Lab 6

Computer Communication Networks 1

Static Routing: Single Segment & Multiple Segments

The lab's schedule

Published date:	03/05/22
Quiz date:	10,12/05/22
Deadline for the final report:	19/05/22

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Reading material

- Be familiar with these Linux commands by reading the manual:

rmdir	mv	man
chmod	cp	pwd
kill	rm	ls
ping	mkdir	more
nano	ifconfig	tcpdump
ftp	ssh	scp
arp	route	

(For the lab entry quiz only study the highlighted commands)

- You can read the "*man pages*" by execute the command:
  `man "Name_of_instruction"`
  on a Linux system or at the website: http://linux.die.net/man

- Read about filtering packets in Wireshark (both links):
  https://www.Wireshark.org/docs/wsug_html_chunked/ChWorkDisplayFilterSection.html
  https://www.Wireshark.org/docs/wsug_html_chunked/ChWorkBuildDisplayFilterSection.html

- Be familiar with the term of "*Static Routing*".
  http://en.wikipedia.org/wiki/Static_routing

- Be familiar with the routing table structure and its fields:
  http://en.wikipedia.org/wiki/Routing_table#Contents_of_routing_tables

- The route decision on a Router, based on the routing table and the principle of "*Longest prefix match*". Read about this topic:
  http://en.wikipedia.org/wiki/Longest_prefix_match

- Be familiar with the term of "*default gateway*".
  http://en.wikipedia.org/wiki/Default_gateway

- Be familiar with the Internet Control Message Protocol (*ICMP*)
  https://supportforums.cisco.com/document/7416/icmp-internet-control-message-protocol

- Be familiar with the working principles of "*traceroute*" and its uses:
  http://en.wikipedia.org/wiki/Traceroute#Implementation

Preliminary questions

- Write the syntax for a *Wireshark display filter* that shows IP datagrams with a destination IP address equal to 10.0.1.50 and Ethernet frame sizes greater than 400 bytes. ip.add == 10.0.1.50 && eth.len < 400
- Write the syntax for a *Wireshark display filter* that shows packets containing ICMP messages with a source or destination IP address equal to 10.0.1.12 and frame numbers between 15 and 30. icmp && ip.add= 10.0.1.12
- In computers network which based on *static routing*, how a new entry is inserted?
- What is the "*Gateway*" field and what its purpose?

- Given the following Routing table, through which gateway packets with source address 10.0.155.136, would be routed?

Network Destination	Gateway
0.0.0.0/0	10.0.2.1
10.0.0.0/16	10.0.2.2
10.0.144.0/20	10.0.2.3
10.0.155.0/25	10.0.2.4
10.0.155.128/32	10.0.2.5

- Given the following *routing table* at PC1, assuming its *default gateway* is 10.0.2.4, what is the range of IP addresses which will be routed to its *default gateway*?

Network Destination	Gateway
10.1.1.0/24	10.0.2.1
10.1.2.0/24	10.0.2.2
10.1.3.0/24	10.0.2.3

- What is the command to set a *static route* on a Linux PC to network 10.0.12.0/12 through gateway 10.1.35.4?
- What is the command to delete the entry from question 5?
- Explain which packets are sent when issuing the command *traceroute* and what is the different between them?
- How could we use *tracroute* for discover a network's topology?

Good Luck!