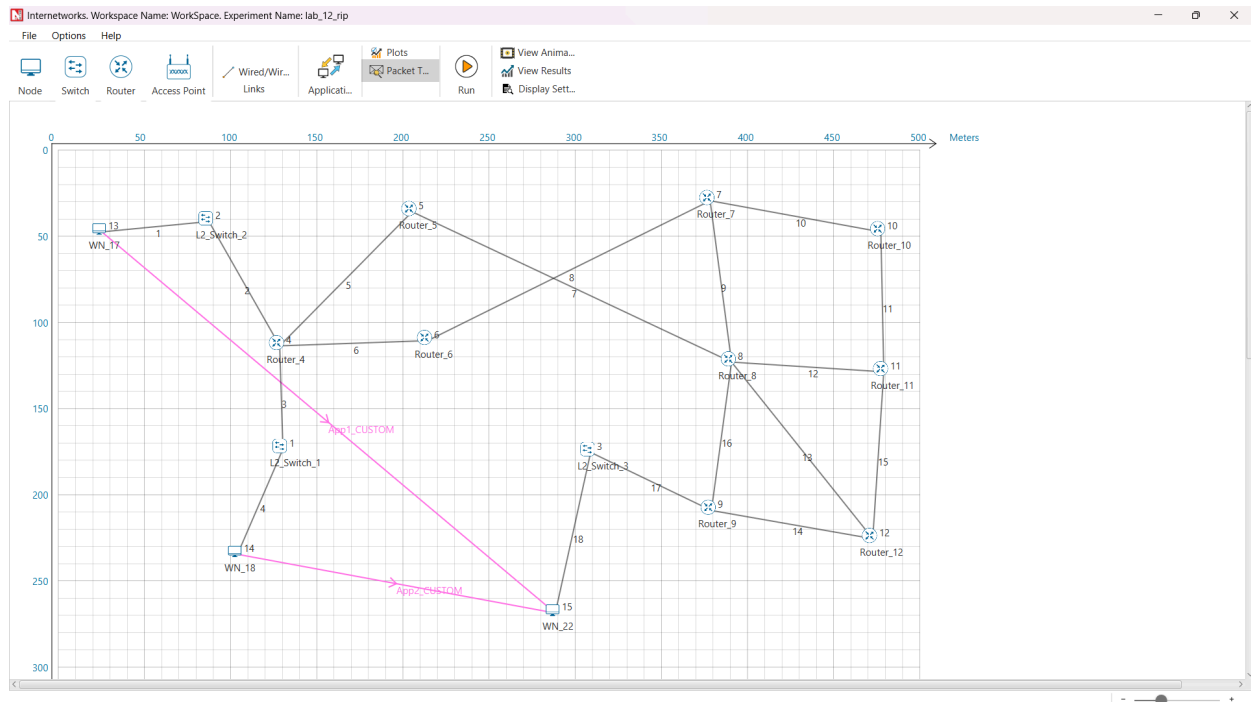# Assignment 12
RIP vs OSPF

Network Topology -

1) Routes followed -
   a) Before link failure -
      i) RIP -
         (1) App 1: WN17 -> L2_2 -> R4 -> R5 -> R8 > R9 -> L2_3 -> WN22
         (2) App 2: WN18 -> L2_1 -> R4 -> R5 -> R8 > R9 -> L2_3 -> WN22

      ii) OSPF -
         (1) App 1: WN17 -> L2_2 -> R4 -> R6 -> R8 > R9 -> L2_3 -> WN22
         (2) App 2: WN18 -> L2_1 -> R4 -> R6 -> R8 > R9 -> L2_3 -> WN22

   b) After link failure -
      i) RIP -
         (1) App 1: WN17 -> L2_2 -> R4 -> R5 -> R8 > R9 -> L2_3 -> WN22
         (2) App 2: WN18 -> L2_1 -> R4 -> R5 -> R8 > R9 -> L2_3 -> WN22
             (NO CHANGE AFTER LINK FAILURE)

      ii) OSPF -
         (1) App 1: WN17 -> L2_2 -> R4 -> R5 -> R8 > R9 -> L2_3 -> WN22
         (2) App 2: WN18 -> L2_1 -> R4 -> R5 -> R8 > R9 -> L2_3 -> WN22
             (ROUTE CHANGED AS PER LOWER COST)

2) Routing Overhead in packets -
    a) RIP - 374 packets
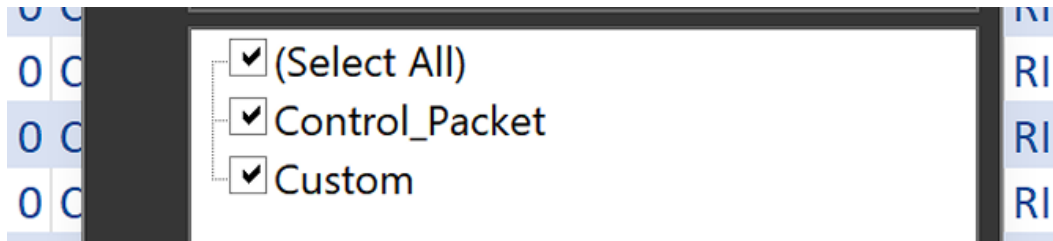
Link_id	Link_throughput_plot	Packet_transmitt...		Packet_errored		Packet_collided	
		Data	Control	Data	Control	Data	Control
All	NA	45336	374	49	1	0	0
1	NA	3500	0	5	0	0	0
2	NA	3495	0	9	0	0	0
3	NA	2998	0	5	0	0	0
4	NA	3000	0	2	0	0	0
5	NA	6479	32	4	0	0	0
6	NA	0	28	0	0	0	0
7	NA	6475	31	5	0	0	0
8	NA	0	33	0	0	0	0
9	NA	0	30	0	0	0	0
10	NA	0	33	0	0	0	0

    b) OSPF - 552 packets

Link_id	Link_throughput_plot	Packet_transmitt...		Packet_errored		Packet_collided	
		Data	Control	Data	Control	Data	Control
All	NA	47804	552	56	1	0	0
1	NA	3500	0	2	0	0	0
2	NA	3498	0	6	0	0	0
3	NA	2993	0	6	0	0	0
4	NA	3000	0	7	0	0	0
5	NA	3982	49	4	0	0	0
6	NA	2493	33	0	0	0	0
7	NA	3978	44	4	1	0	0
8	NA	2493	43	0	0	0	0
9	NA	2493	45	2	0	0	0
10	NA	0	46	0	0	0	0
11	NA	0	44	0	0	0	0

3) Different type of Control Packets
    a) RIP - 1 type only i.e. Control Packet

    b) OSPF - 5 types namely : DD, HELLO, LSACK, LSREQ, LSUPDATE

4) Overhead
    a) RIP

Link_id	Link_throughput_plot	Packet_transmitt...		Packet_errored		Packet_collided		Bytes_transmitted(bytes)	Payload_transmitted(bytes)	Overhead_transmitted(bytes
		Data	Control	Data	Control	Data	Control			
All	NA	45336	374	49	1	0	0	68335640	66309996	2025644

b) OSPF
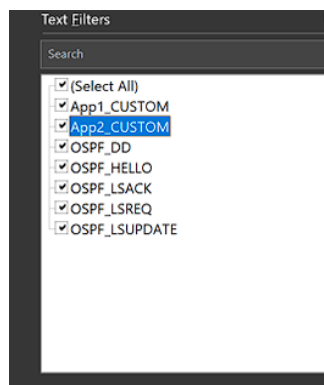
Link_Metrics_Table

Link_Metrics

Link_id	Link_throughput_plot	Packet_transmitt... Data	Control	Packet_errored Data	Control	Packet_collided Data	Control	Bytes_transmitted(bytes)	Payload_transmitted(bytes)	Overhead_transmitted(bytes)	
All	NA	47804	552	56	1	0	0	71865268	69712080	2153188	

5) Application metrics

a) RIP

Application_Metrics_Table

Application_Metrics

Application Id	Application Name	Source Id	Destination Id	Packet generated	Packet received	Payload generated (bytes)	Payload received (bytes)	Throughput (Mbps)	Delay(microsec)	Jitter(microsec)
1	App1_CUSTOM	13	15	3500	3472	5110000	5069120	0.579328	876.600000	0.000000
2	App2_CUSTOM	14	15	3000	2979	4380000	4349340	0.579912	998.139094	1.082176

b) OSPF

Application_Metrics_Table

Application_Metrics

Application Id	Application Name	Source Id	Destination Id	Packet generated	Packet received	Payload generated (bytes)	Payload received (bytes)	Throughput (Mbps)	Delay(microsec)	Jitter(microsec)
1	App1_CUSTOM	13	15	3500	3466	5110000	5060360	0.578327	929.923601	0.035798
2	App2_CUSTOM	14	15	3000	2974	4380000	4342040	0.578939	1039.715857	0.719179

6) IP metrics

a) RIP

IP_Metrics_Table

IP_Metrics

Device Id	Packet sent	Packet forwarded	Packet received	Packet discarded	TTL expired	Firewall blocked	
4	6509	6479	32	0	0	0	
5	6509	6475	29	0	0	0	
6	34	0	29	0	0	0	
7	48	0	48	0	0	0	
8	6540	6470	81	0	0	0	
9	6494	6462	30	0	0	0	
10	34	0	32	0	0	0	
11	48	0	47	0	0	0	
12	48	0	45	0	0	0	
13	3500	0	0	0	0	0	
14	3000	0	0	0	0	0	
15	0	0	6451	0	0	0	

b) OSPF

IP_Metrics_Table

IP_Metrics

Device Id	Packet sent	Packet forwarded	Packet received	Packet discarded	TTL expired	Firewall blocked	
4	6522	6479	40	0	0	0	
5	4025	3978	46	0	0	0	
6	2532	2493	38	0	0	0	
7	2558	2493	69	0	0	0	
8	6581	6465	118	0	0	0	
9	6511	6458	51	0	0	0	
10	47	0	43	0	0	0	
11	70	0	71	0	0	0	
12	74	0	75	0	0	0	
13	3500	0	0	0	0	0	
14	3000	0	0	0	0	0	
15	0	0	6440	0	0	0	