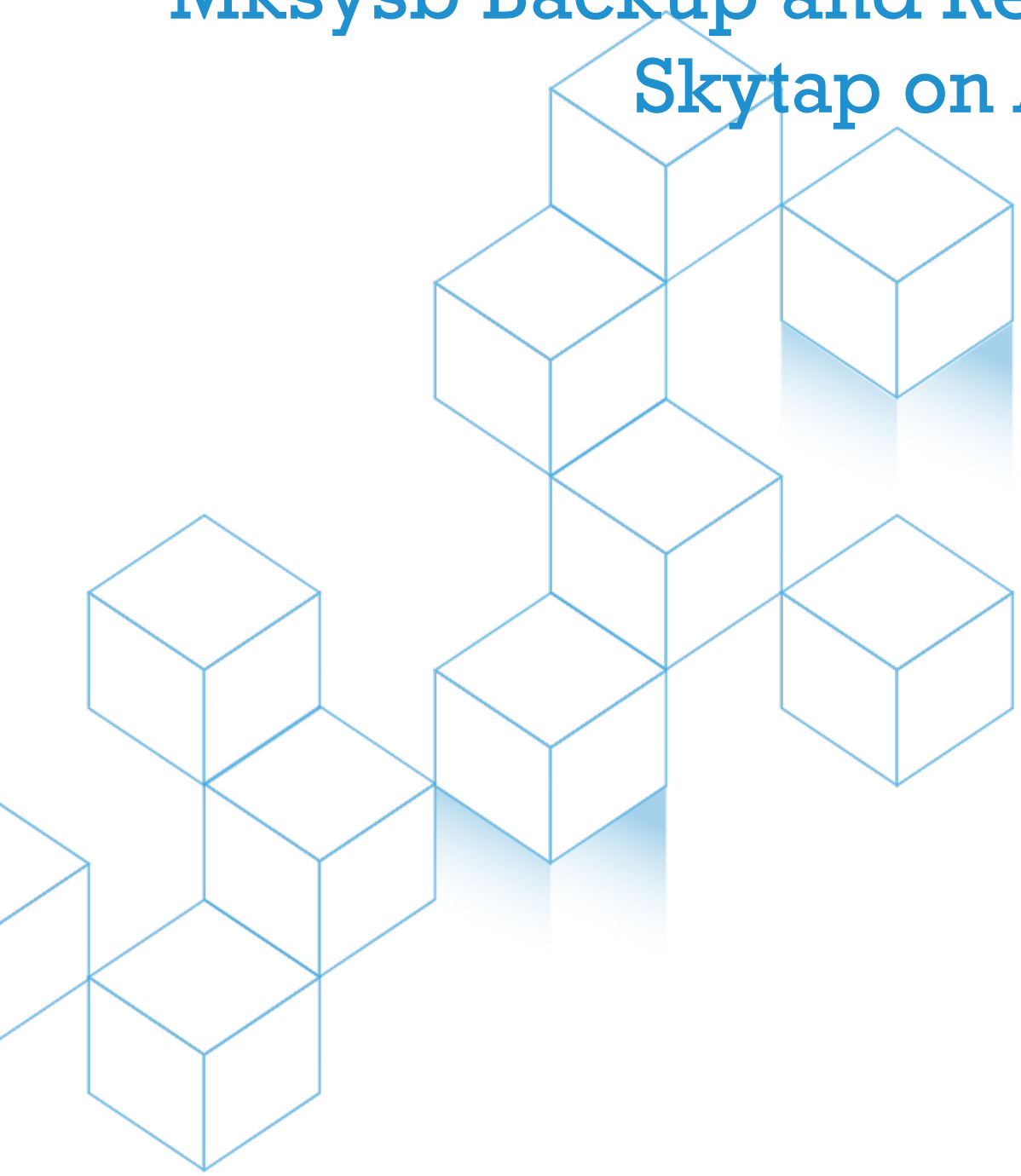
# Mksysb Backup and Restore Skytap on Azure



# Mksysb Backup and Restore in Skytap

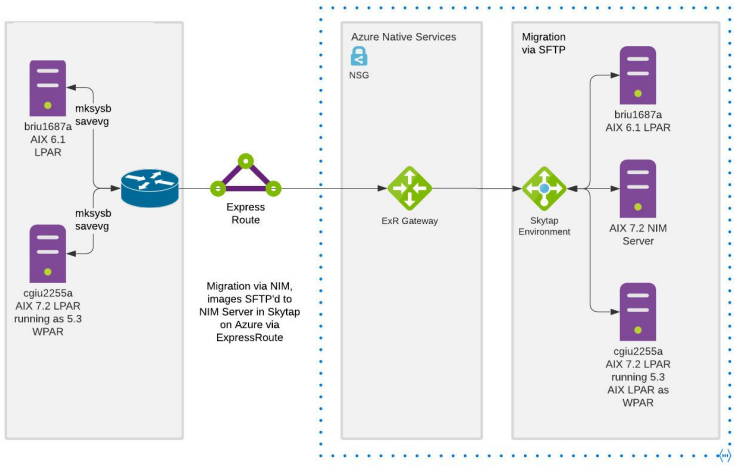
1) Backing up on-prem system using mksysb
    a. Prechecks –
        - Error logs for any OS level issues
        - Check Software inconsistencies using # lppchk -v
        - Resolve any operating system level issue to take a healthy system Backup
        - Enough free space to backup all files in a filesystem
    b. Backup execution
        - Populate the /tmp/exclude.rootvg file for excluding the filesystems from the backup
        - Use command # mksysb -ipX /<FS>/<hostname>.mksysb

```
# mksysb -ipX /backup/myhost.mksysb

Creating information file (/image.data) for rootvg.

Creating list of files to back up

Backing up 78998 files.....

78998 of 78998 files backed up (100%)
0512-038 mksysb: Backup Completed Successfully.
```

        - It may take some time to complete the backup
        - Verify content of mksysb using # lsmksysb -lf /<FS>/<hostname>.mksysb

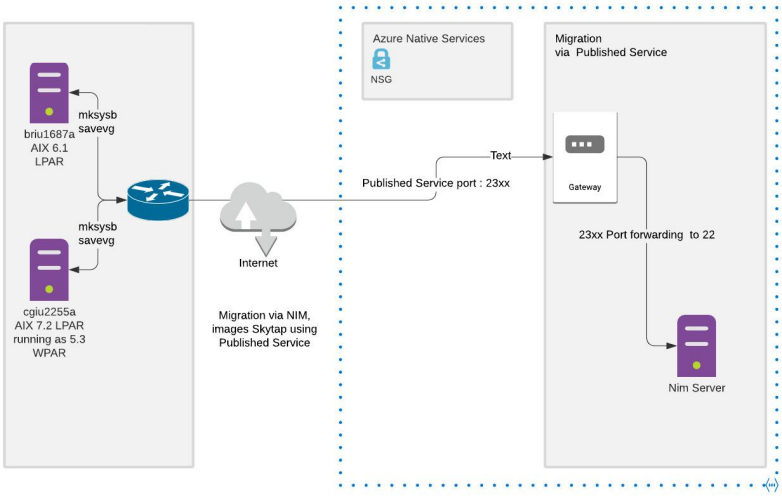
```
# lsmksysb -lf /backup/myhost.mksysb
VOLUME GROUP:           rootvg
BACKUP DATE/TIME:       Thu Dec 16 00:38:18 UTC 2021
UNAME INFO:             AIX sapaix 2 7 00C97B604B00
BACKUP OSLEVEL:         7.2.3.15
MAINTENANCE LEVEL:      7200-03
SERVICEPACK LEVEL:      7200-03-02-1846
BACKUP SIZE (MB):       28448
SHRINK SIZE (MB):       8483
VG DATA ONLY:           no

rootvg:
LV NAME             TYPE       LPs     PPs     PVs  LV STATE      MOUNT POINT
hd5                 boot       1       1       1    closed/syncd  N/A
hd6                 paging     16      16      1    open/syncd    N/A
hd8                 jfs2log    1       1       1    open/syncd    N/A
hd4                 jfs2       168     168     1    open/syncd    /
hd2                 jfs2       160     160     1    open/syncd    /usr
hd9var              jfs2       6       6       1    open/syncd    /var
hd3                 jfs2       320     320     1    open/syncd    /tmp
hd1                 jfs2       160     160     1    open/syncd    /home
hd10opt             jfs2       13      13      1    open/syncd    /opt
```

2) Transferring Mksysb to Skytap
    a. **Option 1 (Direct Connectivity**)
        - VPN or ExpressRoute
        - Network planning is required ahead of time
        - Secured and Fast data transfer
        - Future Proof



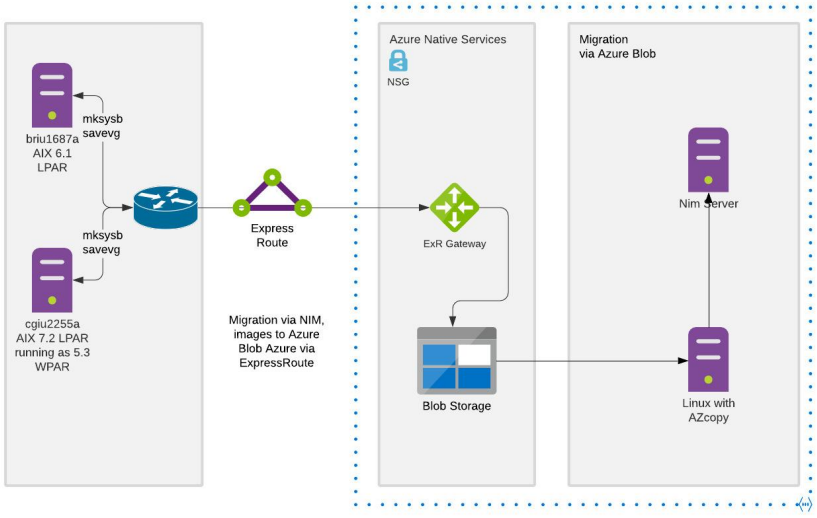

b. **Option 2 (Published Service)**

- Fastest and cheapest to deploy
- Native Skytap support
- Only Nim server in Skytap is required to started data transfer
- Encrypted Data Transfer over public Internet
- Only recommended for POC

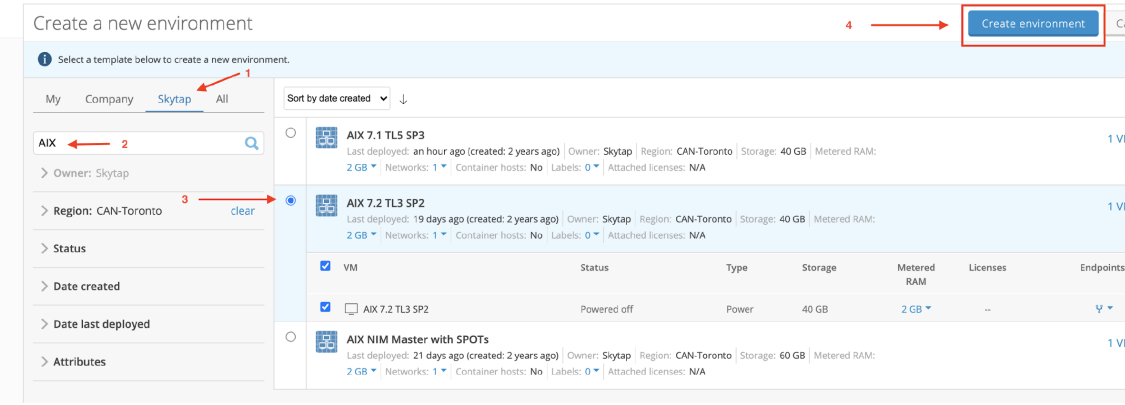



c. **Option 3 (Azure Blob)**

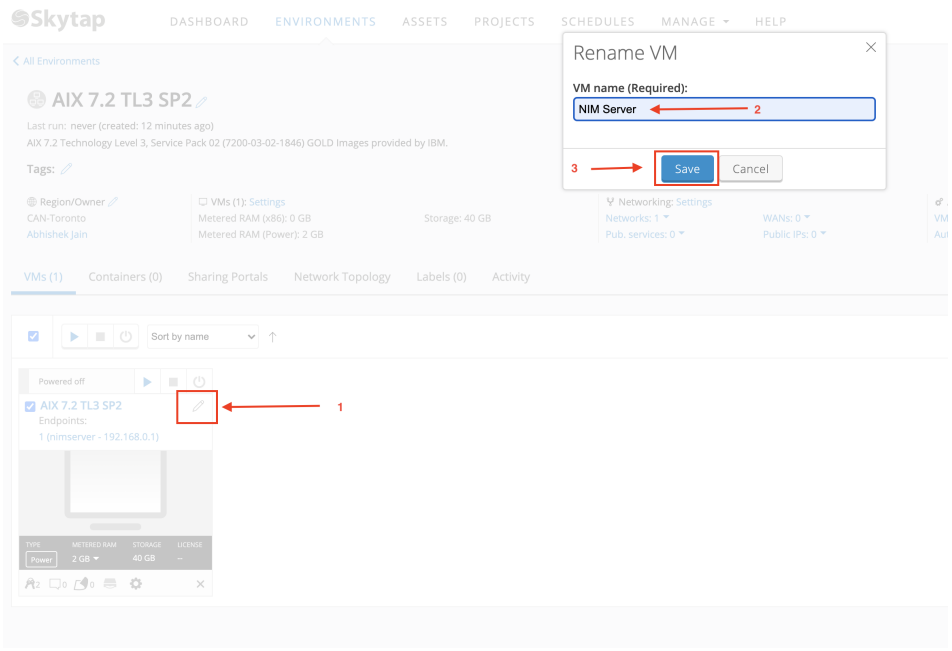
- Azure Blob Storage
- Secured and Fast data transfer
- Additional VM for AZ copy required
- Future Proof
- Data can be copied over even before Skytap service is Started



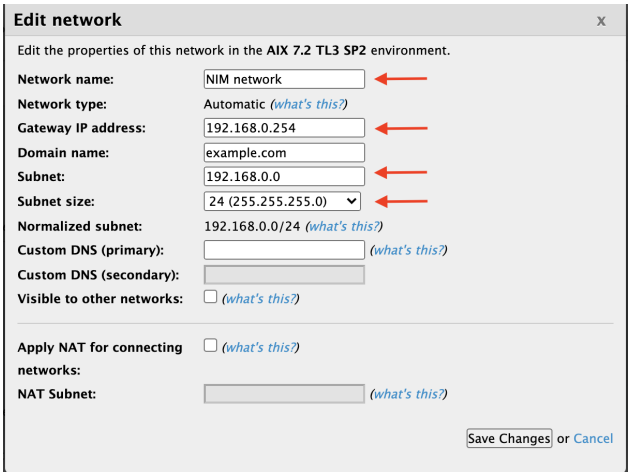

3) Restore In Skytap
    a. Initiate a NIM server in Skytap
        - Deploy a new AIX template using public templates (Latest AIX level Recommended)



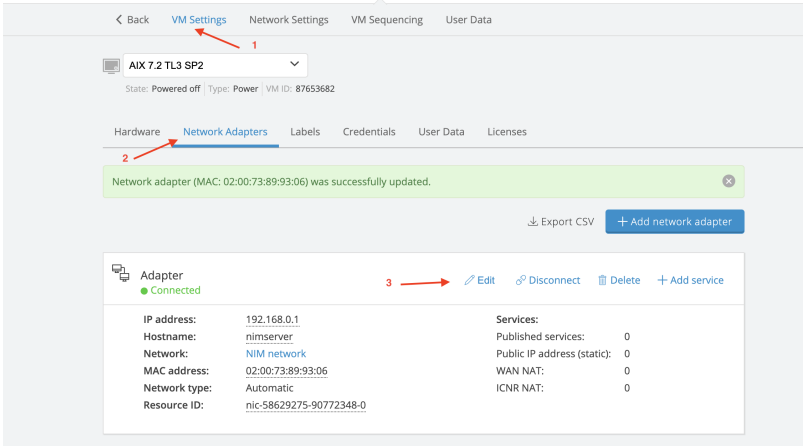

        - Rename the Lpar to NIM server




- Setup the Desired Network and attach the network to the Lpar




- Set the desired hostname in Adapter setting

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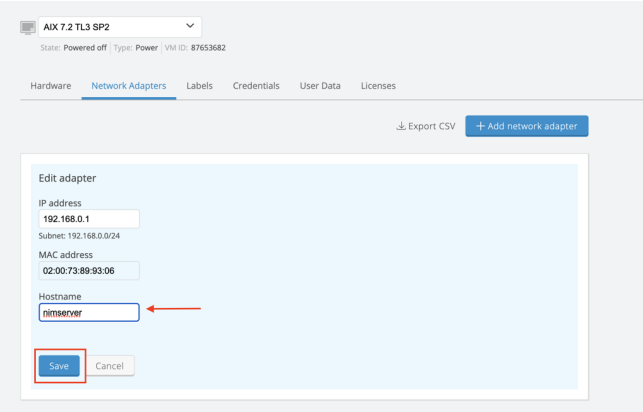
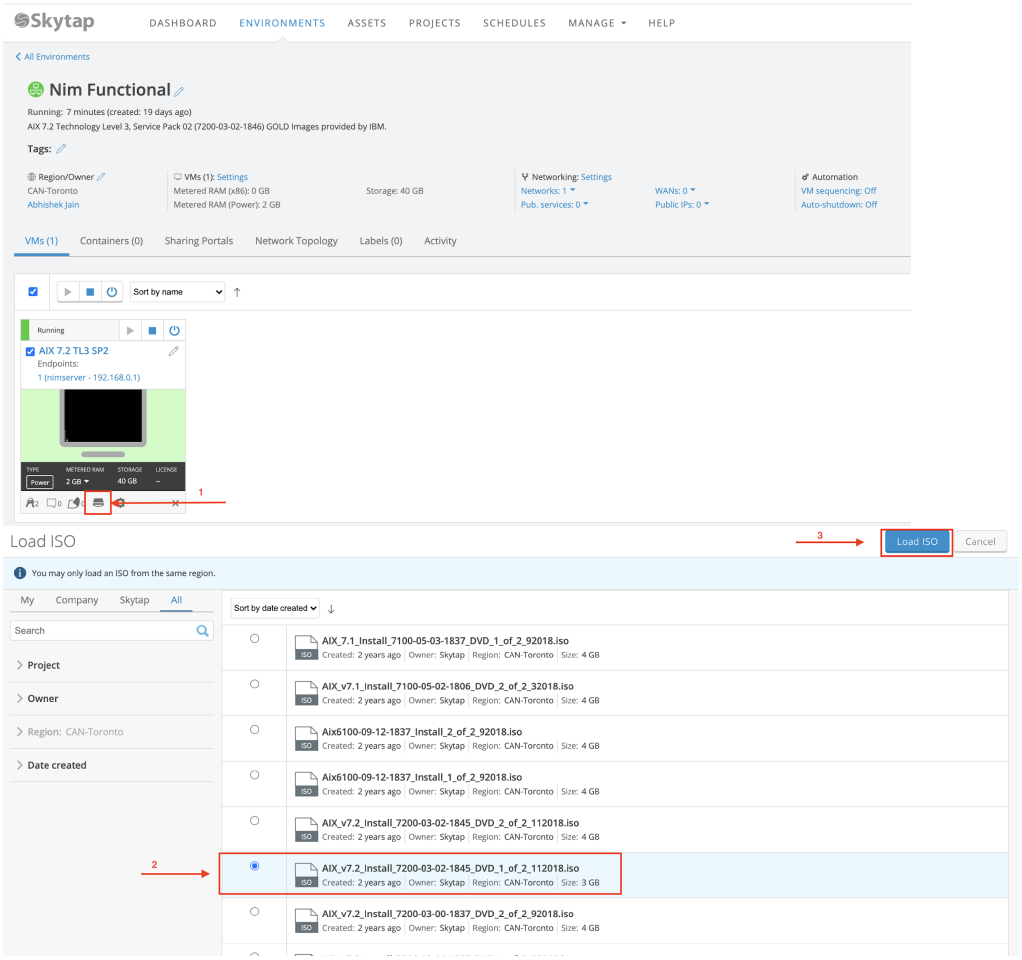



- Power on the Lpar and logon with root access

b. Configure NIM Server

- Check if required file sets are Installed # lslpp -l | grep -i nim
- Attach Install ISO image to the server



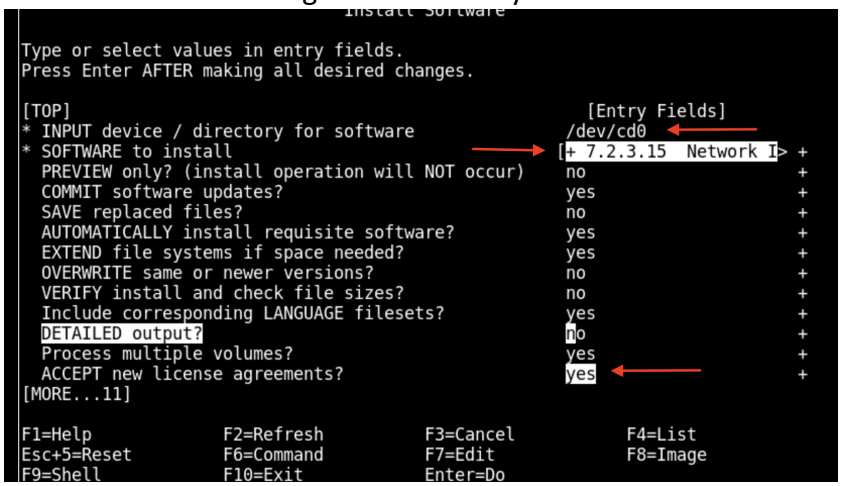

- Run #cfgmgr in OS to configure CDROM

- List CDROM to confirm # lsdev -Cc cdrom

```
#
#
#
# cfgmgr
#
#
# lsdev -Cc cdrom
cd0 Available  Virtual SCSI Optical Served by VIO Server
```

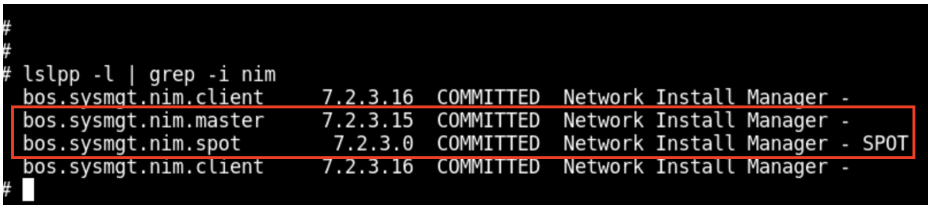
- Install file sets from CDROM # smitty install_latest

1. Select CDROM using F4 or esc+4 keys
2. Search for NIM in software to install
3. Select NIM master using F7 or esc+7 keys

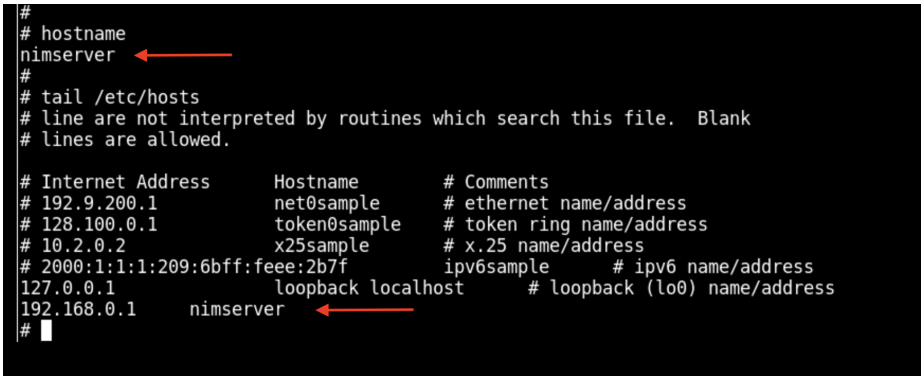


4. Continue installation

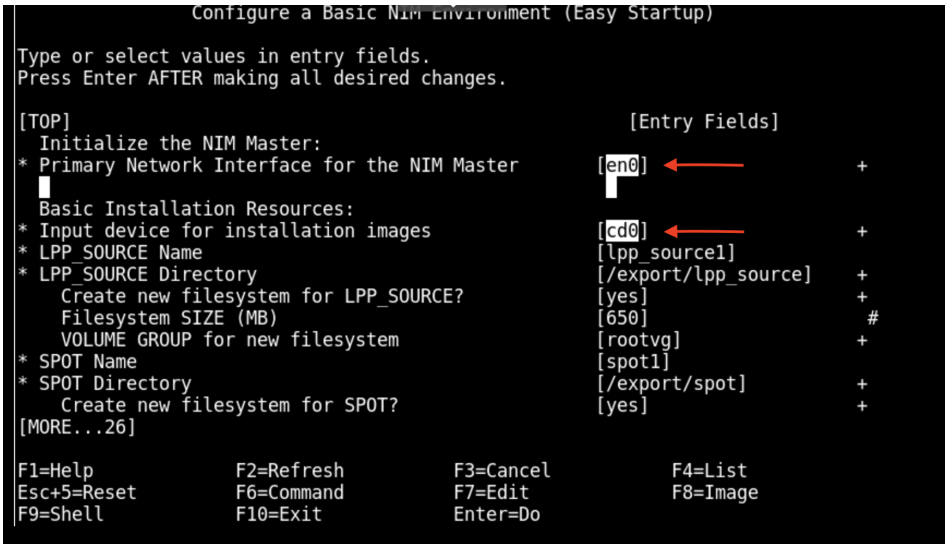

- Exit installation menu using F10 or esc+0
- Confirm Installation is done # lslpp -l | grep -i nim



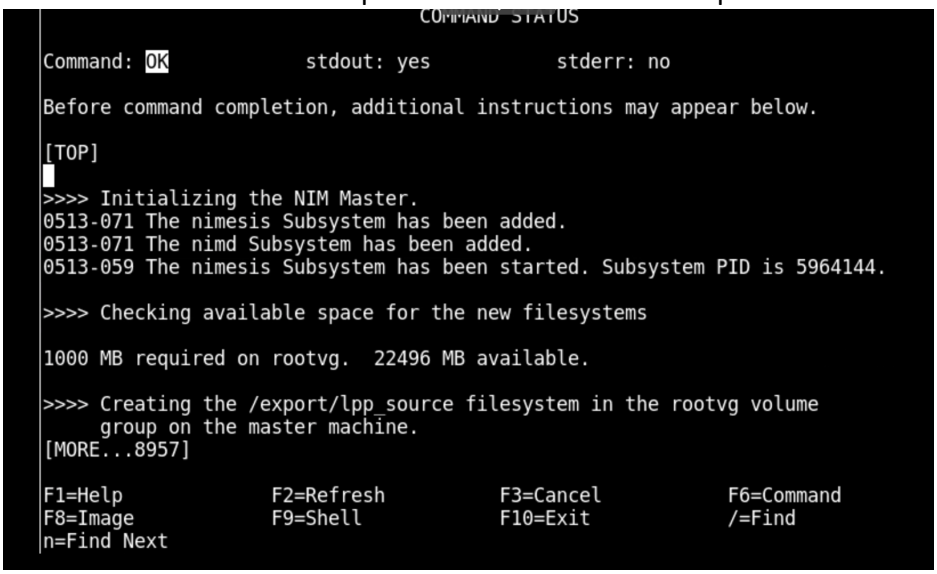
- Set Hostname and /etc/hosts to exact name as step 3b




- Run NIM configuration # smitty nim_config_env




- Press enter to start- this step will take ~30 mins to complete




- Congratulations NIM Server is Ready !!!!

4) Setup Client on NIM server to restore Mksysb

a. Update the /etc/hosts file with the client hostname

```
# tail /etc/hosts
# lines are allowed.

# Internet Address      Hostname        # Comments
# 192.9.200.1           net0sample      # ethernet name/address
# 128.100.0.1           token0sample    # token ring name/address
# 10.2.0.2              x25sample       # x.25 name/address
# 2000:1:1:1:209:6bff:feee:2b7f         ipv6sample      # ipv6 name/address
127.0.0.1               loopback localhost      # loopback (lo0) name/address
192.168.0.1     nimserver
192.168.0.2     nimclient
#
```

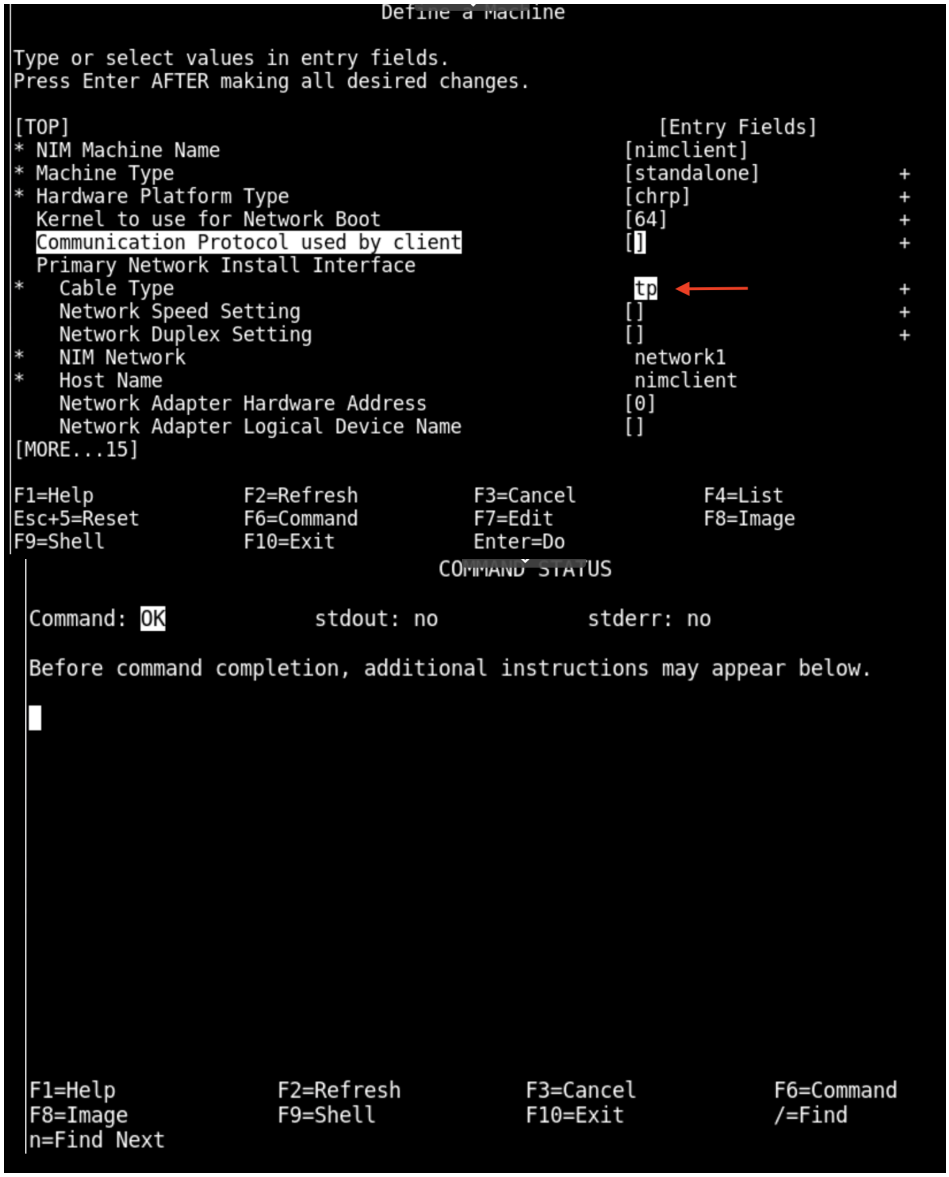
b. Verify hostname is resolved

```
#
# host 192.168.0.2
nimclient is 192.168.0.2
#
# host nimclient
nimclient is 192.168.0.2
#
```

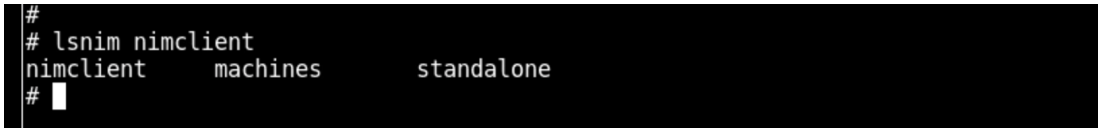
c. Add the Client in NIM config # smitty nim_mkmac and enter the client hostname

```
                                Define a Machine

Type or select a value for the entry field.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
* Host Name of Machine                                [nimclient]
    (Primary Network Install Interface)



F1=Help             F2=Refresh          F3=Cancel           F4=List
Esc+5=Reset         F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

d. Change the setting as below and press enter

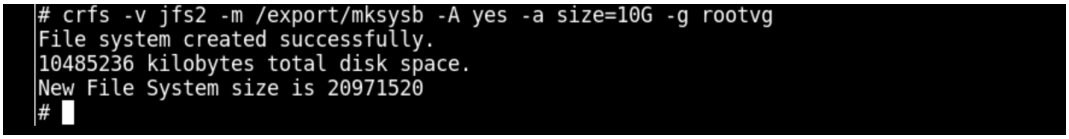



e. NIM Client is defined and can be verified in # lsnim nimclient




f. Copy the Source Mksysb in a new filesystem /export/mksysb

- Create the filesystem # crfs -v jfs2 -m /export/mksysb -A yes -a size=10G -r rootvg

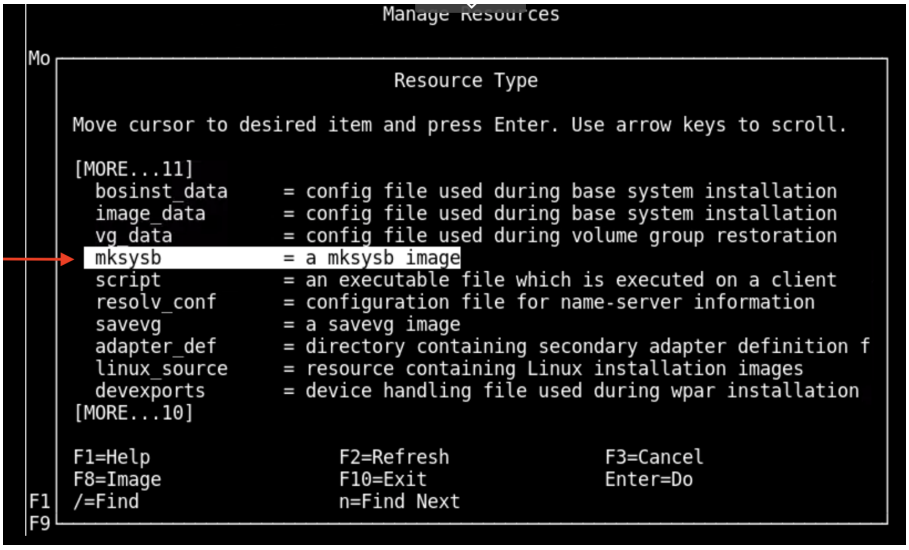


- List the mksysb file content lsmksysb -lf <filename>

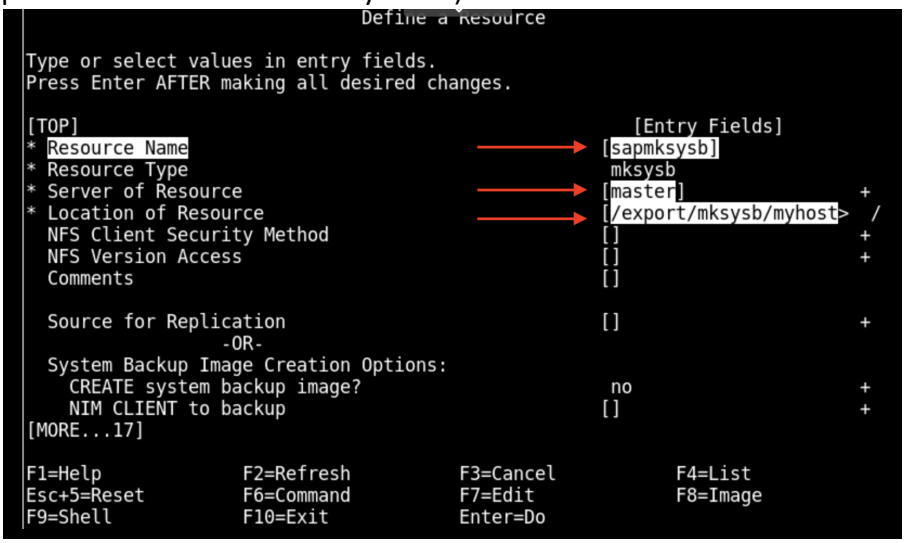
```
bash-4.3# lsmksysb -lf myhost.mksysb
VOLUME GROUP:           rootvg
BACKUP DATE/TIME:       Thu Dec 16 00:38:18 UTC 2021
UNAME INFO:             AIX sapaix 2 7 00C97B604B00
BACKUP OSLEVEL:         7.2.3.15
MAINTENANCE LEVEL:      7200-03
SERVICEPACK LEVEL:      7200-03-02-1846
BACKUP SIZE (MB):       28448
SHRINK SIZE (MB):       8483
VG DATA ONLY:           no

rootvg:
LV NAME             TYPE       LPs     PPs     PVs  LV STATE      MOUNT POINT
hd5                 boot       1       1       1    closed/syncd  N/A
hd6                 paging     16      16      1    open/syncd    N/A
hd8                 jfs2log    1       1       1    open/syncd    N/A
hd4                 jfs2       168     168     1    open/syncd    /
hd2                 jfs2       160     160     1    open/syncd    /usr
hd9var              jfs2       6       6       1    open/syncd    /var
hd3                 jfs2       320     320     1    open/syncd    /tmp
hd1                 jfs2       160     160     1    open/syncd    /home
hd10opt             jfs2       13      13      1    open/syncd    /opt
```

g. Create the NIM resources for restoration

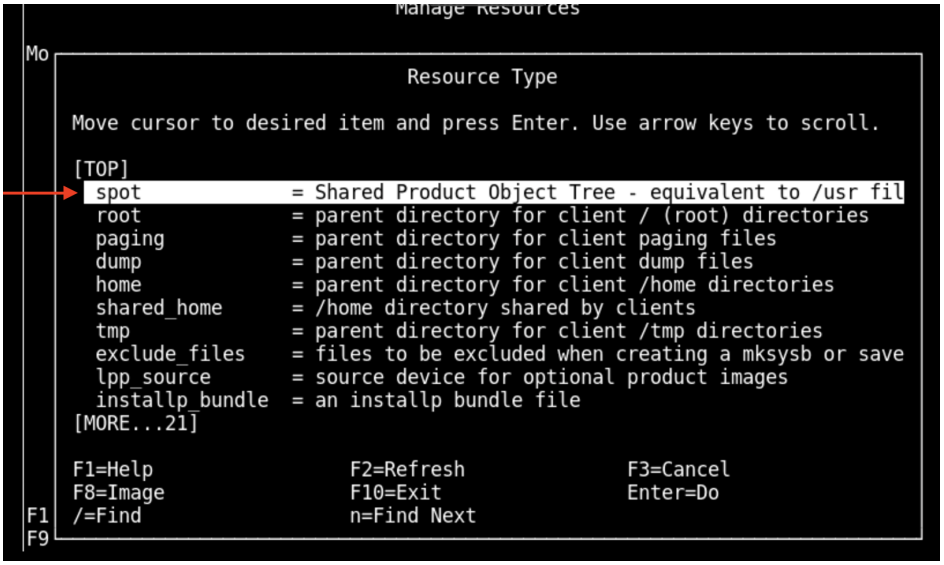
- We need two NIM resources to restore Mksysb
  1. Mksysb resource
  2. Spot resource
- Mksysb - # smitty nim_res > define a resource and select mksysb and press enter



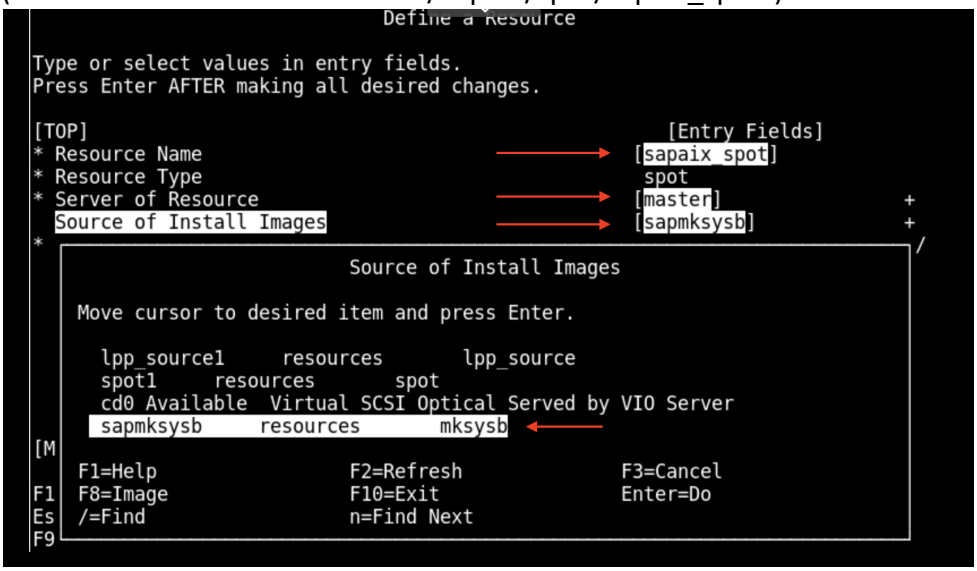
- Fill in the Name, Server of resource and location of resource (absolute path for location of the mksysb file)



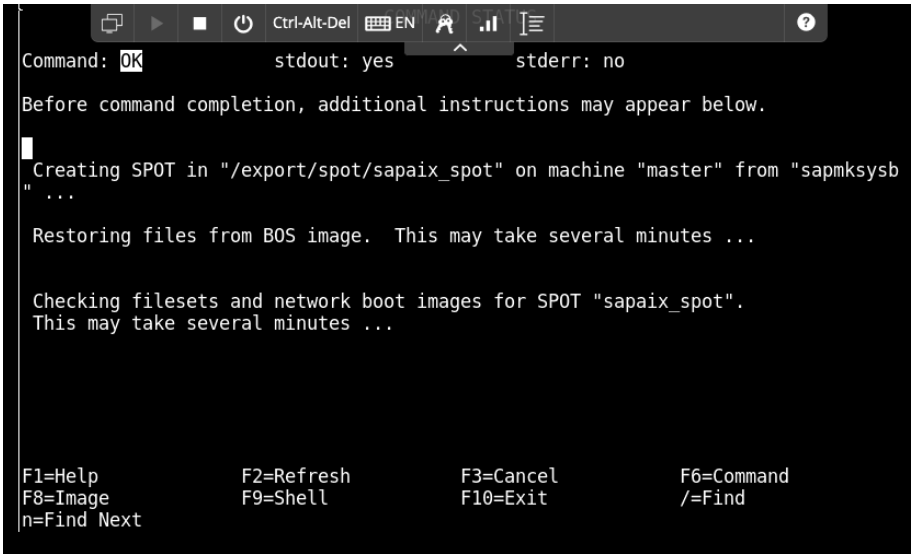

- Define Spot from mksysb resource # smitty nim_res -> define a resource select spot and press enter (Make sure you have enough space in /export/spot filesystem ~2 GB)



- Enter Name, Server of resource, Source of Install images and Location (absolute Path for the resource “/export/spot/sapaix_spot”)

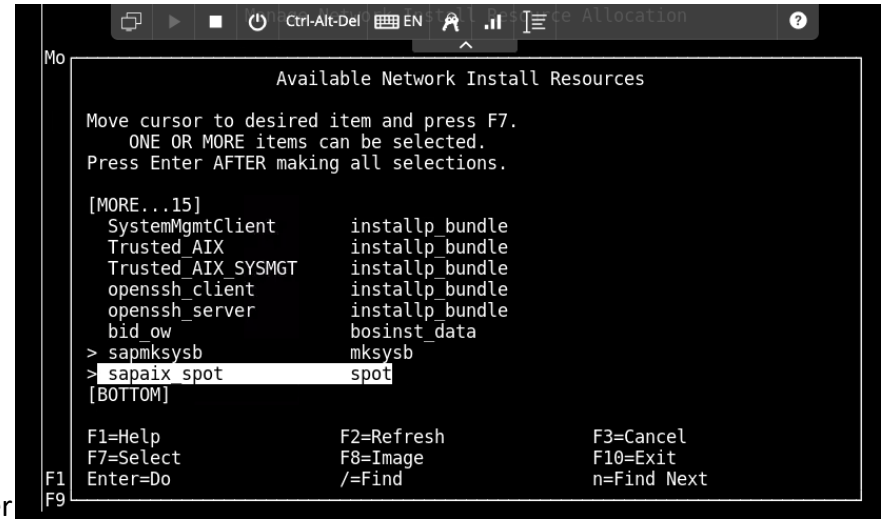



- Creation of spot will take some time ~ 15 to 30 mins

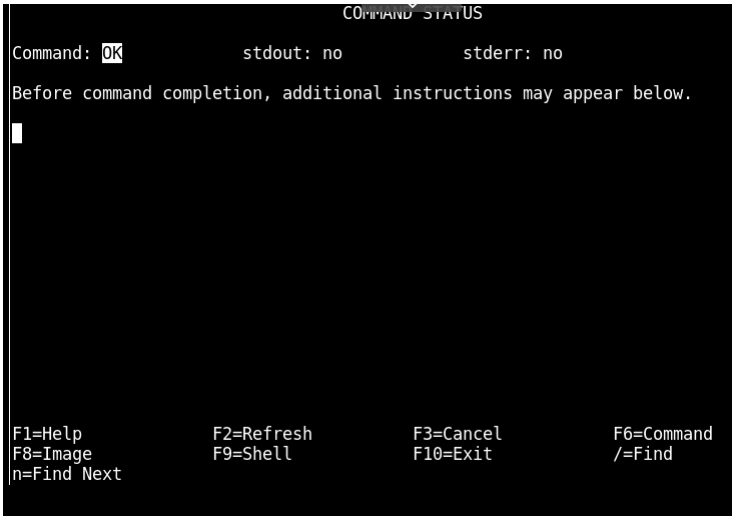



- Assign resources to nimclient machine defined earlier in the document
  # smitty nim_mac_res -> Allocate Network Install resources and select nimclient from the list and press enter

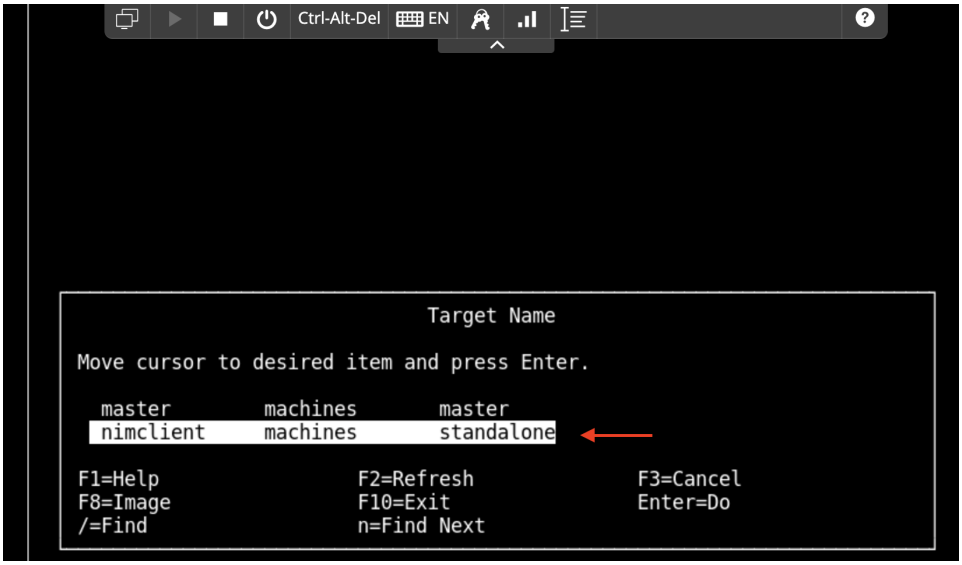
- Use F7 or Esc+7 to select the sapmksysb and sapaix_spot and press enter



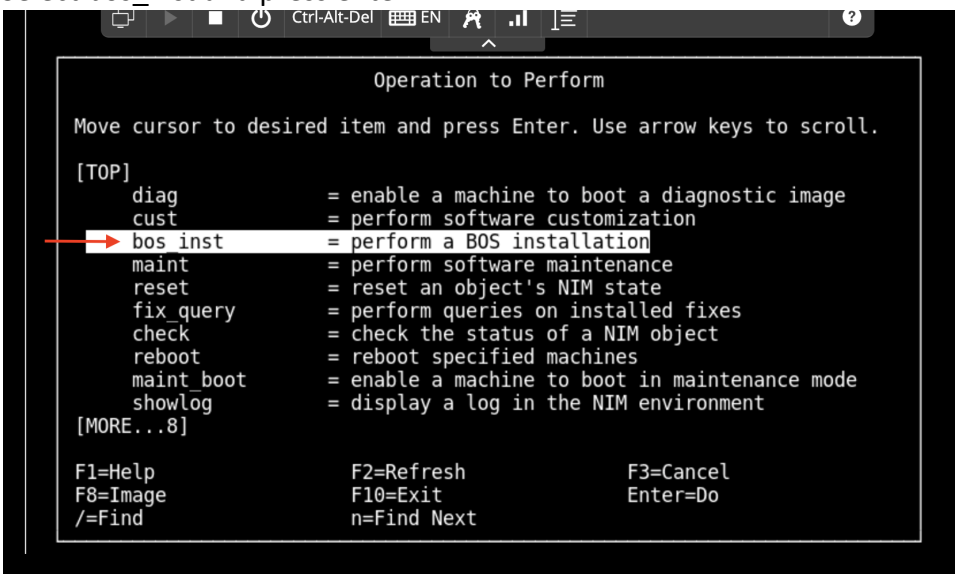

- Command output will be as below exit using F10 or esc+0



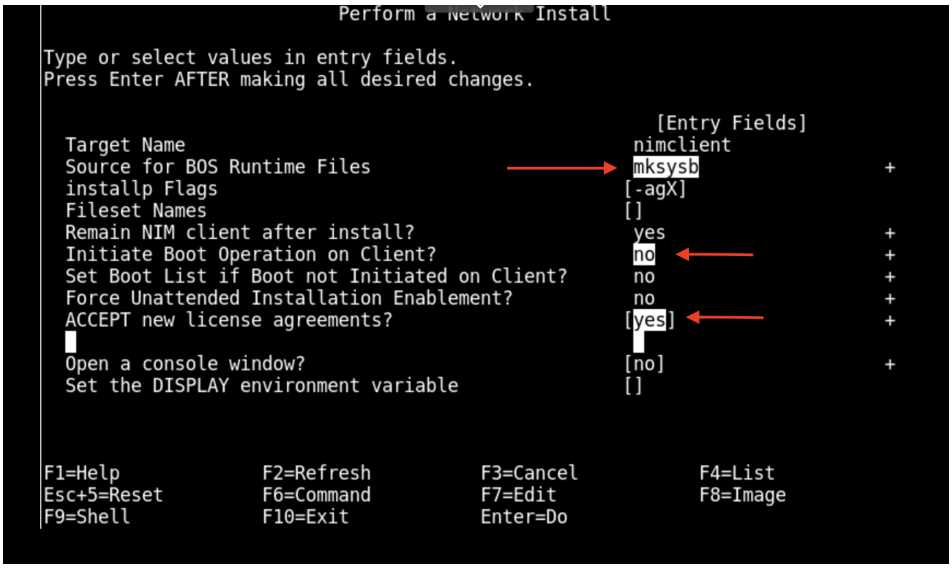
- Enable Bos installation for the client # smitty nim_mac_op > nimclient



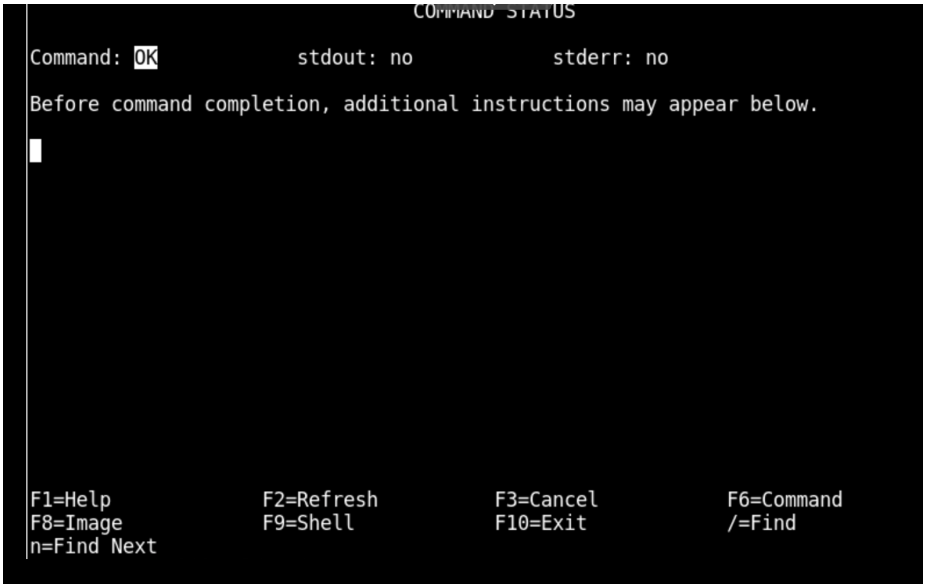

- Select bos_inst and press enter



- Select the below options for mksysb restore `( Use Arrow keys and F4 or Esc+4)`




- Ready to ROCK n ROLL !

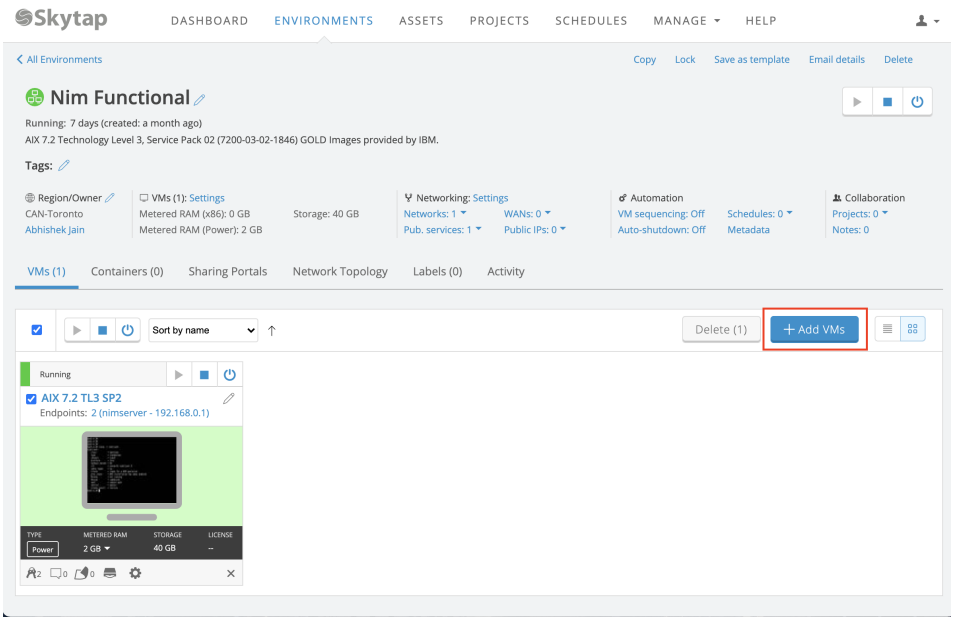


- Verify the client Status # lsnim -l nimclient

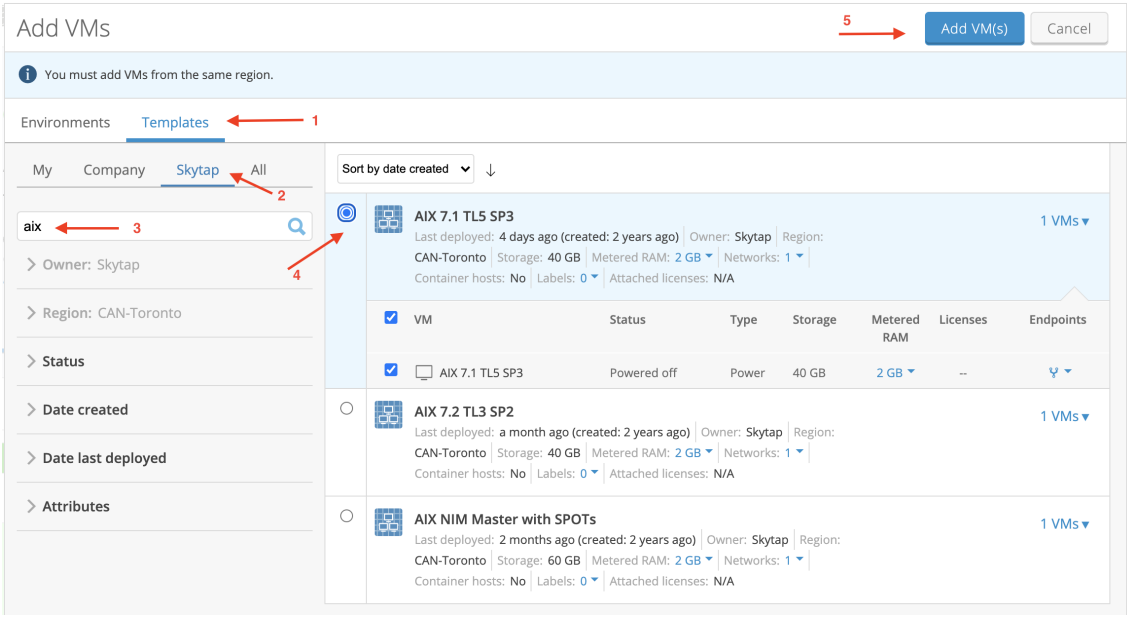
```
bash-4.3#
bash-4.3#
bash-4.3# lsnim -l nimclient
nimclient:
   class          = machines
   type           = standalone
   connect        = nimsh
   platform       = chrp
   netboot_kernel = 64
   if1            = network1 nimclient 0
   cable_type1    = tp
   Cstate         = ready for a NIM operation
   prev_state     = BOS installation has been enabled
   Mstate         = not running
   mksysb         = sapmksysb
   spot           = sapaix_spot
   control        = master
   Cstate_result  = failure
bash-4.3#
```

h. Setup New lpar to restore the mksysb

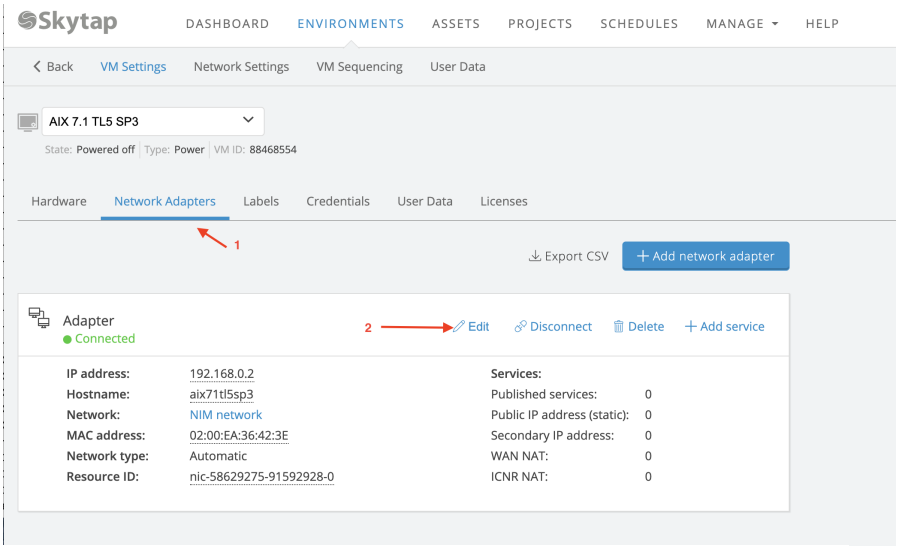
- From the Skytap dashboard Add a new lpar in your existing Environment

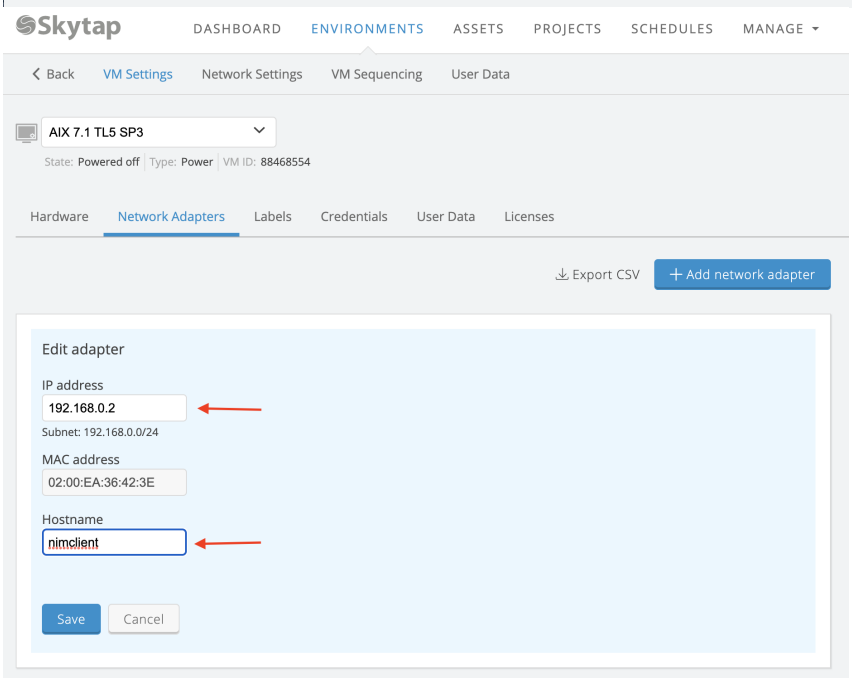


- Select Templates and choose any AIX template and add VM



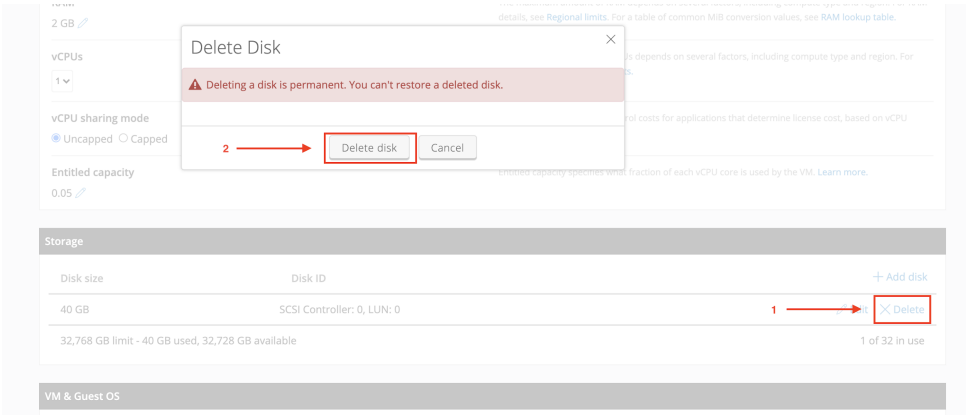
- Edit the setting on VM and Set Hostname and IP



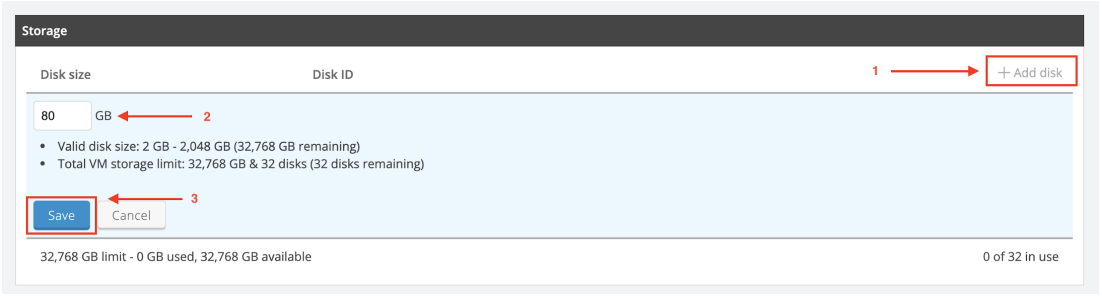




- From hardware setting assign the disks as per Source lpar rootvg

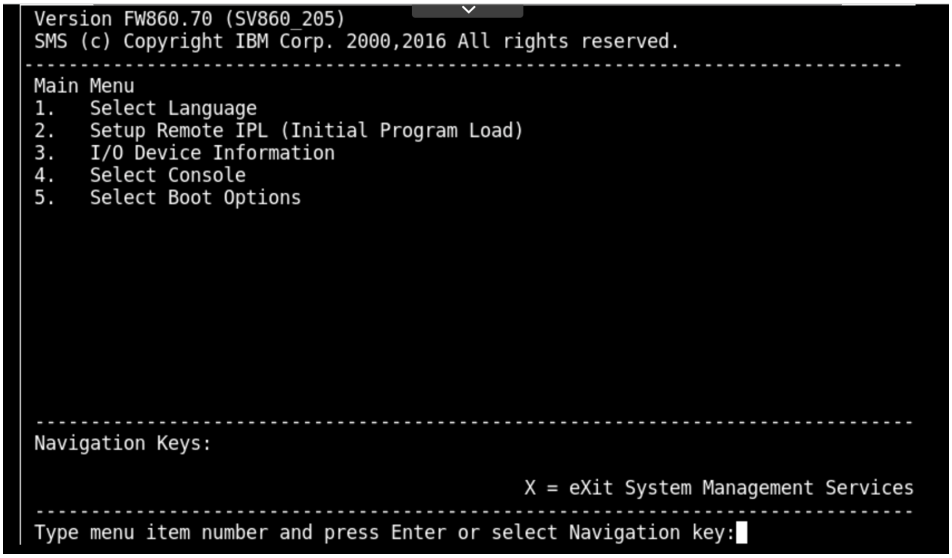
1. Delete the existing disk and add new disk




2. Add new disk

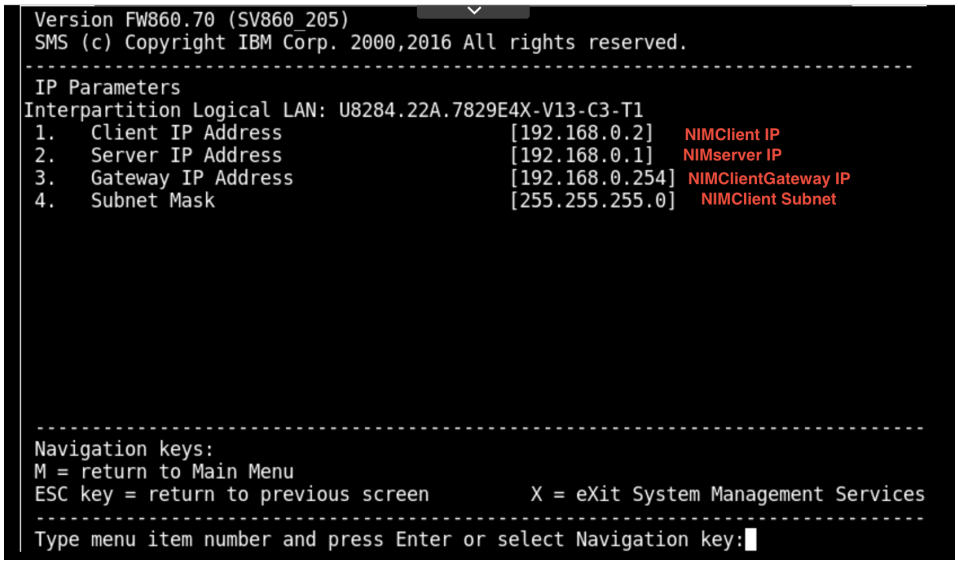



3. Update the CPU/RAM if required and start the lpar and open the console. System will enter in SMS menu




- Setup NIC/Ethernet to boot using NIM server using below sequence
  1. " 2 - Setup Remote IPL"
  2. " 1 - Interpartition Logical LAN"
  3. " 1 - IPv4 – Address Format"
  4. " 1 - BOOTP"
  5. " 1 – IP Parameters"

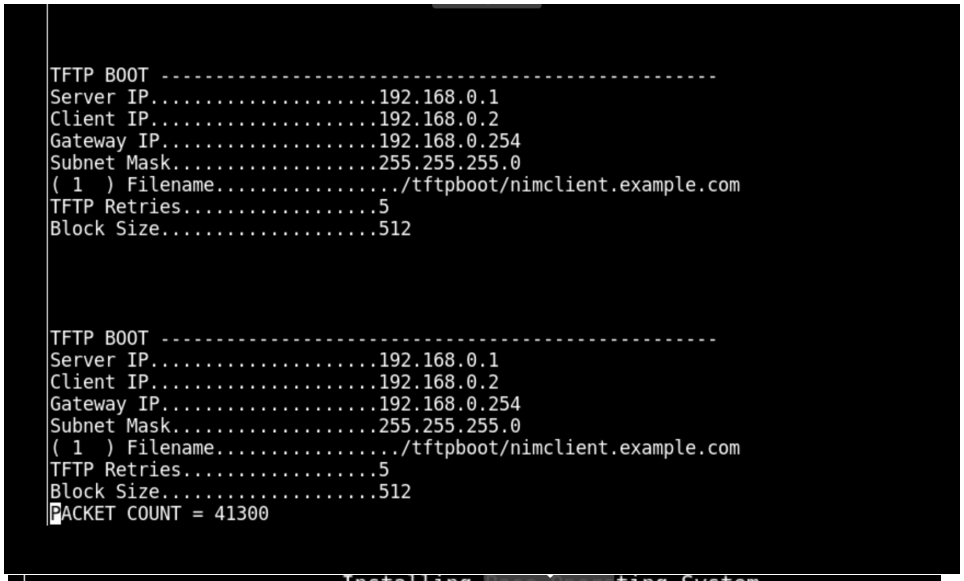
6. Configure the IPS to match the IP as below

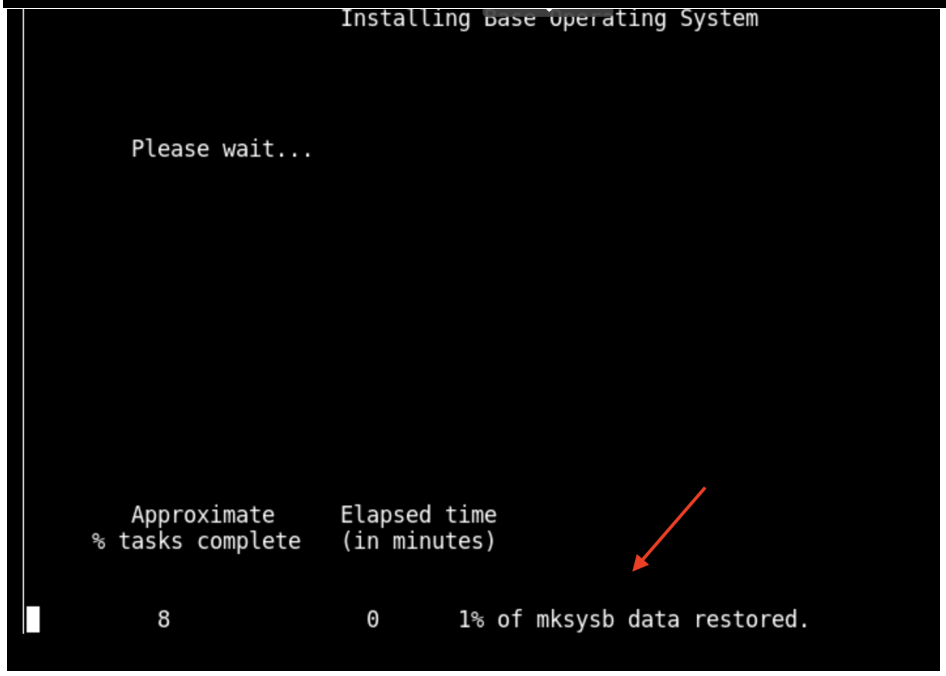



7. Press esc to return to previous Menu and run “3 - Ping Test” -> press 1 and enter to execute


8. On successful ping press enter and return to main menu using “M”

9. Press X to exit and server should start boot using the LAN adapter



10. It will take 10 – 20 Mins to restore Mksysb and server will reboot with the Mksysb restored

```
#
#
# uname -a
AIX nimclient 2 7 00FB29E44C00
#
# df -g
Filesystem    GB blocks      Free %Used    Iused %Iused Mounted on
/dev/hd4           5.25      5.05    4%    14569     2% /
/dev/hd2           5.00      2.95   41%    45896     7% /usr
/dev/hd9var        0.25      0.16   36%      741     2% /var
/dev/hd3          10.00      6.48   36%     1781     1% /tmp
/dev/hd1           5.00      5.00    1%       61     1% /home
/dev/hd11admin      0.12      0.12    1%        5     1% /admin
/proc                 -         -    -         -      - /proc
/dev/hd10opt       0.50      0.13   74%    14141    32% /opt
/dev/livedump      0.25      0.25    1%        4     1% /var/adm/ras/livedump
#
```

# Savevg Backup and Restore in Skytap

5) Backup and restore data volumes using savevg
   a. Prechecks –
      - Minimise active read/writing to disk to avoid file or database corruption
      - Verify enough free space to backup volume group to your filesystem
   b. Backup execution -
      - Verify volume group has desired volumes:
        1. run # lsvg and #lsvg -a app to review volumes to be backed up

```
# lsvg
rootvg
app
data
# lsvg -l app
app:
LV NAME             TYPE       LPs     PPs     PVs  LV STATE      MOUNT POINT
applv               jfs2       1278    1278    1    open/syncd    /app
#
```

        2. run backup to location with sufficient space with the command # savevg -r -f /tmp/backup/app.image app

```
#
# savevg -r -f /tmp/backup/app.image app

Creating information file for volume group app.

Backing up user Volume Group information files only.
Creating list of files to back up.
Backing up 6 files

6 of 6 files (100%)
0512-038 savevg: Backup Completed Successfully.
# 
```

c. Copy backup to Skytap LPAR (see copy methods above for mksysb)

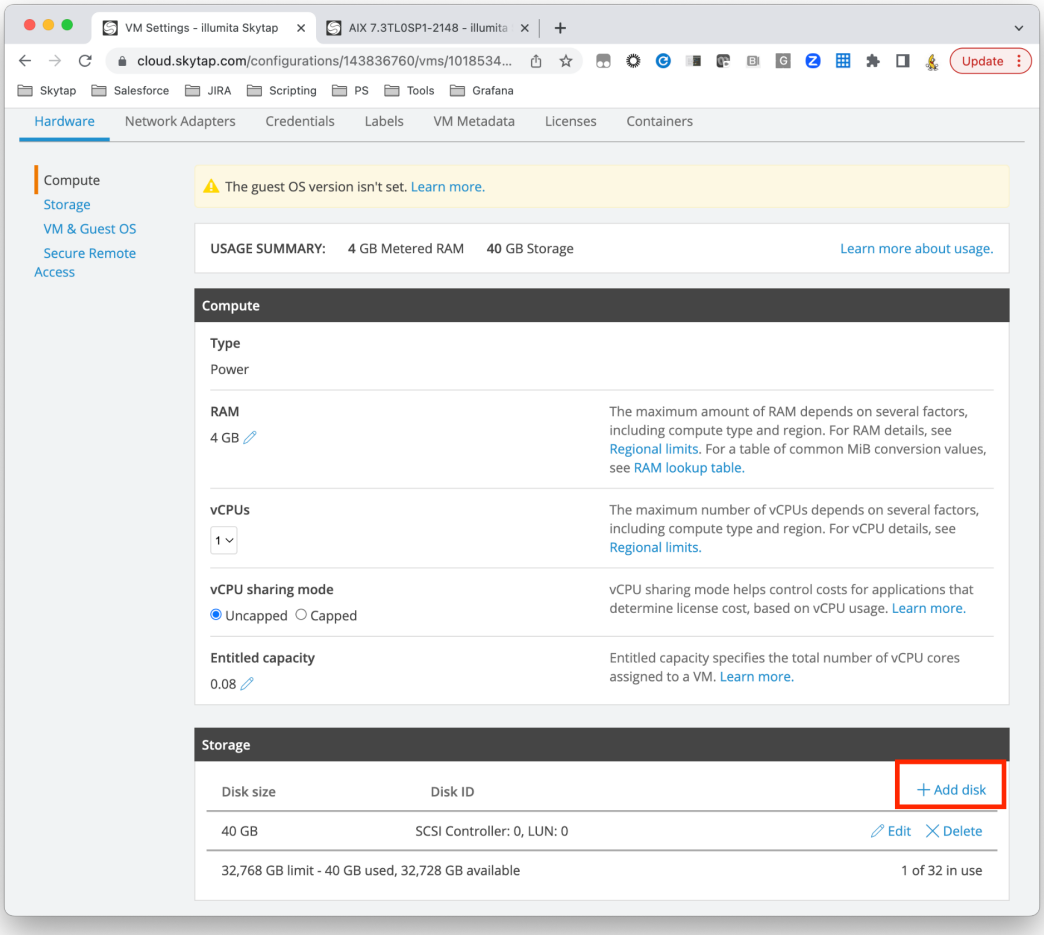
d. Prepare system in Skytap to restore volumes. Note: if you want to shrink your volumes when restoring, you should pick smaller sizes that are still sufficient for the data in the volume group.

- Identify physical volumes associated with the volume and their sizes:
  1. run # lspv and # lspv hdisk1 to confirm the size in megabytes of any necessary disks

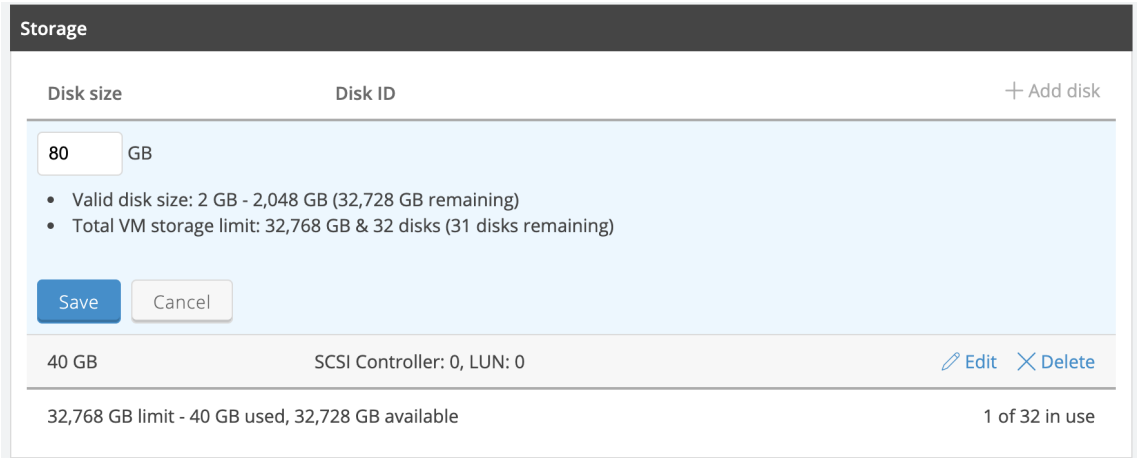
```
#
# lspv
hdisk0          00fb3aca9c0a8fc1                    rootvg          active
hdisk1          00fb4f3c486538a2                    app             active
hdisk2          00fb4f3c486580b9                    data            active
# lspv hdisk1
PHYSICAL VOLUME:    hdisk1                  VOLUME GROUP:     app
PV IDENTIFIER:      00fb4f3c486538a2 VG IDENTIFIER     00fb4f3c00004c00000001874
86538b8
PV STATE:           active
STALE PARTITIONS:   0                       ALLOCATABLE:      yes
PP SIZE:            64 megabyte(s)          LOGICAL VOLUMES:  1
TOTAL PPs:          1278 (81792 megabytes)  VG DESCRIPTORS:   2
FREE PPs:           0 (0 megabytes)         HOT SPARE:        no
USED PPs:           1278 (81792 megabytes)  MAX REQUEST:      256 kilobytes
FREE DISTRIBUTION:  00..00..00..00..00
USED DISTRIBUTION:  256..256..255..255..256
MIRROR POOL:        None
# 
```

- In Skytap add disks to your restore target of sufficient size

a. Shut down the restore LPAR in Skytap, go to edit VM and add disks




b. Pick how much storage you need and save




c. Repeat for any additional physical disks you need to add

d. Start LPAR when disks added

6) Run restores for savevg

a. identify the sizes of your disks to make sure you are restoring to the correct locations with # lspv and # bootinfo -s hdisk1

```
# lspv
hdisk0          00fb3aca9c0a8fc1                    rootvg          active
hdisk1          none                                None
hdisk2          none                                None
# bootinfo -s hdisk1
81920
#
```

b. run # lssavevg -f app.image -l to confirm contents of savevg file

```
# lssavevg -f app.image -l
VOLUME GROUP:           app
BACKUP DATE/TIME:       Mon Apr 3 13:56:22 CDT 2023
UNAME INFO:             AIX aix7 3 7 00FB4F3C4C00
BACKUP OSLEVEL:         7.3.0.0
MAINTENANCE LEVEL:      7300-00
SERVICEPACK LEVEL:      7300-00-01-2148
BACKUP SIZE (MB):       81792
SHRINK SIZE (MB):       3201
VG DATA ONLY:           yes

app:
LV NAME             TYPE       LPs     PPs     PVs  LV STATE      MOUNT POINT
applv               jfs2       1278    1278    1    open/syncd    /app
#
```

c. run restore # restvg -f app.image hdisk1 (add flag -s to restore with minimum size, you can specify multiple hdisks if desired)

```
# restvg -f app.image hdisk1

Will create the Volume Group:   app
Target Disks:   hdisk1
Allocation Policy:
        Shrink Filesystems:     no
        Preserve Physical Partitions for each Logical Volume:   no

Enter y to continue: y
```

d. Finished!