Lecture No 09

Knowledge about various network related commands :

ping,

netstat,

tracert,

traceroute,

ipconfig

DOS Ping Display

C:\WINDOWS>ping 172.28.118.1

Pinging 172.28.118.1 with 32 bytes of data:

Successful replies

Reply from 172.28.118.1: bytes=32 time=1ms TTL=255
Reply from 172.28.118.1: bytes=32 time=1ms TTL=255
Reply from 172.28.118.1: bytes=32 time=1ms TTL=255
Reply from 172.28.118.1: bytes=32 time=1ms TTL=255

Key results

Ping statistics for 172.28.118.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms

Cisco IOS Ping Display

- Differs in format from DOS display
- Contains same information
- You'll work with IOS ping in an upcoming lab.

ICMP Echo Request

- To check the configuration of layer 3-1 on your PC, you can ping a special internal test address - the loopback address.
- Try it now -
  - Open a DOS window
  - `>ping 127.0.0.1`

ICMP Echo Request

- To check the configuration of layer 3-1 between your PC and another host, you can ping that host's address.
- Try it now -
  - Open a DOS window
  - `>ping 172.28.118.10`

ICMP Echo Request

- You can also use hostnames in the ping command (if DNS is running, or host tables are enabled).
- Try it now -
  - Open a DOS window
  - **`>ping academy1`**

Traceroute

- Tool used to trace path from source to destination host.
- TCP/IP not designed for traceroute, so it is sometimes unpredictable.

Traceroute Packets

- Most traceroute programs, including the Cisco IOS traceroute, send UDP packets (User Datagram Protocol).
- Micrososft tracert sends ICMP echo request (ping) packets.

Traceroute Command

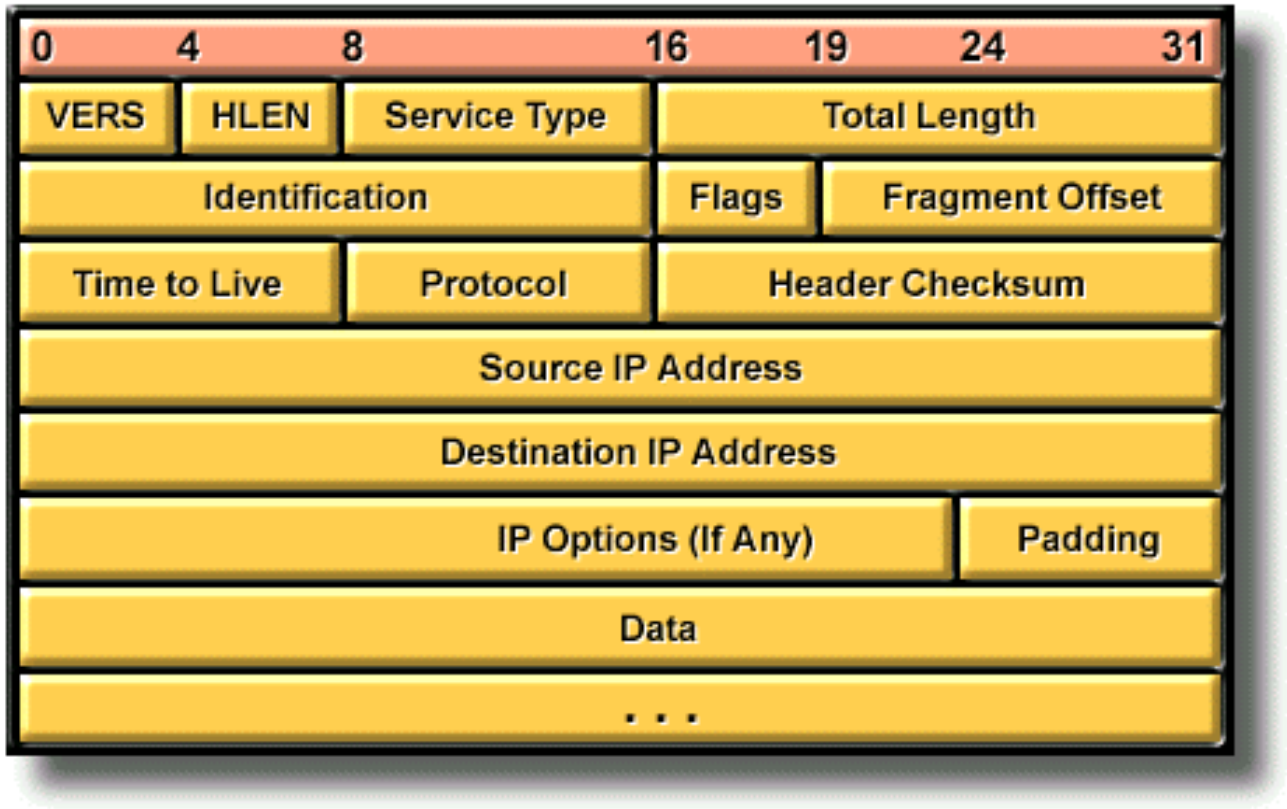
- Unix: `traceroute`
- Cisco IOS: `traceroute (trace)`
- DOS: `tracert`

Traceroute Operation

- **Transmits packets with small Time-To-Live (TTL) values.**
  - First packets have TTL = 1
  - Second have TTL = 2
  - Third have TTL = 3
  - etc.

Time to Live Field

TTL →



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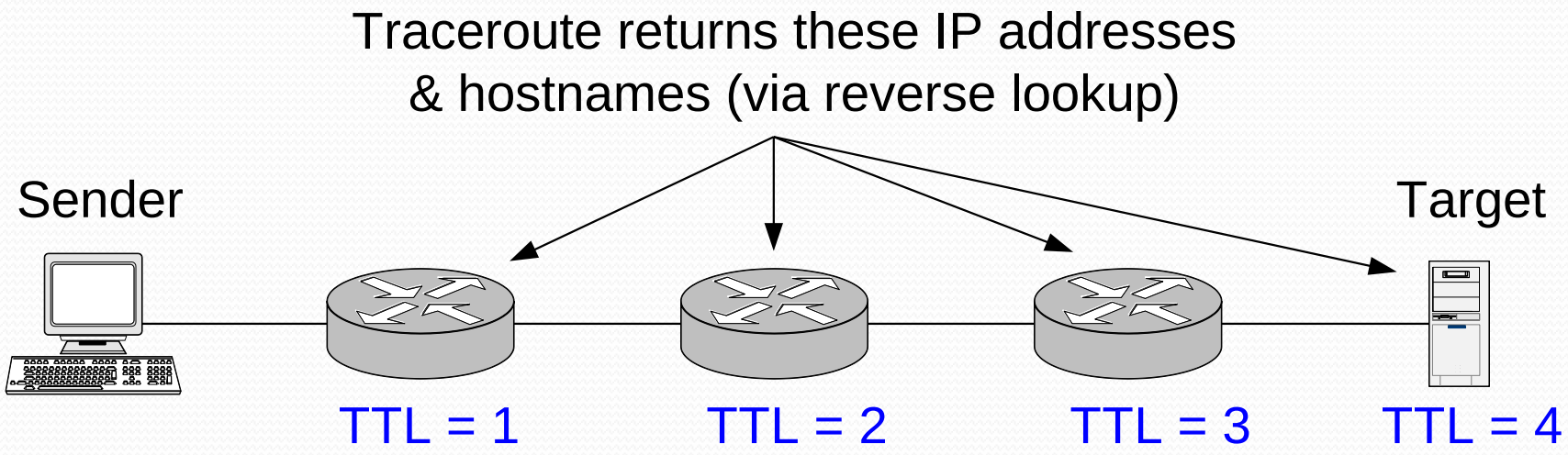
Traceroute Operation

- Generates messages from each router used along the path.
- Every router that handles a packet subtracts one from the packet's TTL. If the TTL reaches zero, the packet has *expired* and is discarded.
- At that point, most routers send an ICMP Time Exceeded message back to the sender - traceroute uses this message.
- A TTL value of one should produce a message from the first router; two from the second; etc.

Traceroute Operation



DOS Traceroute Display

C:\WINDOWS>tracert www.husd.k12.ca.us

Tracing route to www.husd.k12.ca.us [206.110.193.5]
over a maximum of 30 hops:

Hop

Round trip time

Router

1	**1 ms**	**1 ms**	**1 ms**	**192.168.0.1**
2	**23 ms**	**32 ms**	**32 ms**	**adsl-63-198-176-254.dsl.snfc21.pacbell.net [63.198.176.254**
3	**20 ms**	**19 ms**	**21 ms**	**core4-g3-0.snfc21.pbi.net [216.102.187.130]**
4	**20 ms**	**19 ms**	**19 ms**	**ded2-fa12-0-0.snfc21.pbi.net [209.232.130.5]**
5	**25 ms**	**51 ms**	**21 ms**	**vip-Alameda-Co.cust-rtr.pacbell.net [216.102.184.2]**
6	**44 ms**	**37 ms**	**43 ms**	**206.110.252.174**
7	**47 ms**	**40 ms**	**40 ms**	**www.husd.k12.ca.us [206.110.193.5]**

Trace complete.