

Practical - 1

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Topic : Study of various Network commands used in Linux and Windows.

Basic Network Commands:

`arp -a`:

ARP is a short form of address resolution protocol. It will show the IP address of your computer along with the IP addresses and MAC address of your router.

`hostname`:

This is the simplest of all TCP/IP commands. It simply displays the name of your computer.

`ipconfig /all`:

This command displays detailed configuration information about your TCP/IP connection through Router, Gateway, DNS, DHCP, and type of Ethernet adapter in your system.

`nbtstat -a`:

This command helps solve problems with NetBIOS name resolution. (Nbt stands for NetBIOS over TCP/IP).

`netstat`:

netstat displays a variety of statistics about a computer's active TCP/IP connections. It is a command line tool for monitoring network connections both incoming and outgoing as well as viewing route tables, interfaces statistics, etc.

Eg: `netstat -n`

nslookup;

(name server lookup) is a tool used to perform DNS lookups in Linux. It is used to display DNS details, such as the IP address of a computer, NS servers, etc. It can operate in two modes; interactive and non-interactive.
eg: nslookup www.google.com

pathping;

It is unique to Windows, and is a combination of Ping and Traceroute commands. Pathping traces the route to the destination address then launches a 2s second test of each router along the way, gathering rate of data loss along each hop.

ping;

(Packet Internet Groper) command is the best way to test connectivity between two nodes. Ping uses ICMP (Internet Control Message Protocol) to communicate to other devices.

1. #ping hostname (ping localhost)
2. #ping ip address (ping 4.2.2.2)
3. #ping fully qualified domain name (ping www.facebook.com).

Route;

route command is used to show/manipulate IP routing table. It is primarily used to set up static routes to specific host or networks via an interface.

Linux networking commands

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1. ip

The ip command is one of the basic commands every administrator will need in daily work. The ip command can show address information, manipulate routing, plus display network various devices, interfaces, and tunnels.

ip <OPTIONS><OBJECT><COMMAND>

- To show the IP addresses assigned to an interface on your server.

[root@server ~] # ip address show

- To assign an IP to an interface, for example, enps03.

[root@server ~] # ip address add 192.168.1.254/24 dev enps03

- To delete an IP on an interface:

[root@server ~] # ip address del 192.168.1.253/24 dev enps03

2. ifconfig

This command is a staple in many sysadmin's tool belt for configuring and troubleshooting networks. It has since been replaced by the ip command.

3. mtr

MTR (Mrtg's traceroute) is a program with a command line interface that serves as a network diagnostic and troubleshooting tool. This command combines the functionality of the ping & traceroute commands.

Syntax:

mtr <options> hostname / IP

- The basic mtr command shows you statistics, including each hop (hostname) with time and loss %.

[root@server ~] # mtr google.com

b. Show numeric IP address & hostnames, too:

[root@server ~] # mtr -b google.com

c. Set the number of pings that you want to send:

[root@server ~] mtr -c 10 google.com

4. tcpdump

The tcpdump command is designed for capturing and displaying packets.

- You can install tcpdump with command below:

[root@server ~] # dnf install -y tcpdump

- If you want to capture traffic on eth0:

[root@server ~] # tcpdump -i eth0

- To capture only HTTPS traffic,

[root@server ~] tcpdump -i eth0 -c host www.google.com
and port 443

5. ping

Ping is a tool that verifies IP-level connectivity to another TCP/IP computer by sending Internet Message Control Protocol (ICMP) Echo Request Message.

[root@server ~] # ping google.com

PING google.com (216.58.206.174) 56(84) bytes of data.

64 bytes from sof02327-in-f14.1e100.net (216.58.206.174):

icmp_seq = 1 ttl = 56 time = 10.7 ms

64 bytes from sof02327-in-f14.1e100.net (216.58.206.174):

icmp_seq = 2 ttl = 56 time = 10.2 ms

^C

Aborted: user wrote breakme.cfm and set .o
file has unit file ('smallest') of class prlbulm

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Configuring network connection by using nmcli (Efferent)

1. #nmcli connection show

Name	UUID	Type	Device
Wired connection 1	asebb690-cc20-3368-8f8-0314a22f3f75	ethernet	enp1s0

2. Configure IPv4 settings:

#nmcli connection modify "Wired connection" ipv4.method auto

3. Configure IPv6 settings:

#nmcli connection modify "Wired connection 1" ipv6.method auto

4. Activate the profile:

#nmcli connection up eth0-LAN

Verification:

1. #ip address show enp1s0 (Display the IP settings of NIC)
2. #ip route show default (Display IPv4 default Gateway)
3. #ip -6 route show default (Display IPv6 default Gateway)
4. #cat /etc/hosts.conf (Display DNS settings)
5. #ping <host-name-or-IP-address> to verify that host can send packets to other hosts.

Result:

Thus, the Basic Network Commands has been executed successfully.