

# Video & TV over IP

## OTT and RTP Streaming

Video applications are increasingly being integrated into IP-based infrastructures. The areas of application are diverse. They range from video telephony, video conferencing, video surveillance and video streaming to IP TV. The QoS requirements in terms of data rates and performance characteristics of video transmission pose particular challenges for networks. In addition, extensive security measures often have to be met due to the sensitivity of the content. Video transmissions can be either unidirectional or bidirectional as unicast or multicast. In this course, participants will learn the basics of transporting and controlling video information. It also explains the measures that need to be taken to ensure quality and security in an IP network.

### Course Contents

- SIP und H.323
- Codecs und Bandbreiten
- Transport von Videodaten: (S)RTP und HTTP(S)
- Unicast und Multicast
- OTT-Streaming
- IP-TV
- RTSP – Real Time Streaming Protocol
- Video Surveillance, Video-Überwachung, Video-Konferenz
- QoS-Maßnahmen
- Netzwerkdesign und Security
- WebRTC

**E-Book** The detailed digital documentation package, consisting of an e-book and PDF, is included in the price of the course.

### Target Group

The course is suitable for planners and administrators who want to integrate video solutions based on IP into their network.

### Prerequisites

Participants need a sound knowledge of Ethernet switching as well as IP and routing, such as that acquired in the Ethernet, Routing & Switching - Technology Fundamentals course. In addition, an understanding of QoS concepts is required, as taught in the course Quality of Service - Basic Concepts of Converged Networks.

### This Course in the Web



You can find the up-to-date information and options for ordering under the following link:  
[www.expertteach-training.com/go/IPTV](http://www.expertteach-training.com/go/IPTV)

### Reservation

On our Website, you can reserve a course seat for 7 days free of charge and in a non-committal manner. This can also be done by phone under +49 6074/4868-0.

### Guaranteed Course Dates

To ensure reliable planning, we are continuously offering a wide range of guaranteed course dates.

### Your Tailor-Made Course!

We can precisely customize this course to your project and the corresponding requirements.

| Training           | Prices, excl. of V.A.T. |         |
|--------------------|-------------------------|---------|
| Classes in Germany | 2 Days                  | € 1,795 |
| Online Training    | 2 Days                  | € 1,795 |
| Dates upon request |                         |         |

Status 07/25/2025



EXPERTTeach



# Table of Contents

## Video & TV over IP – OTT and RTP Streaming

|                                                         |                                                               |                                                             |
|---------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|
| <b>1 Video über IP – Ein Überblick</b>                  | <b>2.6.3 Adaptive Streaming over HTTP (DASH)</b>              | <b>4.3 Session Description Protocol</b>                     |
| <b>1.1 Einsatzgebiete</b>                               | <b>2.7 Laufzeiten, Paketverluste und Laufzeitschwankungen</b> | <b>4.3.1 Aufbau des Message Body mit SDP</b>                |
| <b>1.1.1 Videotelefonie</b>                             | <b>2.7.1 Was ist Quality of Service?</b>                      | <b>4.3.2 SDP für Fortgeschrittene</b>                       |
| <b>1.1.2 Videokonferenz</b>                             | <b>2.7.2 Bausteine für QoS</b>                                | <b>4.4 WebRTC</b>                                           |
| <b>1.1.3 Video-Streaming</b>                            | <b>2.7.3 QoS-Aktionen</b>                                     | <b>4.4.1 WebRTC und UC-Architekturen</b>                    |
| <b>1.1.4 Videoüberwachung</b>                           | <b>2.7.4 Access-Listen und Policies</b>                       | <b>4.4.2 HTTP</b>                                           |
| <b>1.1.5 IPTV</b>                                       | <b>2.7.5 Typische Probleme</b>                                | <b>4.4.3 STUN, TURN und ICE</b>                             |
| <b>1.2 Weitere Nutzdatenverbindungen</b>                | <b>2.7.6 Queueing</b>                                         |                                                             |
| <b>1.3 Technische Umsetzung</b>                         | <b>2.7.7 Wo braucht man Queueing?</b>                         | <b>5 IPTV</b>                                               |
| <b>1.3.1 Kontrollverbindung</b>                         | <b>2.7.8 Die Grundfragen des Queueings</b>                    | <b>5.1 Standardisierung von IPTV</b>                        |
| <b>1.3.2 Übersicht Transport</b>                        |                                                               | <b>5.1.1 IPTV und IMS</b>                                   |
| <b>1.3.3 Videotransport über RTP</b>                    | <b>3 Video Codecs</b>                                         | <b>5.1.2 HbbTV</b>                                          |
| <b>1.3.4 Steuerung des RTP-Stroms</b>                   | <b>3.1 Video-Grundlagen</b>                                   | <b>5.2 Protokolle für Multicast IPTV</b>                    |
| <b>1.3.5 HTTP-Streaming</b>                             | <b>3.2 Grundlagen der Bildkompression – JPEG</b>              | <b>5.2.1 Die Settop Box</b>                                 |
|                                                         | <b>3.3 Kompression bewegter Bilder</b>                        | <b>5.2.2 Die Schnittstellen der Settop Box</b>              |
| <b>2 Transport von Video</b>                            | <b>3.3.1 I-, P- und B-Frames</b>                              | <b>5.2.3 Protokolle und ihr Zweck</b>                       |
| <b>2.1 Die Transportprotokolle</b>                      | <b>3.3.2 Level und Profile</b>                                | <b>5.2.4 Optimierung des Codecs</b>                         |
| <b>2.1.1 UDP – Einfach und ungesichert</b>              | <b>3.3.3 Rate Shaping</b>                                     | <b>5.2.5 Optimierung der Middleware</b>                     |
| <b>2.1.2 TCP – Verbindungsorientiert und gesichert</b>  | <b>3.3.4 Qualitätsverbesserung durch Two Pass Encoding</b>    | <b>5.2.6 Optimierungen von IGMP</b>                         |
| <b>2.1.3 QUIC</b>                                       | <b>3.4 Übliche Codecs</b>                                     | <b>5.2.7 Herausforderungen mit Multicast-basiertem IPTV</b> |
| <b>2.2 Video über RTP</b>                               | <b>3.4.1 MPEG-2/H.262</b>                                     | <b>5.3 OTT und IP-TV</b>                                    |
| <b>2.3 Das Realtime Transport Protocol</b>              | <b>3.4.2 MPEG-4/H.264/AVC</b>                                 | <b>5.3.1 Herausforderungen mit Unicast-basiertem IPTV</b>   |
| <b>2.3.1 Anforderungen an RTP</b>                       | <b>3.4.3 High Efficiency Video Coding/ H.265</b>              | <b>5.3.2 OTT-Anbieter</b>                                   |
| <b>2.3.2 Das RTP-Paket</b>                              | <b>3.4.4 VC-1/SMPTE 421M</b>                                  | <b>5.3.3 Weltweite Verteilung</b>                           |
| <b>2.3.3 RTP und QUIC?</b>                              | <b>3.4.5 VP8, VP9 und AV1</b>                                 | <b>5.3.4 P2P TV</b>                                         |
| <b>2.3.4 RTCP – Informationen über RTP-Verbindungen</b> | <b>3.5 MPEG2 Transport Stream</b>                             |                                                             |
| <b>2.3.5 Absichern von RTP</b>                          | <b>3.5.1 Video-Codecs</b>                                     |                                                             |
| <b>2.3.6 Key Management</b>                             | <b>3.5.2 Videoparameter</b>                                   |                                                             |
| <b>2.3.7 SDP Description (SDES)</b>                     | <b>3.5.3 Video und Audio gemeinsam</b>                        |                                                             |
| <b>2.3.8 DTLS-basierter Schlüsselaustausch</b>          | <b>3.6 Forward Error Correction</b>                           |                                                             |
| <b>2.4 Studio Video over IP (SMPTE 2110)</b>            |                                                               |                                                             |
| <b>2.5 Multicasts</b>                                   | <b>4 Kontrollprotokolle</b>                                   |                                                             |
| <b>2.5.1 Multicast-IPv4-Adressen</b>                    | <b>4.1 Steuerung durch RTSP</b>                               |                                                             |
| <b>2.5.2 IGMP</b>                                       | <b>4.1.1 Das Prinzip</b>                                      |                                                             |
| <b>2.5.3 Multicast-IPv6-Adressen</b>                    | <b>4.1.2 Abläufe bei RTSP</b>                                 |                                                             |
| <b>2.5.4 IGMP-Optimierung</b>                           | <b>4.1.3 RTSP-Meldungen</b>                                   |                                                             |
| <b>2.5.5 Layer-Interworking</b>                         | <b>4.1.4 Architektur für VoD</b>                              |                                                             |
| <b>2.5.6 Multicasting im LAN</b>                        | <b>4.1.5 Distribution Server</b>                              |                                                             |
| <b>2.5.7 Ethernet</b>                                   | <b>4.1.6 Die Funktion der Middleware</b>                      |                                                             |
| <b>2.5.8 Ethernet Switching</b>                         | <b>4.2 SIP – Das Session Initiation Protokoll</b>             |                                                             |
| <b>2.5.9 Multicast Routing</b>                          | <b>4.2.1 Einordnung in das ISO/OSI-Modell</b>                 |                                                             |
| <b>2.5.10 PIM Sparse Mode</b>                           | <b>4.2.2 Die Endgeräte: User Agents</b>                       |                                                             |
| <b>2.5.11 Automatic Multicast Tunneling</b>             | <b>4.2.3 Der Protokoll-Aufbau</b>                             |                                                             |
| <b>2.6 HTTP und Video</b>                               | <b>4.2.4 Eine Session im Verlauf</b>                          |                                                             |
| <b>2.6.1 HTTP-Versionen</b>                             |                                                               |                                                             |
| <b>2.6.2 HTTP-Live Streaming (HLS)</b>                  |                                                               |                                                             |

