

16/07/2024

CS19541 - Computer Networks Laboratory Observation

Practical-01

Basic Networking Commands

Aim:

Study of various Network commands used in Linux and Windows.

Commands

- i) arp -a : ARP is short form of address resolution protocol, which show the IP address of your command along with IP address and MAC address of your router.

Output:

Interface: 172.16.8.93 -- 0x4

Internet Address	Physical Address	Type
172.16.8.1	7C-5A-1E-CF-BE-45	dynamic
172.16.8.172	7C-57-58-35-0D-3D	dynamic
172.16.11.255	BB-BB-BB-BB-BB-BB	static
244.0.0.2	01-00-5E-00-00-02	static
244.0.0.251	01-00-5E-00-00-FB	static
239.255.255.250	01-00-5E-7F-BB-BA	static

Interface:	192.168.182.1	---	0xb
Internet Address	physical Address	Type	
192.168.182.255	bb-bb-bb-bb-bb-bb	static	
244.0.0.2	01-00-5e-00-00-02	static	
244.0.0.252	01-00-5e-00-00-fc	static	
239.255.255.250	01-00-5e-7b-bb-fa	static	

2) hostname: It displays the name of your computer.

Output: DESKTOP-V4FUKL3

3) ipconfig/all: This command displays detailed configuration information about your TCP/IP connection.

Output: Windows IP configuration.

Host Name : DESKTOP-V4FUKL3

Primary DNS Suffix :

Node Type : Mixed

IP Routing Enabled : No

WINS Proxy Enabled : No

Ethernet adapter Ethernet 2:

connection-specific DNS suffix:

Description: VirtualBox Host-only Ethernet Adapter

Physical Address: 0A-00-27-00-00-11

DHCP Enabled: No

Subnet Mask: 255.255.255.0

4) nbtstat -a
problems

Output:

o/p: Ethernet

Node

UHOST

Ethernet

Node

Host

VMWA

Node

Host

VMWA

Node

Host

Host

nbtst

Output

Net

Output

Net

Output

Net

Output

Net

Output

Net

Output

Net

Type

static

2 static

fc static

a static

of yours

y8 detailed
our TCP/IP

3f1E

4FUKL3

Ethernet
Adapters

4) nbtstat -a: This command helps solve problems with NetBIOS Name resolution.

Output: 1. nbtstat -a DESKTOP-V4FUKL3
OIP: Ethernet 2:

Node IP Address: [192.168.56.1] Scope Id: []

Host Not found.

Ethernet

Node IP Address: [172.16.8.93] Scope Id: []

Host Not found.

VMWare Network Adapter VMNet8:

Node IP Address: [192.168.8.1] Scope Id: []

Host Not found.

VMWare Network Adapter VMNet1:

Node IP Address: [192.168.182.1] Scope Id: []

Host Not found.

nbtstat -a

Output:

NetBIOS Name Resolution and registration statistics

Resolved By Broadcast = 0

Resolved By Name Server = 0

Registered By Broadcast = 12

Registered By Name Server = 0

nbtstat -s

Output:

VMWare Network Adapter VMNet1:

Node IP Address: [192.168.255.1] Scope Id: []

No connections
VMware Network Adapter VMnet8 Work
Node IP Address: [192.168.72.1] Scope Id: []

No connections

Ethernet: [172.16.8.112] Scope Id: []

Node IP Address: [172.16.8.112] Scope Id: []

No connections

- 5) netstat: netstat displays a variety of statistics about a computer's active TCP/IP connections.

Output:

Active Connections:

Proto	Local Address	Foreign Address	State
-------	---------------	-----------------	-------

TCP 172.16.8.93:52328 8b-in-188:5228 ESTABLISHED

TCP 172.16.8.93:52464 13.107.213.254:https CLOSE_WAIT

TCP 172.16.8.93:52491 52.139.252.32:https ESTABLISHED

TCP 172.16.8.93:52498 923-57-53-203:https TIME_WAIT

TCP 172.16.8.93:52499 20.198.118.190:https ESTABLISHED

TCP 172.16.8.93:52500 923-11-215-11:https CLOSE_WAIT

TCP 172.16.8.93:52501 923-11-215-11:https ESTABLISHED

TCP 172.16.8.93:52502 923-11-215-11:https CLOSE_WAIT

TCP 172.16.8.93:52503 923-11-215-11:https CLOSE_WAIT

TCP 172.16.8.93:52504 40.79.189.58:https ESTABLISHED

TCP 172.16.8.93:52505 13.107.18.254:https ESTABLISHED

6) nslookup:
lookups
Output:
1. nslookup
Output:

Server
Address

Name
Address

Alias

2. nslookup
Output

Server
Address

Name
Address

No
Server
Address

Name
Address

No
Server
Address

A

b) nslookup: It is used to perform DNS lookups in Linux.

Output:

1. nslookup www.facebook.com

Output:

server: Unknown

Address: 172.16.8.1

Non-authoritative answer:

Name: star-mini-c109.facebook.com

Addresses: 2403:2880:f137:182; faze:b00c:0:25de
157.240.192.35

Aliases: www.facebook.com

2. nslookup www.twitter.com

Output:

server: Unknown

Address: 172.16.8.1

Non-authoritative answer:

Name: twitter.com

Address: 104.244.42.1

Aliases: www.twitter.com

7) pathping: Pathping is unique to Windows and is basically a combination of the Ping and Traceroute commands.

options:

-g host-list: Loose source route along host-list

-i address: Use the specified source address

-n: Do not resolve addresses to hostnames.

-p period: Wait period milliseconds between pings.

> pathping -4 172.16.8.1

Tracing route to 172.16.8.1 over a maximum of 30 hops

0 - DESKTOP-ATIVUD8 (172.16.8.113)

1 172.16.8.1

Computing statistics for 25 seconds....

Hop	RIT	Source to Here at This Node	Link	Address
0		Lost/Sent = Pct	Lost/Sent = Pct	DESKTOP-ATIVUD8
1	0ms	0/100 = 0%	0/100 = 0%	[172.16.8.113]

Trace complete.

0/100 = 0% 172.16.8.1

Linux (a)
arp - a gateway

hostname
local

ifconfig:
enp2s0:

basic

wlp3s0

inet6 3 253

nmbl

loop

No

5) netw

kes

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de

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Linux Commands:

- 1) arp - a:
gateway (172.16.8.1) at 7c:5a:1c:c_b be:45
[ether] on enp2s0
- 2) hostname:
localhost.localdomain.
- 3) ifconfig:
enp2s0: flags=4163 <UP,BROADCAST,RUNNING,
 MULTICAST> mtu 1500
 inet 172.16.8.112 netmask 255.255.252.0
 broadcast 172.16.11.255
 ether 50:9a:4c:35:0f:45 txqueuelen
 1000 (Ethernet)
wlp3s0: flags=4099 <UP,BROADCAST,MULTICAST>
 ether 4a:25:d4:c1:93:ab txqueuelen
 mtu 1500
 broadcast 172.16.8.113 mtu 1000 (Ethernet)
- 4) nmlookup -A 172.16.8.1
Looking up status of 172.16.8.1
No reply from 172.16.8.1
- 5) netstat -r
kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS	mtt	Window	Iface
default	gateway	0.0.0.0	UG	0	0	0	enp2s0
172.16.8.0	0.0.0.0	255.255.252.0	U	0	0	0	enp2s0

b) nslookup www.google.com
 Server: 172.16.8.1
 Address: 172.16.8.1 #53 (www)
 Non-authoritative answer:
 Name: www.google.com
 Address: 142.250.183.228
 Name: www.google.com
 Address: 2404:6800:4001:8de::2004
 Windows:
 ping [-t] [-a] [-n count] [-l size]

Important / Linux

1. ip:
 ip command
 commands even
 in daily use
 system
 Eg: ip add
 1: lo < LOOP
 qdisc no
 default ql
 link

2. ifconfig:

enp2s0:

Pinging 172.16.8.1 with 32 bytes of data:
 Reply from 172.16.8.1: bytes=32 time<1ms TTL=64
 Reply from 172.16.8.1: bytes=32 time<1ms TTL=64
 Reply from 172.16.8.1: bytes=32 time<1ms TTL=64
 Reply from 172.16.8.1: bytes=32 time<1ms TTL=64

Ping statistics for 172.16.8.1:

Packets: Sent=26 Received=26, Lost=0
 (0% loss), appropriate round trip times in
 milli-seconds:

Minimum=0ms, Maximum=0ms, Average=0ms

3. mtu:

Output:

local / lu

keys: Help

order of

Host

Packet

Important Linux Networking Commands:

1. ip:

ip command is one of the basic commands every administrator will need in daily work, from setting up new system.

Eg: ip address show

```
1: lo <LOOPBACK,UP,LOWER_UP> mtu 65536  
qdisc no queue state unknown group  
    default qlen 1000
```

```
link layer (loopback) brd 00:00:00:00:00:00 link-layer
```

```
    brd 00:00:00:00:00:00 state UNKNOWN
```

```
    link layer (loopback) brd 00:00:00:00:00:00 link-layer
```

```
    brd 00:00:00:00:00:00 state UNKNOWN
```

2. ifconfig:

```
enp2s0: flags=4163 <UP,BROADCAST,RUNNING,
```

```
    mtu 1500 qdisc mq state UNKNOWN
```

```
    brd 00:00:00:00:00:00 broadcast 172.16.11.207
```

```
    queueing discipline pfifo_fast
```

```
    link layer (ethernet) brd 00:00:00:00:00:00 link-layer
```

3. mtr:

serves as a network diagnostic tool

output:

mtr google.com

my trace route (110.87)

local host: localdomain (e:)

keys: Help display mode restart statistics

order of fields : quit

Host

Packets

Loss %	sent	Last	Avg	Boot	wts	stdv
0.0%	17.8	0.1	0.1	0.0	0.1	0.0

4. **tcpdump**: designed for capturing and displaying packets.

Output: `tcpdump -D`

Observation =

1) Which computer is reachable by device?

Ans: ping is used to and name

2) Which details to reach

Ans: ping to each

from a mts per each per centa

3) Which of your

Ans: IP information network devices,

4) Which status

Ans:

status

Ans:

Observation:

1) Which command is used to find the reachability of a host machine from your device?

Ans: ping - command <hostname or IP>

ping is the primary TCP/IP command used to troubleshoot connectivity, reachability and name resolution.

2) Which command will be give the details of hops taken by a packet to reach its destination?

Ans: tracert (Traceroute)

tracert command will show the route from a computer to a specified host. tracert provides a lot of statistics about each hop, such as response time and percentage.

3) Which command displays the ip configuration of your machine?

Ans: ip <options> <object> <command>

IP command can show address information, manipulate routing, plus display network various devices network various devices, interfaces & funnels.

4) Which command displays the TCP port status in your machine?

Ans: netstat

netstat displays variety of statistical about a computer active TCP/IP connections.

5) Write the modify the ip configuration
in a linux machine?

Ans: i) Assigning IP Address to interfaces

ip address add 192.168.1.254/24
dev enps03

ii) Deleting IP Address:

ip address del 192.168.1.254/24
dev enps03

~~Ques~~
~~16/7/24~~

Result:

Thus, the Network commands using

Linux and Windows are successfully

executed and the output is verified.

3/07/2024

Experiment

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a)

b)

Network
configuration
commands
in Linux
and Windows

Topic:

Date: