

# PING

to check the basic connectivity between two hosts like host to server or host to host.

## What is Ping & how it works

PING stands for Packet Inter Net Groper. A utility or program to determine whether a specific IP address or host / server is accessible from your network or not. The ping utility is commonly used to check for network errors & to diagnosis that problem. It's working mechanism is simple but life saving. It works by sending a packet to the specified IP address / host / server address and waiting for a reply from that host and measured the delay of that response. This is also known as latency.

So, you can know whether a host is reachable from your network and how fast you get a response from that host after you've sent out a PING request. A fast ping or low latency means a more responsive connection, especially in applications where time is everything (like online web games). Normally, ping is measured in milliseconds (ms). higher latency means you have some problem with your network for sure. Though this latency varies a lot depending on routing and Geo location. If you are in USA and you are pinging a host of USA then the delay will be lower. But if you are in USA and you are pinging a host of Bangladesh then definitely your latency will be higher due to Geo location and number of HOPs for that routing.

PING is the primary troubleshoot technique for any connections. It will reply or echo for a response. Ping send a message to a server / host that contains the message "PING" and receive a copy of the message back from that host / server. Ping calculate the "Round Trip Time" (or RTT) that it takes a packet to reach a particular server / host.

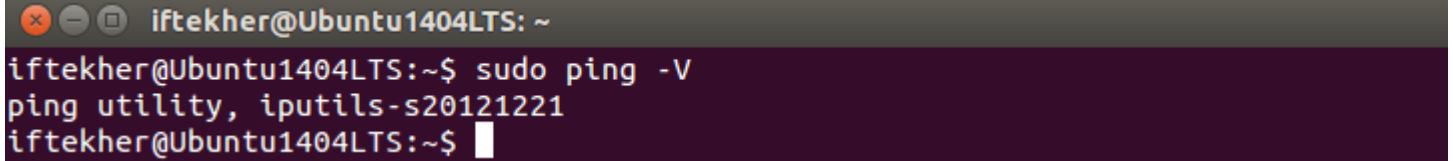
Every modern operating system has this ping tool preinstalled. So, you can find this utility program on every OS just from the terminal ( If you are running like UNIX / Linux operating System ) or from the (Command prompt / MS DOS Prompt ) if you are running a MS Windows operating system.

**Note:** Some host or server may block or not allow any ping or ICMP request for security.

## Getting ping version

To know the version, open a terminal and issue the below command.

```
sudo ping -V
```



```
iftekher@Ubuntu1404LTS: ~  
iftekher@Ubuntu1404LTS:~$ sudo ping -V  
ping utility, iputils-s20121221  
iftekher@Ubuntu1404LTS:~$
```

It will give you the currently installed ping versions to you.

## Ping Execution

There are few differences while you are performing a ping test or pining from a MS Windows based OS and UNIX / Linux like OS.

Simple ping command takes only one parameter and the parameter is the host name or the host IP address that you want to ping. A simple ping example is just like below. Open a terminal and type the following

```
ping unixmen.com
```

Here **unixmen.com** is the host name or a host.

With the above command you will see something like thi

You need to stop the ping command by pressing **CTRL+C**. Else it will ping for infinite time until you stopped it. After every ping commands, it will display a summery report with these following.

**Min:** Minimum time that takes to get a respond from the host that has been pinged from your end.

**Avg:** Average time that takes to get a respond from the host that has been pinged from your end.

**Max:** Maximum time that takes to get a respond from the host that has been pinged from your end.

Also you will see TTL which stands for Time To Live. This is self explanatory and you can understand that this is the time value to get the response of a ping request and if it does not respond within this time, it will be count as a failure of that request.

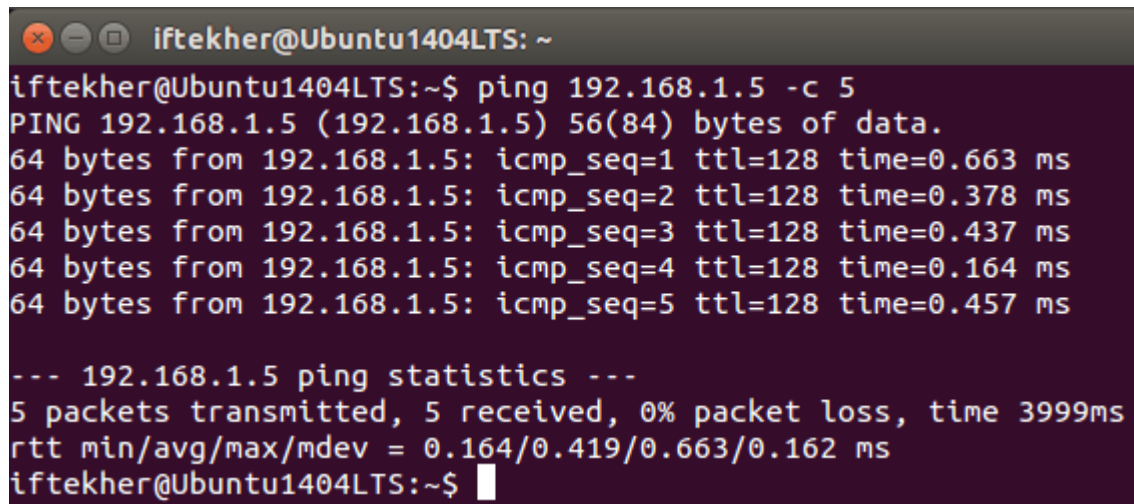
# Ping from local / private network

To ping a host of your local / private network , you need to type the IP address of that host

```
ping 192.168.1.5 -c 5
```

Here, 192.168.1.5 is the host that I want to ping from my local network. This is a host of my local network. I hope that you know all the blocks of private network and those hosts as well.

You will see something like this.

A terminal window with a dark background and light-colored text. The prompt is 'iftekher@Ubuntu1404LTS: ~'. The command 'ping 192.168.1.5 -c 5' has been executed. The output shows five successful ping requests with their respective sequence numbers, TTLs, and times. A summary line shows '5 packets transmitted, 5 received, 0% packet loss, time 3999ms' and 'rtt min/avg/max/mdev = 0.164/0.419/0.663/0.162 ms'.

```
iftekher@Ubuntu1404LTS: ~  
iftekher@Ubuntu1404LTS:~$ ping 192.168.1.5 -c 5  
PING 192.168.1.5 (192.168.1.5) 56(84) bytes of data.  
64 bytes from 192.168.1.5: icmp_seq=1 ttl=128 time=0.663 ms  
64 bytes from 192.168.1.5: icmp_seq=2 ttl=128 time=0.378 ms  
64 bytes from 192.168.1.5: icmp_seq=3 ttl=128 time=0.437 ms  
64 bytes from 192.168.1.5: icmp_seq=4 ttl=128 time=0.164 ms  
64 bytes from 192.168.1.5: icmp_seq=5 ttl=128 time=0.457 ms  
  
--- 192.168.1.5 ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 3999ms  
rtt min/avg/max/mdev = 0.164/0.419/0.663/0.162 ms  
iftekher@Ubuntu1404LTS:~$
```

## Ping count / numbers

Normally, when you run a simple ping command without passing any additional parameters, it will ping that host for infinite time while you are using any Linux OS.

So say, I want ping a host for 10 times, so I will type the following on my terminal.

```
ping -c 10 unixmen.com
```

You will see something like below image.

```
iftekher@Ubuntu1404LTS: ~  
iftekher@Ubuntu1404LTS:~$ ping -c 10 unixmen.com  
PING unixmen.com (104.31.75.35) 56(84) bytes of data.  
64 bytes from 104.31.75.35: icmp_seq=1 ttl=52 time=127 ms  
64 bytes from 104.31.75.35: icmp_seq=2 ttl=52 time=124 ms  
64 bytes from 104.31.75.35: icmp_seq=3 ttl=52 time=125 ms  
64 bytes from 104.31.75.35: icmp_seq=4 ttl=52 time=123 ms  
64 bytes from 104.31.75.35: icmp_seq=5 ttl=52 time=122 ms  
64 bytes from 104.31.75.35: icmp_seq=6 ttl=52 time=142 ms  
64 bytes from 104.31.75.35: icmp_seq=7 ttl=52 time=134 ms  
64 bytes from 104.31.75.35: icmp_seq=8 ttl=52 time=133 ms  
64 bytes from 104.31.75.35: icmp_seq=9 ttl=52 time=133 ms  
64 bytes from 104.31.75.35: icmp_seq=10 ttl=52 time=131 ms  
  
--- unixmen.com ping statistics ---  
10 packets transmitted, 10 received, 0% packet loss, time 9013ms  
rtt min/avg/max/mdev = 122.100/129.894/142.715/6.011 ms  
iftekher@Ubuntu1404LTS:~$
```

Here you can see that it ping 10 times and then it displays the ping summary report to you.

If you are running from a MS Windows OS, type this on the command prompt

```
ping -n 10 unixmen.com
```

```
C:\Windows\system32\cmd.exe

C:\Users\Nayer>ping -n 10 unixmen.com

Pinging unixmen.com [104.31.74.35] with 32 bytes of data:
Reply from 104.31.74.35: bytes=32 time=144ms TTL=52
Reply from 104.31.74.35: bytes=32 time=139ms TTL=52
Reply from 104.31.74.35: bytes=32 time=139ms TTL=52
Reply from 104.31.74.35: bytes=32 time=129ms TTL=52
Reply from 104.31.74.35: bytes=32 time=132ms TTL=52
Reply from 104.31.74.35: bytes=32 time=129ms TTL=52
Reply from 104.31.74.35: bytes=32 time=149ms TTL=52
Reply from 104.31.74.35: bytes=32 time=144ms TTL=52
Reply from 104.31.74.35: bytes=32 time=141ms TTL=52
Reply from 104.31.74.35: bytes=32 time=141ms TTL=52

Ping statistics for 104.31.74.35:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 129ms, Maximum = 149ms, Average = 138ms

C:\Users\Nayer>_
```

## Different packet size

By default, it sends 64 bytes of a ping request to a host if you are using any Linux OS and it will send 32 bytes if you used any MS Windows OS. If you want to change it and want to send heavy packet then do the following

```
ping -s 100 -c 6 unixmen.com
```

```
root@Ubuntu1404LTS: ~  
root@Ubuntu1404LTS:~# ping -s 100 -c 6 unixmen.com  
PING unixmen.com (104.31.74.35) 100(128) bytes of data.  
108 bytes from 104.31.74.35: icmp_seq=1 ttl=54 time=144 ms  
108 bytes from 104.31.74.35: icmp_seq=2 ttl=54 time=153 ms  
108 bytes from 104.31.74.35: icmp_seq=3 ttl=54 time=161 ms  
108 bytes from 104.31.74.35: icmp_seq=4 ttl=54 time=145 ms  
108 bytes from 104.31.74.35: icmp_seq=5 ttl=54 time=146 ms  
108 bytes from 104.31.74.35: icmp_seq=6 ttl=54 time=150 ms  
  
--- unixmen.com ping statistics ---  
6 packets transmitted, 6 received, 0% packet loss, time 5008ms  
rtt min/avg/max/mdev = 144.290/150.357/161.900/6.072 ms  
root@Ubuntu1404LTS:~#
```

Here, you can see that It is not sending 64 bytes. It is sending 108 bytes.

or

From MS Windows OS , type the following

```
ping -l 100 unixmen.com
```

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Nayer>ping -l 100 unixmen.com

Pinging unixmen.com [104.31.74.35] with 100 bytes of data:
Reply from 104.31.74.35: bytes=100 time=119ms TTL=54
Reply from 104.31.74.35: bytes=100 time=137ms TTL=54
Reply from 104.31.74.35: bytes=100 time=112ms TTL=54
Reply from 104.31.74.35: bytes=100 time=133ms TTL=54

Ping statistics for 104.31.74.35:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 112ms, Maximum = 137ms, Average = 125ms

C:\Users\Nayer>_
```

## Increase or decrease the time interval

By default ping waits for 1 second before sending the next packet towards the destination host. You can increase or decrease this using option `-i` if you wish according to meet your requirements.

Let's Increase ping time interval by 3 seconds so that it send ping request after each 3 seconds

```
ping -i 3 unixmen.com
```

```
root@Ubuntu1404LTS: ~  
root@Ubuntu1404LTS:~# ping -i 3 unixmen.com  
PING unixmen.com (104.31.74.35) 56(84) bytes of data.  
64 bytes from 104.31.74.35: icmp_seq=1 ttl=54 time=134 ms  
64 bytes from 104.31.74.35: icmp_seq=2 ttl=54 time=132 ms  
64 bytes from 104.31.74.35: icmp_seq=3 ttl=54 time=126 ms  
64 bytes from 104.31.74.35: icmp_seq=4 ttl=54 time=143 ms  
^C  
--- unixmen.com ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 9011ms  
rtt min/avg/max/mdev = 126.581/134.270/143.282/6.025 ms  
root@Ubuntu1404LTS:~#
```

It will send a ping request with a 3 seconds interval time.

If you want to decrease ping time interval, issue the below command

```
sudo ping -i 0.2 unixmen.com
```

## Flood with ping

This is used to send packets soonest. This is used to test network performance. To do so, issue the below command in the terminal.

```
sudo ping -f unixmen.com
```



```
iftekher@Ubuntu1404LTS: ~  
iftekher@Ubuntu1404LTS:~$ sudo ping -f unixmen.com  
PING unixmen.com (104.31.75.35) 56(84) bytes of data.  
.....  
.....  
.....  
.....  
.....  
.....^C  
--- unixmen.com ping statistics ---  
793 packets transmitted, 270 received, +175 duplicates, 65% packet loss, time 8423ms  
rtt min/avg/max/mdev = 85.562/102.679/129.828/9.313 ms, pipe 2,  
  ipg/ewma 10.636/97.961 ms  
iftekher@Ubuntu1404LTS:~$
```

Press CTRL+C to stop this. You will see something like this and it may differ one host to another and how good your internet connection is.

## Ping with summary statistics

If you want to see the ping summary statistics report only then use the following method. Use option -q to view only the ping statistics summary.

```
ping -c 5 -q unixmen.com
```

You will see something like this just below image.

```
iftekher@Ubuntu1404LTS: ~  
iftekher@Ubuntu1404LTS:~$ ping -c 5 -q unixmen.com  
PING unixmen.com (104.31.75.35) 56(84) bytes of data.  
  
--- unixmen.com ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 4002ms  
rtt min/avg/max/mdev = 126.696/129.734/136.933/3.725 ms  
iftekher@Ubuntu1404LTS:~$
```

Here, you can see that it is not echoing or replying the acknowledgment from the host. It's just showing the report.

# Ping timeout

If you pass the parameter `-w` with your ping command then it will specifies the deadline to terminate the ping output. This specifies the total number of seconds the ping command should send packets to that remote host.

```
ping -w 6 unixmen.com
```

So, the above command will ping the host for 6 seconds and then it will be terminated automatically and will display the result.

## Ping output explanation

While pining a host you will find different output from the ping results.

### Destination Host Unreachable

If the message is simply “Destination Host Unreachable,” then possible best reason is there is no route from the local host system and between the packets that has been sent to the destination desired destination host or a remote router reports that it has no route to the destination host.

### Request timed out

If you see **Request timed out** it means or indicates that no Echo Reply messages were received within the default time of 1 second or the time that you set while you are pining that host. This can be due to many different causes; the most common include network congestion, failure of the ARP request, packet filtering / firewall, routing error, cable fault or switch / router port problem etc etc.

### Unknown host / Ping Request Could Not Find Host

```
ping unixmens.com
```

May be you misspelled the host name or the host does not exists at all in the real internet cloud. Note that, I intentionally misspelled the host name while I ping.

For every ping results you must have 0% packet loss with a good latency or lower response

time. Depending of which transmission medium ( UTP, Fiber Optics Cable, Wi-Fi ) you are using your latency will differ.