Modern Telecommunications: Hands-On Network Convergence - 4 Days

Course 949 Overview

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
- Assessing a Service Level Agreement (SLA)

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Course 949 Outline

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 and video-on-demand
- 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

Circuit-based services

- Assessing the limitations of legacy offerings
- Analysing the ITU-T video conferencing frameworks: H.320 and H.324

Packet network services

- Frame relay
- ATM
- Cellular telephony
- Modern broadband offerings based on xDSL and cable

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

- Optimising addressing, routing and forwarding
- 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