

- Foreword p. XXI
- Preface p. XXIII
- Acknowledgments p. XXV
- 1 Introduction p. 1
- 1.1 Classification of MAC Protocols p. 3
- 1.2 Classification of WDM Local and Metro Networks p. 5
- 1.2.1 Network Architecture p. 5
- 1.2.2 Node Architecture p. 6
- 1.3 WDM Local/Metro Networks with QoS Support p. 8
- 1.4 Organization of this Work p. 9
- 2 Overview on Packet-Switched Photonic Local/Metro Networks p. 11
- 2.1 WDM Passive-Star Networks p. 12
- 2.1.1 Technological Background p. 14
- 2.1.2 Experimental Prototypes p. 26
- 2.1.3 Existing Passive-Star Access Protocols p. 30
- 2.1.4 Comparison of Passive-Star Access Protocols p. 38
- 2.2 WDM Ring Networks p. 39
- 2.2.1 General Description p. 39
- 2.2.2 Technological Background p. 41
- 2.2.3 Experimental Prototypes p. 43
- 2.2.4 Existing WDM Ring Access Protocols p. 48
- 2.2.5 Comparison of WDM Ring Access Protocols p. 53
- 3 Performance Modelling of Access Protocols p. 55
- 3.1 Performance Metrics p. 56
- 3.2 Traffic Modelling p. 57
- 3.2.1 Poisson Traffic p. 58
- 3.2.2 Self-Similar (Fractal) Traffic p. 59
- 3.2.3 Traffic Distribution p. 65
- 3.3 Analytical Modelling through Semi-Markov Processes p. 66
- 3.3.1 Theory of Semi-Markov Processes p. 66
- 3.3.2 Protocol Analysis via Semi-Markov Chains p. 73
- 3.3.3 Numerical Solution of Semi-Markov Chains p. 75
- 3.4 Discrete-Event Simulations p. 79
- 3.4.1 The Used Simulator p. 80
- 3.4.2 Statistical Evaluation of Performance Measures p. 81
- 4 Access Protocols for WDM Passive Stars Supporting QoS p. 83
- 4.1 Basic Access Protocols for WDM Passive-Coupler Networks p. 84
- 4.1.1 Network Architecture p. 84
- 4.1.2 Earliest Available Time Scheduling (EATS) Protocol p. 86
- 4.1.3 Performance Analysis of the EATS Protocol p. 90
- 4.1.4 Distributed Quene (DQ) Protocol p. 107
- 4.1.5 Performance Analysis of the DQ Protocol p. 109
- 4.1.6 Summary p. 119
- 4.2 Basic Access Protocol for AWGM-Based Networks p. 121
- 4.2.1 Network Architecture p. 121
- 4.2.2 Scheduling Algorithm p. 122

- 4.2.3 Performance Analysis p. 124
- 4.2.4 Summary p. 130
- 4.3 Basic Access Protocols with QoS Support p. 131
- 4.3.1 EATS Supporting Real-Time Services (EATS-R) p. 132
- 4.3.2 DQ Supporting Real-Time Services (DQ-R) p. 133
- 4.3.3 AWGM Protocol Supporting Real-Time Services p. 135
- 4.3.4 Performance Study p. 135
- 4.3.5 Summary p. 146
- 4.4 Access Protocol Integrating Real-Time and Data Services p. 147
- 4.4.1 The CONRAD Access Protocol p. 147
- 4.4.2 Performance of CONRAD p. 153
- 4.4.3 Extensions of CONRAD to Different Node Structures p. 161
- 4.4.4 Semi-Markov Model p. 163
- 4.4.5 Summary p. 170
- 5 Access Protocols for WDM Rings with QoS Support p. 173
- 5.1 Basic Access Protocol for Time-Slotted WDM Metro Rings p. 174
- 5.1.1 Network and Node Architecture p. 174
- 5.1.2 Access Protocol p. 175
- 5.1.3 Performance Analysis p. 177
- 5.1.4 Summary p. 185
- 5.2 Access Protocol Supporting QoS Services p. 186
- 5.2.1 System Description p. 187
- 5.2.2 Access Control p. 190
- 5.2.3 Performance Study p. 199
- 5.2.4 Summary p. 223
- 6 Conclusions p. 225
- A List of Abbreviations p. 227
- B List of Mathematical Symbols (Selection) p. 231
- Bibliography p. 235
- Index p. 249