# Daemons and Cron

CIS 68C1

UNIX System Administration

# Daemons

- A **daemon** is a background process
  - Performs a specific system service
    - An NT service is similar
  - Some daemons …
    - are started at boot-time and run continuously
    - are started when needed, and die when completed
    - are started by the kernel
    - are kernel code dressed up to look like daemons
    - will fork themselves to run in the background

# Daemons

- init
  - The primary, critical system daemon
- Common system daemons
  - Paging daemon
    - Faults pages from disk into RAM as needed
  - Swapping daemon
    - Moves entire processes out to disk
  - Filesystem synchronization daemon
    - Flushes cached in-RAM disk blocks to disk

# Daemons

- inetd
  - Networking super-daemon
  - Starts individual daemons as needed
  - Listens for activity on TCP / UDP ports
  - Configuration files
    - /etc/inetd.conf on most systems
    - /etc/services lists TCP/UDP port name/number pairs
    - /etc/protocols lists protocol name/number pairs
    - /etc/rpc lists remote procedure call name/number pairs

# Daemons

- xinetd
  - Enhanced version of inetd
  - Used by Linux instead of inetd
  - Configuration files stored in directory /etc/xinetd.d
    - One file per service, TCP default protocol

```
# default: on
# description: The telnet server serves telnet sessions; it uses \
#       unencrypted username/password pairs for authentication.
service telnet
{
        disable         = no
        flags           = REUSE
        socket_type     = stream
        wait            = no
        user            = root
        server          = /usr/sbin/in.telnetd
        log_on_failure  += USERID
}
```

# Daemons

- NFS Daemons
  - nfsd
    - Serves NFS files
  - mountd
    - Handles NFS filesystem mount requests
  - lockd
    - Handles advisory locks
  - statd
    - Monitors status of NFS servers
  - biod
    - Caches NFS blocks – improves performance
    - read-ahead/write-behind

# Daemons

- Automount Daemons
  - automount
    - Automounter daemon for autofs-based systems
  - amd
    - AMD automounter daemon
- Time Synchronization Daemons
  - timed
  - xntp
- cron
  - Performs periodic, scheduled tasks for users

# Daemons

- NIS Daemons
  - ypbind
    - Locates NIS servers – runs on client and server
  - ypserv
    - Handles NIS queries – runs on all NIS servers
  - ypxfrd
    - Transfers NIS databases to slave servers
  - yppasswdd
    - Listens on master for yppasswd password change requests
  - rcp.nisd
    - Like ypserv, but for NIS+

# Daemons

- Internet Daemons
  - talkd
  - comsat
  - sendmail
  - snmpd
  - rwhod
  - ftpd
  - popper
  - imapd
  - rlogind
  - telnetd
  - rstatd
- Internet Daemons
  - ruserd
  - sshd
  - rshd
  - rexecd
  - rpc.rexd
  - routed
  - gated
  - named
  - syslogd
  - fingerd
  - httpd

# Daemons

- Boot and Configuration Daemons
  - dhcp
    - Dynamically provides IP, gateway, and name servers
  - bootpd
    - BOOTP daemon (precursor to DHCP)
  - tftpd
    - Trivial file transfer used for diskless booting
  - rarpd
    - Responds to reverse ARP requests
  - bootparamd
    - Assists booting of diskless clients

# Cron

- Cron
  - A daemon service that runs periodic jobs
  - Jobs specified in per-user configuration file – a **crontab**
  - The **crontab** configuration file
    - Lists one or more programs to run, and when to run them
    - One **crontab** file per user
  - The **crontab** program
    - The **crontab** program is used to schedule jobs listed in a user's **crontab** configuration file
    - Stores a copy of the user's crontab in its directory
      - Linux: /var/spool/cron

# Cron

- Crontab Format
  - Each line contains six fields, separated by whitespace
    - *minute hour day month weekday command*
  - Field specifications:

| **Field** | **Valid Values** |
|---|---|
| *minute* | 0-59 |
| *hour* | 0-23 |
| *day* | 1-31 |
| *month* | 1-12 |
| *weekday* | 0-6 (0 = Sunday) |
| *command* | The command to be run |

# Cron

- Crontab Format
  - Metacharacters
    - The * wildcard can be used to mean all values
    - Ranges can be specified using a dash
      - *x*-*y* means *x* through *y*, inclusively
    - Lists of values are separated with comma's
      - *x*,*y*,*z* means *x* and *y* and *z*
    - A comment line starts with the # character as the first character
      - Cannot be used within a line
  - Environment variables
    - A line may specify an environment variable setting
      - *variable = value*

# Cron

- Crontab Example

```
# Crontab format:
# Min   Hour   Day   Month   Weekday    Command
#
# Runs mycommand
#   every 30 minutes on Friday (weekday=5)
#   every 30 minutes on the 13th of the month
# (note: does not mean Friday the 13th)
0,30     *     13     *        5       mycommand
#
# Runs the backups command every Monday-Friday at 11:55pm
55       23      *     *       1-5      backups
```

# Cron

- The **crontab** Utility
  - The commands
    - **crontab *file***
      - Installs the crontab *file* into the system crontab directory
      - Schedules the entries within *file* to run
    - crontab –l
      - Lists the **crontab** for the current user
    - crontab –e
      - Edits and re-schedules a user's **crontab**
    - crontab –r
      - Removes a user's **crontab**

# Cron

- Crontab Management
  - /etc/cron.allow
    - If it exists, specifically allows **only** the listed users to run **crontab**
    - If it does not exist, everyone is allowed to run **crontab**
  - /etc/cron.deny
    - If it exists, the listed users are not allowed to run **crontab**
  - Editing these files do not affect existing crontabs or already scheduled jobs
    - The administrator must remove the desired crontabs either manually or by using crontab -r

# Cron

- System Jobs
  - The system maintains its own crontab entries to perform periodic tasks
    - **/etc/crontab**
    - **/etc/cron.d**
  - The entries often drive other, more specific shell scripts

```
# cat /etc/crontab
# run-parts
01 * * * * root run-parts /etc/cron.hourly
02 4 * * * root run-parts /etc/cron.daily
22 4 * * 0 root run-parts /etc/cron.weekly
42 4 1 * * root run-parts /etc/cron.monthly
```

# The Find Utility

- Find
  - A tool used frequently, especially for administrative tasks
  - Works recursively from a given directory
  - Performs some **action** on each files/directory that meets the specified **criteria**
  - Syntax:
    - find *paths expression*

      | | |
      |---|---|
      | *paths* | One or more directories in which to start the search |
      | *expression* | The list of criteria and actions |

  - Default action is to **print** the path of the current file

# The Find Utility

- Find Example
  - find / -name bogus –print
    - Outputs the path of all files under **/** that are named **bogus**
  - find /etc -ctime –1 –print
    - Outputs the path of all files under **/etc** who's status has changed in the past 24 hours
  - find / –name .nfs* –exec rm {} \;
    - Finds and removes all files under / whose names start with .nfs
    - **{}** is replaced by the current file that find is working on
    - The **;** ends the command argument to the exec command
    - The ***** and **;** must be escaped to protect them from the shell