The Geek Stuff

≡ Menu

- Home
- Free eBook
- Start Here
- Contact
- About

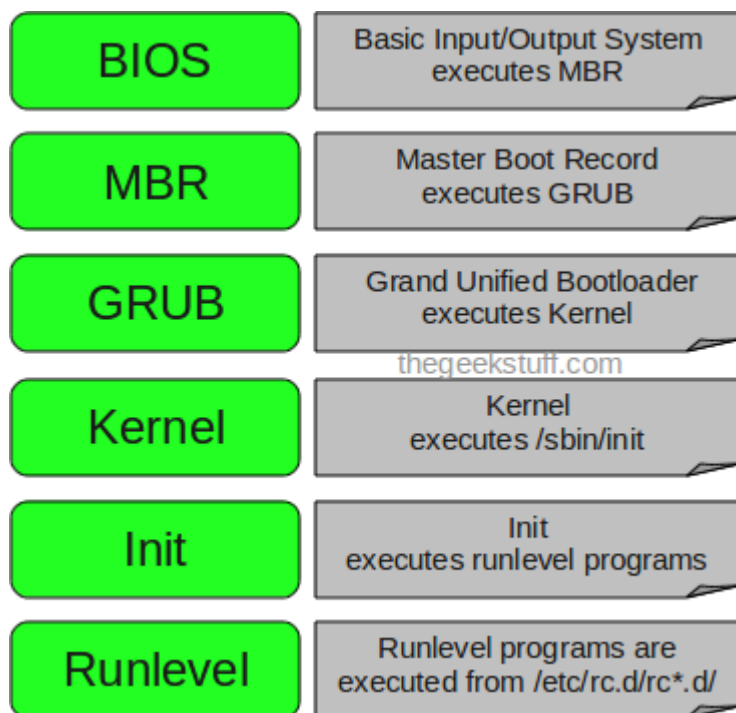# 6 Stages of Linux Boot Process (Startup Sequence)

by Ramesh Natarajan on February 7, 2011

Press the power button on your system, and after few moments you see the Linux login prompt.

Have you ever wondered what happens behind the scenes from the time you press the power button until the Linux login prompt appears?

The following are the 6 high level stages of a typical Linux boot process.

BIOS	Basic Input/Output System executes MBR
MBR	Master Boot Record executes GRUB
GRUB	Grand Unified Bootloader executes Kernel
Kernel	Kernel executes /sbin/init
Init	Init executes runlevel programs
Runlevel	Runlevel programs are executed from /etc/rc.d/rc*.d/

thegeekstuff.com

1. BIOS

- BIOS stands for Basic Input/Output System
- Performs some system integrity checks
- Searches, loads, and executes the boot loader program.
- It looks for boot loader in floppy, cd-rom, or hard drive. You can press a key (typically F12 of F2, but it depends on your system) during the BIOS startup to change the boot sequence.
- Once the boot loader program is detected and loaded into the memory, BIOS gives the control to it.
- So, in simple terms BIOS loads and executes the MBR boot loader.

2. MBR

- MBR stands for Master Boot Record.
- It is located in the 1st sector of the bootable disk. Typically /dev/hda, or /dev/sda
- MBR is less than 512 bytes in size. This has three components 1) primary boot loader info in 1st 446 bytes 2) partition table info in next 64 bytes 3) mbr validation check in last 2 bytes.
- It contains information about GRUB (or LILO in old systems).
- So, in simple terms MBR loads and executes the GRUB boot loader.

3. GRUB

- GRUB stands for Grand Unified Bootloader.
- If you have multiple kernel images installed on your system, you can choose which one to be executed.
- GRUB displays a splash screen, waits for few seconds, if you don't enter anything, it loads the default kernel image as specified in the grub configuration file.
- GRUB has the knowledge of the filesystem (the older Linux loader LILO didn't understand filesystem).
- Grub configuration file is /boot/grub/grub.conf (/etc/grub.conf is a link to this). The following is sample grub.conf of CentOS.

```
#boot=/dev/sda
default=0
timeout=5
splashimage=(hd0,0)/boot/grub/splash.xpm.gz
hiddenmenu
title CentOS (2.6.18-194.el5PAE)
        root (hd0,0)
        kernel /boot/vmlinuz-2.6.18-194.el5PAE ro root=LABEL=/
        initrd /boot/initrd-2.6.18-194.el5PAE.img
```

- As you notice from the above info, it contains kernel and initrd image.
- So, in simple terms GRUB just loads and executes Kernel and initrd images.

4. Kernel

- Mounts the root file system as specified in the "root=" in grub.conf
- Kernel executes the /sbin/init program
- Since init was the 1st program to be executed by Linux Kernel, it has the process id (PID) of 1. Do a 'ps -ef | grep init' and check the pid.
- initrd stands for Initial RAM Disk.
- initrd is used by kernel as temporary root file system until kernel is booted and the real root file system is mounted. It also contains necessary drivers compiled inside, which helps it to access the hard drive partitions, and other hardware.

5. Init

- Looks at the /etc/inittab file to decide the Linux run level.
- Following are the available run levels

- 0 – halt
- 1 – Single user mode
- 2 – Multiuser, without NFS
- 3 – Full multiuser mode
- 4 – unused
- 5 – X11
- 6 – reboot
- Init identifies the default initlevel from /etc/inittab and uses that to load all appropriate program.
- Execute 'grep initdefault /etc/inittab' on your system to identify the default run level
- If you want to get into trouble, you can set the default run level to 0 or 6. Since you know what 0 and 6 means, probably you might not do that.
- Typically you would set the default run level to either 3 or 5.

6. Runlevel programs

- When the Linux system is booting up, you might see various services getting started. For example, it might say "starting sendmail …. OK". Those are the runlevel programs, executed from the run level directory as defined by your run level.
- Depending on your default init level setting, the system will execute the programs from one of the following directories.
  - Run level 0 – /etc/rc.d/rc0.d/
  - Run level 1 – /etc/rc.d/rc1.d/
  - Run level 2 – /etc/rc.d/rc2.d/
  - Run level 3 – /etc/rc.d/rc3.d/
  - Run level 4 – /etc/rc.d/rc4.d/
  - Run level 5 – /etc/rc.d/rc5.d/
  - Run level 6 – /etc/rc.d/rc6.d/
- Please note that there are also symbolic links available for these directory under /etc directly. So, /etc/rc0.d is linked to /etc/rc.d/rc0.d.
- Under the /etc/rc.d/rc*.d/ directories, you would see programs that start with S and K.
- Programs starts with S are used during startup. S for startup.
- Programs starts with K are used during shutdown. K for kill.
- There are numbers right next to S and K in the program names. Those are the sequence number in which the programs should be started or killed.
- For example, S12syslog is to start the syslog deamon, which has the sequence number of 12. S80sendmail is to start the sendmail daemon, which has the sequence number of 80. So, syslog program will be started before sendmail.

There you have it. That is what happens during the Linux boot process.

> [Add your comment](#)

If you enjoyed this article, you might also like..

1. [50 Linux Sysadmin Tutorials](#)
2. [50 Most Frequently Used Linux Commands (With Examples)](#)
3. [Top 25 Best Linux Performance Monitoring and Debugging Tools](#)
4. [Mommy, I found it! – 15 Practical Linux Find Command Examples](#)

- [Awk Introduction – 7 Awk Print Examples](#)
- [Advanced Sed Substitution Examples](#)
- [8 Essential Vim Editor Navigation Fundamentals](#)
- [25 Most Frequently Used Linux IPTables Rules Examples](#)
- [Turbocharge PuTTY with 12 Powerful Add-Ons](#)

5. [Linux 101 Hacks 2nd Edition eBook](#)
   Linux 101 Hacks Book

Bash 101 Hacks Book Sed and Awk 101 Hacks Book Nagios Core 3 Book Vim 101 Hacks Book

Tagged as: [Debian Boot Process](#), [Fedora Boot Process](#), [Linux Kernel Boot Process](#), [Ubuntu Boot Process](#), [UNIX Boot Process](#)

{ 160 comments… [add one](#) }

- Pushpraj February 7, 2011, 1:11 am

  Excellent……!!! 2011 seems to be rocking for TGS viewers….

  [Link](#)

- BalaC February 7, 2011, 2:53 am

  @Ramesh: This is offtopic discussion. Could you write a article on [ack](#). Thanks

  [Link](#)

- shezars February 7, 2011, 4:02 am

  you are rock,,, lol
  nice,

  [Link](#)

- Adam February 7, 2011, 4:20 am

  Great article :)
  You could also write few words about grub2 – configuration files for grub doesn't work in grub2. (Tested in ubuntu)

  [Link](#)

- Edward February 7, 2011, 4:30 am

  very very nice,

  tanx

  [Link](#)

- Ajeya February 7, 2011, 4:58 am

  Hello Ramesh,

  It would have been better if if you could have explained more on each topic. Probably each high level boot process would need a separate page.

  This doc is good for begineers.

  Thanks,
  Ajeya Krishna K R

  [Link](#)

- Abhijeet February 7, 2011, 5:02 am

Good Graphics
Great Tutorial

Keep it up

[Link](#)

- sagar February 7, 2011, 5:36 am

  nice piece of information
  thanks lot

  [Link](#)

- sandeep February 7, 2011, 6:38 am

  Amazinggggggg good job Guys carry on

  [Link](#)

- jameslee February 7, 2011, 6:56 am

  Thank u…

  [Link](#)

- Kuldeep February 7, 2011, 8:09 am

  very well explained !!!!!!!!
  Thanx alot…..

  plz explain GRUB in detail…….How to use GRUB command prompt at system startup ??

  [Link](#)

- Kyle February 7, 2011, 11:02 am

  These are very helpful. Keep 'em coming please!

  [Link](#)

- Yogesh Upadhyay February 7, 2011, 1:22 pm

  Excellent !!! TGS Rocks…

  [Link](#)

- shanil February 7, 2011, 2:08 pm

  thanks alot, just in time to futher clarify things lol..As always, TGS rocks!!!

  [Link](#)

- Júlio Hoffimann Mendes February 7, 2011, 8:15 pm

  I learn to much with your blog. Thank you.

  Regards,
  Júlio.

  [Link](#)

- Steeven Paul Y February 7, 2011, 10:04 pm

I know the terms GRUB, KERNEL,INIT, MBR. But i do not know how they work together. Thanks to Ramesh Natarajan, for his blog and useful posts.

Link
- Lord February 8, 2011, 12:42 am

Thank you RAMESH. this was so good…

Link
- analogtek February 8, 2011, 1:01 am

The file that most would want is. The menu.list that is in the /boot/grub/ directory on my debian system. I often edit this file for a manual kernel update,time out,boot image change.

Link
- Suresh.G February 8, 2011, 2:33 am

Short and Sweet

Link
- Sameer Ambekar February 8, 2011, 8:03 am

Really nice document for quick reference to Linux boot process!!!

Link
- afujita February 8, 2011, 8:09 pm

Great article, thank you :)

Link
- Renjith G February 10, 2011, 1:45 am

Good one. Thanks.

Link
- Mohan February 11, 2011, 10:25 am

plz explain about how to configure zimbra mail server and how to migrate sendmail to zimbra

Link
- Roberto February 11, 2011, 6:17 pm

An excelent article, I see another great article here.

Link
- Hem Chander March 1, 2011, 2:57 pm

This is very helpful I was looking for similar one..thanks

Link
- Pablo March 7, 2011, 10:16 am

Great article Ramesh! But is not completely valid for Ubuntu, which use upstart. Nothing on /etc/inittab, for eg.

Link

- Sameer June 7, 2011, 7:07 am

  Good doc.
  Thanks

  Link
- Verbila June 21, 2011, 5:44 pm

  Love this site, your explanations are excellent, and I like how you define terms and acronyms. Sometimes a man page can make my head spin – your site is the antidote to that – thanks!!

  Link
- ethaqer July 4, 2011, 8:50 pm

  the best explanation ever …

  thanks TGS

  Link
- robin July 7, 2011, 1:30 am

  How many times did i ask myself how to find out order of linuxs' start ?
  when this time i saw your blog via TSG, i see thoroughly.

  thanks a million

  Best Regards
  Robin Guo

  Link
- Senthilkumar July 29, 2011, 12:38 am

  Awesome !! For beginners helped a lot..

  Link
- D VIjay August 11, 2011, 5:48 am

  Excellent, in detail and simple. Thanks very much

  Link
- karthick September 4, 2011, 2:14 am

  Actaully i have failed in my first interview for not answering the above question,but after reading the above answer.i ensure i will get success.its really gud explanation,especially beginners lyk me.Thanks a lot

  Link
- dulanja September 19, 2011, 1:11 am

  great article! very useful! thanks a lot.

  Link
- R.YADAV September 30, 2011, 2:52 am

  really…….my total confuse remove after read this article.Thank you………….

Link

- Gregory October 7, 2011, 2:35 am

  Are you sure that "Depending on your default init level setting, the system will execute the programs from one of the following directories." ?
  For example my system is running on level 3 but executes VERITAS init scripts from rc2.d during the boot as well.

  Link
- Arun October 15, 2011, 8:13 am

  Very Nice.

  Link
- rajesh October 20, 2011, 10:02 pm

  Excellent !!!!!!!!!!!!!!!!!!!!!
  Enough detail and simple .
  Thanks very much

  Best regard,
  rajesh

  Link
- ender October 21, 2011, 1:20 am

  good work fine to know how linux boot and the basic's of the init run level's only by ubuntu you have init s (single user) and init u (re run init) as extra

  Link
- evaa November 12, 2011, 9:12 pm

  wow, your explaination is simple yet full with information
  very helpful ! <3

  Link
- brijesh November 19, 2011, 2:49 pm

  greate usefull

  Link
- Ketan November 30, 2011, 1:34 pm

  I am flabbergasted.. I have made automation on these parts on S and K .,.. It was too Easy to understand this.. The person who post this.. is really a cool techie.. U rock man..

  Link
- hossein January 2, 2012, 12:06 am

  That was very useful information.
  Thanks.

  Link
- NARESH January 17, 2012, 9:45 pm

  Excellent. keep it up..

Link
- Arun January 24, 2012, 9:52 pm

  Nice. Very useful

  Link
- Omkar January 27, 2012, 9:32 am

  short and sweet and precise explanation

  Link
- Anonymous February 3, 2012, 3:53 am

  very good material and easy to understand …great work

  Link
- 54nju1 February 19, 2012, 1:59 pm

  Thanks dude, that was so helpful..

  Link
- subhash March 13, 2012, 8:27 am

  it's very nice material…..i like it……..superb ………

  Link
- sandeep samale March 21, 2012, 9:37 pm

  HI this is very very useful information as interview point of view as well as for study how Linux boots.
  Great info Thank you very much Ramesh

  Link
- Anuj April 12, 2012, 9:28 am

  Great and brief doc for Linux boot process. I truly liked it!!!

  Link
- Ravi May 4, 2012, 11:05 pm

  Thanx

  Link
- Deepika May 9, 2012, 11:03 pm

  Superb article with detailed information.

  Link
- Deepak May 14, 2012, 11:11 am

  It is very nice article :)

  Link
- divya May 21, 2012, 5:19 am

  how to create kickstart server in rhel 6.0

Link
- sasidharan May 25, 2012, 4:54 am

  Excellent stuff from TGS!!!

  Link
- Anand June 3, 2012, 1:41 pm

  gr8 article , got a lot of other info while reading this awesome stuff, thx alot

  Link
- Sumen June 22, 2012, 5:09 am

  Great…very well explained…

  Link
- VIKAS June 26, 2012, 5:15 am

  Very nice, very neatly explained.

  Link
- Saravana Kumar July 12, 2012, 2:18 am

  Keep on the work going

  Link
- Kuldeep Kulkarni July 14, 2012, 1:58 pm

  Nice Stuff !!

  Thanks a lot !!

  Link
- Rakesh yadav jaipur July 19, 2012, 10:20 pm

  really…….my total confuse remove after read this article.Thank you………….

  Link
- Sudhakar July 26, 2012, 1:14 am

  Good One, will be helpfull for new leaners!!!

  Link
- rajendra July 31, 2012, 8:22 am

  excellent

  Link
- Naveen August 8, 2012, 12:17 am

  Its very Good article and helpful for linux beginers

  Link
- Ranjit Rajput September 10, 2012, 12:57 am

  Excellent …

Link
- [Hughe](#) September 10, 2012, 5:21 am

  You can bypass the first three stage using kexec program for fast boot. This saves time when you have to reboot a lot for tuning system or handling init script.

  Debian provides it as kexec-tools package.

  Find the kernel options:
  $ cat /proc/cmdline
  BOOT_IMAGE=/vmlinuz-3.4.0-10.dmz.1-liquorix-amd64 root=UUID=07cf8c3a-d5a5-4b41-833f-16a9afebf70c ro quiet

  Add a kernel image:
  vmlinuz is the kernel image file I uses. If the kernel image uses initrd file, add –initrd option. Without it kernel will panic next boot.

  $ sudo kexec -l /vmlinuz –append="root=UUID=07cf8c3a-d5a5-4b41-833f-16a9afebf70c ro quiet" –initrd=/initrd.img

  Or

  In my Linux box, boot partition is /dev/sda1
  $ sudo kexec -l /vmlinux –append="root=/dev/sda1 ro quiet" –initrd=/initrd.img

  Start warm boot:
  $ sudo kexec -e

  Linux will boot up without going through BIOS, MBR, and Grub.

  Link
- manoj sharma September 18, 2012, 9:14 am

  thanks

  Link
- Guru Reddy September 24, 2012, 8:04 am

  Excellent.., and thank you a lot..,

  Link
- karunakar September 27, 2012, 2:22 pm

  Excellent and simple explanation and a great deal for beginners !! Thank you.

  Link
- Rajeev September 28, 2012, 3:23 am

  very nice

  Link
- Mithun Shrivastav October 11, 2012, 3:01 am

  Hi its excellent. Thanks.

  Link

- Amaresh Samal November 13, 2012, 12:34 pm

  thanks friend…….

  Link
- krish November 14, 2012, 2:11 pm

  what is 1st stage boot loader and what is 2nd stage boot loader ? kindly clear this point also.

  Link
- Rajgopal H.G. November 19, 2012, 12:58 am

  I am working on Linux since decade. Some times I am unable explain the basic stuff like this. Thanks for explaining Ramesh Natarajan. Today onwards, I am the member of your fan club.

  Link
- saurabh December 5, 2012, 2:41 am

  Thanks for this excellent article…………. :-)

  Link
- Purna December 18, 2012, 3:26 pm

  Hello,

  Description is good and very easy to understand, thanks for this.
  If possible please explain in detail about each and every config file or script, how is jumping from on script/config-file to another

  Anyways I am happy for this post.
  Thank you once more….

  Link
- Rajshekhar December 28, 2012, 11:49 am

  Excellent material. So simple to understand it. Doing a great job!!!!!

  Link
- niky December 28, 2012, 1:08 pm

  The Article is good And explained Simple …
  tnx 4 this

  Link
- C subhash January 1, 2013, 6:36 am

  Thanks for this excellent article……

  Link
- Amit Bhandari January 18, 2013, 12:31 am

  its a superb article……….and simple and superb explanation.

  Link
- Rajaswaminathan January 24, 2013, 8:33 am

This is really nice article. Appreciate your excellent work.

Link
- karthi prasanth February 16, 2013, 7:12 am

sir now i am using windows7 and linux in one computer.i dont want to use linux that have 250gb harddisk then how to boot(delete) a linux and how to plaace 250gb in windows7? Pls hlp me.

Link
- Aswathy February 25, 2013, 11:33 am

Thanks Mr.Linux natarajan

Link
- lakshman March 1, 2013, 4:59 am

it was simply good.

Link
- prathamesh March 1, 2013, 11:43 am

thanks dude

Link
- chrly chacko March 1, 2013, 11:15 pm

good keep itup

Link
- Kapil March 20, 2013, 3:46 am

Very Good Explanation.

Thank you very much .

Link
- Lily April 4, 2013, 12:36 pm

Hey,you explained all,excellent.Thanks

Link
- Ranjith April 6, 2013, 1:34 am

Thanks Friend

Link
- shipra April 13, 2013, 11:51 pm

thnkss ..very useful fo me..;) 😊

Link
- Magesh April 16, 2013, 5:29 am

Great Man…..

Link

- laks April 19, 2013, 3:13 am

  its really useful.

  Link
- googler April 22, 2013, 2:25 pm

  Oh yes .. this is what i am seeking for .. something simple and effective ..
  i don't know why most people who talk about boot process and FHS love to make it
  very difficult…
  but you my friend .. u r brilliant .. this really easy and useful explanation ..
  thanks as enormous as the sky

  Link
- shruti April 27, 2013, 1:18 am

  good explanation & easy to understand!!!

  Link
- Anonymous May 4, 2013, 12:36 pm

  excellent, very well explained

  Link
- sudhakar May 21, 2013, 11:24 pm

  Good article ….

  Link
- sreejith ks May 26, 2013, 6:01 pm

  awesome man, what a simply way to explain such a difficult process.,, thanks a lot,,keep going,,

  Link
- Mitesh May 30, 2013, 3:22 am

  Really Nice Article…. learn much from this…
  Thanks

  Link
- Ashokraj R May 30, 2013, 5:45 am

  Thank you

  Link
- Akshay June 23, 2013, 12:05 pm

  Perfect article on Great topic.

  Link
- Shams July 20, 2013, 1:19 pm

  Ramesh,

  Thanks a ton for your efforts to provide such a excellent information by keeping it simple.

You rock man …… Keep it up…

Link

- karthik July 25, 2013, 1:32 am

  nice job.any one can understand this . good explantion

  Link
- Suraj August 2, 2013, 1:12 am

  Superb Article !!! Excellent explanation.

  Keep it on.

  Link
- Kaali Dasu August 9, 2013, 1:50 am

  I got confused by studying the process in another sites however this one is very easy to understand and remember.

  Link
- hariharasudhans August 28, 2013, 10:01 am

  i have littile bit confusion in bootprocessor .nw i clrd & esay to understand…
  good article of boot processor

  Link
- Arun September 6, 2013, 12:26 am

  Thank you for simple, compact and clear explanation . . . :)

  Link
- Pradeep September 14, 2013, 7:47 am

  Good,Easy to understand and very useful for starters……..:)

  Link
- yang September 23, 2013, 7:33 pm

  good! the article is easy to understand,

  Link
- Ramesh October 22, 2013, 10:42 am

  very nice , thanks

  Link
- Akshay Kalra October 24, 2013, 11:37 pm

  Thanks for such a nice explanation…..
  This article has cleared my all doubts.

  Link
- montana November 13, 2013, 12:01 am

Simple and Powerful.
Thanks.

Link

- Mehbub November 19, 2013, 5:16 am

Thanx a lot for ur great explanations buddy…………………..suprm performance
nw i hv nt any confusn

Link

- Pradeep December 13, 2013, 5:14 am

Good work, Thanks

Link

- mohammed tousif December 13, 2013, 7:40 am

excellent

Link

- Ravi singh December 14, 2013, 2:17 pm

Thanks bro … It is realy excellent and easy to understand

Link

- nisha December 27, 2013, 11:34 pm

Thanks for sharing …good article to understand linux boot up process…………………

Link

- Narender January 14, 2014, 11:43 pm

that is why lappy takes so much time for startup, actually this guy is busy in doing this or that, offcourse useful.

Link

- Srikanth January 30, 2014, 4:49 am

Thanks a lot. very nice….

Link

- viji February 3, 2014, 4:32 am

Thanks much

Link

- Satheesh Kumar G February 17, 2014, 12:17 am

Hi Ramesh,

This is the best explanation i've seen so far.

ThnQ very much,…

Link

- Choperro February 28, 2014, 12:11 am

The role of initrd is not clear at all.
What does it contain?
Where does it come from?
When and how is it used?

Also the possibilities and methods to configure each step and its pieces are not
clear at all. We can change boot device (interactively or not), we can change the kernel (interactively or
not), we can change the boot menu and give orders to grub….. can we change initrd? how? what for? and
the init proces? inittab seems to be deprecated in Debian…..

Link

- Choperro February 28, 2014, 1:43 am

  "Programs starts with S are used during startup. S for startup.
  Programs starts with K are used during shutdown. K for kill."

  or

  The S set are the programs that are started when we enter in that runlevel and K is the set of programs that
  are killed when we enter in that runlevel?

  Link

- Harshit Shrivastava March 12, 2014, 3:56 am

  Awesome Tutorial. Linux Boot Process Cleared Very Well.

  Link

- Gurpreet Singh March 14, 2014, 6:15 am

  Excellent Tutorial

  Link

- Spatik March 26, 2014, 10:18 pm

  Nice and well explained, thank you so much.

  Link

- Syam April 11, 2014, 12:16 am

  good one :) great

  Link

- Damodhar Taklakar April 18, 2014, 6:34 am

  Very well explained….! :)

  Link

- venkateswara reddy June 23, 2014, 1:58 am

  i'm learning linux admin so any sugences pls give me and any learning text books and any meteriles

  Link

- priya July 2, 2014, 1:59 am

  excellent… very well explained

Link

- Rod Nussbaumer July 3, 2014, 9:41 am

  The information here all seems correct, however I think you do a disservice to the reader not to mention that this is just one of many different ways to load Linux on a PC architecture. Other architectures use other methods, and there are other methods available on a PC architecture, and the version and configuration of the Linux kernel itself affects the boot process.

  Link

- Hal August 5, 2014, 3:08 pm

  Thank you for a very clear presentation. I have one small comment, I went looking for the meaning of "MBR" and "initrd" before reading on to find you gave them later. May I suggest an expansion of the acronym in brackets immediately after the acronym. Thank you again very well done.

  Link

- Ancklesh August 30, 2014, 9:16 pm

  thanks soo much :)

  Link

- Joyneel September 9, 2014, 11:21 am

  The best consize and apt explanation i have read so far

  Link

- Suresh October 7, 2014, 12:29 pm

  Very well explained. But latest Ubuntu version 14.04 has some changes with respect to above explanation.

  Link

- ashish yadav October 16, 2014, 5:48 am

  very nice …… so helpful.

  Link

- Ashutosh October 31, 2014, 4:11 pm

  you are awesome!

  Link

- dxman November 7, 2014, 2:51 am

  Excellent Article Admin – you simplify the words
  TFS

  Link

- Alexlee joana December 8, 2014, 12:42 am

  Thanks your good article.
  But linux Os (like Cent Os 7) dosen't have grub.conf.
  Please explaing the reason.
  Sorry. I am beginner of Linux!
  Thanks your favor!
  Help me!

Link
- jitendra khasdev January 29, 2015, 12:52 pm

  MBR is a bootloader ?

  Link
- nidhi sardeshpande February 4, 2015, 5:33 am

  wow!i got too much information which was actually new for me. thank you sooo much.

  Link
- rohini rathod February 4, 2015, 5:35 am

  nice experience, nice information, thank you so much.

  Link
- Raj Somwanshi May 24, 2015, 1:03 am

  Good one ……Thanks

  Link
- Harsha Hulikere July 14, 2015, 6:53 pm

  Nice and well explained, thanks a lot ..:)

  Link
- fayaz July 17, 2015, 3:15 am

  great one. it has given a simple procedure and best among all..

  Link
- mike r July 30, 2015, 8:03 am

  good explanation, also some newer linux kernels dont use init, only systemd

  Link
- Prashanth August 4, 2015, 10:09 am

  Thankyou Ramesh. That was so simply explained [image] :) !

  Link
- Vinay September 13, 2015, 11:24 pm

  How to change the runlevel if it is set to 0 or 6.

  Link
- Anusha November 20, 2015, 12:23 am

  Good one… Thanks

  Link
- Rajasekhat December 9, 2015, 2:17 am

  Really good article on Linux boot process.

  Link

- Sunil January 11, 2016, 2:38 pm

  Excellent explaination……

  Link
- Parvathy January 27, 2016, 7:29 am

  Nice,Thanks !

  Link
- ankit February 19, 2016, 2:24 pm

  Ultimate…thanks for sharing the transparency, simplicity and purity of Linux with such a simple Techincal Laguage

  Link
- nagamani March 15, 2016, 2:54 am

  Good One Usefull…. Thank you

  Link
- Nisha March 29, 2016, 4:32 am

  Hai It was awesome to read this. Thanks for your article.

  Link
- Anonymous April 12, 2016, 12:16 am

  It is really very useful
  Thank you
  Mahesh

  Link
- nithya May 9, 2016, 4:22 am

  Superb article.. its very useful to me…. thank u so much

  Link
- Ravi May 15, 2016, 6:47 am

  Great article

  Link
- Malcolm Daniel May 30, 2016, 2:37 pm

  doing great bro keep it up

  Link
- Suraj May 31, 2016, 11:36 pm

  Great article with vast information in short

  Link

Leave a Comment

Name

Email

Website

Comment

Submit

☐ Notify me of followup comments via e-mail

Next post: [UNIX / Linux: 3 Ways to Send Signal to Processes](#)

Previous post: [UNIX / Linux: How to Use Sticky Bit on Directory and File](#)

Linux Sysadmin Workshop
[RSS](#) | [Email](#) | [Twitter](#) | [Facebook](#) | [Google+](#)

Search

EBOOKS

- Linux 101 Hacks Book [Linux 101 Hacks 2nd Edition eBook](#) - Practical Examples to Build a Strong Foundation in Linux
- [Bash 101 Hacks eBook](#) - Take Control of Your Bash Command Line and Shell Scripting
- [Sed and Awk 101 Hacks eBook](#) - Enhance Your UNIX / Linux Life with Sed and Awk
- [Vim 101 Hacks eBook](#) - Practical Examples for Becoming Fast and Productive in Vim Editor
- [Nagios Core 3 eBook](#) - Monitor Everything, Be Proactive, and Sleep Well

POPULAR POSTS

- [12 Amazing and Essential Linux Books To Enrich Your Brain and Library](#)
- [50 UNIX / Linux Sysadmin Tutorials](#)
- [50 Most Frequently Used UNIX / Linux Commands (With Examples)](#)
- [How To Be Productive and Get Things Done Using GTD](#)
- [30 Things To Do When you are Bored and have a Computer](#)
- [Linux Directory Structure (File System Structure) Explained with Examples](#)
- [Linux Crontab: 15 Awesome Cron Job Examples](#)
- [Get a Grip on the Grep! – 15 Practical Grep Command Examples](#)
- [Unix LS Command: 15 Practical Examples](#)
- [15 Examples To Master Linux Command Line History](#)
- [Top 10 Open Source Bug Tracking System](#)
- [Vi and Vim Macro Tutorial: How To Record and Play](#)
- [Mommy, I found it! -- 15 Practical Linux Find Command Examples](#)
- [15 Awesome Gmail Tips and Tricks](#)
- [15 Awesome Google Search Tips and Tricks](#)
- [RAID 0, RAID 1, RAID 5, RAID 10 Explained with Diagrams](#)
- [Can You Top This? 15 Practical Linux Top Command Examples](#)
- [Top 5 Best System Monitoring Tools](#)
- [Top 5 Best Linux OS Distributions](#)
- [How To Monitor Remote Linux Host using Nagios 3.0](#)
- [Awk Introduction Tutorial – 7 Awk Print Examples](#)
- [How to Backup Linux? 15 rsync Command Examples](#)
- [The Ultimate Wget Download Guide With 15 Awesome Examples](#)
- [Top 5 Best Linux Text Editors](#)
- [Packet Analyzer: 15 TCPDUMP Command Examples](#)
- [The Ultimate Bash Array Tutorial with 15 Examples](#)
- [3 Steps to Perform SSH Login Without Password Using ssh-keygen & ssh-copy-id](#)
- [Unix Sed Tutorial: Advanced Sed Substitution Examples](#)
- [UNIX / Linux: 10 Netstat Command Examples](#)
- [The Ultimate Guide for Creating Strong Passwords](#)
- [6 Steps to Secure Your Home Wireless Network](#)
- [Turbocharge PuTTY with 12 Powerful Add-Ons](#)

CATEGORIES

- [Linux Tutorials](#)
- [Vim Editor](#)

- [Sed Scripting](#)
- [Awk Scripting](#)
- [Bash Shell Scripting](#)
- [Nagios Monitoring](#)
- [OpenSSH](#)
- [IPTables Firewall](#)
- [Apache Web Server](#)
- [MySQL Database](#)
- [Perl Programming](#)
- [Google Tutorials](#)
- [Ubuntu Tutorials](#)
- [PostgreSQL DB](#)
- [Hello World Examples](#)
- [C Programming](#)
- [C++ Programming](#)
- [DELL Server Tutorials](#)
- [Oracle Database](#)
- [VMware Tutorials](#)

About The Geek Stuff

Linux 101 Hacks Book My name is **Ramesh Natarajan**. I will be posting instruction guides, how-to, troubleshooting tips and tricks on Linux, database, hardware, security and web. My focus is to write articles that will either teach you or help you resolve a problem. Read more about [Ramesh Natarajan](#) and the blog.

Contact Us

Email Me : Use this [Contact Form](#) to get in touch me with your comments, questions or suggestions about this site. You can also simply drop me a line to say hello!.

[Follow us on Google+](#)

[Follow us on Twitter](#)

[Become a fan on Facebook](#)

Support Us

Support this blog by purchasing one of my ebooks.

[Bash 101 Hacks eBook](#)

[Sed and Awk 101 Hacks eBook](#)

[Vim 101 Hacks eBook](#)

[Nagios Core 3 eBook](#)