TechTarget | SearchEnterprise Linux

PRO+ Content

14 Must-Know Linux Commands

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

In this e-guide:

As a Linux administrator, having a strong grasp of the Linux command line is key; it not only increases your proficiency and speed across shells, but ultimately allows you to use that same knowledge to manage any Linux distribution.

In this exclusive Linux e-guide, discover the top 14 must-know Linux commands for server administrators, with 2 bonus articles giving in-depth knowledge on the benefits of the "IP" and "Mount" commands.

In this guide

The top Linux commands for server administrators

The Linux IP command makes network config easy

Linux mount command reveals storage device access path

Getting more PRO+ exclusive content

The top Linux commands for server administrators

http://searchdatacenter.techtarget.com/tip/The-top-Linux-commands-for-server-administrators

The Linux desktop environment has evolved into amazingly user-friendly, graphical and powerful tools. Not so for the Linux server.

A system administrator must have a strong grasp of the Linux command line. There's a long commands list, but these top Linux commands are of immediate importance to the administration of servers and data centers.

Each command has a different purpose and should immediately go into the admin's toolkit. As you gain experience with using commands on Linux servers, you'll discover new ways to move around or shorten tasks with the command line; some of these tricks are included here.

Cd

The cd command should really be considered part of starting out with Linux server administration. The cd command moves an admin about the directory

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

structure. For example, to move from your home directory to the ~/Downloads directory, you would issue the command cd ~/Downloads. If you're already in your home directory, you could just enter cd Downloads.

The cd command is helpful when you need to back out of a directory. For example, you are in Downloads, and you want to back out to ~/. Simply issue the command cd ../ to back up one directory. You can back out of multiple directories by adding more ../. For example, if you're working within ~/Downloads/A/B/C, you could return to ~/Downloads with the command cd ../../../.

Cp

This is a top Linux command for server admins because it allows you to copy files and directories. The usage is as following:

cp [OPTION] source destination

To copy ~/FILEA to ~/Downloads/, you would issue the command cp ~/FILEA ~/Downloads. You can also rename the file as you copy it: To copy ~/FILEA to ~/Downloads, but rename it FILEB, you would issue the command cp ~/FILEA ~/Downloads/FILEB.

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

One of the more important options for the cp command is the -p option. This option preserves the file attributes such as mode, ownership and timestamps. Issue the command as cp -p ~/FILEA ~/Downloads/FILEB to take advantage of this option.

Crontab

The Linux crontab command allows an administrator to set up scheduled tasks on a system. The command is used as such:

crontab -u USER file

or

crontab -u USER [OPTION]

The best way to use crontab is with the options, which are:

l -l -- list the user's current crontab jobs

l -e -- edit the user's current crontab jobs

l -r -- remove the user's current crontab jobs

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

For example, to edit the crontab jobs for the user jlwallen, issue the command crontab -u jlwallen -e. You will then see that user's crontab jobs opened in the default text editor.

Edit the job as needed and then save the file. You can then list the user's crontab jobs with the command crontab -u jlwallen -l.

Grep

The grep command prints lines that match a pattern. This tool is useful on many levels. Usage is as follows:

grep [OPTIONS] PATTERN [FILE]

The Linux grep command helps admins to locate a specific line that, for example, includes the string wlan0 in a long configuration file named wireless. Relying on human capability would make this a drawn-out, difficult task. With the Linux command line, you issue grep as such

grep -n wlan0 wireless

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

When used with the -n option, grep includes the line number where the pattern is found. You can also use the -E option so that grep sees the PATTERN as a regular expression.

Iptables

Your network may be protected by the best task-specific hardware you can buy. That doesn't mean you shouldn't have a solid understanding of one of the most powerful security tools available for the data center -- iptables. This is an incredibly complex Linux command that requires a significant investment of time to grasp. The basic structure of the command is:

iptables [-t table] [OPTION] chain rule-specification

To truly understand how to use iptables, you must first understand chains and tables. If you don't have a solid understanding of how chains and tables interrelate, start with the command man iptables and read up on the topic.

Kill

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

The kill command allows the Linux administrator to send a signal to a process. In order to use kill, you have to know which signal to send and the process ID (PID) to which you send the signal. The structure of the command is:

kill [OPTIONS] <PID>

To find what signals you can send to a process, issue the command kill -l. Most often, you will use kill -9 PID, where PID is the process to be killed, as the -9 signal is SIGKILL and safely shuts down the process. If you are unsure of the PID, but know the name of the process, you can always opt to use the killall command, such as killall -9 firefox to shut down Firefox processes.

Lsof

The command lsof calls up a list of all open files. While there are quite a few other commands available for seeing all open files, this top Linux command allows you to see everything an admin needs. The problem here is that, without arguments, lsof displays an overwhelming amount of information. To limit the onslaught, try restricting by username:

lsof -u jlwallen

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

Another option is to limit lsof to listing only files opened on a certain port, such as:

lsof -i TCP:22

Lsmod

To see the status of modules in the Linux kernel, run the lsmod command. Effectively, lsmod lists out the contents in /proc/modules in a human readable format. A Linux admin easily troubleshoots server functionality issues by seeing what modules are currently loaded in the kernel. Networking down? Maybe the kernel module for your network interface has been dropped. Issue lsmod to see if that module is loaded. If not, you can always load it with the insmod command.

Mount

The mount command not only helps you mount file systems on Linux servers, it will list out what file systems are mounted and where. This command can be a real lifesaver when you have to troubleshoot where a drive has gone or if you need to add a new drive to a system.

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

When you run the command without arguments, mount will list out every mounted file system on your machine and that file system's mount point.

To mount a drive, use the command structure:

mount -t TYPE DEVICE DIRECTORY

Where TYPE is the file system type -- ext4, NTFS or another -- DEVICE is the physical device name of the drive, and DIRECTORY is where you want the drive mounted.

Ps

The ps command lists out all processes running on a Linux system. There are numerous ways to run the command as it will accept different command syntax. The easiest way to demonstrate the power of ps is to list out every process running as root in user format:

ps -U root -u root u

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

The output includes the username (root), the PID, CPU percentage used by a process, percentage of memory used by a process, when the process was started and the command.

Ssh

To gain access to your current server, or to another server from the machine you are working on, use the secure shell (ssh). The command structure of secure shell is:

ssh -l USER -v ADDRESS_OF_DESTINATION

Where USER is the username to log in as and ADDRESS_OF_DESTINATION is the IP address or URL of the destination server to log into.

There is far more to this top Linux command than that. Read through the man page via man ssh carefully.

Service

The best way to start or stop a service, such as networking, is the service command. The structure is as follows:

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

service script command [OPTIONS]

For example, to restart the networking service, issue the command

service networking restart

Tail

Linux administrators will, at some point, need to watch a log file as it is read to. For example, you are troubleshooting Apache and want to watch the error log in real time. The tail command makes this possible:

tail -f /var/log/apache2/error.log

Within the command window, the Linux OS displays everything written to the error log as it occurs. Tail is an incredibly powerful tool for troubleshooting any Linux server.

W command

The w command shows Linux server admins who is logged into a server and what they are doing. Issue the w command without arguments to get all the information available to all users logged in, or specify a user like: w jlwallen

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

The above command will only output the information, available to the command, about user jlwallen.

These are some of the best Linux server commands for every system administrator. We could add plenty more to the list, but these commands will most certainly get you started on a route to mastering Linux server administration.

The Linux ip command makes network config easy

http://searchdatacenter.techtarget.com/tip/The-Linux-ip-command-makes-network-config-easy

Windows administrators in modern data centers occasionally deal with Linux systems, for example when a vendor delivers its appliance as a VM running the Linux OS. Beginners need to know basics of Linux network configuration.

To start analyzing the network configuration on a Linux box, you'll need to find out what it currently uses. The Linux ip command is the way to go. This

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

command offers an extensive range of options to discover the current network configuration of a machine.

The ip command works with arguments to specify what exactly displays. Use ip addr to find out about current networking, ip link to analyze status of network interfaces and ip route to see the routing table. All of these commands pair with the show command. So ip addr show (see Listing 1) will display current address configuration, ip link show lets you see statistics about a link, and ip route show gives the current routing table.

Listing 1. This output is an example of using the ip addr show command to see current address configuration.

```
[root@server1 ~]# ip addr show

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state
UNKNOWN

    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00

    inet 127.0.0.1/8 scope host lo
```

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

valid_lft forever preferred_lft forever

inet6 ::1/128 scope host

valid_lft forever preferred_lft forever

2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000

link/ether 52:54:00:95:7f:5f brd ff:ff:ff:ff:ff:ff

inet 192.168.122.210/24 brd 192.168.122.255 scope global eth0

valid_lft forever preferred_lft forever

inet6 fd00::210/64 scope global

valid_lft forever preferred_lft forever

inet6 fe80::5054:ff:fe95:7f5f/64 scope link

valid_lft forever preferred_lft forever

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

In its output, the ip addr show command shows all interfaces that exist on your Linux network config. Listing 1 shows two network interfaces. The interface named lo is the loopback interface, used for processes that communicate via the IP protocol. The important interface in the listing is eth0, the first Ethernet interface that was found on this server. On the interface you can see three important parts of the configuration: the MAC address, indicated as link/ether, the IPv4 address as well as the IPv6 address. Verify that this information matches what should be used on your server.

Not all Linux systems will show eth0 as the standard Ethernet network card. Modern Linux kernels use the biosdevname utility, which aims to make it easier to identify a specific network interface. The device name is unique, such as eno1677736, but also is not standardized between different Linux systems. So if you see another device name that isn't eth0, don't panic -- that is expected and normal behavior.

Another useful interface to monitor the current Linux network config is the ip -s link command. This command shows current statistics about packets sent over a network interface. Linux's ip -s link (see Listing 2) helps if you're experiencing

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

problems on a network interface and want to make sure that no packets drop in transit.

Listing 2. This ip -s link output allows an administrator to analyze network packet statistics.

```
[root@server1 ~]# ip -s link

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state
UNKNOWN mode DEFAULT

    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00

    RX: bytes  packets  errors  dropped overrun mcast

    97196      270      0       0       0       0

    TX: bytes  packets  errors  dropped carrier collsns

    97196      270      0       0       0       0

2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc
pfifo_fast state UP mode DEFAULT qlen 1000
```

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

```
    link/ether 52:54:00:95:7f:5f brd ff:ff:ff:ff:ff:ff

    RX: bytes  packets  errors  dropped overrun mcast

    71870878   412311   0       0       0       0

    TX: bytes  packets  errors  dropped carrier collsns

    33588506   290604   0       0       0       0
```

After verifying the network configuration's viability, check routing. To show the current routing table, use ip route show (see listing 3). What you're looking for is the default route, which identifies the IP address of the gateway for accessing other networks.

Listing 3: Output from the Linux ip route show command helps verify routing table configuration.

```
[root@server1 ~]# ip route show

default via 192.168.122.1 dev eth0  proto static  metric 100
```

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

192.168.122.0/24 dev eth0 proto kernel scope link src 192.168.122.210 metric 100

What about ifconfig?

The ifconfig command that shows current networking information on Linux servers has been deprecated for over a decade. What's wrong about using it? The Linux networking stack has changed significantly since ifconfig's heyday -- you will miss information on today's networks if working with ifconfig. The ip command was introduced to manage all aspects of Linux network configuration as the stack changed, and development on the ifconfig command was discontinued.

Linux ifconfig is not accurate, for example, when the administrator wants to work with network cards configured with additional IP addresses. If the additional IP address was configured using the same routines as the ip command uses, you won't see them using ifconfig. For that reason, on many recent Linux distributions, the ifconfig command is no longer included.

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

Linux mount command reveals storage device access path

http://searchdatacenter.techtarget.com/tip/Linux-mount-command-reveals-storage-device-access-path

On a Windows server, you can plug in any storage device and it will be ready for use through any application that browses the file system, typically Explorer. That's not always the case with Linux.

Linux file and directory access works through one large file system that starts on the top with the root directory. This file system tree does not necessarily reside on a single storage device. Administrators use the Linux mount command to integrate multiple storage devices into the directory structure.

In Windows, storage device access is oriented to the device. You'll see optical drives, USB keys and hard drives as separate devices in the Windows Explorer overview, making it easy to access a new device.

To access a device on Linux, it must be mounted by connecting it to a directory. Mounting a device typically is a manual procedure, because only the administrator decides to which directory the device connects. And before you disconnect the device, it must be unmounted. Linux servers rarely use graphical

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

interfaces. If you insert a storage device in a server USB port, nothing will happen.

To mount storage onto Linux servers, first decide which directory should access the device. Then use the Linux mount command to activate it. The mount command typically looks like mount /dev/sdb1 /mnt, where /dev/sdb1 is the device and /mnt is the directory where you want to mount it.

You have to know the exact name of the device to use the Linux mount command. It usually starts with /dev/sd, in which sd can be interpreted as storage device. After sd, you'll see another letter, which is assigned when the device is connected: /dev/sda is the first disk, then /dev/sdb is the second disk. The number following the letter denotes the partition. As devices often, but not always, only have one partition, you'll normally only see the number 1 assigned to it.

Based on the previously mentioned information, you should be able to find the name of the device that you want to mount onto the Linux server. But if you don't, use the Linux prompt to find the information. Right after you have connected the device to your computer, use the dmesg command. This command shows recent kernel activity, including newly detected devices (see listing 1).

Listing 1: Use dmesg to find out device information.

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

[18435.325715] usb 1-1: new high-speed USB device number 2 using ehci-pci

[18435.504105] usb 1-1: New USB device found, idVendor=abcd, idProduct=1234

[18435.504109] usb 1-1: New USB device strings: Mfr=1, Product=2, SerialNumber=3

[18435.504110] usb 1-1: Product: UDisk

[18435.504115] usb 1-1: Manufacturer: General

[18435.504116] usb 1-1: SerialNumber: Jb

[18435.687375] usb-storage 1-1:1.0: USB Mass Storage device detected

[18435.688710] scsi33 : usb-storage 1-1:1.0

[18435.689819] usbcore: registered new interface driver usb-storage

[18436.692763] scsi 33:0:0:0: Direct-Access General UDisk 5.00 PQ: 0 ANSI: 2

[18436.702381] sd 33:0:0:0: Attached scsi generic sg2 type 0

[18436.728121] sd 33:0:0:0: [sdb] 15616000 512-byte logical blocks: (7.99 GB/7.44 GiB)

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

```
[18436.730316] sd 33:0:0:0: [sdb] Write Protect is off

[18436.730319] sd 33:0:0:0: [sdb] Mode Sense: 0b 00 00 08

[18436.732437] sd 33:0:0:0: [sdb] No Caching mode page found

[18436.872492] sd 33:0:0:0: [sdb] Assuming drive cache: write through

[18436.902023] sd 33:0:0:0: [sdb] No Caching mode page found

[18436.917099] sd 33:0:0:0: [sdb] Assuming drive cache: write through

[18436.979578] sdb: sdb1

[18436.997664] sd 33:0:0:0: [sdb] No Caching mode page found

[18437.002400] sd 33:0:0:0: [sdb] Assuming drive cache: write through

[18437.009989] sd 33:0:0:0: [sdb] Attached SCSI removable disk
```

After dmesg has shown the name of the device, find out how many partitions are available on the device by using cat /proc/partitions. This command shows all partitions that are commonly known to the Linux kernel (see listing 2). This information means you can use the mount command for the correct device. The dmesg command also shows a lot of information about devices that you probably don't really want to know about, which you can ignore.

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

Listing 2. Use cat /proc/partitions to see how many partitions exist on a device.

```
[root@server2 ~]# cat /proc/partitions
major minor #blocks name
2    0     4 fd0
8    0  8388608 sda
8    1   512000 sda1
8    2  7875584 sda2
11    0  1048575 sr0
253    0   839680 dm-0
253    1  7032832 dm-1
8    16  7808000 sdb
8    17  2318236 sdb1
```

Linux servers require you to dismount devices before removing them from the system. The umount command dismounts devices, and only works if no files on

In this guide

- The top Linux commands for server administrators
- The Linux IP command makes network config easy
- Linux mount command reveals storage device access path
- Getting more PRO+ exclusive content

the device are in use. Use the umount /dev/sdb1 command to disconnect the /dev/sdb1 device that was mounted in the preceding command.

In this guide

The top Linux commands for server administrators

The Linux IP command makes network config easy

Linux mount command reveals storage device access path

Getting more PRO+ exclusive content

Getting more PRO+ exclusive content

This e-guide is made available to you, our member, through PRO+ Offers—a collection of free publications, training and special opportunities specifically gathered from our partners and across our network of sites.

PRO+ Offers is a free benefit only available to members of the TechTarget network of sites.

Take full advantage of your membership by visiting http://pro.techtarget.com/ProLP/

Images; Fotalia

© 2016 TechTarget. No part of this publication may be transmitted or reproduced in any form or by any means without written permission from the publisher.