

VOIP in MPLS Networks

Two Trend Technologies Combined

Even if there is no direct connection between MPLS and QoS from the technical viewpoint: It is a fact that almost all MPLS networks have been and continue to be equipped with notable quality of service features. One of the central real-time applications for the utilization of this quality of service is the implementation of voice over IP/IP telephony in MPLS networks. The available product range of ISPs extends from pure transport services for real-time data over VoIP-capable VPNs to a complete IP telephony service, where the customer only requires the end devices. The course will enable the participants to integrate voice solutions on the basis of voice-over-IP over an MPLS network. This includes the pure transport of voice over the data network up to the complete scope of performance of a voice network operator on an MPLS platform.

Course Contents

- MPLS Concepts and Trunk Protocols
- Voice over IP (VoIP) and IP Telephony
- VoIP Signaling: SIP, H.323, MGCP
- The Soft Switch in the MPLS Network
- Gateways into the PSTN
- Quality of Service: 802.1p/Q, QoS for VoIP with MPLS, MPLS with DiffServ
- End-to-End QoS and Mapping
- Appropriate MPLS-VPN Concepts for VoIP/IP Telephony
- Central Service VPN (CS-VPN) for VoIP/IP Telephony

In this course of the ExperTeach Networking series, each student will receive the comprehensive ExperTeach course documentation.

Target Group

The course addresses designers and operators of MPLS networks who wish to implement and optimize integrated voice-over-IP solutions.

Knowledge Prerequisites

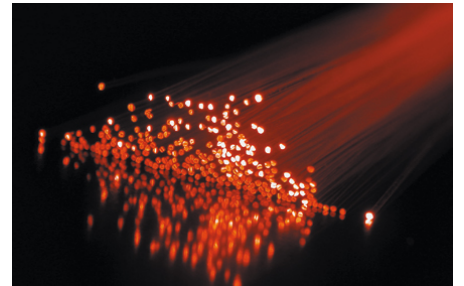
A profound knowledge in the fields of IP and IP routing is required. A good basic know-how in the sectors MPLS and voice-over-IP will be helpful, but is not mandatory.



Reservation and Registration

We will be glad to make a free and non-binding course reservation for you for the duration of two weeks. On www.experteach.de under *Registration*, you can conveniently make course reservations, registrations, and hotel reservations. Alternatively, call us under +49 6074 4868-0.

For closed groups of participants, we can modify the course contents according to your requirements. Do not hesitate to contact us!



3 days €1,695 exclusive of V.A.T.

Course date (mm/dd/yy)/Location

10/04-10/06/10 Frankfurt 12/20-12/22/10 München

Up-to-date information: www.experteach-training.com MPVO



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<p>1 Motivation</p> <p>1.1 Present Voice Networks</p> <p>1.1.1 Carrier PSTNs</p> <p>1.1.2 Virtual Private Networks (VPNs)</p> <p>1.1.3 Cellular Networks</p> <p>1.1.4 Enterprise Networks</p> <p>1.1.5 Voice over IP</p> <p>1.2 Motivation of Packetized Voice Transmission</p> <p>1.3 The MPLS Concept</p> <p>1.3.1 IP Overlay Models—Scalability</p> <p>1.3.2 Sophisticated Requirements—Traffic Engineering</p> <p>1.3.3 Transit Services—Tunneling</p> <p>2 Voice in MPLS Networks</p> <p>2.1 Voice-over-MPLS Solutions</p> <p>2.2 Voice over IP over MPLS</p> <p>2.3 TDM over MPLS</p> <p>2.4 Voice over MPLS</p> <p>2.5 Trunking over ATM</p> <p>2.6 Voice over ATM over MPLS</p> <p>3 Payload Data with Voice over IP</p> <p>3.1 Real-Time Applications over IP—The Mechanisms</p> <p>3.1.1 RTP—Transport and Reconstruction Function</p> <p>3.1.2 RTCP—Information on RTP Connections</p> <p>3.2 rTCP—Header Compression on the Trunk</p> <p>3.3 Bandwidths for VoIP</p> <p>4 Signaling with VoIP</p> <p>4.1 VoIP Concepts in an Overview</p> <p>4.1.1 H.323</p> <p>4.1.2 Megaco/H.248</p> <p>4.1.3 SIP</p> <p>4.2 The H.323 Architecture</p> <p>4.2.1 H.323 Terminal—The Functions of the End Devices</p> <p>4.2.2 H.323 Gateway—The Translator</p> <p>4.2.3 H.323 Gatekeeper—Address Translation and Management</p> <p>4.2.4 H.323 MCU—Management of Conference Calls</p> <p>4.3 Signaling</p> <p>4.3.1 Addressing—Multifarious but Unambiguous</p> <p>4.3.2 RAS—Gatekeeper End-Point Communication</p> <p>4.3.3 The Phases of a Call</p> <p>4.3.4 A Complete Call</p> <p>4.3.5 H.323 Procedures in the TCP/IP Protocol Stack</p> <p>5 MPLS Concepts</p> <p>5.1 On Rails through the Network: Label Switched Paths</p>	<p>5.1.1 IP Routing</p> <p>5.1.2 The Label under Scrutiny</p> <p>5.1.3 Forwarding Information Base</p> <p>5.2 Label Distribution</p> <p>5.2.1 Label Distribution Protocol</p> <p>5.2.2 Unsolicited Downstream: Unsolicited Distribution</p> <p>5.2.3 Downstream on Demand: Labels on Demand</p> <p>5.2.4 Further Label Distribution Mechanisms</p> <p>5.3 Routing Protocols in the IP World</p> <p>5.3.1 The Recommended IGP: OSPF</p> <p>5.3.2 The Trend in Provider Networks: IS-IS</p> <p>5.3.3 Basic Features of BGP-4</p> <p>5.3.4 Transport of Transit Traffic with MPLS</p> <p>6 Quality of Service in the MPLS Network</p> <p>6.1 Queuing</p> <p>6.1.1 The Three Basic Questions</p> <p>6.1.2 In Which Queue?</p> <p>6.1.3 Which Packets Have to be Discarded?</p> <p>6.1.4 When Will Packets be Sent?</p> <p>6.2 QoS Models</p> <p>6.2.1 Hose Model</p> <p>6.2.2 Pipe Model</p> <p>6.3 MPLS with DiffServ</p> <p>6.3.1 TOS vs. DiffServ</p> <p>6.3.2 LSRs and DiffServ</p> <p>6.3.3 Classes of Service and DiffServ</p> <p>6.4 MPLS with IntServ</p> <p>6.4.1 RSVP and Scalability</p> <p>6.4.2 Traffic Engineering via MPLS</p> <p>6.5 QoS in the VLAN</p> <p>7 VPNs for Voice over IP</p> <p>7.1 VPNs</p> <p>7.1.1 VPNs with MPLS and BGP-4</p> <p>7.1.2 The VoIP VPN—A Closed User Group</p> <p>7.1.3 The Central Service VPN for VoIP</p> <p>7.2 Special Issues</p> <p>7.2.1 Call Admission Control</p> <p>7.2.2 Gateways into Other Voice Networks</p> <p>7.2.3 Tariffing and CDRs</p> <p>A Details</p> <p>A.1 The Test Network</p> <p>B List of Abbreviations</p>
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