

# System Administration Tasks

# User and Management

- useradd - Adds a new user account
- userdel - Deletes an existing account
- usermod - Modifies an existing account
- /etc/passwd contains user name, user ID #, home directory, login shell, etc. for each valid user.
- The actual users' passwords are kept encrypted in /etc/shadow, not /etc/passwd.

# Group Management

- `groupadd` - Adds a new group
- `groupdel` - Deletes an existing group
- `groupmod` - Modifies an existing group
- `/etc/group` contains group name, number, membership, and optional group password information.

# Filesystem Backups

- Need for system backups
  - Backups are needed in the event of
    - Hardware failure
    - Filesystem or file corruption
    - Accidental file deletion.
  - RAID does NOT eliminate the need for backups.
  - Ideally, systems would be backing up constantly.
  - Realistically, once per day is reasonable.

# Backup Media and Management Software

- While CD, DVD, and portable hard drives are all viable options, tape is generally the backup media of choice.
- Backup Management Systems
  - Incremental Backups
  - Commercial products
  - Amanda (Advanced Maryland Automatic Disk Archiver) from University of Maryland

# Backup Utilities

- tar - Tape Archiver
  - Backs up and restores files
  - Optional gzip compression
- cpio - Copy in/out
  - Backs up and restores files.
- dump - Backs up entire filesystems
  - dump's partner is restore

# tar

- tar is a very useful utility for backing up files, moving files around, or transferring files among \*nix computers.
- Many software packages are distributed in compressed tar format.

# tar options

- tar has many options, some of the most frequently-used are:
  - --help - displays tar command-line syntax
  - -c - Create a new archive
  - -x -Extract files from an archive
  - -f -Use the name of the following file as the file to work with, i.e. to “tar” to or extract from
  - -z - Use gzip compression

# Scheduling Tasks

- Cron Daemon, crond
  - crond - System service for scheduling periodic tasks.
  - Each user may create a file called a crontab (cron table) used to schedule periodic tasks.
    - /var/spool/cron
    - Cron emails the output of scheduled tasks to the user.
- Standard system cron directories
  - /etc/cron.hourly, /etc/cron.daily,
  - /etc/cron.weekly, /etc/cron.monthly

# crontab file

- A crontab contains 6 fields per line.
  - Minute
  - Hour
  - Day of month
  - Month
  - Day of week
  - Command
- An asterisk (\*) in any field matches all possible values.

# at command

- at is similar to cron but it runs a command once at a specified time instead of periodically.
- Typing “at” followed by a time and/or date puts the user into an interactive shell.
- At the “at>” prompt, you can specify the commands you want run at the time specified above.
- CTRL-d exits the at shell and schedules the tasks.
- at emails the output of the scheduled tasks to the user.

# System Reports

- vmstat
  - displays virtual memory statistics
- top
  - Displays system resource information
  - Displays top system tasks in terms of system resources
  - Also displays summary information about system resources (memory, cpu, etc.)

# More System Reports

- lsof - LiSt all Open Files
- lsof lists all files currently open on the system and the process associated with each.
- Open files listed by lsof include libraries, binary files, text files, network sockets, etc.

# Good System Admin Practices

- Choose good for passwords for administrative accounts.
  - No dictionary words, no common names.
  - Mix letters, numbers, and special characters.
  - Six characters minimum length.
- Check root's mailbox regularly, or forward root's mail to yourself at another account.
- Monitor system logs frequently.
  - logwatch

# System Logs

- /var/log - System log directory
- syslogd - System logging daemon
  - /etc/syslog.conf config file
- logrotate - Program run daily by crond to rotate system log files.
  - /etc/logrotate.conf config file
  - /etc/logrotate.d directory

# syslogd

- syslogd is the program responsible for the majority of system and application logging.
- Programmers code their programs to send logging messages to syslog, but where those messages actually end up is totally configurable by the system administrator.

# syslog.conf

- /etc/syslog.conf is syslogd's config file.
- Each line in syslog.conf consists of a facility, a priority, and destination(s).
  - The facility is one of:
    - auth, authpriv, cron, daemon, kern, lpr, mail, news, user, uucp, or local*n* where *n* is a number.
  - The priority is one of:
    - debug, info, notice, warning, err, crit, alert, emerg.
  - destination(s) is one of more files, hosts, or terminals to send the log message to.

# logrotate

- logrotate helps manage system logs
- logrotate's configuration scheme is similar to that of xinetd.
- Global configuration directives that affect logrotate itself or apply to all logs go in `/etc/logrotate.conf` / `/etc/logrotate.d`.
- Configuration directives for individual logs go in the individual files in `/etc/logrotate.d`.

# rpm

- rpm is the Redhat Package Manager
- rpm is used to install, uninstall, update, and manage packages under Redhat Linux and Fedora.
- Important Options to rpm
  - -qa lists all installed rpm packages
  - --rebuilddb rebuilds the local rpm database of package information.

# rpm

- Install, update, and uninstall options
  - -i installs packages
  - -F freshens packages
    - installs new version only if an older version exists
    - deletes old version
  - -U updates packages
    - installs new package
    - deletes old version if it exists.
  - -e uninstalls packages

# Disk Usage Information

- du reports disk usage for files and directories
  - du *<file or directory>*
  - du options
    - -k - Reports usage in Kilobytes
    - -s - Report total usage for directory tree, rather than usage for individual files.
- df lists mounted filesystems and usage
  - df options
    - -k - Reports usage in kilobytes
    - -i - Reports inode usage

# Text Utilities

- grep - Searches for strings in text or text files.
  - String patterns to search for are expressed as regular expressions
- awk - Pattern scanning utility
  - Can be used to break up lines of text.
- grep and awk are even more powerful text tools when used together.

# awk

- awk - pattern scanning tool
- Awk can be used to work with words within a line of text
- `awk {'print $n'}` prints the nth word in the line.
- `awk {'print $2 "=" print $1'}` prints the 2nd and 1st words in a line separated by '='

- **sort** - Text sorting utility
  - sorts lines of text
  - `sort -u` eliminates duplicates while sorting
- **wc** - Word or line counting utility
  - `wc` with no arguments displays line, word, and byte counts.
  - `wc -w` counts words
  - `wc -l` counts lines

# Text Paging Utilities

- more - Displays text one page at a time
  - RETURN advances one line
  - SPACE advances one page
  - '/' searches for a string
- less - alternative to more
  - More features than more