

## Modern Telecommunications: Hands-On Network Convergence - 4 dagar

*kurser 949*

### **You Will Learn How To**

- Architect, implement and manage converged network solutions
- Align integrated infrastructure requirements with business drivers
- Leverage communication technologies for voice, data and video convergence
- Exploit the capabilities of next-generation networks
- Optimise networks for end-to-end Quality of Service (QoS) delivery
- Apply best practices to ensure the integrity of your converged network

### **Course Benefits**

Developing a network infrastructure that supports voice, data and video applications provides a significant opportunity to reduce costs, improve productivity and increase efficiency. This course covers the complex technologies needed to integrate telecommunications and data networking. Through an evolving case study, you assess the conflicting requirements of mixed-media applications to develop an integrated network solution.

### **Who Should Attend**

Network service providers, enterprise planners, network administrators and those involved in planning and implementing a converged network infrastructure. A basic knowledge of data networks at the level of Course 450, "Networking Comprehensive Introduction", is recommended.

### **Hands-On Training**

In this course, you gain practical experience designing and building a converged infrastructure. Exercises include:

- Defining performance goals
- Choosing the best infrastructure for integrated services
- Implementing VLANs to optimise voice traffic
- Designing and deploying a robust converged network infrastructure
- Configuring QoS in switches and routers
- Deploying MPLS switching and tunnelling
- Assessing a Service Level Agreement (SLA)

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### Introduction to Network Convergence Fundamentals of integrated networks

- Why convergence matters
- Key business drivers
- Characterising the integrated network

### Requirements of converged solutions

- Identifying integrated applications: VoIP, IPTV, messaging, video-on-demand and presence
- Evaluating the organisational impact

### Evaluating Service Provider

#### Technologies

#### Transporting voice and video

- Examining the requirements of integrated applications
- Encoding voice and video for digital transmission
- Achieving transmission efficiency using compression
- Comparing standard compression algorithms
- Assessing and leveraging existing technologies

### Converged network building blocks

- Circuit vs. packet network services
- Leased line and dial-up
- Packet and mobile services
- Modern broadband offerings

### Building IP Networks

#### The evolving local area network (LAN)

- Deploying switched Ethernet
- Incorporating IEEE 802.11 wireless LANs
- Separating voice and data using VLANs
- Controlling the Spanning Tree topology

### Working with IPv4 and IPv6

- Routing vs. forwarding
- Choosing a scalable routing protocol
- Optimising addressing in the core
- Going beyond best-efforts
- Leveraging multicast communications

### Integrating network services

- Naming and addressing with DNS and DHCP
- Managing the network with SNMP
- Supporting IP telephony and video conferencing with H.323 and SIP
- Analysing IP server placement

### Strengthening the Infrastructure

#### Establishing architecture requirements

- Ensuring aggregation efficiency and scalability
- Incorporating resilience for high availability
- Creating a return on investment (ROI)

### Designing a hierarchical network

- Differentiating access, distribution and core elements
- Integrating data, voice and video terminals
- Structuring enterprise and service provider networks
- Developing next generation provider networks that support broadband services

### Delivering End-to-End Quality of Service

#### Defining Quality of Service (QoS)

- Delay
- Jitter
- Loss
- Availability
- Preserving application integrity with class-based queuing

### Achieving scalable QoS in large networks

- Establishing trust boundaries
- Identifying the elements of QoS configuration

### QoS-enabling the IP infrastructure

- Configuring QoS parameters on switches and routers
- Applying additional router QoS features

### Transitioning to an Integrated Solution

#### Moving from TDM to IP

- Upgrading the network
- Migrating the signalling: SS7 and Q.931
- Optimising server placement

### Core network services

- Switching IP using MPLS
- Leveraging VPN technologies
- Firewall traversal

### Managing Your Infrastructure

#### Operating the network

- Integrating SNMP for network management
- Recording parameters and statistics in the management information base (MIB)

### Implementing service level agreements (SLAs)

- Assessing application criticality
- Defining critical performance metrics

- Deploying and monitoring SLAs