Homework – 3

Rahul Chowdary Garigipati – 800765549

1.) What is the Difference between OSPF and BGP. (descriptive question)

Ans.) OSPF (Open Shortest Path First), also known as **internal gateway protocol** and BGP (Border Gateway Protocol), also known as **external gateway protocol**, are two of the most popular, standard-based dynamic routing protocols used around the world.

Although **OSPF** and **BGP** are both **dynamic routing protocols** and perform similar tasks, they calculate their routing decisions and advertise routes in different ways. Thus, some situations favour BGP as a protocol, while others prefer OSPF.

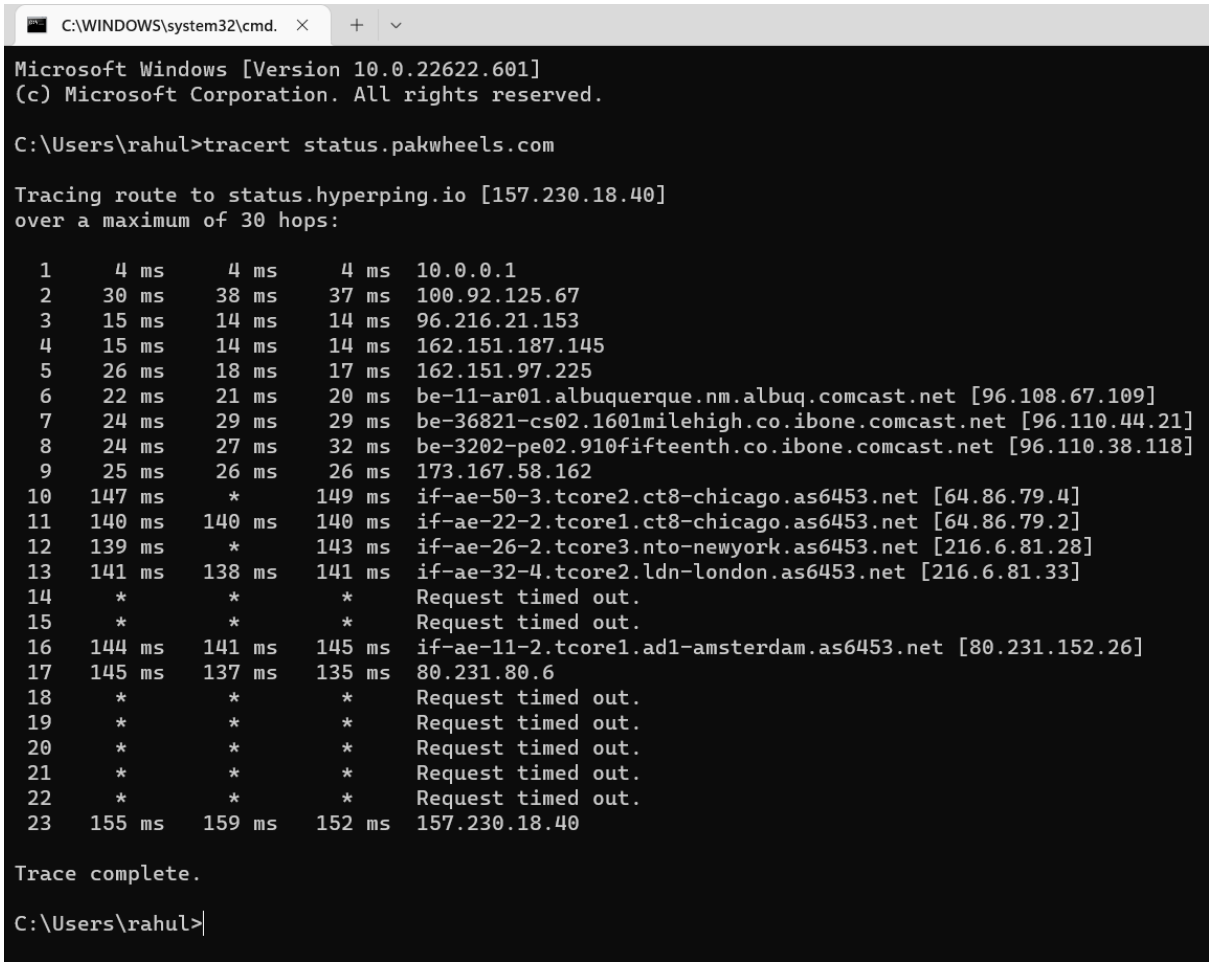
OSPF prefers fastest path rather than shortest path. In Open Shortest Path First, **internet protocol is used.**

BGP prefers best path. In Border Gateway Protocol, **transmission control protocol is used.**

The main difference between **OSPF** (Open Shortest Path First) and **BGP** (Border Gateway Protocol) is that, OSPF is an **intra-domain** routing protocol while, BGP is the **inter-domain** routing protocol.

2.) Do a trace route as discussed in the class for (status.pakwheels.com)

Ans.)

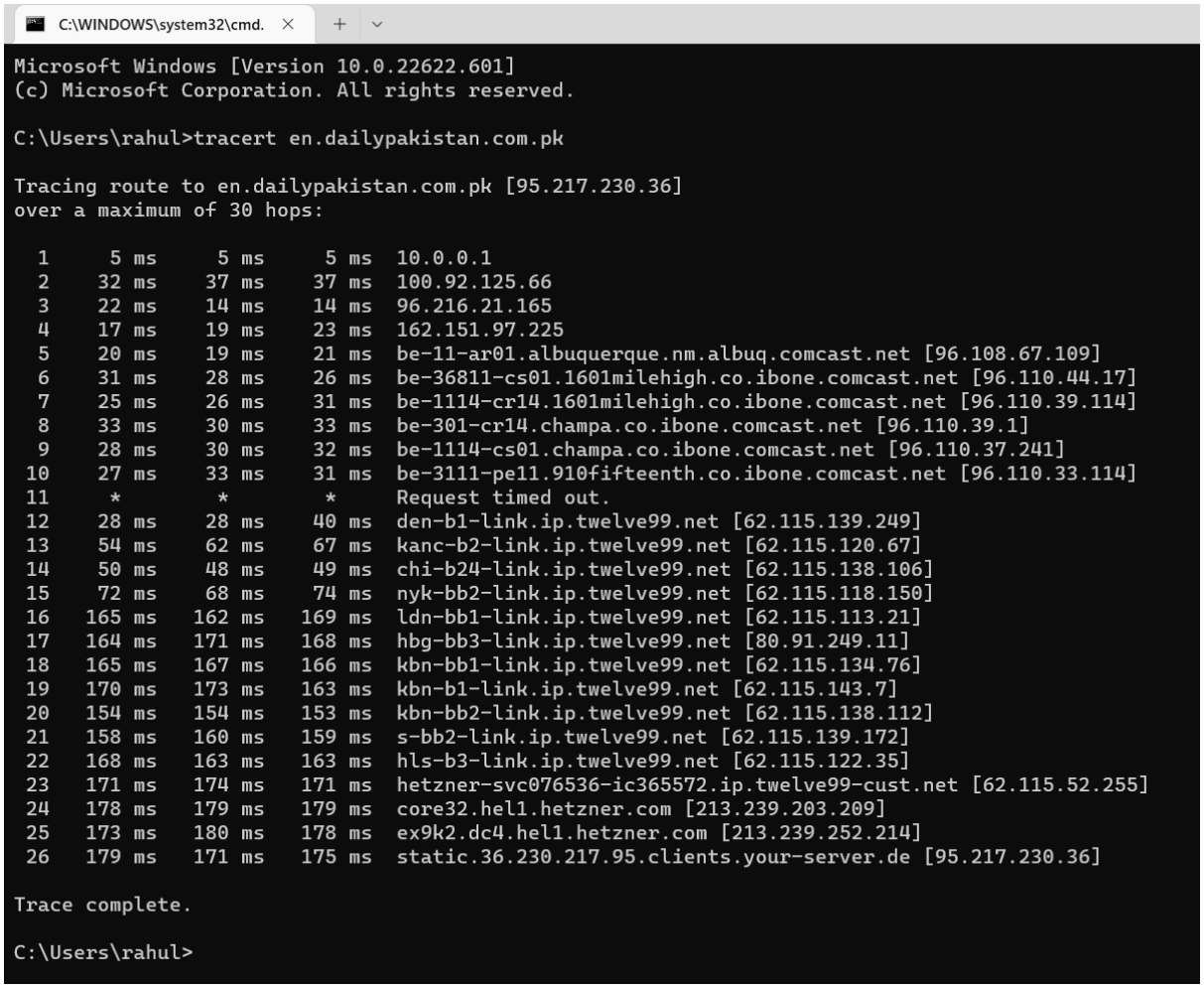


Trace Route for the status.pakwheels.com

It took 23 hops to traceroute the status.pakwheels.com.

3.) Do a trace route as discussed in the class for (en.dailypakistan.com.pk)

Ans.)

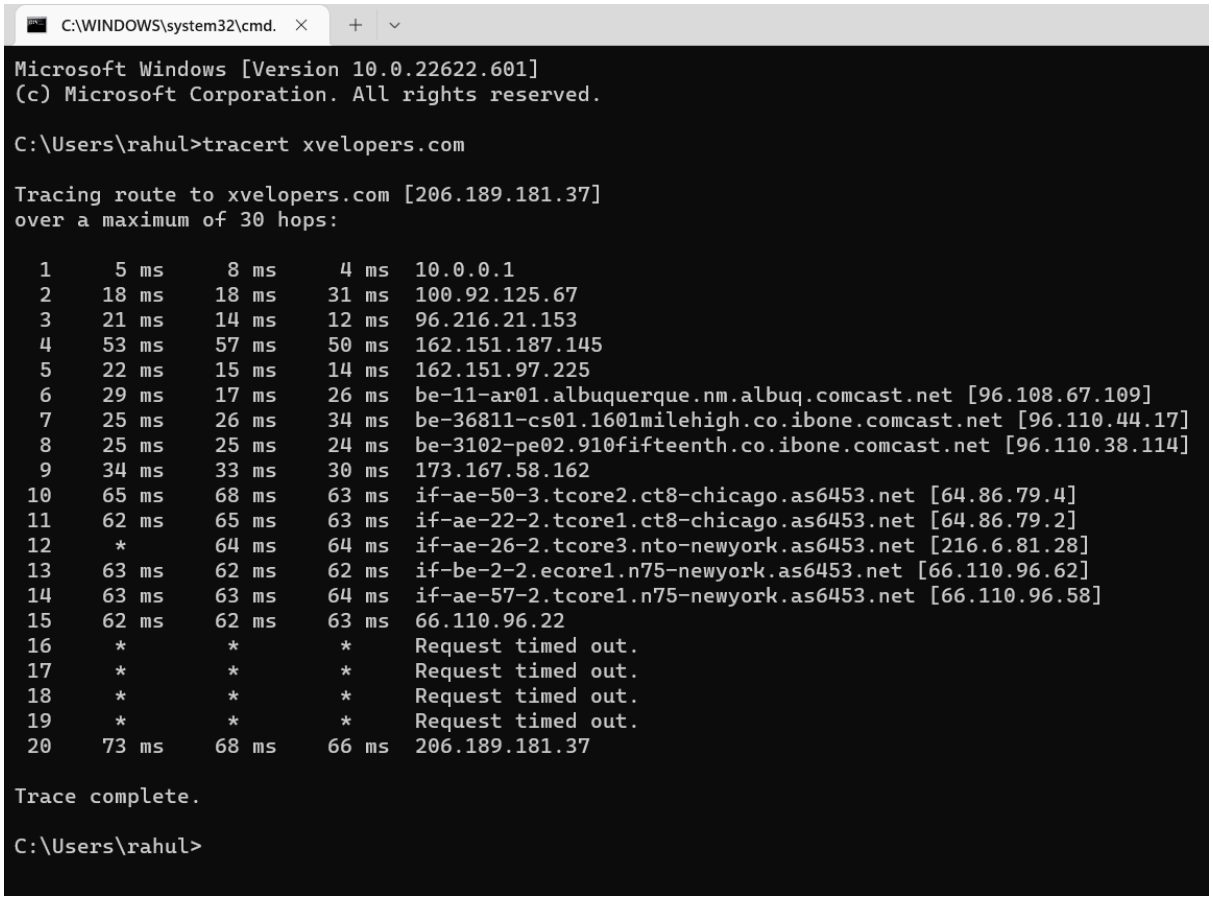


Trace Route for en.dailypakistan.com.pk

It took 26 hops to traceroute en.dailypakistan.com.pk.

4.) Do a trace route as discussed in the class for (xvelopers.com)

Ans.)



Trace Route for xvelopers.com

It took 20 hops to traceroute xvelopers.com.

5.) Imagine we have a bus switching fabric on a switching with 4 ports. Assume FIFO being used to avoid collision on the bus. Describe a scenario where this setup would experience head of line blocking.

Ans.) In a bus switching fabric, each port`s input and output are connected on a single bus. Messages are heard by every output port.

Ports must handle complexity like forwarding decisions at input ports, buffering at output, and possibly input ports.

Input Buffers are there so that the packets sent from input ports to temporarily hold received packets until Output Buffer queue has free slots.

Output Buffers are there so that the packets remain queued until output port is available to receive.

If FIFO is being used then any input packet that sends the request to the destination gets the first priority rather than some packet that wants to send an urgent message. Then in this case if any two input ports has the same output port request, then it forms a contention or head of line blocking in this case.

6.) Imagine BGP in Figure1 has run for long enough that everyone has found a path to everywhere else. What would John's routing table look like.

Ans.) John`s Routing Table, if considering BGP:

Source	Destination	Hops	Interface
John	Alice	8	John-Bob-Alice
John	Bob	1	John-Bob
John	Carol	9	John-Bob-Alice-Carol
John	Craig	11	John-Craig
John	Kent	20	John-Kent (or) John-Walter-Trent-Kent
John	Trent	19	John-Walter-Trent
John	Walter	13	John-Walter
John	Charlie	4	John-Bob-Charlie
John	Jill	6	John-Bob-Charlie-Jill
John	Paul	15	John-Craig-Paul
John	Denise	24	John-Craig-Denise

7.) Imagine in Figure1 John left and BGP runs until its stable again. What would the routing table for Craig look like ?

Ans.) Craig`s Routing Table, if we are considering BGP:

Source	Destination	Hops	Interface
Craig	Alice	13	Craig-Charlie-Bob-Alice
Craig	Bob	6	Craig-Charlie-Bob
Craig	Carol	14	Craig-Charlie-Bob-Alice-Carol
Craig	Charlie	1	Craig-Charlie
Craig	Jill	3	Craig-Charlie-Jill
Craig	Paul	4	Craig-Paul
Craig	Kent	27	Craig-Walter-Trent-Kent
Craig	Trent	26	Craig-Walter-Trent
Craig	Walter	20	Craig-Walter
Craig	Denise	13	Craig-Denise

8.) Imagine there is a network with a DHCP server. Unknown device keeps connecting to the network and acts as an alternate DHCP server. You want to catch whoever is behind this. Describe a plan to monitor and identify this device.

Ans.) One simple method is to run a sniffer like “wireshark” on a computer and send out a DHCP request and see if any requests other than the real DHCP server is getting an offer, then we know there is a problem.

And we can also configure switches to block DHCP offers.

9.) Consider a routing table below with the mapping of IP addresses to the interfaces.

IP Address	Interface
10.0.0.0/16	ETH1
192.168.21.11/2	ETH2
0.0.0.0/0	ETH1
192.1678.25.23/0	ETH3
78.22.43.55	ETH2

Map the following IP address to the interfaces that they would go to

a.) 192.268.25.23/24 would go to the interface **ETH3** according to the precedence rule.

b.) 192.268.21.11/16 would go to the interface **ETH2** according to the precedence rule.

c.) 0.0.0.0/1 would go to the interface **ETH1** according to the precedence rule.

10.) Consider a routing table below with the mapping of IP addresses to the interfaces.

IP Address	Interface
2001:db8:abcd:0012::0/64	ETH1
2001:db8:abcd:0012::0/80	ETH2
2001:db8:abcd:0012::0/96	ETH1
2001:db8:abcd:0012::0/112	ETH3
2001:db8:abcd:0012::0/128	ETH2

Map the following IP address to the interfaces that they would go to

a.) 2001:db8:abcd:0012::0/72 would go to the interface **ETH2,** according to the preceding rule the packets from 65 to 80 goes to the ETH2.

b.) 2001:db8:abcd:0012::0/88 would go to the interface **ETH1,** according to the preceding rule the packets from 81 to 96 goes to the ETH1.

c.) 2001:db8:abcd:0012::0/100 would go to the interface **ETH3,** according to the preceding rule the packets from 97 to 112 goes to the ETH3.

d.) 0.0.0.0/1 would go to the interface **ETH1,** according to the preceding rule the packets from 0 to 64 goes to the ETH1.