Discrete Time Analysis of Priority Queues Using Matrix-analytic Methods

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ABSTRACT

In this talk we present discrete-time models for a class of preemptive priority queues. Specifically we show how to set up and analyze the model using the matrix-analytic methods. Tail behavior of such queues is of interest to the performance analysts. For the cases where the tail behavior is geometric we present a method for computing the decay rate. Finally we propose future directions in this research and present the challenges that are faced.

BIOGRAPHY

Dr. Alfa is a professor of telecommunication systems at the University of Manitoba, Department of Electrical and Computer Engineering. His research covers, but not limited to, the following areas: performance analysis and resource allocation in telecommunication systems, modeling of communication networks, queueing theory, optimization, analysis of cognitive radio networks, modeling and analysis of wireless sensor networks, developing efficient decoding algorithms for LDPC codes, channel modeling, traffic estimation for the Internet, and cross layer analysis. Dr. Alfa also works in the application of queueing theory to other areas such as transportation systems, manufacturing systems and healthcare systems. He was NSERC Chair for tele-traffic from 2004 to 2012. He has carried out applied research for Nortel Networks, Bell-Northern Research, TRLabs (now TRTech), Bell Canada, Winnipeg Regional Health Authority, Motor-coach Industries, and several other industries. Dr. Alfa teaches courses on telecommunication networks, queueing theory, optimization and network theory. He has authored a book, "Queueing Theory for Telecommunications: Discrete Time Modelling of a Single Node System", published by Springer in 2010. He is currently working on another book, "Applied Discrete Time Queueing Theory" to be published by Springer in 2014.