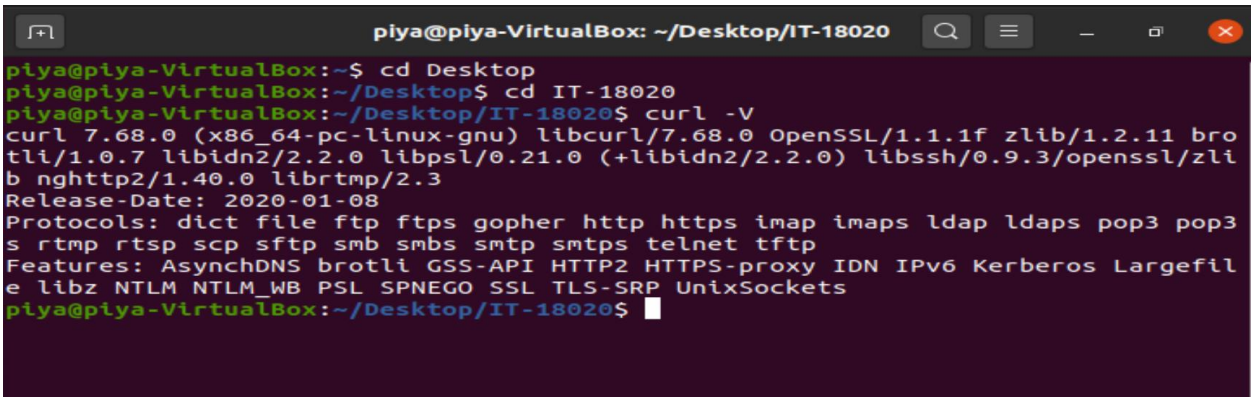
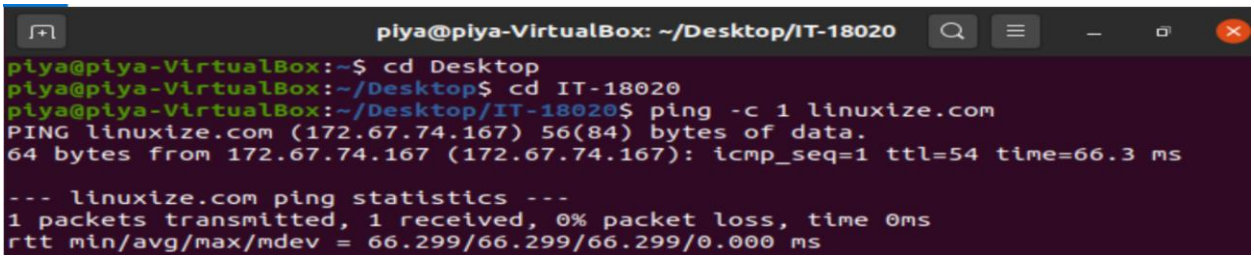
1.curl: The curl command transfers data to or from a network server using one of the supported protocols(HTTP,HTTPS,FTP,FTPS)



2.**ping:**The ping command resolves the domain name into an IP address and stars sending ICMP packeges to the destination.



3.wget: This command is used for downloading files from the web.

4.tc: The tc command is used to display or modify traffic control settings.

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ tc
Usage:  tc [ OPTIONS ] OBJECT { COMMAND | help }
        tc [-force] -batch filename
where  OBJECT := { qdisc | class | filter | chain |
                   action | monitor | exec }
       OPTIONS := { -V[ersion] | -s[tatistics] | -d[etails] | -r[aw] |
                    -o[neline] | -j[son] | -p[retty] | -c[olor]
                    -b[atch] [filename] | -n[etns] name | -N[umeric] |
                     -nm | -nam[es] | { -cf | -conf } path }
piya@piya-VirtualBox:~/Desktop/IT-18020$
```

5.dig: The dig command is used to gather DNS information

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ dig

; <<>> DiG 9.16.1-Ubuntu <<>>
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 10401
;; flags: qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;.                              IN      NS

;; ANSWER SECTION:
.                       70351   IN      NS      e.root-servers.net.
.                       70351   IN      NS      b.root-servers.net.
.                       70351   IN      NS      f.root-servers.net.
.                       70351   IN      NS      i.root-servers.net.
.                       70351   IN      NS      h.root-servers.net.
.                       70351   IN      NS      l.root-servers.net.
.                       70351   IN      NS      m.root-servers.net.
.                       70351   IN      NS      a.root-servers.net.
.                       70351   IN      NS      j.root-servers.net.
.                       70351   IN      NS      c.root-servers.net.
.                       70351   IN      NS      k.root-servers.net.
.                       70351   IN      NS      d.root-servers.net.
```

```
;; Query time: 4 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: বুধ নভেম্বর 18 13:08:07 +06 2020
;; MSG SIZE  rcvd: 239

piya@piya-VirtualBox:~/Desktop/IT-18020$
```

6.whois:whois searches for an object in a WHOIS database

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ whois
Usage: whois [OPTION]... OBJECT...

-h HOST, --host HOST    connect to server HOST
-p PORT, --port PORT    connect to PORT
-I                      query whois.iana.org and follow its referral
-H                      hide legal disclaimers
      --verbose         explain what is being done
      --help            display this help and exit
      --version         output version information and exit

These flags are supported by whois.ripe.net and some RIPE-like servers:
-l                      find the one level less specific match
-L                      find all levels less specific matches
-m                      find all one level more specific matches
-M                      find all levels of more specific matches
-c                      find the smallest match containing a mnt-irt attribute
-x                      exact match
-b                      return brief IP address ranges with abuse contact
-B                      turn off object filtering (show email addresses)
-G                      turn off grouping of associated objects
-d                      return DNS reverse delegation objects too
-i ATTR[,ATTR]...       do an inverse look-up for specified ATTRibutes
-T TYPE[,TYPE]...       only look for objects of TYPE
-K                      only primary keys are returned
-r                      turn off recursive look-ups for contact information
```

```
-R                      force to show local copy of the domain object even
                        if it contains referral
-a                      also search all the mirrored databases
-s SOURCE[,SOURCE]...   search the database mirrored from SOURCE
-g SOURCE:FIRST-LAST    find updates from SOURCE from serial FIRST to LAST
-t TYPE                 request template for object of TYPE
-v TYPE                 request verbose template for object
-q [version|sources|types]  query specified server info
```

7.ssh:SSH stands for secure shell.It is used to surely connect to a remote system

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ ssh
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-B bind_interface]
           [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
           [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
           [-i identity_file] [-J [user@]host[:port]] [-L address]
           [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
           [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
           [-w local_tun[:remote_tun]] destination [command]
```

8.scp:SCP stands for secure copy command.It is used to copy files/folders between servers in secure way.

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ scp
usage: scp [-346BCpqrTv] [-c cipher] [-F ssh_config] [-i identity_file]
           [-J destination] [-l limit] [-o ssh_option] [-P port]
           [-S program] source ... target
piya@piya-VirtualBox:~/Desktop/IT-18020$
```

9.rsync: Rsync is a most commonly used command for copying and synchronizing files and directories.

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ rsync
rsync  version 3.1.3  protocol version 31
Copyright (C) 1996-2018 by Andrew Tridgell, Wayne Davison, and others.
Web site: http://rsync.samba.org/
Capabilities:
    64-bit files, 64-bit inums, 64-bit timestamps, 64-bit long ints,
    socketpairs, hardlinks, symlinks, IPv6, batchfiles, inplace,
    append, ACLs, xattrs, iconv, symtimes, prealloc

rsync comes with ABSOLUTELY NO WARRANTY.  This is free software, and you
are welcome to redistribute it under certain conditions.  See the GNU
General Public Licence for details.

rsync is a file transfer program capable of efficient remote update
via a fast differencing algorithm.

Usage: rsync [OPTION]... SRC [SRC]... DEST
  or   rsync [OPTION]... SRC [SRC]... [USER@]HOST:DEST
  or   rsync [OPTION]... SRC [SRC]... [USER@]HOST::DEST
  or   rsync [OPTION]... SRC [SRC]... rsync://[USER@]HOST[:PORT]/DEST
  or   rsync [OPTION]... [USER@]HOST:SRC [DEST]
  or   rsync [OPTION]... [USER@]HOST::SRC [DEST]
  or   rsync [OPTION]... rsync://[USER@]HOST[:PORT]/SRC [DEST]
The ':' usages connect via remote shell, while '::' & 'rsync://' usages connect
to an rsync daemon, and require SRC or DEST to start with a module name.
```

```
Options
 -v, --verbose               increase verbosity
     --info=FLAGS            fine-grained informational verbosity
     --debug=FLAGS           fine-grained debug verbosity
     --msgs2stderr           special output handling for debugging
 -q, --quiet                 suppress non-error messages
     --no-motd               suppress daemon-mode MOTD (see manpage caveat)
 -c, --checksum              skip based on checksum, not mod-time & size
 -a, --archive               archive mode; equals -rlptgoD (no -H,-A,-X)
     --no-OPTION             turn off an implied OPTION (e.g. --no-D)
 -r, --recursive             recurse into directories
 -R, --relative              use relative path names
     --no-implied-dirs       don't send implied dirs with --relative
 -b, --backup                make backups (see --suffix & --backup-dir)
     --backup-dir=DIR        make backups into hierarchy based in DIR
     --suffix=SUFFIX         set backup suffix (default ~ w/o --backup-dir)
 -u, --update                skip files that are newer on the receiver
     --inplace               update destination files in-place (SEE MAN PAGE)
     --append                append data onto shorter files
     --append-verify         like --append, but with old data in file checksum
 -d, --dirs                  transfer directories without recursing
 -l, --links                 copy symlinks as symlinks
 -L, --copy-links            transform symlink into referent file/dir
     --copy-unsafe-links     only "unsafe" symlinks are transformed
     --safe-links            ignore symlinks that point outside the source tree
     --munge-links           munge symlinks to make them safer (but unusable)
```

```
-k, --copy-dirlinks           transform symlink to a dir into referent dir
-K, --keep-dirlinks           treat symlinked dir on receiver as dir
-H, --hard-links              preserve hard links
-p, --perms                   preserve permissions
-E, --executability           preserve the file's executability
    --chmod=CHMOD             affect file and/or directory permissions
-A, --acls                    preserve ACLs (implies --perms)
-X, --xattrs                  preserve extended attributes
-o, --owner                   preserve owner (super-user only)
-g, --group                   preserve group
    --devices                 preserve device files (super-user only)
    --copy-devices            copy device contents as regular file
    --specials                preserve special files
-D                            same as --devices --specials
-t, --times                   preserve modification times
-O, --omit-dir-times          omit directories from --times
-J, --omit-link-times         omit symlinks from --times
    --super                   receiver attempts super-user activities
    --fake-super              store/recover privileged attrs using xattrs
-S, --sparse                  turn sequences of nulls into sparse blocks
    --preallocate             allocate dest files before writing them
-n, --dry-run                 perform a trial run with no changes made
-W, --whole-file              copy files whole (without delta-xfer algorithm)
    --checksum-choice=STR     choose the checksum algorithms
-x, --one-file-system         don't cross filesystem boundaries
-B, --block-size=SIZE         force a fixed checksum block-size
```

```
-e, --rsh=COMMAND             specify the remote shell to use
    --rsync-path=PROGRAM      specify the rsync to run on the remote machine
    --existing                skip creating new files on receiver
    --ignore-existing         skip updating files that already exist on receiver
    --remove-source-files     sender removes synchronized files (non-dirs)
    --del                     an alias for --delete-during
    --delete                  delete extraneous files from destination dirs
    --delete-before           receiver deletes before transfer, not during
    --delete-during           receiver deletes during the transfer
    --delete-delay            find deletions during, delete after
    --delete-after            receiver deletes after transfer, not during
    --delete-excluded         also delete excluded files from destination dirs
    --ignore-missing-args     ignore missing source args without error
    --delete-missing-args     delete missing source args from destination
    --ignore-errors           delete even if there are I/O errors
    --force                   force deletion of directories even if not empty
    --max-delete=NUM          don't delete more than NUM files
    --max-size=SIZE           don't transfer any file larger than SIZE
    --min-size=SIZE           don't transfer any file smaller than SIZE
    --partial                 keep partially transferred files
    --partial-dir=DIR         put a partially transferred file into DIR
    --delay-updates           put all updated files into place at transfer's end
-m, --prune-empty-dirs        prune empty directory chains from the file-list
    --numeric-ids             don't map uid/gid values by user/group name
    --usermap=STRING          custom username mapping
    --groupmap=STRING         custom groupname mapping
```

```
     --chown=USER:GROUP       simple username/groupname mapping
     --timeout=SECONDS        set I/O timeout in seconds
     --contimeout=SECONDS     set daemon connection timeout in seconds
 -I, --ignore-times           don't skip files that match in size and mod-time
 -M, --remote-option=OPTION   send OPTION to the remote side only
     --size-only              skip files that match in size
 -@, --modify-window=NUM      set the accuracy for mod-time comparisons
 -T, --temp-dir=DIR           create temporary files in directory DIR
 -y, --fuzzy                  find similar file for basis if no dest file
     --compare-dest=DIR       also compare destination files relative to DIR
     --copy-dest=DIR          ... and include copies of unchanged files
     --link-dest=DIR          hardlink to files in DIR when unchanged
 -z, --compress               compress file data during the transfer
     --compress-level=NUM     explicitly set compression level
     --skip-compress=LIST     skip compressing files with a suffix in LIST
 -C, --cvs-exclude            auto-ignore files the same way CVS does
 -f, --filter=RULE            add a file-filtering RULE
 -F                           same as --filter='dir-merge /.rsync-filter'
                              repeated: --filter='- .rsync-filter'
     --exclude=PATTERN        exclude files matching PATTERN
     --exclude-from=FILE      read exclude patterns from FILE
     --include=PATTERN        don't exclude files matching PATTERN
     --include-from=FILE      read include patterns from FILE
     --files-from=FILE        read list of source-file names from FILE
 -0, --from0                  all *-from/filter files are delimited by 0s
 -s, --protect-args           no space-splitting; only wildcard special-chars
```

```
 -s, --protect-args           no space-splitting; only wildcard special-chars
     --address=ADDRESS        bind address for outgoing socket to daemon
     --port=PORT              specify double-colon alternate port number
     --sockopts=OPTIONS       specify custom TCP options
     --blocking-io            use blocking I/O for the remote shell
     --stats                  give some file-transfer stats
 -8, --8-bit-output           leave high-bit chars unescaped in output
 -h, --human-readable         output numbers in a human-readable format
     --progress               show progress during transfer
 -P                           same as --partial --progress
 -i, --itemize-changes        output a change-summary for all updates
     --out-format=FORMAT      output updates using the specified FORMAT
     --log-file=FILE          log what we're doing to the specified FILE
     --log-file-format=FMT    log updates using the specified FMT
     --password-file=FILE     read daemon-access password from FILE
     --list-only              list the files instead of copying them
     --bwlimit=RATE           limit socket I/O bandwidth
     --stop-at=y-m-dTh:m      Stop rsync at year-month-dayThour:minute
     --time-limit=MINS        Stop rsync after MINS minutes have elapsed
     --outbuf=N|L|B           set output buffering to None, Line, or Block
     --write-batch=FILE       write a batched update to FILE
     --only-write-batch=FILE  like --write-batch but w/o updating destination
     --read-batch=FILE        read a batched update from FILE
     --protocol=NUM           force an older protocol version to be used
     --iconv=CONVERT_SPEC     request charset conversion of filenames
     --checksum-seed=NUM      set block/file checksum seed (advanced)
```

```
     --checksum-seed=NUM      set block/file checksum seed (advanced)
     --noatime                do not alter atime when opening source files
 -4, --ipv4                   prefer IPv4
 -6, --ipv6                   prefer IPv6
     --version                print version number
(-h) --help                   show this help (-h is --help only if used alone)

Use "rsync --daemon --help" to see the daemon-mode command-line options.
Please see the rsync(1) and rsyncd.conf(5) man pages for full documentation.
See http://rsync.samba.org/ for updates, bug reports, and a
rsync error: syntax or usage error (code 1) at main.c(1580)          t=3.1.3]
```

10.ngrep: It can be used to analyze and search network packets for a given regex pattern or string.

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ sudo ngrep port 80
[sudo] password for piya:
interface: enp0s3 (10.0.2.0/255.255.255.0)
filter: ( port 80 ) and ((ip || ip6) || (vlan && (ip || ip6)))
####
T 35.222.85.5:80 -> 10.0.2.15:54784 [AS] #4
  ..
##
T 10.0.2.15:54784 -> 35.222.85.5:80 [AP] #6
  GET / HTTP/1.1..Host: connectivity-check.ubuntu.com..Accept: */*..Connecti
  on: close....
#
T 35.222.85.5:80 -> 10.0.2.15:54784 [A] #7
  ......
#
T 35.222.85.5:80 -> 10.0.2.15:54784 [AP] #8
  HTTP/1.1 204 No Content..Date: Wed, 18 Nov 2020 07:36:37 GMT..Server: Apac
  he/2.4.18 (Ubuntu)..X-NetworkManager-Status: online..Connection: close....
##
T 35.222.85.5:80 -> 10.0.2.15:54784 [AF] #10
  ......
##
T 35.222.85.5:80 -> 10.0.2.15:54784 [A] #12
  ......
```

11.ifconfig: This command is used to configure the kernel-resident networking interfaces

```
piya@piya-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::82ee:ba8c:3085:6617  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:29:d4:bb  txqueuelen 1000  (Ethernet)
        RX packets 102146  bytes 113011754 (113.0 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 25536  bytes 1607427 (1.6 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 1575  bytes 94464 (94.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1575  bytes 94464 (94.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

piya@piya-VirtualBox:~$
```

12.tcpdump: It is used to capture and analyze network traffic going through our system.

13.wireshark:

```
piya@piya-VirtualBox:~$ tcpdump
tcpdump: enp0s3: You don't have permission to capture on that device
(socket: Operation not permitted)
piya@piya-VirtualBox:~$ wireshark
14:21:14.735           Warn Could not compile "of" in colorfilters file "/home/p
iya/.wireshark/colorfilters".
"of" is neither a field nor a protocol name.
14:21:14.735           Warn Could not compile "Checksum Errors" in colorfilters
file "/home/piya/.wireshark/colorfilters".
Neither "cdp.checksum_bad" nor "1" are field or protocol names.
```

14.route: Route command is used to show/manipulate the IP routing table.

```
piya@piya-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         _gateway        0.0.0.0         UG    100    0        0 enp0s3
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 enp0s3
link-local      0.0.0.0         255.255.0.0     U     1000   0        0 enp0s3
piya@piya-VirtualBox:~$
```

15.ip:ip command is used to assign an address to a network interface.

```
piya@piya-VirtualBox:~$ ip
Usage: ip [ OPTIONS ] OBJECT { COMMAND | help }
       ip [ -force ] -batch filename
where  OBJECT := { link | address | addrlabel | route | rule | neigh | ntable |
                   tunnel | tuntap | maddress | mroute | mrule | monitor | xfrm
 |
                   netns | l2tp | fou | macsec | tcp_metrics | token | netconf
| ila |
                   vrf | sr | nexthop }
       OPTIONS := { -V[ersion] | -s[tatistics] | -d[etails] | -r[esolve] |
                    -h[uman-readable] | -iec | -j[son] | -p[retty] |
                    -f[amily] { inet | inet6 | mpls | bridge | link } |
                    -4 | -6 | -I | -D | -M | -B | -0 |
                    -l[oops] { maximum-addr-flush-attempts } | -br[ief] |
                    -o[neline] | -t[imestamp] | -ts[hort] | -b[atch] [filename]
 |
                    -rc[vbuf] [size] | -n[etns] name | -N[umeric] | -a[ll] |
                    -c[olor]}
piya@piya-VirtualBox:~$
```

16.sysctl:sysctl command reads the information from the /proc/sys directory.

```
piya@piya-VirtualBox:~$ sysctl

Usage:
 sysctl [options] [variable[=value] ...]

Options:
  -a, --all             display all variables
  -A                    alias of -a
  -X                    alias of -a
      --deprecated      include deprecated parameters to listing
  -b, --binary          print value without new line
  -e, --ignore          ignore unknown variables errors
  -N, --names           print variable names without values
  -n, --values          print only values of the given variable(s)
  -p, --load[=<file>]   read values from file
  -f                    alias of -p
      --system          read values from all system directories
  -r, --pattern <expression>
                        select setting that match expression
  -q, --quiet           do not echo variable set
  -w, --write           enable writing a value to variable
  -o                    does nothing
  -x                    does nothing
  -d                    alias of -h

 -h, --help     display this help and exit
 -V, --version  output version information and exit

For more details see sysctl(8).
```

17.nc: It is used for reading,writing,redirecting data across a network.

```
piya@piya-VirtualBox:~$ nc
usage: nc [-46CDdFhklNnrStUuvZz] [-I length] [-i interval] [-M ttl]
          [-m minttl] [-O length] [-P proxy_username] [-p source_port]
          [-q seconds] [-s source] [-T keyword] [-V rtable] [-W recvlimit] [-w
timeout]
          [-X proxy_protocol] [-x proxy_address[:port]]           [destination]
 [port]
piya@piya-VirtualBox:~$
```

18.socat: The socat command shuffles data between two locations.

```
piya@piya-VirtualBox:~$ socat
2020/11/18 14:37:16 socat[6531] E exactly 2 addresses required (there are 0); u
se option "-h" for help
piya@piya-VirtualBox:~$ socat - TCP4:www.example.com:80
piya@piya-VirtualBox:~$
```

19.telnet: This command used to create a remote connection with a system over a TCP/IP network.

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ telnet
telnet> h
Commands may be abbreviated.  Commands are:

close           close current connection
logout          forcibly logout remote user and close the connection
display         display operating parameters
mode            try to enter line or character mode ('mode ?' for more)
open            connect to a site
quit            exit telnet
send            transmit special characters ('send ?' for more)
set             set operating parameters ('set ?' for more)
unset           unset operating parameters ('unset ?' for more)
status          print status information
toggle          toggle operating parameters ('toggle ?' for more)
slc             set treatment of special characters

z               suspend telnet
environ         change environment variables ('environ ?' for more)
telnet>
```

20.netstat: It is used to connect to list out all the network connections on a system.

```
piya@piya-VirtualBox:~/Desktop/IT-18020$ netstat -a | more
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:ssh             0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6654            0.0.0.0:*               LISTEN
tcp6       0      0 [::]:ssh                [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 0.0.0.0:52750           0.0.0.0:*
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 piya-VirtualBox:bootpc  _gateway:bootps         ESTABLISHED
udp6       0      0 [::]:47327              [::]:*
udp6       0      0 [::]:mdns               [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
```