

Certified IP Professional (CIPP): QoS and Traffic Engineering

Covers: How to implement a multiservice IP network with support for RT & NRT traffic

hands-on



Overview

Voice, video, data and IPTV systems require skills to practically plan & dimension an IP network to handle a traffic mix of real and non real time. You will learn how to define a Quality of Service (QoS) strategy and then how to implement this practically using queuing, policing & traffic mapping with both DiffServ and RSVP. Multicast IP is also covered for support of real time services. Analytical and troubleshooting skills will be developed through the use of tools such as a network analyzer.

You will be able to

- Explain triple & quad play services
- Use traffic engineering techniques
- Understand the QoS framework
- Deploy techniques for implementing QoS in IP networks
- Know how session border control works
- Implement DiffServ and RSVP
- Implement multicasting
- Perform capacity planning for IP networks
- Dimension an IP network for multiple services
- Calculate IP capacity using Erlangs
- Provision resources for packet traffic
- Provision resources for real-time voice & video traffic

Who can benefit

Network administrators, planners and engineers wishing to build on their knowledge of IP in a practical environment and enable QoS in their networks.

Pre requisite knowledge

It is essential that the participants have a good knowledge of the fundamentals of IP. The participant should have successfully completed the Certified IP Engineer (CIPE) practical and theory assessment.

Outline

Introduction

- Triple and quad play service models
- IPTV systems & service features
- Designing IP networks for multiple services
- Service requirements for QoS
- What is meant by GoS, CoS, QoS and QoE?
- Managing the user experience
- Policy & SLA management

Implementing Quality of Service

- Voice & video codecs
- Key QoS parameters
- Quantifying quality & setting KPIs
- Classify, Queue & Schedule Architecture
- Queue types
- Implementing a queuing hierarchy
- Policing & shaping

- Defining token bucket parameters
- IP QoS provision
- QoS at the Ethernet layer
- Implementing the 802.1p protocol
- QoS in the WAN environment (MPLS, MetroEthernet & SDH)
- Implementing Differentiated Services
- Implementing Integrated Services & RSVP
- Session border control
- Performance enhancing proxies & packet filters
- Policy control

TCP/IP Performance Parameters

- Efficiency of the IP transmission network
- Buffers & segments
- IP congestion control mechanisms
- Packet overheads & retransmission
- Compression/suppression mechanisms
- Effects of segment loss & latency

IP Multicasting

- Multicast address structure & assignment
- Internet Group Management Protocol (IGMP)
- IGMP snooping
- Routing of multicast traffic
- Protocol-Independent Multicast (PIM)

Traffic Engineering

- Capacity Planning
- Provisioning of capacity for IP traffic
- Network dimensioning
- Oversubscription & services
- What is an Erlang?
- Variations to Erlang formula
- Where is Erlang valid?
- Provisioning for real-time traffic
- Provisioning for non real-time traffic
- Link utilization & system delay

Hands-on exercises, review questions & section summaries throughout

DURATION 5 days

MAXIMUM CLASS SIZE 12