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1.8.4. Core based trees: CBT; 1.8.5. Bidirectional PIM; 1.8.6. Cost of explicit methods; 1.9. Inter-domain multicast routing; 1.9.1. MASC/BGMP architecture; 1.9.2. BGP multiprotocol extensions; 1.9.3. Interaction with intra-domain routing; 1.9.4. BGMP; 1.9.5. PIM-SM and MSDP solution; 1.10. Model of multicasting with a single source: SSM; 1.10.1. Express; 1.10.2. The SSM and PIM-SM model; 1.10.3. Limitations of PIM-SSM; 1.11. Multicasting and IPv6; 1.11.1. IPv6 multicast addressing; 1.11.2. Protocol for group subscription: MLD; 1.11.3. RP-embedded mechanism; 1.12. Other multicast routing proposals; 1.12.1. Simple multicast; 1.12.2. Logical addressing and routing: LAR; 1.12.3. Reunite; 1.12.4. Hop by hop multicast routing: HBH; 1.13. Comparison of various protocols; 1.13.1. Quality of the broadcast trees; 1.13.2. Cost of protocols; 1.14. Alternatives to multicast routing; 1.14.1. Multiple unicast connections; 1.14.2. Multicasting for small groups; 1.14.3. Application level multicast; 1.15. Conclusion; 1.16. Bibliography; 1.17. Glossary of acronyms; Chapter 2. Hierarchical Multicast Protocols with Quality of Service; 2.1. Introduction; 2.2. Multicast principle; 2.2.1. Advantage of multicasting; 2.2.2. Technological constraints; 2.2.3. Main types of trees; 2.2.3.1. Shared tree/specific tree; 2.2.3.2. Shortest path tree (SPT); 2.2.3.3. Steiner tree; 2.2.3.4. Centered tree (CBT); 2.2.3.5. Summary; 2.3. Multicast routing protocols; 2.3.1. DVMRP; 2.3.2. PIM; 2.3.3. MOSPF; 2.3.4. IP multicast; 2.3.5. Limitations of the current multicast routing protocols; 2.3.5.1. DVMRP; 2.3.5.2. PIM; 2.4. Quality of service in multicast routing; 2.4.1. SJP; 2.4.2. QoSMIC; 2.4.3. QMRP; 2.4.4. Conclusion; 2.5. Hierarchical multicasting; 2.5.1. HDVMP

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## Sommario/riassunto

This book examines multicast technology and will be a key text for undergraduate engineering students and master students in networks and telecoms. However, it will be equally useful for a wide range of professionals in this research field. Multicast routing was introduced with the advent of multiparty applications (for example, videoconferencing on the Internet) and collaborative work (for example, distributed simulations). It is related to the concept of group communication, a technique introduced to reduce communication costs. The various problems of multicast routing on the Internet ar

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