

Zero to Root in 12 Months

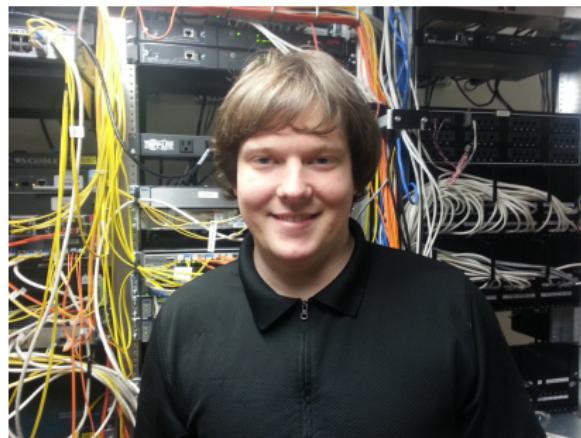
Training and Utilizing Junior Sysadmins in Higher Education

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Introduction

Computer Action Team
Braindump
Utilization

Presenters

Agenda

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- ▶ Computer Action Team introduction and history
- ▶ Braindump program
- ▶ Utilization
- ▶ Personal Stories

Stats

- ▶ 4 Buildings
- ▶ 5K users
- ▶ 600 Workstations, 100 Servers
- ▶ 7 general use computer labs
- ▶ Manage hundreds of commercial and OSS software pkgs
- ▶ 1854 active networking jacks
- ▶ Multiple 10GigE links to the internet

Operating Systems

- ▶ Windows
- ▶ Ubuntu
- ▶ RedHat/Centos
- ▶ Solaris/Derivatives

CAT Services

- ▶ Web
- ▶ License management
- ▶ Network homedirs
- ▶ Bulk storage over NFS/Samba
- ▶ Database (mysql/postgres)
- ▶ Project Management & VCS
- ▶ Backups
- ▶ VPN
- ▶ Networking
- ▶ Mail

Background

- ▶ Founded in early 90s by Janaka Jayawardena, Director of IT for Engineering
- ▶ Originally a means by Janaka to grow UNIX hackers that got out of hand.
- ▶ In-house apprenticeship program to bring student volunteers into sysadmin and other IT roles.
- ▶ Hire them later (once they know what they are doing)

Particulars

- ▶ 1+ yr program
- ▶ Open to any PSU student/staff
- ▶ Friday nights, 6pm-10pm
- ▶ 4 hours helpdesk volunteering a week
- ▶ Time, as needed, spent working on learning and projects.

Typical Braindump

- ▶ Senior CAT speaks
- ▶ 3-4 hour presentation on a technical subject, usually part of a "track"
- ▶ Informal, questions and tangents throughout
- ▶ A Braindump cohort begins with about 60 people but attrition soon sets in.

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Particulars
Typical Braindump
Catacombs
Scratching Post
Mentor Session





Catacombs

- ▶ Sandbox environment
- ▶ Physical equipment
- ▶ Braindump group has total control of hardware and network
- ▶ Goal is to replicate production
- ▶ Install operating systems and set up services





Scratching Post

- ▶ Office hours
- ▶ Student driven
- ▶ Senior CAT sits down with students for 2 or more hours per week
- ▶ Place to drill down into internals
- ▶ Different teaching format for different types of learning

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Mentor Session

- ▶ Small groups of about 10 students
- ▶ Two mentors
- ▶ Takes place in a lab environment
- ▶ Tutorial on the basics
 - ▶ CAT Environment
 - ▶ Shell
 - ▶ SSH
 - ▶ Basic Scripting
 - ▶ IRC

Root

- ▶ "You let students have root?!"

Root

- ▶ "Yes"
- ▶ "But not at first"

What do they provide for us

- ▶ First tier support in person and via phone and email
- ▶ Password resets
- ▶ Lab monitoring

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Self selection

- ▶ Students who want to give back to production will self select
- ▶ Usually about 20% of the braindump will do this

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What does that looks like

- ▶ Self selecting students will come to scratching post and team meetings
- ▶ Small tasks will be assigned that can be performed as a user

What do they provide for us

- ▶ Read/grep logs for general issues
- ▶ Analyze logs in debugging of a specific issue
- ▶ Write utility and status scripts
- ▶ Second tier support via email and house calls
- ▶ Build, package, install software
- ▶ Monitor systems for runaway processes
- ▶ Basic commits to puppet, nagios, and graphite
- ▶ Commits to internal web applications

More self selection

- ▶ 3 months in, students are let into the combs
- ▶ More attrition
- ▶ Motivated students will learn and/or demonstrate ability to install operating systems and setup services

What do they do for us

- ▶ Test upgrades to services
- ▶ Database
- ▶ Web applications

- ▶ Test and evaluate new services to deploy
 - ▶ LDAP/Kerberos
 - ▶ Hadoop
- ▶ Significant changes to puppet, nagios, graphite
- ▶ Extend infrastructure

Rooting

- ▶ At 6 months in, some students will have demonstrated:
 - ▶ Personal integrity
 - ▶ Participation at team meetings
 - ▶ Basic competence with the technologies we use
- ▶ If these criteria are met we usually give them root access to the 'client' systems.

Rooting

- ▶ Student rooters get:
 - ▶ workstations and services
 - ▶ not fileservers
 - ▶ not ldap or dns
 - ▶ some, less critical, database servers
 - ▶ This is to minimize 'blast zone' in case of a screwup
- ▶ Windows is a bit different because they have fewer services and kerberos

What do they do for us

- ▶ OS installs/reinstalls
- ▶ OS Upgrades/Patches
- ▶ Networking
- ▶ VM management
- ▶ Puppet development, testing environments
- ▶ Restores from backup
- ▶ Mail debugging
- ▶ General Debugging

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Further Promotion

After another six months or so, we sometimes promote them again to full root.

This means fileservers, puppet masters, authoritative dns servers, ldap servers, and database servers.

What do they do for us

- ▶ At this level they are on-par with FTEs
- ▶ Exports list
- ▶ Filesystem create/destroy
- ▶ Group membership
- ▶ Full puppet production commit access
- ▶ DNS zones

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Other tracks

- ▶ Networking team
 - ▶ IOS ninja and debug networking for users
- ▶ Syndicat
 - ▶ Web development, mostly PHP
- ▶ User Support
 - ▶ Advanced user support

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Stories

Stories and Thank You