[Linux Booting Process](http://shabbathster.blogspot.com/2013/09/linux-booting-process.html)

                                 ## BOOTING-PROCESS##  
                               ###########################  
  
#Part I:-  
########  
  
--> When we Power on the system and the power is stabilized, we get the power boat signal, In pc, this location is in the BIOS (Basic Input output system) which is stored in flash memory on the motherboard.  
  
-> After getting the power boat signal the main task of bios is to perform POST, i.e Power On self-test.  In this it will check that wether this components are working properly or not.  
  
-> After doing post the next task of the BIOS is to search for the boot sequence order to load boot loader which is call as boot strap loader.  A boot device can be a floppy disk, a CD-ROM, a partition on a Hard Disk. or even USB flash memory stick.  
  
  
BIOS Ist stage boot loader:-  
###############################  
  
  If the Hard Disk is selected as boot device then the BIOS will search for MBR in sector 1 of cylinder 0, Head 0 location, here the control of BIOS GOES TO MBR when MBR is loaded into RAM.  
  
  
  MBR is divided into 3 sections  
------------------------------------  
                   MBR 512 Bytes  
          ---------------------------------------------------------------------  
         |                                 |                                   |  
          
  
BS(Boot Sector 446)                     PT(PARTITION TABLE 64)               MAGIC KEY(2)  
         |  
BL(BOOT LOADER)                   INFORMATION ABOUT PRIMARY PARTIn.        INFORMATION ABOUT ACTIV                                                                                                                                                                                        E PARTIn.  
         |                        & Size allocated is 16 bytes for  
                                  Primary Partition. Only four Primary  
LILO              GRUB            Partition can Created.                     
/etc/lilo.conf   /etc.grub.conf  
config file      config file  
  
LILO = LINUX LOADER  
GRUB = GRUB UNIFIED BOOT LOADER           
  
  
  
  
  
  
In short the first stage boot loader has one purpose to load the 2nd stage Boot Loader  
[hd0,0) = hd0 is Hard Disk Number & 0 is Partition Number  
tracking information from cat /boot/grub/device.map --- give how much hard drives are there.  
  
## 1st Stage Boot Loader to 2ND STAGE BOOT LOADER:-  
######################################################  
  
            BL  
            |  
        -----------              
   |                |   
  LILO             GRUB  
  
In this it display (MBR) a list of available kernel which is defined in '/etc/gurb.conf' file.  
  
  
# 2nd STAGE BOOT LOADER TO KERNEL:-  
######################################  
  
   In this Kernel takes control of 2nd stage Boot Loader.  It mount the Root File System and Loader /sbin/init because of this /sbin/init system gets initialize & then it loads /etc/inittab  
  
  
----------------------------------------------------------------------------------------------------------------------  
  
  
##########PART II############  
###############################  
  
-> Kernel executes 'etc/inittab' means it reads that file on which it first check the runlevel.  
  
-> After checking runlevel kernel executes the next /etc/rc.d/rc.sysinit in a subshell of inittab shell and executes all the conten  of tis sysinit file.  
  
-> '/etc/rc.d/rc.sysinit' sets global umask, set global path, set up the  Networking subsystem and checks the hostname and basically start the System Daemon.  
  
-> All the above information are present in /etc/sysconfig/network  and execute 17 function from /etc/init.d/ functions.  It is a shell script file.   As below:  
  
1) Action  
2) Checkpid  
3) Confirm  
4) Doemon  
5) Echo Failure  
6) Echo Passwd  
7) Echo Success  
8) Echo Warning  
9) Failure  
10) Killproc  
11) passed  
12) PidfileofProc  
13) Pid of Proc  
14) Status  
15) Strstr  
16) Sucess  
17) Warning  
  
After the 17 Function Kernel displays the "Welcome to Red Hat..." from /etc/redhat-relase file'  
  
--> then mounts the local file system from /etc/fstab, here rc.sysinit over & kernel come back to init file.  
  
----> then starts different daemons...  
  
----------------------------------------------------------------------------------------------------------------------  
  
  
  
##### PART3#########  
###########################  
  
  
->After starting daemons in a specific runlevel, init daemon will come back to /etc/inittab file.   
Then init daemon will call /sbin/mingetty daemon.  
  
# getty:- It is a program that opens a tty port, prompts for a login name & runs the /bin/login command.  
  
  
->Mingetty doeman will read & display contenits of /etc/issue file.  In this files some magic keys are given which are taken from man mingetty"  
  
1:2345: respawn: /sbin/mingetty tty1  
  
This line says tht mingeety is called only on runlevel 2,3,4,5  
"respawn" --> if you try to kill migeety again it will regenerate that daemon.  
  
-> Mingetty demon will then call /bin/login.  When user enters a username, login will call /usr/bin/passwd & user enters a password.  By entering right credentails user in authenticated.  After user authentic, login daemon will hand over the control to mngetty daemon.  Then mingetty will search for  
         "/.hushlogin" file in user home directro.  If file is not present in users home directroy, then it will display contents of :  
  
-> lastlog\*  
-> /etc/motd/file  
-> /var/spool/mail/$USER  (is there any mail for a user or not)  
.bashrc -> is only used when u start bash as a non-login shell,  
bash\_profile-> whenever is start bash as a login shell  
  
Eg: you have a new mail in /var/spool/mail/  
  
After this mingetty will go to ram and bash will come into picture.  
Bash will own some of global & local configuration files related with users.  
  
 --> Start of /etc/profile(contain system startup program)  
--> end of /etc/profile  
--> start of bash\_profile  
--> start of /etc/bashrc  
--> start of .bashrc  
 --> end o f /etc/bashrc  
--> end of .bashrc  
--> end of bash\_profile  
  
   When user will logout if will read " ~/.bash\_logout" file  
  
/bin/login  
/user/bin/passwd  
  
 For the passwd =>grub -md5-crypt  
vim /etc/grup.conf  
  
ls /root/.hushlogin  
ls /home/user/.hushlogin  
  
display  user information  
lastlog  
vi /etc/motd  
/var/spool/mail/$user

============================================================================🡺>

# [Linux Boot](http://shabbathster.blogspot.com/2013/09/linux-boot.html)

POWERON  
 |  
 BIOS  
 |   
 POST -- POWERON SELF TEST  
 |  
 Boot Strap Loader  
 |  
 boot Seq order  
 |  
 [CDROM]  
 [FDD]  
 [HDD]  
 |  
 MBR  --> 512 bytes  
 |   
BS   :- Boot Sector\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
             |   |     |  
            BS(446) PT(64) MAGIC KEY(2)  
    |  
    BL (BootLoader)  
    |   
 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
        | |  
 LILO or GRUB  
LILO :- Linux Loader  
GRUB :- Grand Unified Boot Loader  
/etc/lilo.conf /etc/grub.conf  
 |   
 After the kernel is extracted  
 |  
 INIT is known as father of all process INIT (binary) --- PID is 1  
 |  
     /etc/inittab  
 |  
 id:3:initdefault: --> /etc/inittab  
 |     
 /etc/rc.d/rc.sysinit --> /etc/init.d/function  
 |  
 /etc/rc.d/rc3.d ---> will run if it is specified in                        inittab file    
   
-------------------------------------------------------------------------------  
  
 -: Boot Loader :-  
  
  
/boot/grub/grub.conf   ---->  /etc/grub.conf  
  
#ls -l /boot/grub/grub.conf  
-rw------- 1 root root 652 Aug 11 00:12 /boot/grub/grub.conf  
  
#ls -l /etc/grub.conf  
lrwxrwxrwx 1 root root 22 Jun 29 04:14 /etc/grub.conf -> ../boot/grub/grub.conf  
  
----------------->>  Sample file of grub.conf  <<--------------------------- p="">  
# grub.conf generated by anaconda  
#  
# Note that you do not have to rerun grub after making changes to this file  
# NOTICE:  You have a /boot partition.  This means that  
#          all kernel and initrd paths are relative to /boot/, eg.  
#          root (hd0,2)  
#          kernel /vmlinuz-version ro root=/dev/sda4  
#          initrd /initrd-version.img  
#boot=/dev/sda  
default=1  
timeout=15  
splashimage=(hd0,2)/grub/splash.xpm.gz  
hiddenmenu  
title Red Hat Enterprise Linux Server (2.6.18-92.el5)  
        root (hd0,2)  
        kernel /vmlinuz-2.6.18-92.el5 ro root=LABEL=/ rhgb quiet  
        initrd /initrd-2.6.18-92.el5.img  
title Windows XP  
        rootnoverify (hd0,0)  
        chainloader +1  
             
-------------------------------------------------------------------------------------  
  
  
  
  
 Daemons --> Greek word means [helper/servant/server]  
  
Linux/Unix --- Daemons     
Microsoft  --- TSR [Terminate & Stay Resident Program]  
   
 Daemons  
   |  
 ---------------------   
 |      |   
                Application      System [Kernel threads]   
  
System Daemons      | Application Daemons    | Process  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     |   |   
Simlarity :-     
1> All are exec   
2> All come in RAM  
3> All come into RAM & they get PID    
     |   |  
=============================================================================  
Disimlarity      |   |   
     |   |  
Starts / Stops      |     I Starts / Stops    |   I start but stops auto  
Auto     |    no effect on system    |    e.g ls command  
any tricks will     |   |   
crash the system    |   |  
             |       |                      =============================================================================  
   
 Managing Application Daemons  
   
 Application Daemons    
 \_\_\_\_\_\_\_\_\_\_\_\_|\_\_\_\_\_\_\_\_\_\_\_  
 |        |  
            Independent     Dependent (xinetd)    
   
To find which daemons are independent or dependent the command is :--  
  
# chkconfig --list | less   ---> [To list all deamons]  
  
amd             0:off 1:off 2:off 3:off 4:off 5:off 6:off  
ypserv          0:off 1:off 2:off 3:off 4:off 5:off 6:off  
gpm          0:off 1:off 2:off 3:off 4:off 5:off 6:off  
dc\_server       0:off 1:off 2:off 3:off 4:off 5:off 6:off  
mysqld          0:off 1:off 2:off 3:off 4:off 5:off 6:off  
bgpd            0:off 1:off 2:off 3:off 4:off 5:off 6:off  
xinetd based services:  
 echo: off  
 swat: off  
 amanda: off  
 telnet: off  
 finger: off  
  
# chkconfig --list gpm   ---> [To list details about one appln daemon]  
gpm             0:off   1:off   2:on    3:on    4:on    5:on    6:off  
  
To find out machine is running in which current runlevel the command is -  
# runlevel  
N 3   
  
N --> N or 3/5 means previous runlevel  
3 --> current runlevel  
  
How daemons can be control ?  
  
chkconfig [--level ]   
  
# chkconfig --level 35 gpm on  
# chkconfig --level 3 gpm on  
# chkconfig --level 3 gpm off  
# chkconfig --level 3 gpm reset  
  
# ntsysv  (To manage for current run level)  
# ntsysv --level 35  
  
To start daemons immediately use following command --  
# service start  
# service stop  
# service restart  
# service status  
  
   For example : -  
# service gpm stop  
# service gpm start  
# service gpm restart  
# service gpm status  
  
#/etc/init.d/gpm restart  
#/etc/init.d/gpm stop  
#/etc/init.d/gpm start  
#/etc/init.d/gpm status  
  
#/etc/rc.d/rc3.d/S85gpm restart  
#/etc/rc.d/rc3.d/S85gpm start  
#/etc/rc.d/rc3.d/S85gpm stop  
#/etc/rc.d/rc3.d/S85gpm status  
  
To manage service graphically  
Note :- Use terminal to run a command  
  
#system-config-services  
  
Note :- Remember above command starts daemons  
only on next reboot or if you switch your runlevel  
by using e.g init 3 / init 5 command  
  
# Trap CTRL-ALT-DELETE    ----> /etc/inittab  
ca::ctrlaltdel:/sbin/shutdown -t3 -r now  
  
If you are UPS then do next part -->  
  
pf::powerfail:/sbin/shutdown -f -h +2 "Power Failure; System Shutting Down"  
  
pr:12345:powerokwait:/sbin/shutdown -c "Power Restored; Shutdown Cancelled"  
  
#shutdown  
Usage:    shutdown [-akrhfnc] [-t secs] time [warning message]  
                  -a:      use /etc/shutdown.allow  
                  -k:      don't really shutdown, only warn.  
                  -r:      reboot after shutdown.  
                  -h:      halt after shutdown.  
                  -f:      do a 'fast' reboot (skip fsck).  
                  -F:      Force fsck on reboot.  
                  -n:      do not go through "init" but go down real fast.  
                  -c:      cancel a running shutdown.  
                  -t secs: delay between warning and kill signal.  
                  \*\* the "time" argument is mandatory! (try "now") \*\*  
  
  
1:2345:respawn:/sbin/mingetty tty1  
 |  
     /etc/issue ---> /etc/issue.net (from network)   
 |  
. If Runlevel 5, then script "prefdm" is executed..  
     
 NOW INITTAB IS OVER  
  
Note:  
      What is a getty? [RHL has agetty\*   [Alternate Linux getty]  
                                mgetty\*   [Modem getty]  
                                mingetty\* [Minimal getty]  
  
      A getty is a program that opens a tty port, prompts for a login name,  
      and runs the /bin/login command. It is normally invoked by init.  
  
      The mingetty daemon is used to listen for virtual consoles  
      (like the 6 that run by default with your keyboard and monitor)  
      and cannot be used to handle serial lines  
  
      You will need to configure agetty or mgetty to listen on the serial ports,      because they are capable of responding to input on physical serial ports.  
  
    h.  The first mingetty [awake one] loads dev drv /dev/tty1  
        \* execs /etc/issue [Magic cookies Allowed: man uname  / man mingetty]  
 |  
 \* mingetty then executes the /bin/login process  
   and is then put in to sleep state by init  
   
 \* /bin/login displays login. You login!  
         
 \* /bin/login execs /usr/bin/passwd which challenges for passwd from  
   user which then does authentication and authorization using PAM  
         
 \* init then puts the login daemon into sleep state, wakes up  
   mingetty which now takes over   
         
 \* mingetty checks for .hushlogin in $HOME/$USER  
   
      If $HOME/.hushlogin DOES NOT EXISTS  
      then it does the foll :  
       
         - execs lastlog\* -u $USER using /var/log/lastlog  
                - execs /etc/motd  
         - checks users mail, if any, in /var/spool/mail/$USER  
   
        \* init then wakes /bin/login process  
         
 \* mingetty then goes into zombie state and is killed by init  
         
 \* login then loads /bin/bash as a monitored child process     
         
 \* /bin/bash takes over and login goes into sleep state  
   
        \* Execs /etc/profile    Sets system-wide ENV variables Global Profile  
                    
    exec /etc/inputrc  Sets keyb mappings  [See stty -a]  
                       Show Terminal characteristics  
  
                          eg # stty intr ^g   --> Keyboard mapping  
      # stty -echo     --> Terminal Characteristics  
  
   eg /etc/inputrc See man bash - /bell-style  
      ============  
      set bell-style [audible] [none] [visible]  
      set disable-completion [off] on  
  
      To do it per-user:  
      =================  
      setterm -blength 0 [in per user .bash\_profile]  
      or  
      xset b off [in GUI]  
                      [bash -r, --noediting as args in /etc/passwd  
                  7th field]  
   
mount -t vfat /dev/hda7 /mnt/c  
mount -t vfat /dev/hda7 /mnt/c  
mount -t vfat /dev/hda7 /mnt/c  
mount -t vfat /dev/hda7 /mnt/c  
mount -t vfat /dev/hda7 /mnt/c  
mount -t vfat /dev/hda7 /mnt/c