AIX Server and Informix DB Disaster Recovery

Insight (ifx01) DRP procedure

Sunguard System Environment:

- Configuration ID: p690 Hotsite 2; LPAR11
- Hostname : ifx01
- OS level: 5300-08-01-0819
- CPU : 2
- Memory : 8G
- Internal Disk: 144G (4 x 36G)
- External Disk: 300G (6 x 50G)
- Network: 1 x 1000G
- DDS5 DAT72 Tape Drive: 1

Use HMC to connect to LPAR11 as a console.

Insight backup tapes:

- IFX01 system – April 29th + April 21st
- IFX01 App – May 2nd + May 3rd
- IFX01 DB – May 2nd + May 3rd

Step 1: Restore the basic OS (rootvg) via OS backup tape

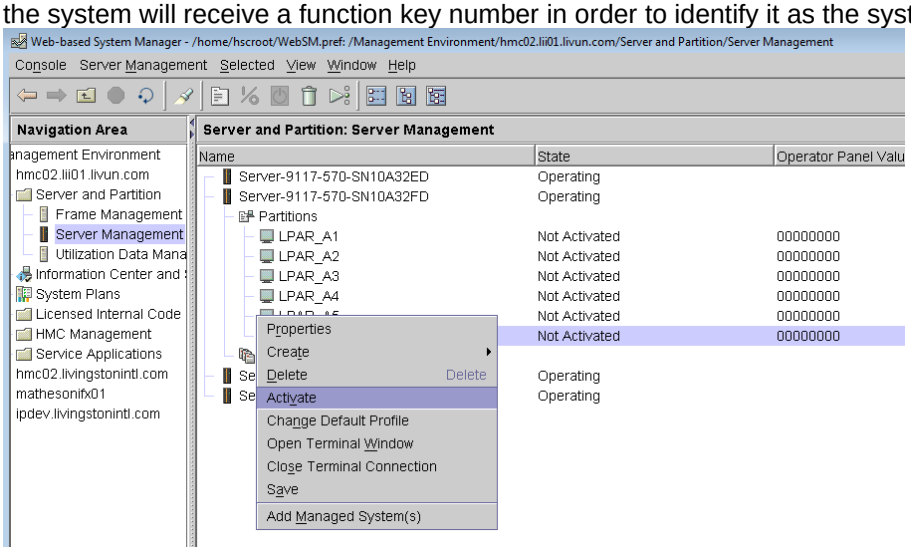
1. Display and/or change the primary boot device.
   To display the primary boot device:
   # bootlist -m normal -o

   To change the primary boot device to tape drive:
   # bootlist -m normal rmt0

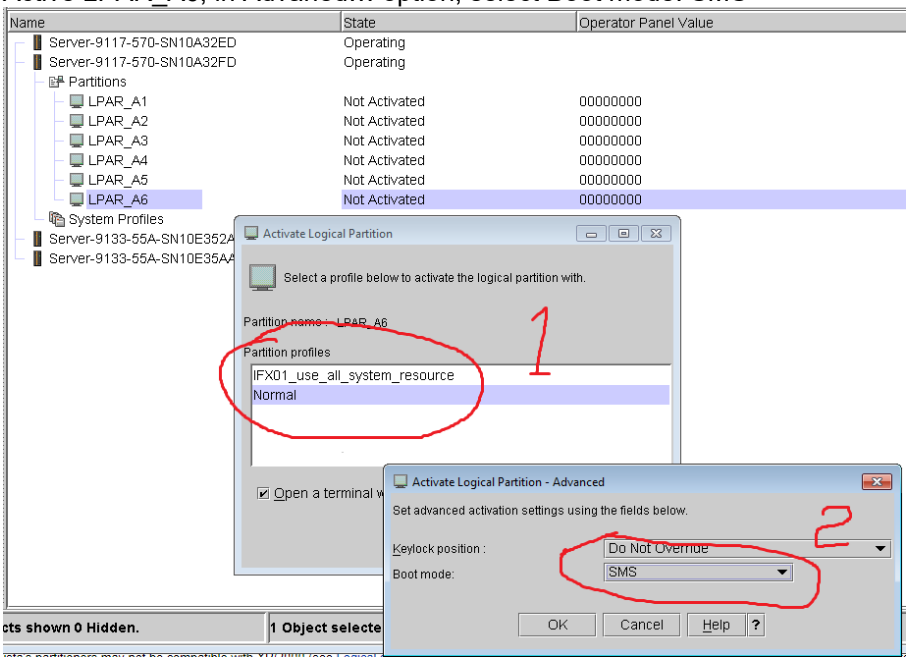
2. Power off system by:
   # sync; sync; sync; shutdown -F
   .
3. Turning on the external devices first is necessary so that the system unit can identify them during the startup (boot) process. These include:
   - Terminals
   - Tape drives
   - Monitors
   - External disk drives

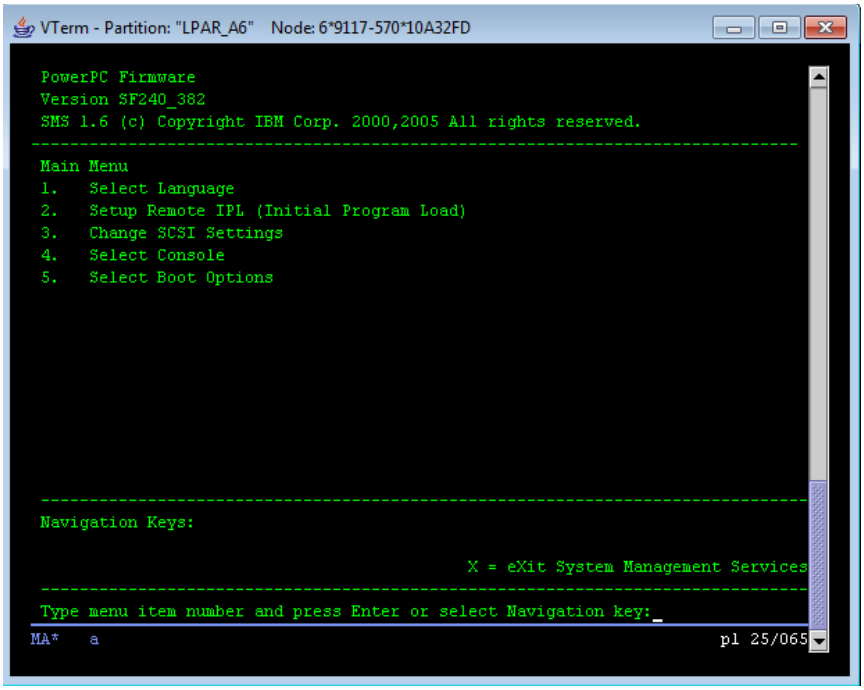
4. Power on the system. When booting, a screen will appear (before the one in Figure 1-1) asking you to press a function key (such as F1) to select the proper display as the system console. Each display on

the system will receive a function key number in order to identify it as the system console



Active LPAR_A6, in Advaned… option, select Boot mode: SMS

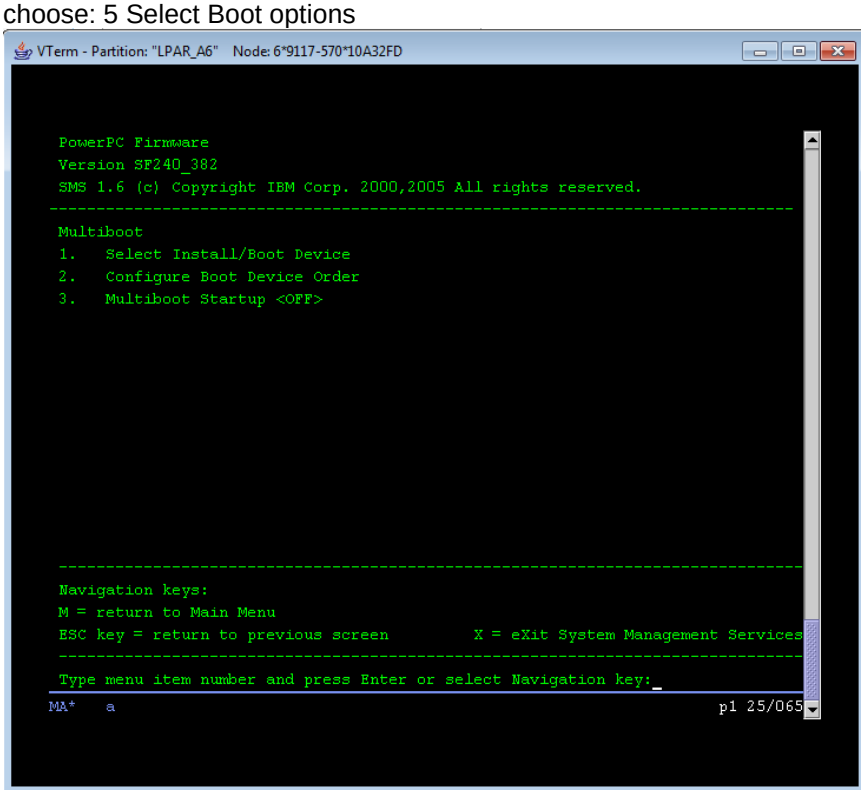




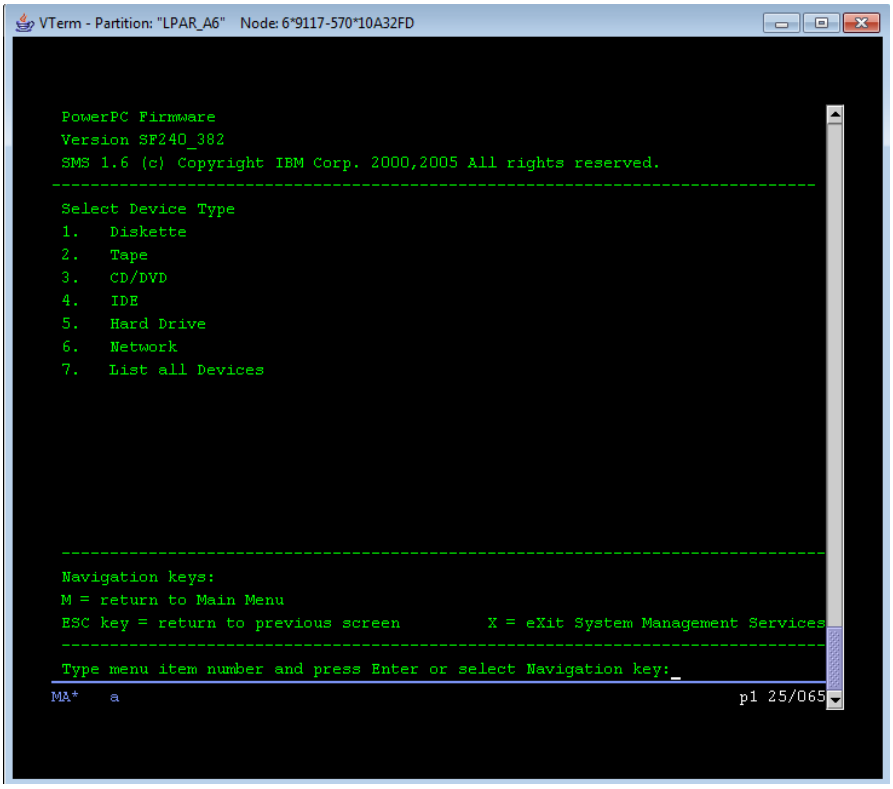
For SMS, we have 5 options for NVROM parameters setting, and or operation

1. Select Language, you should always choose English, or just leave it alone
2. Setup Remote IPL, it's impotant to choose an enternet interface and set ip/routor to access NIM server
3. change scsi settings if you have lots of scsi cards connetions which may have scsi ID confliction
4. Select Console, always cureent one you work on
5. Select Boot Options

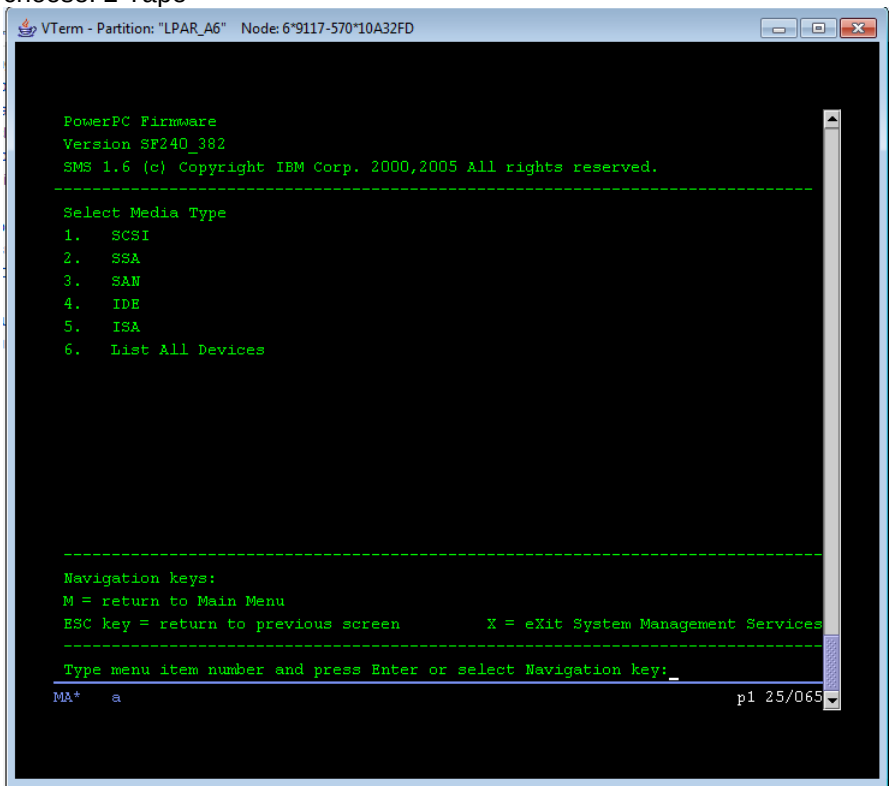
choose: 5 Select Boot options



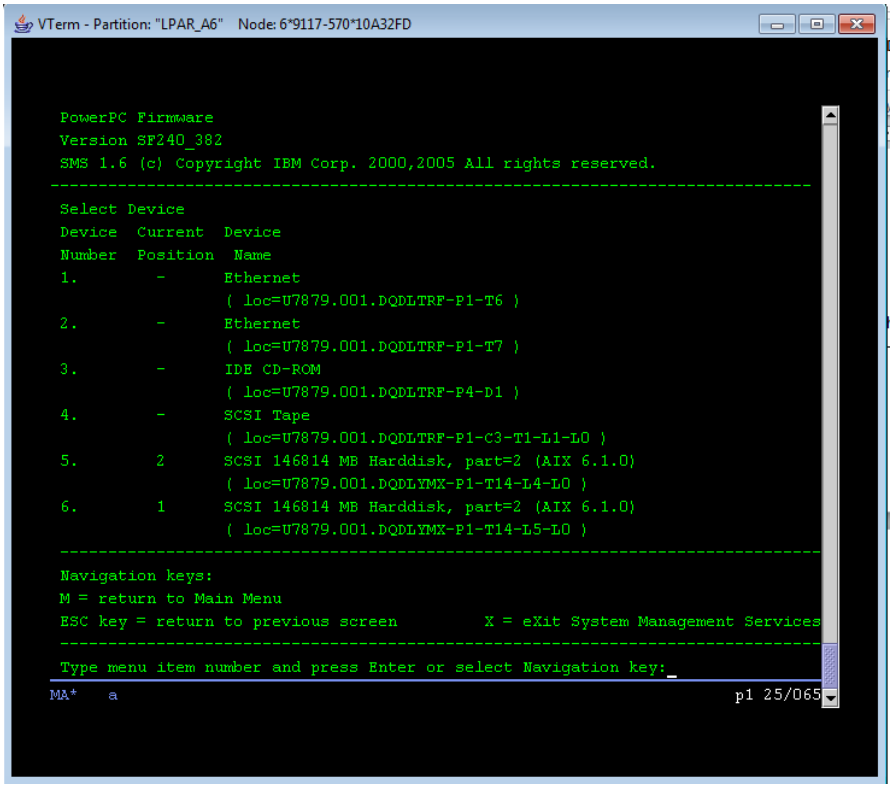
choose: 1 Select Install/Boot Device



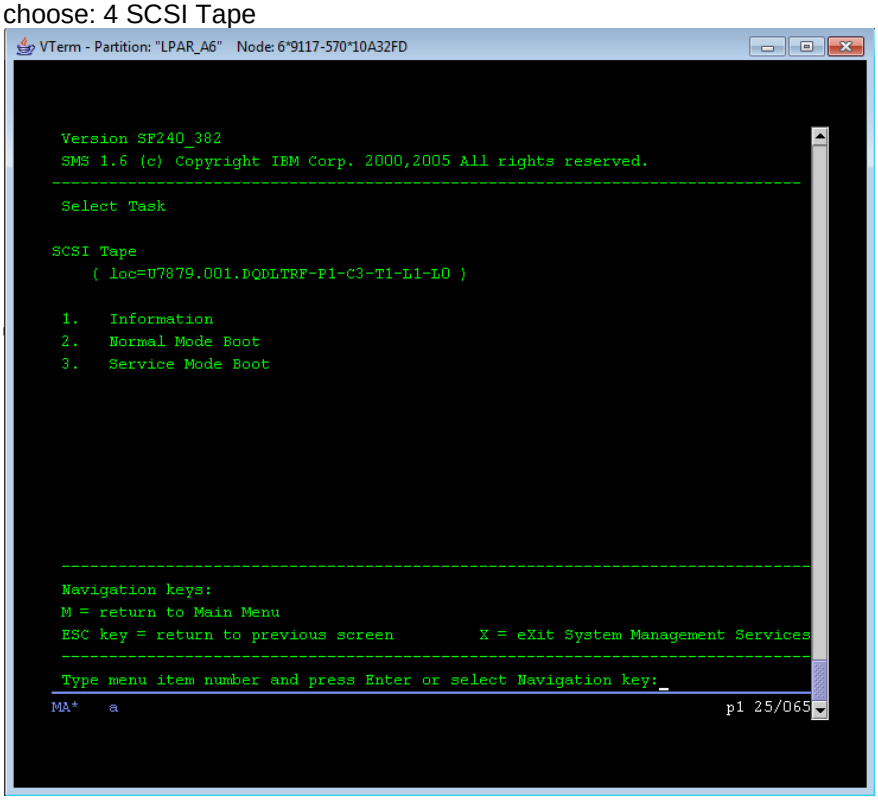
choose: 2 Tape



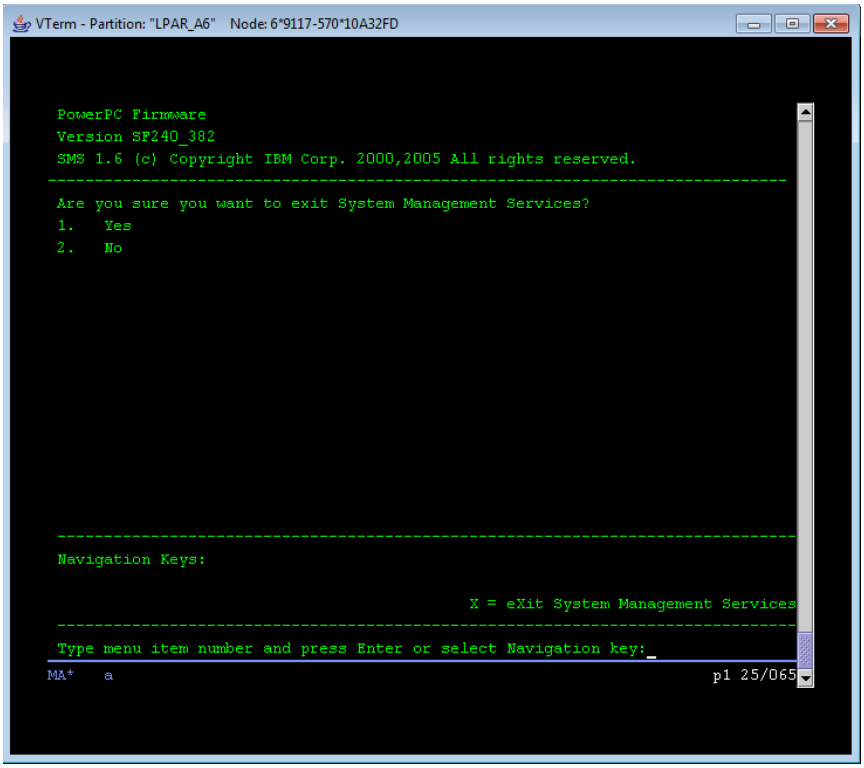
choose: 6 List All devices



choose: 4 SCSI Tape

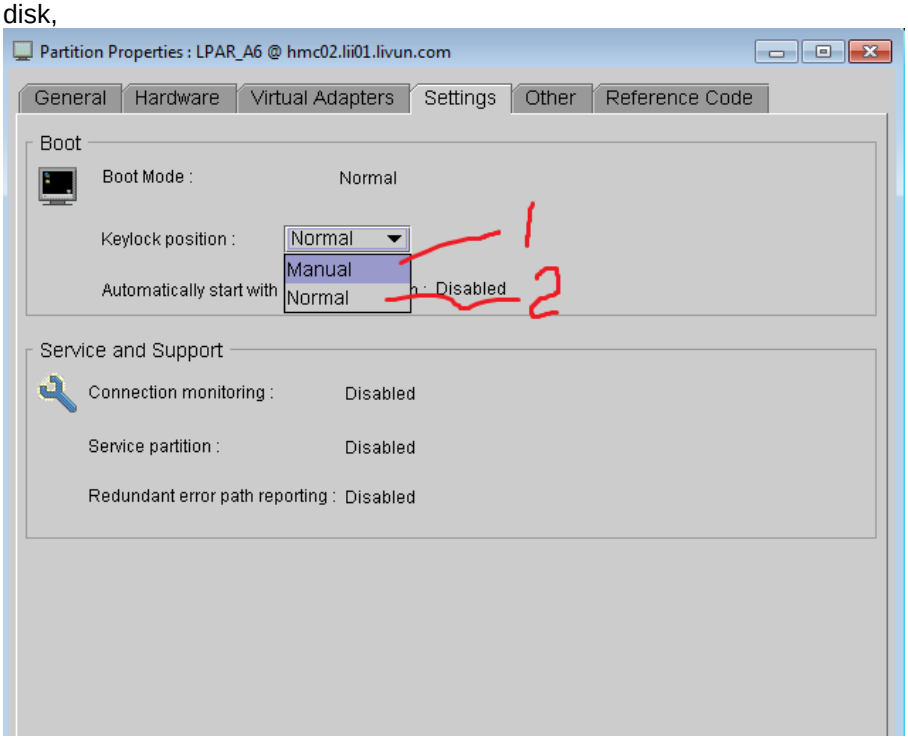


choos: 3 Sercei Mode Boot

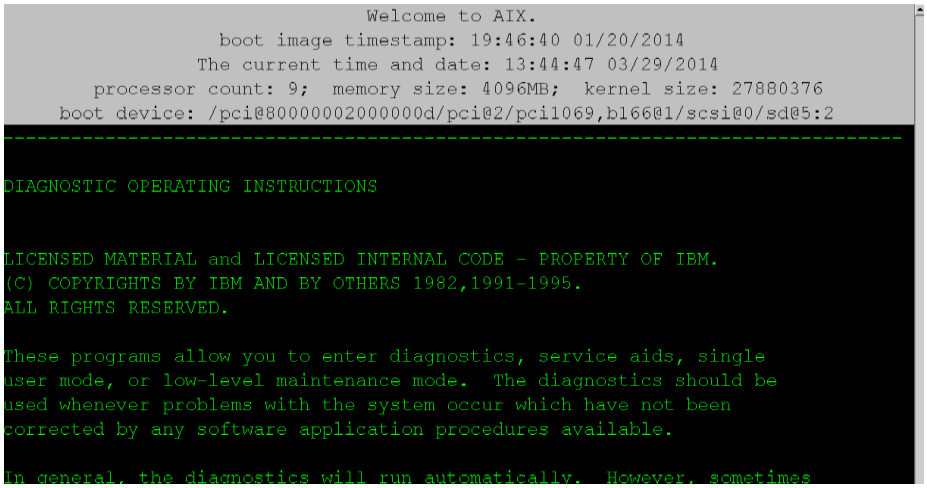


choose: 1 yes

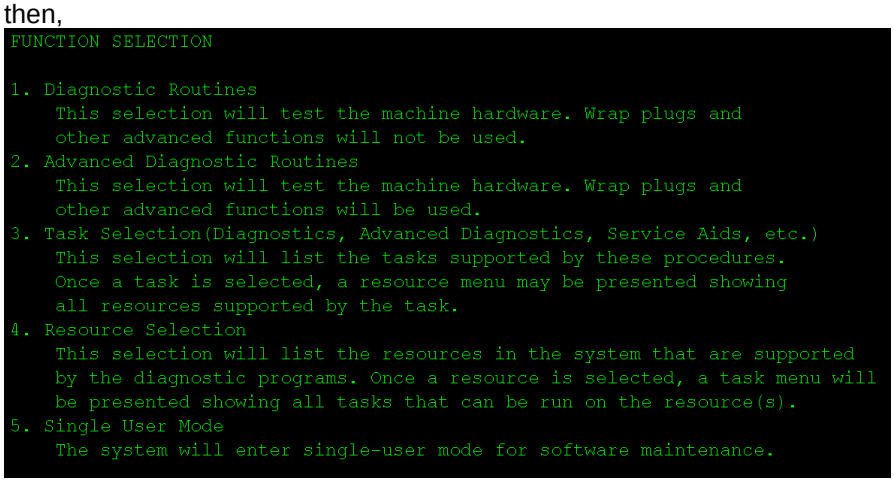
TIPS: If you need diagnose system hardware status right after you load the OS kernel from local hard disk,



if choose 1, then



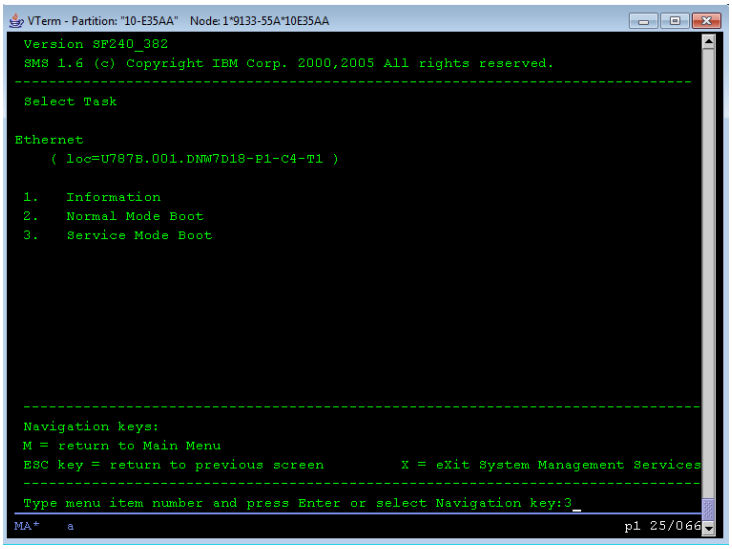
then,



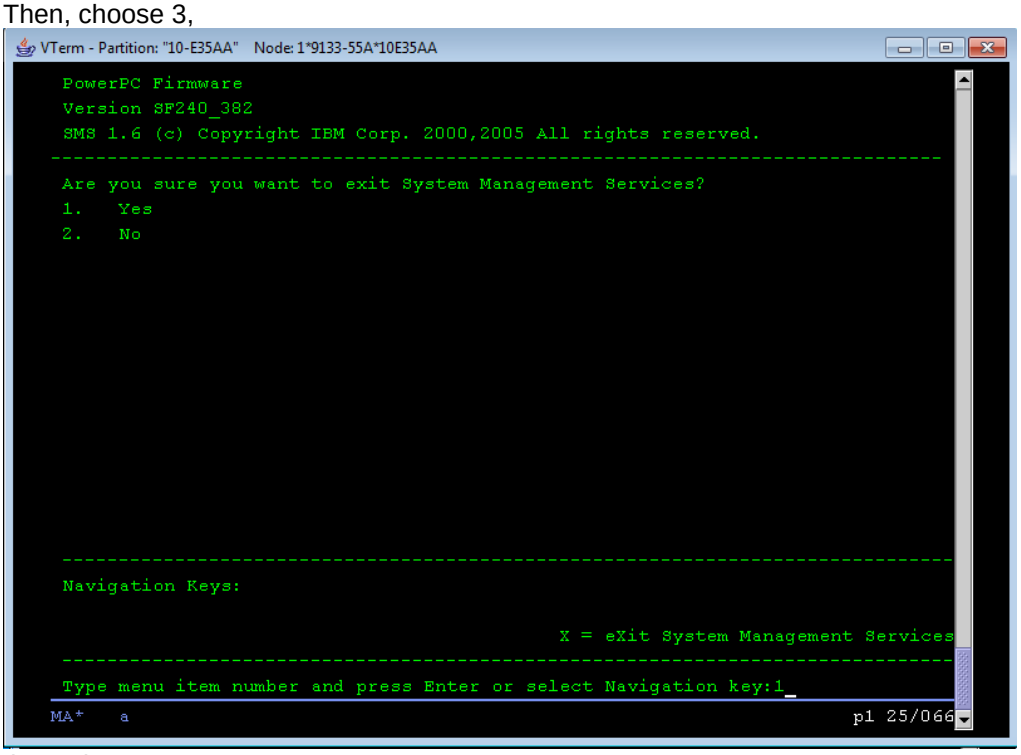
You choose 5, then init 2 to start the system OS to multiple user run level.

TIPS: If Select boot/install from Network/DVD/Tape, which means load OS kernel Not from Hard Disk, you will face a situation that you may install a new OS,migrate OS, recover OS on to a selected Hard Disk,

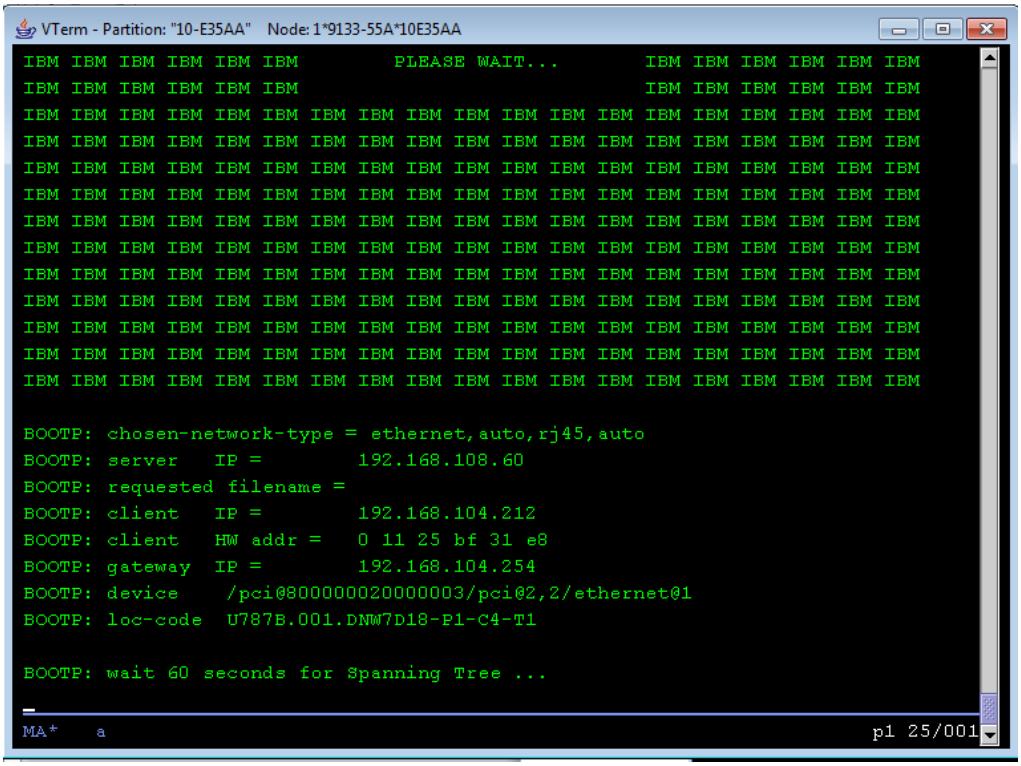
choose 3..Service Mode Boot, if you just want to load OS kernel in Service Mode, which configure Kernal by current system hardware, and enter a diagnose, maintenance for system recovery, totally new installation, and/or migration status



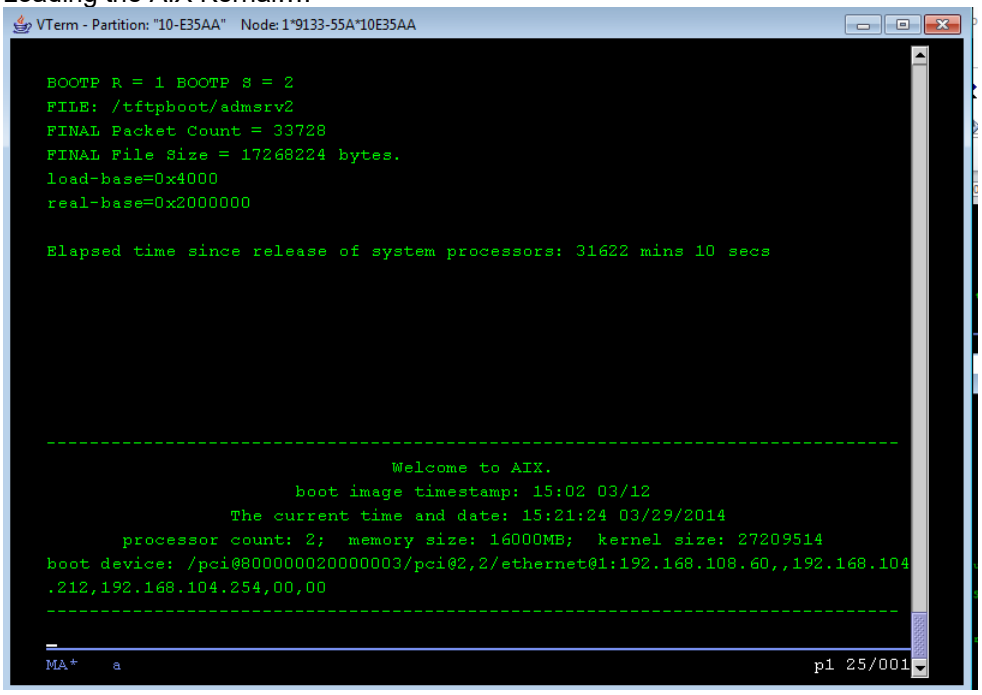
Then, choose 3,



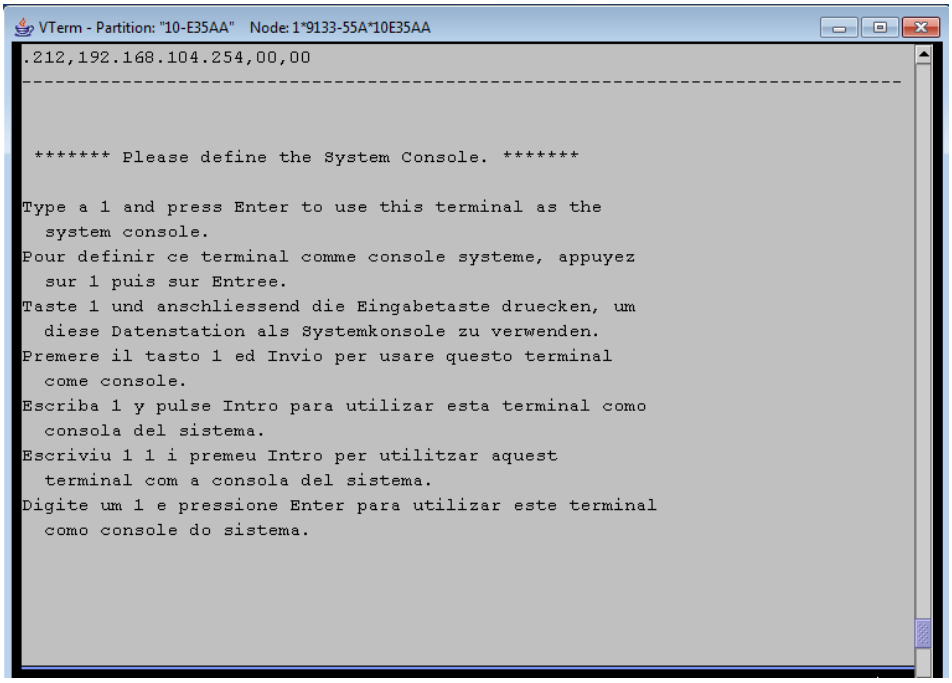
then, choose 1,

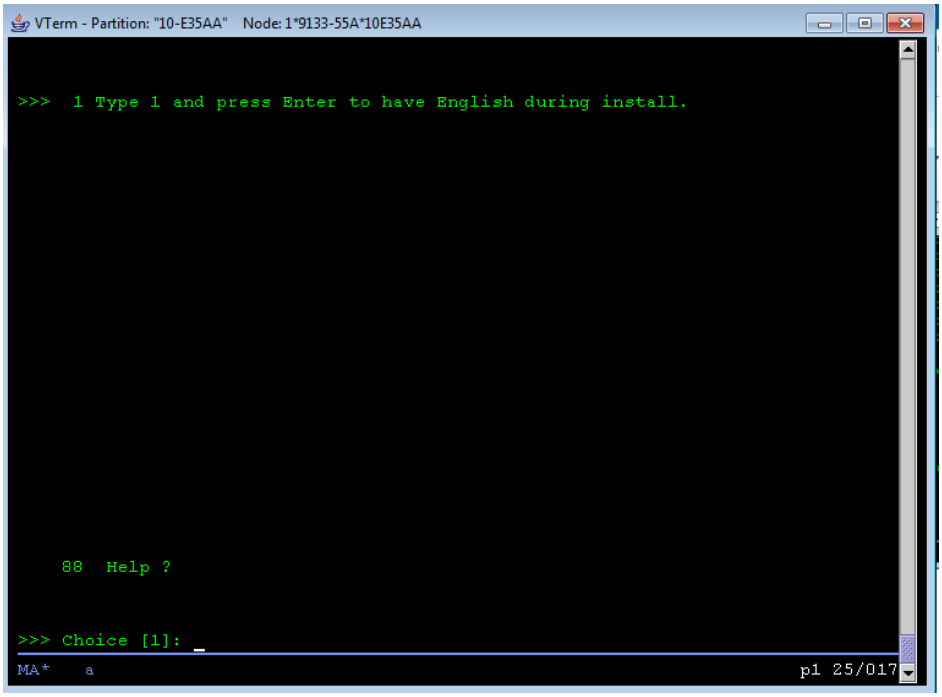


Loading the AIX Kernal….

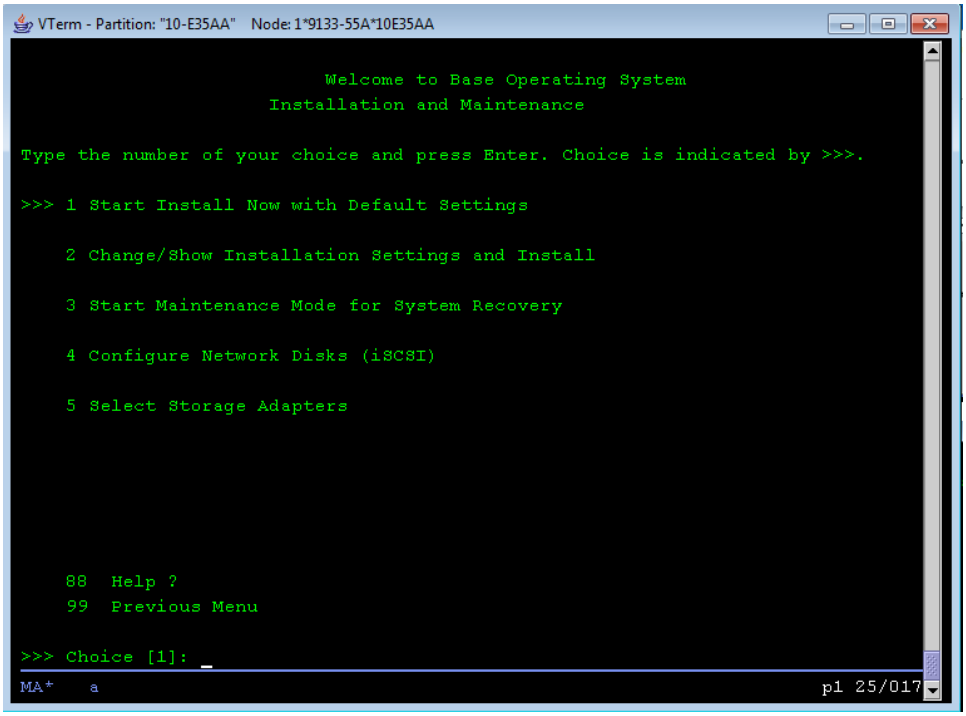


Following operation are controlled by OS kernel…



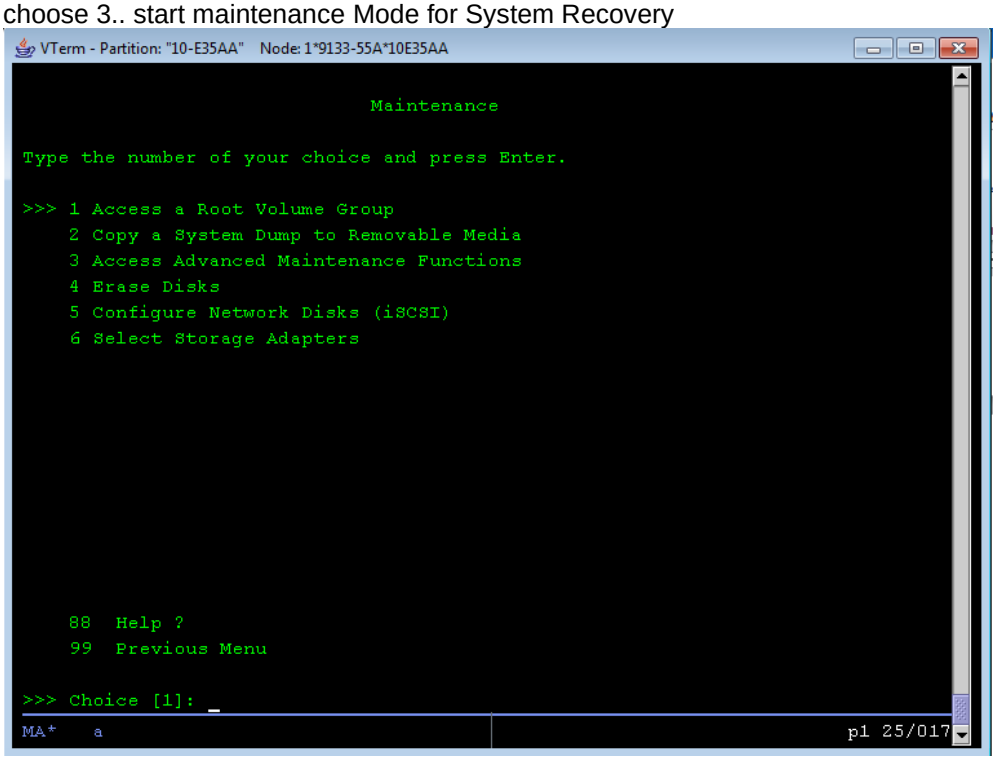


choose 1, have English during install



1. Start install Now with Dedault settings
2. Change/Show Installation Settings and install
3. Start maintenance Mode for System Recovery
4. Chfigure Network Disk (iscsi)
5. Select Storage Adapters

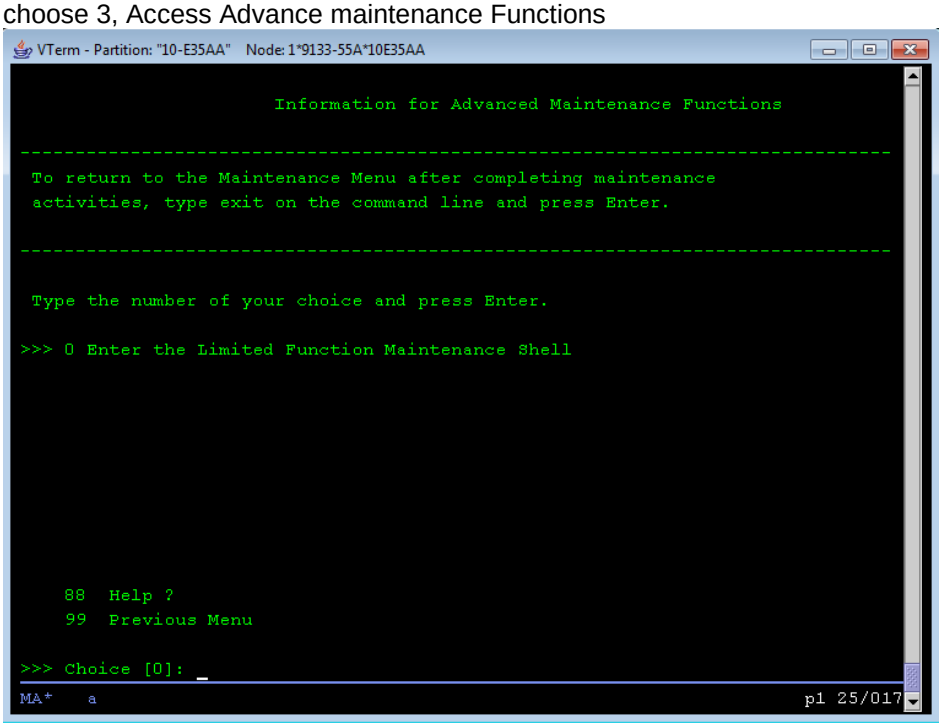
choose 3.. start maintenance Mode for System Recovery



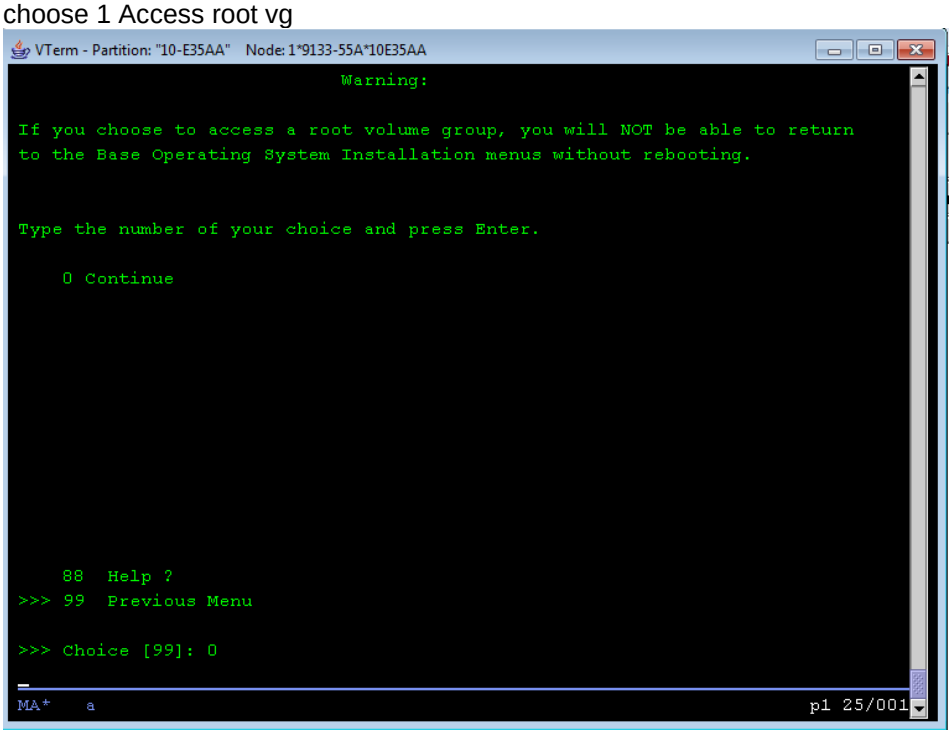
1. Access a Root Volume Group
2. Copy a system Dump to Removable Media
3. Access Advance Maintenace Functions
4. Erase Disks

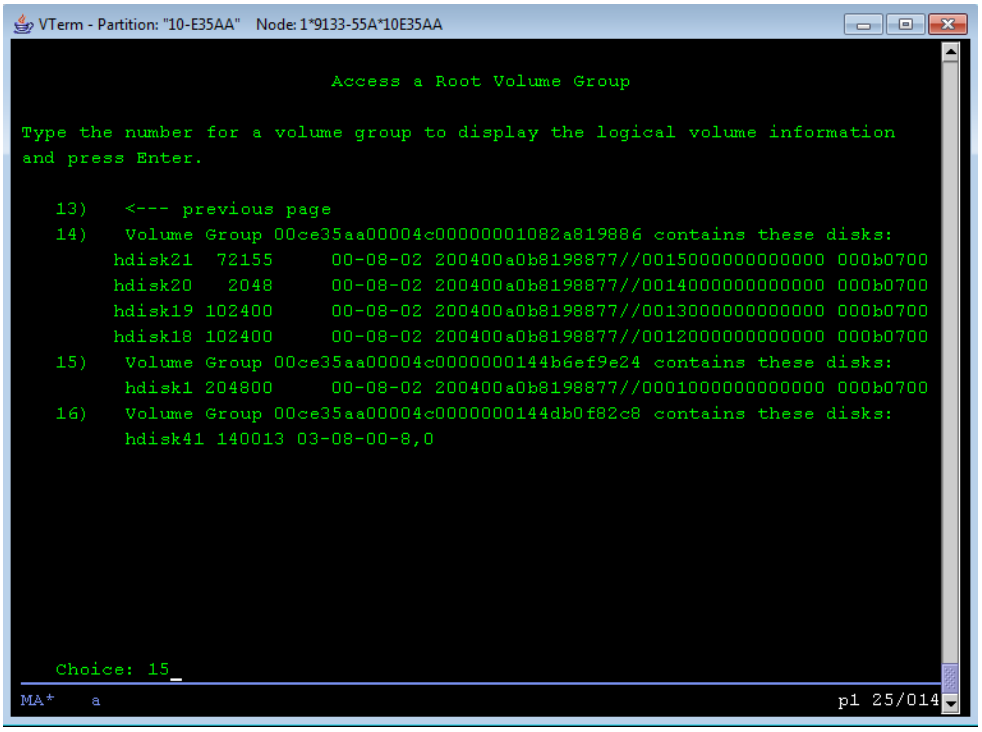
5. Configure Network Disks (iscsi)
6. Select Storage Adapters

choose 3, Access Advance maintenance Functions

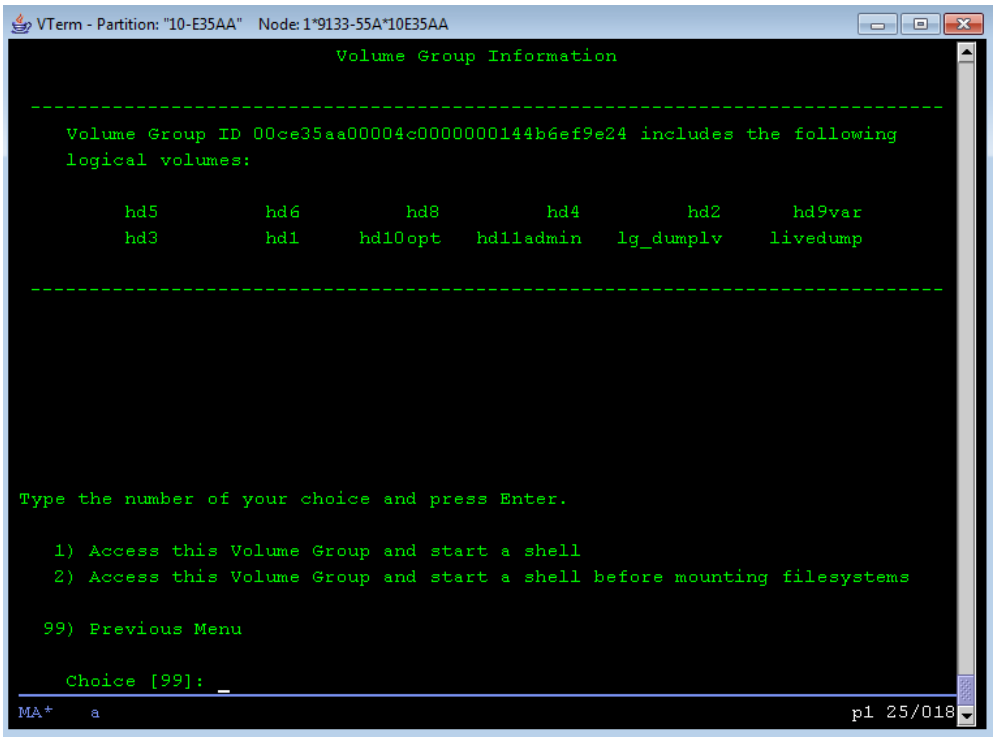


choose 1 Access root vg

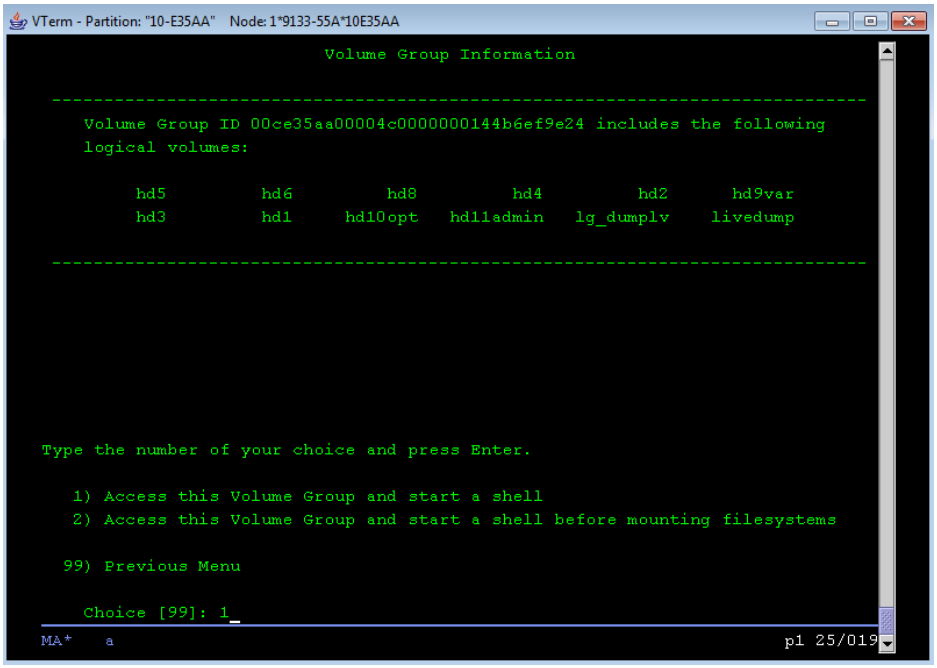


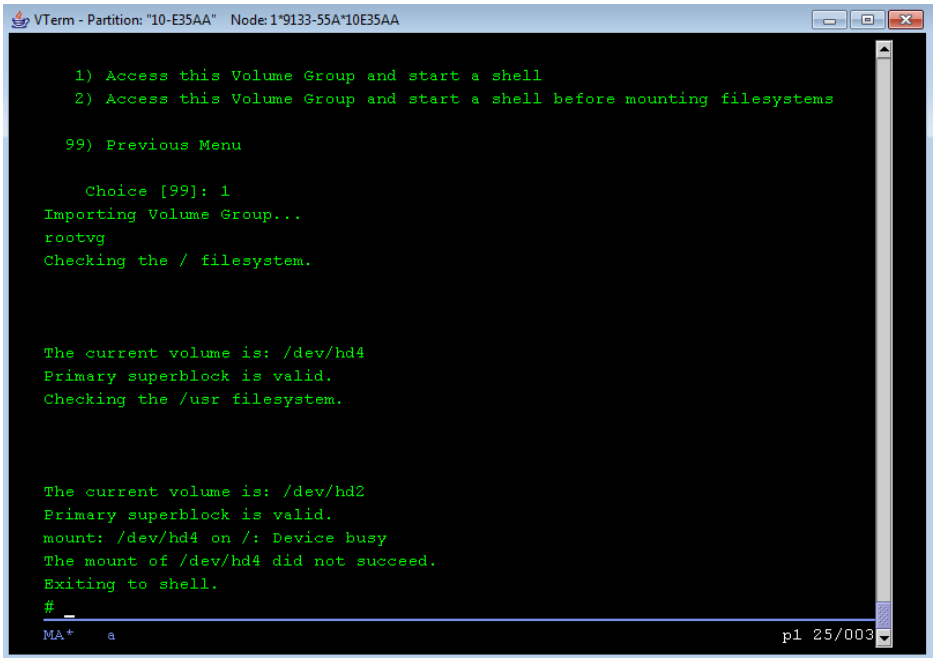


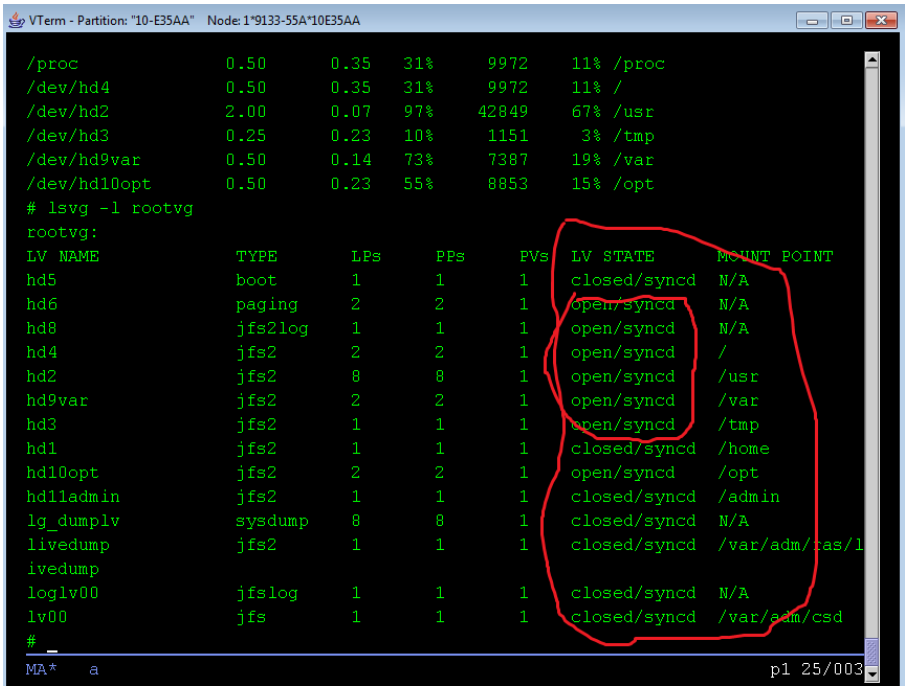
choose 15, Volume Group hdisk1



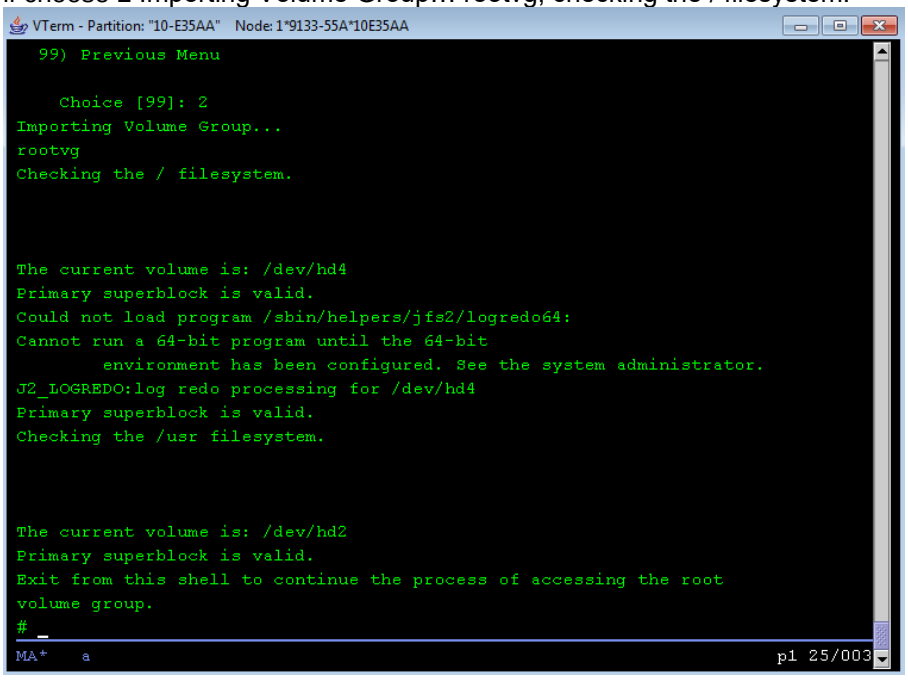
choose 1 Access this volume Group and start a shell, then you can fsck each filesystems on rootvg, and even change root password on /etc/passwd. or using #passwd directly.

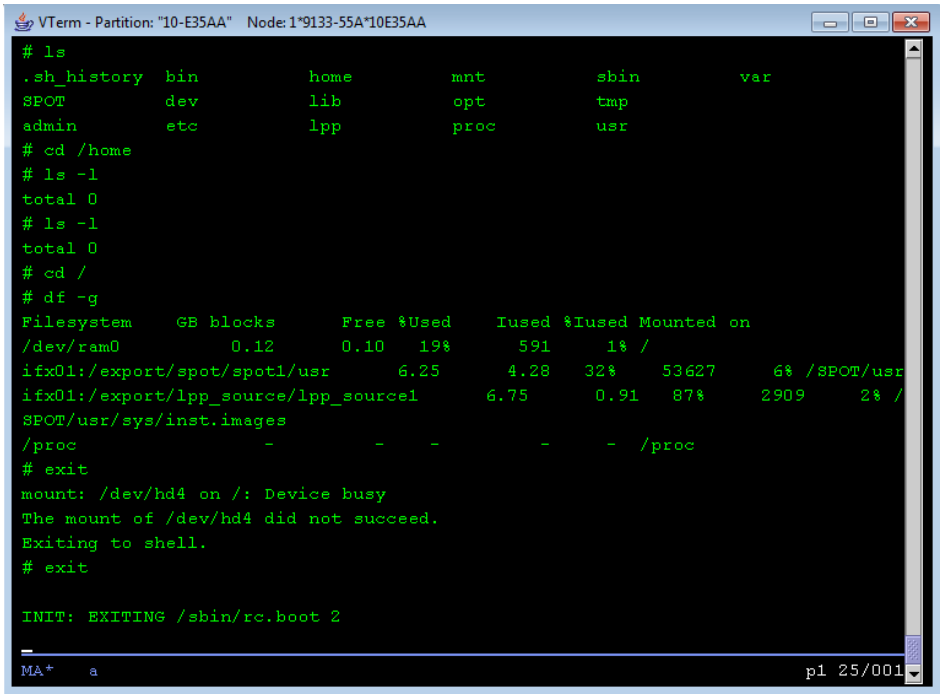

VTerm - Partition: "10-E35AA" Node: 1*9133-55A*10E35AA
Volume Group Information
Volume Group ID 00ce35aa00004c0000000144b6ef9e24 includes the following logical volumes:
hd5 hd6 hd8 hd4 hd2 hd9var
hd3 hd1 hd10opt hd11admin lg_dumplv livedump
Type the number of your choice and press Enter.
1) Access this Volume Group and start a shell
2) Access this Volume Group and start a shell before mounting filesystems
99) Previous Menu
Choice [99]: 1
MA* a
p1 25/019


VTerm - Partition: "10-E35AA" Node: 1*9133-55A*10E35AA
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
Importing Volume Group...
rootvg
Checking the / filesystem.
The current volume is: /dev/hd4
Primary superblock is valid.
Checking the /usr filesystem.
The current volume is: /dev/hd2
Primary superblock is valid.
mount: /dev/hd4 on /: Device busy
The mount of /dev/hd4 did not succeed.
Exiting to shell.
#
MA* a
p1 25/003



if choose 2 Importing Volume Group… rootvg, checking the / filesystem.





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5. Insert mksysb OS backup tape media into the Tape Drive. The system begins booting from the installation media. After several minutes, c31 is displayed in the LED (if your system has an LED; A screen similar to the one in Figure 1-1 is displayed).

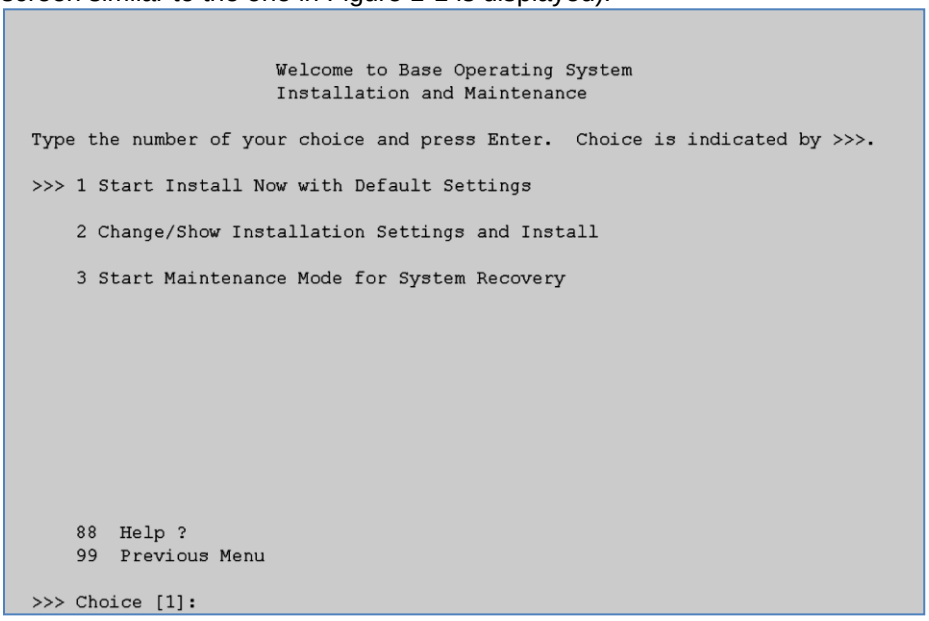

Figure 1-1

6. Select option 3, Start Maintenance Mode for System Recovery, and press Enter. A screen similar to the one in Figure 1-2 is shown.

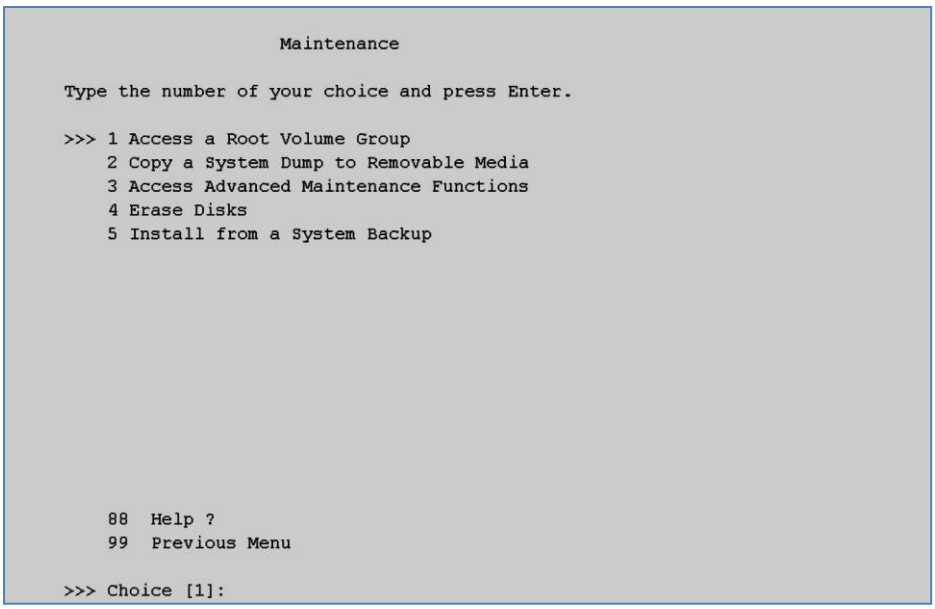

Figure 1-2

If you want to change root passwd here using ” 1 Access a Root Volume Group”

7. Enter 5, Install from a system backup

   Next System Backup Installation and Settings screen specifies disks where you want to install the backup image. The Change Disk(s) Where You Want to install screen displays. This screen lists all available disks on which you can install the system backup image. Three greater-than signs (>>>) mark each selected disk. Type the number and press Enter for each disk you choose. Type the number of a selected disk to deselect it. You can select more than one disk.

   We can select all 4 internal disks (hdisk0 hdisk1 hdisk2 hdisk3) to create rootvg.

8. After you have finished selecting disks, press the Enter key.

9. Type 0 to accept the settings in the System Backup Installation and Settings screen. The Installing Base Operating System screen displays the rate of completion and duration.

After OS restored from backup tape, the OS should be boot in normal mode.

Step 2: Setup System file systems environment for Application restoration

1. Preparation in /etc/filesystems:

   # cp /etc/filesystems /etc/filesystems.backup.20120503

   Remove stanza entries of following filesystems in /etc/filesystems:
   /ix_root
   /ix_plog
   /ix_llog
   /ix_dat1
   /ix_dat2
   /ix_dat3
   /ix_idx1
   /ix_idx2
   /ix_idx3

/ix_temp

/usr/apps
/netins
/dmqjtmp
/recyclebox

/ach_root
/ach_plog
/ach_llog
/ach_dat1
/ach_dat2
/ach_idx1
/ach_idx2
/ach_temp

 # vi /etc/filesystems

2. Use 6 external disks (300G) to create application and database storage space:

```
# Create Volume Group dbvg
/usr/sbin/mkvg -s 256 -f -y dbvg hdisk4 hdisk5 hdisk6 hdisk7 hdisk8 hdisk9

# Create Logic Volumes
/usr/sbin/mklv -t jfs2log -y loglv00 dbvg 1
/usr/sbin/mklv -t jfs2 -y ixrootlv dbvg 1
/usr/sbin/mklv -t jfs2 -y ixploglv dbvg 1
/usr/sbin/mklv -t jfs2 -y ixlloglv dbvg 4
/usr/sbin/mklv -t jfs2 -y ixdat1lv dbvg 88
/usr/sbin/mklv -t jfs2 -y ixdat2lv dbvg 100
/usr/sbin/mklv -t jfs2 -y ixdat3lv dbvg 76
/usr/sbin/mklv -t jfs2 -y ixidx1lv dbvg 28
/usr/sbin/mklv -t jfs2 -y ixidx2lv dbvg 20
/usr/sbin/mklv -t jfs2 -y ixidx3lv dbvg 16
/usr/sbin/mklv -t jfs2 -y ixtemplv dbvg 16

/usr/sbin/mklv -t jfs2 -y appslv dbvg 40
/usr/sbin/mklv -t jfs2 -y netinslv dbvg 10
/usr/sbin/mklv -t jfs2 -y dmqjtmplv dbvg 50
/usr/sbin/mklv -t jfs2 -y recyclelv dbvg 40

/usr/sbin/mklv -t jfs2 -y achrootlv dbvg 1
/usr/sbin/mklv -t jfs2 -y achploglv dbvg 1
/usr/sbin/mklv -t jfs2 -y achlloglv dbvg 4
/usr/sbin/mklv -t jfs2 -y achdat1lv dbvg 152
/usr/sbin/mklv -t jfs2 -y achdat2lv dbvg 164
/usr/sbin/mklv -t jfs2 -y achidx1lv dbvg 12
/usr/sbin/mklv -t jfs2 -y achidx2lv dbvg 12
/usr/sbin/mklv -t jfs2 -y achtemplv dbvg 8


# Create FileSystems
/usr/sbin/crfs -v jfs2 -d ixrootlv -m /ix_root -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixploglv -m /ix_plog -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixlloglv -m /ix_llog -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixdat1lv -m /ix_dat1 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixdat2lv -m /ix_dat2 -A yes -p rw -a logname=loglv00
```

/usr/sbin/crfs -v jfs2 -d ixdat3lv -m /ix_dat3 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixidx1lv -m /ix_idx1 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixidx2lv -m /ix_idx2 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixidx3lv -m /ix_idx3 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d ixtemplv -m /ix_temp -A yes -p rw -a logname=loglv00

/usr/sbin/crfs -v jfs2 -d appslv -m /usr/apps -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d netinslv -m /netins -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d dmqjtmplv -m /dmqjtmp -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d recyclelv -m /recyclebox -A yes -p rw -a logname=loglv00

/usr/sbin/crfs -v jfs2 -d achrootlv -m /ach_root -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achploglv -m /ach_plog -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achlloglv -m /ach_llog -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achdat1lv -m /ach_dat1 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achdat2lv -m /ach_dat2 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achidx1lv -m /ach_idx1 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achidx2lv -m /ach_idx2 -A yes -p rw -a logname=loglv00
/usr/sbin/crfs -v jfs2 -d achtemplv -m /ach_temp -A yes -p rw -a logname=loglv00

Mount all these filesystems
/usr/sbin/mount all

Step 3: Restore Application

To restore the backups from a single-volume, multiple-backup tape, for example:

```
# restore -xvqs 5 -f /dev/rmt0.1
# restore -xvqs 4 -f /dev/rmt0.1
```

The first command extracts all files from the fifth archive on the multiple-backup tape specified by /dev/rmt0.1. The .1 designator specifies the tape device will not be retensioned when it is opened and that it will not be rewound when it is closed. It is necessary to use a no-rewind-on-close, no-retension-on-open tape device because of the behavior of the -s flag. The second command extracts all the files from the fourth archive (relative to the current location of the tape head on the tape). After the fifth archive has been restored, the tape read/write head is in a position to read the archive. Since you want to extract the ninth archive on the tape, you must specify a value of 4 with the -s flag. This is because the -s flag is relative to your position on the tape and not to an archives position on the tape. The ninth archive is the fourth archive from your current position on the tape.

The Application file systems backup sequence:

filesystem: /	File Archive number: 1
filesystem: /home	File Archive number: 2
filesystem: /usr	File Archive number: 3
filesystem: /var	File Archive number: 4
filesystem: /tmp	File Archive number: 5
filesystem: /opt	File Archive number: 6
filesystem: /ibm	File Archive number: 7
filesystem: /netins	File Archive number: 8
filesystem: /dmqjtmp	File Archive number: 9
filesystem: /recyclebox	File Archive number: 10
filesystem: /usr/apps	File Archive number: 11
filesystem: /insight	File Archive number: 12
filesystem: /var/adm/ras/livedump	File Archive number: 13
filesystem: /admin	File Archive number: 14

We need to restore file systems**: /ibm; /netins; /dmqjtmp; /recyclebox; /usr/apps**; The other file systems are restored by OS restore process (They are in rootvg).

1. Insert APP backup tape media into the Tape Drive.
   # tctl –f /dev/rmt0 rewind

2. To restore /ibm file system, Change to a directory that will be used to restore the files
   # cd /ibm
   # restore -xvqs 7 –f /dev/rmt0.1

   You have not read any media yet.
   Unless you know which volume your file or files are on, you should start with the last volume and work towards the first volume.
   Specify the next volume number: **1**

   [Type the volume number and press Return. If you have only one volume, type `1` and press Return]

   Do you want to set the owner or the mode for the current directory? [yes or no] **no**
   [To keep the mode of the current directory unchanged, enter **no** at the `set owner/mode` prompt]

3. Then, to restore /netins file system:
   # cd /netins
   # restore -xvqs 1 –f /dev/rmt0.1

   You have not read any media yet.
   Unless you know which volume your file or files are on, you should start with the last volume and work towards the first volume.
   Specify the next volume number: **1**

   Do you want to set the owner or the mode for the current directory? [yes or no] **no**

4. Then, to restore /dmqjtmp file system:
   # cd /dmqjtmp
   # restore -xvqs 1 –f /dev/rmt0.1

   You have not read any media yet.
   Unless you know which volume your file or files are on, you should start with the last volume and work towards the first volume.
   Specify the next volume number: **1**

   Do you want to set the owner or the mode for the current directory? [yes or no] **yes**

5. Then, to restore /recyclebox file system:
   # cd /recyclebox
   # restore -xvqs 1 –f /dev/rmt0.1

   You have not read any media yet.
   Unless you know which volume your file or files are on, you should start with the last volume and work towards the first volume.
   Specify the next volume number: **1**

   Do you want to set the owner or the mode for the current directory? [yes or no] **yes**

6. Then, to restore /usr/apps file system:
   # cd /usr/apps
   # restore -xvqs 1 –f /dev/rmt0.1

   You have not read any media yet.
   Unless you know which volume your file or files are on, you should start with the last volume and work towards the first volume.
   Specify the next volume number: **1**

   Do you want to set the owner or the mode for the current directory? [yes or no] **yes**

7. Eject the tape from tape drive:
   # tctl –f /dev/rmt0.1 offline

Step 4: Setup Informix database Restore Environment

Create Database Storage files (chunks) for informix dbspace

```
cd /ix_dat1
/usr/bin/touch ix_dat1.1
/usr/bin/touch ix_dat1.10
/usr/bin/touch ix_dat1.11
/usr/bin/touch ix_dat1.12
/usr/bin/touch ix_dat1.13
/usr/bin/touch ix_dat1.14
/usr/bin/touch ix_dat1.15
/usr/bin/touch ix_dat1.16
/usr/bin/touch ix_dat1.17
/usr/bin/touch ix_dat1.18
/usr/bin/touch ix_dat1.19
/usr/bin/touch ix_dat1.2
/usr/bin/touch ix_dat1.20
/usr/bin/touch ix_dat1.21
/usr/bin/touch ix_dat1.22
/usr/bin/touch ix_dat1.3
/usr/bin/touch ix_dat1.4
/usr/bin/touch ix_dat1.5
/usr/bin/touch ix_dat1.6
/usr/bin/touch ix_dat1.7
/usr/bin/touch ix_dat1.8
/usr/bin/touch ix_dat1.9

cd /ix_dat2
/usr/bin/touch ix_dat2.1
/usr/bin/touch ix_dat2.10
/usr/bin/touch ix_dat2.11
/usr/bin/touch ix_dat2.12
/usr/bin/touch ix_dat2.13
/usr/bin/touch ix_dat2.14
/usr/bin/touch ix_dat2.15
/usr/bin/touch ix_dat2.16
/usr/bin/touch ix_dat2.17
/usr/bin/touch ix_dat2.18
/usr/bin/touch ix_dat2.19
/usr/bin/touch ix_dat2.2
/usr/bin/touch ix_dat2.20
/usr/bin/touch ix_dat2.21
/usr/bin/touch ix_dat2.22
/usr/bin/touch ix_dat2.23
/usr/bin/touch ix_dat2.24
/usr/bin/touch ix_dat2.25
/usr/bin/touch ix_dat2.3
/usr/bin/touch ix_dat2.4
/usr/bin/touch ix_dat2.5
/usr/bin/touch ix_dat2.6
/usr/bin/touch ix_dat2.7
/usr/bin/touch ix_dat2.8
/usr/bin/touch ix_dat2.9
```

```
cd /ix_dat3
/usr/bin/touch ix_dat3.1
/usr/bin/touch ix_dat3.10
/usr/bin/touch ix_dat3.11
/usr/bin/touch ix_dat3.12
/usr/bin/touch ix_dat3.13
/usr/bin/touch ix_dat3.14
/usr/bin/touch ix_dat3.15
/usr/bin/touch ix_dat3.16
/usr/bin/touch ix_dat3.17
/usr/bin/touch ix_dat3.18
/usr/bin/touch ix_dat3.19
/usr/bin/touch ix_dat3.2
/usr/bin/touch ix_dat3.3
/usr/bin/touch ix_dat3.4
/usr/bin/touch ix_dat3.5
/usr/bin/touch ix_dat3.6
/usr/bin/touch ix_dat3.7
/usr/bin/touch ix_dat3.8
/usr/bin/touch ix_dat3.9

cd /ix_idx1
/usr/bin/touch ix_idx1.1
/usr/bin/touch ix_idx1.2
/usr/bin/touch ix_idx1.3
/usr/bin/touch ix_idx1.4
/usr/bin/touch ix_idx1.5
/usr/bin/touch ix_idx1.6
/usr/bin/touch ix_idx1.7

cd /ix_idx2
total 0
/usr/bin/touch ix_idx2.1
/usr/bin/touch ix_idx2.2
/usr/bin/touch ix_idx2.3
/usr/bin/touch ix_idx2.4
/usr/bin/touch ix_idx2.5

cd /ix_idx3
/usr/bin/touch ix_idx3.1
/usr/bin/touch ix_idx3.2
/usr/bin/touch ix_idx3.3
/usr/bin/touch ix_idx3.4

cd /ix_llog
/usr/bin/touch ix_llog.1

cd /ix_plog
/usr/bin/touch ix_plog.1

cd /ix_root:
/usr/bin/touch ix_root.1

cd /ix_temp
/usr/bin/touch ix_temp.1
/usr/bin/touch ix_temp.2
/usr/bin/touch ix_temp.3
/usr/bin/touch ix_temp.4

cd /
/usr/bin/chown -R informix:informix ix*
/usr/bin/chmod -R 660 ix*
/usr/bin/chmod 777 ix*


Reboot the system
```

 # sync; sync; sync; shutdown -Fr

Step 5: Restore Informix database

1. Setup Informix running environment:

   Login as root

   # hostname ifx01
   # ifconfig en0 192.168.108.60

   login as USER Informix

   $ . ./ids115.env ipdb

2. Restore Informix Database:

   Insert Informix 'ontape -s' backup tape media into the Tape Drive
   $ ontape –r

```
Please mount tape 1 on /dev/rmt0 and press Return to continue:…
[enter]

Continue to restore? (y/n) y
Do you want to back up the logs? (y/n) n

Warning : If you intent to use J/Foundation or GLS for Unicode feature(GLU) with this server
instance, please make sure that your SHMBASE value specifies in onconfig is 0x40000000L or
above. Otherwise you will have problems while attaching or dynamically adding virtul shared
memory segments. Please refer to Server machine notes for more information.

Restore a level 1 archive (y/n) n
Do you want to restore log tapes? (y/n) n

/usr/apps/inf/ver115UC3/bin/onmode –sy

Program over
```

3. Bring the database server online when the restore is over
   $ onmode -m

Step 6: Bring Database and application online

Run Informix:

```
login as USER Informix
$ . ./ids115.env ipdb
$ oninit
```

Shutdown Informix:

```
$ onmode –ky
```

Run Tuxedo Application:

```
login as ipgown
$ cd /usr/apps/ipg/ver001/srv/locus
$ . ./setenv.locus
$ tmboot –y
```

Shutdown Tuxedo Application:

```
# tmshutdown -y
```

For Archive database server ardb DRP consideration

Archive database storage architecture:

IBM Informix Dynamic Server Version 11.50.UC3W2 -- On-Line -- Up 02:24:07 -- 929856 Kbytes

Dbspaces

address	number	flags	fchunk	nchunks	pgsize	flags	owner	name
50431810	1	0x1	1	1	4096	N	informix	rootdbs
5051dd50	2	0x1	2	1	4096	N	informix	llogdbs
5051deb0	3	0x1	3	2	4096	N	informix	tempdbs1
5138a018	4	0x1	4	1	4096	N	informix	plogdbs
5138a178	5	0x1	5	44	4096	N	informix	datadbs1
5138a2d8	6	0x1	27	48	4096	N	informix	datadbs2
5138a438	7	0x1	51	3	4096	N	informix	indxdbs1
5138a598	8	0x1	54	3	4096	N	informix	indxdbs2

8 active, 2047 maximum

Chunks

address	chunk/dbs	offset	size	free	bpages	flags	pathname
50431970	1	1	0	62500	54561	PO--	/ach_root/ach_root.1
5138a6f8	2	2	0	250000	124947	PO--	/ach_llog/ach_llog.1
5138a8c8	3	3	0	250000	249547	PO--	/ach_temp/ach_temp.1
5138aa98	4	4	0	62500	2447	PO--	/ach_plog/ach_plog.1
5138ac68	5	5	0	250000	0	PO--	/ach_dat1/ach_dat1.1
5138ae38	6	5	0	250000	3	PO--	/ach_dat1/ach_dat1.2
5138b018	7	5	0	250000	1	PO--	/ach_dat1/ach_dat1.3
5138b1e8	8	5	0	250000	1	PO--	/ach_dat1/ach_dat1.4
5138b3b8	9	5	0	250000	1	PO--	/ach_dat1/ach_dat1.5
5138b588	10	5	0	250000	0	PO--	/ach_dat1/ach_dat1.6
5138b758	11	5	0	250000	0	PO--	/ach_dat1/ach_dat1.7
5138b928	12	5	0	250000	0	PO--	/ach_dat1/ach_dat1.8
5138baf8	13	5	0	250000	0	PO--	/ach_dat1/ach_dat1.9
5138bcc8	14	5	0	250000	0	PO--	/ach_dat1/ach_dat1.10
5138c018	15	5	0	250000	0	PO--	/ach_dat1/ach_dat1.11
5138c1e8	16	5	0	250000	0	PO--	/ach_dat1/ach_dat1.12
5138c3b8	17	5	0	250000	1	PO--	/ach_dat1/ach_dat1.13
5138c588	18	5	0	250000	0	PO--	/ach_dat1/ach_dat1.14
5138c758	19	5	0	250000	3	PO--	/ach_dat1/ach_dat1.15
5138c928	20	5	0	250000	0	PO--	/ach_dat1/ach_dat1.16
5138caf8	21	5	0	250000	0	PO--	/ach_dat1/ach_dat1.17
5138ccc8	22	5	0	250000	0	PO--	/ach_dat1/ach_dat1.18
5138d018	23	5	0	250000	0	PO--	/ach_dat1/ach_dat1.19
5138d1e8	24	5	0	250000	1	PO--	/ach_dat1/ach_dat1.20
5138d3b8	25	5	0	250000	1	PO--	/ach_dat1/ach_dat1.21
5138d588	26	5	0	250000	0	PO--	/ach_dat1/ach_dat1.22
5138d758	27	6	0	250000	1	PO--	/ach_dat2/ach_dat2.1
5138d928	28	6	0	250000	0	PO--	/ach_dat2/ach_dat2.2
5138daf8	29	6	0	250000	0	PO--	/ach_dat2/ach_dat2.3
5138dcc8	30	6	0	250000	0	PO--	/ach_dat2/ach_dat2.4
5138e018	31	6	0	250000	0	PO--	/ach_dat2/ach_dat2.5
5138e1e8	32	6	0	250000	0	PO--	/ach_dat2/ach_dat2.6
5138e3b8	33	6	0	250000	0	PO--	/ach_dat2/ach_dat2.7
5138e588	34	6	0	250000	0	PO--	/ach_dat2/ach_dat2.8
5138e758	35	6	0	250000	0	PO--	/ach_dat2/ach_dat2.9
5138e928	36	6	0	250000	0	PO--	/ach_dat2/ach_dat2.10
5138eaf8	37	6	0	250000	3	PO--	/ach_dat2/ach_dat2.11
5138ecc8	38	6	0	250000	0	PO--	/ach_dat2/ach_dat2.12
5138f018	39	6	0	250000	0	PO--	/ach_dat2/ach_dat2.13
5138f1e8	40	6	0	250000	0	PO--	/ach_dat2/ach_dat2.14
5138f3b8	41	6	0	250000	0	PO--	/ach_dat2/ach_dat2.15
5138f588	42	6	0	250000	0	PO--	/ach_dat2/ach_dat2.16
5138f758	43	6	0	250000	0	PO--	/ach_dat2/ach_dat2.17
5138f928	44	6	0	250000	0	PO--	/ach_dat2/ach_dat2.18
5138faf8	45	6	0	250000	0	PO--	/ach_dat2/ach_dat2.19
5138fcc8	46	6	0	250000	0	PO--	/ach_dat2/ach_dat2.20
51390018	47	6	0	250000	0	PO--	/ach_dat2/ach_dat2.21
513901e8	48	6	0	250000	0	PO--	/ach_dat2/ach_dat2.22
513903b8	49	6	0	250000	0	PO--	/ach_dat2/ach_dat2.23
51390588	50	6	0	250000	0	PO--	/ach_dat2/ach_dat2.24
51390758	51	7	0	250000	2	PO--	/ach_idx1/ach_idx1.1
51390928	52	7	0	250000	162	PO--	/ach_idx1/ach_idx1.2
51390af8	53	7	0	250000	245901	PO--	/ach_idx1/ach_idx1.3
51390cc8	54	8	0	250000	176857	PO--	/ach_idx2/ach_idx2.1
51391018	55	8	0	250000	249997	PO--	/ach_idx2/ach_idx2.2
513911e8	56	8	0	250000	249997	PO--	/ach_idx2/ach_idx2.3

```
513913b8    57      3       0           256000      255997      PO--  /ach_temp/ach_temp.2
51391588    58      5       0           250000      0   PO--  /ach_dat1/ach_dat1.23
51391758    59      5       0           250000      0   PO--  /ach_dat1/ach_dat1.24
51391928    60      5       0           250000      0   PO--  /ach_dat1/ach_dat1.25
51391af8    61      5       0           250000      0   PO--  /ach_dat1/ach_dat1.26
51391cc8    62      5       0           250000      0   PO--  /ach_dat1/ach_dat1.27
51395018    63      5       0           250000      0   PO--  /ach_dat1/ach_dat1.28
513951e8    64      6       0           250000      0   PO--  /ach_dat2/ach_dat2.25
513953b8    65      6       0           250000      1   PO--  /ach_dat2/ach_dat2.26
51395588    66      6       0           250000      0   PO--  /ach_dat2/ach_dat2.27
51395758    67      6       0           250000      0   PO--  /ach_dat2/ach_dat2.28
51395928    68      6       0           250000      0   PO--  /ach_dat2/ach_dat2.29
51395af8    69      6       0           250000      0   PO--  /ach_dat2/ach_dat2.30
51395cc8    70      5       0           250000      1   PO--  /ach_dat1/ach_dat1.29
51396018    71      5       0           250000      1   PO--  /ach_dat1/ach_dat1.30
513961e8    72      5       0           250000      1   PO--  /ach_dat1/ach_dat1.31
513963b8    73      5       0           250000      3   PO--  /ach_dat1/ach_dat1.32
51396588    74      5       0           250000      0   PO--  /ach_dat1/ach_dat1.33
51396758    75      6       0           250000      0   PO--  /ach_dat2/ach_dat2.31
51396928    76      6       0           250000      0   PO--  /ach_dat2/ach_dat2.32
51396af8    77      6       0           250000      0   PO--  /ach_dat2/ach_dat2.33
51396cc8    78      5       0           250000      2   PO--  /ach_dat1/ach_dat1.34
51397018    79      5       0           250000      1   PO--  /ach_dat1/ach_dat1.35
513971e8    80      6       0           250000      0   PO--  /ach_dat2/ach_dat2.34
513973b8    81      6       0           250000      0   PO--  /ach_dat2/ach_dat2.35
51397588    82      5       0           250000      5   PO--  /ach_dat1/ach_dat1.36
51397758    83      5       0           250000      5   PO--  /ach_dat1/ach_dat1.37
51397928    84      5       0           250000      125PO--  /ach_dat1/ach_dat1.38
51397af8    85      6       0           250000      0   PO--  /ach_dat2/ach_dat2.36
51397cc8    86      6       0           250000      0   PO--  /ach_dat2/ach_dat2.37
51398018    87      6       0           250000      0   PO--  /ach_dat2/ach_dat2.38
513981e8    88      6       0           250000      0   PO--  /ach_dat2/ach_dat2.39
513983b8    89      6       0           250000      0   PO--  /ach_dat2/ach_dat2.40
51398588    90      5       0           250000      397PO--  /ach_dat1/ach_dat1.39
51398758    91      6       0           250000      0   PO--  /ach_dat2/ach_dat2.41
51398928    92      6       0           250000      0   PO--  /ach_dat2/ach_dat2.42
51398af8    93      5       0           250000      141PO--  /ach_dat1/ach_dat1.40
51398cc8    94      6       0           250000      0   PO--  /ach_dat2/ach_dat2.43
51399018    95      5       0           250000      141PO--  /ach_dat1/ach_dat1.41
513991e8    96      6       0           250000      0   PO--  /ach_dat2/ach_dat2.44
513993b8    97      5       0           250000      0   PO--  /ach_dat1/ach_dat1.42
51399588    98      6       0           250000      0   PO--  /ach_dat2/ach_dat2.45
51399758    99      6       0           250000      0   PO--  /ach_dat2/ach_dat2.46
51399928    100     6       0           250000      34945 PO--  /ach_dat2/ach_dat2.47
51399af8    101     6       0           250000      184461PO--  /ach_dat2/ach_dat2.48
51399cc8    102     5       0           250000      45709 PO--  /ach_dat1/ach_dat1.43
5139a018    103     5       0           250000      249997PO--  /ach_dat1/ach_dat1.44
 103 active, 2047 maximum

NOTE: The values in the "size" and "free" columns for DBspace chunks are
      displayed in terms of "pgsize" of the DBspace to which they belong.

Expanded chunk capacity mode: disabled
```

Monthly data space change:

```
69,71c69,71
< 51390928 52      7       0           250000      1698      PO--  /ach_idx1/ach_idx1.2
< 51390af8 53      7       0           250000      249997    PO--  /ach_idx1/ach_idx1.3
< 51390cc8 54      8       0           250000      177497    PO--  /ach_idx2/ach_idx2.1
---
> 51390928 52      7       0           250000      162           PO--  /ach_idx1/ach_idx1.2
> 51390af8 53      7       0           250000      245901    PO--  /ach_idx1/ach_idx1.3
> 51390cc8 54      8       0           250000      176857    PO--  /ach_idx2/ach_idx2.1

117,119c117,119
< 51399928 100     6       0           250000      182409    PO--  /ach_dat2/ach_dat2.47
< 51399af8 101     6       0           250000      249997    PO--  /ach_dat2/ach_dat2.48
< 51399cc8 102     5       0           250000      211597    PO--  /ach_dat1/ach_dat1.43
---
> 51399928 100     6       0           250000      34945     PO--  /ach_dat2/ach_dat2.47
> 51399af8 101     6       0           250000      184461    PO--  /ach_dat2/ach_dat2.48
```

```
> 51399cc8 102     5       0           250000      45709     PO--  /ach_dat1/ach_dat1.43
```

For Create new chunks for Dbspace: datadbs1 and datadbs2:

Dbspace 6: 432406 - 219406= 213000(page) * 4 = 852000 (kilobyte)
Dbspace 5: 211597 - 45709 = 165888(page) * 4 = 663552 (kilobyte)
+
==== ==========
1,515,552 (kilobyte)

For ip_arch03 to hold 18 months data, we still need 6 months (from Nov,2012) data space:
1515552 * 6 = 9,093,312 (kilobyte)