



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.

x Ignite-UX (rbox)		_ 🗆 🗙
<u>F</u> ile <u>V</u> iew <u>O</u> ptions	Actions	Help
	<u>V</u> iew Install History <u>B</u> oot Client	IGNITE UX
Installation Clients	Add New Client for Recovery	0 of 0 selected
	Run <u>T</u> utorial/Server Setup	
	(nothing selected)	
		H
		Sol



Add Client for recovery (cont.)

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

Enter the to add for	name of t recovery	he new clier (e.g. hpcos	nt that yo elf or hpo	ou would like coelf.hp.com):
Hostname:	ĺ			
Ignite wil necessary If remsh f a password	l try to s to create ails, a w. for rexes	remsh to the the client indow will p	e client t directory pop up ask	o get informatio on this server. ing you to enter





Create network recovery archive

🔀 Ignite-UX (rbox)		_ 🗆 🗵
<u>F</u> ile <u>V</u> iew <u>O</u> ptions	Actions	Help
Installation Clients	<u>V</u> iew Install History <u>B</u> oot Client <u>A</u> dd New Client for Recovery Run <u>T</u> utorial/Server Setup	IGNITE UX 1 of 1 selected
rbox	<u>C</u> lient Status <u>I</u> nstall Client <u>S</u> top Install Create Network Recovery Archive	
	Create Tape Recovery Archive Nove to History Remove Client	
	- View <u>H</u> ardware View/Print Manifest Change Icon <u>N</u> ame	





Create network recovery archive (cont.)

X Create Network Recovery Archive: Actions on Server		
Create Network Recovery Archive: Actions on Client		
the The Transformer Create Network Recovery Archive: Setting Defau	It Values	
Create Network Recovery Archive: Specifying Content		X
Create Network Recovery Archive: Skip these Screens		
lick below to skip these information screens next time. ou can use "Server Configuration/Session Options" n the Options menu to change this setting.		
Jo not show this information again		
		Cancel
< Back Finish	Cancel :el	

Create network recovery archive (cont).



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

🗙 Recovery: Archive Content (rbox)	
X Recovery: Archive Content (rbox) Disks/Volume Groups Add selected disk/vg Status Disk/VG In Part /dev/vx/dsk/roi Untouched /dev/vg01	Archive Content List Category: exclude Pathname: /opt] (optional) Add Remove Hide Category Pathname inc_entire /dev/vx/dsk/ri exclude /opt essential /sbin
	essential /dev essential /stand



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





 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.
- -<u>archive</u> cfg contains the location of the archive and it's impact on disk space.
- -<u>control</u> cfg contains information about other disks, volume groups and cloning.







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.





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
```





• 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
```



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"





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.







 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.





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.
```









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/vqX

(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 н. 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 EI-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.)

🛪 Nero Express		
Image recording Write a premastered image		200
Image file:	D:\ignite\recovery\images\cdfs.iso	
Destination drive:	F: HL-DT-ST RW/DVD GCC-4480B [CD-R	/BW]
<u>₩</u> riting speed:	48x (7,200 KB/s)	
<u>N</u> umber of copies:		
Nero	More >>	Back <u>N</u> ext





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 \rightarrow Hardware manuals
- http://docs.hp.com/hpux/os/11.0/index.html → Release Notes
- <u>http://docs.hp.com/hpux/os/11i/index.html</u> → 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





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Ignite: Installing the OS Archive

Basic Software System File System Advanced
Configurations: HP-UX B.11.11a3197da 🗖 Description
Environments: English HP-UX 11.00 CDE - 32 = (HP-UX B.11.00)
Root Disk SEAGATE_ST34572WC, 8/4.5.0, 4095 MB
File System: Logical Volume Manager (LVM) with VxFS 🗖
Root Swap (MB) 512 Physical Memory (RAM) = 256 MB
Languages English Keyboards
Show Summary Save As Reset Configuration
Go! Cancel Help



Server GUI - Install Dialogue: Basic



Basic Software System File System Advanced
Configurations: HP-UX B.11.11a3197da 🗖 Description
Environments: English HP-UX 11.00 CDE - 32 - (HP-UX B.11.00)
Root Disk SEAGATE_ST34572WC, 8/4.5.0, 4095 MB
File System: Logical Volume Manager (LVM) with VxFS =
Root Swap (MB) 512 Physical Memory (RAM) = 256 MB
Languages English
Additional
Show Summary Save As Reset Configuration
Go! Cancel Help



Server GUI - Install Dialogue: Basic

The miscellaneous controls lis - setting config file variab - shortcutting complex tasks	ted are for les, and	two purposes:	
Cloning to different HW?	FALSE	FALSE / TRUE	
Allow use of other disks	YES	NO / YES	
			V
ОК	Cancel		Help







Allow Use of Other Disks ...

Model	H/W Path	Size (MB)		
SEAGATE_ST32 SEAGATE_ST32 SEAGATE_ST32	550W 10/8.5.0 550W 10/8.3.0 550W 10/8.2.0	2033 2033 2033	VG00 NO (default)	
Model	H/W Path Size	(MB)		
HP_C2490WD HP_C2490WD SECOTE_ST22550W	10/0.6.0 2033 10/0.4.0 2033		} VG01	
SEAGATE_ST32550W SEAGATE_ST32550W SEAGATE_ST32550W	10/8.4.0 2033 10/8.3.0 2033 10/8.3.0 2033		- VG02	
SEAGATE_ST32550W	10/8.2.0 2033			5
ОК	Cance	1	Help	
			H Sc	IP WOR



Ignite: Installing the OS Archive

Basic Software System	File System Advanced		
Category	Marked ? Product	Description	
All HPUXAdditions Uncategorized	Yes General Patch	nes Mark to load all patch:	
Change Depot Loca	tion	Mark/Unmark Selection(s)	
Show Summary.	Save As	Reset Configuration	
Go!	Cancel	Help	
			HP WORLD 20 Solutions and Technology Conference



Ignite: Installing the OS Archive

Final System	Parameters: Set parameters now 🖃	
Hostname:	12403c×ď	
IP Address:	15.17.144.26 Subnet Mask: 0xfffff800	
Time:	15:13 Day: 25 Month: October 🖃 Year: 2001	
Set Time 2	one (PST8PDT) Network Services	
Set Roo	t Password Additional Interface(s)	
Show Su	mary Save As Reset Configuration	
Show Su	nmary Save As Reset Configuration	
Show Su Go!	nmary Save As Reset Configuration Cancel Help	

Server GUI - Install Dialogue: **Network Services**



Static Routes	DNS NIS XNTP		
Gateway	Destination	Count	\sim
15,17,151.	253 default	1 Add	
		- Modify	
		Remove	•
Destination	(IP Address or defaultį́ "default"):		
Gateway	(IP Address): 15,17,15	1.253	
	Destination Hop Coun	t: 1į	
ОК	Ca	ncel	Help





Ignite: Installing the OS Archive

Basic Software System File System Advanced	
Final System Parameters: <u>Set parameters now</u>	
Hostname: i2403cxď	
IP Address: 15,17,144,26 Subnet Mask: 0xffff800	
Time: 15:13 Day: 25 Month: October 🖃 Year: 2001	
Set Time Zone (PST8PDT) Network Services	
Set Root Password Additional Interface(s)	
Show Summary Save As Reset Configuration	
Go! Cancel Help	
	HP WORL

2004

Server GUI - Install Dialogue: Additional Interfaces









Ignite: Installing the OS Archive

Stand HFS 300 21 vg00 Fixed MB Add primary SWAP+D 512 0 vg00 Range MB Modify /tmp VxFS 140 57 vg00 Fixed MB Modify /tmp VxFS 76 79 vg00 Fixed MB Remove Usage: HFS Group: vg00 Mount Dir: /stand Size: Fixed MB 300 Avail: 348 MB Add/Remove Disks Additional Tasks Image: State Configuration	Basic Software S	Usage Siz	™ Advanced e(MB) %Used Group	Size Type			
Usage: HFS Group: vg00 Mount Dir: /standi Size: Fixed MB 300 Avail: 348 MB Add/Remove Disks Additional Tasks Golditional Tasks Save As Reset Configuration	<mark>∕stand</mark> primary ⁄ ∕tmp	HFS 300 SWAP+D 512 V×FS 140 V×FS 76	21 vg00 0 vg00 57 vg00 79 vg00	Fixed MB Range MB Fixed MB Fixed MB	Add Modify Remove		
Add/Remove Disks Additional Tasks I Show Summary Save As Reset Configuration	Usage: <u>HFS</u> Group: <u>vg00</u> Mount Dir: <mark>/standł</mark> Size: Fixed MB I 300ł Avail: 348 MB						
Show Summary Save As Reset Configuration	Add/Remove Disks						
Show Summary Save As Reset Configuration							
Cal I Canaal I Hala I	Show Sum	mary	Save As	Reset Configur	Holp		



Server GUI - Install Dialogue: **Advanced Volume Layout**



Mount Dir	Vol Name	Usage	Size(MB)	Group I	Name I	lisks	
	1vo12	SWAP+	512	vg00	1	A	Modify
1	lvol3	HFS	84	vg00	1		
	dump	DUMP	2000	vg00	1		
/home	lvol4	HFS	120	vg00	2		
Cont Alloc:	No 💷	Stripe	s: 0		Stripe	s Size:	DEF 💷
B-block Relo:	Yes 🖃	Vo	l Name:	lvol4 🗖		Disk Ma	apping
0K		1	Cancel				Help



Server GUI - Install Dialogue: Disk Mapping

Mount f	°oint: ∕home —	Any Assigned Disks		
Marke Yes No	ed ? Description SEAGATE_ST32550W SEAGATE_ST32550W Mount Point: //home Volume allocation will disks.	H/W Path Group Name \$ 10/8.5.0 vg00 2 10/8.3.0 vg00 2 10/8.2.0 vg00 2 Any Assigned Dis L be spread across any ava	Size (MB) 2033 MB 2033 MB 2033 MB sks ailable	
	ОК	Cancel	Help	HP WORLI Solutions and Technology Co





