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Nota di contenuto	Networks and Services; Contents; Foreword; Preface; 1 Introduction and Overview; 1.1 Introduction; 1.2 Basic Ethernet; 1.3 Synchronization; 1.4 Pseudowires; 1.5 Protection; 1.6 Carrier Ethernet Architecture and Services; 1.7 Carrier Ethernet Traffic Management; 1.8 Ethernet Operations, Administrations, and Maintenance (OAM); 1.9 Circuit Emulation; 1.10 Ethernet Local Management Interface (ELMI); 1.11 PBT; 1.12 T-MPLS and MPLS-TP; 1.13 Virtual Private LAN Services (VPLS); 2 Basic Ethernet; 2.1 Introduction; 2.2 CSMA/CD; 2.3 Full Duplex, Pause, Autonegotiation; 2.4 Repeaters and Hubs 2.5 Bridges 2.6 Switches; 2.7 Physical Layer; 2.8 Temperature Hardening; 2.9 Standards; 2.10 Ethernet Frame Types and the Ethertype Field; 2.11 Conclusion; References; 3 Synchronization; 3.1 Introduction; 3.2 Application Requirements; 3.3 Synchronization Standards; 3.4 NTP/SNTP; 3.5 Precision Time Protocol (IEEE 1588); 3.6 Synchronous-Ethernet Networks (SyncE); 3.7 Conclusion; References; 4 Pseudowires; 4.1 Introduction; 4.2 Protocol Layers; 4.3 Payload Types; 4.4 Pseudowire Architecture; 4.5 Control Plane; 4.6 Multisegment Architecture; 4.7 Multisegment Pseudowire Setup Mechanisms 4.8 Resiliency 4.9 Quality of Service and Congestion Control; 4.10

Operations and Maintenance (OAM); 4.11 Security; 4.12 Conclusion; References; 5 Ethernet Protection; 5.1 Introduction; 5.2 Automatic Protection Switching (APS) Entities; 5.3 Linear Protection; 5.4 Ring Protection; 5.5 Link Aggregation; 5.6 Conclusion; References; 6 Carrier Ethernet Architectures and Services; 6.1 Introduction; 6.2 Standards; 6.3 Architecture; 6.4 Interfaces; 6.5 Services; 6.6 Conclusion; References; 7 Carrier Ethernet Traffic Management; 7.1 Introduction; 7.2 Policing; 7.3 Queuing, Scheduling, and Flow Control; 7.4 Three CoS Model; 7.5 SLAs (Service-Level Agreements); 7.6 SLAs; 7.7 Application-CoS-Priority Mapping; 7.8 Bandwidth Profile; 7.9 Conclusion; References; 8 Carrier Ethernet OAM&P (Operations, Administration, Management, and Performance); 8.1 Introduction; 8.2 Link OAM; 8.3 Service OAM; 8.4 Maintenance Entities; 8.5 Maintenance Points; 8.6 OAM Addressing and Frame Format; 8.7 Continuity Check Message (CCM); 8.8 Loopback and Reply Messages (LBM and LBR); 8.9 Link Trace and Reply Messages (LTM and LTR); 8.10 Ethernet Alarm Indication Signal (ETH-AIS); 8.11 Ethernet Remote Defective Indication (ETH-RDI); 8.12 Ethernet Locked Signal (ETH-LCK); 8.13 Performance Measurements; 8.14 Performance Monitoring; 8.15 Loss Measurements; 8.16 Availability; 8.17 Frame Delay Measurements; 8.18 Interframe Delay Variation (IFDV) Measurements; 8.19 Testing; 8.20 Security; 8.21 OAM Bandwidth; 8.22 Conclusion; References; 9 Circuit Emulation Services (CES); 9.1 Introduction; 9.2 Circuit Emulation Functions; 9.3 Adaptation Function Headers; 9.4 Synchronization; 9.5 TDM Application Signaling; 9.6 CESoETH Defects and Alarms; 9.7 Performance Monitoring of CESoETH; 9.8 CESoETH Service Configuration

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## Sommario/riassunto

This book provides a comprehensive understanding of current and debated future networking technologies. It gives insight into building end-to-end networks and services with Carrier Ethernet, PBT, MPLS-TP, and VPLS while also shedding light on the pros and cons of these technologies for service providers and enterprise network owners. Focusing on layer-2 networking and services, *Networks and Services* covers: The basics of Ethernet such as protocol stack, bridges, switches, and hubs; Key techniques that are being used in building carrier-class Carrier Ethernet networks

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