COMP3331/9331 Computer Networks and Applications Assignment 2 for Session 2, 2017

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1.Data structure:

Using adjacency matrix to model the network topology. two three 2-dimensional arrays represent delays, capacities. Also using ArrayList to help with modeling the workloads. HashMap and Map help with storing data.

2.

Performance Metrics	Routing Protocols		
	SHP	SDP	LLP
Total number of virtual circuits requested	5884	5884	5884
Total number of packets	176067	176067	176067
Number of successfully routed packets	168633	169145	168906
Percentage of successfully routed packets	95.78%	96.07%	95.93%
Number of blocked packets	7434	6922	7161
Percentage of blocked packets	4.22%	3.93%	4.07%
Average number of hops per circuit	2.69	3.41	6.77
Average cumulative prop. delay of circuit	162.33	141.19	355.03

Note: Packet rate data in the table above is 1 packet/sec.

3. The percentage of successfully routed packets shows LLP < SHP < SDP. SHP produces the fewest average hops, because it finds the shortest physical routes and no other algorithm could use fewer hops. LLP produces the largest numbers of hops per packet as minimising the number of hops is irrelevant to its decision-making, which is finding the least loaded paths. This observation reflects why LLP delivers a larger percentage of lost packets than SDP, because there are usually more possible paths for LLP to choose between source and destination than SHP can choose from. SDP has the least delay because it finds the paths with the lowest delays, and LLP has the highest delay because the least loaded paths are often not the shortest and with a much higher average hops, there is certainly more delay.

https://youtu.be/viA8YpLMWsE