

Performance indices of an M/M/c/k system

Consider communication channel, with a buffer of 16 packets. Packets arrive at rate $\lambda = 1200$ *pkt/s*, and require an average transmission (service) time $D = 1.25$ ms. Modelling the system as an M/M/1/16, determine:

- Compute the average utilization of the channel
- Compute the probability of having 14 packets in the system
- Compute the average number of packets in the system
- Compute the throughput and the drop rate
- Compute the average response time and the average time spend in the queue

To improve the system, and reduce the drop rate, a second channel with the same average transmission time is added. The network interface sends the next packet on the first channel that becomes available. Modelling the system as an M/M/2/16, compute the same performance indices:

- Compute the average utilization (**not** *the total utilization*) of the channel
- Compute the probability of having 14 packets in the system
- Compute the average number of packets in the system
- Compute the throughput and the drop rate
- Compute the average response time and the average time spend in the queue