Introduction to Systems Administration

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What does it mean?

► "System administration is like keeping trains on time; no one notices except when they're late"

► Where's the sysadmin?
- They are hiding under the stairs
- They are in the basement conducting the rituals to keep the machines running
- It's 9 AM. He/she is not working that late.
- He/she's looking up the BOFH excuse of the day.
- He/she's out getting a caffeine fix.
- You *have* a system administrator?
- You *are* the system administrator
- …

Balance, Daniel-san!

► System administration often lends to extremes

- Draconian dictators who rule with an "iron fist"
- Eager-to-please admins who run from one user's request to another

► A balance must be found

- Being accessible to user's needs (and wants), while maintaining authority over policies and practices

An example…

► A user "blotto" has processes running wild and eating up CPU time

- \# kill -9 `ps aux | awk '$1=="blotto" {print $2}'`

- \# write blotto
  You've got a lot of processes running and taking up CPU time, is there a problem I can help with?
  ^D

- Walking over to blotto's desk…

Evolution

► The roles and tasks of systems administrators have evolved over the past 20-30 years

► Some things will never change
- Users accidentally deleting files
- Users asking the same, simple questions
- Installing programs and O/S updates
- Maintaining systems on the network
- System security

Same, but Different

► Some things are the same in theory, but the details have changed
- Printer administration
- System performance tuning
- Disk space optimization
- Network glitches
- Backups
- [silly] User questions

Many Hats

► System Administrators are often required to be a "Jack of all trades" and be skilled in a wide range of areas
- Typically goes beyond the "obvious" management of a system or systems
  - ► Managing user accounts
  - ► Printer technician
  - ► Network engineer
  - ► Security engineer / auditor
  - ► Programmer
  - ► Help Desk
  - ► Consultant
  - ► ...anything else that comes up!

Finding Zen

► Philosophies of Systems Administration
- Automate everything
- Document everything
- Communicate as much as possible
- Know your resources
- Know your users
- Know your business
- Security CANNOT be an afterthought
- Plan ahead
- Expect the unexpected

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► Covers essential system administration tasks as well as fundamental ideas that must be embraced

► Sometimes a bit philosophical

► "getting your feet wet"-type overviews of many areas of system administration

  ▪ In-depth discovery is left as an exercise for the reader

What We Cover

► Overview of system functions such as bootup and single-user modes
► Superuser / root / administrative powers
► Files, directories, permissions
► Processes and management
► Brief introduction to some essential tools (grep, awk, man, pipes, etc.)
► Networking
  ▪ Toplogies
  ▪ Subnetting of IP networks
► User and group management
► Automation
► Security
  ▪ Where do risks come from?
  ▪ How to mitigate and manage risks
► Iptables firewalls
► Guest lecture(s)
► Additional material as time and class interest permits