

Next Generation Networks Architecture & Design

Next Generation Networks (NGN) are slowly but surely taking shape. They will basically be MPLS networks able to provide IP connections with high bit rates. The new structures are largely founded on practical experience gathered in the fields of voice over IP and UMTS. The signaling is based on SIP and the architecture of the signaling components follows the principles of IP Multimedia Subsystems (IMS). The distinctive characteristic of NGN lies in the separation of network, access technology, and services: The network constitutes the platform for innovative services that can be accessed from anywhere and at any time.

Course Contents

- Definition of NGN
- Standardization: ITU, ETSI (TISPAN), etc.
- Benefits for ISPs, Content Providers, and Customers
- Services in an NGN—Voice, Video, and more (Triple Play)
- Components of NGN
- NGN-Capable Access-Technologies
- The Core Network in an NGN
- The IP Multimedia Subsystem
- Signaling with SIP
- Service Creation Environments and APIs
- Mobility (Roaming)
- Open Issues and Preview

In this course from the ExperTeach Networking series, each participant will receive the comprehensive ExperTeach course documentation.

Target Group

This course is designed for network designers and consultants who are interested in gaining a thorough insight into the topic of Next Generation Networks. The focus is on explaining the underlying concepts and used protocols and indicating open issues and risks.

Knowledge Prerequisites

Knowledge of up-to-date LAN and WAN technologies, as well as of the functioning of IP-based networks are prerequisites for a successful participation in the course.

Course Objectives

This course gives the student conceptual insight into the new philosophy. The detailed know-how required to understand and competently evaluate NGN concepts is achieved by means of an exhaustive discussion of the used protocols.



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-benelux.com under *Registration*, you can conveniently make course reservations, registrations, and hotel reservations. Alternatively, call us under +31 (0)76 52 32 950.

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



3 days €1,545 exclusive of V.A.T.

Course date (dd.mm.yy)/Location

06.12.-08.12.10 Breda 02.03.-04.03.11 Breda

Up-to-date information: www.experteach-benelux.com NXGN



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Next Generation Networks – Architecture & Design

1 Objectives of Next Generation Networks

- 1.1 What Is a Next Generation Network?
 - 1.1.1 The Definition by the ITU
 - 1.1.2 3GPP—3G Partnership Project
 - 1.1.3 ETSI—The European Idea with TISPAN
- 1.2 A First Glance on the IMS
- 1.3 Services of the NGN—An Introduction
 - 1.3.1 Multimedia: VoIP, VoD, IPTV, Virtual Reality

2 SIP and RTP

- 2.1 SIP—The Session Initiation Protocol
 - 2.1.1 Classification into the ISO/OSI Model
 - 2.1.2 Borrowed? But from where?
 - 2.1.3 Standardization
- 2.2 Components of the SIP Architecture and Their Tasks
 - 2.2.1 The End Devices: User Agents
 - 2.2.2 The Gateways
 - 2.2.3 The SIP Proxy
 - 2.2.4 Addressing: SIP and Tel URIs
- 2.3 Protocol Setup
 - 2.3.1 Requests from INVITE to BYE
 - 2.3.2 Further Methods
 - 2.3.3 Responses from 100 Trying to 600 Busy Everywhere
 - 2.3.4 A Session with Two Proxies
- 2.4 Real-Time Applications via IP-RTP
- 2.5 Session Description Protocol
 - 2.5.1 Setup of the Message Body with SDP

3 The IMS Architecture

- 3.1 The IMS Architecture in an Overview
 - 3.1.1 Components of the IMS
 - 3.1.2 Protocols Used in the IMS
 - 3.1.3 An Example
- 3.2 The IMS Architecture in Detail
 - 3.2.1 Setup of the NGN According to ETSI
- 3.3 Call Session Control Functions
 - 3.3.1 Proxy CSCF
 - 3.3.2 Interrogating CSCF
 - 3.3.3 Serving CSCF
- 3.4 Application Server
 - 3.4.1 Legacy Services of GSM/UMTS
 - 3.4.2 Media Resource Function
- 3.5 User Administration with HSS and SLF
- 3.6 Interworking with the PSTN
 - 3.6.1 The Interworking Reference Model
 - 3.6.2 The Breakout Gateway Control Function
- 3.7 Session Border Controller
 - 3.7.1 SBC and NAT
 - 3.7.2 Access Control through Session Border Controllers

- 3.7.3 SBC and IMS
- 3.8 TISPAN Components of the IMS
 - 3.8.1 Resource and Admission Control System
 - 3.8.2 Network Attachment Subsystem

4 The Transport Networks

- 4.1 In the Core: MPLS
 - 4.1.1 Label Switched Paths
 - 4.1.2 IP-VPNs with MPLS and BGP-4
- 4.2 Metropolitan Ethernet
 - 4.2.1 Features of Ethernet and their Consequences
 - 4.2.2 Point-to-Point Connections
 - 4.2.3 Multipoint-to-Multipoint Service
 - 4.2.4 Provider Bridging—IEEE 802.1ad
 - 4.2.5 Provider Backbone Bridging—IEEE 802.1ad
 - 4.2.6 T-MPLS
 - 4.2.7 VPLS
 - 4.2.8 General Features of the Backbone Technology
 - 4.2.9 Standardization
- 4.3 Digital Subscriber Line
 - 4.3.1 ADSL2 and ADSL2+
 - 4.3.2 VDSL, VDSL2, and Fiber-to-the-Curb
 - 4.3.3 Delay Aspects
 - 4.3.4 ATM DSLAMs
 - 4.3.5 Ethernet DSLAMs
 - 4.3.6 IP DSLAMs
 - 4.3.7 Ethernet Aggregation for DSL Networks
- 4.4 Broadband Cable
 - 4.4.1 DOCSIS Variants
 - 4.4.2 The Cable Modem
 - 4.4.3 Packet-Cable Concept
- 4.5 Mobile Communications
 - 4.5.1 UMTS
 - 4.5.2 UMTS Releases in an Overview
 - 4.5.3 HSUPA, HSPA, HSPA (+)
 - 4.5.4 Migration to R4
 - 4.5.5 Long Term Evolution: LTE

5 Applications in the NGN

- 5.1 IPTV
 - 5.1.1 Protocols
 - 5.1.2 From the Transmitting Station to the Monitor
 - 5.1.3 Added Value of IPTV
- 5.2 Video-on-Demand
- 5.3 Service Creation
 - 5.3.1 Service Creation Environments
 - 5.3.2 APIs (Parlay)

6 Cross-Provider Aspects

- 6.1 Scenarios for VoIP Interconnection
 - 6.1.1 Peering Today and Tomorrow
 - 6.1.2 CoS and PHB

- 6.1.3 Session Peering
- 6.2 ENUM—Call Number Mapping and Detection
 - 6.2.1 Address Structure
 - 6.2.2 The ENUM Request in Detail
 - 6.2.3 ENUM in Germany
 - 6.2.4 Discussion
- 6.3 Billing Methods for VoIP-Peering
 - 6.3.1 Bill & Keep
 - 6.3.2 Calling Party Network Pays
 - 6.3.3 The Viewpoint of the End Customer: Calling Party Pays
 - 6.3.4 Further Procedures
 - 6.3.5 Discussion

A List of Abbreviations

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