

OS Info Project

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The objective of this project is to demonstrate how to display operating system information using commands in Kali Linux. This includes showing IP addresses, hard disk information, the top 5 directories in the home directory, and monitoring CPU usage every 10 seconds.

Linux/Unix

The procedure to find os name and version on Linux:

1. Open the terminal application (bash shell)
2. For remote server login using the ssh: **ssh user@server-name**
3. Type any one of the following command to find os name and version in Linux:
cat /etc/os-release
lsb_release -a
hostnamectl
4. Type the following command to find Linux kernel version:
uname -r

Sample Output:

```
NAME="Ubuntu"
VERSION="17.10 (Artful Aardvark)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 17.10"
VERSION_ID="17.10"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=artful
UBUNTU_CODENAME=artful
```

UCSD Support. "UC San Diego - How to Find OS Version of Your Device." *It Services - How to Find OS Version of Your Device - Information Technology*, 2023, support.ucsd.edu/its?id=kb_article_view&sysparm_article=KB0032481.

5. df

Df is not a partitioning utility, but prints out details about only mounted file systems. The list generated by df even includes file systems that are not real disk partitions.

Here is a simple example

```
$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda6        97G   43G   49G  48% /
none            4.0K    0  4.0K   0% /sys/fs/cgroup
udev            3.9G   8.0K   3.9G   1% /dev
tmpfs           799M   1.7M   797M   1% /run
none            5.0M    0   5.0M   0% /run/lock
none            3.9G   12M   3.9G   1% /run/shm
none           100M   20K   100M   1% /run/user
/dev/sda8       196G  154G   33G  83% /media/13f35f59-f023-4d98-b06f-9dfaebefd6c1
/dev/sda5        98G   37G   62G  38% /media/4668484A68483B47
```

Only the file systems that start with a /dev are actual devices or partitions.

Use grep to filter out real hard disk partitions/file systems.

```
$ df -h | grep ^/dev
/dev/sda6        97G   43G   49G  48% /
/dev/sda8       196G  154G   33G  83% /media/13f35f59-f023-4d98-b06f-9dfaebefd6c1
/dev/sda5        98G   37G   62G  38% /media/4668484A68483B47
```

Moon, Silver. "10 Commands to Check Disk Partitions and Disk Space on Linux." *BinaryTides*, 4 Jan. 2023, www.binarytides.com/linux-command-check-disk-partitions/.

So, what does the sleep command do in Linux?

1. `/bin/sleep` is Linux or Unix command to delay for a specified amount of time.
2. You can suspend the calling shell script for a specified time. For example, pause for 10 seconds or stop execution for 2 minutes.
3. In other words, the sleep command pauses the execution on the next shell command for a given time.
4. GNU version of sleep command supports additional options
5. For example, suspend a bash shell script or command prompt for five seconds, type: `sleep 5`
6. Common examples of sleep commands include scheduling tasks and delaying the execution to allow a process to start. Another usage is waiting until a wifi network connection available to stream large file over the network.

Gite, Vivek. *What Does the Sleep Command Do in Linux?* - Nixcraft, 13 Dec. 2022, www.cyberciti.biz/faq/what-does-the-sleep-command-do-in-linux/.

Find Largest Directories in Linux

If you want to display the biggest directories in the current working directory, run:

```
# du -a | sort -n -r | head -n 5
```

```
tecmin Original VM's # du -a | sort -n -r | head -n 5
14014416 .
4676824 ./Ubuntu 15.04
4676612 ./Ubuntu 15.04/Ubuntu 15.04.vdi
4308280 ./Fedora 21 Workstation
4307972 ./Fedora 21 Workstation/Fedora 21 Workstation.vdi
tecmin Original VM's #
```

Find the Biggest Directories Only

Let us break down the command and see what says each parameter.

- `du` command: Estimate file space usage.
- `a` : Displays all files and folders.
- `sort` command : Sort lines of text files.
- `-n` : Compare according to string numerical value.
- `-r` : Reverse the result of comparisons.
- `head` : Output the first part of the files.
- `-n` : Print the first 'n' lines. (In our case, We displayed the first 5 lines).

Saive, Ravi. "How to Find Top Directories and Files (Disk Space) in Linux." *How to Find Most Used Disk Space Directories and Files in Linux*, 20 July 2023, www.tecmint.com/find-top-large-directories-and-files-sizes-in-linux/.

3. Calculating CPU Usage

3.1. Getting CPU Usage Using *vmstat*

The *vmstat* command displays CPU activity in near-real time:

```
[root@localhost ~]# vmstat 3 4
procs -----memory----- --swap-- --io-- --system-- -----cpu-----
 r b swpd free buff cache si so bi bo in cs us sy id wa st
 4 0      0 1347080 6120 941464 0 0 68 11 72 137 1 2 97 0 0
 1 0      0 1347080 6120 941464 0 0 0 0 0 84 157 1 2 97 0 0
 1 0      0 1347080 6120 941464 0 0 0 0 0 59 107 1 1 98 0 0
 1 0      0 1347080 6120 941464 0 0 0 0 1 59 104 1 1 98 0 0
```

The columns under CPU provide an overview of where the processor time is spent:

- *us* – time spent running non-kernel code
- *sy* – time spent running kernel code
- *id* – time spent idle
- *wa* – time spent waiting for I/O
- *st* – time is stolen from a virtual machine

The *id* column is what we're interested in. With the delay of a second, we calculate the CPU usage using *vmstat*:

```
[root@localhost ~]# echo "CPU Usage: `${100-$(vmstat 1 2|tail -1|awk '{print $15}')}')%"`"
CPU Usage: 2%
```

baeldung. "Get Overall CPU Usage on Linux." *Baeldung on Linux*, 18 Mar. 2024, www.baeldung.com/linux/get-cpu-usage.

Using Complex Commands

The *watch* command also allows you to use more complex user-defined commands, with their own arguments and options. One way to do this is to use the backslash ('\') symbol:

```
watch [options] \
```

Using the command above brings you to the next line in the terminal, where you need to add the user-defined command. Once you hit **Enter**, it executes the command. For instance:

```
watch -n 5 \
echo "watch command example output"
```

```
phoenixnap@test-system:~$ watch -n 5 \
> echo "watch command example output"
```

Another option is to add the user-defined command in single quotation marks:

```
watch [options] '[command]'
```

Using the example above, the command would be:

```
watch -n 5 'echo "watch command example output"'
```

```
Every 5.0s: echo "watch command example output" test-system: Thu Aug 5 06:31:38 2021
watch command example output
```

Kovačević, Aleksandar. "Linux Watch Command - Examples and How to Use It." *Knowledge Base by phoenixNAP*, 11 Aug. 2021, phoenixnap.com/kb/linux-watch-command.

3 Answers

Sorted by: Highest score (default)



You can use the `read` command. If you are using `bash`:

536

```
read -p "Press enter to continue"
```



In other shells, you can do:



```
printf "%s " "Press enter to continue"
read ans
```



As mentioned in the comments above, this command does actually require the user to press `enter`; a solution that works with any key in `bash` would be:

```
read -n 1 -s -r -p "Press any key to continue"
```

Explanation by [Rayne](#) and [wchargin](#)

`-n` defines the required character count to stop reading

`-s` hides the user's input

`-r` causes the string to be interpreted "raw" (without considering backslash escapes)

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edited Mar 1, 2022 at 13:34

answered Jul 5, 2016 at 6:48



kos
187 ● 1 ● 6



MKT
6,021 ● 1 ● 15 ● 7

kos. "How Can I Make 'Press Any Key to Continue.'" *Unix & Linux Stack Exchange*, 1 Mar. 2022, unix.stackexchange.com/questions/293940/how-can-i-make-press-any-key-to-continue.

TL;DR: How Do I Create an Infinite Loop in Bash?

"

To create an infinite loop in Bash, you can use the `'while'` loop with the condition set to `'true'`, while `true`. This will keep the loop running indefinitely until it's explicitly stopped.

Here's a simple example:

```
1 while true
2   do
3     echo 'This is an infinite loop'
4   done
5
6 # Output:
7 # 'This is an infinite loop'
8 # 'This is an infinite loop'
9 # 'This is an infinite loop'
10 # ...
```

In this example, we've used the `'while'` loop with the condition set to `'true'`. This means the loop will keep running and echoing `'This is an infinite loop'` until it's explicitly stopped by the user.

RamugliaGabriel is the owner and founder of IOFLOOD.com, Gabriel. "Creating an Infinite Bash Loop: Linux Shell Script Syntax." *Linux Dedicated Server Blog*, 4 Dec. 2023, ioflood.com/blog/bash-infinite-loop/.

```
(kali㉿kali)-[~]  
$ cat /etc/os-release ← Typing cat /etc/os-release  
PRETTY_NAME="Kali GNU/Linux Rolling"  
NAME="Kali GNU/Linux"  
VERSION_ID="2023.3"  
VERSION="2023.3" ← Shows the version  
VERSION_CODENAME=kali-rolling  
ID=kali  
ID_LIKE=debian  
HOME_URL="https://www.kali.org/"  
SUPPORT_URL="https://forums.kali.org/"  
BUG_REPORT_URL="https://bugs.kali.org/"  
ANSI_COLOR="1;31"
```

Display the Linux version.

5 #1. Display Linux version while accessing the folder /etc/os-release to find out the information
Information on Geany

```
projectver1.sh x  
1 #!/bin/bash  
2  
3 echo 'Hello user!'  
4 echo '  
5 #~ 1. Display Linux version while accessing the folder /etc/os-release to find out the information  
6  
7 echo 'Your Linux Version is:'  
8 cat /etc/os-release | grep -w VERSION | awk -F= '{print $2}'  
9 echo '  
10 sleep 2  
11  
(kali㉿kali)-[~/LF]  
$ bash projectver1.sh  
Hello user!  
  
Your Linux Version is:  
"2023.4"
```

To filter out the rest of the data in /etc/os-release and display the version number using awk -F=, you can use grep -w VERSION. After displaying the result, you can pause the script for 2 seconds using sleep so that the user can read it.


```
(kali@kali)-[~]
$ ifconfig
```

eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.20.129 netmask 255.255.255.0 broadcast 192.168.20.255

Display the internal/private IP address.

```
(kali@kali)-[~]
$ curl ifconfig.io
```

115.66.200.80

Display the external/public IP address.

```
(kali@kali)-[~]
$ route
```

Kernel IP routing table

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
default	192.168.20.2	0.0.0.0	UG	100	0	0	eth0
192.168.20.0	0.0.0.0	255.255.255.0	U	100	0	0	eth0

Display the default gateway.

```
12 #~ 2.1 Display the user private IP Address
13 echo 'Your Private IP Address is: '
14 ifconfig | grep broadcast | awk '{print $2}'
15 echo ''
16 sleep 2
17
18 #~ 2.2 Display the user public IP Address
19 echo 'Your Public IP Address is: '
20 curl ifconfig.io
21 echo ''
22 sleep 2
23
24 #~ 2.3 Display the user default gateway
25 echo 'Your default gateway is: '
26 route | grep default | awk '{print $2}'
27 echo ''
28 sleep 2
29
30 #~ 3.1 Display the total hard disk size
```

Hello user!

Your Linux Version is:
"2023.4"

Your Private IP Address is:
192.168.20.129

Your Public IP Address is:
115.66.200.80

Your default gateway is:
192.168.20.2

Displaying the output of all the IP addresses in Geany.

```
(kali㉿kali)-[~]
$ df -h | grep -v udev | grep -v tmpfs
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sda1	79G	37G	38G	50%	/

Display hard disk information by excluding udev and tmpfs.

```
(kali㉿kali)-[~]
$ df -h | grep /dev/sda1
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sda1	79G	37G	38G	50%	/

Display hard disk information using grep /dev/sda1, using different colours to differentiate the total size, used space, and available space on the hard drive.

```
projectver1.sh x
29
30 #~ 3.1 Display the total hard disk size
31 echo 'Your total hard disk size is: '
32 df -h | grep /dev/sda | awk '{print $2}'
33 echo ''
34 sleep 2
35
36 #~ 3.2 Display the free space in hard disk
37 echo 'Your free space in hard disk is: '
38 df -h | grep /dev/sda | awk '{print $4}'
39 echo ''
40 sleep 2
41
42 #~ 3.3 Display the used up space in hard disk
43 echo 'Your used up space in hard disk is: '
44 df -h | grep /dev/sda | awk '{print $3}'
45 echo ''
46 sleep 2
47
```

```
Your total hard disk size is:
79G

Your free space in hard disk is:
38G

Your used up space in hard disk is:
37G
```

Use grep /dev/sda1 to display the row and awk to print individual information.

```
(kali@kali)~$ du -h /home | sort -rh | head -n5
```

7.7G /home/kali
7.7G /home
3.6G /home/kali/.cache
2.7G /home/kali/.cache/vmware/drag_and_drop
2.7G /home/kali/.cache/vmware

Annotations:
- added /home to search for the whole home directory (points to /home)
- head -n5 shows the top 5 file size in home directories (points to head -n5)
- added -h so that it prints file size in human readable number format (points to -h)

Display the top 5 directories in the home directory and their sizes.

```
projectver1.sh x
48 #~ 4. Display the top 5 file directories and size in /home
49 echo 'Your top 5 file directories in /home is as followed: '
50 du -h /home | sort -rh | head -n5
51 echo '
52 sleep 2
53
```

Your top 5 file directories in /home is as followed:

```
7.7G /home/kali
7.7G /home
3.6G /home/kali/.cache
2.7G /home/kali/.cache/vmware/drag_and_drop
2.7G /home/kali/.cache/vmware
```

Display the top 5 directories in the home directory and their sizes in Geany.

```

projectver1.sh x
54 #~ 5.1 Display a message telling the user to press Ctrl + C to exit the script
55 echo 'The script will proceed to display CPU Usage every 10 seconds, press Ctrl + C to exit the script.'
56 read -n 1 -s -r -p "Press any key to continue"
57 echo ' '
58
The script will proceed to display CPU Usage every 10 seconds, press Ctrl + C to exit the script.
Press any key to continue

```

To exit the script, the user must press Ctrl + C. The command displaying Linux CPU usage every 10 seconds will continue running until this action is taken. After reading the message, the user can press any key to continue.

```

(kali@kali)-[~]
$ echo "CPU Usage: "$[100-$(vmstat 1 2|tail -1|awk '{print $15}')]%"
CPU Usage: 2%

```

By typing the command it displays the CPU Usage as shown below

Display the CPU usage using the vmstat command.

Using watch command

```

refresh every 10 seconds
watch -n10 echo "CPU Usage: "$[100-$(vmstat 1 2|tail -1|awk '{print $15}')]%"

```

Every 10.0s: echo CPU Usage: 4%

CPU Usage: 4%

Shows the realtime and updates every 10 seconds

Display the CPU Usage in Geany.

```

Every 10.0s: echo CPU Usage: 4%
CPU Usage: 4%

```

Typing the command to display CPU Usage

```

Every 10.0s: echo CPU Usage: 4%
CPU Usage: 4%

```

Display the CPU usage, refreshing every 10 seconds in Geany.

Using while true command

```

projectver1.sh x
62 #~ 5.22 Display the CPU Usage (Using while true command)
63 while true
64 do
65     # Display CPU usage
66     echo "$(date)" CPU Usage: "$[100-$(vmstat 1 2|tail -1|awk '{print $15}')]%"
67
68     # Sleep for 10 seconds (Using 9 instead of 10 because it matches the exact result)
69     sleep 9
70 done
71
Thu Jul 18 10:54:42 PM +08 2024 CPU Usage: 2%
Thu Jul 18 10:54:52 PM +08 2024 CPU Usage: 5%
Thu Jul 18 10:55:02 PM +08 2024 CPU Usage: 3%
Thu Jul 18 10:55:13 PM +08 2024 CPU Usage: 15%
^C

```

By using the while true command, the script continues in a loop. I've included a date command to inform the user of the time when the script will display CPU usage using the vmstat command. Additionally, I've added sleep 9 to refresh every 10 seconds, matching the time interval specified by the date command.

References

UCSD Support. "UC San Diego - How to Find OS Version of Your Device." *IT Services - How to Find OS Version of Your Device - Information Technology*, 2023, support.ucsd.edu/its?id=kb_article_view&sysparm_article=KB0032481.

Moon, Silver. "10 Commands to Check Disk Partitions and Disk Space on Linux." *BinaryTides*, 4 Jan. 2023, www.binarytides.com/linux-command-check-disk-partitions/.

Gite, Vivek. *What Does the Sleep Command Do in Linux?* - Nixcraft, 13 Dec. 2022, www.cyberciti.biz/faq/what-does-the-sleep-command-do-in-linux/.

Saive, Ravi. "How to Find Top Directories and Files (Disk Space) in Linux." *How to Find Most Used Disk Space Directories and Files in Linux*, 20 July 2023, www.tecmint.com/find-top-large-directories-and-files-sizes-in-linux.

baeldung. "Get Overall CPU Usage on Linux." *Baeldung on Linux*, 18 Mar. 2024, www.baeldung.com/linux/get-cpu-usage.

Kovačević, Aleksandar. "Linux Watch Command - Examples and How to Use It." *Knowledge Base by phoenixNAP*, 11 Aug. 2021, phoenixnap.com/kb/linux-watch-command.

kos. "How Can I Make 'Press Any Key to Continue.'" *Unix & Linux Stack Exchange*, 1 Mar. 2022, unix.stackexchange.com/questions/293940/how-can-i-make-press-any-key-to-continue.

RamugliaGabriel is the owner and founder of IOFLOOD.com, Gabriel. "Creating an Infinite Bash Loop: Linux Shell Script Syntax." *Linux Dedicated Server Blog*, 4 Dec. 2023, ioflood.com/blog/bash-infinite-loop/.