CST8177 – Linux II

booting, services, SysVinit
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Today's Topics

- midterm
- more booting
- SysVinit
- services

Booting Sequence (CentOS)

- Power button pressed
- BIOS
- POST
- MBR : contains grub stage 1
- grub stage 1 : to find grub stage 2
- grub stage 2 : to launch kernel
- kernel running
- init process (PID 1) : consults inittab
- /etc/inittab
- /etc/init.d/rc.sysinit
- /etc/rc.d/rc 3   :   assuming default runlevel 3

/etc/inittab

- /etc/inittab contains records of the form
  - id:runlevels:action:process
  - id: identifies an entry
  - runlevels: the runlevels in which the action should be taken
  - action: the action that should be taken
  - process: the process to be executed

/etc/inittab (cont'd)

- Some of the possible Actions:
  - respawn: process to be restarted whenever it terminates
  - wait: process to be started once, and init will wait for its termination
  - once: process executed once upon entering runlevel
  - boot: executed during system boot (runlevels ignored)
  - bootwait: executed during system boot, and init waits for its termination (runlevels ignored)
  - initdefault: runlevel to be entered on system boot (process ignored)
  - sysinit: executed before any boot or bootwait (runlevels ignored)

CentOS /etc/inittab

- id:3:initdefault:
- si::sysinit:/etc/rc.d/rc.sysinit
- l0:0:wait:/etc/rc.d/rc 0
- l1:1:wait:/etc/rc.d/rc 1
- l2:2:wait:/etc/rc.d/rc 2
- l3:3:wait:/etc/rc.d/rc 3
- l4:4:wait:/etc/rc.d/rc 4
- l5:5:wait:/etc/rc.d/rc 5
- l6:6:wait:/etc/rc.d/rc 6

gettys and xdm

- # consoles: virtual consoles CTRL-ALT-F(1-6)
- 1:2345:respawn:/sbin/mingetty tty1
- 2:2345:respawn:/sbin/mingetty tty2
- 3:2345:respawn:/sbin/mingetty tty3
- 4:2345:respawn:/sbin/mingetty tty4
- 5:2345:respawn:/sbin/mingetty tty5
- 6:2345:respawn:/sbin/mingetty tty6
- # the X display manager (GUI)
- x:5:respawn:/etc/X11/prefdm -nodaemon

When booting

- ▸ # default runlevel 3
- ▸ /etc/init.d/rc.sysinit
- ▸ /etc/init.d/rc 3

SysVinit scripts

- /etc/init.d/*
  - these are scripts for starting, stopping, restarting services
- /etc/rc.d/rc.N.d/*   #where N is a runlevel
  - these are symbolic links to service's script
  - begins with K means service should not be running in that runlevel: call it with "stop" argument
  - begins with S means service should be running in that runlevel: call it with "start" argument
- chkconfig maintains these scripts

chkconfig

- all /etc/init.d/* scripts manageable by chkconfig have two or more commented lines
- first tells chkconfig what runlevels, and start and stop priority
- runlevels is "-" if by default should not be started in any runlevel
- second is a description
- For example: /etc/init.d/ntpd
- # chkconfig: - 58 74
- # description: ntpd is the NTPv4 daemon. \
- # The Network ....

/etc/rc.d/rcN.d/*

- The `/etc/rc.d/rcN.d/` (N=0,1,2,3,4,5,6) directories contain symbolic links to scripts in `/etc/init.d`
- These links are maintained by chkconfig
- Upon entering runlevel 3 (for example):
  - each `/etc/rc3.d/K*` script is called with "stop" (if that service is running)
  - each `/etc/rc3.d/S*` script is called with "start" (if that service is not running)
  - The ordering of the scripts is given by the chkconfig priority, which is a number in the symlink name, that orders the scripts

/etc/rc.d/rcN.d/* (cont'd)

- example /etc/rc3.d/S03vmware-tools
  - vmware-tools is configured to run in runlevel 3
    - otherwise, there would be a K99-vmware-tools script there instead
  - 03 is the priority of starting vmware-tools service when entering that run level
- This is a symlink to /etc/init.d/vmware-tools

service – run a System V init script

- service SCRIPT COMMAND [OPTIONS]
- SCRIPT is /etc/init.d/SCRIPT
- COMMAND is an argument to the script
  - start
  - stop
  - restart
  - *etc*
  - start and stop must be recognized by SCRIPT
- Example: service ntpd start
  - same effect as /etc/init.d/ntpd start
- Example: service ntpd stop
  - same effect as /etc/init.d/ntpd stop