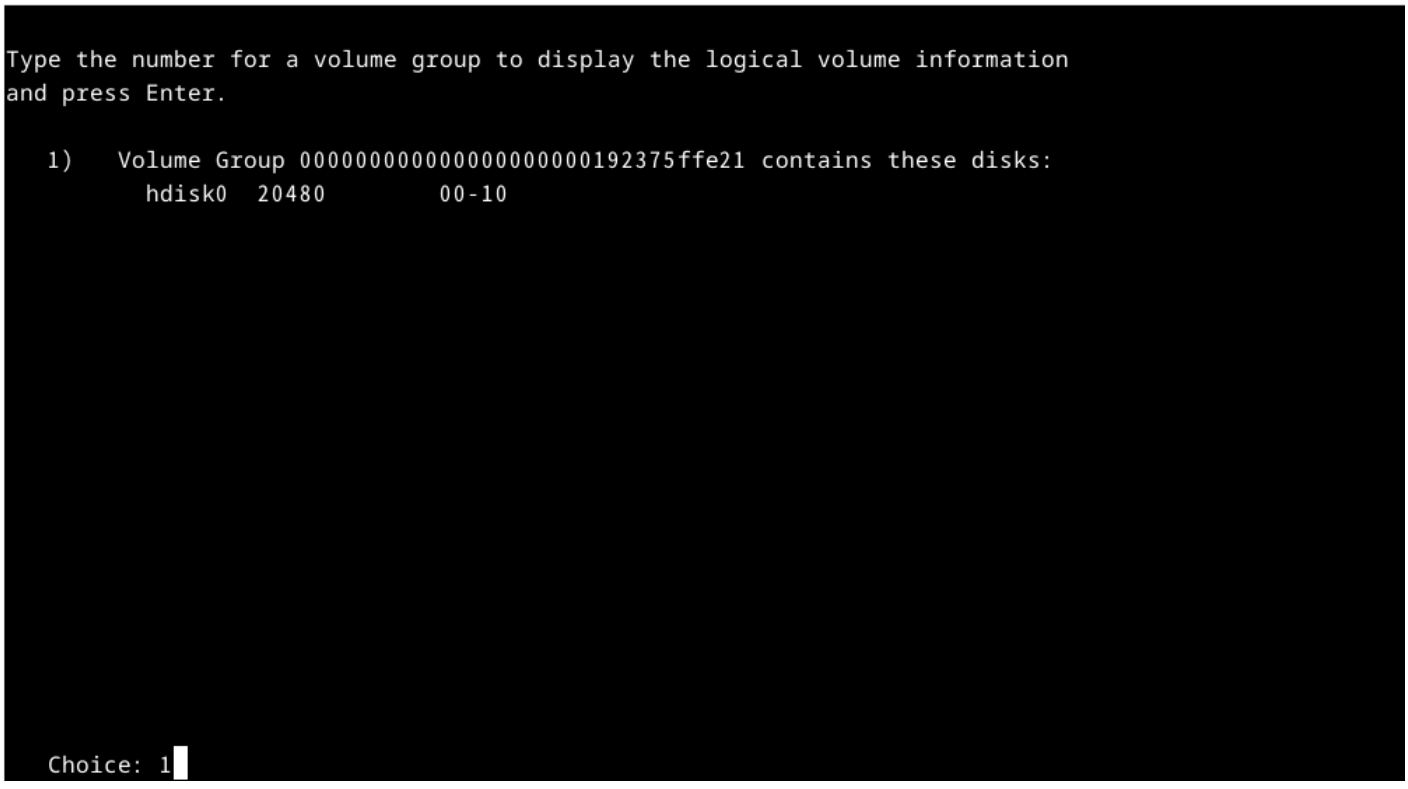
Type 3


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


Type the number for a volume group to display the logical volume information
and press Enter.
1) Volume Group 00000000000000000000192375ffe21 contains these disks:
hdisk0 20480 00-10
Choice: 1

Type 1

```
--------------------------------------------------------------------------------
   Volume Group ID 00000000000000000000192375ffe21 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

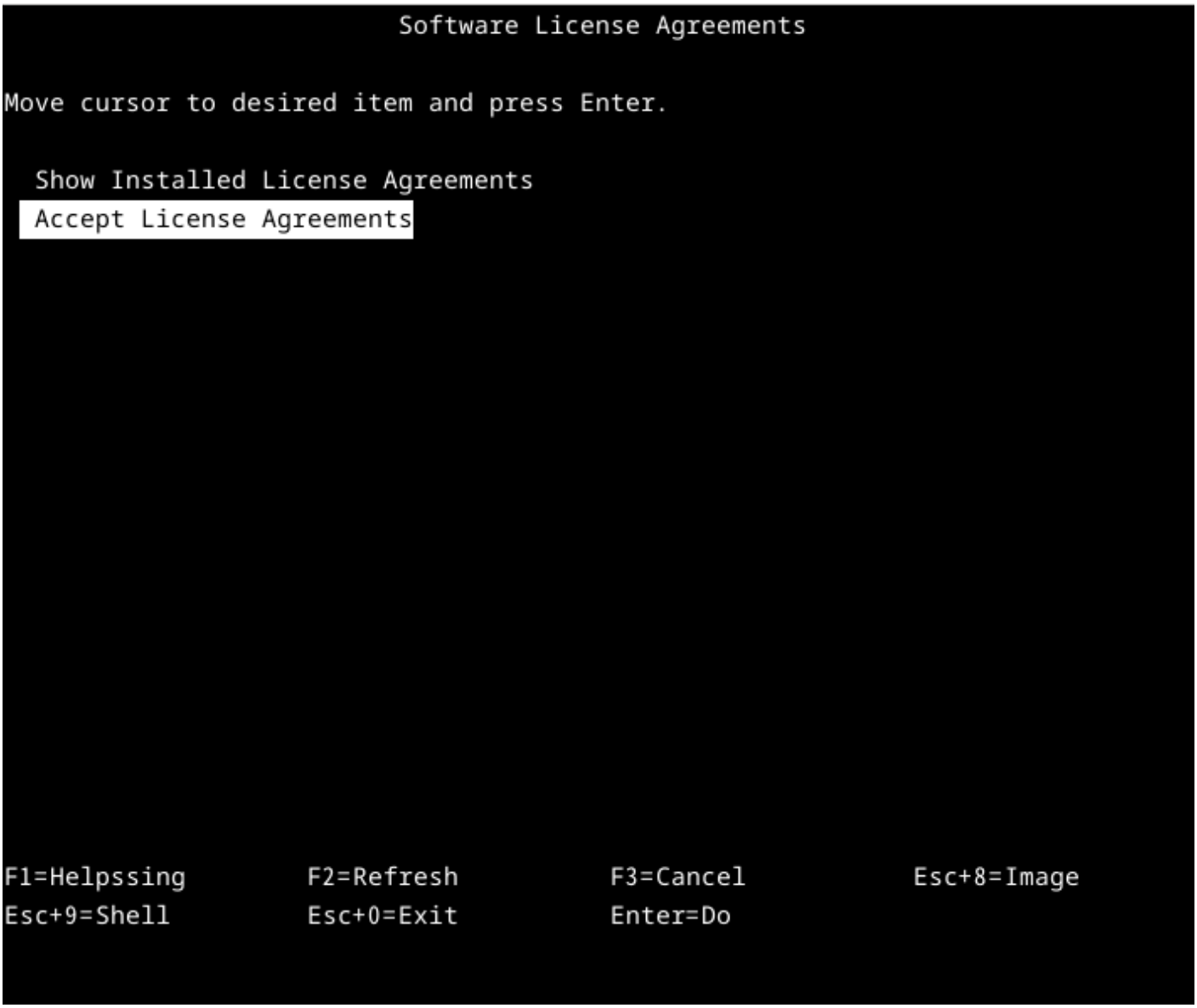
```
cd aix72VM

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

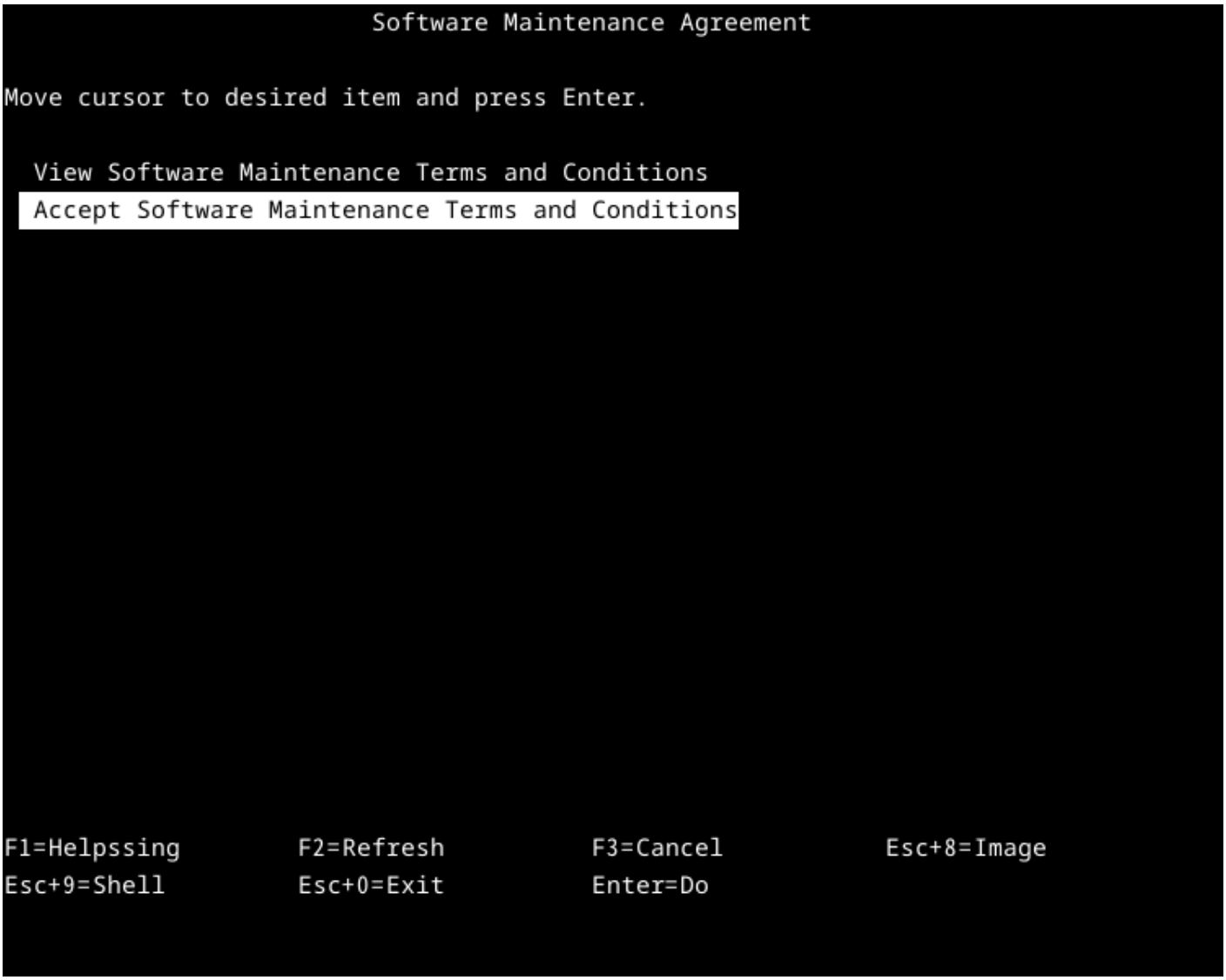
```
                          Set Terminal Type
The terminal is not properly initialized.  Please enter a terminal type
and press Enter.  Some terminal types are not supported in
non-English languages.

     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)
    88  Help ?       | to return to this screen.
                     |
>>> Choice []: vt100
```

Select: Accept License Agreements

> Tips: ????????????????????????????? Ctrl + C
> ?????????????????????????????

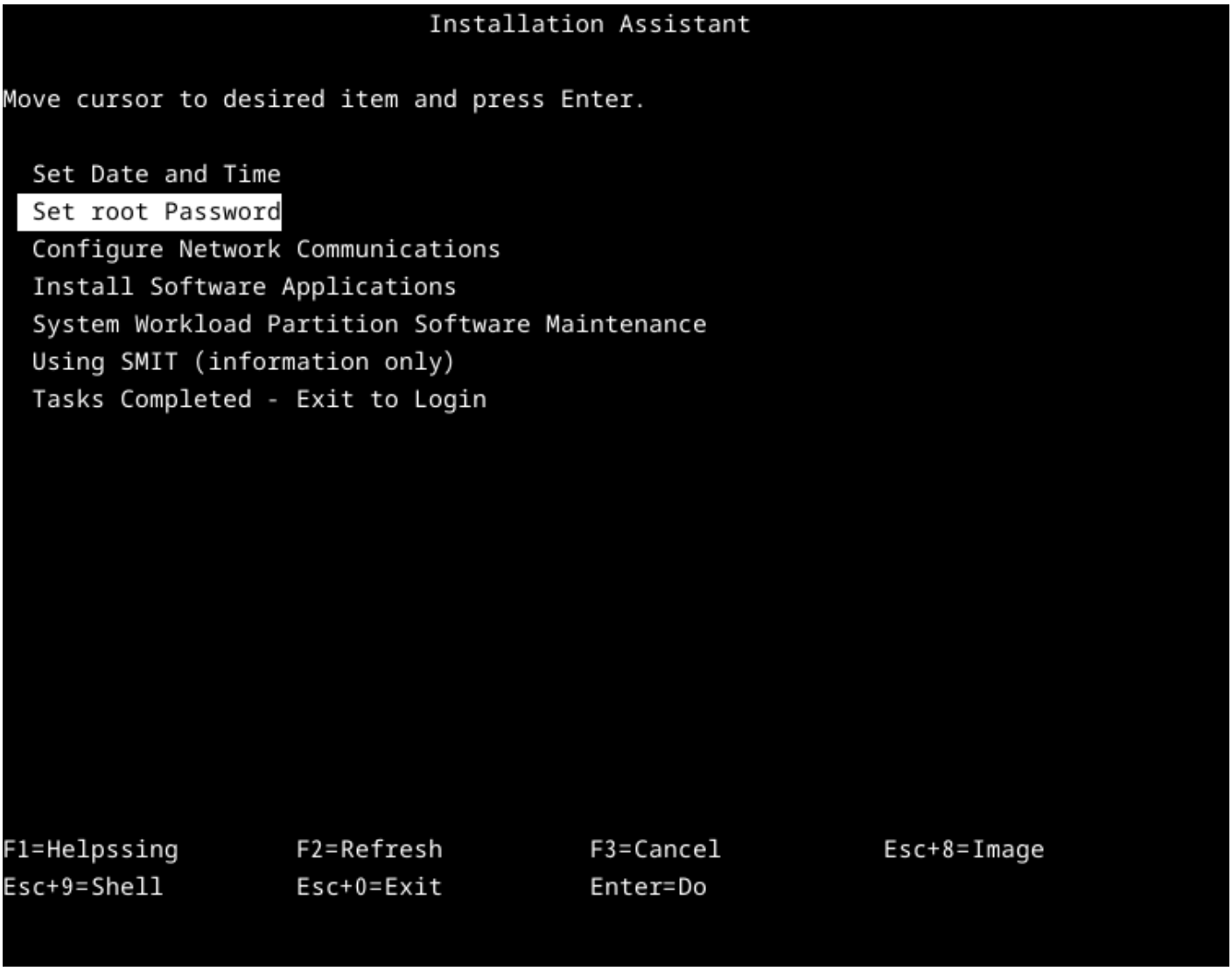


Select: Accept Software Maintenance Terms and Conditions



Select: Set root Password

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



?????? root ????

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
DHCPRANGE=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/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
```

- ??????

? 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. ?? `lslpp -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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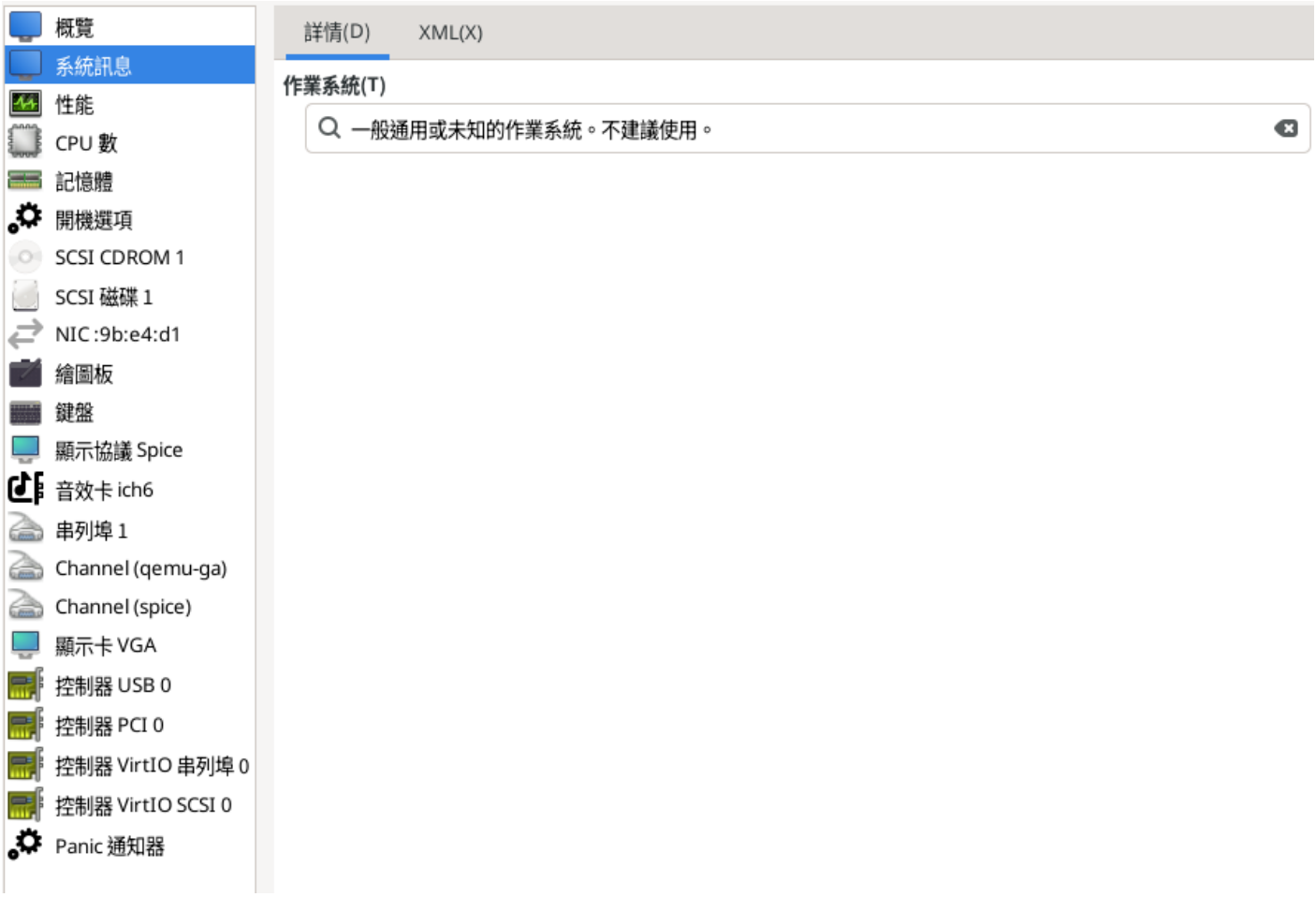
SCSI CDROM 1
SCSI 磁碟 1
NIC :9b:e4:d1
繪圖板
鍵盤
顯示協議 Spice
音效卡 ich6
串列埠 1
Channel (qemu-ga)
Channel (spice)
顯示卡 VGA
控制器 USB 0
控制器 PCI 0
控制器 VirtIO 串列埠 0
控制器 VirtIO SCSI 0
Panic 通知器
詳情(D)
XML(X)
基本詳情
名稱(N)：
AIX-VM
UUID：
53259c57-4ddd-4a57-8c9d-856a5c35e811
狀態：
已關閉
標題(I)：
描述(E)：
虛擬機管理程式詳情
虛擬機管理程式：
QEMU TCG
架構：
ppc64
模擬器：
/usr/bin/qemu-system-ppc64
機器類型(T)：
pseries-8.2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SCSI 磁碟 1
NIC :9b:e4:d1
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顯示協議 Spice
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顯示卡 VGA
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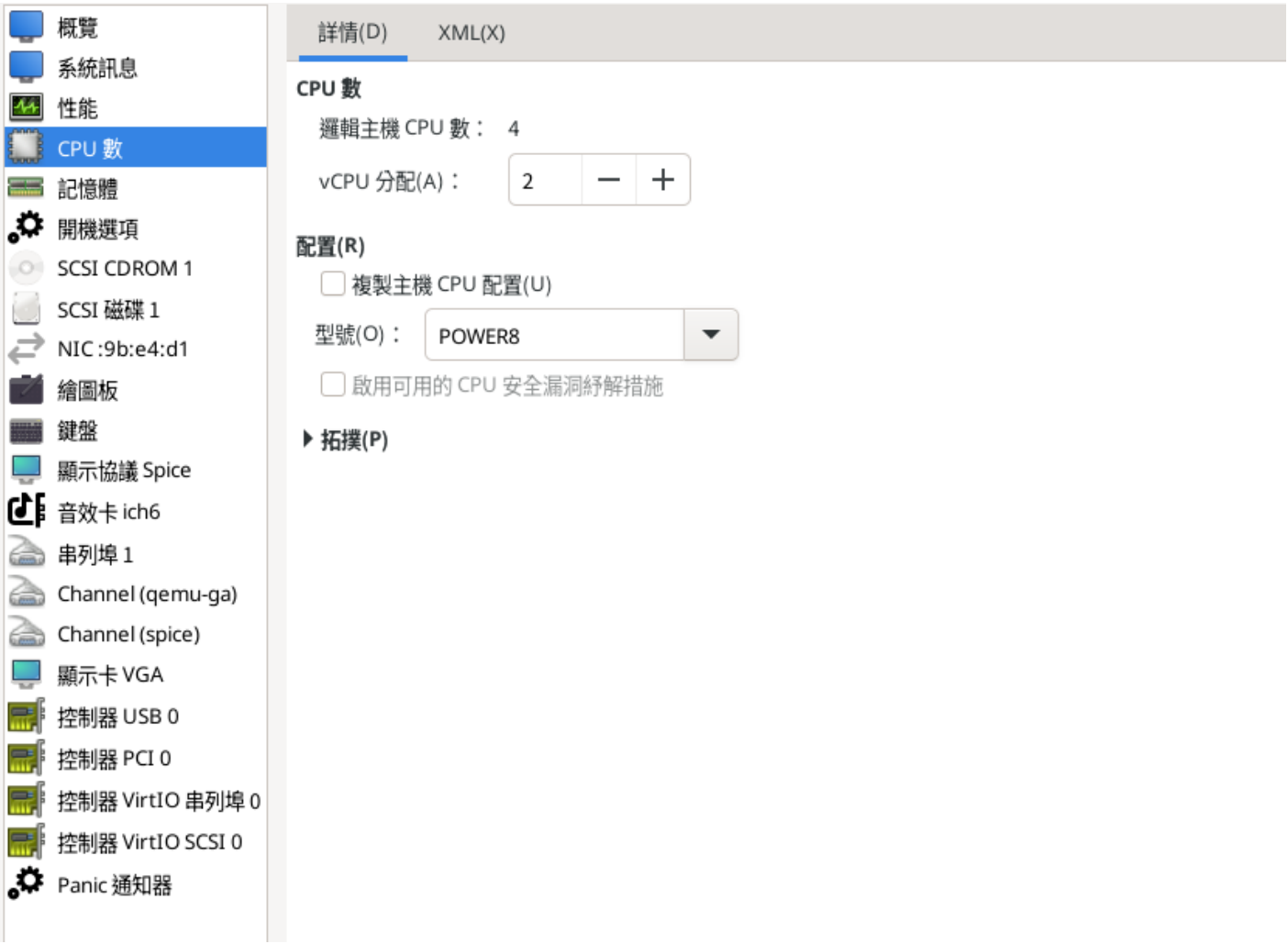
控制器 PCI 0
控制器 VirtIO 串列埠 0
控制器 VirtIO SCSI 0
Panic 通知器
詳情(D)
XML(X)
作業系統(T)
一般通用或未知的作業系統。不建議使用。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控制器 VirtIO 串列埠 0
控制器 VirtIO SCSI 0
Panic 通知器
詳情(D)
XML(X)
CPU 數
邏輯主機 CPU 數： 4
vCPU 分配(A)： 2
配置(R)
複製主機 CPU 配置(U)
型號(O)： POWER8
啟用可用的 CPU 安全漏洞紓解措施
拓撲(P)


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Panic 通知器
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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)


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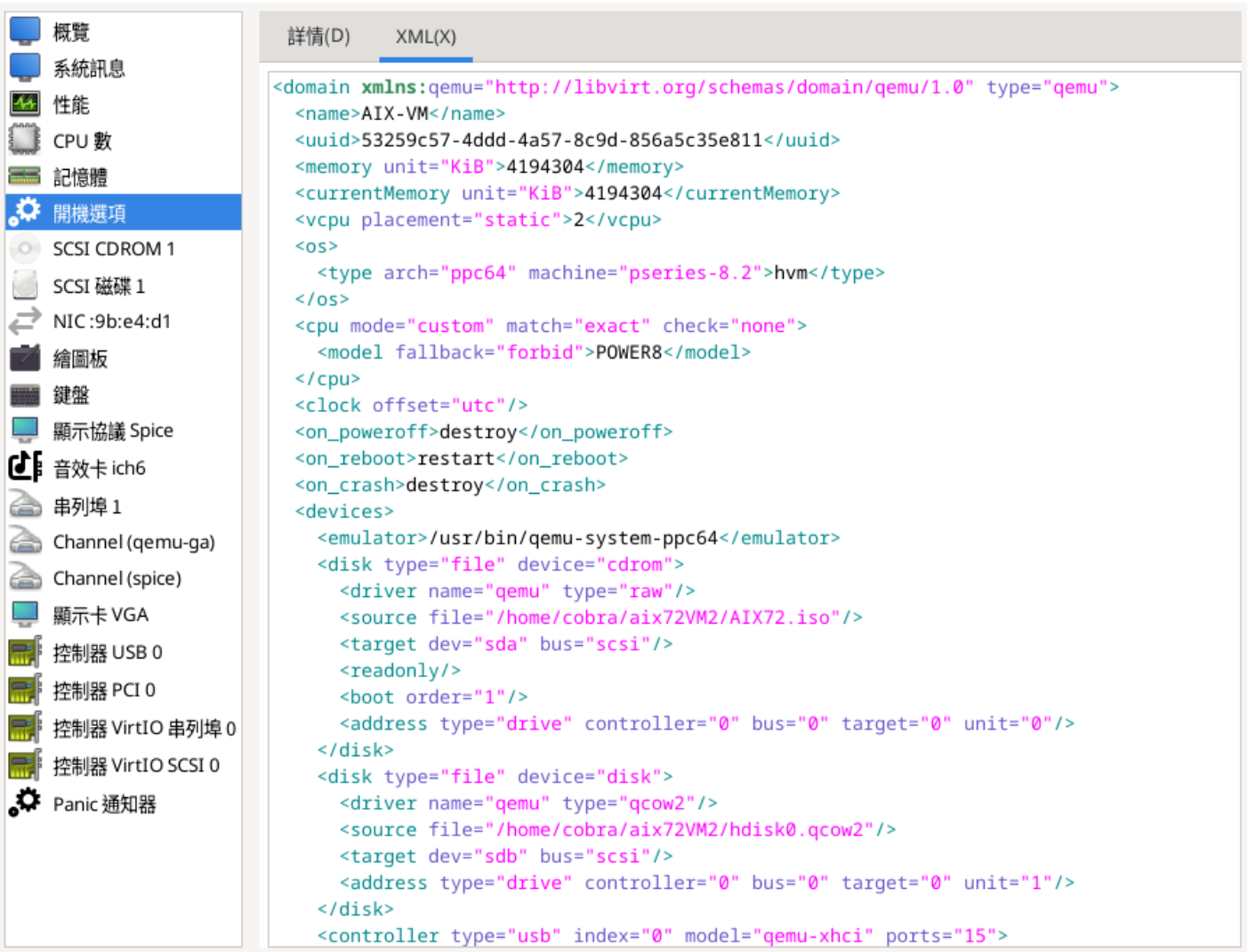
Channel (qemu-ga)
Channel (spice)
顯示卡 VGA
控制器 USB 0
控制器 PCI 0
控制器 VirtIO 串列埠 0
控制器 VirtIO SCSI 0
Panic 通知器
詳情(D)
XML(X)
自動啟動
主機開機時啟動虛擬機(U)
開機裝置順序
啟用開機選單(N)
SCSI CDROM 1
SCSI 磁碟 1
NIC :9b:e4:d1
直接核心開機(E)


概覽
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)
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顯示卡 VGA
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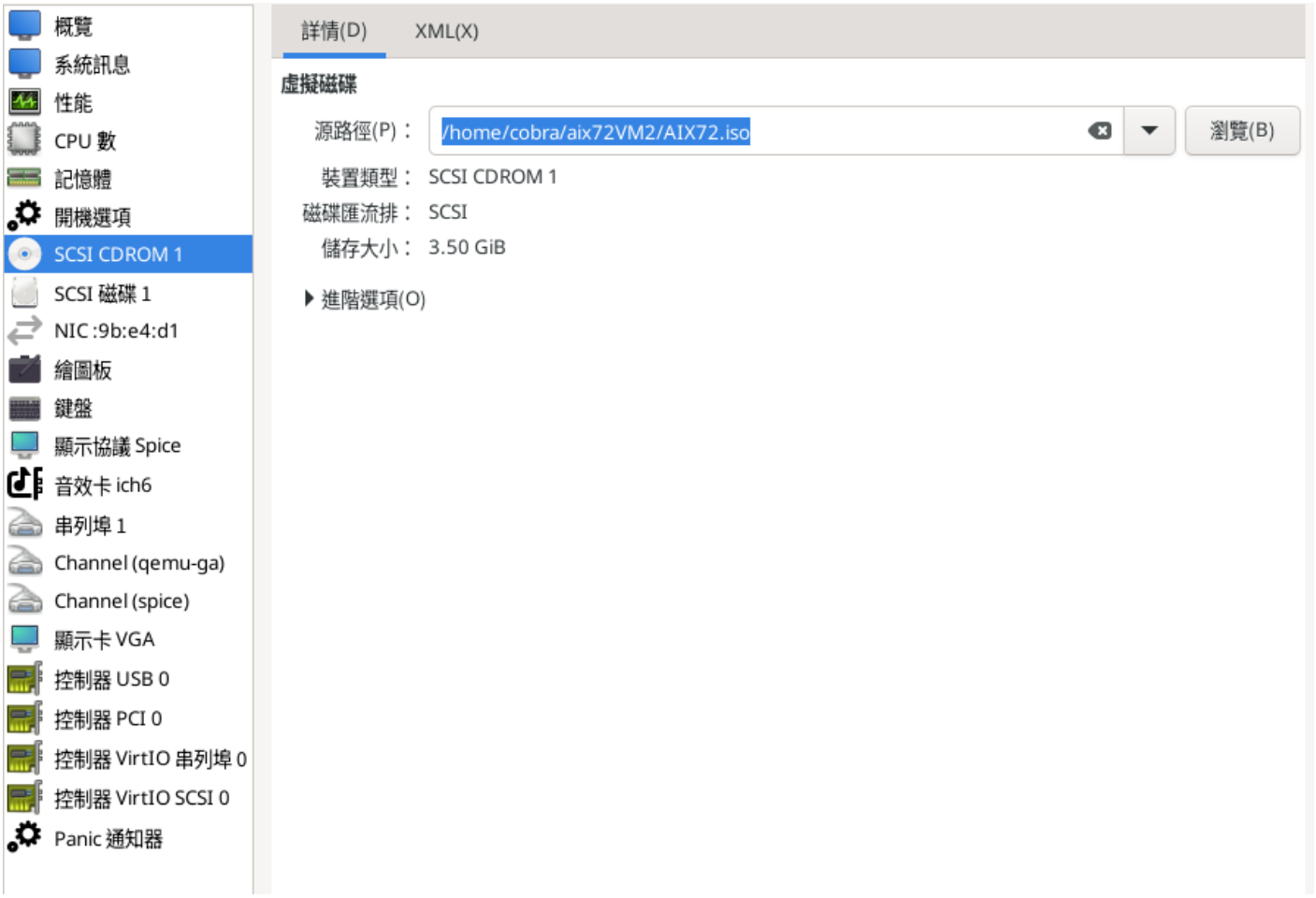
控制器 PCI 0
控制器 VirtIO 串列埠 0
控制器 VirtIO SCSI 0
Panic 通知器
詳情(D)
XML(X)
<domain xmlns:qemu="http://libvirt.org/schemas/domain/qemu/1.0" type="qemu">
<name>AIX-VM</name>
<uuid>53259c57-4ddd-4a57-8c9d-856a5c35e811</uuid>
<memory unit="KiB">4194304</memory>
<currentMemory unit="KiB">4194304</currentMemory>
<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">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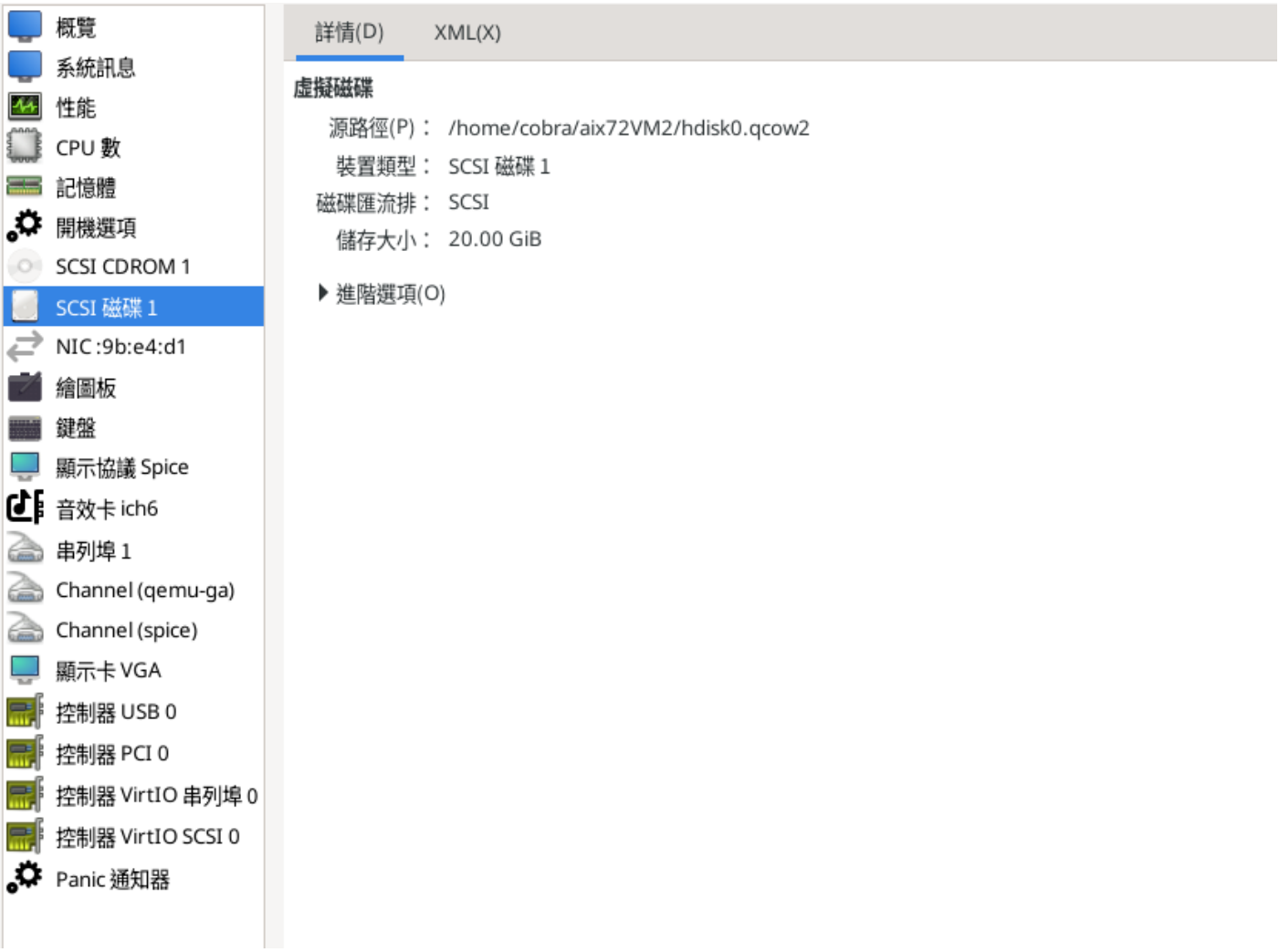
控制器 VirtIO 串列埠 0
控制器 VirtIO SCSI 0
Panic 通知器
詳情(D)
XML(X)
虛擬磁碟
源路徑(P)：
/home/cobra/aix72VM2/AIX72.iso
瀏覽(B)
裝置類型： SCSI CDROM 1
磁碟匯流排： SCSI
儲存大小： 3.50 GiB
進階選項(O)


概覽
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記憶體
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SCSI 磁碟 1
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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 □ hdisk1, □□□ hdisk1 □□□□□
alt_disk_copy -B -d hdisk1
```

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

```
# □□ rootvg □ 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. Commit Applied Software Updates

> “ ????????? commit???????????????

smitty > Software Installation and Maintenance > Software Maintenance and Utilities > Commit Applied Software Updates

2.???Installp

> “ ?????????????????????????????? installp??????????

```
# Check if any EFIX installed, if so, remove it before update.
lslpp -e
emgr -r -L <EFIX-Label>

# Using smitty
smitty install_latest

# Using CLI
installp -acd /mnt/iso bos.rte.install

# Check the version
lslpp -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

3.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

4.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]

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 EFIX label, execute the following command:
>
> # /usr/sbin/emgr -P
>
> To remove the given EFIX, execute the following command:
>
> # /usr/sbin/emgr -r -L <EFIX label>
>
> For more information on EFIX management please see the emgr man page and documentation.

Solution:

```
# List the EFIX installed
emgr -l

# List the EFIX locked
emgr -P

# Remove the EFIX locked
emgr -r -L <EFIX 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
nfso -a

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

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

lppchk: Inconsistent state

?? `lppchk -v` ??????

> lppchk: The following filesets need to be installed or corrected to bring
>   the system to a consistent state:
>
>   bos.net.nfs.client 7.2.5.201   (usr: APPLIED, root: not installed)
>   bos.net.nfs.client 7.2.5.203   (usr: APPLIED, root: not installed)

Solution:

```
installp -Or bos.net.nfs.client
```

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 <PV-NAME>

# □□ 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 hidisk2

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

# Remove a VG with PVs hdisk3, hdisk4
```

```
reducevg <vg-name> hdisk3 hdisk4

# List commands
lsvg <VG-NAME>     # Check the VG
lsvg -l <VG-NAME>  # Check the LVs in the VG
lsvg -p <VG-NAME>  # Check the PVs in the VG
```

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>

# List the PVs for specified LV
lslv -l <LV-NAME>
```

LV Mirror

```
# Add a copy of LV hd4 into specified PV hdisk1
## mklvcopy <LV-NAME> <NUMBER-of-COPY(1|2)> <PV-NAME>
mklvcopy hd4 2 hdisk1

syncvg -v rootvg

# Verify the state
## Check STALE PVs: 0, STALE PPs:0
lsvg rootvg

## Check the LV STATE: open/syncd
lsvg -l rootvg

# Remove a copy of LV from specified PV
rmlvcopy hd4 1 hdisk1
```

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:
${errlogl}
EOF
        mail -s "$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
```

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
```

AIX Simple Firewall

Prerequisities

Packages to be installed

- bos.msg.en_US.net.ipsec
- bos.net.ipsec.keymgt
- bos.net.ipsec.rte
- clic.rte.kernext
- clic.rte.lib

CLI

```
lslpp -l bos.msg.en_US.net.ipsec

  Fileset                      Level  State      Description
  ----------------------------------------------------------------------------
Path: /usr/lib/objrepos
  bos.msg.en_US.net.ipsec    7.2.5.0  COMMITTED  IP Security Messages - U.S.
                                                 English
```

Start/Stop IP Security

CLI

```
# Start command for ipsec_v4
/usr/sbin/mkdev -c ipsec -t 4
/usr/sbin/mkfilt -v 4 -u -z P

# Stop command
/usr/sbin/rmdev -l ipsec_v4
```

Smitty

`smitty ipsec4` > Start/Stop IP Security > Start IP Security

- Start IP Security: [Now and After Reboot]
- Deny All Non_Secure IP Packets: [no]

Verify command

```
> lsdev -C | grep ipsec
ipsec_v4    Available       IP Version 4 Security Extension
ipsec_v6    Available       IP Version 6 Security Extension

> lsdev -l ipsec_v4
ipsec_v4 Available  IP Version 4 Security Extension
```

?????

```
cp /etc/syslog.conf /etc/syslog.conf.bak
echo "local4.debug /var/log/ipsec.log" >> /etc/syslog.conf
touch /var/log/ipsec.log
chmod 0644 /var/log/ipsec.log
refresh -s syslogd
```

??/??????

- ?????????????????????????? filesystem??????????
- ??(Rule)?????? *Logging control* ???

```
# Start the packet logging
mkfilt -v4 -g start

# Stop the packet logging
mkfilt -v4 -g stop
```

Filter Rules

????

- genfilt : ????
- rmfilt : ????
  - `rmfilt -v 4 -n 3` : ???? 3
- chfilt : ????
  - `chfilt -v 4 -n 3 -s xxx.xxx.xxx.xxx` : ????3 ??? IP
- ?????? : `mkfilt -v 4 -u`
- ?????? : `mkfilt -v 4 -d`
- ?????? : `lsfilt -v 4 -O`

????

- `-v 4` : IPv4 ??
- `-a` : Action?P (Permit), D (Deny)
- `-n` : ????
- `-s` : ?? IP ?????? 192.168.99.1 ? 192.168.99.0
- `-m` : ??????? IP ? 255.255.255.255?C ?? IP ? 255.255.255.0
- `-d` : ?? IP ?????? 192.168.99.1 ? 192.168.99.0
- `-M` : ??????? IP ? 255.255.255.255?C ?? IP ? 255.255.255.0
- `-g` : source routing, ?? N, Y(default)
- `-c` : Protocol, ?? tcp, udp, all
- `-O eq -P 21` : Port 21 (FTP)
- `-O any -P 0` : ?? Port (????)
- `-O neq -P 22` : ? SSH ????
- `-w` : Direction, ?? I (inbound), O (outbound) ? B (both)
- `-l` : ??????????? Y, N(default) (?????????)
- `-i` : ??????? all, en0
- `-D` : Description, ??????

????? by ip/port

Inbound Rule : ?? FTP (port 21) ?????? IP (my-linux-ip) ????

```
genfilt -v 4 -a P -s <my-linux-ip> -m 255.255.255.255 -d <aix-server-IP> -M 255.255.255.255 -g
Y -c tcp -o any -p 0 -O eq -P 21 -r B -w I -l Y -f Y -i all


genfilt -v 4 -a D -s 0.0.0.0 -m 0.0.0.0 -d <aix-server-IP> -M 255.255.255.255 -g Y -c tcp -o
any -p 0 -O eq -P 21 -r B -w I -l N -f Y -i all
```

- Rule 0,1,2 ???????
- TIPs
  - ??????????????????
  - ??????? Permit ?????? Deny ????

```
root@aixvm:> lsfilt -v4 -O


1|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|no|udp|eq|4001|eq|4001|both|both|no|all
packets|0|all|0|||Default Rule
2|*** Dynamic filter placement rule for IKE tunnels ***|no
3|permit|192.168.99.1|255.255.255.255|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|
inbound|yes|all packets|0|all|0|||
4|deny|0.0.0.0|0.0.0.0|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|inbound|no|all
packets|0|all|0|||
```

```
0|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|yes|all|any|0|any|0|both|both|no|all
packets|0|all|0|||Default Rule

root@aixvm:> lsfilt -v4
Beginning of IPv4 filter rules.
Rule 1:
Rule action         : permit
Source Address      : 0.0.0.0
Source Mask         : 0.0.0.0
Destination Address : 0.0.0.0
Destination Mask    : 0.0.0.0
Source Routing      : no
Protocol            : udp
Source Port         : eq  4001
Destination Port    : eq  4001
Scope               : both
Direction           : both
Logging control     : no
Fragment control    : all packets
Tunnel ID number    : 0
Interface           : all
Auto-Generated      : yes
Expiration Time     : 0
Description         : Default Rule

Rule 2:
*** Dynamic filter placement rule for IKE tunnels ***
Logging control     : no

Rule 3:
Rule action         : permit
Source Address      : 192.168.99.1
Source Mask         : 255.255.255.255
Destination Address : 192.168.99.100
Destination Mask    : 255.255.255.255
Source Routing      : yes
Protocol            : tcp
Source Port         : any 0
Destination Port    : eq  21
Scope               : both
```

```
Direction           : inbound
Logging control     : yes
Fragment control    : all packets
Tunnel ID number    : 0
Interface           : all
Auto-Generated      : no
Expiration Time     : 0
Description         :

Rule 4:
Rule action         : deny
Source Address      : 0.0.0.0
Source Mask         : 0.0.0.0
Destination Address : 192.168.99.100
Destination Mask    : 255.255.255.255
Source Routing      : yes
Protocol            : tcp
Source Port         : any 0
Destination Port    : eq  21
Scope               : both
Direction           : inbound
Logging control     : no
Fragment control    : all packets
Tunnel ID number    : 0
Interface           : all
Auto-Generated      : no
Expiration Time     : 0
Description         :

Rule 0:
Rule action         : permit
Source Address      : 0.0.0.0
Source Mask         : 0.0.0.0
Destination Address : 0.0.0.0
Destination Mask    : 0.0.0.0
Source Routing      : yes
Protocol            : all
Source Port         : any 0
Destination Port    : any 0
Scope               : both
```

```
Direction           : both
Logging control     : no
Fragment control    : all packets
Tunnel ID number    : 0
Interface           : all
Auto-Generated      : no
Expiration Time     : 0
Description         : Default Rule

End of IPv4 filter rules.
```

????? by ip

Inbound Rule : ?????? IP (my-linux-ip) ??????????

```
# Allow from 192.168.99.1
genfilt -v 4 -a P -s 192.168.99.1 -m 255.255.255.255 -d 192.168.99.100 -M 255.255.255.255 -g N
-c tcp -o any -p 0 -O any -P 0 -r B -w I -l Y -f Y -i all

# Deny from all
genfilt -v 4 -a D -s 0.0.0.0 -m 0.0.0.0 -d 192.168.99.100 -M 255.255.255.255 -g N -c tcp -o
any -p 0 -O any -P 0 -r B -w I -l N -f Y -i all -D "Deny from All"
```

Optional: ?? SSH ???????????????

```
# Deny non-SSH services from All
genfilt -v 4 -a D -s 0.0.0.0 -m 0.0.0.0 -d 192.168.99.100 -M 255.255.255.255 -g N -c tcp -o
any -p 0 -O neq -P 22 -r B -w I -l N -f Y -i all -D "Deny non-SSH Services from All"
```

????

?? 3 ? 4 ????

```
...
3|deny|0.0.0.0|0.0.0.0|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|inbound|no|all
packets|0|all|0|||
4|permit|192.168.99.1|255.255.255.255|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|
inbound|yes|all packets|0|all|0|||
...
```

???

1. ??? 4 ??`rmfilt -v4 -n 3`
2. ????????????? 3?`genfilt -v 4 -n 3 -a P -s 192.168.99.1 -m 255.255.255.255 -d 192.168.99.100 -M 255.255.255.255 -g Y -c tcp -o any -p 0 -O eq -P 21 -r B -w I -l Y -f Y -i all`

????

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

```
rmfilt -v4 -n all
```

??/????

??

- ???`expfilt -r -f .`
- `-f .` : ????????????? *ipsec_fltr_rule.exp*
- `-r` : ????????????? *Direction ????*

```
root@aixvm:ipsec_filters> lsfilt -v4 -O

1|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|no|udp|eq|4001|eq|4001|both|both|no|all
packets|0|all|0|||Default Rule
2|*** Dynamic filter placement rule for IKE tunnels ***|no
3|permit|192.168.99.8|255.255.255.255|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|
inbound|yes|all packets|0|all|0|||
4|deny|0.0.0.0|0.0.0.0|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|inbound|no|all
packets|0|all|0|||
0|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|yes|all|any|0|any|0|both|both|no|all
packets|0|all|0|||Default Rule

root@aixvm:ipsec_filters> expfilt -r -f .

Filter rule 3 for IPv4 has been exported successfully.
Filter rule 4 for IPv4 has been exported successfully.
Filter rule(s) have been exported to ipsec_fltr_rule.exp successfully.

root@aixvm:ipsec_filters> ls -l
total 16
-rw-r--r--    1 root     system          417 Jun 03 15:37 ipsec_fltr_rule.exp
```

??

- ???`impfilt -f .` ???????

```
root@aixvm:ipsec_filters> ls -l
total 16
-rw-r--r--    1 root     system          417 Jun 03 15:37 ipsec_fltr_rule.exp

root@aixvm:ipsec_filters> lsfilt -v4 -O
1|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|no|udp|eq|4001|eq|4001|both|both|no|all
packets|0|all|0|||Default Rule
2|*** Dynamic filter placement rule for IKE tunnels ***|no
3|permit|192.168.99.8|255.255.255.255|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|
inbound|yes|all packets|0|all|0|||
4|deny|0.0.0.0|0.0.0.0|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|inbound|no|all
packets|0|all|0|||
0|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|yes|all|any|0|any|0|both|both|no|all
packets|0|all|0|||Default Rule

root@aixvm:ipsec_filters> rmfilt -v4 -n all
Filter rule 3 for IPv4 has been removed successfully.
Filter rule 4 for IPv4 has been removed successfully.

root@aixvm:ipsec_filters> impfilt -f .
Filter rule 3 for IPv4 imported as rule 3.
Filter rule 4 for IPv4 imported as rule 4.
Filter rule(s) have been imported successfully.

root@aixvm:ipsec_filters> lsfilt -v4 -O
1|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|no|udp|eq|4001|eq|4001|both|both|no|all
packets|0|all|0|||Default Rule
2|*** Dynamic filter placement rule for IKE tunnels ***|no
3|permit|192.168.99.8|255.255.255.255|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|
inbound|yes|all packets|0|all|0|||
4|deny|0.0.0.0|0.0.0.0|192.168.99.100|255.255.255.255|yes|tcp|any|0|eq|21|both|inbound|no|all
packets|0|all|0|||
0|permit|0.0.0.0|0.0.0.0|0.0.0.0|0.0.0.0|yes|all|any|0|any|0|both|both|no|all
packets|0|all|0|||Default Rule
```

?????

Rule:

- action: deny
- source: 192.168.99.1
- destination: any
- protocol: all
- direction: inbound

```
genfilt -v 4 -a D -s 192.168.99.1 -m 255.255.255.255 -d 0.0.0.0 -M 0.0.0.0 -g Y -c all -r B -w I -l Y -f Y -i all
```

Scripts

Usage: Add new IP of whitelist

1. Edit file: aixfw-config.sh
2. Clean out all rules: `./aixfw-cmd.sh cleanall`
3. Config new rules: `./aixfw-config.sh`
4. Preview the list of rules: `./aixfw-cmd.sh show`
5. Restart the firewall: `./aixfw-cmd.sh restart`

aixfw-cmd.sh

```
#!/usr/bin/env bash
# AIX built-in firewall commands
# Author: A-Lang
# Created: 2025/7/11


Usage() {
    echo
    echo "Usage: `basename $0` [start|stop|restart|show|cleanall]"
    echo "e.g  : `basename $0` show"
    echo "Options:"
    echo "  [start]   - Start Firewall"
    echo "  [stop]    - Stop Firewall"
    echo "  [restart] - Restart/Reload Firewall"
    echo "  [show]    - List All Rules of Firewall"
    echo "  [cleanall] - Clean out All custom rules of Firewall"
}

ToUpper() {
```

```
    echo $1 | tr "[:lower:]" "[:upper:]"
}

fw_start() {
    mkfilt -v4 -u
}

fw_stop() {
    mkfilt -v4 -d
}

fw_cleanall() {
    rmfilt -v4 -n all
}

fw_show() {
    lsfilt -v4 -O
}

################ Main Codes ################
if [ $# -ne 1 ];
then
    Usage
    exit 1
fi

cmd="$(ToUpper $1)"
case $cmd in
    "START") fw_start;;
    "STOP")  fw_stop;;
    "RESTART") fw_stop; fw_start;;
    "SHOW")  fw_show;;
    "CLEANALL") fw_cleanall;;
    *) Usage; exit;;
esac

#echo "Done!"
```

aixfw-config.sh

```
#!/usr/bin/env bash
# Purpose: Setting up AIX built-in firewall as Whitelist mode
# Author: A-Lang
# Created: 2025/7/14

serverip="10.22.210.99"

while true; do
echo "The Server IP is $serverip"
read -p "Are you sure that you want to continue? (y/N): " input
input=${input:-n}
    case "$input" in
        y|Y)
            echo
            break
            ;;
        n|N)
            echo "Exit"
            exit 1
            ;;
        *) echo "Please answer Y or N.";;
    esac
done

## Add the allowed IPs below
# For AIX VM only
#genfilt -v 4 -a P -s 192.168.99.1 -m 255.255.255.255 -d $serverip -M 255.255.255.255 -g N -c
tcp -o any -p 0 -O any -P 0 -r B -w I -l Y -f Y -i all -D "For AIX VM only"

# Servers-B
# NOTE: Please replace xxx.xxx.xxx.xxx with the source IP that is allowed to access the
server.
#genfilt -v 4 -a P -s xxx.xxx.xxx.xxx -m 255.255.255.255 -d $serverip -M 255.255.255.255 -g N
-c tcp -o any -p 0 -O any -P 0 -r B -w I -l Y -f Y -i all -D "Additional Information"

genfilt -v 4 -a P -s 10.14.225.48    -m 255.255.255.255 -d $serverip -M 255.255.255.255 -g N -
c tcp -o any -p 0 -O any -P 0 -r B -w I -l Y -f Y -i all -D "DEV01"
genfilt -v 4 -a P -s 10.14.226.31    -m 255.255.255.255 -d $serverip -M 255.255.255.255 -g N -
c tcp -o any -p 0 -O any -P 0 -r B -w I -l Y -f Y -i all -D "DEV02"
```

```
## Add the allowed IP above

# Deny from all
genfilt -v 4 -a D -s 0.0.0.0 -m 0.0.0.0 -d $serverip -M 255.255.255.255 -g N -c tcp -o any -p
0 -O any -P 0 -r B -w I -l N -f Y -i all -D "Deny from All"
```