

Homework Exercises for Chapter 6.4-6.5.6 (S-38.149)

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1. Consider a three-node unidirectional bus network with nodes A, B, and C. Poisson-distributed connection requests arrive at node A at rate λ , with exponentially distributed holding times. There are two wavelengths available. Each connection is destined randomly for nodes B and C with equal probabilities. Calculate the blocking probability for each of the case where all nodes are wavelength-selective cross-connects in a wavelength routed network.
2. Repeat the above calculations for a case where the nodes A, B, and C are now wavelength-interchange cross-connects in a wavelength routed network.
3. The 10 nodes of a Petersen network each generates 1 Erlang of traffic for a given number of λ -channels per waveband. If each λ -channel is fully occupied by a single logical connection, what is the maximum carried traffic that can be sustained by the Petersen network.