

Automating the deployment of FreeBSD & PC-BSD® systems

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The problem:

You want to (quickly) deploy multiple
FreeBSD or PC-BSD systems.

You like what you hear about this whole
“ZFS” thing



There are currently two ways to accomplish this:



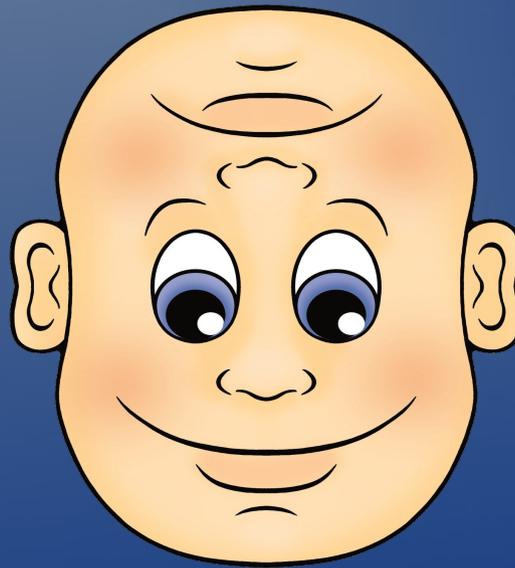
Solution #1

- Write your own installation scripts
- Configure network booting by hand
- Maintain as necessary



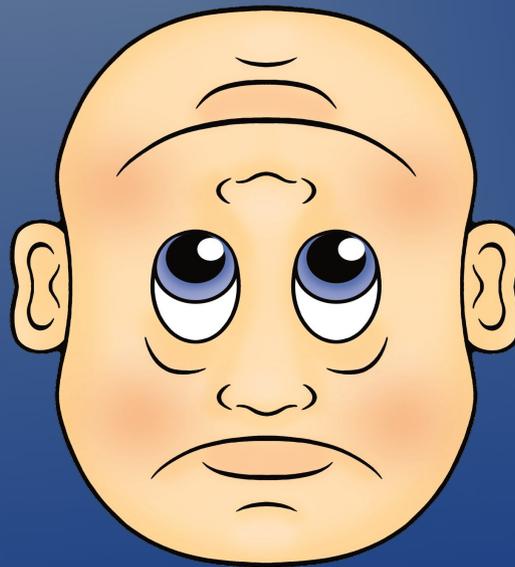
When to consider Solution #1:

- You have a very unique installation
- You are a FreeBSD God – Congrats!



When to not consider Solution #1:

- Manual disk partitioning isn't your thing
- You work for a living



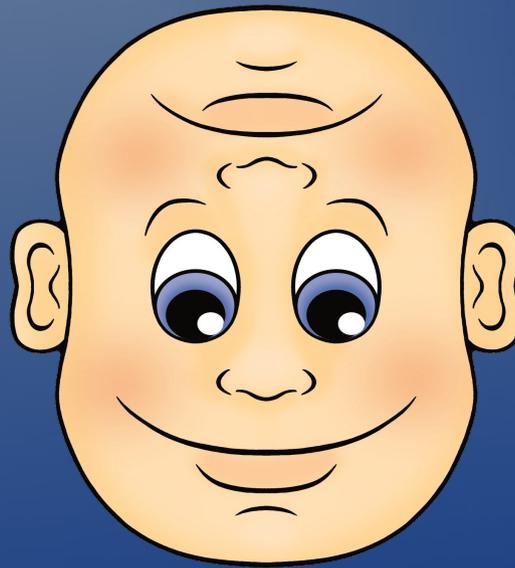
Solution #2

- Use the **pc-thinclient** utility included with PC-BSD & TrueOS



When to consider Solution #2:

- You don't enjoy disk partitioning
- You want to have a weekend



What you will need:

- A system with a network interface (2)?
- Running PC-BSD 9.1 / TrueOS 9.1
- A few GB of disk space



Getting Started

- First, checkout a FreeBSD ports tree

On TrueOS

```
# portsnap fetch extract update
```



On PC-BSD

Control panel → System Manager → Tasks
→ Fetch Ports



Getting Started

```
root@trueos:/root # pc-thinclient
```



Getting Started

```
/usr/local/bin/pc-thinclient will install the components to convert  
this system into a thin-client server.  
Continue? (Y/N) █
```



Getting Started

```
Do you wish to make this a remote X desktop server or install server?  
(r/i) █
```

- Install server
- Or desktop “Thin-Client” server



Short Detour



What is Remote Desktop?

- The thin-client utility can operate both install server or desktop server
- Allows diskless clients to boot via PXE
- Brings up GDM login on client



Why would you run Remote Desktop?

- You have a bunch of low-end clients
- You want to simplify backup, security and management



Why should you not run Remote Desktop?

- You don't have a server with horsepower
- You need sound support on the clients



Back to your previously scheduled presentation



Getting Started

```
What NIC do you wish DHCPD to listen on? (I.E. re0)
nic) em0
```

- Will run DHCPD
- Be careful which cable is used



Getting Started

```
Starting /etc/rc.d/nfsd...OK  
Starting /etc/rc.d/inetd...OK  
Starting /usr/local/etc/rc.d/isc-dhcpd...OK
```

To perform system installations, place your custom pc-sysinstall scripts in:

```
/usr/home/thinclient/installscripts
```

An example script is provided in the above directory

For unattended installations, save your pc-sysinstall script as:

```
/usr/home/thinclient/installscripts/unattended.cfg
```

Your system is now setup to do PXE booting!



Getting started

- You may now connect a client system
- To PXE boot, you may need to check BIOS on client first



Its Demo time!



Customizing the install

- Of course you will want your own installation options / archives, etc
- It is possible to adjust entirely on server side



The two key directories:

- /home/thinclient/installscripts
- /home/thinclient/installarchive

Client mounted as:

- /installscripts
- /installarchive



- `pc-sysinstall.example` can be used as a template for other installations

Example #1

Changing to ZFS



Example disk layout:

```
disk0-part=UFS+SUJ 1000 /  
disk0-part=SWAP 2000 none  
disk0-part=UFS+SUJ 0 /usr  
commitDiskLabel
```

Converted to ZFS becomes:

```
disk0-part=ZFS 0 /,/root,/tmp,/usr,/var  
commitDiskLabel
```



Example #2

Changing installation archive



Example install archive:

```
installMedium=local  
localPath=/installarchive  
packageType=tar  
installFile=fbsd-release.txz
```

Changed to custom archive:

```
installMedium=local  
localPath=/installarchive  
packageType=tar  
installFile=fbsd-8.4-amd64.txz
```



Example #3

User Management



```
# Root Password  
rootPass=root
```

```
# User Setup  
userName=kris  
userComment=Kris Moore  
userPass=kris  
userShell=/bin/csh  
userHome=/home/kris  
userGroups=wheel,operator  
commitUser
```



Example #4

Advanced Commands



Run command inside installed system

```
runCommand=sh /root/initme.sh
```

Run command outside installed system

```
runExtCommand=mount -t devfs devfs ${FSMNT}/dev
```



Example #5

Packages, oh my!



```
installPackages=apache22 mysql55-server
```

Can use short package names, or full versions.



PKGNG support

- Checks package format before install
- Will “boot-strap” PKGNG if necessary



Example #6

FreeBSD dist files



```
# Install from vanilla FreeBSD dist files
```

```
installMedium=local
```

```
localPath=/distfiles/9.1-Release/amd64/dist
```

```
packageType=dist
```

```
distFiles=base doc games kernel lib32
```



Putting the Automated in “Fully Automated”

File: /home/thinclient/installscripts/unattended.cfg

- If config exists, the client will boot and begin installation after 30 seconds.
- System will shutdown when finished
- **USE WITH CAUTION!!**



Scalability

- All CPU instructions are run on the client
- Server is in essence a large “File Server”
- Will be mostly disk IO / network speed dependent



Scalability

- Default DHCP server is configured for 99 clients
- To adjust edit the file:
 - `/usr/local/etc/dhcpd.conf`
 - `range 192.168.2.100 192.168.2.199;`



Tips and Tricks

- The PC-BSD GUI installer is your friend
- Every install is a scripted install
- After installation a copy of the pc-sysinstall.cfg file is saved to:
 - /root/pc-sysinstallcfg



Tips and Tricks

- To greatly speed up installations, use ZFS mirrored drives, SSD, or even TMPFS



What's next?

- Improvements to pc-sysinstall
- Faster setup of initial thin-client environment



Questions? Comments?

wiki.pcbbsd.org
lists.pcbbsd.org
forums.pcbbsd.org



Thank you!

www.slideshare.net/krispcbsd/bsdcan2013

