

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
<i>minute</i>	0-59
<i>hour</i>	0-23
<i>day</i>	1-31
<i>month</i>	1-12
<i>weekday</i>	0-6 (0 = Sunday)
<i>command</i>	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