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ETS

Course Profile

IP QoS - Protocols & Technologies

ETS365

Duration:

2 days

Objectives:

Explain the techniques, principles and technology associated with implementing IP Quality of Service (QoS).

Describe the IETF's Integrated Services standard and accompanying protocols such as RSVP, RTP and RTCP.

Describe the IETF's Differentiated Services standard and how it can be used to provide quality of service on a per-hop basis.

Explain the various queuing and congestion avoidance techniques used by QoS-aware routers to implement services such as IntServ and DiffServ.

Describe MPLS and how it can be used to improve routing efficiency and thus provide a basis for good QoS support.

Explain how IPv6 and class-based queuing all help to provide IP quality of service.

Who should attend:

Technical specialists, support personnel, communications specialists, consultants and network administrators who need a good grounding in all aspects of IP QoS and how to implement it.

Prerequisites:

Good understanding of IPv4 and routing.

Follow-on courses:

Any other advanced data communications course would be recommended, for example Understanding MPLS (ETS361).

Course style:

The course is presented as a mixture of discussion and teaching sessions.



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Key contents:

IntServ

RSVP

Traffic Conditioning

Class Based Queuing

RED

TOS and Priority

MPLS

MPLS and Frame Relay

IPv6

IPv6 Routing

DiffServ

RTP/RTCP

DiffServe in IPv4 and IPv6

Weighted Fair Queuing

WRED

Traffic Policing and Shaping

MPLS and ATM

MPLS v MPOA

IPv6 and QoS Support

IPv6 Security



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Detailed contents:

TCP/IP Refresher

Architecture

IP

- Addressing/Subnetting

Routing

- Unicast Packets
- Multicast Packets

TCP

- Reliability
- Congestion Control

UDP

Introducing QoS

What is QoS?

Why do we need it?

Things to Consider

- Isochronism
- Delay
- Loss
- Jitter
- Others

Applying QoS

- At the Core
- At the Edge

IP QoS Models

- Best Effort
- IntServ
- DiffServ



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Detailed contents continued:

Integrated Services

What is IntServ?

Objectives of IntServ

Principles of Operation

- Controlled Load Service
- Guaranteed Service
- RSVP
- RTP/RTCP

Packet Formats

Traffic Management

FIFO Routers v QoS Routers

Fair Queuing

Weighted Fair Queuing

Class-Based Queuing

Hierarchical Link Sharing

Custom Queuing

Priority Queuing

TOS Field

IP Precedence

Header Compression

Congestion Management

RED

WRED

Tail Drop

ECN



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Detailed contents continued:

Differentiated Services

What is DiffServ?

Objectives of DiffServ

Principles of Operation

- Traffic Conditioning
- Metering and Marking
- PHB Groups
- Assured Forwarding PHB
- Expedited Forwarding PHB
- IP Class Selector PHB
- The DS Byte

Supporting DiffServ in IPv4

Supporting DiffServ in IPv6

Relationship with MPLS

MPLS

What is MPLS?

Objectives of MPLS

MPLS Terminology

Principles of Operation

- Labels and FEC Labels
- Label Switch Routing
- LSP and Label Stacks
- Label Distribution Protocol

MPLS and Routing

MPLS over ATM

MPLS over Frame Relay

Providing QoS



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Detailed contents continued

IPv6

Differences with IPv4

IPv6 Security

IPv6 Routing

IPv6 QoS Support

- Traffic Classes and Flow Labels

Layer 2 QoS

ATM QoS

Frame Relay QoS

Ethernet QoS

Mapping Layer 2 and Layer 3



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To book this course, or to obtain more information, contact:

The Course Administrator

ETS Ltd.

Old Gunn Court

North Street

Dorking

RH4 1DE, UK

Telephone: +44 (0)1306 504 100

Facsimile: +44 (0)1306 880 820

e-mail: sales@etsl.co.uk

internet: www.etsl.co.uk

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