

QoS AND MOBILE TECHNOLOGIES

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TABLE OF CONTENTS

	TITLE	No
PART 1:QoS APPROACHES		
CHAPTER 1:	Introduction to QoS Approaches	2
CHAPTER 2:	Internet Quality Of Service Architectures	11
CHAPTER 3:	Integrated Services	17
CHAPTER 4:	Differentiated Services	21
CHAPTER 5:	Quality Of Service (QoS) Ad-Hoc On-Demand Distance Vector (AODV)	27
CHAPTER 6:	QoS Routing In Ad-Hoc Wireless Networks	33
CHAPTER 7:	MPLS And Traffic Engineering	41
PART 2: MOBILITY MANAGEMENT APPROACHES		
CHAPTER 8:	Introduction to Mobility Management	47
CHAPTER 9:	Nested Mobile Networks	53
CHAPTER 10:	Evaluation of NEMO Extensions	59
CHAPTER 11:	Handoff Process In Micromobility Protocols	65
CHAPTER 12:	Comparison Between Network Simulators	71
PART 3: WIRELESS TECHNOLOGY		
CHAPTER 13:	Introduction to Local Area Network (LAN) Communication Protocols	77
CHAPTER 14:	MANET routing protocols	85
CHAPTER 15:	VANET Applications	95
CHAPTER 16:	Vehicle To Vehicle Routing Protocols	101
CHAPTER 17:	Wi-Fi Mesh Network	111
CHAPTER 18:	Overview Of Wimax Mesh	117
CHAPTER 19:	Current Trends On WIMAX Using MIMO Technology	129
CHAPTER 20:	Self-Organized Femtocell Networks	141
CHAPTER 21:	Self-Organized Synchronization For Femtocell Network	155
CHAPTER 22:	Spectrum Management In Femtocell	169
CHAPTER 23:	Smart Grid Communication	179
CHAPTER 24:	UWB Overview	189
CHAPTER 25:	ZIGBEE Applications	197

CHAPTER 26:	Improvement Of Vertical Handover In GPRS/WIFI Seamless Convergence	205
CHAPTER 27:	The Application Of Sensor Network And Routing Protocols In Wireless Communication	215
CHAPTER 28:	A Study Of Channel Assignment Approach To Reduce Frequent Reassignment	227
CHAPTER 29:	Association Management Schemes For Wireless Mesh Network	231
CHAPTER 30:	Challenges In Multi-Radio Multi-Channel Wireless Mesh Network	237
CHAPTER 31:	Mobility Support in Diffserv and MPLS network	243
CHAPTER 32:	Mobility Management And Context Transfer	247
CHAPTER 33:	LTE -Advanced Overview	251
CHAPTER 34:	Time Synchronization Protocols And Approaches	261
CHAPTER 35:	MPLS Architectures	265

CHAPTER 7

MPLS AND TRAFFIC ENGINEERING

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7.1 INTRODUCTION

Multiprotocol Label switching Protocol MPLS [1] framework is used by network provider widely and backbone technology for their infrastructure. That is because MPLS provide efficient bandwidth utilization and Quality of Service Provisioning. Providing QoS and traffic Engineering is very essential specially in supporting the requirement of real time traffic as well as mission critical applications. This chapter presents a review of traffic engineering in MPLS

7.2 TRAFFIC ENGINEERING CONCEPT IN MPLS

Traditional Routing protocols are based on algorithms that use the shortest path between two points, where the routers exchange information, periodically, about the nodes that it is connected to and current cost, in term of delay, losses, jitter etc., then each router update the knowledge of its surrounding by integrating these information into its local routing table. Then upon forwarding any packet the router consult the table to find the shortest path. Shortest path routing conserves network resources, but it may also cause the following problems [2]:

1. The shortest paths of routes from different sources overlap at some links, which causes congestion on those links.
2. The traffic from a source to a destination exceeds the capacity of the shortest path, while a longer path between these two ends is under-utilized.

Traffic Engineering TE [3] is becoming an important tool for the internet for service providers. Because it enables them to resolve and meet the challenges due to the increased volume of the internet traffic [Sri].

MPLS traffic engineering dynamically establishes and maintains an LSP tunnel across the MPLS domain using signaling protocols. The two signaling mechanisms used for distributing labels across an MPLS domain, in the context of traffic engineering and QoS, are constraint-based routing label distribution protocol (CRLDP) [4], and resource reservation protocol with traffic engineering extension (RSVP-TE) [4]. Explicit routing or constraint-based routing is particularly interesting for traffic engineering purpose.