ANALYSIS OF EARLY DROPPING MECHANISM FOR OPTICAL BURST SWITCHED NETWORKS

This dissertation was submitted in partial fulfillment of the requirement for the Degree of Master of Science in Telecommunications

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Abstract

Quality of Service in Optical Burst Switched Networks using Early Dropping Mechanism with Different Network Characteristics

Keywords: Optical Burst Switching (OBS), Absolute Quality of Service (QoS), Early Dropping Mechanism, Dense Wave Length Division Multiplexing (DWDM).

Optical Burst Switching is a promising bufferless DWDM switching technology that can potentially provide high wavelength utilization. Quality of Service support has become an important issue in OBS networks. There are two models to guarantee QoS in OBS networks. Those are relative QoS guarantee and absolute QoS guarantee. Most existing schemes are based on relative QoS model and in those models the service levels can be defined relative to the service requirements of another class of traffic. In absolute QoS model it provides a bound for loss probability of the guaranteed traffic. This kind of hard guarantee is essential to support applications with bandwidth constraints. Further efficient admission control and recourse provisioning mechanisms will enhance the service of absolute QoS model to guarantee the service requirements in the OBS networks. Early dropping mechanism is proposed to maintain the dropping probability in Absolute QoS model in OBS networks. Due to the bufferless nature of the OBS core nodes, the early dropping mechanism computes the intentional dropping probability based on measured , online loss probability. In early dropping mechanism it can be simply implemented by using a threshold value which is responsible to maintain the maximum acceptable loss probability. But in this mechanism the lower priority class of traffic suffers from high loss probability when higher priority Glasses exceed its threshold vales of loss probability. Early dropping by Span mechanism introduces a span of acceptable loss probabilities rather than using one threshold value andthis mechanism has improved QoS guarantee in higher priority classes of traffic while reducing the loss probability of lower priority classes as well. Further the performance of this mechanism can be

applied in a dynamic wave length assigning network in order to guarantee the absolute QoS with efficient recourse provisioning.

Declaration

I certify that this dissertation does not incorporate without acknowledgement any material previously submitted for a degree in any University to the best of my knowledge and believe that it does not contain any material previously published, written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for inter-library loans, and for the title and summary to be made available to outside organizations.

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To the best of my knowledge, the above particulars are correct.

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Supervisor

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"I believe I am here to express my sincere thanks because of the great support and encouragement of all of you."

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List of Abbreviations

BA	Burst Assembler
BHP	Burst Header Packet
EDS	Early Drop by Span
EDT	Early Drop by Threshold
FDL	Fiber Delay Line
FEC	Forward Equivalent Class
IETF	Internet Engineering Task Force
JET	Just-Enough-Time
LAUT	Latest Available Unscheduled Time
LOBS	Labeled Optical Burst Switching
MPLS	Multi-Protocol Label Switching
OBS	Optical Burst Switching
OPS	Optical Packet Switching
OXC	Optical Cross Connect
PQ	Priority Queuing
QoS	Quality of Service
RAM	Random Access Memory
RED	Random Early Detection
RM	Routing Module
SCU	Switch Control Unit
TAG	Tell-And-Go
TAW	Tell-And-Wait
WADM	Wavelength Add-Drop Multiplexers
WDM	Wavelength Division Multiplexing

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