Creating a recovery CD or DVD using make_net_recovery

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Goal of this presentation

- To walk through the steps of creating a recovery archive and configuring it on CD or DVD.

Requirements

- Ignite-UX will have to be installed on the client, or a system on the network with the client.
- Enough disk space to hold the image(s)
- Enough disk space to create additional work volumes
- A CD or DVD burner (PC will work)

Overview

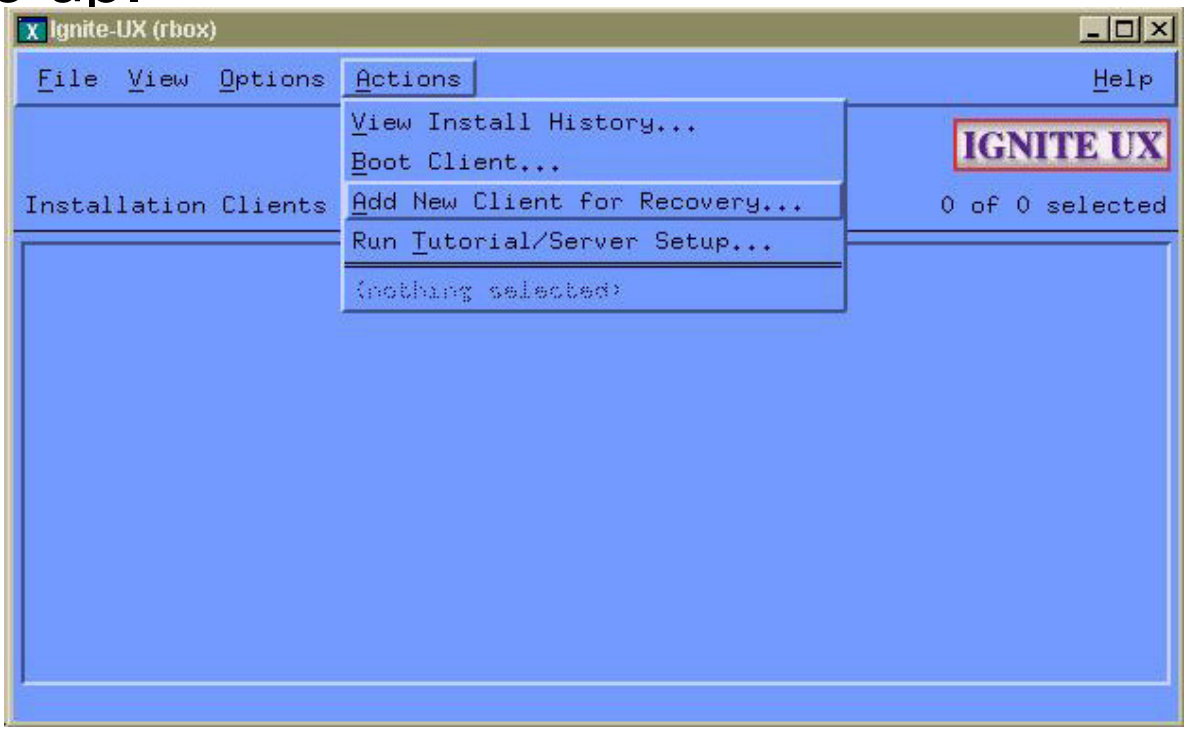
- Add client for recovery
- Create network recovery archive of client
  - Include and/or Exclude files or filesystems as needed
- Create archive of any additional files or filesystems
- Edit existing configuration files and templates as needed
- Create logical volumes to hold the images
- Create a filesystem image
- Create a LIF file
- Wrap the LIF file onto the filesystem image
- DVD Media
- Itanium images
- Burn the filesystem image(s) onto a CD or DVD

Add Client for recovery

- Log onto the Ignite-UX server and type:

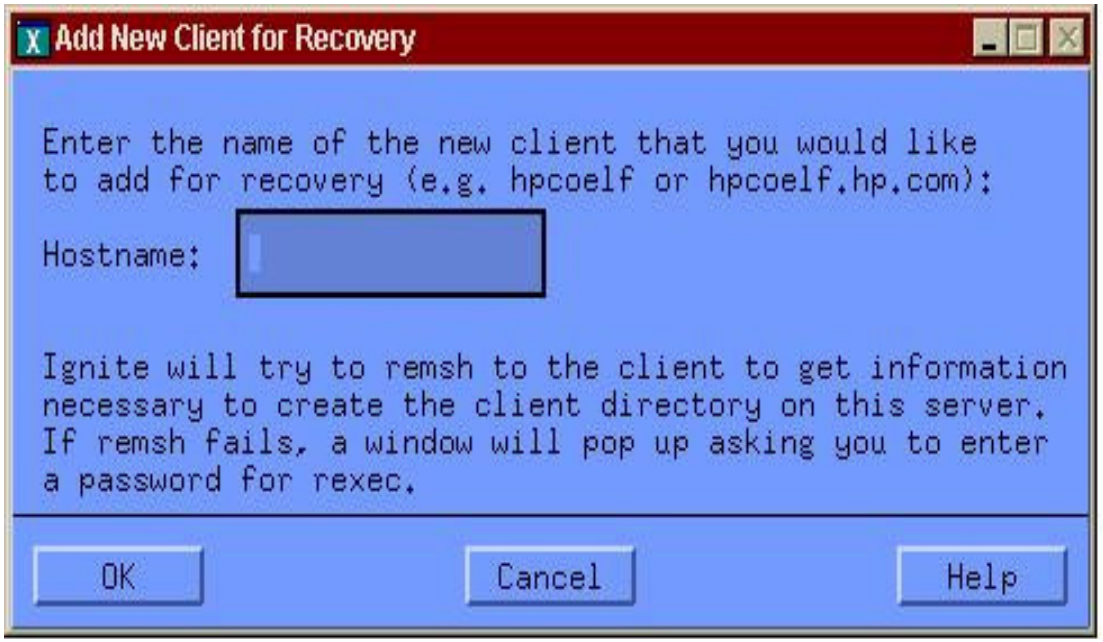
```
# export DISPLAY=<my IP>:0.0
# /opt/ignite/bin/ignite
```

- If your display is capable of graphics this window will appear. If not, a terminal user interface will come up.

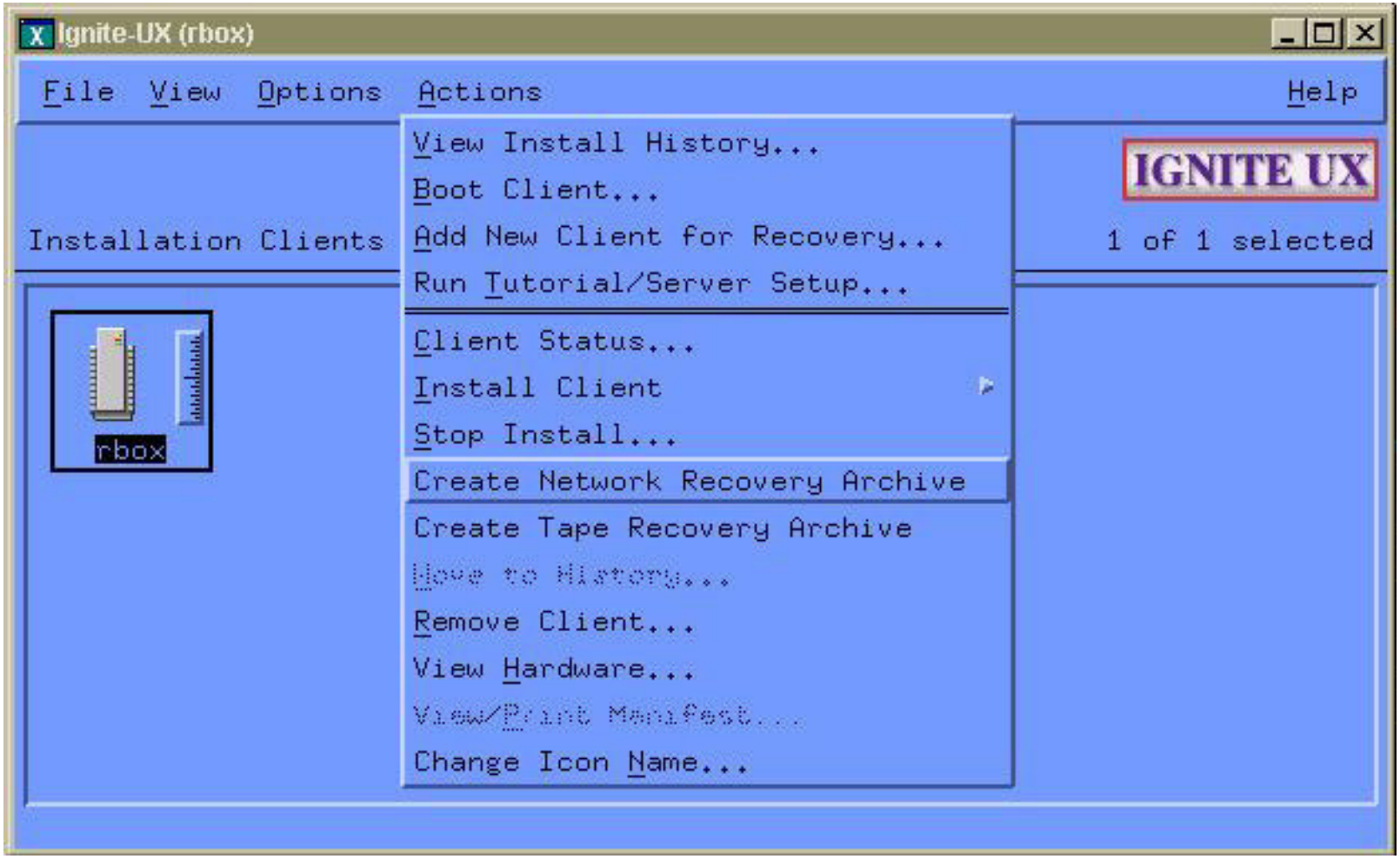


Add Client for recovery (cont.)

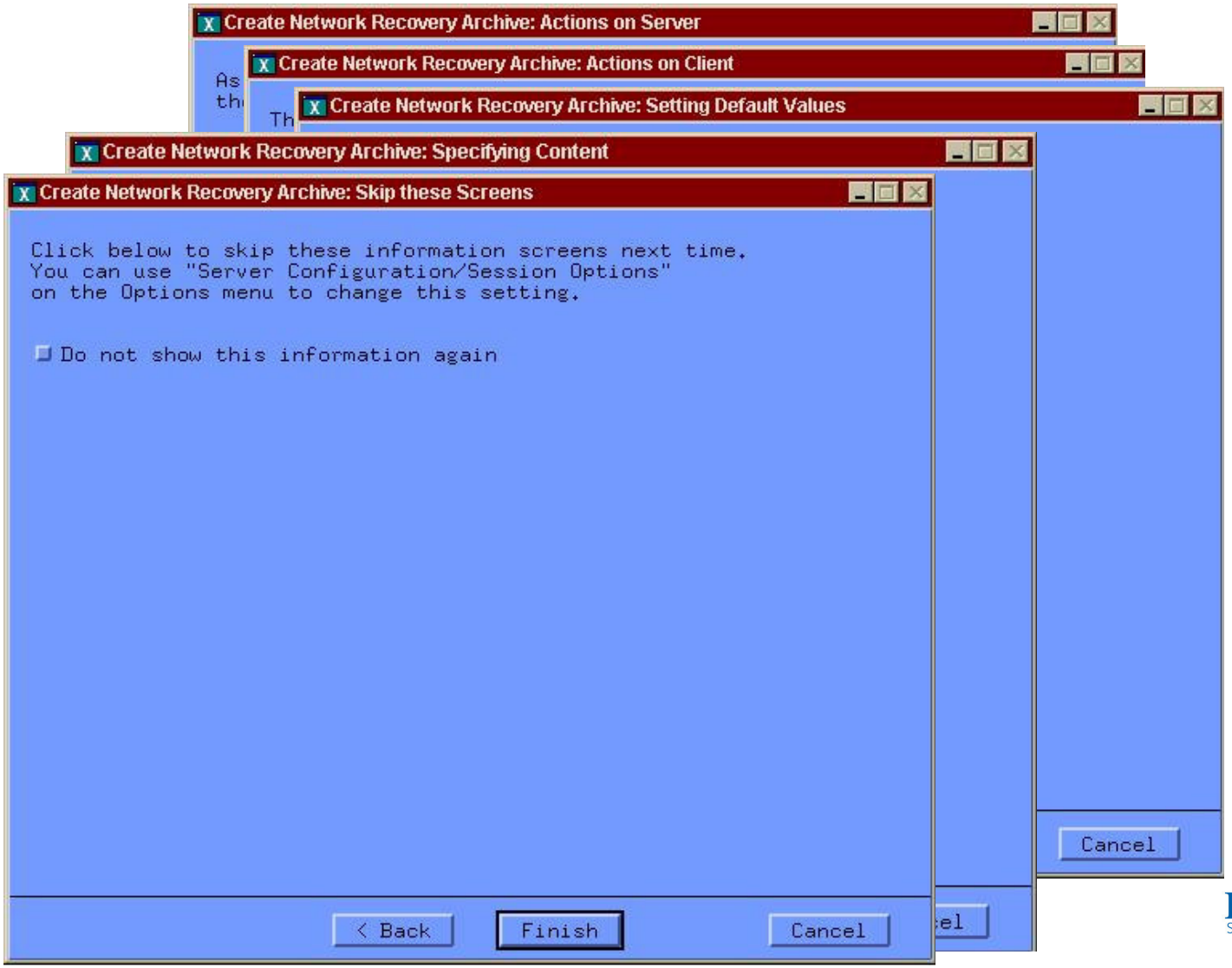
- If the .rhosts is not setup on the client, you will be prompted for the root password.



Create network recovery archive

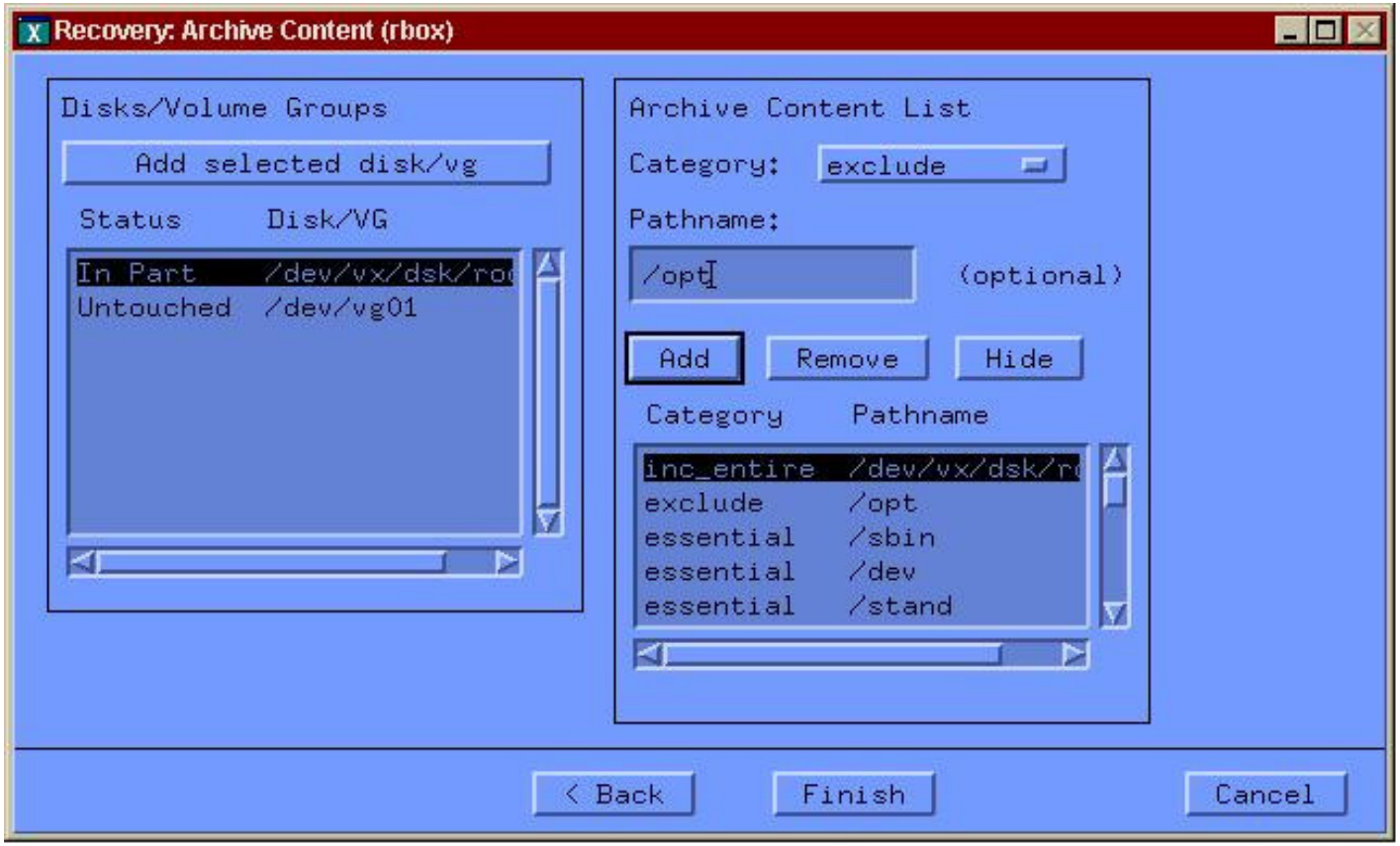


Create network recovery archive (cont.)



Create network recovery archive (cont).

- Include or exclude filesystems or files as needed.
- Make sure the archive can fit onto a 650mb CD.



Create archive of any additional files or filesystems

- In this example, /opt will be put on a separate CD.
- On the client:

```
# cd /
# pax -wx ustar -f - opt | gzip -9c > /tmp/opt_archive.gz
```

- If the client is not the Ignite server, the /tmp/opt_archive file will have to be copied to the server.

Edit existing configuration files and templates

- Make_net_recovery automatically creates the configuration files that will be needed to configure the CD or DVD.

- This does not include the configuration file(s) needed for any additional archives that are created for separate CDs. Ignite-UX supplies a template file that can be used for this called **`/opt/ignite/data/examples/noncore_cfg`**

Edit existing configuration files and templates (cont.)

- The config files that make_net_recovery creates for us are located in:

  `/var/opt/ignite/clients/<client>/recovery/<date,time>/`

  - system_cfg - contains the LVM/VxVM layout with disk sizes, volume sizes, filesystem sizes, mount point names…etc.
  - archive_cfg - contains the location of the archive and it's impact on disk space.
  - control_cfg - contains information about other disks, volume groups and cloning.

Edit existing configuration files and templates (cont.)

- system_cfg
  - This file could be modified to change things like the IP address of the system, the root password, hostname, etc.
  - It is not required to change this file for making the CD or DVD.

Edit existing configuration files and templates (cont.)

- archive_cfg
  - This file will have to be modified to change the configuration from network to disk.
  - The required changes are boxed and in blue, as follows:

```
# cd /var/opt/ignite/clients/<client name>/recovery/<date>
# vi archive_cfg
…
 load_order = 0
 source_format – archive
…
```

Edit existing configuration files and templates (cont.)

- archive_cfg changes (continued from previous slide)
  - Comment out the following lines:

```
...
# if nfs_source is used, be sure to export the source.
# (source_type == "NET")
# nfs_source =
"15.1.2.3:/var/opt/ignite/recovery/archives/<hostname>
"
# }
```

Add this:

```
source_type="DSK"  # change source_type to DSK
```

for a Compact Disk

Edit existing configuration files and templates (cont.)

- archive_cfg changes (continued from previous slide)

```
….
# specified in the sw_source:
# (source_type == "NET") { #comment out source_type test

archive_path = "<archive name>"

# } else {
#     archive_path = "1"
# }
….
```

- **The archive_path is the actual archive itself. It's name will be in date/time format similar to "2004-06-07,18:00"**

Edit existing configuration files and templates (cont.)

- control_cfg
  - This config file contains information about the other disks that were on the system and NOT part of the image. If the disks were in a volume group, they will be hidden by default.
  - If this CD or DVD is used to clone with, this config file is not necessary to include in the LIF.

Edit existing configuration files and templates (cont.)

- Create a config file for other CDs if there are multiple archives. To do this, copy the template file from **`/opt/ignite/data/examples/noncore_cfg`** to **`/var/opt/ignite/clients/<client>/recovery/<date>/opt_cfg`**
- Edit this file and make the following changes. The following example is for the **`/opt`** filesystem, but can be done on any filesystem.

Edit existing configuration files and templates (cont.)

- **Modify the sw_source statement**:

```
sw_source "opt_archive" {
        description =
        source_format = archive
        # source_type="NET"
        # Change this to be your NFS server's IP and path:
        # nfs_source =
"14.12.99.113:/var/opt/ignite/archives"
        source_type="DSK"
        change_media=TRUE  # this will prompt for a media change #
when there is a sw_sel statement that
# uses the “opt_archive” sw_source.
}
```

Edit existing configuration files and templates (cont.)

- Modify the sw_sel statement:

```
sw_sel "The opt filesystem" {
        description = "opt filesystem on a separate CD"
        sw_source = "opt_archive"
        archive_type = gzip tar
        archive_path = "opt_archive.gz"
        sw_category = "Disciplines"
        impacts = "/" 1Kb
        impacts = "/opt" 799503Kb
    }=TRUE  # set to true so that it will be automatically
selected if installing non-interactive.
```

Create Logical Volumes and Filesystems to hold the images

- There are 2 ways to create a filesystem image. One way is to create a logical volume for each CD that we are going to create. We then put a filesystem on it, mount it and copy our archive file to it. At that point we use the dd command to create filesystem image.

- Another way to create the filesystem image is to use the "mkisofs" command. The advantage of doing it this way is that we do not need to create the additional logical volumes and use dd. The mkisofs command was introduced to support archives greater than 2Gb but it can be used with any archive.

Create Logical Volumes and Filesystems to hold the images – not using mkisofs

- In our example, we will need 2 logical volumes and filesystems, since there will be 2 CDs. One for the core archive and the other for /opt.

```
# lvcreate -L <size> /dev/vgX
```

(where <size> is the size of the archive plus 10%. Do this for the core archive and for opt_archive.)

```
# newfs -F hfs /dev/vgX/rlvolX
```

(an HFS filesystem should be used)

```
# mkdir /core_image
# mkdir /opt_image
# mount /dev/vgX/lvolX /core_image
# mount /dev/vgX/lvolX /opt_image
```

Create Logical Volumes and Filesystems to hold the images – no mkisofs (cont.)

- Now we need to copy the archives to our new filesystems:

```
# cd /var/opt/ignite/recovery/archives/<hostname>/
```

  - This is the default location of the archive and it's name is <date>,<time>

```
# cp <archive> /core_image
# cp /tmp/opt_archive.gz /opt_image
# rmdir /core_image/lost+found
# rmdir /opt_image/lost+found
```

Create a Filesystem image of the volumes – no mkisofs

- Create a file that is the filesystem image for each filesystem. You will need a filesystem with enough space to hold the files. Use the dd command to do this:

```
# umount /core_image
# umount /opt_image
# dd if=/dev/vgX/rlvolX of=/var/tmp/core_fs
bs=1024k
# dd if=/dev/vgX/rlvolX of=/var/tmp/opt_fs bs=1024k
```

- Now the opt_fs file is ready to be burned to a CD, but the core_fs still needs to be made bootable.

Create a Filesystem image of the archives using mkisofs

- **Using mkisofs we do not need to create additional logical volumes and filesystems for /core_image and /opt_image. Instead, use the following commands to generate the filesystem image for the core and /opt archives:**
- `# mkisofs -U -D -o /var/tmp/opt_fs.iso /tmp/opt_archive.gz`

  `# cd /var/opt/ignite/recovery/archives/<hostname>/`

  `# mkisofs -U -D -o /var/tmp/core_fs.iso ./<archive>`

  In this example /var/tmp must have enough space to hold these archives plus the additional ISO attributes that mkisofs added. Another 10% should be plenty.

- **The *mkisofs* command is on the Application Release media in the TechSysConf.TC-OpenSource.XCDROAST-RUN fileset (usually CD number 1).**

Create a LIF file

- Now create a LIF file to make the core image bootable:

```
# cd /var/opt/ignite/clients/<client>/recovery/<date,time>
```
(or wherever your config files are)

```
# make_medialif -f system_cfg -f archive_cfg -f noncore_cfg
  -R -v -l /var/tmp/lif_file -r <release> (-o <kernel>)
```
(this is on one command line)

- This will create the **`/var/tmp/lif_file`** (or whatever name you choose). This file will need to be “wrapped” onto the core_fs or core_fs.iso file.

Wrap the LIF file onto the Filesystem image

- The instl_combine command is used to combine the LIF file to the filesystem image.
- First, let's edit the LIF file and make sure it does not try to contact an Ignite-UX server:

```
# instl_adm -d -F /var/tmp/lif_file >
/tmp/config.out

# vi /tmp/config.out
```

- Add the line:

```
control_from_server=false and run_ui=true

#instl_adm -F /var/tmp/lif_file -f /tmp/config.out
```

(make sure there are no errors)

Wrap the LIF file onto the Filesystem image (cont.)

- If there are no errors, combine the LIF. This will result in the **`/var/tmp/core_fs or core_fs.iso`** file being bootable.

```
#/opt/ignite/lbin/instl_combine -F
/var/tmp/lif_file -C /var/tmp/core_fs (or
core_fs.iso if using mkisofs)
```

(one command line)

- The **`/var/tmp/core_fs[.iso]`** file is now ready to be burned to the CD.

DVD Media

- Creating DVD media that can hold over 2Gb is like the steps in the previous slides except for a couple of differences.
  - The LIF file will need to be copied to the directory where the archive is.
  - We will need to use the *mkisofs* command to create this filesystem format, instead of using dd.
- The *mkisofs* command is on the Application Release media in the fileset
  - TechSysConf.TC-OpenSource.XCDROAST-RUN

DVD Media (cont.)

- Following our configuration examples so far, we could copy the archive image to **`/core_archive`**, but we will need to copy the LIF file from **`make_medialif`** there also.

```
# cd /var/opt/ignite/recovery/archives/<hostname>
# cp <archive> /core_image
# cp /var/tmp/lif_file /core_image
```

DVD Media (cont.)

- **Create the filesystem image:**

```
# cd /var/opt/ignite/recovery/archives/<hostname>
# cp <archive> /core_image
# cp /var/tmp/lif_file /core_image
```
(lif_file was created with make_medialif as described on a previous slide)

```
# cd /core_image

# mkisofs -U -max-iso9660-filenames -D -o /var/tmp/cdfs.iso  -b
  lif_file -no-emul-boot  /core_image

# /opt/ignite/lbin/instl_combine -C /var/tmp/cdfs.iso
```

- The cdfs.iso file is now a bootable image that can be burned to a DVD.

Itanium images

Itanium (IPF) systems require a couple of additional steps:

- The generic EFI boot partition needs to be copied into the directory with the archive and the LIF.
- The El-Torito filesystem format is required for IPF systems.

Itanium images (cont.)

Create the filesystem image:

Create a pseudo-root directory containing the files to be copied to the CD/DVD file system. In our example, we can use /core_image:

```
# cd /var/opt/ignite/recovery/archives/<client>
# cp <archive> /core_image
```

Copy the LIF volume created by make_medialif into the /core_image directory.

```
# cp /var/tmp/lif_file /core_image/lif_file
```

Copy the generic IPF boot partition into the pseudo root:

```
# cp /opt/ignite/boot/EFI_CD_image /core_image
```

Itanium images (cont.)

Run mkisofs to create the file system image and save it in the file: /var/tmp/cdfs.iso. This command line will create two boot partitions in the image: one to contain the IPF boot partition (EFI shell), and another to contain the LIF volume.

```
# mkisofs -U -max-iso9660-filenames -D -o \
  /var/tmp/cdfs.iso -no-emul-boot -b EFI_CD_image \
 -eltorito-alt-boot -no-emul-boot -b lif_file \
  /core_image
```

Note that even with the -U,-max-iso9660- filenames, and -D options, there are limitations to the lengths of filenames, etc. See the mkisofs(8) man page for details.

Itanium images (cont.)

Run instl_combine to relocate the LIF header to the beginning of the IS09660 image:

```
# instl_combine -C /var/tmp/cdfs.iso
```

The /var/tmp/cdfs.iso file can be burned to a CD or DVD.

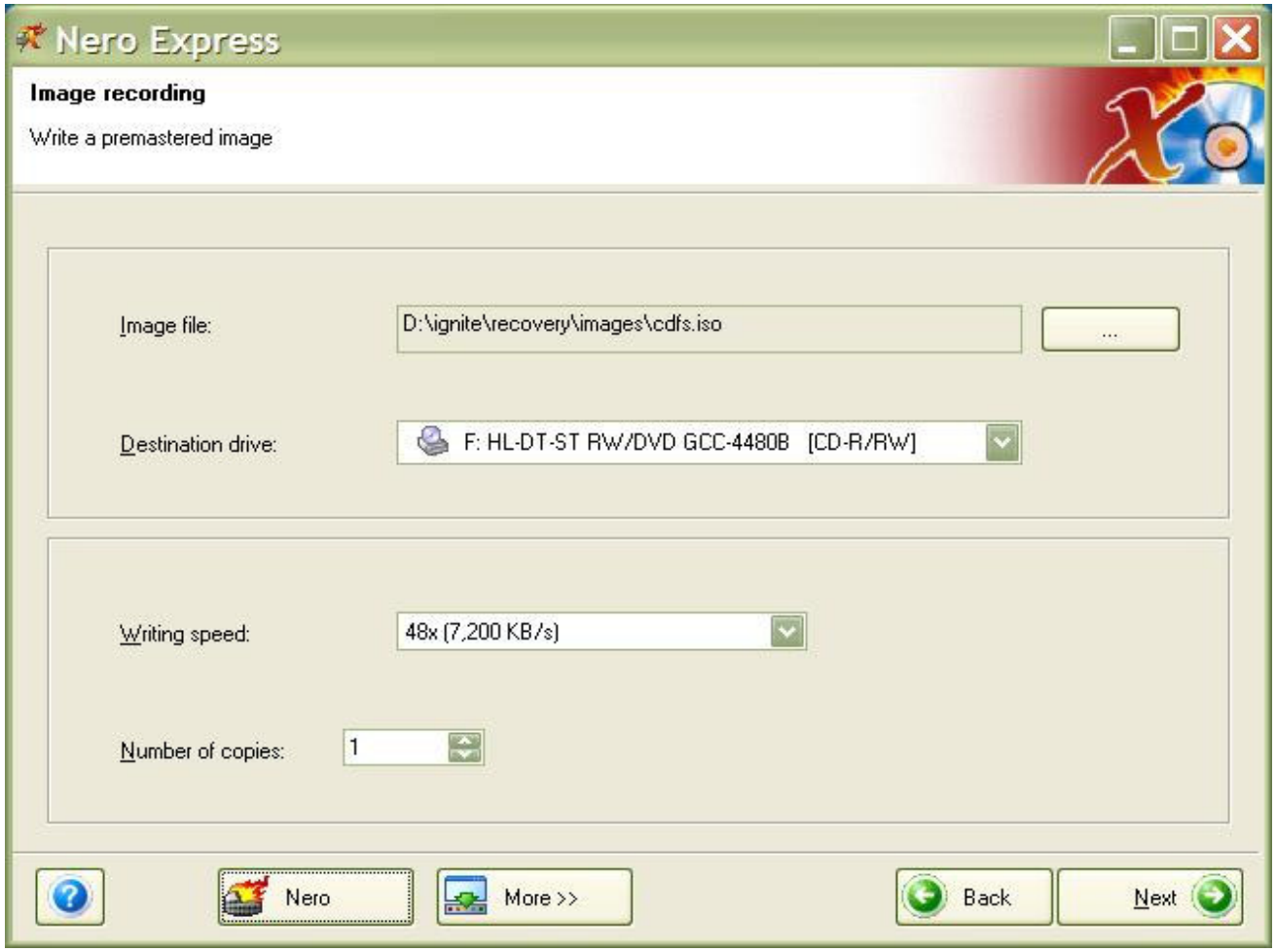
Burn the image(s) to a CD or DVD

- A PC can be used to burn the file to a CD or DVD. The PC burner software must be able to create an ISO image and write in a raw mode. Two utilities that will work are *Easy CD Creator* from *Adaptec* and the *Nero StartSmart* software. Nero has a trial version that can be downloaded from www.nero.com which works.

- The key to burning on a PC is to select the option of creating a disk image. The PC software will usually support a "*.iso" extension.

Burn the image(s) to a CD or DVD

Burn the image(s) to a CD or DVD (cont.)



Burn the image(s) to a CD or DVD (cont.)

- To use an HP-UX system for burning, the “cdrecord” application can be used. cdrecord is included in the same fileset with mkisofs on the Application Media
  - TechSysConf.TC-OpenSource.XCDROAST-RUN
  - Also online at

ftp://sunsite.unc.edu:/pub/Linux/utils/disk-management/

An example command of cdrecord is:

```
# cdrecord -v speed=2 dev=1,1,0 /var/tmp/newsys/fs_image_iso
```

```
(the hardware path would be card instance 1 SCSI
target 1 SCSI LUN 0)
```

Notes on Cloning

The CD/DVD can be used to recover the system that it was created on or install the image to a *different* system.

There are 2 basic guidelines to follow when cloning.

- The version of Ignite-UX that is used must support the hardware.
- The OS on the source system must support the target system.

Notes on Cloning (cont.)

The Hardware Enablement patch bundles add functionality for things like:

- Processors
- Processor speeds
- I/O adapters
- I/O devices

Notes on Cloning (cont.)

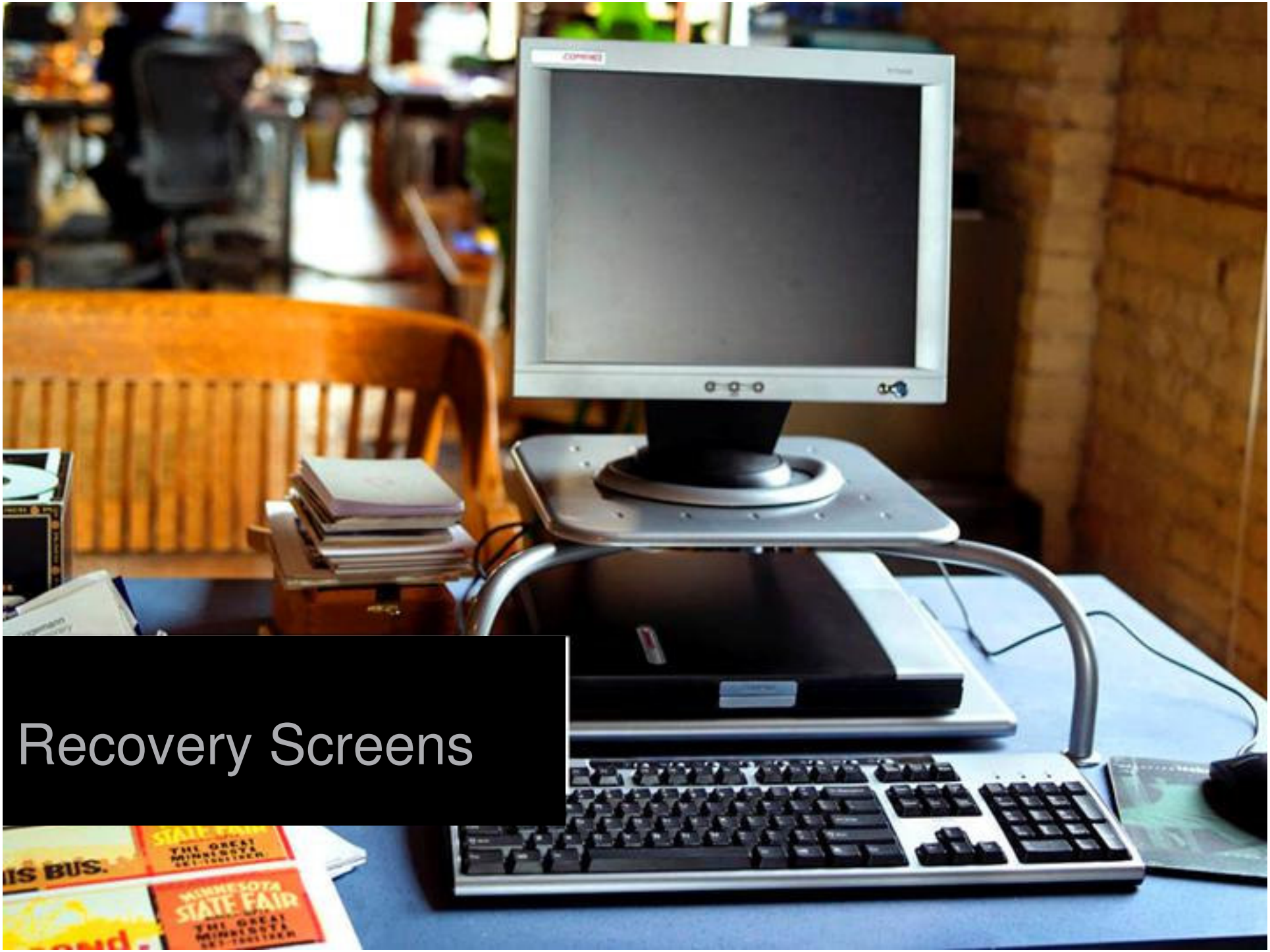
Which Hardware Enablement bundle do I need?

There is information about the HWE patches and required OS revision online at

- http://docs.hp.com/hpux/hw/index.html → Hardware manuals
- http://docs.hp.com/hpux/os/11.0/index.html → Release Notes
- http://docs.hp.com/hpux/os/11i/index.html → Release Notes
- http://software.hp.com/SUPPORT_PLUS → Support Plus CD info

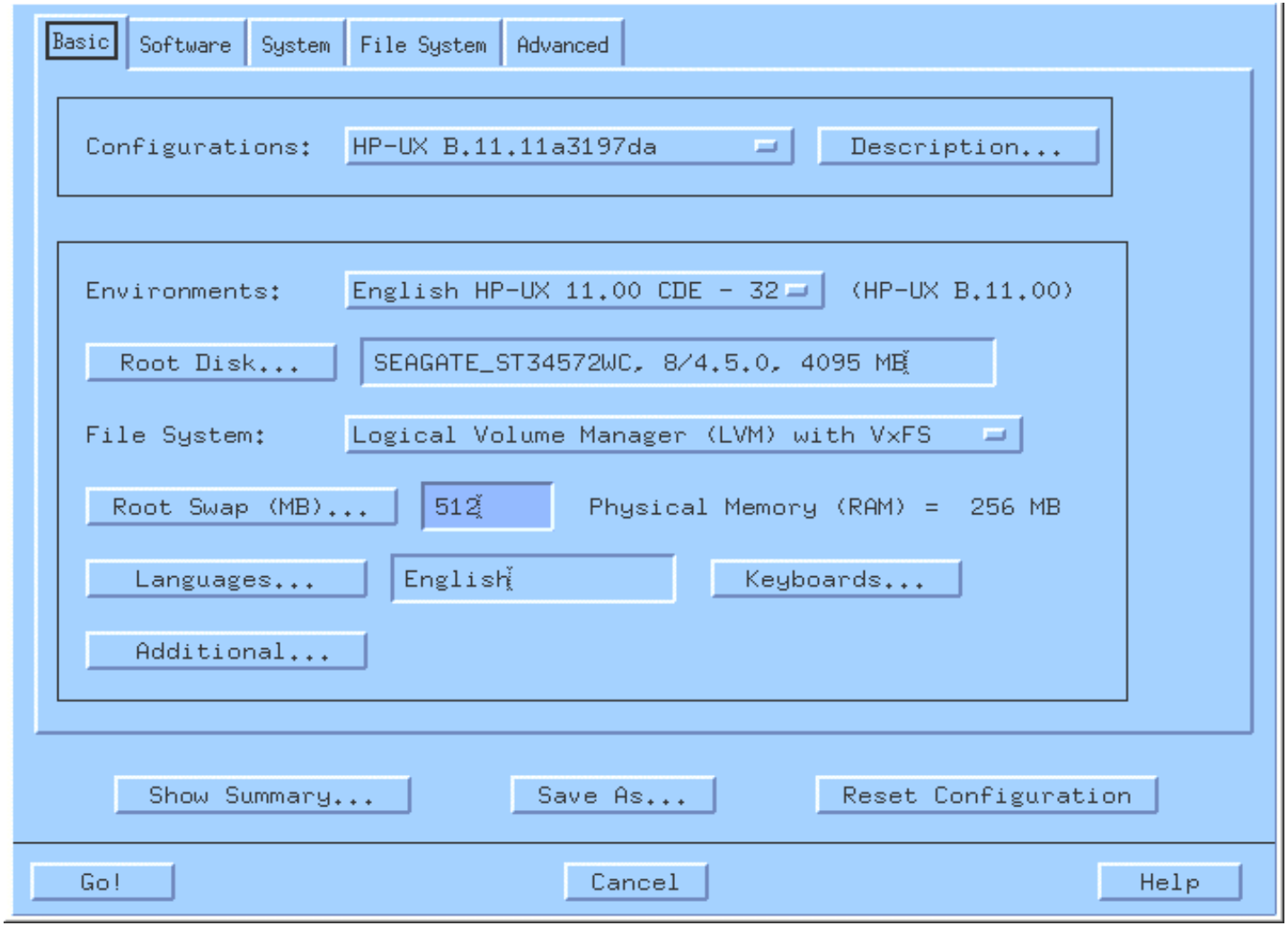
Notes on Cloning (cont.)

- When recovering a system from a make_net_recovery image, there is a button in the User Interface called **"Cloning to different HW?".** If set to true the system will generate a new kernel from the /stand/system file that was created from the archive and the recovery. This is the default behavior if the hardware model is different. If set to false, the /stand/vmunix kernel itself will be restored from the archive.
  - The button is located on the "Basic" tab in the "Additional" area.

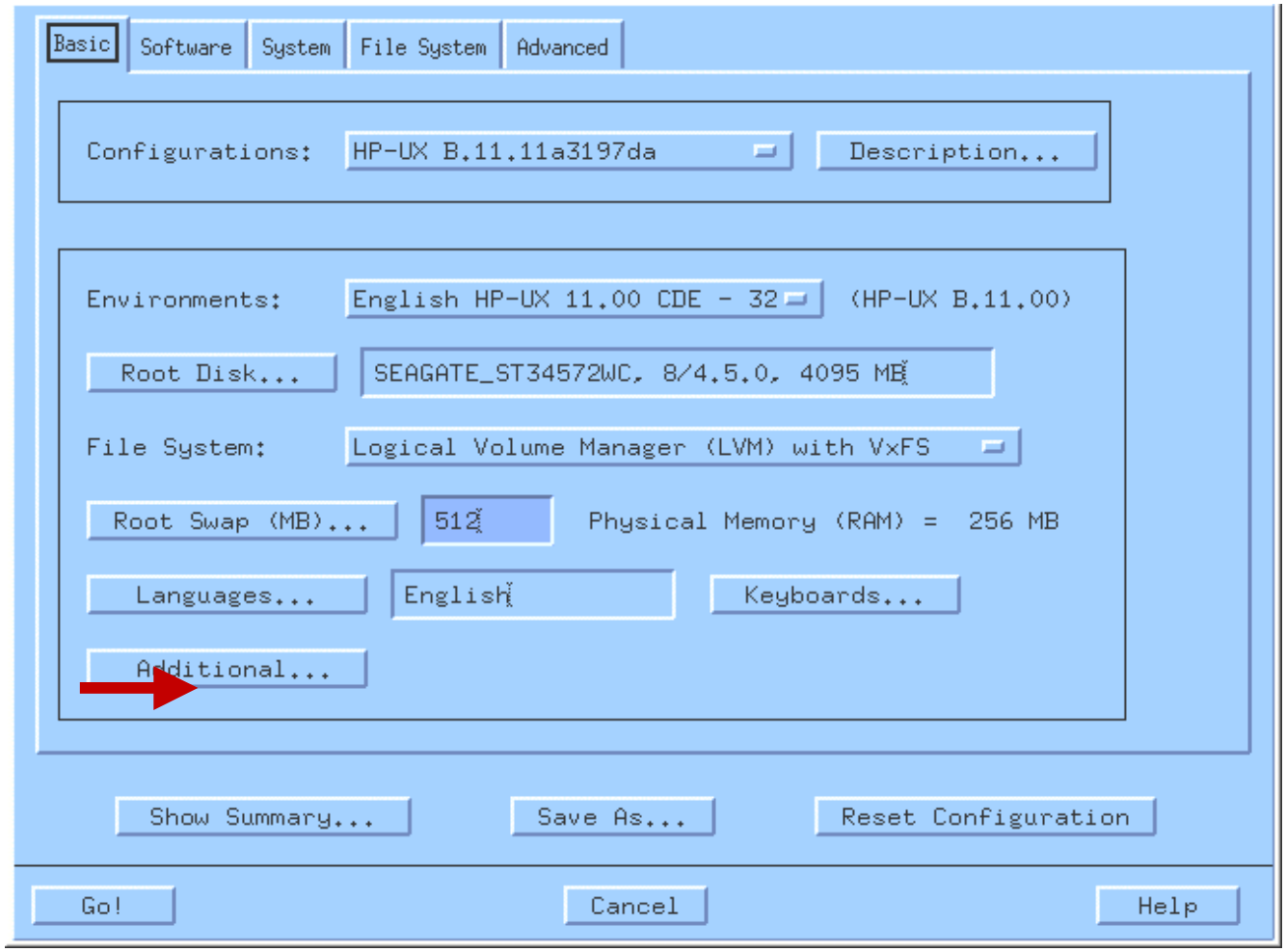

Recovery Screens

Recovery Screens

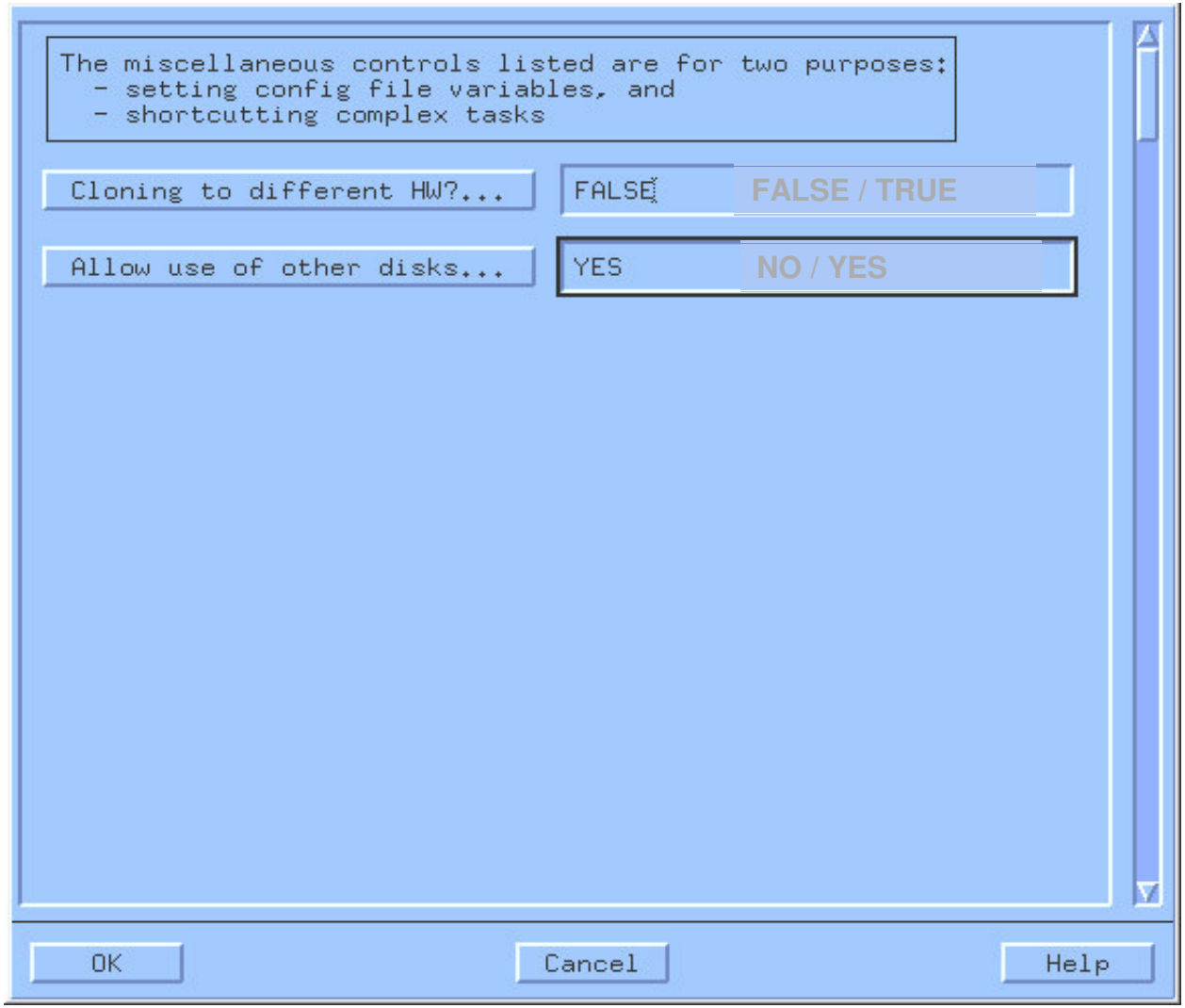
Ignite: Installing the OS Archive



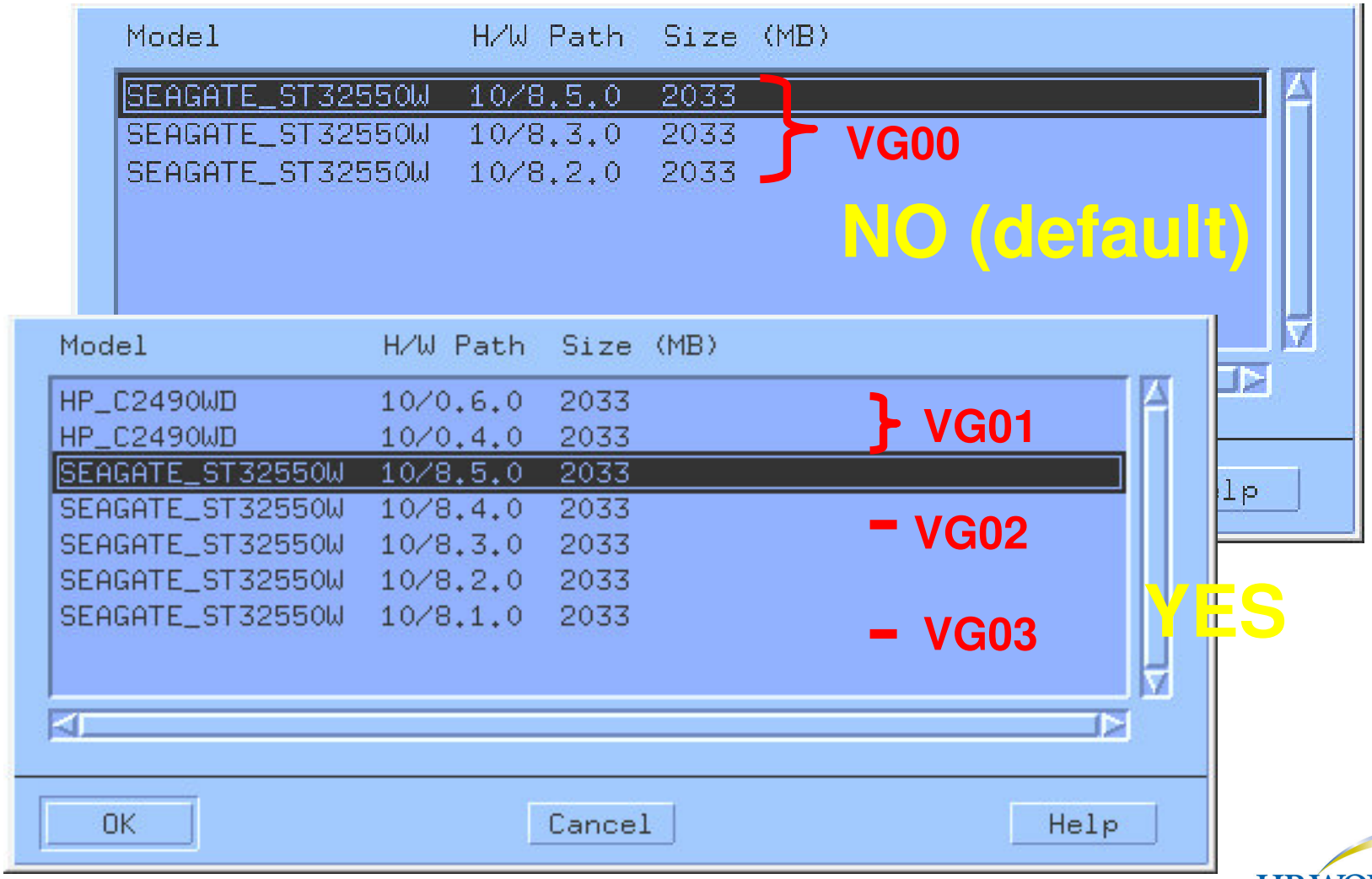
Server GUI - Install Dialogue: Basic



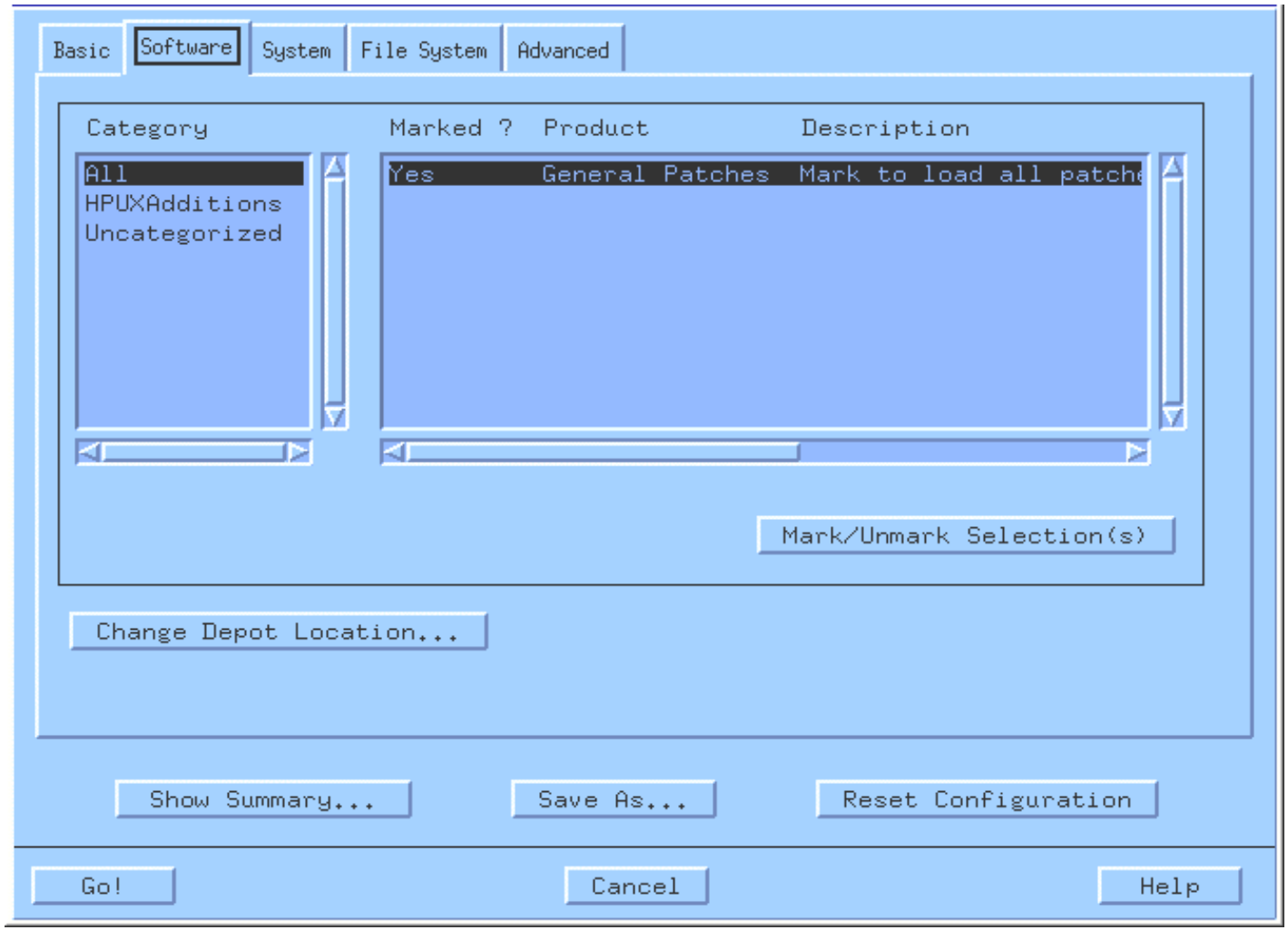
Server GUI - Install Dialogue: Basic



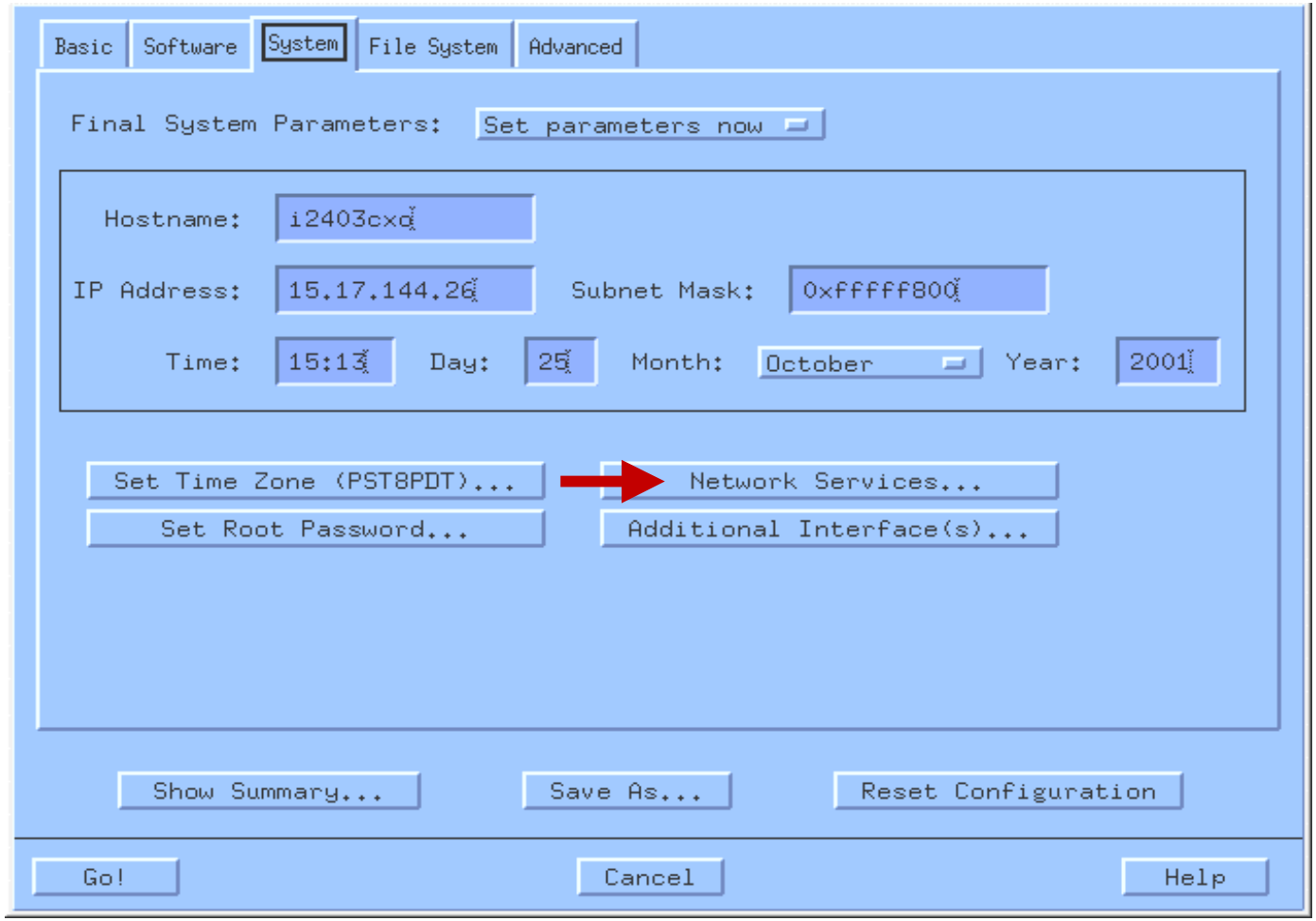
Allow Use of Other Disks ...



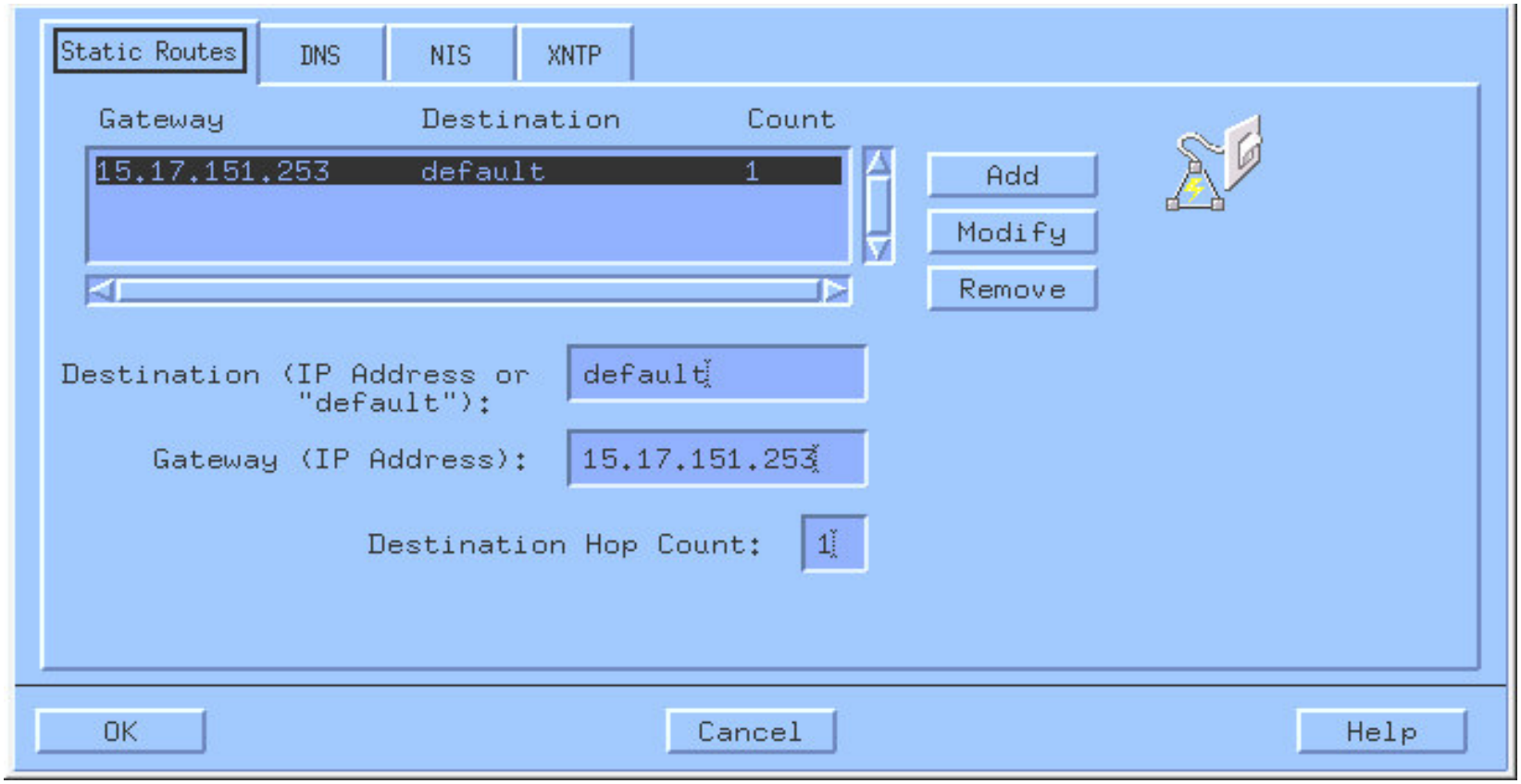
Ignite: Installing the OS Archive



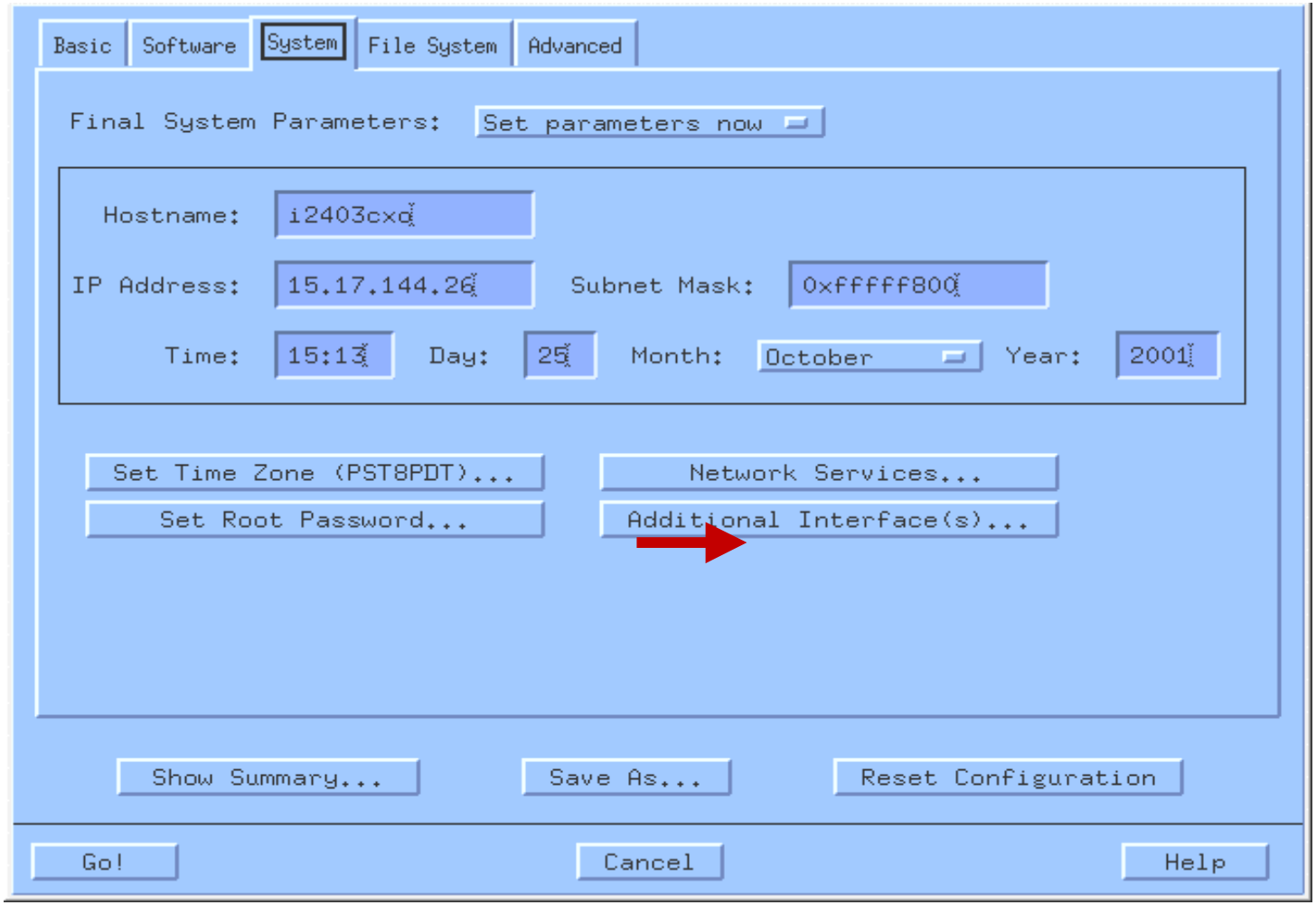
Ignite: Installing the OS Archive



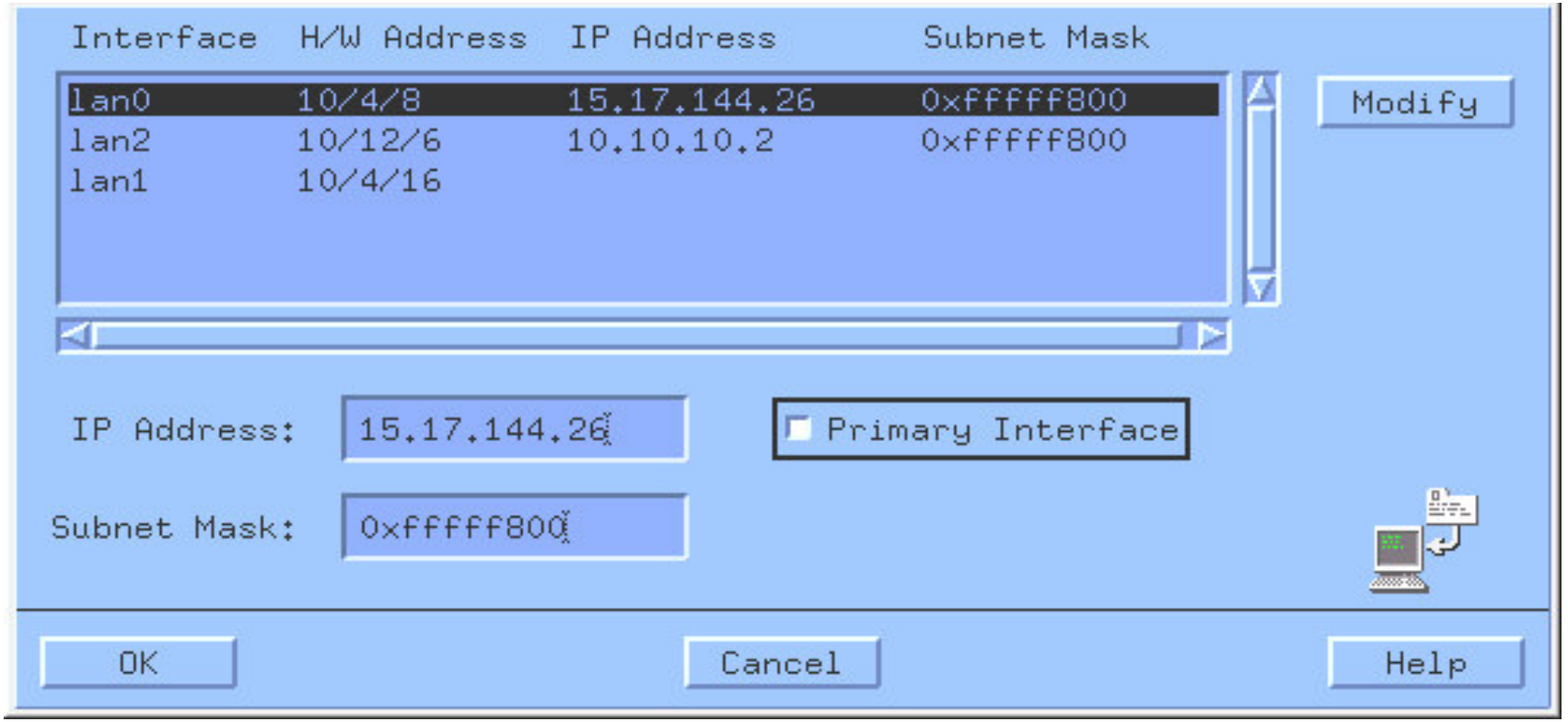
Server GUI - Install Dialogue: Network Services



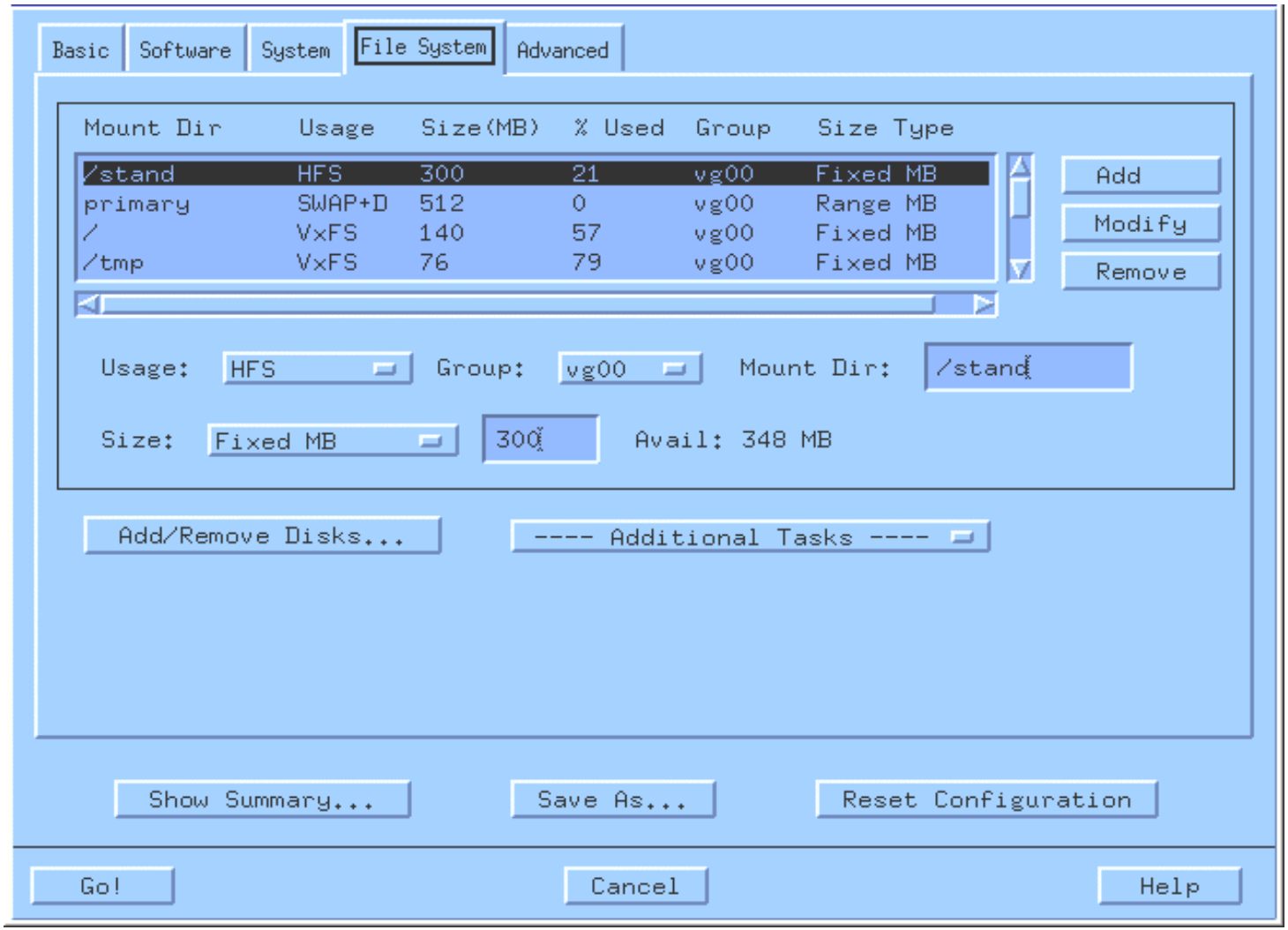
Ignite: Installing the OS Archive



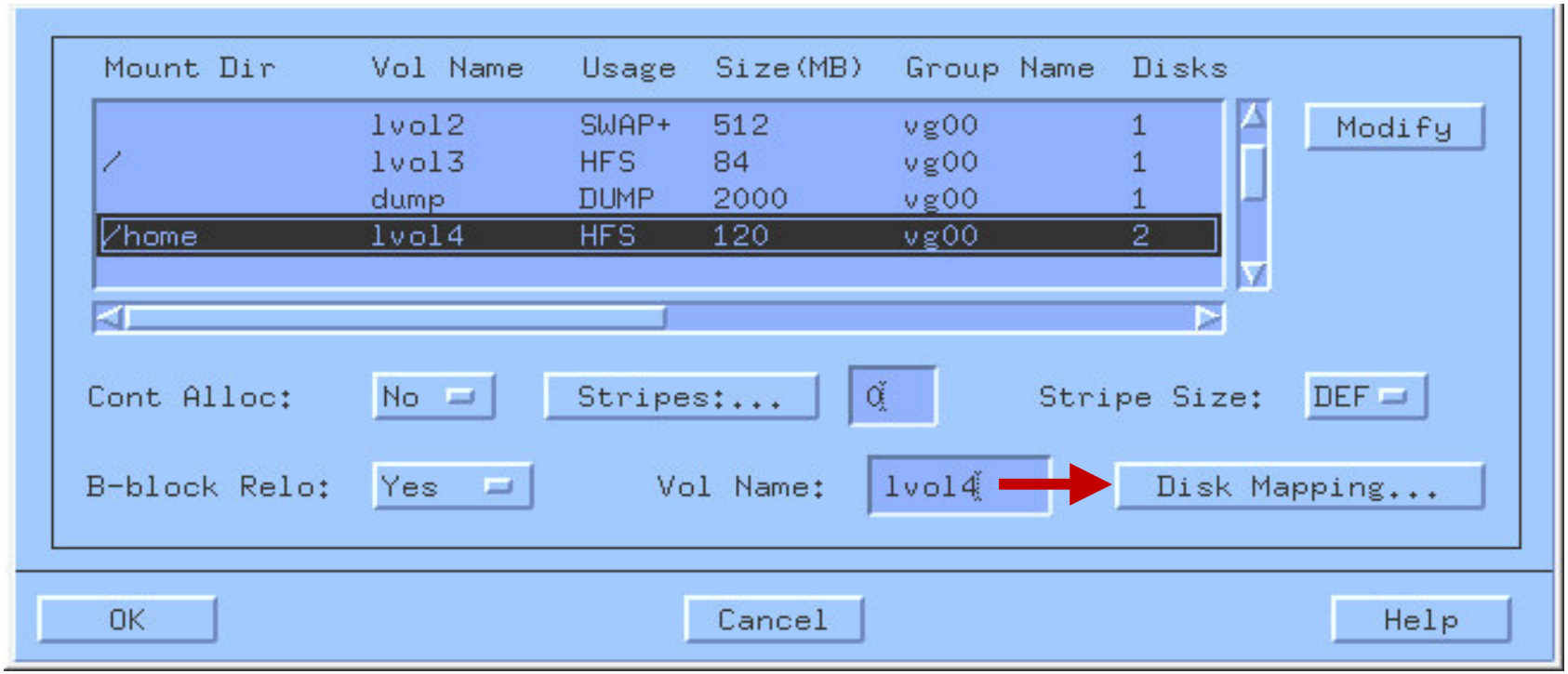
Server GUI - Install Dialogue: Additional Interfaces



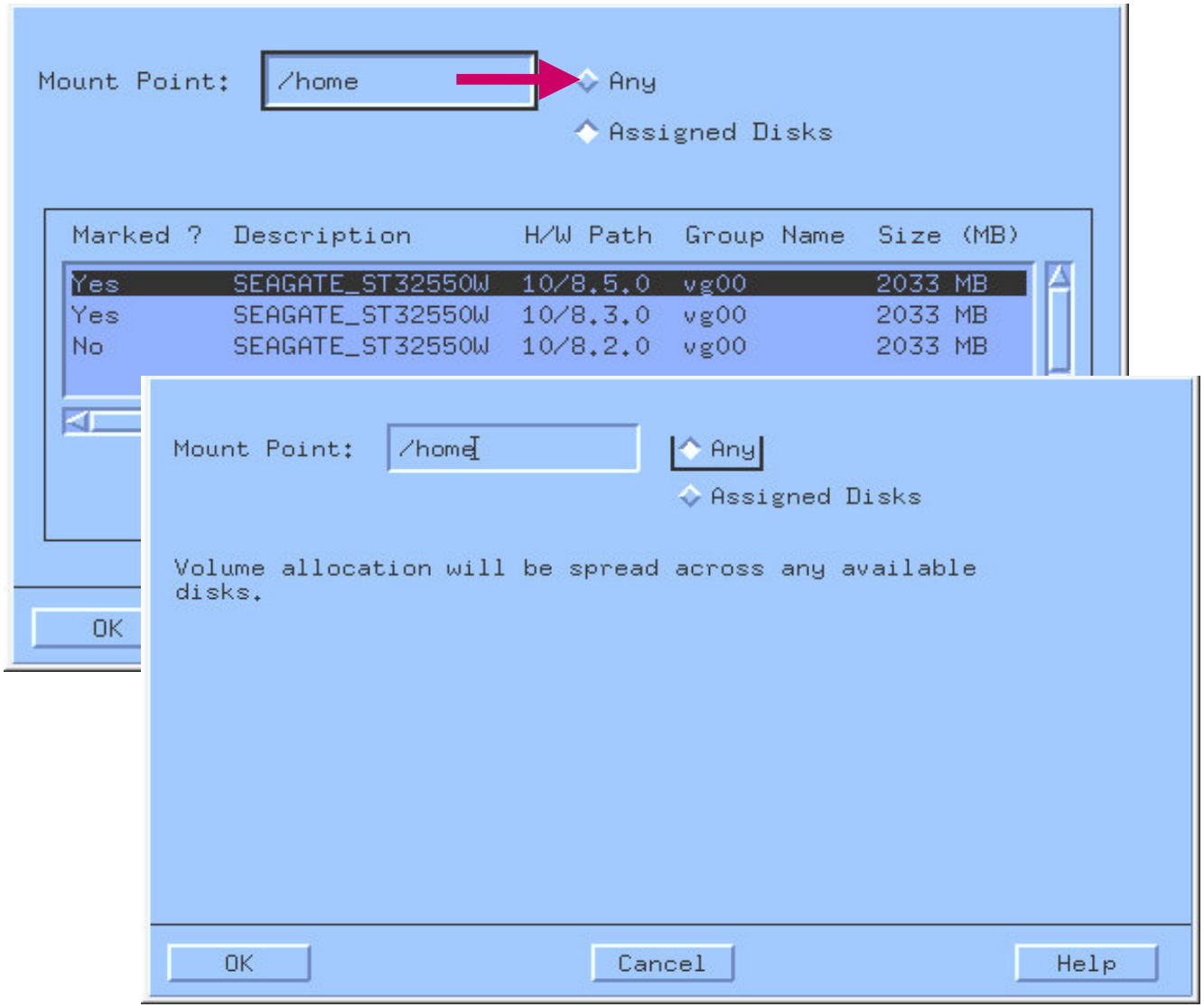
Ignite: Installing the OS Archive



Server GUI - Install Dialogue: Advanced Volume Layout



Server GUI - Install Dialogue: Disk Mapping

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