

The Power of Radmind & Xhooks

James Reynolds

The University of Utah

Student Computing Labs, Mac Group

About me



- ✦ Started in 1999
 - ✦ Mac OS 9, RevRdist, Assimilator, TB2
- ✦ Started deploying Mac OS X 10.1 early 2002
- ✦ Been using Radmind since middle/late 2002
- ✦ Wrote ULabMin, Entman, now called Xhooks
- ✦ I make iPhone apps, musician, draw, make Lego animations, etc.,.

About this session

- ✦ Radmind
 - ✦ History
 - ✦ Current users
 - ✦ Future
- ✦ Student Computing Labs
 - ✦ How we do it (staging, syncing, Xhooks)
- ✦ This is not a Radmind introduction

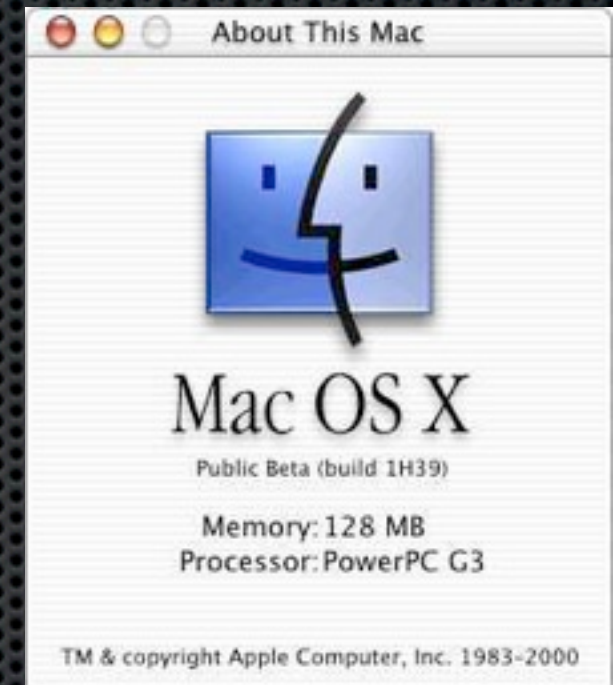
About Radmind

- ✦ Written by these guys
- ✦ Unix tools that scans the hard disk
- ✦ A server daemon



The past

- ✦ September 13, 2000 - Mac OS X PB
- ✦ March 24, 2001 - Mac OS X 10.0
 - ✦ No method to deploy (except CD and sneakernet)
- ✦ September 25, 2001 - Mac OS X 10.1 released
 - ✦ Still no network method to deploy



The first deployment method

- ✧ February 2002:



- ✧ MacOSXLabs.org (MacEnterprise today) made public
- ✧ ASR posted on password protected website
 - ✧ Unsupported
 - ✧ Required booting to Mac OS 9



More deployment options

- ✧ May 6-10, 2002 WWDC
 - ✧ Mac OS 9 funeral
 - ✧ Higher Education Lab Administrator BOF
 - ✧ Radmind demoed
 - ✧ NetBoot and ASR demoed
 - ✧ RsyncX demoed



Middle of 2002

- ✦ Mac OS X 10.1.2 default on new Macs
- ✦ Radmin, RsyncX, NetBoot, ASR
- ✦ iTunes 2
- ✦ 2nd Gen iPod (5, 10, 20 GB)
- ✦ PowerMac G4/1.0 Dual Processor (Quicksilver), iMac G4/700 15-inch (lampshade), iBook G3/700 14-inch, PowerBook G4/800 (DVI-Titanium), eMac G4/700



Since then

- ✦ Radmind was adopted at many places
- ✦ Now other tools are available and many have big followings
- ✦ Is Radmind still relevant?...

Who uses Radmind today?

- ✦ 550 student Macs - The Australian National University
- ✦ 500+ Macs - Stanford
- ✦ 50+ Ubuntu desktops - Institut für Nachrichtentechnik
- ✦ 328 Xserves & 30+ Mac workstations - GeoCenter
- ✦ 200 Mac workstations/laptops - The William Paterson University
- ✦ 200 Mac/Linux workstations - University of New Hampshire

Who uses Radmind today?

- ✦ 30+ Macs workstations and 328 Xserves - GeoCenter
- ✦ 475 Mac workstations - UC San Deigo
- ✦ ~380 Linux/Unix workstations & servers - Carnegie Mellon University
- ✦ ~230 Macs - UC Davis
- ✦ 150 lab Macs - Purdue
- ✦ 700+ - Bowling Green State University

Who uses Radmind today?

- ✦ 40+ student Macs - Goldsmiths University of London
- ✦ ~100 lab Macs - University of Minnesota
- ✦ 42 Macs - College of Design, Iowa State University
- ✦ 150 Mac workstations - Goshen College ITS
- ✦ 1100+ student/staff Macs workstations/laptops/kiosks
- The University of Utah (SCL and College of Fine Arts)
- ✦ 1300+ Macs - The University of Michigan

Who uses Radmind today?

- ✦ 100+ systems at Goldsmith, University of London
- ✦ 350 Mac workstations - Columbia College Chicago
- ✦ 200 Macs - University of Vermont
- ✦ 200 Macs - University of Wisconsin at River Falls
- ✦ 200 Macs - The Moving Picture Company
- ✦ 1250 Mac student/staff workstations/laptops - St Louis Park Schools (3 servers and small IT staff)

Who uses Radmind today?

- ✦ 600+ Macs - Penn State University
- ✦ 350 Macs - Boston University
- ✦ 475 Mac workstations - UC San Deigo
- ✦ 2000 Macs - New Lenox School District 122
- ✦ ~200 Mac workstations and Unix kiosks - Columbia University in the City of New York
- ✦ The University of Illinois at Urbana-Champaign

Columbia
COLLEGE CHICAGO

PENNSTATE
1855

NEW LENOX
SCHOOL DISTRICT 122

MPC



STANFORD
UNIVERSITY



GeoCenter



Goldsmiths
UNIVERSITY OF LONDON



UC DAVIS
UNIVERSITY OF CALIFORNIA

Carnegie Mellon



WILLIAM
PATERSON
UNIVERSITY

UNIVERSITY OF
WISCONSIN

River Falls

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

PURDUE
UNIVERSITY



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



BGSU
Bowling Green State University



Who uses Radmind today?

- ✦ I know there are people who didn't speak up
- ✦ Of those who spoke up (24 locations)
 - ✦ 10,000+ Machines
 - ✦ Macs/Linux/Unix
 - ✦ Student/staff workstations/laptops or servers/kiosks
 - ✦ Mostly schools, 2 businesses

Who uses Radmind today?

- ✧ Of those who spoke up
 - ✧ Small IT staff
 - ✧ Requires some skill and time to set up
 - ✧ Little time spent maintaining it
 - ✧ Few Radmind servers (1-3)
 - ✧ Uniform
 - ✧ Flexible
 - ✧ Some say nothing else can do what Radmind can

Why do people use it?

- ✦ Assurance that things are what you want (tripwire)
- ✦ Overloading allows Lego-like images
- ✦ Radmind can be molded to fit a deployment need
 - ✦ Scanning and applying tasks are split between tools
 - ✦ Allows interjection and Lego-like building
 - ✦ The tools deal only with text
 - ✦ Data is easy to inspect and modify with scripts
 - ✦ How do you diff .pkg's or MCX?

Why don't people like it?

- ✦ It was the only solution for a few years
 - ✦ People tried to use it for things it wasn't suited for
 - ✦ The style clashed with some (e.g. Apple)
 - ✦ Admin newbies had to learn too much (exceptions)
- ✦ Disappointed it wasn't more than it is
 - ✦ The GUI didn't keep up with the tools
 - ✦ It had potential to be the one tool that ruled them all

Why don't people like it?

- ✦ It's only a skeleton and requires scripting
- ✦ It's flexibility breeds massive complexity
 - ✦ Can be set up very wrong
 - ✦ Requires an intimate knowledge of the OS and apps
- ✦ Unsure of its future
 - ✦ Little is said about it now
 - ✦ Went from 4 developers to 1 over worked developer

Future of Radmind

- ✧ Radmind is not a free product
 - ✧ Paid for by University of Michigan *customers*
 - ✧ It does what UMich wants
 - ✧ Given away freely, but certainly not an altruistic project made for the "greater good"
- ✧ A windows version is almost alpha (community project)
- ✧ A great community
- ✧ But...

Future of Radmind

- ✧ Wesley Craig and Andrew Mortensen consulting firm
 - ✧ Radmind will be fully-supported software
 - ✧ Dedicated development resources
 - ✧ Radmind will remain open source software
 - ✧ Will continue to accept patches, review bugs and participate in discussions on the mailing lists
- ✧ info@greenbrainconsulting.com

Looking deeper into the future...

- ✦ "PCs are going to be like trucks. Less people will need them." - Steve Jobs
- ✦ Is Apple going to turn desktops into iOS-like appliances?
 - ✦ Restore or Replace
 - ✦ Wont run scripts



Photo by Matthew Visinsky

We will always need trucks

- ✦ Xcode, Logic, Final Cut Studio, Adobe Creative Suite, Maya, AutoCAD, Office, etc.
- ✦ But are we going to manage them the same way as today?



Scale and upgrade

- ✦ Upgrading is easy if you don't have much variety
- ✦ Adding machines is easy if you don't have much variety
- ✦ Radmind manages everything
 - ✦ How do you allow variety, scale it, and upgrade it?
- ✦ The rest of this presentation will show how I've used Radmind so I can scale and upgrade effectively over 100 different machine configurations

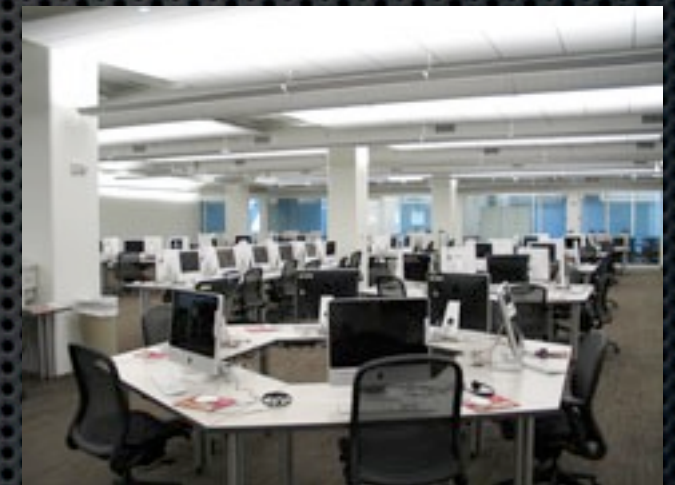
Case Study - SCL

- ✦ Student Computing Labs,
Marriott Library,
The University of Utah
- ✦ 5 full time, 5 part time staff
 - ✦ Many "side" projects
- ✦ 2 Radmind servers



650 Macs

- ✦ Open area student/public workstations
 - ✦ Specialized digital video stations
 - ✦ Scanner stations
 - ✦ Wacom tablet stations
 - ✦ Developer Tools everywhere
- ✦ Classrooms
 - ✦ Maya, etc



650 Macs

- ✦ Staff desktops/laptops (even me! finally)
- ✦ Checkout laptops
- ✦ Kiosks
 - ✦ Proxied library catalog search
 - ✦ Internet kiosks requiring login
- ✦ Special purpose machines (Xgrid, QT Broadcasters)



About Radmind

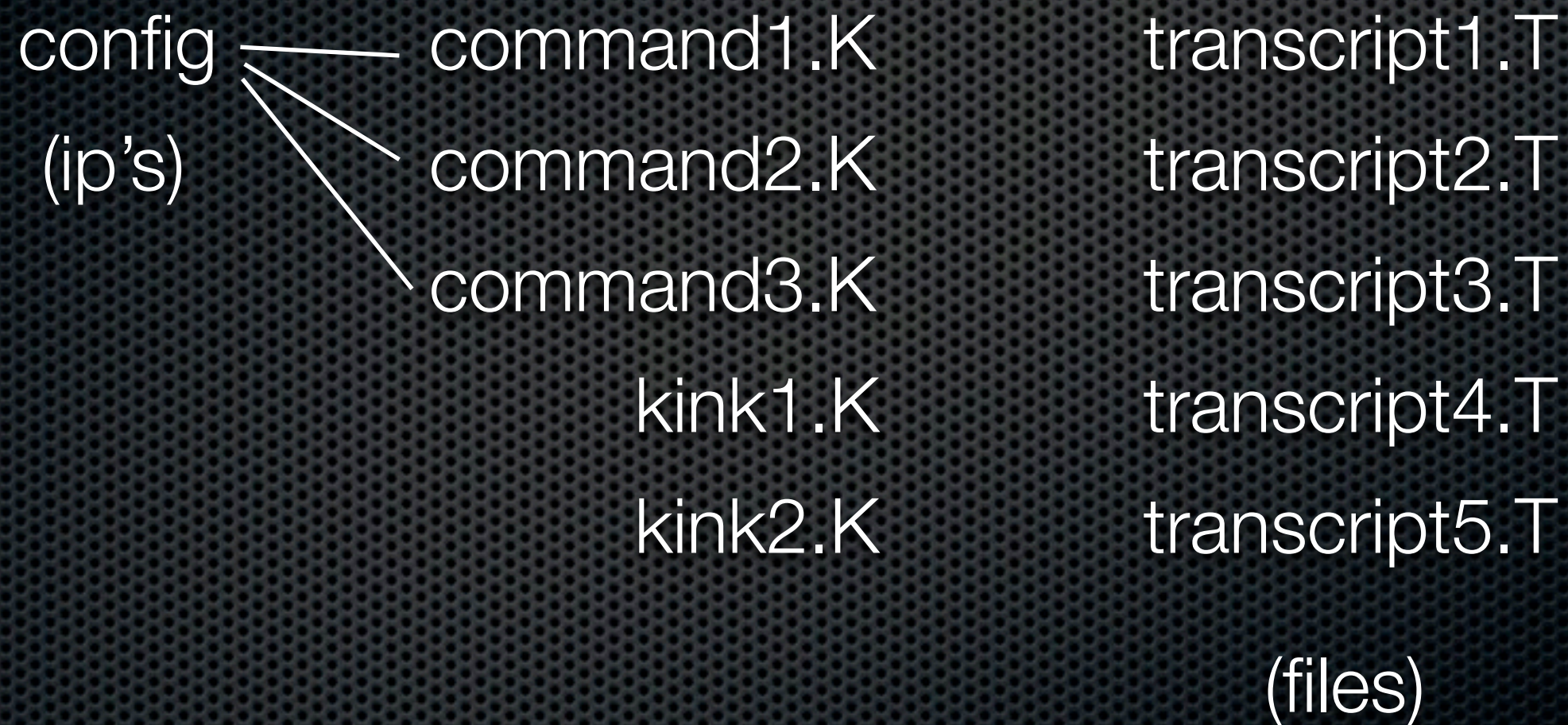
config
(ip's)

command1.K
command2.K
command3.K
kink1.K
kink2.K

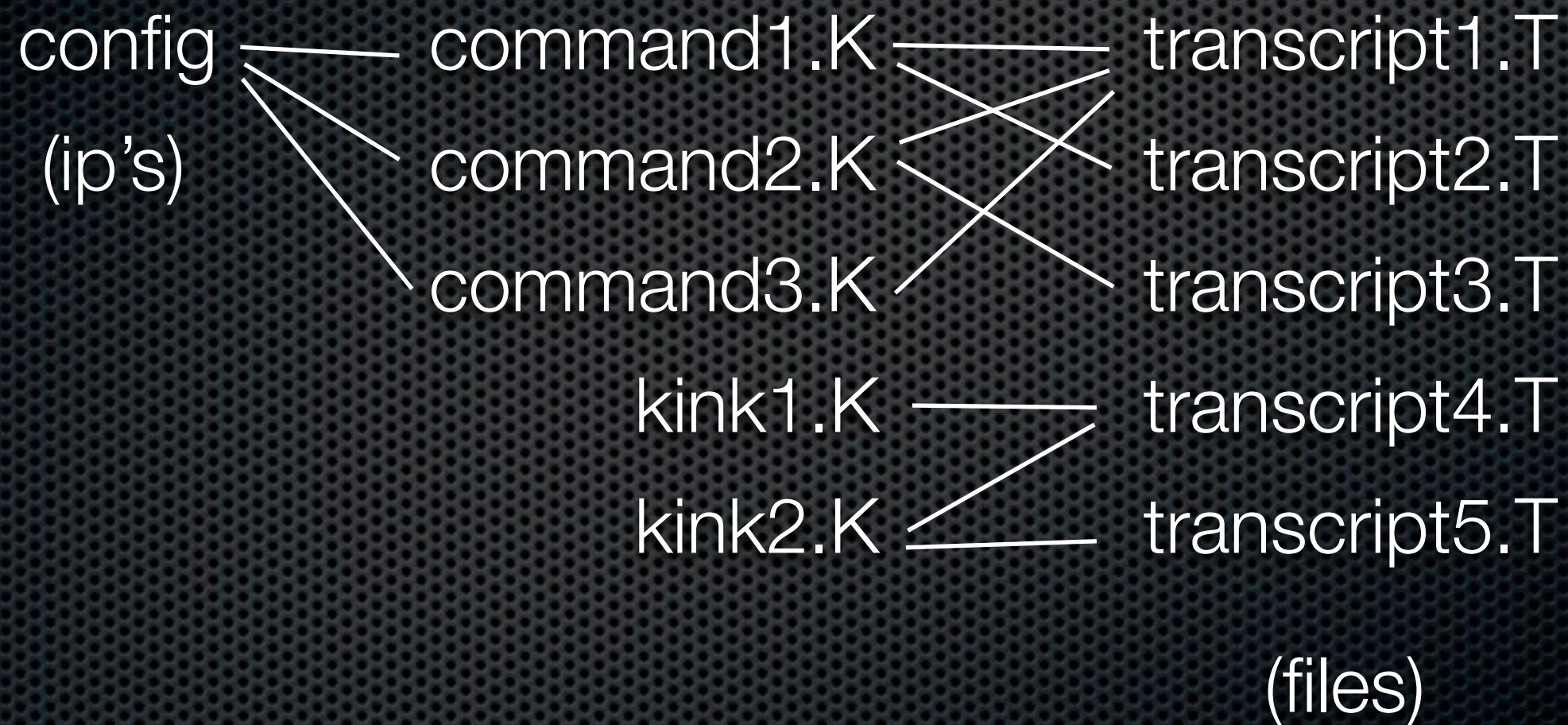
transcript1.T
transcript2.T
transcript3.T
transcript4.T
transcript5.T

(files)

About Radmind



About Radmind



About Radmind

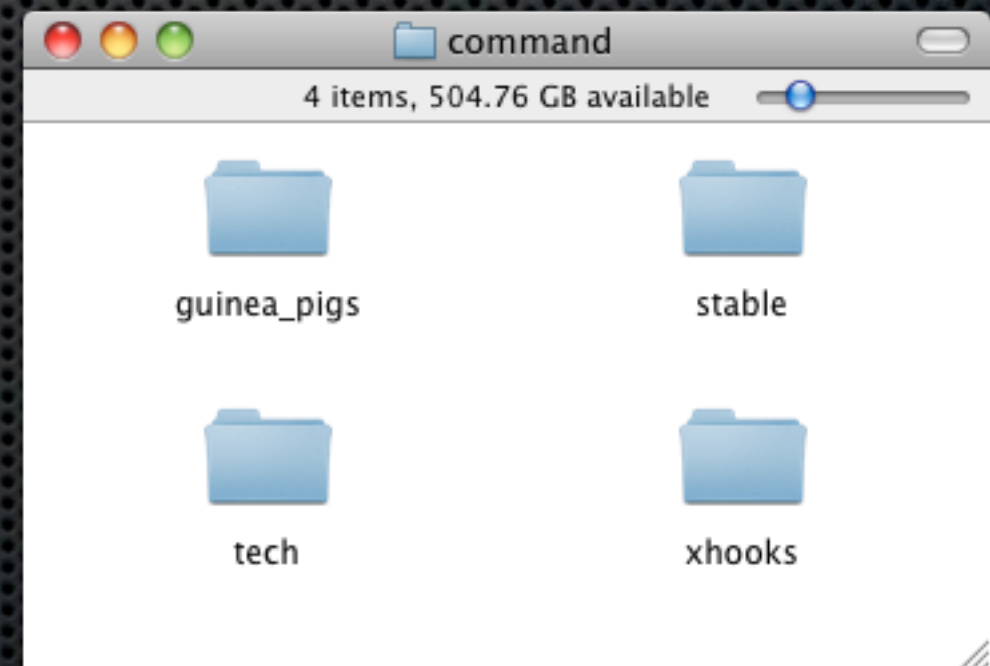


About Radmind



Radmind organization

- ✧ This is how we set it up
- ✧ 3 command file branches
 - ✧ "stable"
 - ✧ "guinea_pigs"
 - ✧ "tech"



Branches

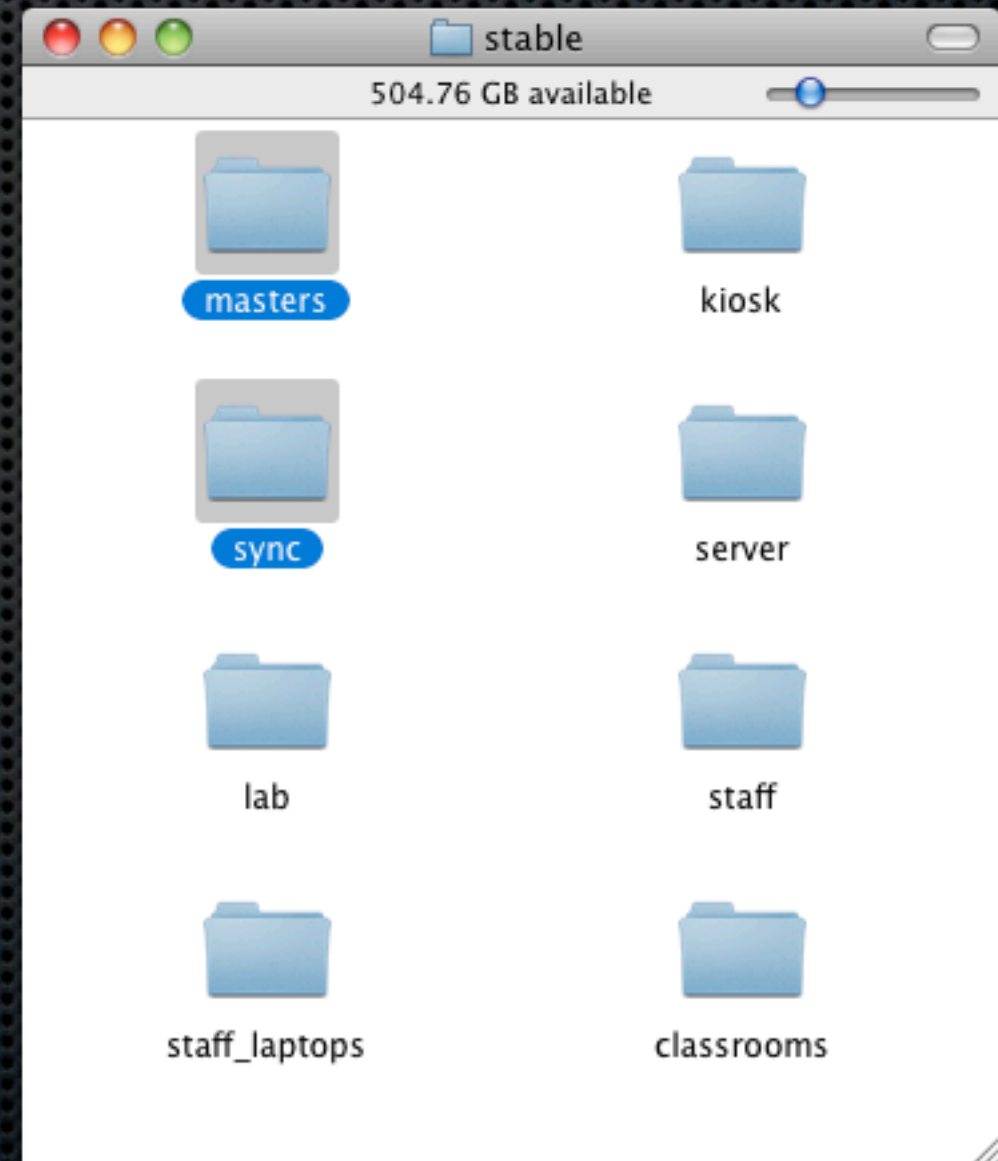
config
(ip's)

stable/
guinea_pigs/
tech/person1/
tech/person2/
tech/person3/

transcript1.T
transcript2.T
transcript3.T
transcript4.T
transcript5.T

Branches

- ✧ Branches are similar
- ✧ "master" folder in all
- ✧ "sync" folder in all
- ✧ Machine command files



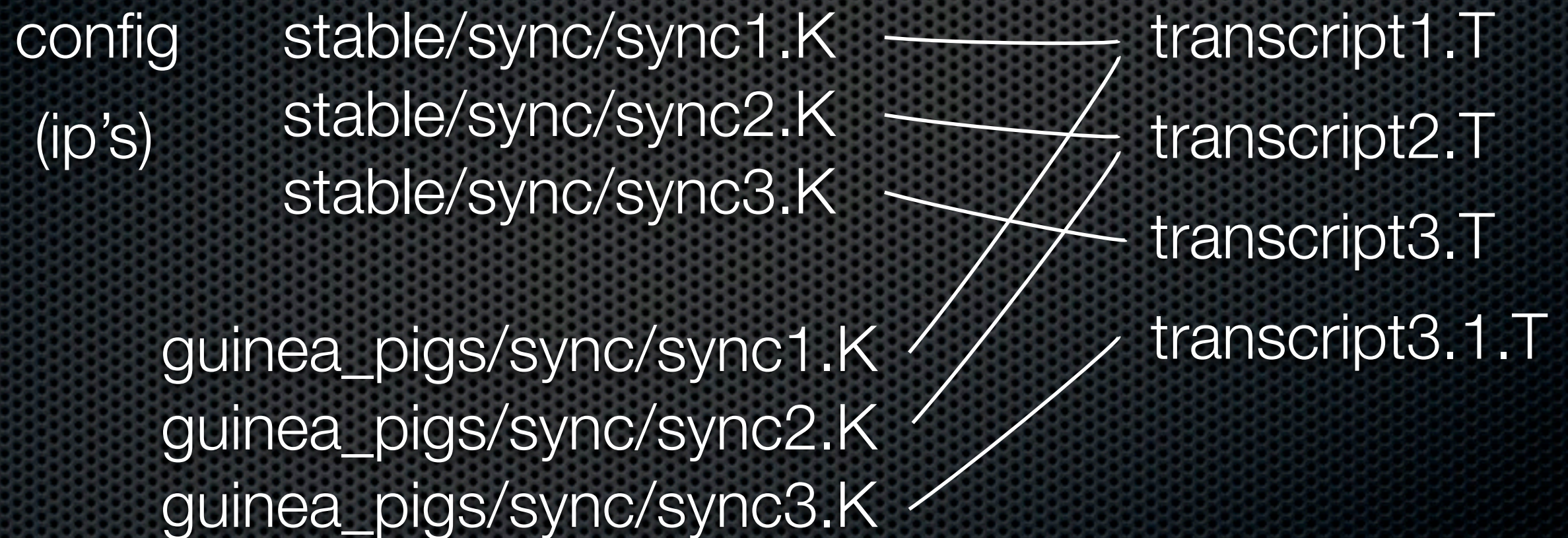
Branches



Sync command files

- ✦ Contains the kinks that differentiate machines
- ✦ We update these constantly
- ✦ About 63 kinks, number changes over time
 - ✦ 19 to specify location stuff
 - ✦ 7 scanners
 - ✦ 6 workstation variations
 - ✦ Other variations like laptop, staff, kiosk, etc

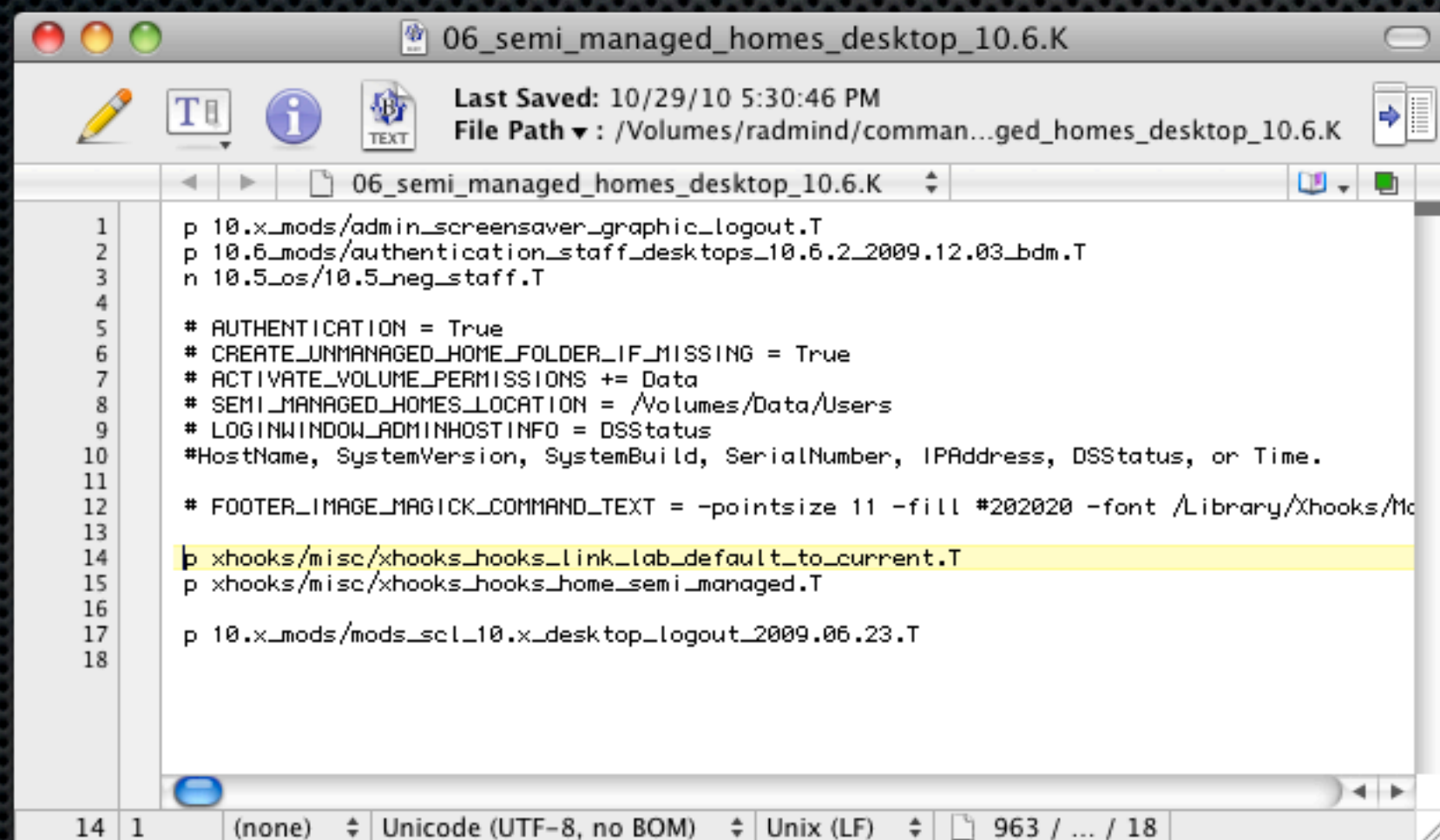
Sync command files



Sync organized by type

- ✦ 01_os_10.6.K
- ✦ 02_os_apps_10.6_orig.K
- ✦ 03_xhooks_10.6.K
- ✦ 04_everywhere.K
- ✦ 05_everywhere_10.6.K
- ✦ 06_fully_managed_homes_10.6.K
- ✦ 06_semi_managed_homes_desktop_10.6.K
- ✦ 06_semi_managed_homes_laptop_10.6.K

A sync command file



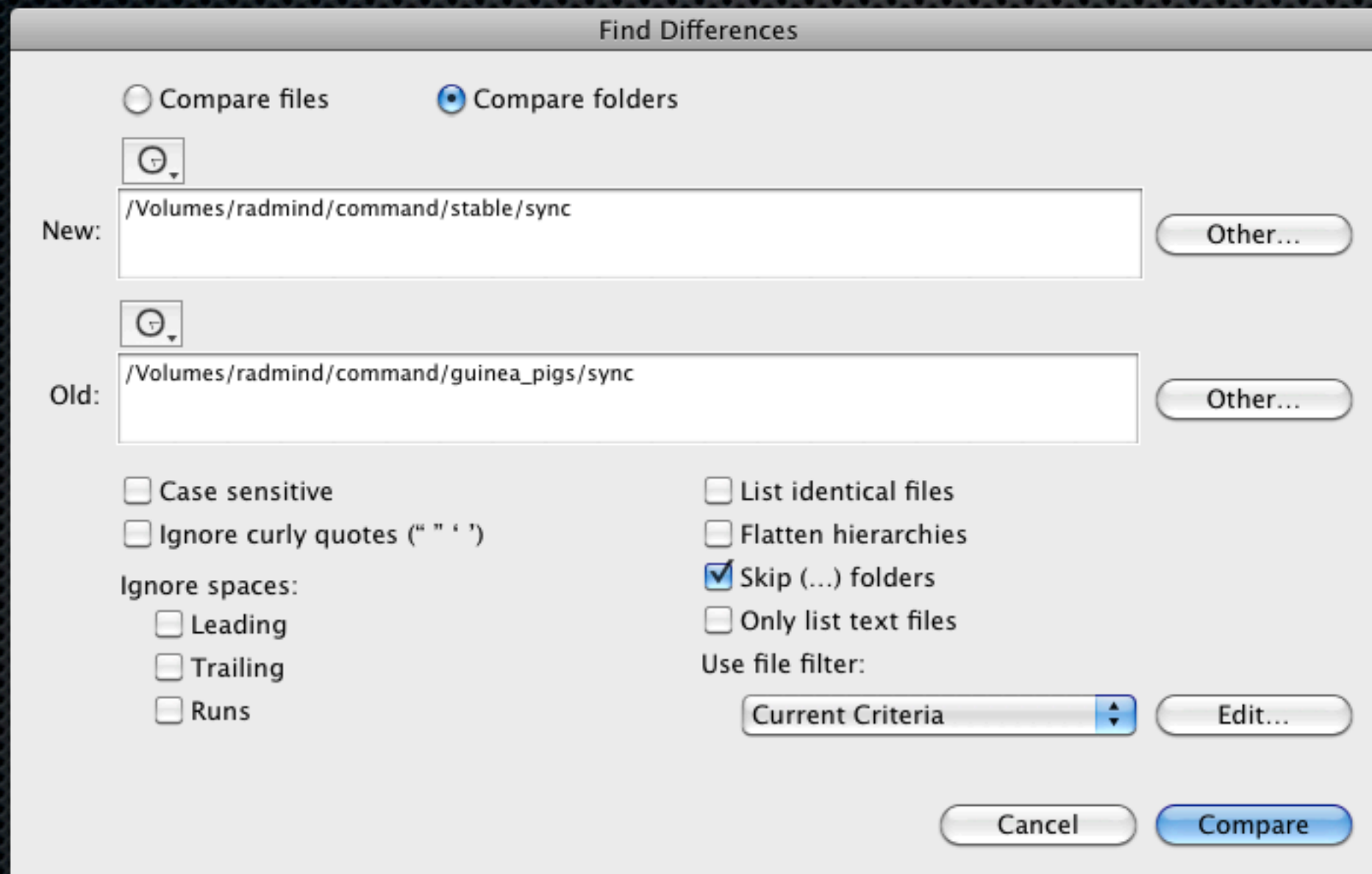
The screenshot shows a text editor window titled "06_semi_managed_homes_desktop_10.6.K". The window has a menu bar with icons for editing, text, and information. The status bar at the top indicates "Last Saved: 10/29/10 5:30:46 PM" and "File Path: /Volumes/radmind/comman...ged_homes_desktop_10.6.K". The main text area contains a list of commands and settings, with line numbers 1 through 18 on the left. Line 14 is highlighted in yellow. The status bar at the bottom shows "14 1 (none) Unicode (UTF-8, no BOM) Unix (LF) 963 / ... / 18".

```
1 p 10.x_mods/admin_screensaver_graphic_logout.T
2 p 10.6_mods/authentication_staff_desktops_10.6.2_2009.12.03_bdm.T
3 n 10.5_os/10.5_neg_staff.T
4
5 # AUTHENTICATION = True
6 # CREATE_UNMANAGED_HOME_FOLDER_IF_MISSING = True
7 # ACTIVATE_VOLUME_PERMISSIONS += Data
8 # SEMI_MANAGED_HOMES_LOCATION = /Volumes/Data/Users
9 # LOGINWINDOW_ADMINHOSTINFO = DSStatus
10 #HostName, SystemVersion, SystemBuild, SerialNumber, IPAddress, DSStatus, or Time.
11
12 # FOOTER_IMAGE_MAGICK_COMMAND_TEXT = -pointsize 11 -fill #202020 -font /Library/Xhooks/Mo
13
14 p xhooks/misc/xhooks_hooks_link_lab_default_to_current.T
15 p xhooks/misc/xhooks_hooks_home_semi_managed.T
16
17 p 10.x_mods/mods_scl_10.x_desktop_logout_2009.06.23.T
18
```


How we make updates

- ✦ The sync folder is how we manage stages
 - ✦ Each tech updates their own stuff
 - ✦ Periodically all the tech sync folders will be synced
 - ✦ Then guinea_pigs is synced with tech
 - ✦ Then stable is synced with guinea_pigs
 - ✦ This process is really slow actually
- ✦ This is bypassed pretty often, but prevents most mass destruction from updating production command files

Syncing different branches



BBEdit File Edit Text View Search Markup Window #! CVS Help 17 s--10.7 Fri 16:57:37

04_everywhere.K Last Saved: 10/21/10 10:38:09 AM File Path: /Volumes/radmind/command/stable/sync/04_everywhere.K

04_everywhere.K Last Saved: 10/7/10 7:09:24 PM File Path: /Volumes/radmind/command/guinea_pigs/sync/04_everywhere.K

2 p 10.x_nods/nods_scl_10.x_everywhere_2009.09.14_bds.T
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----- Extensions -----
p 3rdparty_addons/ext_westest_4.041.T
p 3rdparty_addons/ext_sconch_5.1.0_build_14_2009.12.09_rcg.T
p 3rdparty_addons/ext_growl_1.2.1_2010.08.10_bds.T
* TEMPLATE_USER_LOGIN_HINDOOL_PLIST += /Library/PreferencePanes/Growl.prefPane/Contents/Resources/GrowlHelperApp.app @
* TEMPLATE_USER_LOGIN_HINDOOL_PLIST += /Applications/Utilities/HardwareGrowler.app @

----- Apps ----- MacTech Group (everywhere.K)
p app_mactech/app_bbedi_9.3_mactech_2009.12.03_bds.T
p app_mactech/app_bxand_2.7_2009.11.25_rcg.T
p app_mactech/app_carbon_copy_catcher_3.3_2009.12.16_rcg.T
p app_mactech/app_cronnix_3.0.2_2009.05.29_rcg.T
p app_mactech/app_data_rescue_3.1_2009.11.28_tn.T
p app_mactech/app_disk_warrior_4.2_2009.10.06_bds.T
p app_mactech/app_drive_genius_3.0_2010.05.20_tn.T
p app_mactech/app_eavesdrop_0.504-jr.T
p app_mactech/app_filesalvage_7.0_2009.12.12_tn.T
p app_mactech/app_fseventer_2.6.6_2009.05.29_rcg.T
p app_mactech/app_keyconfigure_6.2.0_5_2010.06.04_tn.T
p app_mactech/app_lingon_2.1.1_2009.05.29_rcg.T
p app_mactech/app_mac_the_ripper_2.6.6-jr.T
p app_mactech/app_macopen_2.5.1_2009.05.29_rcg.T
p app_mactech/app_pacifist_2.6.4_2010.10.04_rcg.T
p app_mactech/app_plistedit_pro_1.5_2010.07.27_tn.T
p app_mactech/app_pseudo_1.2.3_2009.05.29_rcg.T
p app_mactech/app_open_firmware_password_1.2.1_2009.05.29_rcg.T
p app_mactech/app_remember_0.3.5b_2009.11.20_rcg.T
p app_mactech/app_script_debugger_4.5_2009.09.02_tn.T
p app_mactech/app_sloth_1.3.1_2009.05.29_rcg.T
p app_mactech/app_superduper_2.6.2_v87_2009.12.16_rcg.T
p app_mactech/app_xray_1.1_2009.05.29_rcg.T

----- Scripts ----- MacTech Group
p app_mactech/admin_mactech_scripts-radmind_audit.T

----- Apps ----- Public Utilities (group_apps_public_utilities.K)
p app_multimedia/app_realplayer_10.1.0.503-jr.T
p app_util/app_stuffit_standard_10.0.1.T
p app_multimedia/app_divx_7.2_2010.01.15_tn.T

24 1 (none) : Unicode (UTF-8, no BOM) : Unix (LF) : 1,991 / 124 / 45

24 1 (none) : Western (Mac OS Roman) : Unix (LF) : 1,991 / 124 / 45

Differences

New Folder: /Volumes/radmind/command/stable/sync Old Folder: /Volumes/radmind/command/guinea_pigs/sync

In both (7 items) Only in new (23 items) Only in old (0 items)

02_os_apps_10.6_orig.K
03_xhooks_10.6.K
04_everywhere.K
15_workstation_01.K
15_workstation_02_10.6.K

01_os_10.5.K
02_os_apps_10.5_moved.K
02_os_apps_10.5_orig.K
03_xhooks_10.5.K
03_xhooks_10.5_no_hooks.K

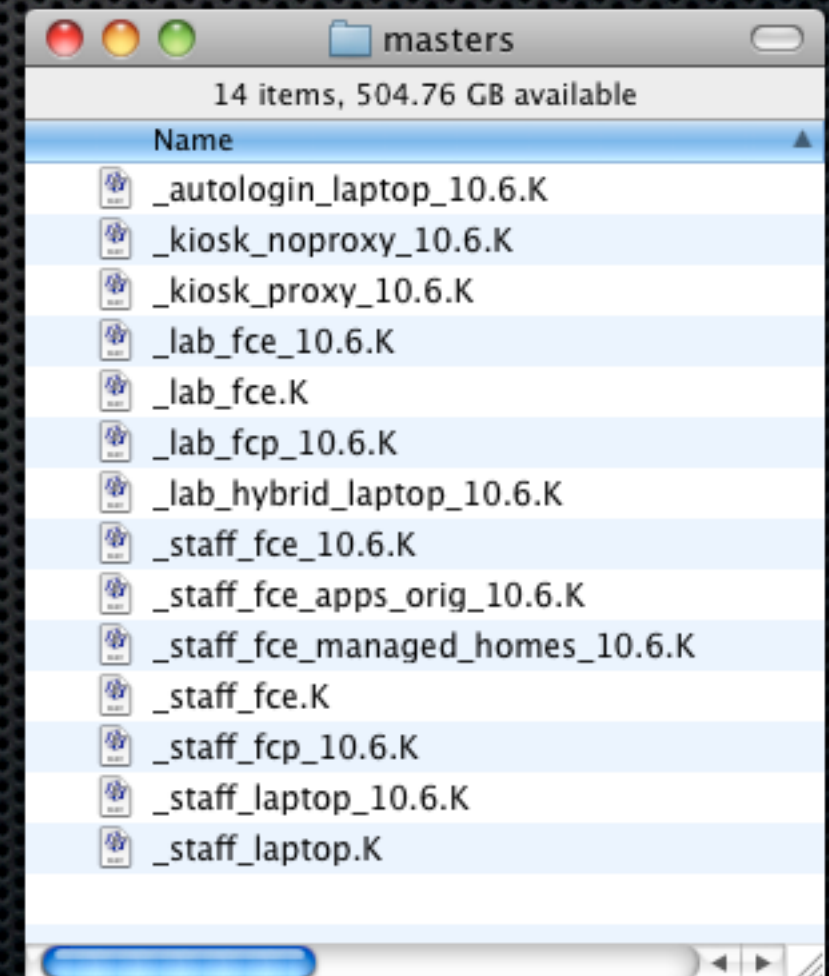
New File: /Volumes/radmind/command/stable/sync/04_everywhere.K -- Apply Apply -- Old File: /Volumes/radmind/command/guinea_pigs/sync/04_everywhere.K

Nonmatching Lines (File 04_everywhere.K: Line 24; File 04_everywhere.K: Line 24)

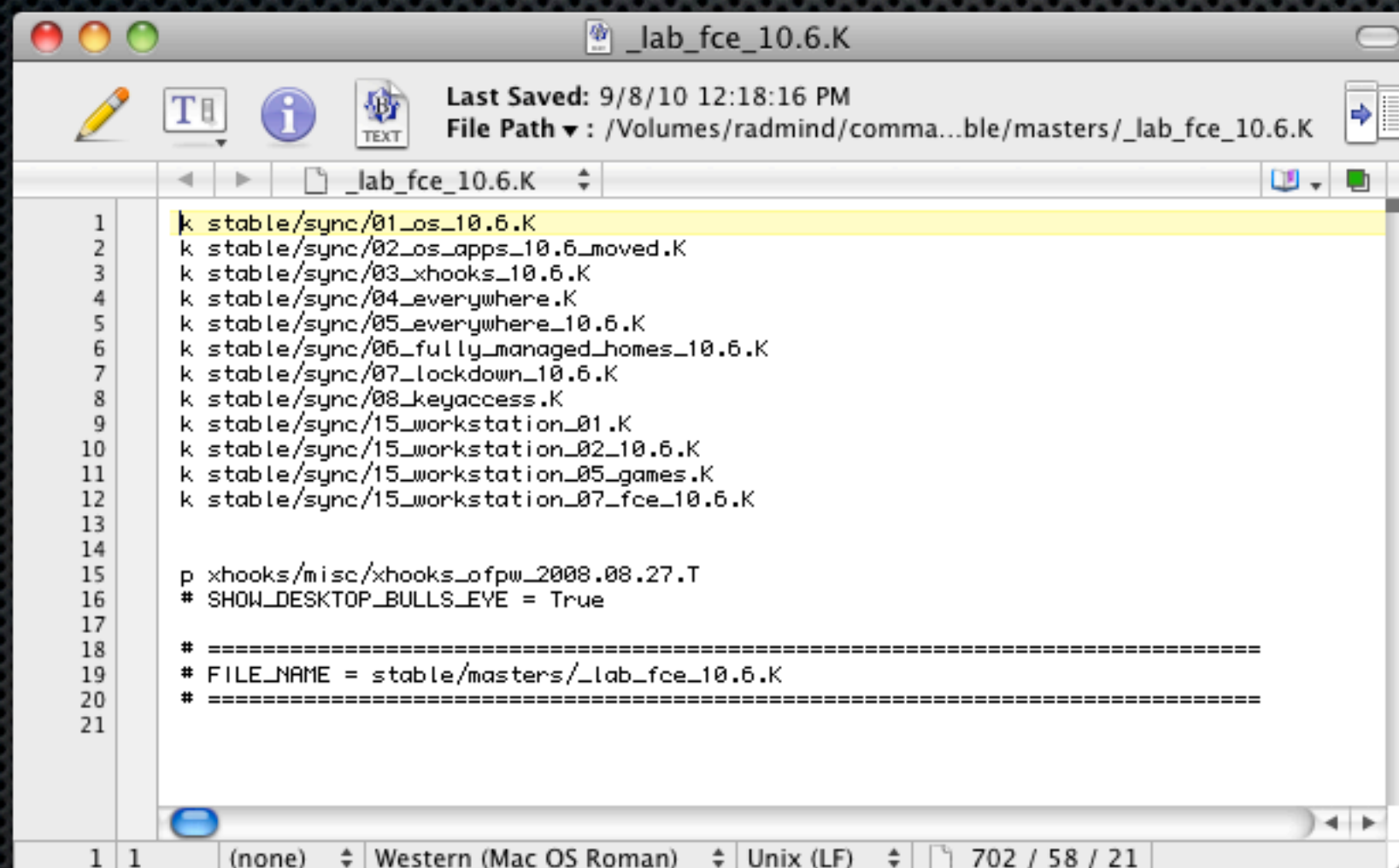
One difference found.

Master command files

- ✧ The main machine types
 - ✧ We have 14 or so
- ✧ Point to sync command files
- ✧ These are as generic as can be
- ✧ Almost all of our other command files is a child of one of these
 - ✧ Some machines point to these
- ✧ Masters rarely updated



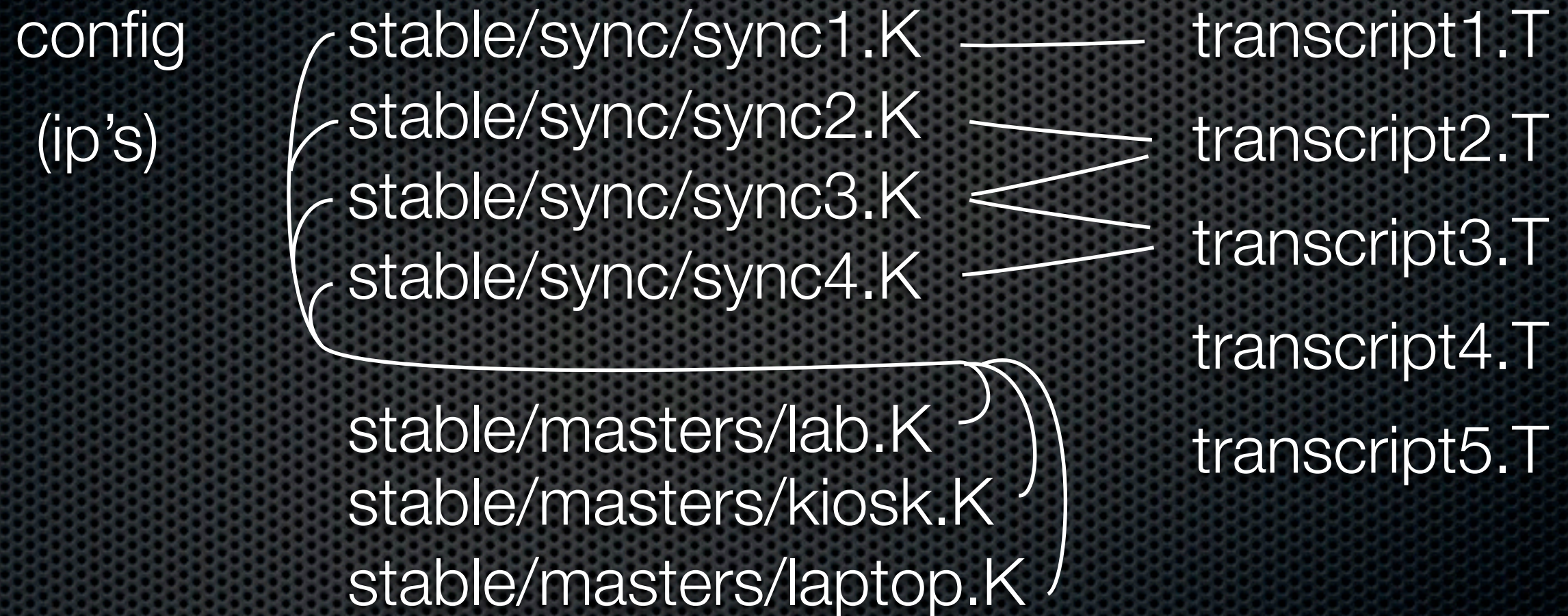
A master command file



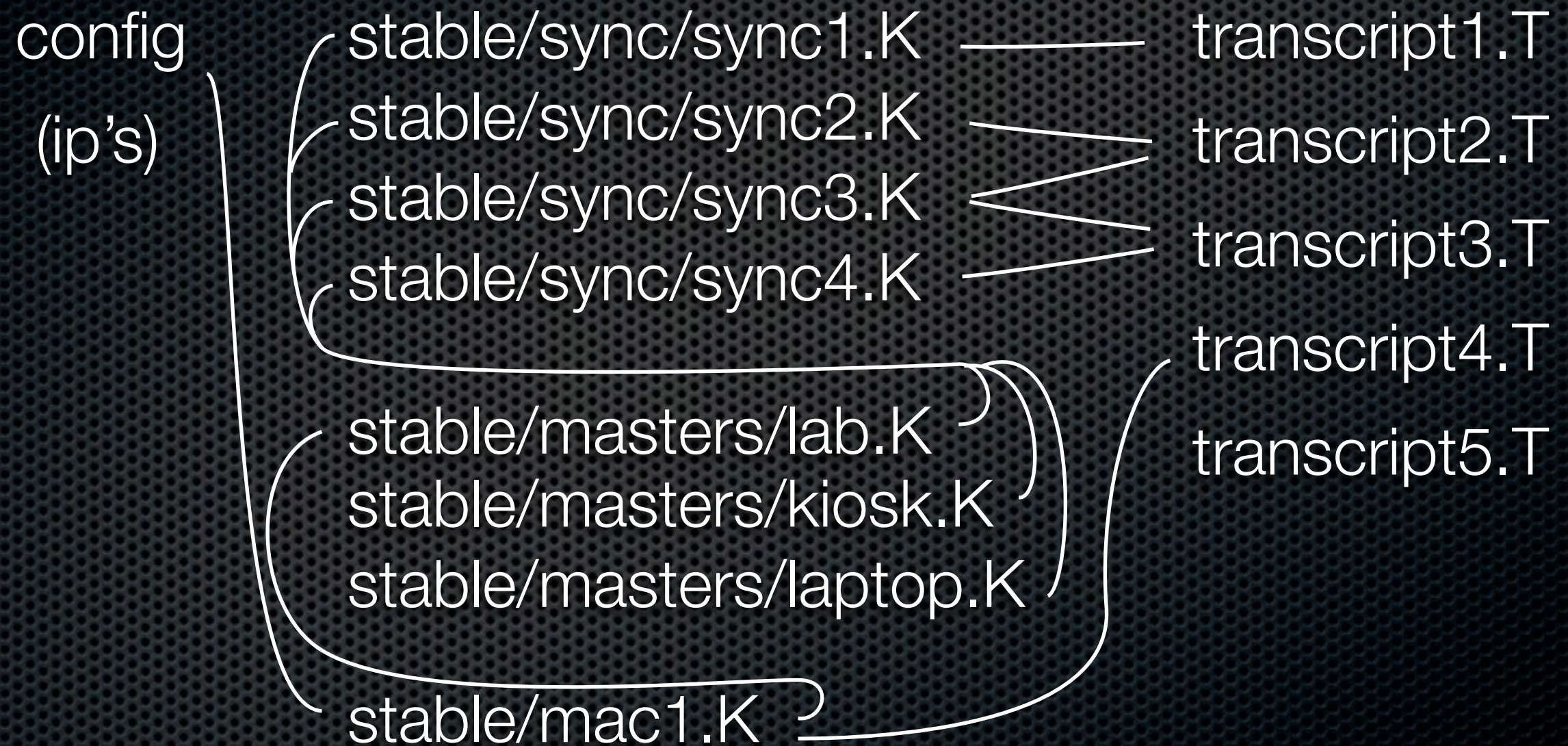
```
1 k stable/sync/01_os_10.6.K
2 k stable/sync/02_os_apps_10.6_moved.K
3 k stable/sync/03_xhooks_10.6.K
4 k stable/sync/04_everywhere.K
5 k stable/sync/05_everywhere_10.6.K
6 k stable/sync/06_fully_managed_homes_10.6.K
7 k stable/sync/07_lockdown_10.6.K
8 k stable/sync/08_keyaccess.K
9 k stable/sync/15_workstation_01.K
10 k stable/sync/15_workstation_02_10.6.K
11 k stable/sync/15_workstation_05_games.K
12 k stable/sync/15_workstation_07_fce_10.6.K
13
14
15 p xhooks/misc/xhooks_ofpw_2008.08.27.T
16 # SHOW_DESKTOP_BULLS_EYE = True
17
18 # =====
19 # FILE_NAME = stable/masters/_lab_fce_10.6.K
20 # =====
21
```

1 1 (none) Western (Mac OS Roman) Unix (LF) 702 / 58 / 21

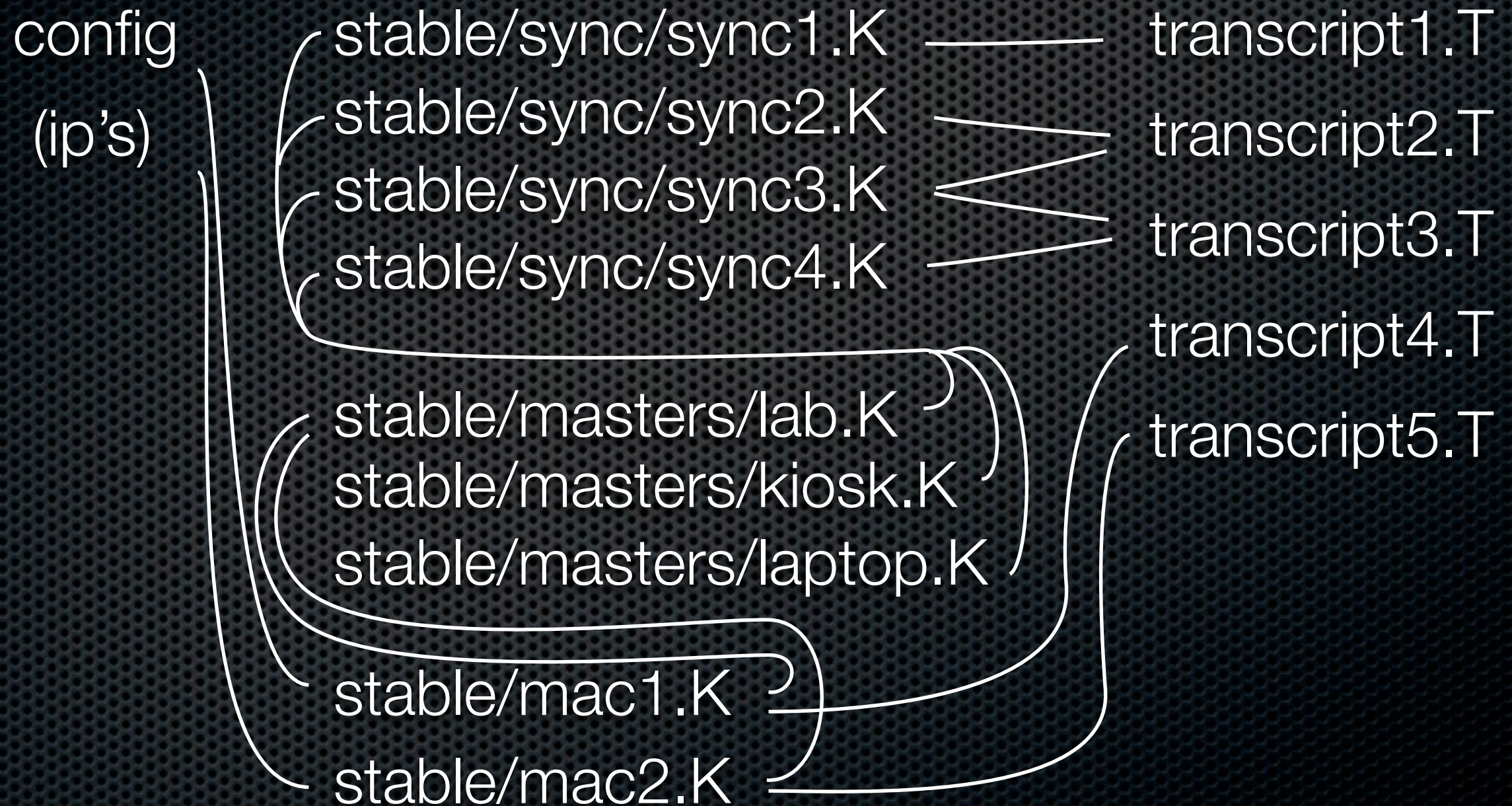
Master command files



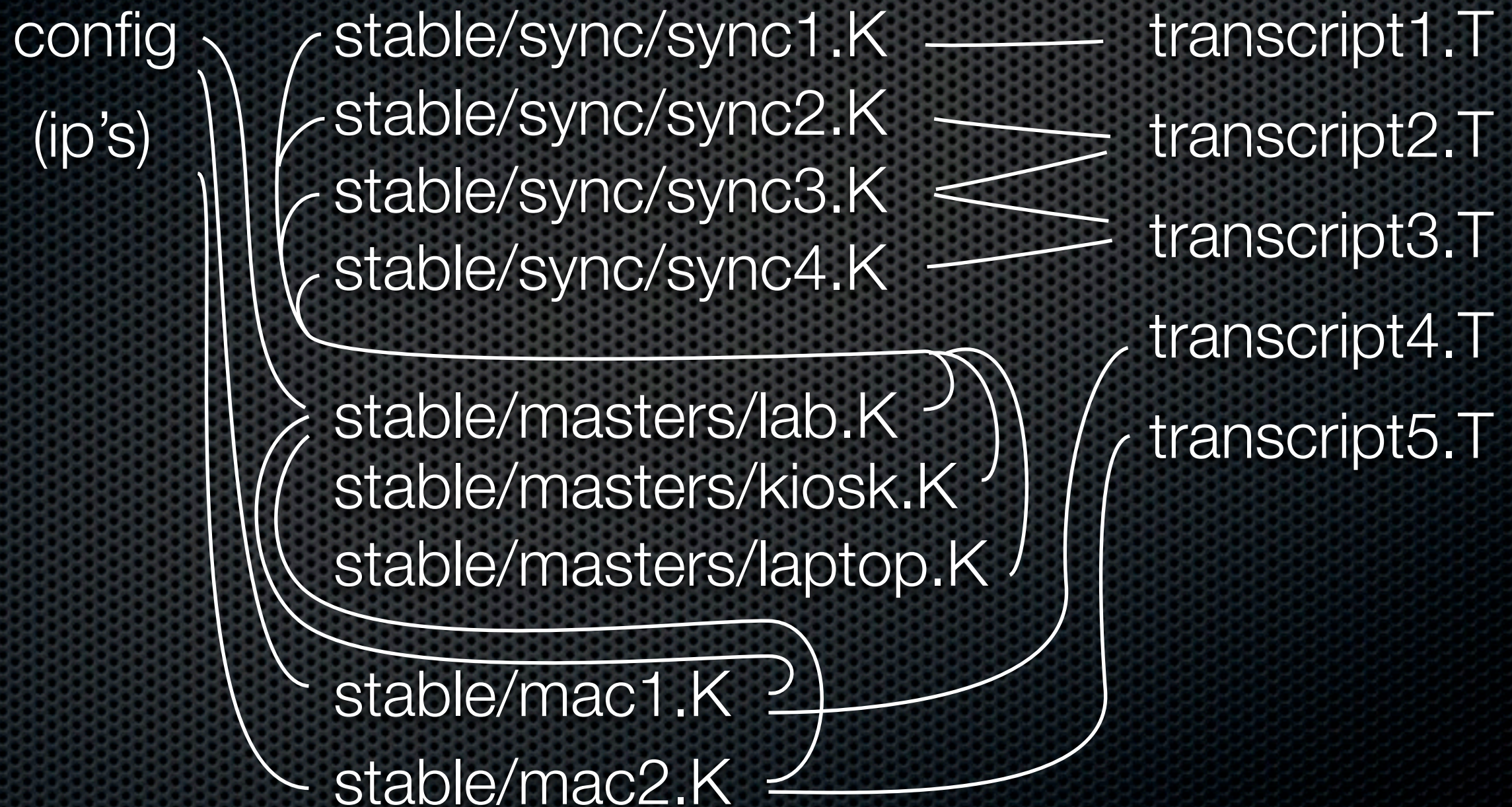
Master command files



Master command files

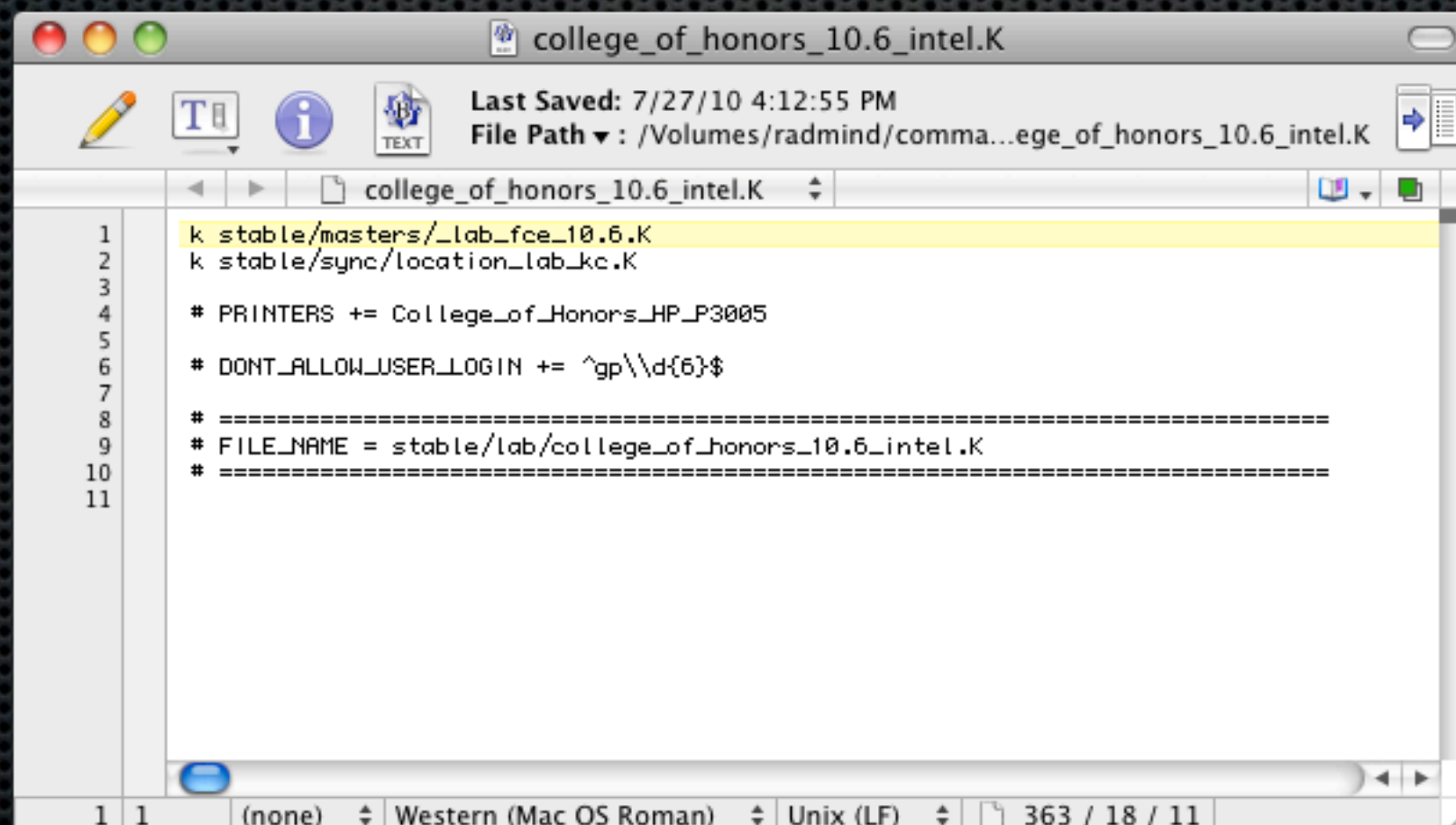


Master command files



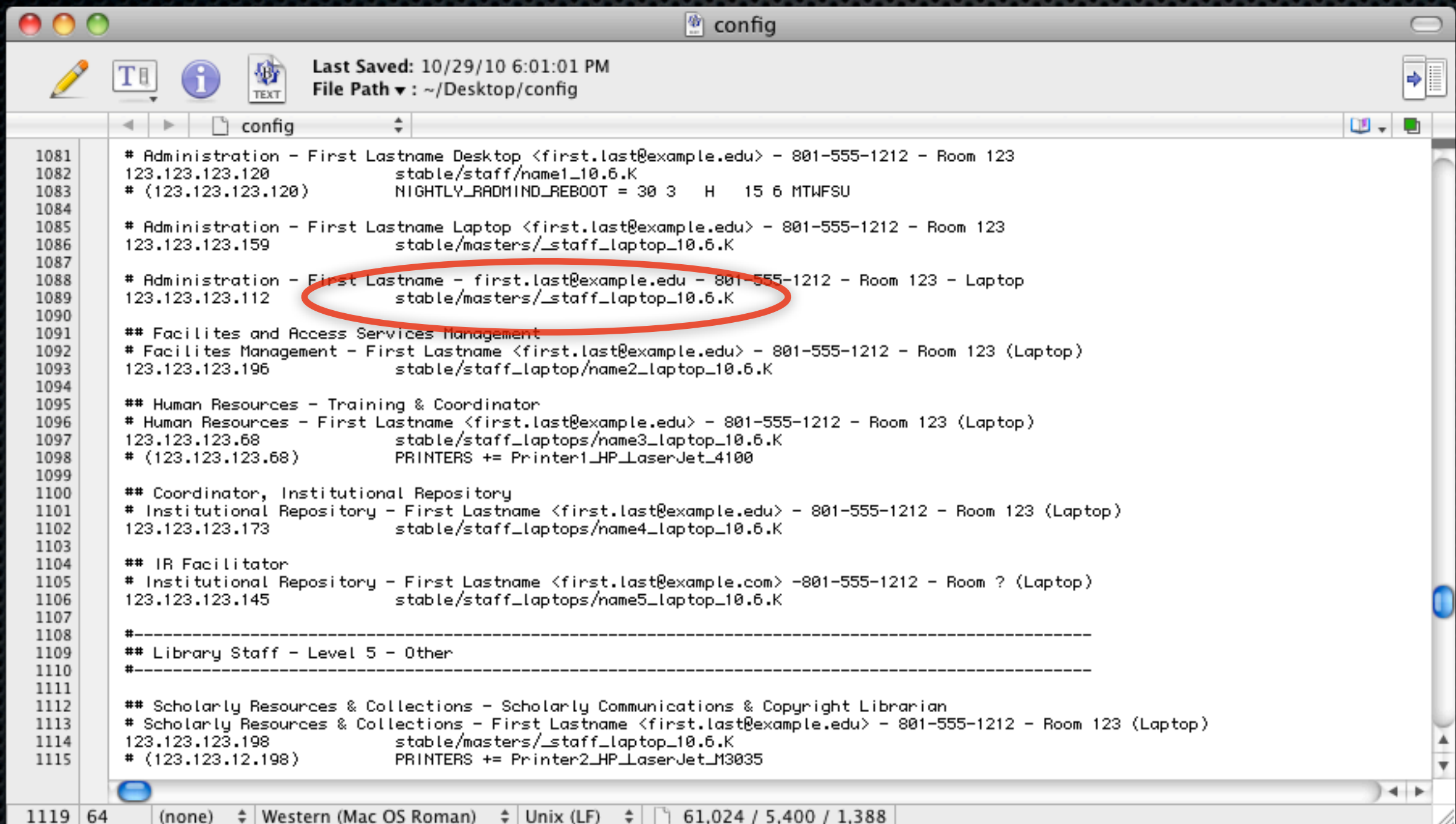
Purpose of masters

- ✦ Helps us identify ***exactly*** why a machine has a unique command file (by making it small)



```
1 k stable/masters/_lab_fce_10.6.K
2 k stable/sync/location_lab_kc.K
3
4 # PRINTERS += College_of_Honors_HP_P3005
5
6 # DONT_ALLOW_USER_LOGIN += ^gp\\d{6}$
7
8 # =====
9 # FILE_NAME = stable/lab/college_of_honors_10.6_intel.K
10 # =====
11
```


Pointing directly at a master



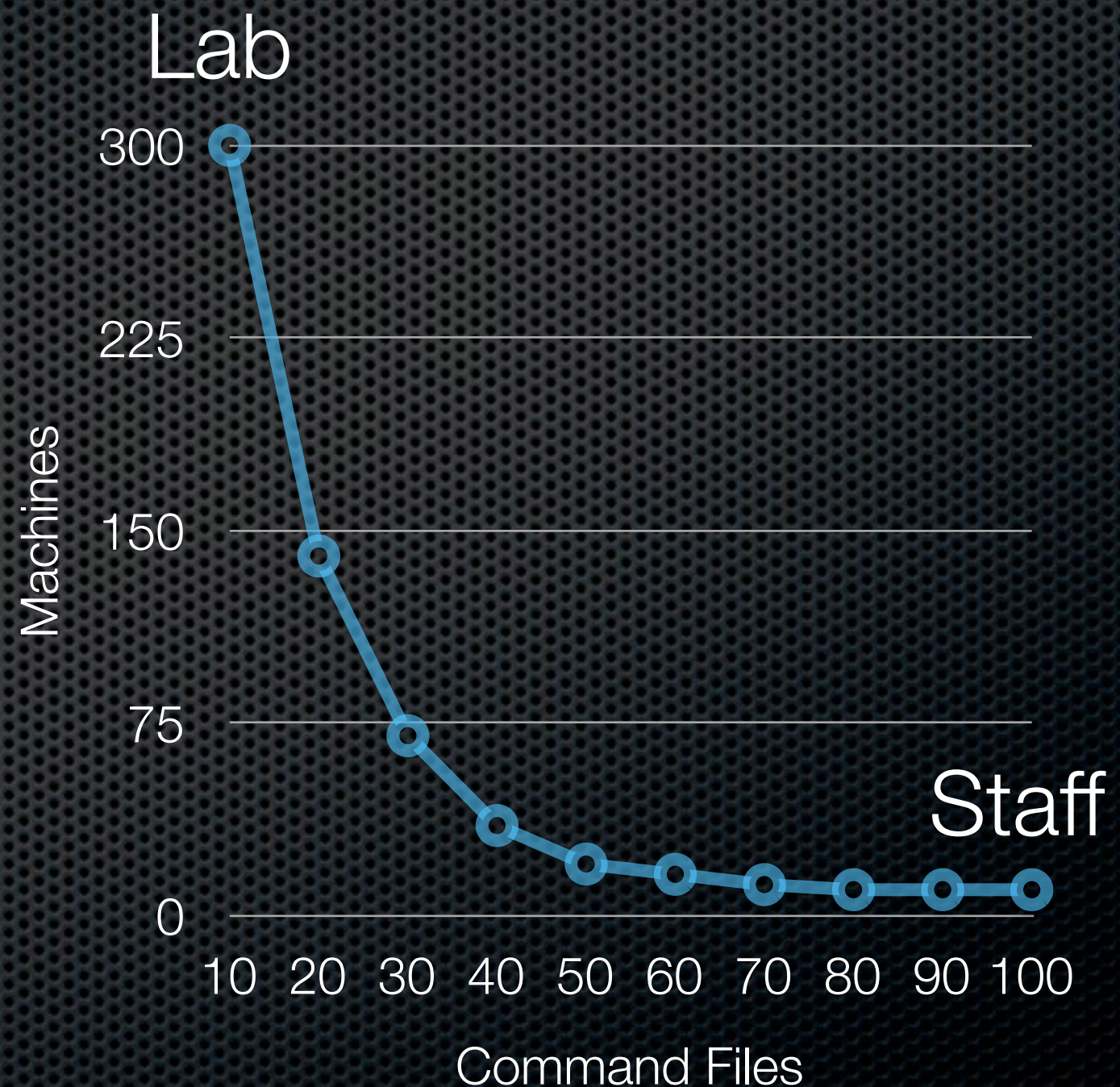
```
1081 # Administration - First Lastname Desktop <first.last@example.edu> - 801-555-1212 - Room 123
1082 123.123.123.120      stable/staff/name1_10.6.K
1083 # (123.123.123.120)   NIGHTLY_RADMIND_REBOOT = 30 3   H   15 6 MTWFSU
1084
1085 # Administration - First Lastname Laptop <first.last@example.edu> - 801-555-1212 - Room 123
1086 123.123.123.159      stable/masters/_staff_laptop_10.6.K
1087
1088 # Administration - First Lastname - first.last@example.edu - 801-555-1212 - Room 123 - Laptop
1089 123.123.123.112      stable/masters/_staff_laptop_10.6.K
1090
1091 ## Facilities and Access Services Management
1092 # Facilities Management - First Lastname <first.last@example.edu> - 801-555-1212 - Room 123 (Laptop)
1093 123.123.123.196      stable/staff_laptop/name2_laptop_10.6.K
1094
1095 ## Human Resources - Training & Coordinator
1096 # Human Resources - First Lastname <first.last@example.edu> - 801-555-1212 - Room 123 (Laptop)
1097 123.123.123.68       stable/staff_laptops/name3_laptop_10.6.K
1098 # (123.123.123.68)    PRINTERS += Printer1_HP_LaserJet_4100
1099
1100 ## Coordinator, Institutional Repository
1101 # Institutional Repository - First Lastname <first.last@example.edu> - 801-555-1212 - Room 123 (Laptop)
1102 123.123.123.173      stable/staff_laptops/name4_laptop_10.6.K
1103
1104 ## IR Facilitator
1105 # Institutional Repository - First Lastname <first.last@example.com> -801-555-1212 - Room ? (Laptop)
1106 123.123.123.145      stable/staff_laptops/name5_laptop_10.6.K
1107
1108 #-----
1109 ## Library Staff - Level 5 - Other
1110 #-----
1111
1112 ## Scholarly Resources & Collections - Scholarly Communications & Copyright Librarian
1113 # Scholarly Resources & Collections - First Lastname <first.last@example.edu> - 801-555-1212 - Room 123 (Laptop)
1114 123.123.123.198      stable/masters/_staff_laptop_10.6.K
1115 # (123.123.12.198)    PRINTERS += Printer2_HP_LaserJet_M3035
```


Master vs sync

- ✧ Sync command files
 - ✧ Change often
 - ✧ Not a full machine
- ✧ Master command files
 - ✧ Rarely change
 - ✧ Machines can point directly to master command files or list a master as the first line of it's unique command file

Why all this work?

- ✦ Reduce command files!
- ✦ Reduce contents of command files!
- ✦ My philosophy is, once you get this large, the problem is knowing what is going on, scaling, and upgrading



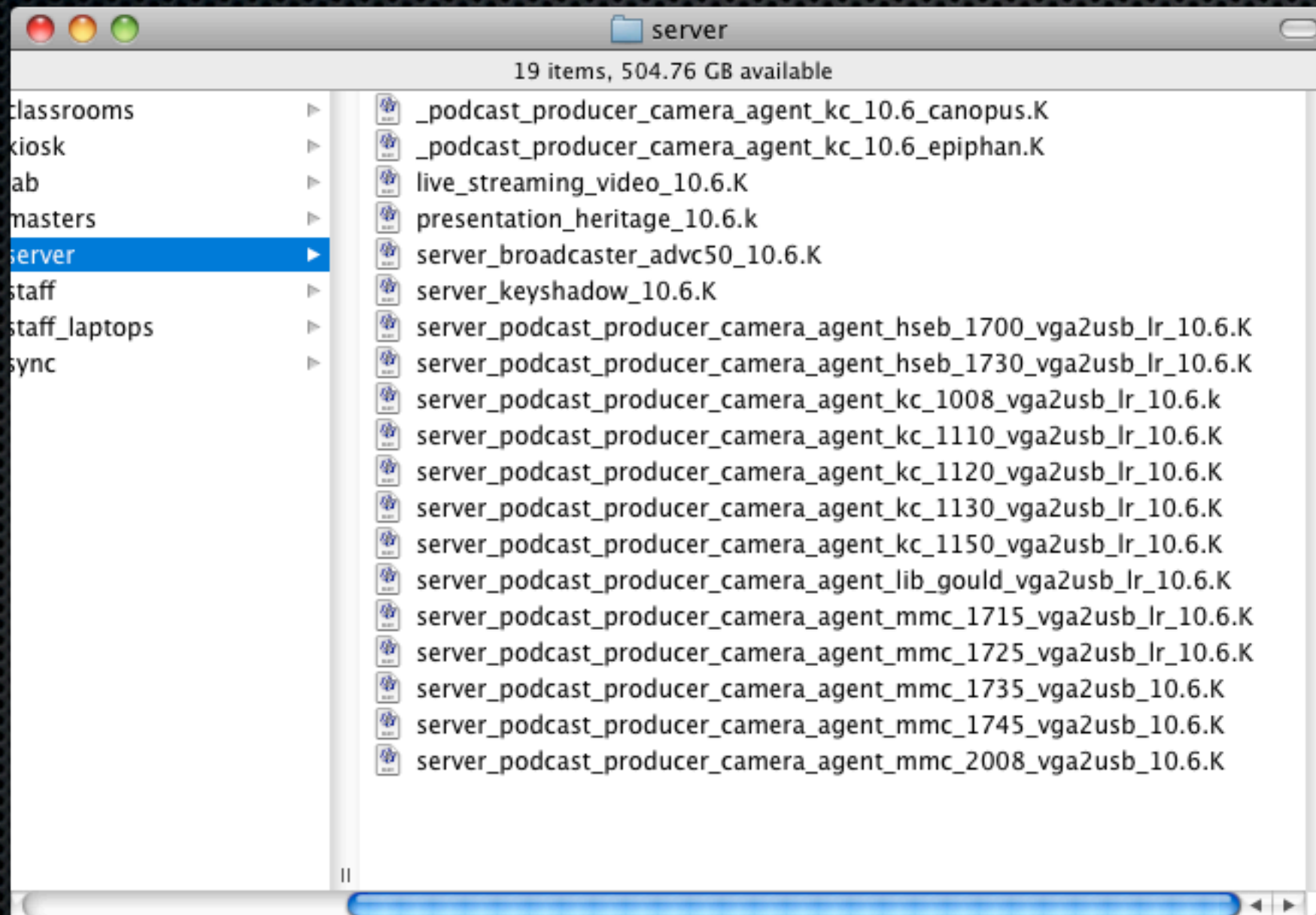
Honesty time

- ✦ A coworker of mine said I was just moving the work and making it more technical, not reducing it
- ✦ If you don't have a 1 command file to 50+ machine situation, don't use Radmin!
- ✦ If you don't need to manage the system (tripwire), don't use Radmin!
- ✦ 1 to 1 is possible but not worth it if that is all you have

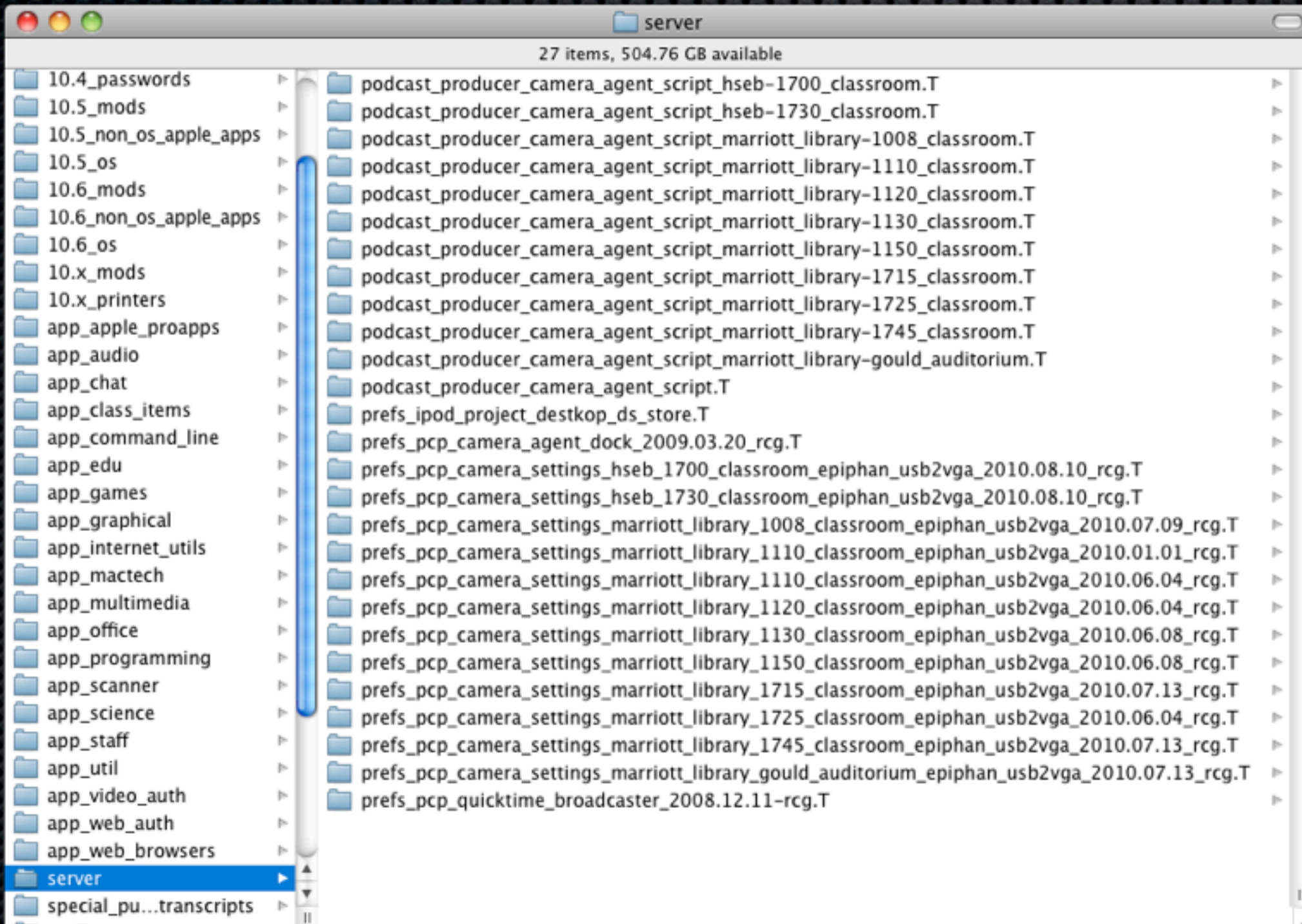
Xhooks

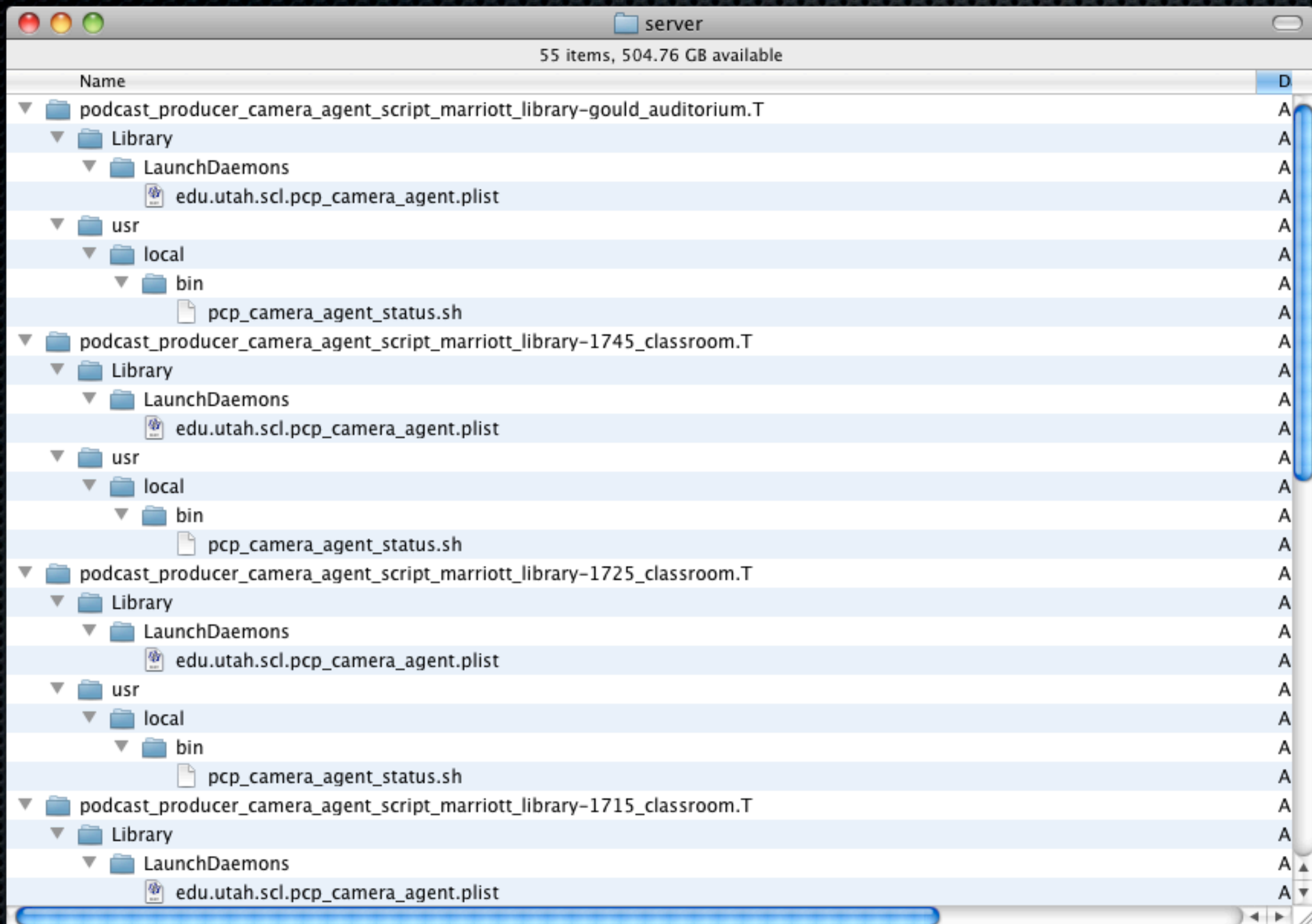
- ✦ Was called ULabmin, then Entman, now Xhooks
- ✦ Initial purpose
 - ✦ Unify scripts into one overload
- ✦ The following example is a problem that keeps coming back when using Radmind and why Xhooks exists

Lots of command files



Reason? Lots of overloads





BBEdit File Edit Text View Search Markup Window #! CVS Fri 18:47:44

pcp_camera_agent_status.sh Last Saved: 8/13/10 3:51:36 PM File Path: /Volumes/radmin...ra_agent_status.sh

```
26 MAIL_TO='example@example.edu'
27 PATH_TO_SYSTEMSETUP="/usr/sbin/systemsetup"
28 PATH_TO_LOG_DIR=`mkdir -p /var/log/pcp_camera_status`
29 PATH_TO_LOG_FILE="/var/log/pcp_camera_status/${CURRENT_DATE}-pcp_camera"
30 PCP_SERVER="example.edu"
31 PCP_USERNAME="example"
32 PCP_PASSWORD="example"
33 PCP_CAMERA_NAME='Marriott Library - Gould Auditorium'
34 PCP_CAMERA_STATUS=`podcast -s "${PCP_SERVER}" -u "${PCP_USERNAME}" -p
35 PCP_CAMERA_AGENT_STATUS="/usr/sbin/pcastctl agent status"
36
37 #####
38 #####
39
40 run_as_root()
41 {
42
43 # Make sure only root can run our script
44 if [ "${id -u}" != "0" ]; then
45     echo "This script must be run as root" 1>&2
46     exit 1
47 fi
48
49 }
50
51 #####
52 #####
53
54 get_computer_name()
55 {
56
```

pcp_camera_agent_status.sh Last Saved: 8/13/10 3:50:35 PM File Path: /Volumes/radmin...ra_agent_status.sh

```
26 MAIL_TO='example@example.edu'
27 PATH_TO_SYSTEMSETUP="/usr/sbin/systemsetup"
28 PATH_TO_LOG_DIR=`mkdir -p /var/log/pcp_camera_status`
29 PATH_TO_LOG_FILE="/var/log/pcp_camera_status/${CURRENT_DATE}-pcp_camera"
30 PCP_SERVER="example.edu"
31 PCP_USERNAME="example"
32 PCP_PASSWORD="example"
33 PCP_CAMERA_NAME='Marriott Library - 1745 Classroom'
34 PCP_CAMERA_STATUS=`podcast -s "${PCP_SERVER}" -u "${PCP_USERNAME}" -p
35 PCP_CAMERA_AGENT_STATUS="/usr/sbin/pcastctl agent status"
36
37 #####
38 #####
39
40 run_as_root()
41 {
42
43 # Make sure only root can run our script
44 if [ "${id -u}" != "0" ]; then
45     echo "This script must be run as root" 1>&2
46     exit 1
47 fi
48
49 }
50
51 #####
52 #####
53
54 get_computer_name()
55 {
56
```

33 1 Unix Shell Script Western (Mac OS Roman) Unix (LF)

Differences

New File: /Volumes/radmin/file/serv.../pcp_camera_agent_status.sh ← Apply Apply → Old File: /Volumes/radmin/file/serv.../pcp_camera_agent_status.sh

► Nonmatching Lines (File pcp_camera_agent_status.sh; Line 33; File pcp_camera_agent_status.sh; Line 33)

One difference found.

Problem?

- ✦ Lots of command files to manage machines that are identical except for part of a line of one file
- ✦ Radmin's special files could manage this
 - ✦ Special files have never worked in practice

ULabMin solution

- ✦ Unify the scripts in one overload
- ✦ Use many different overloads for settings
 - ✦ Updating the settings was unbelievably awful
 - ✦ This is why special files don't work also
- ✦ Reduced transcripts but did not reduce command files

Entman solution

- ✦ Unify settings in one overload and turn them on or off with vaguely named switches ("trigger file" overloads)
 - ✦ Sucked worse because I forgot what switches did
 - ✦ Trigger file overloads became painful to make
- ✦ Did reduce command files but not a lot

Xhooks solution

- ✦ Map variables from config and command files to scripts
- ✦ Command file reduction is huge
- ✦ Finding out what is configured to do what is easier
- ✦ Adding new scripts and settings is easier than anything
 - ✦ No middlemen overloads
- ✦ Fixing the previous example using Xhooks

AppleBBEditFileEditTextViewSearchMarkupWindow#!CVSSHelpFri 18:49:51

pcp_camera_agent_status.shLast Saved: 8/13/10 3:51:36 PMFile Path: /Volumes/radmin...ra_agent_status.sh

13141516171819202122232425262728293031323334353637383940414243

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implied warranties of any kind.

Global Editable Variables

CURRENT_DATE=`date +%Y.%m.%d`
PATH_TO_SYSTEMSETUP="/usr/sbin/systemsetup"
PATH_TO_LOG_DIR=`mkdir -p /var/log/pcp_camera_status`
PATH_TO_LOG_FILE="/var/log/pcp_camera_status/\${CURRENT_DATE}-pcp_camera_
PCP_CAMERA_STATUS=`podcast -s "\${PCP_SERVER}" -u "\${PCP_USERNAME}" -p
PCP_CAMERA_AGENT_STATUS="/usr/sbin/pcastctl agent status"

if [-f "/Library/Preferences/Xhooks/edu.utah.scl.radmin.xhooks.conf.l
 "/Library/Preferences/Xhooks/edu.utah.scl.radmin.xhooks.conf.ba
else
 echo "ERROR \$0 /Library/Preferences/Xhooks/edu.utah.scl.radmin.xh
 exit 1
fi

run_as_root()
{

321Unix Shell ScriptWestern (Mac OS Roman)Unix (LF)

pcp_camera_agent_status.shLast Saved: 8/13/10 3:50:35 PMFile Path: /Volumes/radmin...ra_agent_status.sh

12131415161718192021222324252627282930313233343536373839404142

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Global Editable Variables

CURRENT_DATE=`date +%Y.%m.%d`
MAIL_TO='example@example.edu'
PATH_TO_SYSTEMSETUP="/usr/sbin/systemsetup"
PATH_TO_LOG_DIR=`mkdir -p /var/log/pcp_camera_status`
PATH_TO_LOG_FILE="/var/log/pcp_camera_status/\${CURRENT_DATE}-pcp_camera_
PCP_SERVER="example.edu"
PCP_USERNAME="example"
PCP_PASSWORD="example"
PCP_CAMERA_NAME='Marriott Library - 1745 Classroom'
PCP_CAMERA_STATUS=`podcast -s "\${PCP_SERVER}" -u "\${PCP_USERNAME}" -p
PCP_CAMERA_AGENT_STATUS="/usr/sbin/pcastctl agent status"

run_as_root()
{

371Unix Shell ScriptWestern (Mac OS Roman)Unix (LF)

Differences

New File: /Volumes/radmin/file/serv.../pcp_camera_agent_status.sh ← Apply ↻ Apply → Old File: /Volumes/radmin/file/serv.../pcp_camera_agent_status.sh

Extra lines in Old before 26 in New (File pcp_camera_agent_status.sh; Line 26; File pcp_camera_agent_status.sh; Line 26)

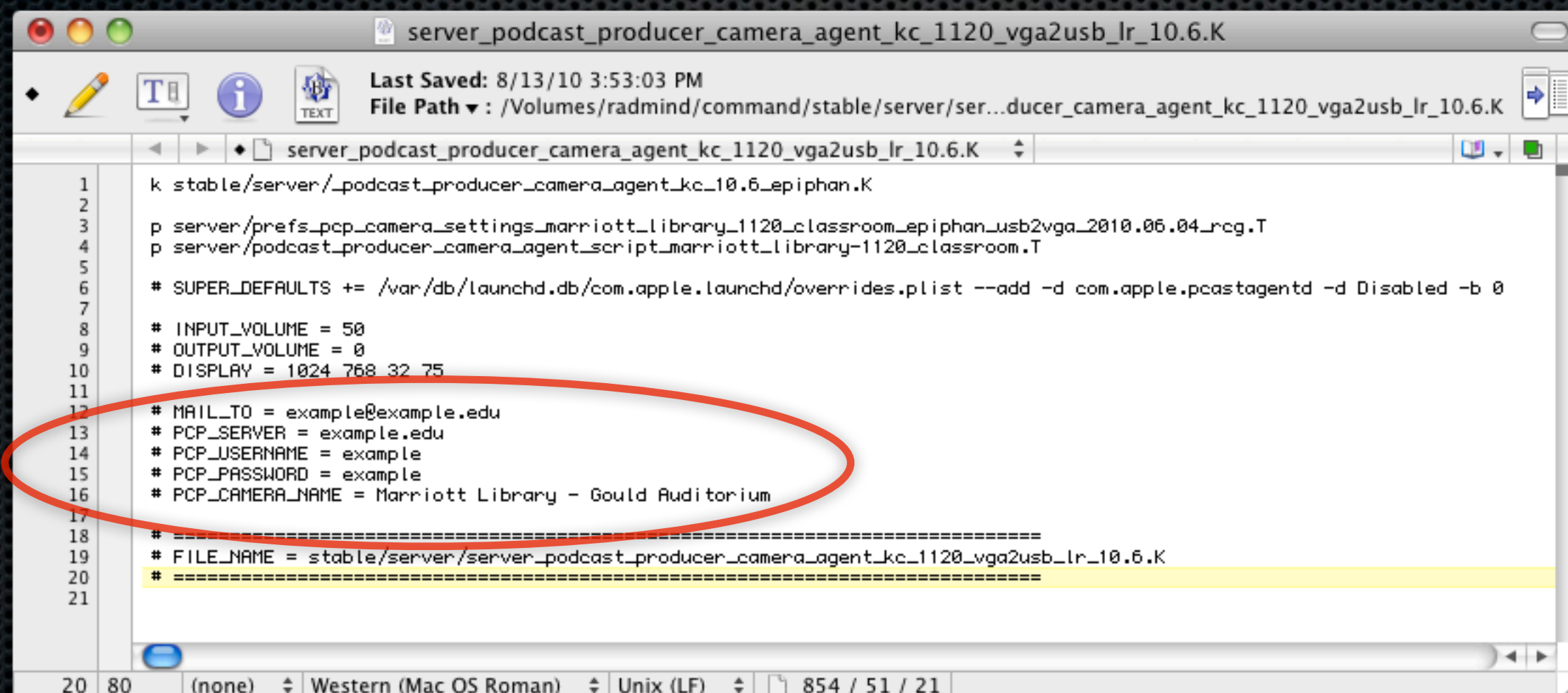
Extra lines in Old before 29 in New (File pcp_camera_agent_status.sh; Line 29; File pcp_camera_agent_status.sh; Line 30:33)

Extra lines in New before 37 in Old (File pcp_camera_agent_status.sh; Line 32:38; File pcp_camera_agent_status.sh; Line 37)

3 differences found.

Variables in command file

- ✱ This still requires multiple command files



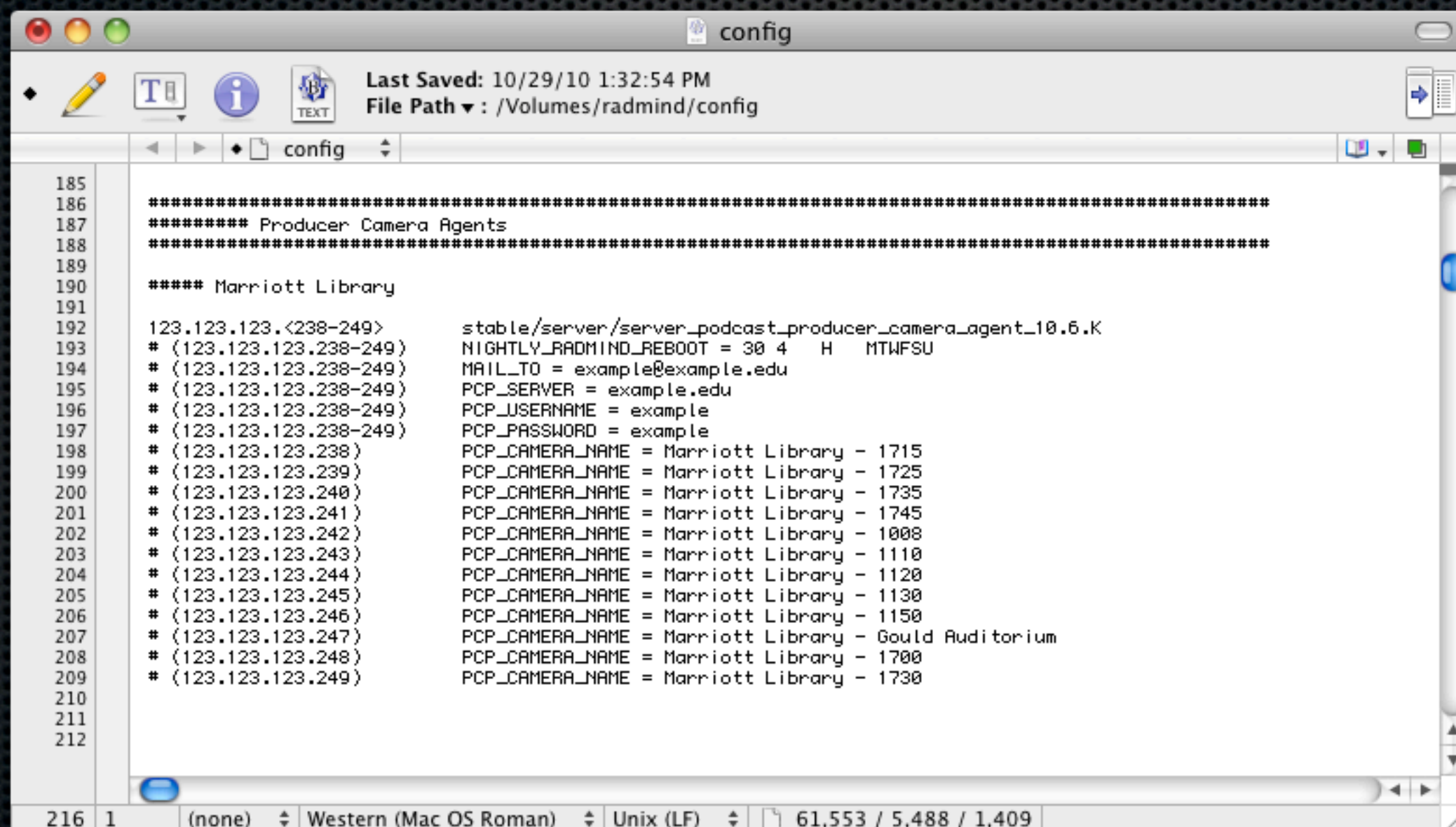
The screenshot shows a text editor window titled "server_podcast_producer_camera_agent_kc_1120_vga2usb_lr_10.6.K". The window displays a command file with the following content:

```
1 k stable/server/_podcast_producer_camera_agent_kc_10.6_epiphan.K
2
3 p server/prefs_pcp_camera_settings_marriott_library_1120_classroom_epiphan_usb2vga_2010.06.04_rec.T
4 p server/podcast_producer_camera_agent_script_marriott_library_1120_classroom.T
5
6 # SUPER_DEFAULTS += /var/db/launchd.db/com.apple.launchd/overrides.plist --add -d com.apple.pcastagentd -d Disabled -b 0
7
8 # INPUT_VOLUME = 50
9 # OUTPUT_VOLUME = 0
10 # DISPLAY = 1024 768 32 75
11
12 # MAIL_TO = example@example.edu
13 # PCP_SERVER = example.edu
14 # PCP_USERNAME = example
15 # PCP_PASSWORD = example
16 # PCP_CAMERA_NAME = Marriott Library - Gould Auditorium
17
18 # =====
19 # FILE_NAME = stable/server/server_podcast_producer_camera_agent_kc_1120_vga2usb_lr_10.6.K
20 # =====
21
```

A red oval highlights the section containing the variable definitions from line 12 to line 16. The status bar at the bottom indicates the file is 854 / 51 / 21 bytes, using Western (Mac OS Roman) encoding and Unix (LF) line endings.

Variables in config file

- ✦ This requires only one command file



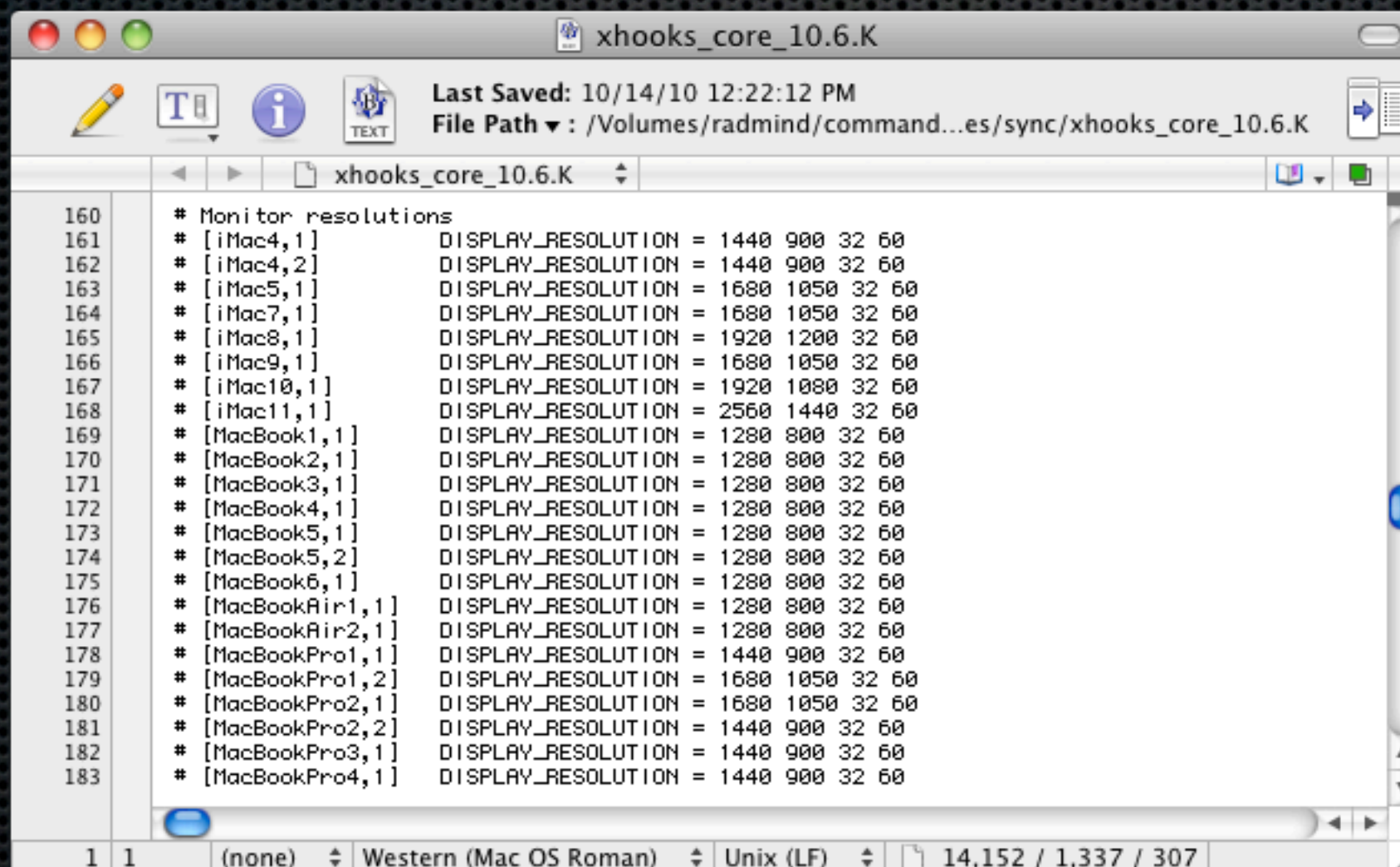
```
185 *****
186 ***** Producer Camera Agents
187 *****
188
189 ***** Marriott Library
190
191 123.123.123.<238-249> stable/server/server_podcast_producer_camera_agent_10.6.K
192 # (123.123.123.238-249) NIGHTLY_RADMIND_REBOOT = 30 4 H MTWFSU
193 # (123.123.123.238-249) MAIL_TO = example@example.edu
194 # (123.123.123.238-249) PCP_SERVER = example.edu
195 # (123.123.123.238-249) PCP_USERNAME = example
196 # (123.123.123.238-249) PCP_PASSWORD = example
197 # (123.123.123.238-249)
198 # (123.123.123.238) PCP_CAMERA_NAME = Marriott Library - 1715
199 # (123.123.123.239) PCP_CAMERA_NAME = Marriott Library - 1725
200 # (123.123.123.240) PCP_CAMERA_NAME = Marriott Library - 1735
201 # (123.123.123.241) PCP_CAMERA_NAME = Marriott Library - 1745
202 # (123.123.123.242) PCP_CAMERA_NAME = Marriott Library - 1008
203 # (123.123.123.243) PCP_CAMERA_NAME = Marriott Library - 1110
204 # (123.123.123.244) PCP_CAMERA_NAME = Marriott Library - 1120
205 # (123.123.123.245) PCP_CAMERA_NAME = Marriott Library - 1130
206 # (123.123.123.246) PCP_CAMERA_NAME = Marriott Library - 1150
207 # (123.123.123.247) PCP_CAMERA_NAME = Marriott Library - Gould Auditorium
208 # (123.123.123.248) PCP_CAMERA_NAME = Marriott Library - 1700
209 # (123.123.123.249) PCP_CAMERA_NAME = Marriott Library - 1730
210
211
212
```


How does this magic work?

- ✧ /Library/Preferences/Xhooks/
 - ✧ edu.utah.scl.radmind_xhooks_config.bash
 - ✧ edu.utah.scl.radmind_xhooks_config.perl
 - ✧ edu.utah.scl.radmind_xhooks_config.plist
- ✧ Generated on clients by a script that reads /var/radmind/client/command.K and all kinks
- ✧ /var/radmind/config settings put in a command file

Even more magic

- Command file variable qualifiers by IP, model, & factor



The screenshot shows a text editor window titled "xhooks_core_10.6.K". The window has a menu bar with icons for editing, text, and information. The status bar at the top indicates "Last Saved: 10/14/10 12:22:12 PM" and "File Path: /Volumes/radmind/command...es/sync/xhooks_core_10.6.K". The main text area displays a list of monitor resolutions for various Apple devices, with line numbers 160 through 183 on the left. The text is as follows:

```
160 # Monitor resolutions
161 # [iMac4,1] DISPLAY_RESOLUTION = 1440 900 32 60
162 # [iMac4,2] DISPLAY_RESOLUTION = 1440 900 32 60
163 # [iMac5,1] DISPLAY_RESOLUTION = 1680 1050 32 60
164 # [iMac7,1] DISPLAY_RESOLUTION = 1680 1050 32 60
165 # [iMac8,1] DISPLAY_RESOLUTION = 1920 1200 32 60
166 # [iMac9,1] DISPLAY_RESOLUTION = 1680 1050 32 60
167 # [iMac10,1] DISPLAY_RESOLUTION = 1920 1080 32 60
168 # [iMac11,1] DISPLAY_RESOLUTION = 2560 1440 32 60
169 # [MacBook1,1] DISPLAY_RESOLUTION = 1280 800 32 60
170 # [MacBook2,1] DISPLAY_RESOLUTION = 1280 800 32 60
171 # [MacBook3,1] DISPLAY_RESOLUTION = 1280 800 32 60
172 # [MacBook4,1] DISPLAY_RESOLUTION = 1280 800 32 60
173 # [MacBook5,1] DISPLAY_RESOLUTION = 1280 800 32 60
174 # [MacBook5,2] DISPLAY_RESOLUTION = 1280 800 32 60
175 # [MacBook6,1] DISPLAY_RESOLUTION = 1280 800 32 60
176 # [MacBookAir1,1] DISPLAY_RESOLUTION = 1280 800 32 60
177 # [MacBookAir2,1] DISPLAY_RESOLUTION = 1280 800 32 60
178 # [MacBookPro1,1] DISPLAY_RESOLUTION = 1440 900 32 60
179 # [MacBookPro1,2] DISPLAY_RESOLUTION = 1680 1050 32 60
180 # [MacBookPro2,1] DISPLAY_RESOLUTION = 1680 1050 32 60
181 # [MacBookPro2,2] DISPLAY_RESOLUTION = 1440 900 32 60
182 # [MacBookPro3,1] DISPLAY_RESOLUTION = 1440 900 32 60
183 # [MacBookPro4,1] DISPLAY_RESOLUTION = 1440 900 32 60
```

The status bar at the bottom shows "1 1", "(none)", "Western (Mac OS Roman)", "Unix (LF)", and "14,152 / 1,337 / 307".

What else does Xhooks do?

- ✦ Run scripts at specific times (the "hooks")
 - ✦ Startup/login/logout/nightly/post-radmind
 - ✦ Use iHooks to show a "busy" message
- ✦ Automate Radmin runs (Startup, Login/Logout, Night)
- ✦ Manage user writable files (cache replication)
 - ✦ Including generic home folders (with lost and found)
- ✦ Semi manage homes (local MCX external accounts)

What else does Xhooks do?

- ✦ Customize the AppleMenu
- ✦ Set volume (osascript -e "set volume \$VARIABLE")
- ✦ Set input/output audio sources/destinations
- ✦ Set display resolution and brightness
- ✦ Set desktop background
 - ✦ Add graphic to desktop background (ImageMagick)
 - ✦ Add optional message to desktop background

What else does Xhooks do?

- ✦ Customize Loginwindow
 - ✦ Including holiday themes
- ✦ Add certificates the way that Apple's updaters do
- ✦ Modify any plist file from command file
- ✦ Modify proxy network settings intelligently
- ✦ Set computer name
- ✦ Run Duti (sets file extension app mappings)

What else does Xhooks do?

- ✦ Set firewall (IPFW)
- ✦ Rename hard disks, change ignore permissions
- ✦ Fix ByHost files
- ✦ Manage System Menubar items
- ✦ Manage Login Items
- ✦ Run a kiosk
- ✦ Restrict logins by grep pattern

What else does Xhooks do?

- ✦ Add a shutdown and restart user
- ✦ Play sounds at login (for Halloween really...)
- ✦ Manage printers (using lpadm and big config file)
- ✦ Set firmware password
- ✦ Sleep machines only when logged out
- ✦ Compare transcripts
- ✦ Download overloads out of context

All optional

- ✦ All of this is so much that it is hard to know what is happening
- ✦ /Library/Xhooks/Modules/xhooks/hooks
 - ✦ Anything in there gets executed based on the name
- ✦ To turn a script on via Radmind I use transcripts that put links in the execution directory to the actual scripts

My biggest concern

- ✧ Using Xhooks to do too much
- ✧ Let other tools do what they do well
 - ✧ Radmind manages whole files well
 - ✧ Radmind does not manage files in pieces
 - ✧ Differences and overloading are good for Radmind
 - ✧ 50 *similar* overloads/command files are not

Package like installs

- ✦ download_overload.pl
 - ✦ Custom command files
 - ✦ Negative ignores “.”
 - ✦ Positives are what you want to download
 - ✦ Removes “-” lines
 - ✦ I would like to make this a Puppet provider
 - ✦ Working on uninstaller & tracking current state

Xhooks wrap-up

- ✦ Perl, sh, AppleScript, Cocoa utils
- ✦ xktcheck made for ARD and runs ktcheck, updates printers, computer names, radmind schedule
- ✦ My dream is to intergrate Puppet and Radmin
 - ✦ Manifests & config/command files need intergration
 - ✦ Even use Puppet to make overloads
 - ✦ Use Puppet to install often changing apps
 - ✦ Use Puppet for laptops, Radmin for lab

Making overloads

- ✦ InstaDMG used to create baseload
 - ✦ Minimalist as possible
 - ✦ We create a “first boot” overload w/ nothing but junk
 - ✦ Overload with real stuff made by Setup Assistant
- ✦ “Overload” maker machines w/ minimal OS

Making overloads

- ✦ Some installers step on each other too much
- ✦ Apple & Adobe installers lumped together
 - ✦ iWorks, iLife & Pro apps installed in same overload
 - ✦ Dev tools separate
 - ✦ CS5
 - ✦ We “deploy” an app by splitting /Applications stuff
- ✦ OS specific versions kept in folder named os_10.x

Making overloads

- ✧ We inspect and diff overloads
 - ✧ plcat, pldiff
 - ✧ /etc/authorization
- ✧ Scripts that check permissions
 - ✧ Many apps *ship* with misconfigured installers
 - ✧ Installing packages will never show you this
- ✧ Found differences between 10.5 PPC and 10.5 Intel

Making overloads

- ✦ Scripts that take machines to an installable state
- ✦ Overloads from packages
 - ✦ Install a package
 - ✦ Run a simple script that reads a package bom file
- ✦ Scripts that update existing transcripts
- ✦ Beware of assumptions!

Imaging machines

- ✦ One machine is used to create ASR images
 - ✦ A radmind managed machine runs radmind on a 2nd volume putting identical image (except the setting that starts the script) and makes an DMG of it
 - ✦ Currently not working
- ✦ Deploy Studio & PSU Blast Image Config to reimage

Laptops

- ✦ Checkout laptops
 - ✦ Staff manually runs radmind periodically
- ✦ Staff
 - ✦ Laptops are only initial install
 - ✦ We have a nag GUI but aren't satisfied with it
 - ✦ We meet with staff to update laptop

Other words of wisdom

- ✦ You must understand the OS
 - ✦ I can't manage Linux
- ✦ Documentation never happens (flexibility kills it)
 - ✦ Make solutions part of the process
 - ✦ Write scripts to do tasks and the script is the documentation
 - ✦ Force workers to use the scripted workflows
 - ✦ (I only remember where to look)

The moral of the story

- ✦ Radmind's demise has been greatly exaggerated
- ✦ Minimize command files and transcripts
 - ✦ Use kinks strategically
 - ✦ Unify and segregate the right things
 - ✦ Use something like Xhooks to manage partial files

The moral of the story

- ✦ We have been able to scale unbelievably
 - ✦ Number of distinct configurations is well over 100
- ✦ Upgrading major OS versions keeps getting easier
- ✦ Less work for me, more work for the grunts
 - ✦ More time for "side" projects

Questions?