



Worldwide Sales Training & Communications

PSU Blast Image Config 2.0

May 24, 2004

Technical Problems

Click the Help button in the top-right corner of the player for technical support.

Or call (408) 203-7693



Mac OS X Labs Deployment Project

macosxlabs.org



Welcome

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Computing Services
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Worldwide Sales Training & Communications

PSU Blast Image Config 2.0



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May 24, 2004



Overview



- Part I
 - Intro to PSU Blast Image Config
 - New Features
 - Creating the Master Image
 - Demo Run



Overview



- Part II
 - Default/Autorun Preferences
 - Bootable DVD with Autorun Restore
 - Master Image Creation Tips and Tricks
 - PSU's Lab Deployment with BIC



What is PSU Blast Image Config?

- A freeware tool originally for PSU only
- A complete software solution to quickly restore and configure a Macintosh back to a known state:
 - Configure and set the Open Firmware security, preventing unauthorized access
 - Set the date and time
 - Restore a master disk image quickly
 - Change the startup disk to the restored disk



What is PSU Blast Image Config?

- Configure the network settings on the restored disk (via ncutil):
 - IP Address : DHCP or Manual (Static)
 - Subnet Mask & Router
 - DNS Servers
 - Network Names (Computer and Local)
- Extensible through pre and post restore scripts and default/autorun preferences



Who can benefit from BIC?

- IT Support Staff
 - Faculty/Employee Desktop Support
 - Student Computing Labs
- Mac Repair Staff
 - Quickly restore a Mac, faster turn around time for rebuilds
- System Administrators
 - Keep master disk image of server ready for quick build



When would this be used?

- To build a Mac out of the box to be exactly like a default system configuration
- Erase a Mac, do a clean restore and reset the Open Firmware security, set date and time
- Doing a major OS X upgrade (ie, 10.2 to 10.3)



What's new in 2.0?



- Support for Mac OS X 10.3
- Much faster restore times
- Support for international date and time Formats (ie, yyyy/mm/dd versus mm/dd/yyyy)
- Restore images over http
- Pre and post restore scripts
- Completely configurable Open Firmware settings



What's new in 2.0?

- Autorun/default settings preferences support
- Specify Network Names (AppleTalk/Rendezvous)
- Specify DNS Servers
- No longer need network template settings file thanks to ncutil tool written by Jeff Frey:

<http://deaddog.duch.udel.edu/~frey/darwin/ncutil.php>

ncutil The logo for the ncutil tool, featuring the word "ncutil" in a cursive script followed by a graphic of a network cable connector.



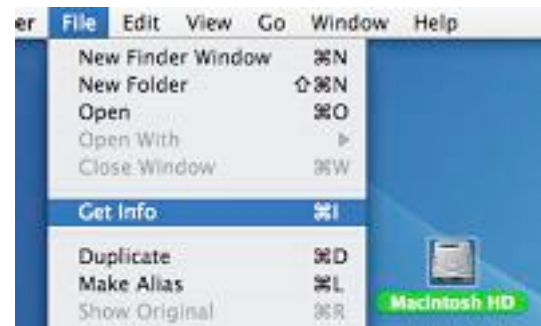
Creating the Master Image...

- Read the asr (Apple Software Restore) man page: Open terminal.app and enter "man asr"
- Install Mac OS X on the master Mac and set it up the way you want it to work. Ie, Applications, printers, automated scripts, etc.
- Boot up from another partition or External FireWire Hard Disk with Mac OS X 10.3.x
- Login with an administrator account



Master Image: Enable Perms

- Enable Permissions on the Disk to Image:
 - Select "Macintosh HD"
 - File, Get Info
 - UN-check "Ignore ownership on this volume"

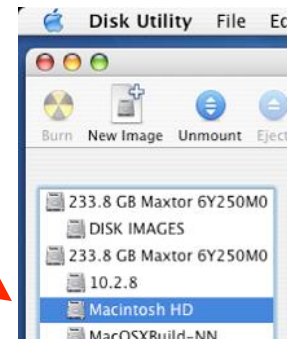


Master Image: Repair Master HD

- Launch Disk Utility



- Select the disk that will be imaged from

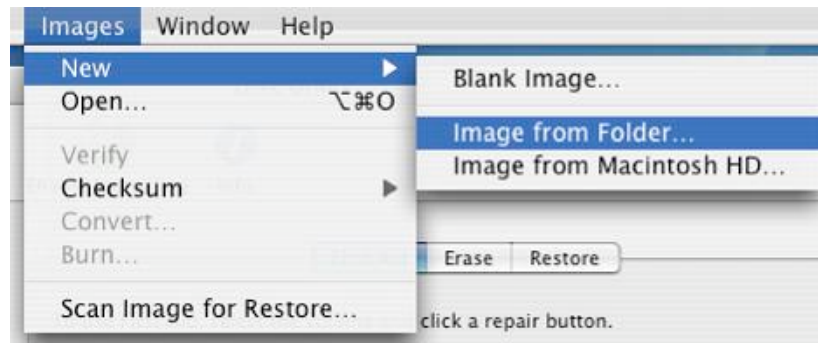


- Click the “Repair Disk” button



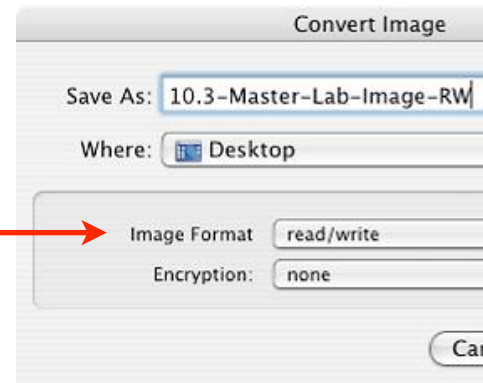
Master Image: Create the Image

- Images, New, Image From Folder...
 - Don't select "Image From Macintosh HD..." or won't be able to block restore to any volume larger than the master hard disk



Master Image: Create the Image

- Save the image as Read/Write as you'll need to make changes to it later

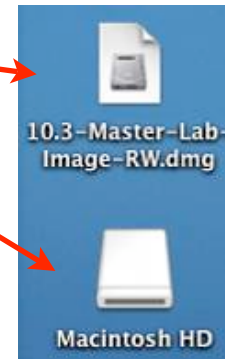


- **NOTE:** "Image from Folder..." requires that the space to save the image is 2x larger as the source volume data size



Master Image: Cleanup

- Unmount the original master Volume HD FIRST
- Mount the read-write master image
- Open Terminal.app



Master Image: Cleanup

- In the terminal, become root and delete files:

```
% sudo -s
```

```
% rm /Volumes/<ImageVolName>/var/db/  
BootCache.playlist
```

```
% rm /Volumes/<ImageVolName>/var/db/  
volinfo.database
```

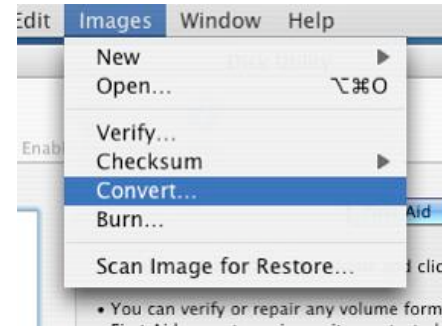
```
% rm -r /Volumes/<ImageVolName>/var/vm/  
swap*
```

- Quit terminal, unmount the master disk image

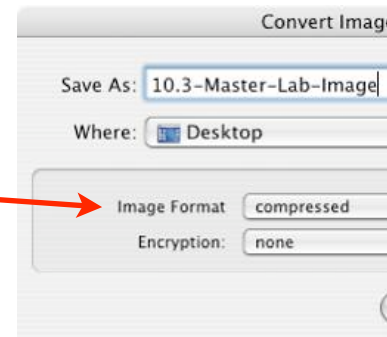


Master Image: Convert Image

- In Disk Utility:
 - Images, Convert...

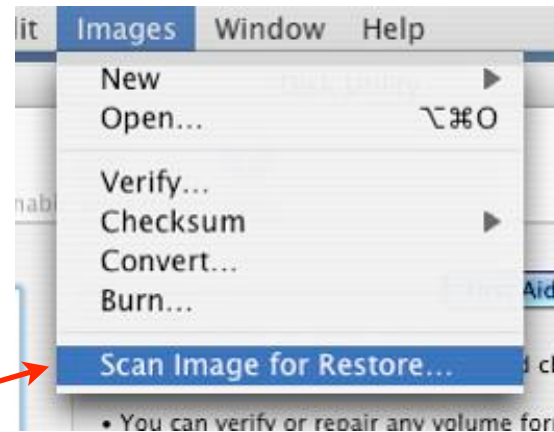


- Change the Image Format to **Compressed**



Master Image: Scan for Restore

- If you want to be able to verify the data restored, the image must be “Scanned for Restore” to add checksum data to the image
- In Disk Utility:
 - Images, **Scan for Restore...**



PSU BIC 'RestoreImages' folder

- Copy/Move the compressed and scanned image to the **RestoreImages** folder for easy access, or
- Images can be on another hard disk, server, or via http too!



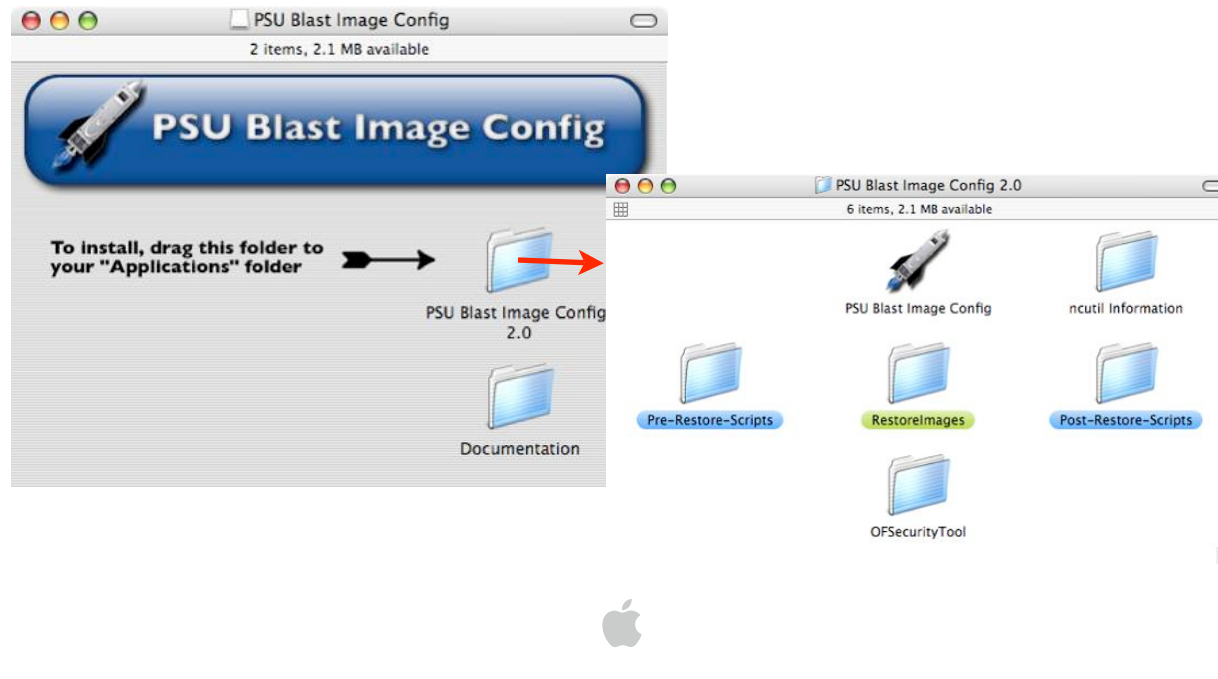
BIC 2.0 System Requirements

- Mac OS X 10.2.2 or higher, including 10.3
- Administrator Account
- If Open Firmware security is desired, the Mac must be capable of supporting it
- If you need to configure the network settings on the restored disk, ncutil **must be installed**
- Various Unix command line tools
 - asr, disktool, find, bless, ioreg, hdiutil, etc.



BIC 2.0 Application Folder

- Blast Image Config 2.0 disk image download:



Demo Run: Login

- Can run BIC 2.0 from any mounted volume
- Must be launched as an admin or root user



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Blast Image Config
Information Technology Services
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Please enter in an administrator
userid and password:

UserID:

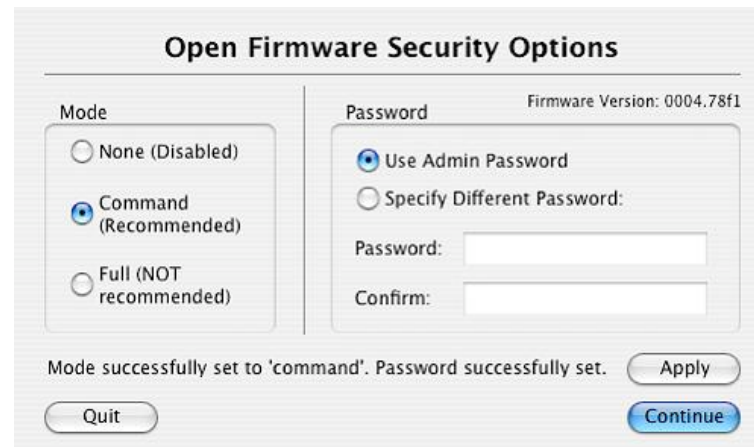
Password:

Cancel OK



Demo Run: Open Firmware Security

- To prevent booting from other devices and entering single user mode, enable Open Firmware Security



The screenshot shows a dialog box titled "Open Firmware Security Options". It is divided into two main sections: "Mode" and "Password".

Mode: This section contains three radio button options: "None (Disabled)", "Command (Recommended)", and "Full (NOT recommended)". The "Command (Recommended)" option is selected.

Password: This section is titled "Password" and includes the text "Firmware Version: 0004.78f1". It contains two radio button options: "Use Admin Password" (selected) and "Specify Different Password:". Below these options are two text input fields labeled "Password:" and "Confirm:". The "Apply" button is disabled.

At the bottom of the dialog, there is a status message: "Mode successfully set to 'command'. Password successfully set." Below this message are three buttons: "Quit", "Apply", and "Continue". The "Continue" button is highlighted in blue.



Demo Run: Open Firmware Security

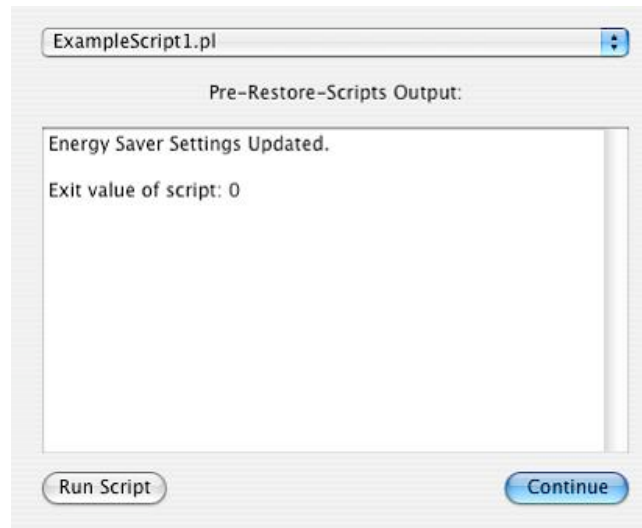
- Things to be aware of:
 - Some older Macs do NOT support OF Security, check Apple for firmware updaters
 - If forget password, will need to change RAM configuration and reset the PRAM 3 times
 - Do NOT use a capital “U” in the Open Firmware password:

[http://docs.info.apple.com/article.html?
artnum=107666](http://docs.info.apple.com/article.html?artnum=107666)



Demo Run: Pre Restore Script(s)

- Run shell/perl scripts, displays STDOUT and exit value:



Demo Run: Set the Date & Time

- Different date formats supported, 12/24 hour time:

Configure Date and Time

Date Set

Current System Date:
5/5/04

Month Day Year
05 / 05 / 2004

Time Set

Current System Time:
9:23:03 AM

Time Format: 12
 AM PM

Hour Minute
09 : 23

Date and time updated.

Quit Apply OK



Demo Run: Configure Network

- Before restore, can specify how to configure the network settings on the restored disk
- Remember: ncutil **must** be installed to configure network settings



Demo Run: Config IP Settings...

- Static IP Configuration

- Specify IP address

- Subnet Mask

- Router (Aka, Gateway)

Enter Network Settings:

IP Address:

192 . 168 . 1 . 50

Subnet Mask:

255 . 255 . 255 . 0

Router:

192 . 168 . 1 . 1

Save Network Settings



Demo Run: DNS Servers...

- Can specify up to 3 DNS Servers
- Can read in default servers from an autorun/Defaults preferences file

Enter DNS Server Settings:

Primary DNS Server:
192 . 168 . 1 . 200 ✓

Second DNS Server:
192 . 168 . 1 . 201 ✓

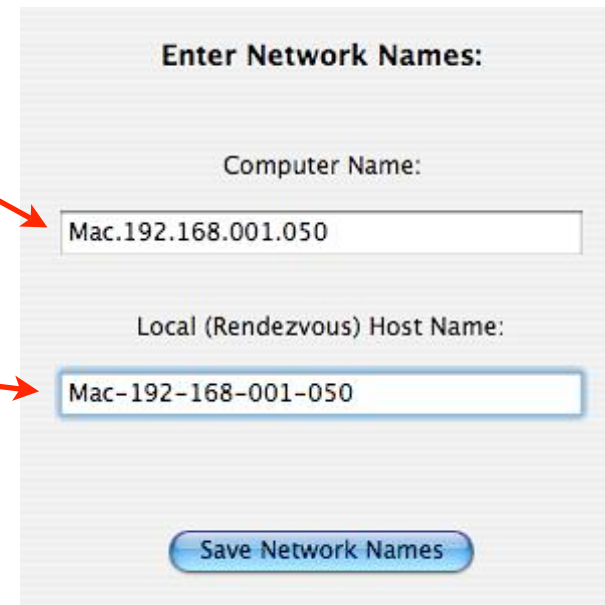
Third DNS Server:
192 . 168 . 1 . 202 ✓

Save DNS Settings



Demo Run: Network Names

- Specify the Computer (AppleTalk) Name
- Specify the Local (Rendezvous) Host Name
- Can use variable substitution in the autorun/defaults prefs



Enter Network Names:

Computer Name:
Mac.192.168.001.050

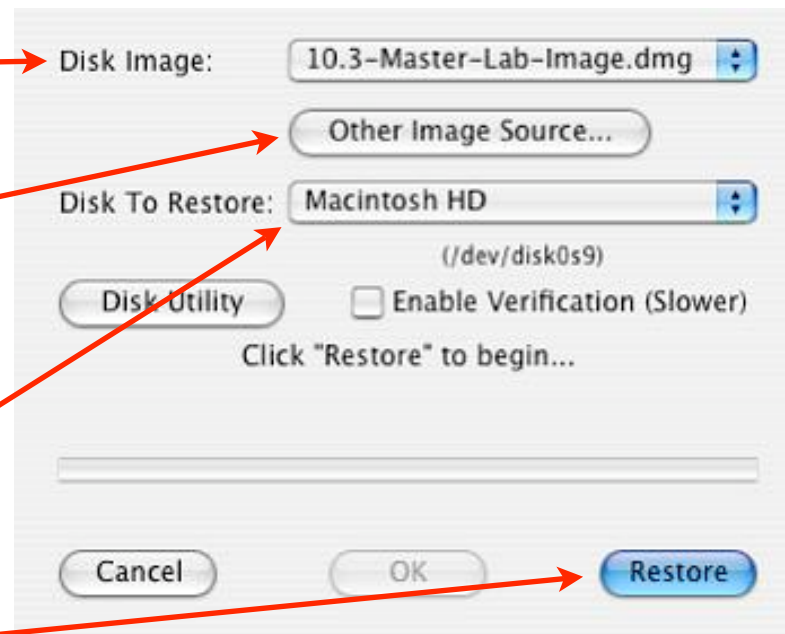
Local (Rendezvous) Host Name:
Mac-192-168-001-050

Save Network Names

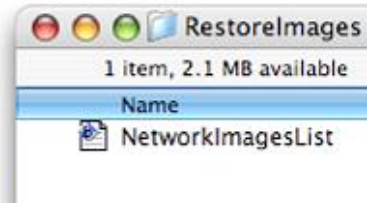


Demo Run: Restore the Disk

- Select Restore Image,
- Or specify Other Source,
- Select Disk to be Restored,
- Click Restore



Demo Run: Other Image Source



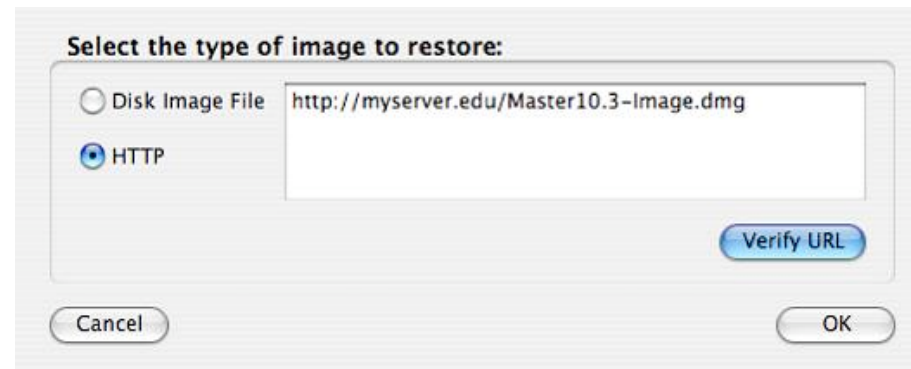
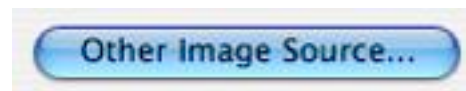
- Can specify network based images in the **NetworkImagesList** file

- File contains http: url's to images, ie:
**http://
myserver.edu/
Master10.3-
Image.dmg**



Demo Run: Other Image Source

- Via the **Other Image Source** button, can specify other file or network location for restore image



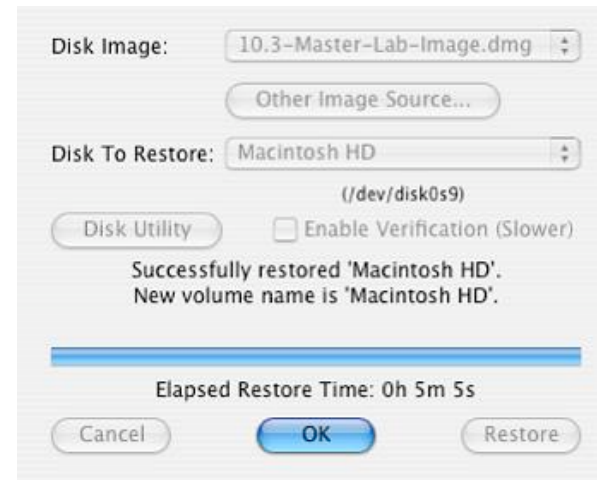
Demo Run: Other Image Source

- Local and other image sources added to the **Disk Image** popup menu:



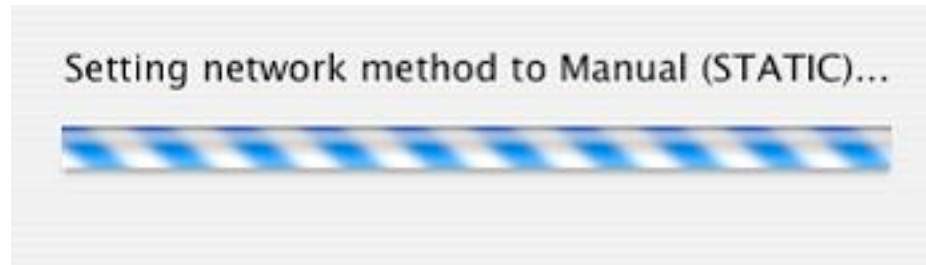
Demo Run: Restore Complete

- Restore status shows elapsed time and percentage done of the restore and verify
- AFTER restore, verifies restored volume file system and attempts to repair it if required
- Old and new volume name is reported at end of restore



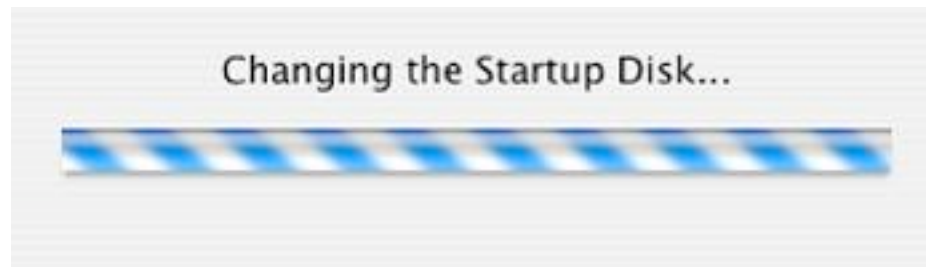
Demo Run: Apply Network Settings

- After restore is complete, the network settings on the restored disk are configured as specified before starting the restore (Don't Modify or DHCP or Static)



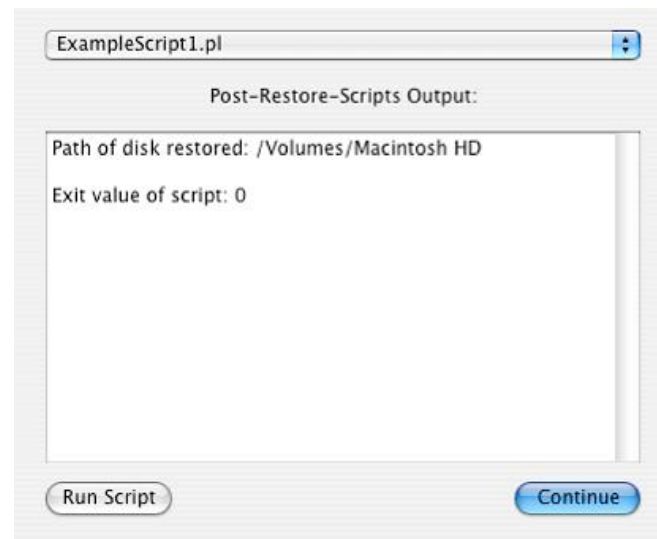
Demo Run: Set the Boot Disk...

- Via the bless command, sets the startup/boot disk to the restored disk
- Uses the newest version of the bootx file from the booted drive or the restored disk



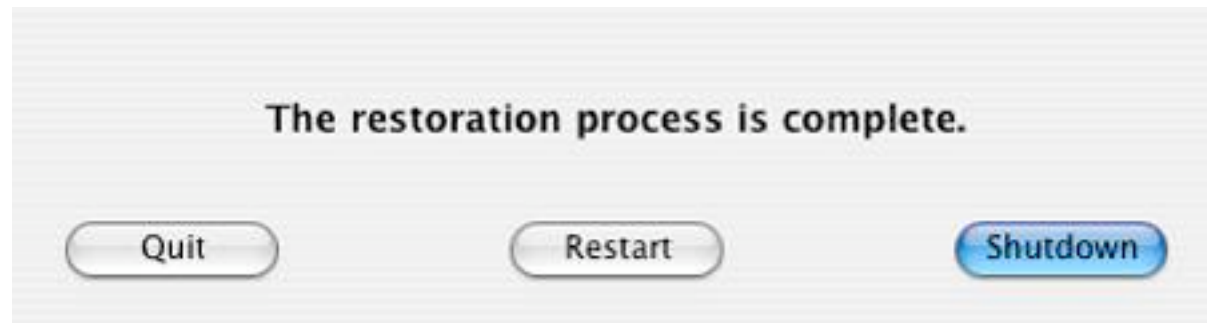
Demo Run: Post Restore Scripts

- Post restore scripts receive the path to the restored volume



Demo Run: Restore Complete

- Can Quit, Restart, or Shutdown when complete
- Can specify which button is the default with the autorun/Default preferences



Q&A



Default/Autorun Preferences

- If the `edu.psu.clc.blastimageconfig` file is installed in `~/Library/Preferences/`, BIC 2.0 will read it for the default and/or autorun settings
- Useful for quick and simple installs
- Can have default settings without autorunning turned on, but must have defaults set to autorun
- Useful for system admins to force the person doing the restore to use certain defaults



Default/Autorun Preferences

- Example keys and values in the `edu.psu.clc.blastimageconfig` file:

`AUTO_RUN=YES`

`PROMPT_TO_AUTORUN=YES`

`LOCK_OF_SETTINGS=YES`

`PRE_RESTORE_SCRIPT=testScript.pl`

`NETWORK_CONFIG=SET_IP`



Default/Autorun Preferences

- More keys and values:

DNS_SERVER1=192.168.1.200

COMPUTER_NAME=Mac.{\$IP}

DEFAULT_DISK_IMAGE=10.3-Master.dmg

ENDING_TASK=RESTART

- Many more not shown, more being added



Bootable DVD Autorun Restore

- BIC 2.0 can run from a bootable DVD created with bootCD from:

<http://www.charlessoft.com/>



- Must add additional command line tools and frameworks to support BIC 2.0 from a DVD Boot
- G5's : Find a 10.2.8 G5 System Install CD/DVD



Bootable DVD image creation

- On a Mac running 10.2.8:
 - Configure the network settings as you'd want them to be on the bootable DVD
 - Enable root user login
 - /Applications/Utilities/NetInfo Manager
 - Security menu, Authenticate,
 - Enable Root User, enter new password
 - Login as root



Bootable DVD image creation

- as Root, copy BIC 2.0 folder to /Applications
- as Root, Add the BIC 2.0 app as a startup item
- Add the **edu.psu.clc.blastimageconfig** autorun prefs to /var/root/Library/Preferences/
- Install ncutil from <http://deaddog.duch.udel.edu/ncutil-install.tgz>
- Download & launch BootCD from <http://www.charlessoft.com>



Bootable DVD image creation

- In the Boot CD Image Creator dialog, do this:



Bootable DVD image creation

- BootCD will run for a while creating the image...
- Click **OK** on the “Choose Applications” dialog,
- Click **Cancel** on the “Choose Applications to include on CD” (do NOT add BIC 2.0 now)
- BootCD will finalize the bootable DVD image - wait for the “Image Complete” dialog, click the **Great!** button
- Quit out of BootCD



Bootable DVD image creation

- Mount the bootable DVD image
- Via the Finder, copy the PSU BIC 2.0 folder to the “Applications” folder on the root of the mounted image
- Copy your master image to the **RestoreImages** folder in the PSU BIC 2.0 folder on the image



Bootable DVD image creation

- Open /Applications/Utilities/Terminal.app
- Run **psuPrepareBootDVD.pl** to copy the necessary command line tools and frameworks to the image to support BIC 2.0:

```
psuPrepareBootDVD.pl /Volumes/Bootable\ DVD
```



Bootable DVD image creation

- Unmount the image and burn it to a DVD-R with Disk Copy under 10.2 or Disk Utility under 10.3
- Boot a Mac with the DVD, watch BIC 2.0 autorun and restore
- Note: Sometimes the Mac's built-in hard disk doesn't mount when booted with a bootCD created DVD, use Disk Utility to erase it or mount it on the Desktop
- Everyone goes home happy.



Image Creation Tips and Tricks

- During testing, can restore a read-write image, but with “enable verification” un-checked (off)
- Compressed images will restore faster even with time spent on decompressing data
- If Disk Utility’s “Scan for Restore” doesn’t work, open terminal.app and try:

```
sudo asr -imagescan /path/to/Imagefile.dmg
```



PSU's Lab Deployment with BIC

- Staff dedicated to installing, building and moving lab computers
- Primarily use bus-powered, external FireWire Disks to build Macs
- Use bootable DVD's when need to build many Macs out of the box
- Images on the firewire disks are pretty large, updated every 2 months or so
- No DHCP on networks, static IP only (can't netboot across segments)



Download and Documentation



- Blast Image Config 2.0 main web page:

<http://clc.its.psu.edu/Labs/Mac/Resources/blastimageconfig/default.aspx>

- ncutil download:

<http://deaddog.duch.udel.edu/~frey/darwin/ncutil.php>



Q&A





Worldwide Sales Training & Communications

BIC at School of Visual Arts, Penn State



Daniel Ritter
Lab Supervisor
Penn State University
School of Visual Arts

BIC in the SVA

- In the Labs
 - Create Master Image, image labs, fast rollout
 - Digital Photo and Graphic Design Labs
- In the Field
 - Wide variation in Hardware and locations
- Pitfalls
 - Machine requirements, hardware issues
- My Process
 - Prepare image, user prep, clone, post clean



BIC In the Labs

- Identical machines / software loads
- Easy per-semester rollout
- Rapid recovery on-the-fly



BIC in the Field

- Mixed machines
- 'Base' image
- Per-user details



Pitfalls

- Machines lacking firewire support
- Blue-and-White G3s
- Manual imaging
- Root user; documentation
- Hardware failures



My Process

- Tools preparation
- User Preparation
- Blasting peeps
- Post-process
- User-specific details



Q&A

