System Administration: An introduction

- What is a system administrator (SA)?
  - Anyone who manages a computer not solely for their own use.

- What are the goals of system administration?
  - Ensure that computing systems run correctly and as efficiently as possible
  - Ensure that all users can and do use the computing systems to carry out their required work in the easiest and most efficient manner.

Essential Tasks of SA

- Adding and removing users
- Adding and removing hardware
- Installing and upgrading software
- Performing backups
- Monitoring the system
- Troubleshooting
- Maintaining local documentation
- Auditing security
- Helping users

http://en.wikipedia.org/wiki/System_administration
Successful System Administration

- In the middle of all the tasks, how to make you AND the supported user satisfied?
  - You have the power to set up the system work the way you like
  - The user can ask for the way they want
- Need to find a balance between
  - Authority and responsibility
  - Service and cooperation

System Administration

- As a job, Systems Administration is
  - Fulfilling
  - Complex
  - Painful/annoying
  - Highly interactive
  - Employable and well paid
  - Thankless
Successful System Administration

- How to make each task go smoothly?
  - Plan ahead carefully
  - Follow the plan faithfully
  - Handle the unexpected problems wisely
    - Learn from the failures
    - Make a better plan next time

CASE #1 – what to plan

- Editing system configuration files.
  - Keep a copy before any change to the configuration file
    - Use suffix of .dist, .orig, .old, .sav, .yyymmdd, etc
    - Keep the current modification date
      - cp –p
  - Plan how to back up if the change didn’t work
    - System does not even boot
      - boot to single user mode and copy the old version back
  - Test the change on a non-production environment first
    - Eliminate the most obvious problems
  - Make one major change at a time
    - Make the test easier
CASE #2 – what could go wrong?

- FC7 upgrade in CS lab summer 2008
  - A team of SAs tested the FC7 for over 2 month before the upgrade
    - Lots of problems were found and fix
  - But still more problems in CS lab fall 2008 after the upgrade
    - Xserver freezes during logout
    - Tail does not support "tail +2", which make submit break
    - Periodically yp timeout for login and other commands
    - Submit failed twice after fixing "tail" problem
    - No email confirmation from wopr with submit
    - Firefox takes long time to start
    - User can not log in with NIS password after enabling the name service cache
    - Dr. Shene’s Thread program no longer working
    - Dr. Lowther’s program can not be compiled

How to handle problems

- Being able to diagnose and solve problems is an essential part of Systems Administration
  - Stay calm, breath
  - Find the cause of the problem
  - Fix the problem
How to prevent crises

- By carrying out all the things that you know you should be doing
  - such as
    - Change root password regularly
    - Faithfully perform backups (no matter how tedious)
    - Test every change several times
    - Check the syslog daily
    - Monitor the performance regularly
    - Stick to policies you’ve set
    - Set up failover devices/services
    - Apply OS updates

Ethics

- Systems Administration is a profession.
- It is a powerful profession.
- A Systems Administrator must be ethical
  - Respect private information
  - Do not abuse power
Finding resources

- Online resources
  - Vendor online Technical library
  - Search engines
  - Mailing lists.
  - Online forums.
- Printed resources
- Vendor support

Successful System Administration

- My personal experience of how to be a good, productive administrator:
  - Build a solid computer science background
    - Impossible to know everything
    - Try to be a fast learner
  - Be proactive and look ahead
    - ready and have the desire to learn
  - Accumulate and improve problem solving skills
  - Most importanly - Enjoy administration work!