

PC-SysInstall

A new system installer backend for PC-BSD &
FreeBSD

Kris Moore

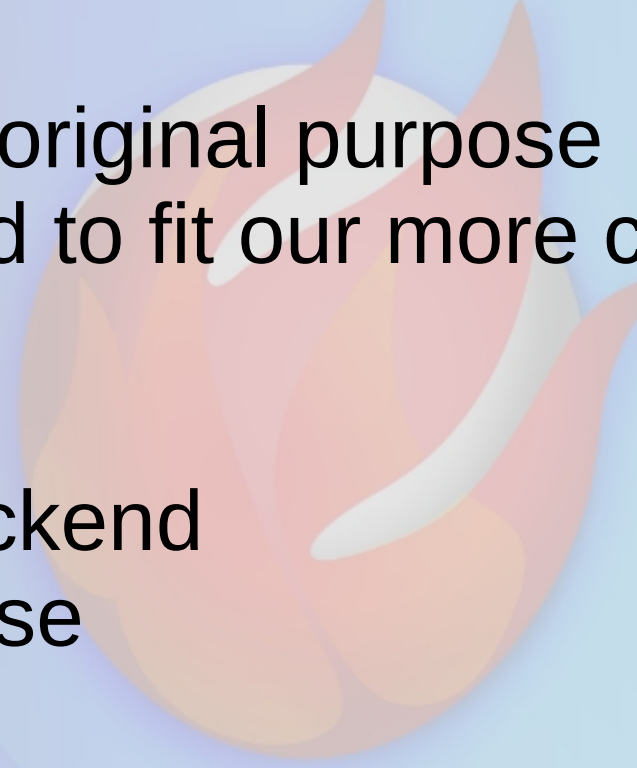
kris@pcbsd.org

PC-BSD Software / iXsystems

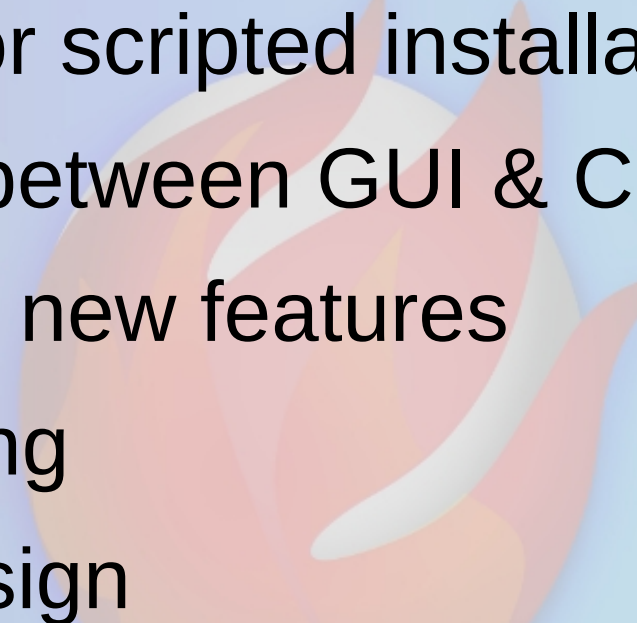


Why another Installer?!?!?

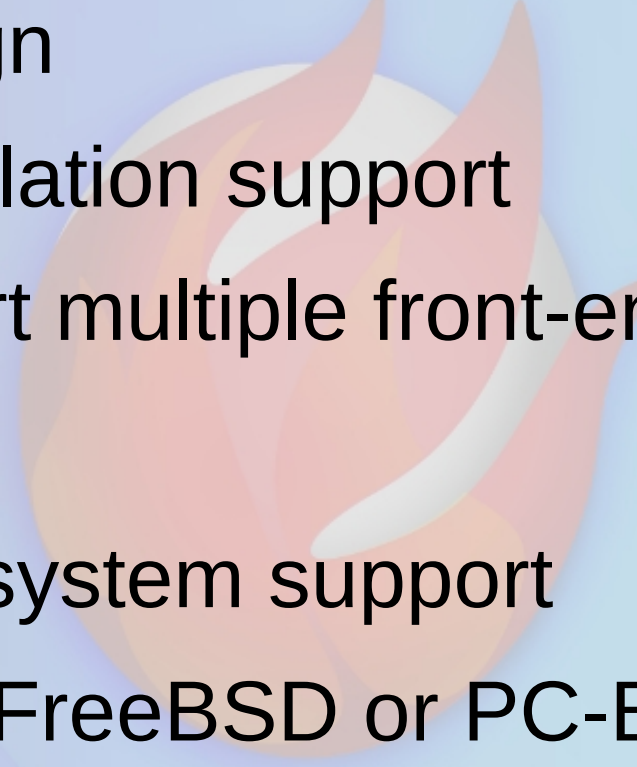
Available BSD install options

- SysInstall
 - Great for its original purpose
 - Not designed to fit our more complex needs
 - Bsdinstaller
 - Lua based backend
 - Used in pfSense
 - Fininstall
 - Python based backend
 - SoC project
- 

Legacy PC-BSD Installer

- No backend for scripted installations
 - Twisted logic between GUI & CLI backend
 - Difficult to add new features
 - No error logging
 - Monolithic Design
- 

Features Needed in New Installer

- Modular Design
 - Scripted Installation support
 - Able to support multiple front-ends
 - Error logging
 - Improved file-system support
 - Able to install FreeBSD or PC-BSD
 - Full localization options - xorg & console
- 

Design Choices for PC-SysInstall

Most installers fall into one of two types:

Back-seat drivers

- or -

Sleeping Dogs

Design Choices for PC-SysInstall

- Hybrid Program Flow
 - Allows front-end developers to make flow choices
 - Allows using backend manually
- Written in Shell
 - Using standard `/bin/sh`
 - No non-standard base system tools (minus rsync)
 - Fast, easy to debug “on the fly”
 - Can interface with variety of front-ends

New Features of PC-SysInstall

- Can install PC-BSD or Traditional FreeBSD
- Support for enabling gmirror across two drives
- Able to use variety of FS's
 - UFS, UFS w/softupdate, UFS w/gjournal, ZFS
- Geli-based partition encryption
- Automatic file-system labeling with glabel
- Installation logging
- Install via disk / network & custom images

Using PC-SysInstall

- Located in /PCBSD/pc-sysinstall on install disk
- Single command “./pc-sysinstall” provides all functionality, from queries to actual installation
- pc-sysinstall called using various commands / flags to perform specific functions

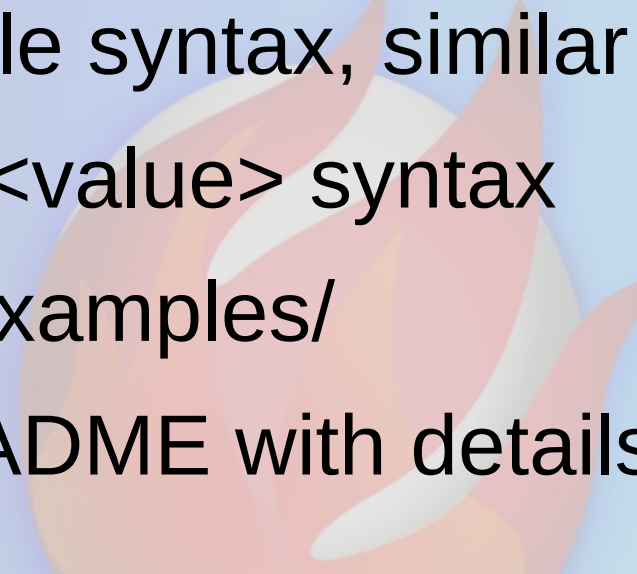
Query Commands

- `disk-list` – Listing of installable drives
- `disk-part` – Listing of partitions on specific drive, including free space, block listing, label
- `list-tzones` – Timezone listing
- `xkeyboard-layouts` – Available xorg keyboard layout options for i18n

Action Commands

- create-part – Add new MBR partition/slice
- delete-part – Remove a partition / slice
- -c <cfg> - Start installation with specified config
- start-autoinstall <autocfg> - Use with automated installations, remote http/ftp config file fetching

Install file configuration

- Install config file syntax, similar to sysinstall
 - Using `<key>=<value>` syntax
 - Examples in `examples/`
 - `examples/README` with details on all variables
/ code blocks
- 

Examination of configuration

installMode=fresh

hostname=pcbsd-8

installType=FreeBSD

installMedium=dvd

packageType=tar

installComponents=ports,src



Examination of configuration

disk0=ad0

partition=all # (all, free, s1, s2, s3, s4)

mirror=ad1

mirrorbal=split # (prefer, round-robin, balance)

bootManager=bsd # (bsd/none)

CommitDiskPart

disk0-part=UFS+S 500 / # (UFS, UFS+S, UFS+J, ZFS, SWAP & “.eli”)

disk0-part=SWAP 2000 none

disk0-part=UFS 0 /usr

commitDiskLabel

Examination of configuration

disk0=ad0

partition=all # (all, free, s1, s2, s3, s4)

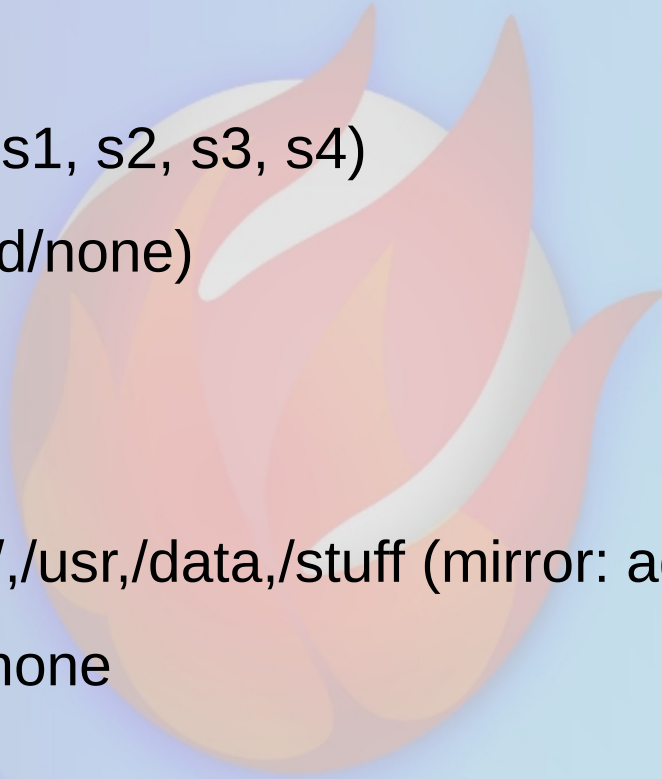
bootManager=bsd # (bsd/none)

CommitDiskPart

disk0-part=ZFS 800000 /,/usr,/data,/stuff (mirror: ad1)

disk0-part=SWAP 2000 none

commitDiskLabel



Examination of configuration

disk0=ad0

partition=all # (all, free, s1, s2, s3, s4)

bootManager=bsd # (bsd/none)

CommitDiskPart

disk0-part=UFS 500 /boot

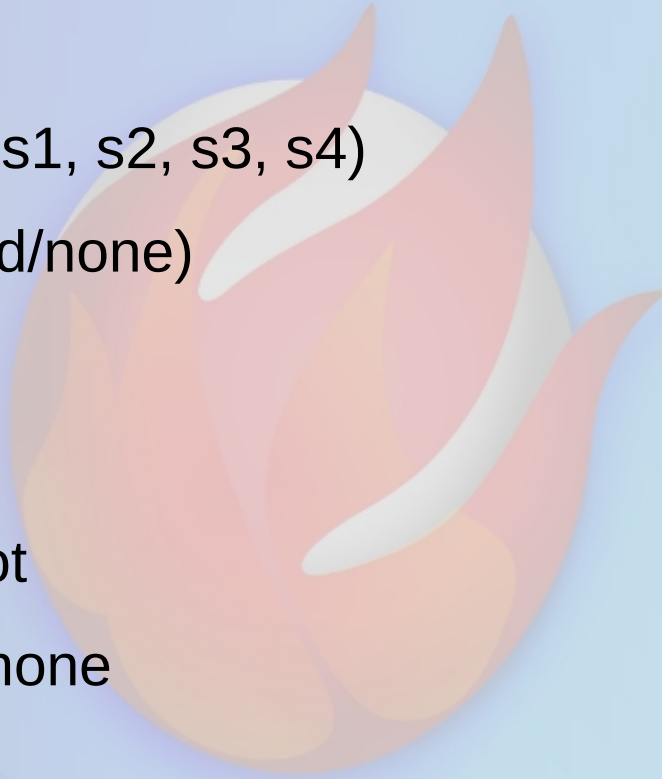
disk0-part=SWAP 2000 none

disk0-part=UFS.eli 500 /

disk0-part=UFS.eli 500 /usr

encpass=my passphrase

commitDiskLabel



Examination of configuration

netDev=AUTO-DHCP

OR

netDev=nfe0

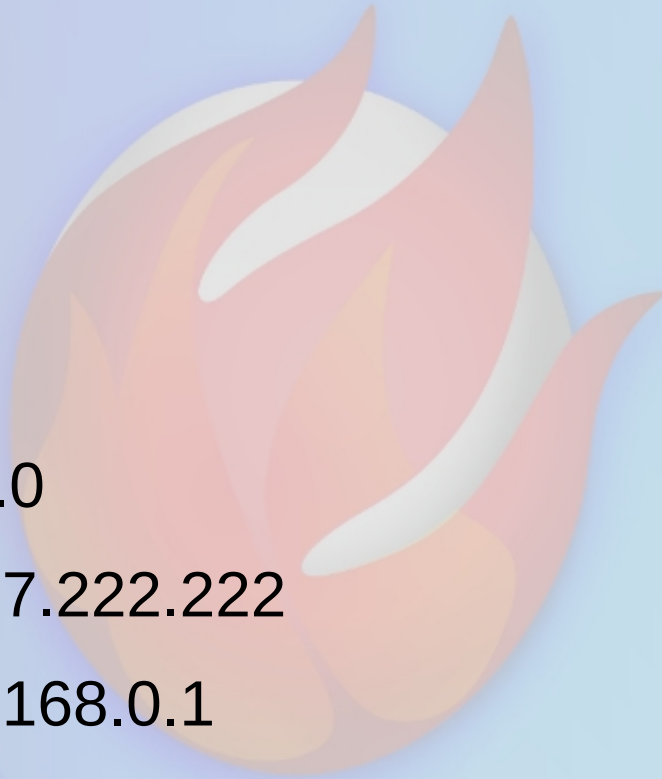
netIP=192.168.0.49

netMask=255.255.255.0

netNameServer=208.67.222.222

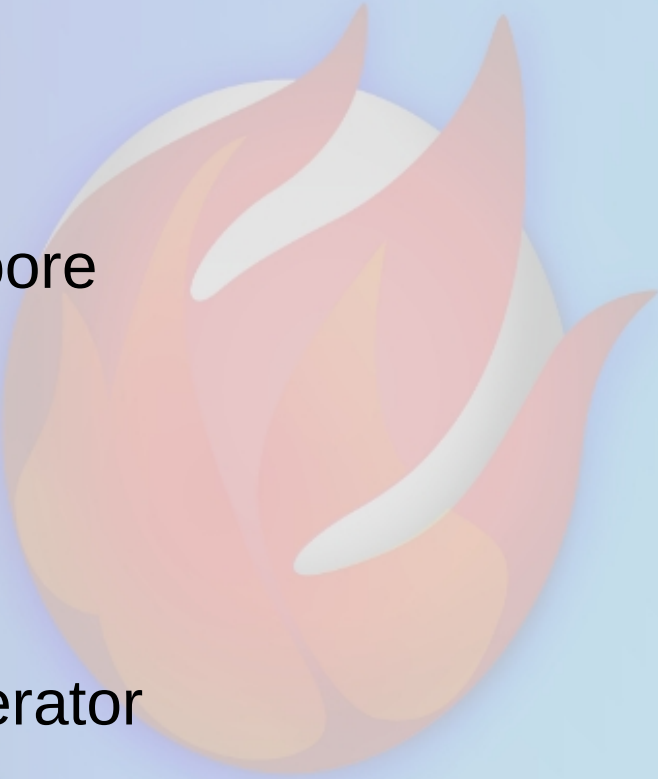
netDefaultRouter=192.168.0.1

netSaveDev=AUTO-DHCP



Examination of configuration

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



Examination of configuration

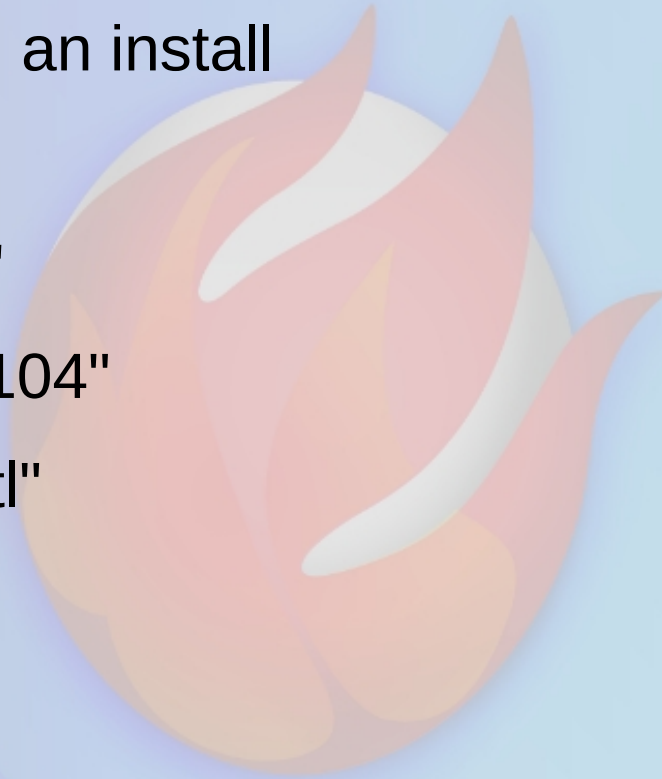
Options for localizing an install

localizeLang="jp"

localizeKeyLayout="jp"

localizeKeyModel="pc104"

localizeKeyVariant="intl"

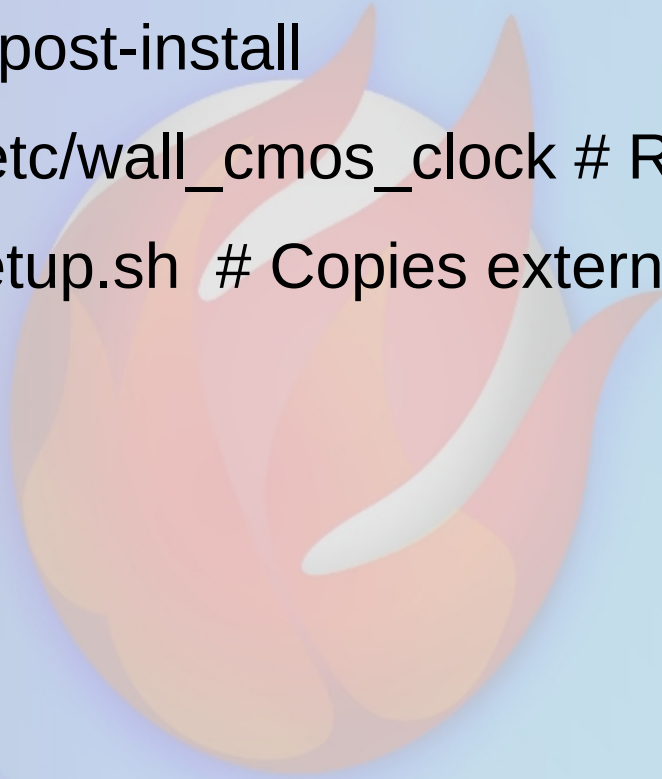


Examination of configuration

Run any commands post-install

runCommand=touch /etc/wall_cmos_clock # Runs inside mount

runScript=/root/post-setup.sh # Copies external script into mount



pc-autoinstall.conf

Starts installation with remote configuration:

pc_config: <http://192.168.0.2/cust-install.cfg>

nic_config: dhcp-all

shutdown_cmd: shutdown -p now

More in [examples/pc-autoinstall.conf](#)

Putting it all together



Putting it all together

The screenshot shows the PC-BSD SysInstaller Summary screen. The window title is "SysInstaller". In the top left, there is the PC-BSD logo with the tagline "Personal Computing, served up BSD style!". In the top right, the word "Summary" is displayed. On the left side, there is a vertical navigation menu with buttons for "Language", "Keyboard", "System", "Disk", "Users", "Time", "Components", "Summary" (which is highlighted in red), "Installation", and "Finished". The main content area is titled "Pre-Install Summary" and contains a sub-window titled "Installation Summary". This sub-window lists the following options:

- The system will be installed with the following options:**
 - Performing a fresh install of PC-BSD
 - Installing From: DVD/USB
- The disk will be setup with the following configuration:**
 - Partition: ad0(ALL):
 - FileSystem: UFS+S
 - Size: 2048MB
 - Mount: /
 - Partition: ad0(ALL):
 - FileSystem: SWAP
 - Size: 1534MB
 - Partition: ad0(ALL):
 - FileSystem: UFS+S
 - Size: 1024MB

Below the sub-window, a message reads: "Please check the summary above, and click 'back' to make any corrections." At the bottom of the window, there are three buttons: "Abort", "Back", and "Next".

Putting it all together

The image shows a terminal window titled "xterm" with the prompt "pcbsd# vi /tmp/sys-install.cfg". The terminal content is mostly blank, indicating a text editor in use. To the right, a portion of the FreeBSD installer is visible, showing the "Installation" section. Below the terminal, a summary table for the partition is displayed.

Time	
Components	
	Partition: ad0(ALL): FileSystem: UFS+S Size: 2048MB Mount: /

Putting it all together

```
xterm
# Auto-Generated pc-sysinstall configuration
installInteractive=no
installMode=fresh
installType=PCBSD
packageType=uzip

# Doing PC-BSD Install make sure to start xorg-gui at first boot
runCommand=cp /usr/PCBSD/xorg-gui/conf/ttys.xsetup /etc/ttys
runCommand=sh /usr/PCBSD/Scripts/reset-firewall
installMedium=dvd
netSaveDev=AUTO-DHCP

# Timezone
timeZone=America/New_York
enableNTP=yes

# Keyboard Layout Options
localizeKeyModel=pc104
localizeKeyLayout=us

# Disk Setup for ad0
disk0=ad0
partition=ALL
bootManager=none
commitDiskPart

# Partition Setup for ad0(ALL)
# All sizes are expressed in MB
# Avail FS Types, UFS, UFS+S, UFS+J, ZFS, SWAP
# UFS,eli, UFS+S,eli, UFS+J,eli, ZFS,eli, SWAP,eli
disk0-part=UFS+S 2048 /
disk0-part=SWAP 1534 none
disk0-part=UFS+S 1024 /var
disk0-part=UFS+S 15869 /usr
commitDiskLabel
```

Putting it all together

The screenshot shows the PC-BSD SysInstaller Summary screen. The window title is "SysInstaller". In the top left, there is the PC-BSD logo with the tagline "Personal Computing, served up BSD style!". In the top right, the word "Summary" is displayed. On the left side, there is a vertical navigation menu with buttons for "Language", "Keyboard", "System", "Disk", "Users", "Time", "Components", "Summary" (which is highlighted in red), "Installation", and "Finished".

The main content area is titled "Installation Summary" and contains the following text:

The system will be installed with the following options:
Performing a fresh install of PC-BSD
Installing

The disk configuration:

Partition: ad0(ALL):
FileSystem: SWAP
Size: 1534MB

Partition: ad0(ALL):
FileSystem: UFS+S
Size: 1024MB

Below the summary, it says: "Please check the summary above, and click 'back' to make any corrections."

Overlaid on the summary is a dialog box titled "PC-BSD Installer" with a question mark icon. The dialog asks "Start the installation now?" and has two buttons: "Yes" and "No".

At the bottom of the SysInstaller window, there are three buttons: "Abort", "Back", and "Next".

Future Additions

- Bugfixes & more Bugfixes
- Support for encryption pass-phrases - DONE
- Multiple zfs mounts per-pool / raidz - DONE
- Switch to using gpart / GPT - DONE
- More FreeBSD specific options, SSH, Network, distributions, etc.

Questions?

