CS607 : Advanced Computer Networks

Assignment 2 – Queuing in a Packet Switch

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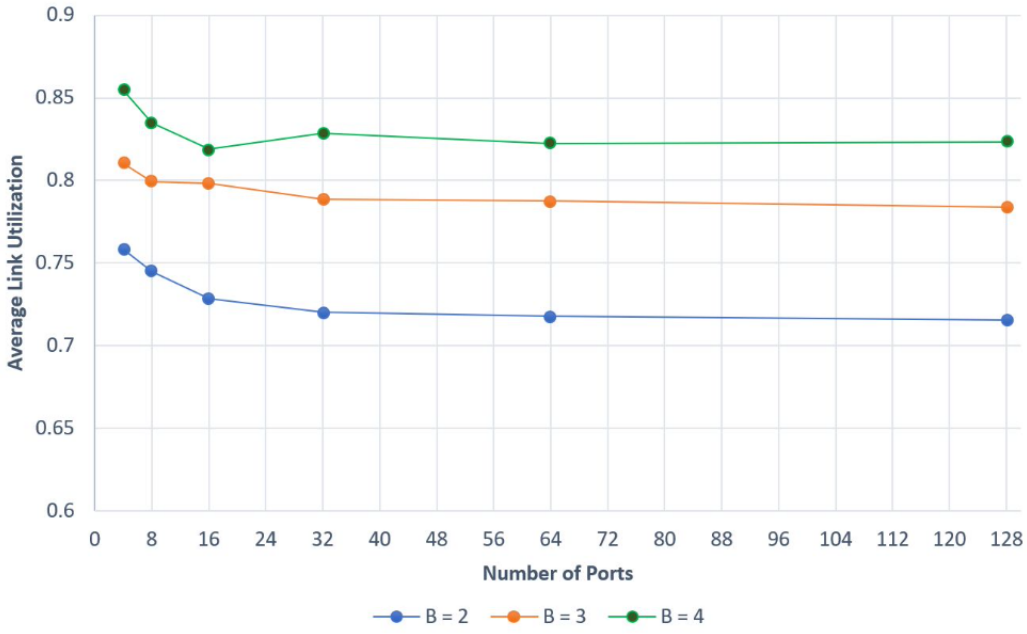
1 Graph 1 - INQ

X-axis : Number of Ports and Y-axis : Average Link Utilization

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}

Here, we have chosen p = 0.9 and T = 500



It is observed from the graph that when packet generation probability is 0.9, the average link utilization increases with an increase in the number of ports. However, link utilization increases when we increase the buffer size.

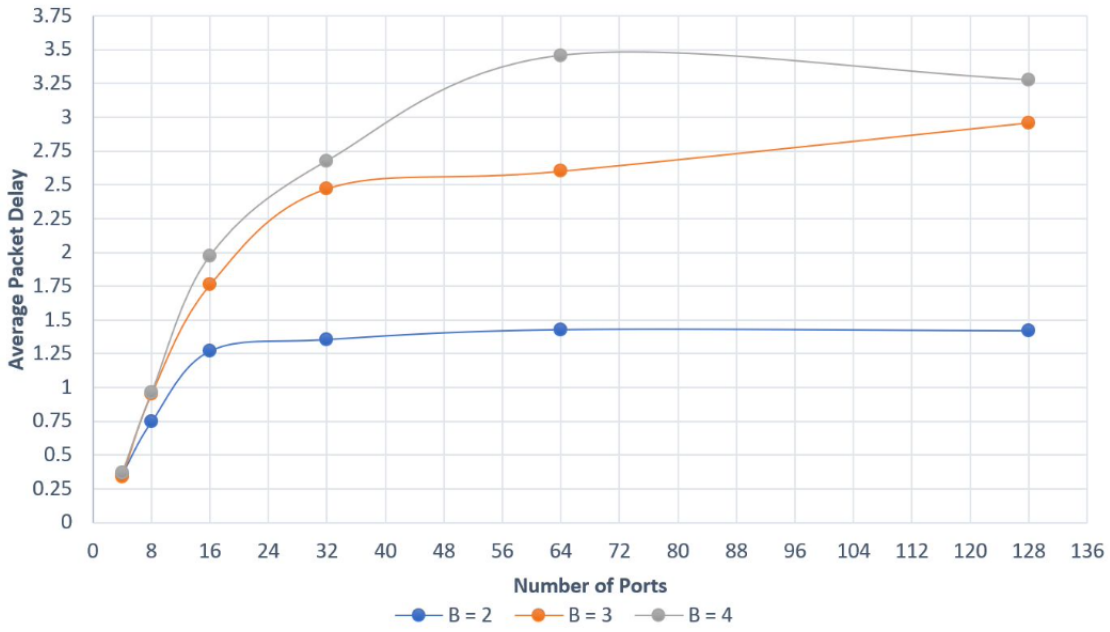
2 Graph 2 - KOUQ

Obtain graph for different values of Number of ports (vary from 4 to 128) with the average packet delay and average link utilization when the buffer size is vary (2,3,4) and

X-axis : Number of Ports and Y-axis : Average Packet Delay

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}



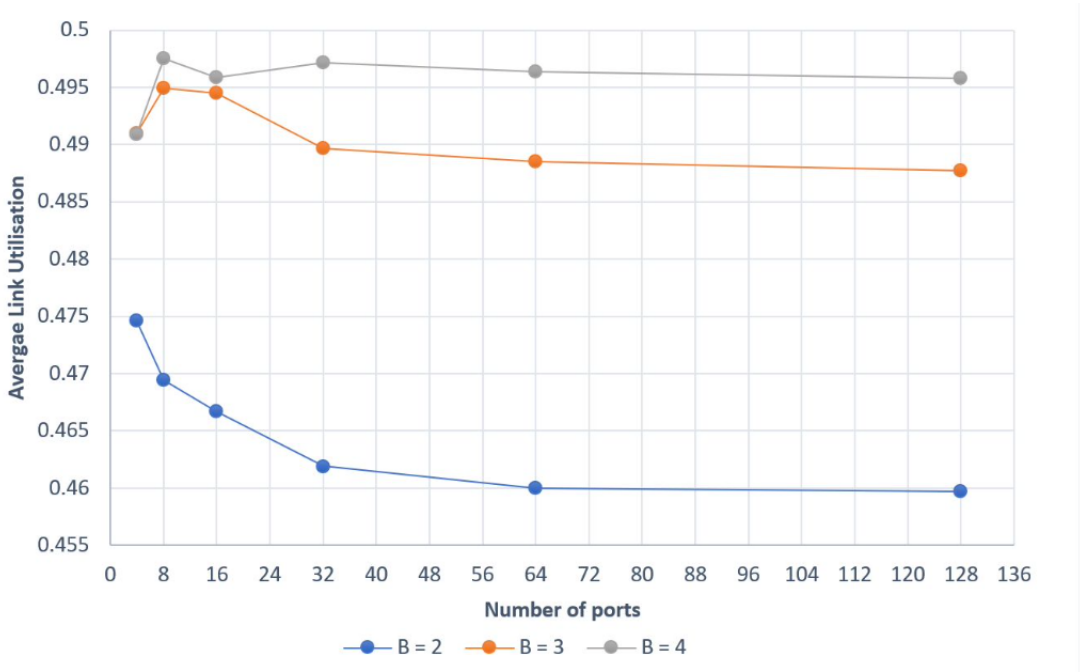
In the graph, it is observed that average delay increases with an increase in the number of ports. The average delay also increases when we increase the buffer size.

3 Graph 3 - KOUQ

X-axis : Number of Ports and Y-axis : Average Link Utilization

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}



It is observed that average link utilization increases with an increase in the number of ports. The average link utilization also increases when we increase the buffer size.

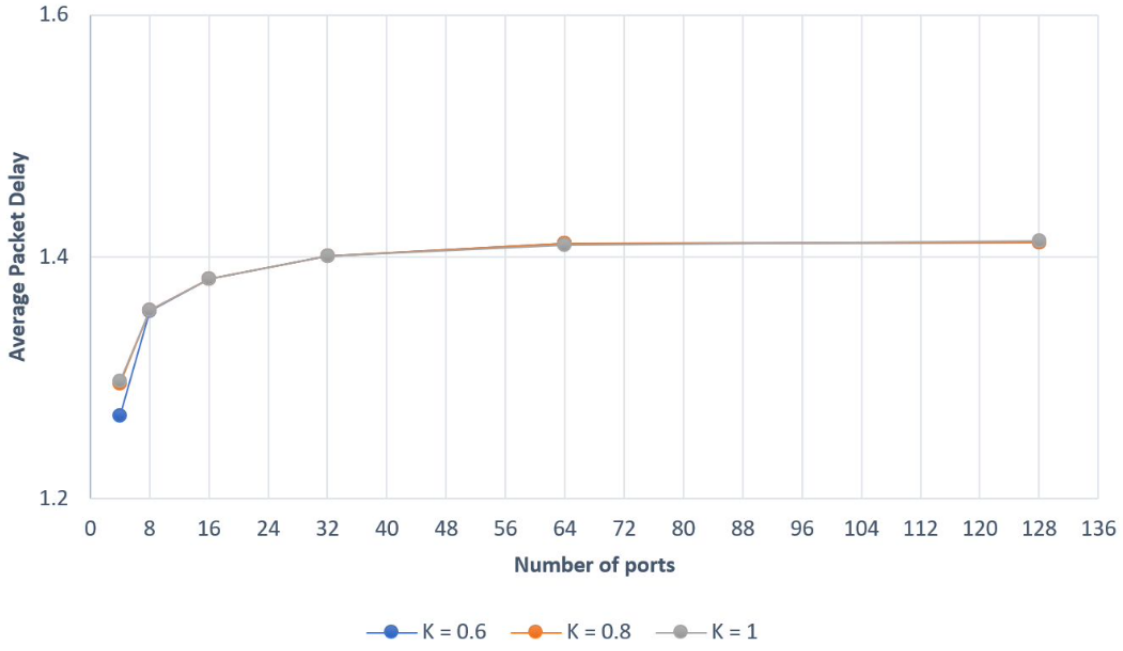
4 Graph 4 - KOUQ

Obtain graph for different values of knockout value is varies(0.6,0.8,1.0)

X-axis : Number of Ports and Y-axis : Average Packet Delay

K = {0.6, 0.8, 1.0}

N = {4, 8, 16, 32, 64, 128}



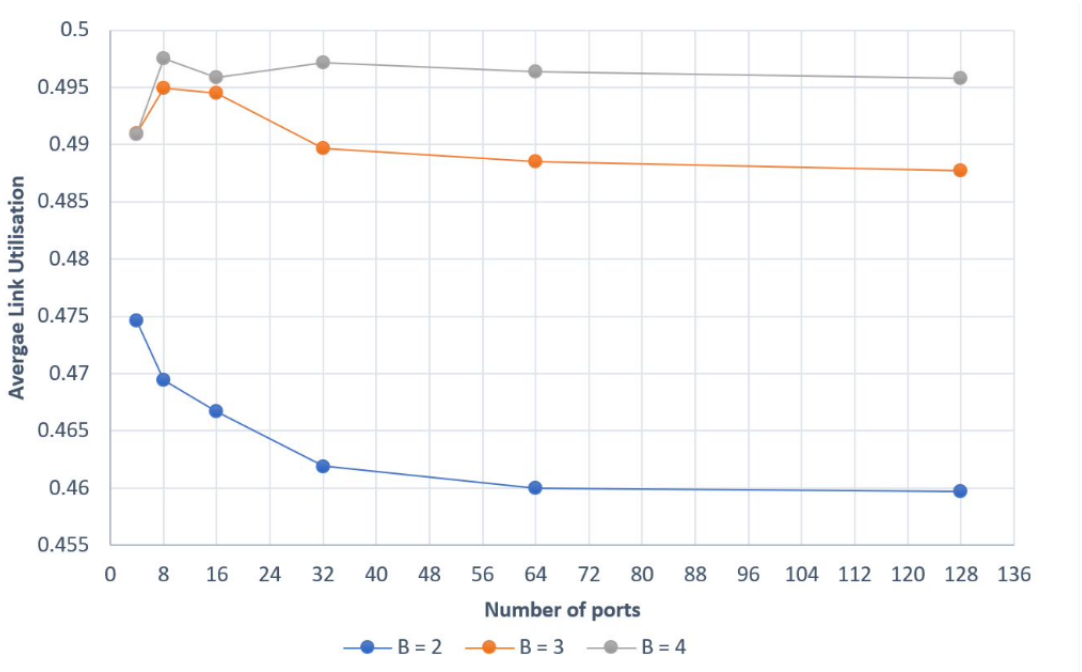
Average packet delay increases with the number of ports. But it does not vary much with the increase in K.

5 Graph 5 - KOUQ

X-axis : Number of Ports and Y-axis : Average Link Utilization

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}



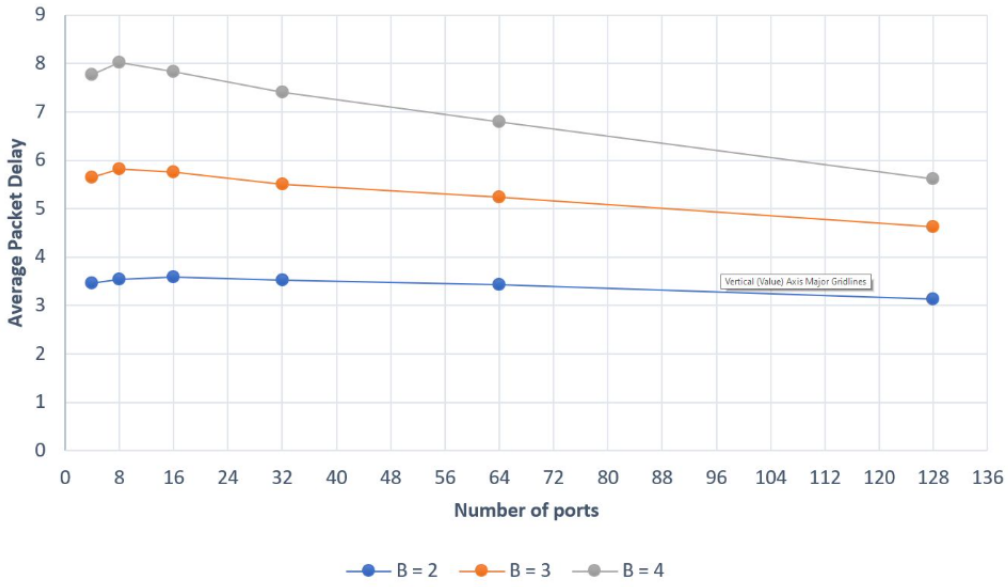
It is observed that average link utilization increases with an increase in the number of ports. The average link utilization also increases when we increase the buffer size.

6 Graph 6 - ISLIP

X-axis : Number of Ports and Y-axis : Average Packet Delay

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}



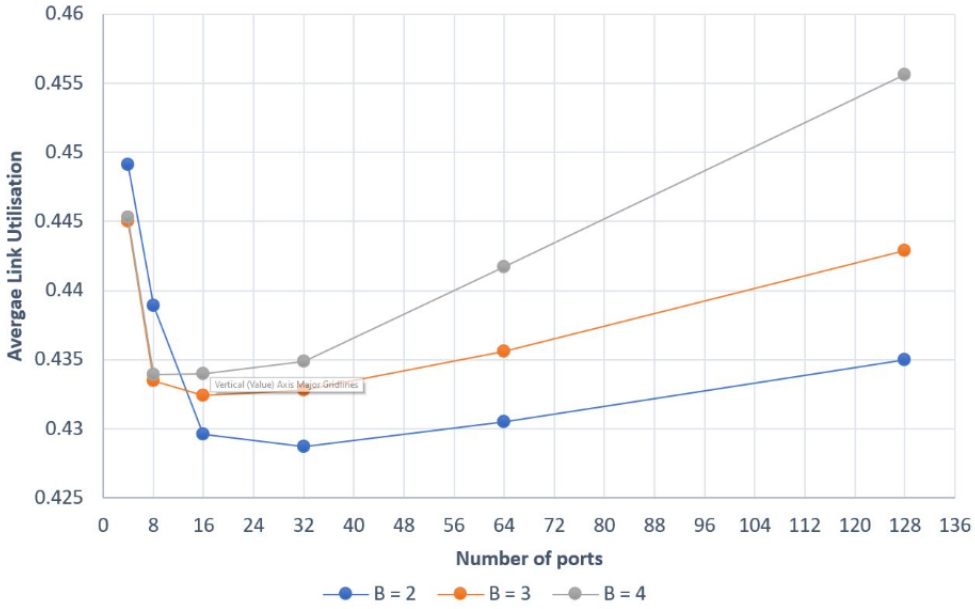
Average packet delay decreases slightly as the number of ports is increased. Also, the average packet delay increases with buffer size.

7 Graph 7 - ISLIP

X-axis : Number of Ports and Y-axis : Average Link Utilization

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}



As the number of ports is increased, the average link utilization first decreases and then it increases. Also, average link utilization increases with buffer size.

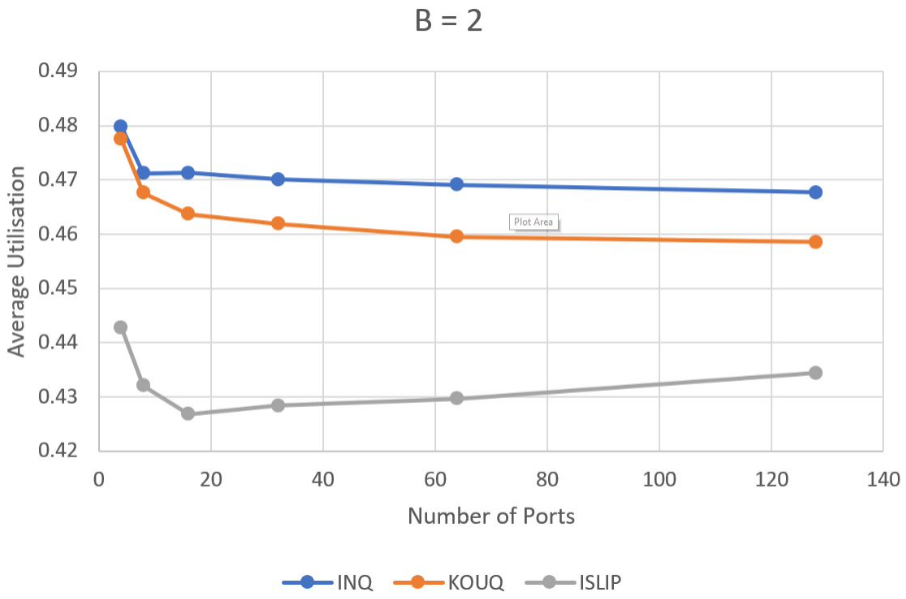
8 Graph 8 - INQ, KOUQ and ISLIP

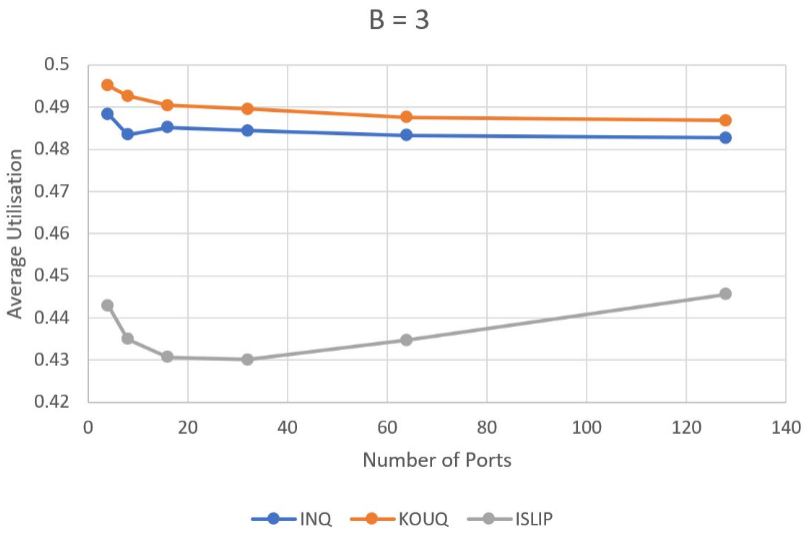
Varying number of ports for INQ, KOUQ and INQ

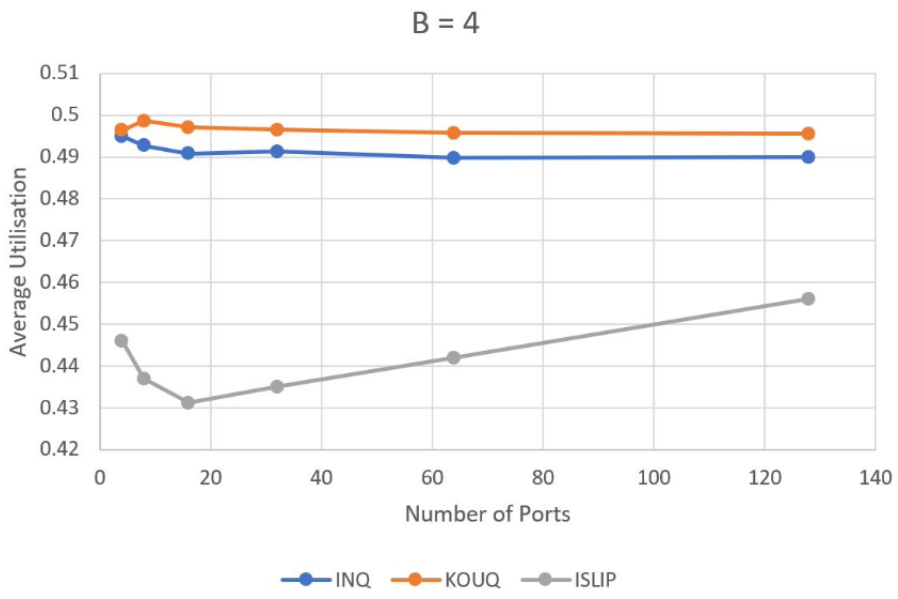
X-axis : Number of Ports and Y-axis : Average Link Utilization

B = {2,3,4}

N = {4, 8, 16, 32, 64, 128}







When the number of ports is small, KOUQ has better average link utilization. But as the number of ports increases the difference between the utilization of 3 algorithms decreases.

9 Graph 9 - INQ, KOUQ and ISLIP

Varying Packet Generation Probability for INQ, KOUQ and INQ.

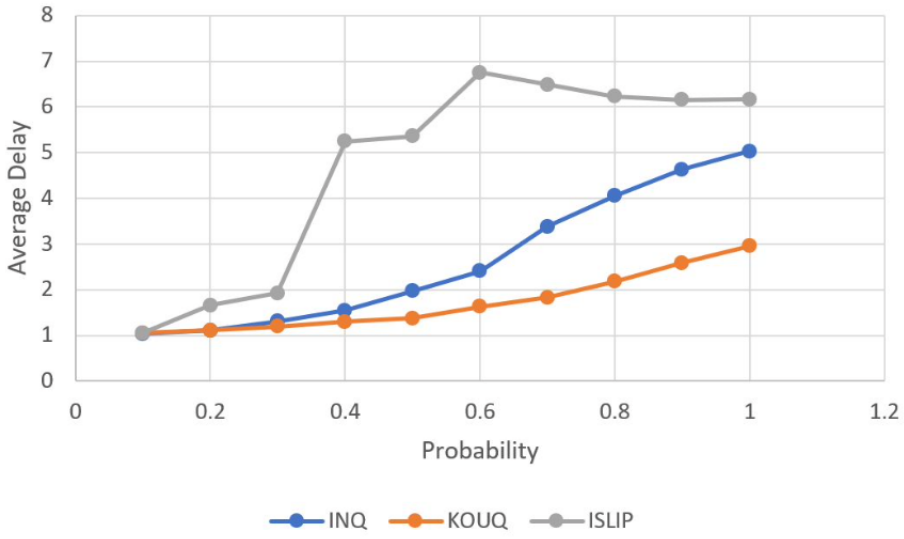
X-axis : Packet Generation Probability and Y-axis : Average Packet Delay

B = 4

N = 8

K = 0.6

Packet Generation Probability = {0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1}



Average packet delay increases with an increase in packet generation probability. For high packet generation probability KOUQ has the minimum delay. And Islip has the maximum delay.

10 Graph 10 - INQ, KOUQ and ISLIP

Varying Packet Generation Probability for INQ, KOUQ and INQ.

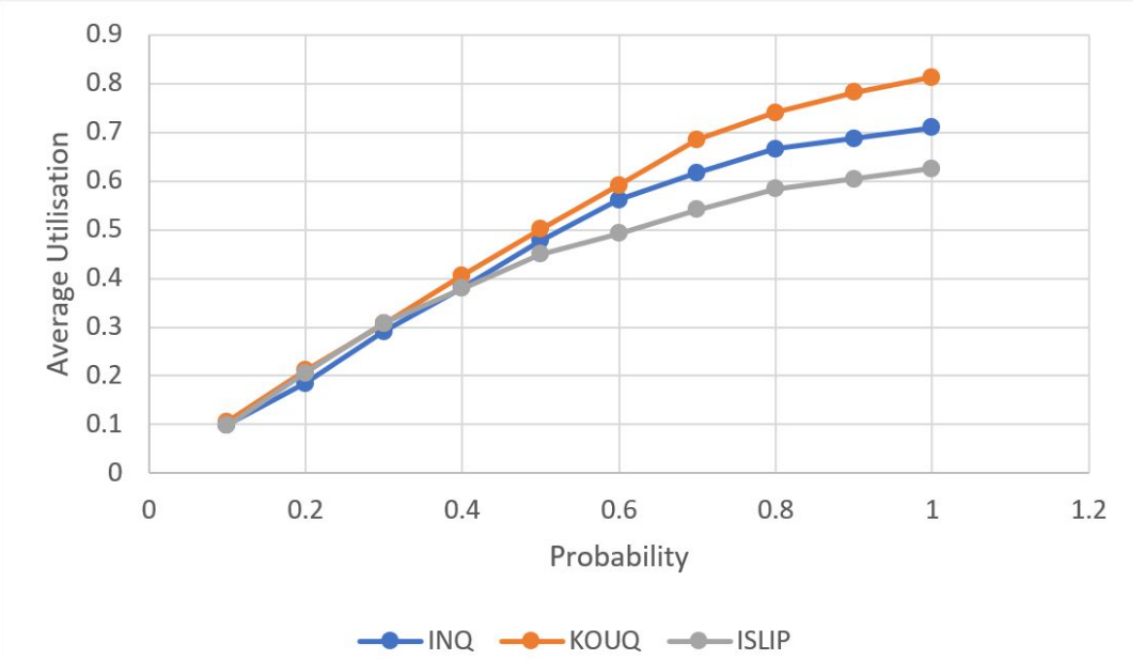
X-axis : Packet Generation Probability and Y-axis : Average Link Utilization

B = 4

N = 8

K = 0.6

Packet Generation Probability = {0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1}



As packet generation probability increases, average link utilization also increases. For high packet generation probability KOUQ has the maximum utilization.

11 Conclusion

- Average Packet delay and Average Link utilization both increase with an increase in packet generation probability.
- As the number of ports increases, Average delay also increases.
- KOUQ performs better in terms of utilization if the number of ports is less (4,8,16).
- For high packet generation probability (>0.5) KOUQ performs better in terms of link utilization. It also has the minimum packet delay.