8 Netcat (nc) Command with Examples

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Netcat (or **nc** in short) is a simple yet powerful networking command-line tool used for performing any operation in Linux related to **TCP**, **UDP**, or **UNIX**-domain sockets.

Netcat can be used for port scanning, **port redirection**, as a port listener (for incoming connections); it can also be used to open remote connections and so many other things. Besides, you can use it as a backdoor to gain access to a target server.

In this article, we will explain **Netcat** usage commands with examples.

How to Install and Use Netcat in Linux

To install the **netcat package** on your system, use the default package manager for your Linux distribution.

```
$ yum install nc                 [On CentOS/RHEL]
$ dnf install nc                 [On Fedora 22+ and RHEL 8]
$ sudo apt-get install Netcat    [On Debian/Ubuntu]
```

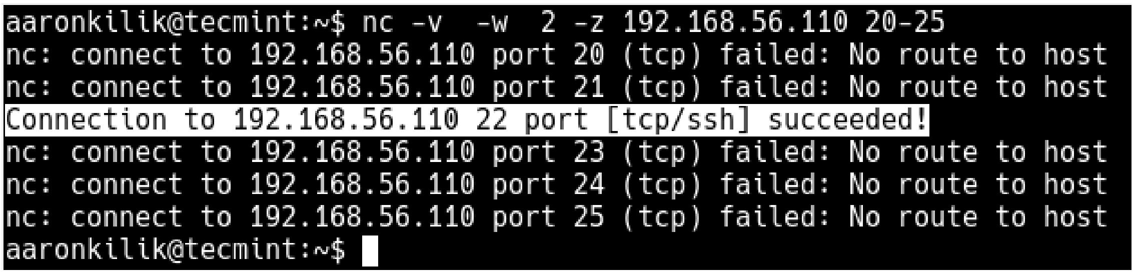
Once **netcat package** installed, you can proceed further to learn the usage of **netcat command** in the following examples.

Port Scanning

Netcat can be used for port scanning: to know which ports are open and running services on a target machine. It can scan a single or multiple or a range of open ports.

Here is an example, the `-z` option sets **nc** to simply scan for listening daemons, without actually sending any data to them. The `-v` option enables verbose mode and `-w` specifies a timeout for connection that can not be established.

```
$ nc -v -w 2 z 192.168.56.1 22     #scan a single port
OR
$ nc -v -w 2 z 192.168.56.1 22 80  #scan multiple ports
OR
$ nc -v -w 2 z 192.168.56.1 20-25  #scan range of ports
```



```
aaronkilik@tecmint:~$ nc -v  -w  2 -z 192.168.56.110 20-25
nc: connect to 192.168.56.110 port 20 (tcp) failed: No route to host
nc: connect to 192.168.56.110 port 21 (tcp) failed: No route to host
Connection to 192.168.56.110 22 port [tcp/ssh] succeeded!
nc: connect to 192.168.56.110 port 23 (tcp) failed: No route to host
nc: connect to 192.168.56.110 port 24 (tcp) failed: No route to host
nc: connect to 192.168.56.110 port 25 (tcp) failed: No route to host
aaronkilik@tecmint:~$
```

Scan for Open Ports in Linux

Transfer Files Between Linux Servers

Netcat allows you to transfer files between two Linux computers or servers and both these systems must have **nc** installed.

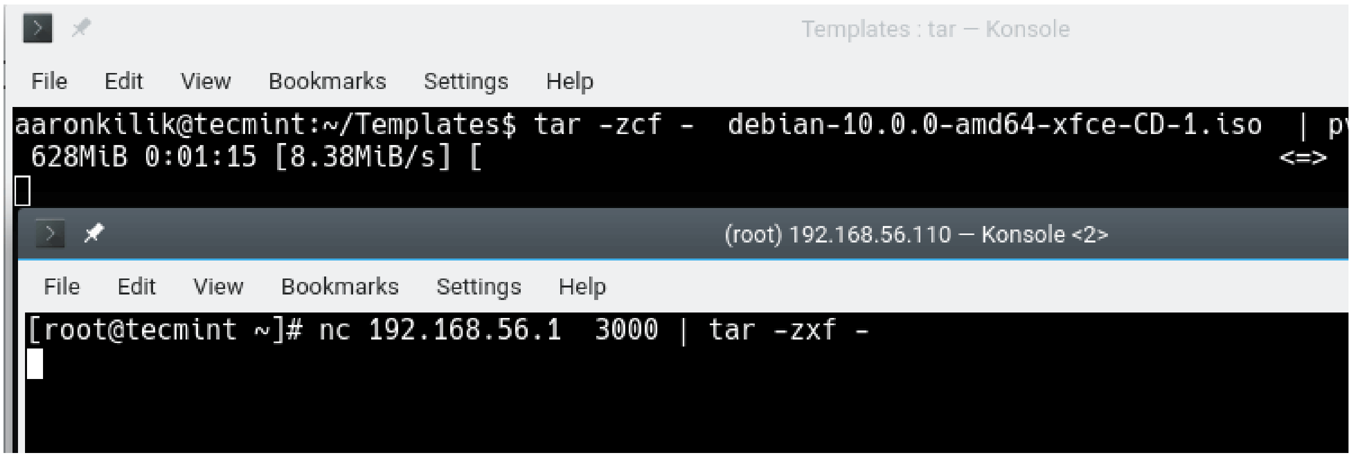
For example, to copy an ISO image file from one computer to another and monitor the transfer progress (using the pv utility), run the following command on the sender/server computer (where the ISO file exists).

This will run **nc** in listening mode (`-l` flag) on port **3000**.

```
$ tar -zcf - debian-10.0.0-amd64-xfce-CD-1.iso  | pv | nc -l -p 3000 -q 5
```

And on the receiver/client computer, run the following command to obtain the file.

```
$ nc 192.168.1.4 3000 | pv | tar -zxf -
```


Templates : tar — Konsole
File Edit View Bookmarks Settings Help
(root) 192.168.56.110 — Konsole <2>
File Edit View Bookmarks Settings Help

```
aaronkilik@tecmint:~/Templates$ tar -zcf -  debian-10.0.0-amd64-xfce-CD-1.iso  | p
 628MiB 0:01:15 [8.38MiB/s] [                                                  <=>
```

```
[root@tecmint ~]# nc 192.168.56.1  3000 | tar -zxf -
```

File Transfer Between Linux Systems

Create a Command Line Chat Server

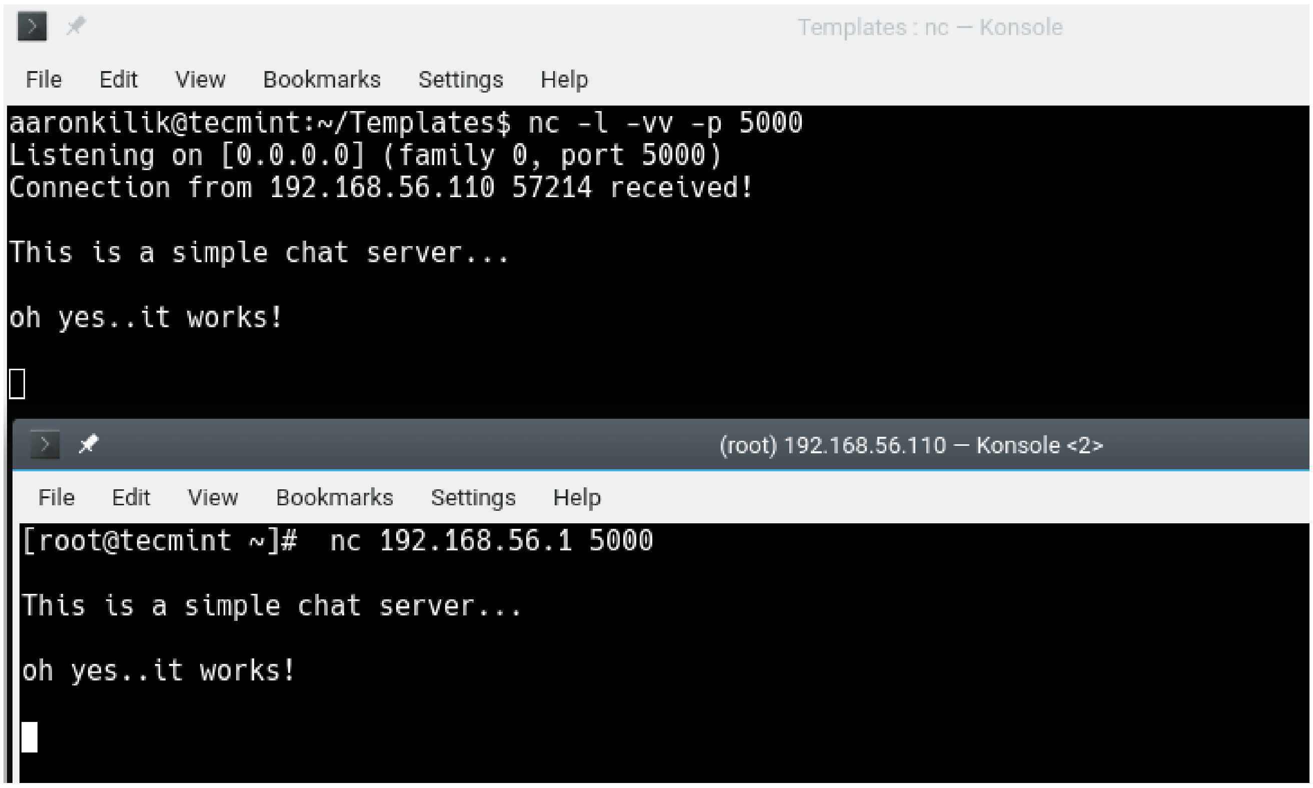
You can also use **Netcat** to create a simple command-line messaging server instantly. As in the previous usage example, **nc** must be installed on both systems used for the chat room.

On one system, run the following command to create the chat server listening on port **5000**.

```
$ nc -l -vv -p 5000
```

On the other system, run the following command to launch a chat session to a machine where the messaging server is running.

```
$ nc 192.168.56.1 5000
```


Templates : nc — Konsole
File Edit View Bookmarks Settings Help
(root) 192.168.56.110 — Konsole <2>
File Edit View Bookmarks Settings Help

```
aaronkilik@tecmint:~/Templates$ nc -l -vv -p 5000
Listening on [0.0.0.0] (family 0, port 5000)
Connection from 192.168.56.110 57214 received!

This is a simple chat server...

oh yes..it works!
```

```
[root@tecmint ~]#  nc 192.168.56.1 5000

This is a simple chat server...

oh yes..it works!
```

Create Chat Server in Command Line

Create a Basic Web Server

Wit the `-l` option of **nc command** used to create a basic, insecure web server to serve static web files for learning purposes. To demonstrate this, create a `.html` file as shown.

```
$ vim index.html
```

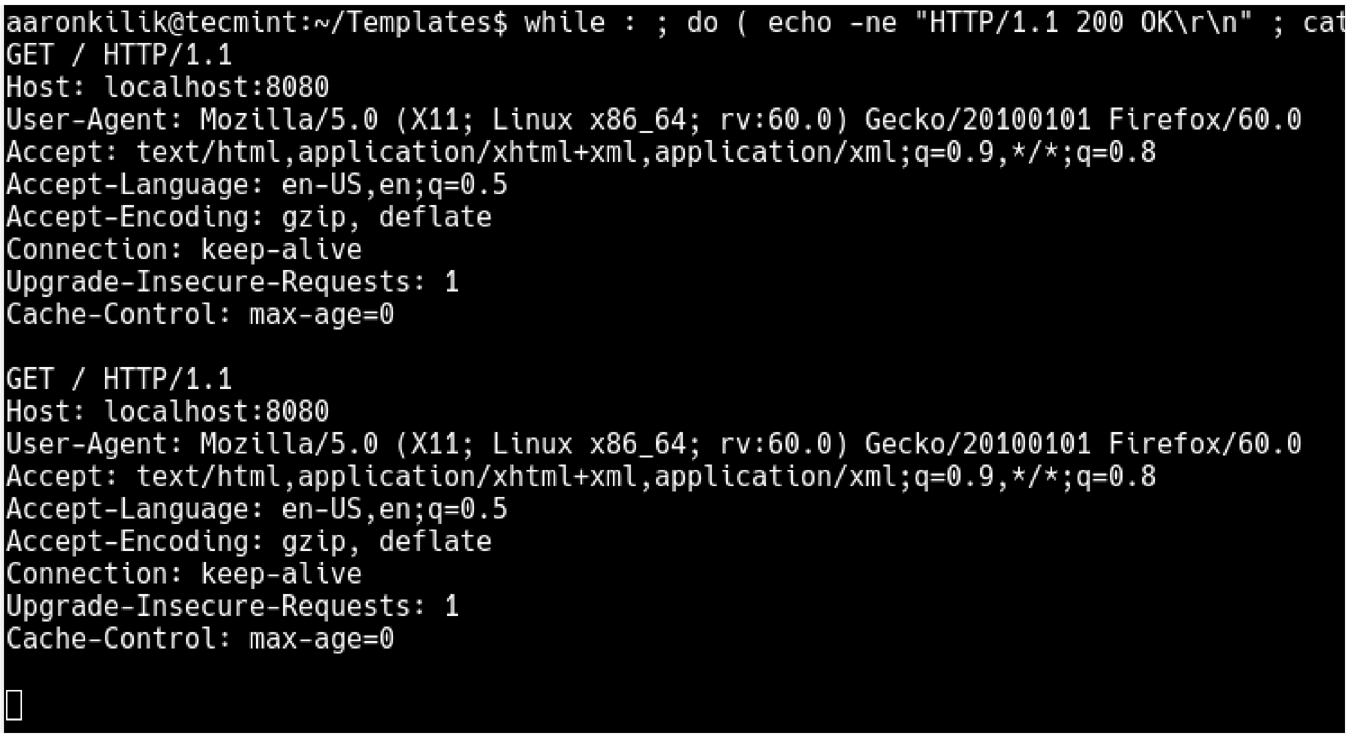
Add the following HTML lines in the file.

```
<html>
        <head>
                <title>Test Page</title>
        </head>
        <body>
                      <p>Serving this file using Netcat Basic HTTP server!</p>
        </body>
</html>
```

Save changes in the file and exit.

Then serve the above file over HTTP by running the following command, which will enables the HTTP server to run continuously.

```
$ while : ; do ( echo -ne "HTTP/1.1 200 OK\r\n" ; cat index.html; ) | nc -l -p 8080 ; done
```



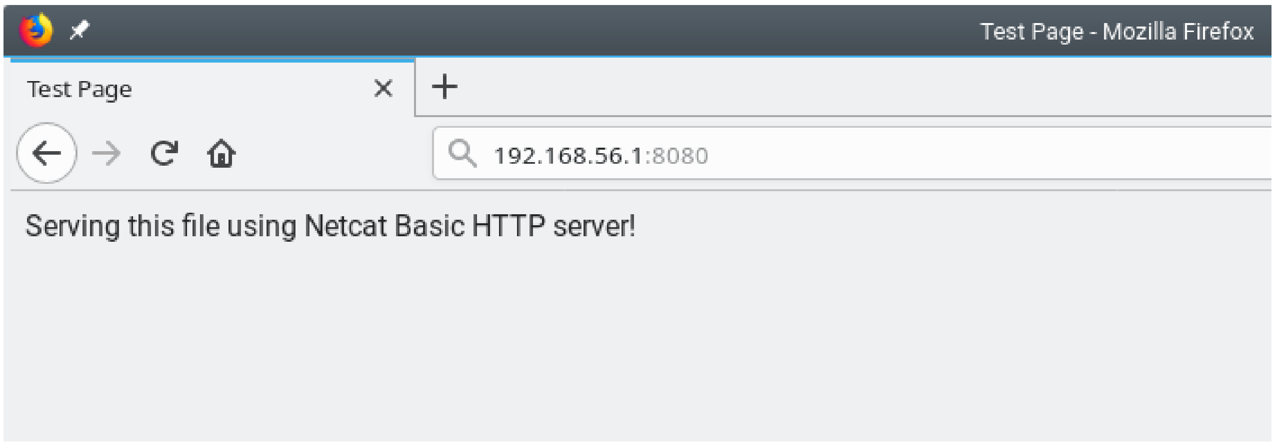
```
aaronkilik@tecmint:~/Templates$ while : ; do ( echo -ne "HTTP/1.1 200 OK\r\n" ; cat
GET / HTTP/1.1
Host: localhost:8080
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101 Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Cache-Control: max-age=0

GET / HTTP/1.1
Host: localhost:8080
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101 Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Cache-Control: max-age=0
```

Create Web server in Command line

Then open a web browser and can access the content using the following address.

```
http://localhost:8080
OR
http://SERVER_IP:8080
```



Serving this file using Netcat Basic HTTP server!

Test Web Server

Note that you can to stop the **Netcat HTTP server** by pressing `[Ctrl+ C]`.

Troubleshoot Linux Server Connection

Another useful usage of **Netcat** is to troubleshoot server connection issues. Here, you can use **Netcat** to verify what data a server is sending in response to commands issued by the client.

The following command retrieves the home page of **example.com**.

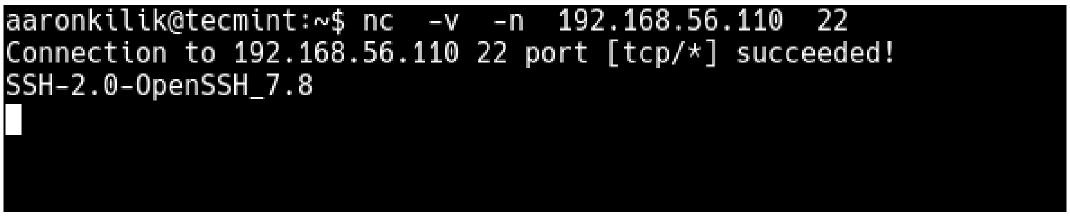
```
$ printf "GET / HTTP/1.0\r\n\r\n" | nc text.example.com 80
```

The output of the above command includes the headers sent by the web-server which can be used for troubleshooting purposes.

Find a Service Running on Port

You can also use **Netcat** to obtain port banners. In this case, it will tell you what service is running behind a certain port. For example to know what type of service is running behind port **22** on a specific server, run the following command (replace **192.168.56.110** with the target server's IP address). The `-n` flag means to disable DNS or service lookups.

```
$ nc -v -n 192.168.56.110 80
```



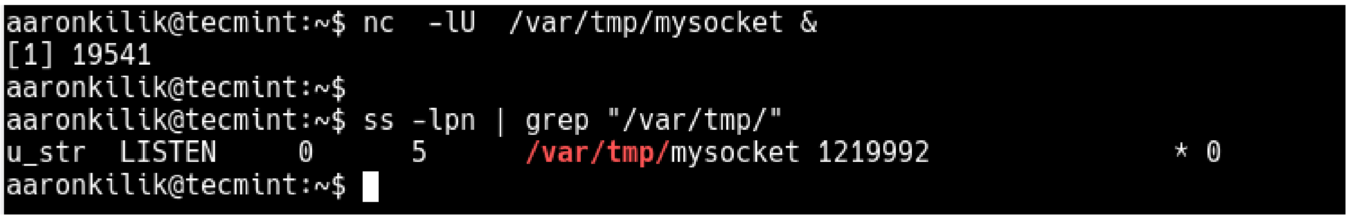
```
aaronkilik@tecmint:~$ nc  -v  -n  192.168.56.110  22
Connection to 192.168.56.110 22 port [tcp/*] succeeded!
SSH-2.0-OpenSSH_7.8
```

Find Service Running on Port

Create a Stream Sockets

Netcat also supports creation of UNIX-domain stream sockets. The following command will create and listen on a UNIX-domain stream socket.

```
$ nc -lU /var/tmp/mysocket &
$ ss -lpn | grep "/var/tmp/"
```



```
aaronkilik@tecmint:~$ nc  -lU  /var/tmp/mysocket &
[1] 19541
aaronkilik@tecmint:~$
aaronkilik@tecmint:~$ ss -lpn | grep "/var/tmp/"
u_str  LISTEN     0      5      /var/tmp/mysocket 1219992                * 0
aaronkilik@tecmint:~$
```

Create Stream Socket in Command Line

Create a Backdoor

You can as well run **Netcat** as a backdoor. However, this calls for more work. If **Netcat** is installed on a target server, you can use it to create a backdoor, to get a remote command prompt.

To act a backdoor you need **Netcat** to listen on a chosen port (e.g port **3001**) on the target server and then you can connect to this port from your machine as follows.

This is the command intended to run on the remote server where the `-d` option disables reading from stdin, and `-e` specifies the command to run on the target system.

```
$ nc -L -p 3001 -d -e cmd.exe
```

Last but not least, **Netcat** can be used as a proxy for different services/protocols including HTTP, SSH, and many more. For more information, see its man page.

```
$ man nc
```

In this article, we have explained 8 practical **Netcat command usage examples**. If you know any other practical use case(s), share with us via the feedback form below. You can ask a question as well.