Systems & Network Training

Network design

A 5 day Hands on training course

Save on expenses. This course is also available on your premises.

Description

This course provides you with the knowledge needed to perform the design of a network infrastructure that supports desired network solutions to achieve effective performance, scalability, and availability. We recognise that the role of design does not normally require hands on skills but hands on sessions are used to reinforce the theory not to teach configuration or troubleshooting.

Key outcomes

By the end of the course delegates will be able to:

- ✔ Create HA enterprise network designs.
- ✔ Develop optimum Layer 3 designs.
- ✔ Design effective modern WAN and data center networks.
- ✔ Develop effective migration approaches to IPv6.
- ✔ Create effective network security designs.

Training approach

This structured course uses Instructor Led Training to provide the best possible learning experience. Small class sizes ensure students benefit from our engaging and interactive style of teaching with delegates encouraged to ask questions throughout the course. Quizzes follow each major section allowing checking of learning. Hands on sessions are used throughout to allow delegates to consolidate their new skills.

Details

Who will benefit?
Anyone involved with network design.

Prerequisites
TCP/IP foundation for engineers.

Duration: 5 days

Overall rating: ★★★★★

Generic training	Small class sizes	Hands On training	Our courseware	Customise your course
Generic training compliments product specific courses covering the complete picture of all relevant devices including the protocols “on the wire”.	We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.	The majority of our courses use hands on sessions to reinforce the theory.	We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.	Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.
“*Friendly environment with expert teaching that teaches the why before the how.”* G.C. Fasthosts	*“Excellent course. The small class size was a great benefit...”* M.B. IBM	*“Not many courses have practice added to it. Normally just the theoretical stuff is covered.”* J.W. Vodafone	*“Comprehensive materials that made the course easy to follow and will be used as a reference point.”* V.B. Rockwell Collins	*“I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on.”* S.R. Qinetiq

Network design

Course content

Part I Reliable, resilient enterprise L2/3 network design
Optimal Enterprise Campus Design: Enterprise campus design principles, hierarchy, modularity, flexibility, resiliency.
EIGRP design: EIGRP Design, Should you use EIGRP?
OSPF design: OSPF scalability designs, OSPF area design, OSPF Full-Mesh Design, OSPF Hub-and-Spoke Design, OSPF convergence design and optimization techniques.
IS-IS Design: The protocol, IS-IS hierarchical architecture, IS-IS vs OSPF, IS-IS Deep Dive, IS-IS Design Considerations.
BGP design: BGP overview, Designing Scalable iBGP Networks, BGP Route Reflector Design, Enhancing the Design of BGP Policies with BGP Communities, Case Study: Designing Enterprise wide BGP Policies Using BGP Communities, BGP Load-Sharing Design.
Part II Enterprise IPv6 Design Considerations
IPv6 Design Considerations in the Enterprise: IPv6 Deployment and Design Considerations, Considerations for Migration to IPv6 Design, IPv6 Transition Mechanisms, Final Thoughts on IPv6 Transition Mechanisms.
Challenges of the Transition to IPv6: IPv6 Services, Link Layer Security Considerations.
Part III Modern Enterprise Wide-Area Networks Design
Service Provider—Managed VPNs: Choosing Your WAN Connection, Layer 3 MPLS VPNs, Case Study: MPLS VPN Routing Propagation, Layer 2 MPLS VPN Services.
Enterprise-Managed WANs: Enterprise-Managed VPNs, GRE, Multipoint GRE, Point-to-Point and Multipoint GRE, IPsec, IPsec and dynamic VTI, DMVPN, Case Study: EIGRP DMVPN, DMVPN and Redundancy, Case Study: MPLS/VPN over GRE/DMVPN, SSL VPN.
Enterprise WAN Resiliency Design: WAN Remote-Site Overview, MPLS L3 WAN Design Models, Common L2 WAN Design Models, Common VPN WAN Design Models, 3G/4G VPN Design Models, Remote Site Using Local Internet, Remote-Site LAN, Case Study: Redundancy and Connectivity, NGWAN, SDWAN, and IWAN Solution Overview, IWAN Design Overview, Enterprise WAN and Access Management.
Part IV Enterprise Data Center Designs
Multitier Data Center Designs: Case Study: Small Data Centers (Connecting Servers to an Enterprise LAN), Case Study: Two-Tier Data Center Network Architecture, Case Study: Three-Tier Data Center Network Architecture.
Trends and Techniques to Design Modern Data Centers: The Need for a New Network Architecture, Limitations of Current Networking Technology, Modern Data Center Design Techniques and Architectures, Multitenant Data Center.
SDN: SDN characteristics, How SDN addresses current Networking Limitations, SDN Architecture Components, SDN Network Virtualization overlays.
Data Center Connections: Data Center Traffic Flows, The Need for DCI, IP Address Mobility, Case Study: Dark Fiber DCI, Pseudowire DCI.
Part V Design QoS for Optimized User Experience
QoS Overview: QoS Overview, IntServ versus DiffServ, Classification and Marking, Policers and Shapers, Policing Tools: Single-Rate Three-Color Marker, Policing Tools: Two-Rate Three-Color Marker, Queuing Tools, Dropping Tools.
QoS design principles and best practices: QoS overview, classification and marking design principles, policing and remarking design principles, queuing design principles, dropping design principles, Per-Hop behavior queue design principles, RFC 4594 QoS Recommendation, QoS Strategy Models. Campus QoS, WAN QoS, Data Center QoS.
MPLS VPN QoS Design: The Need for QoS in MPLS VPN, Layer 2 Private WAN QoS Administration, Fully Meshed MPLS VPN QoS Administration, MPLS DiffServ Tunneling Modes, Sample MPLS VPN QoS Roles.
IPsec VPN QoS Design: The Need for QoS in IPsec VPN, VPN Use Cases and Their QoS Models, IPsec Refresher, Encryption and Classification: Order of Operations, MTU Considerations, DMVPN QoS Considerations.
Part VI IP Multicast Design
Enterprise IP Multicast Design: How Does IP Multicast Work? Multicast Protocols, Multicast Forwarding and RPF Check, Multicast Protocol Basics, PIM-SM Overview, Multicast Routing Table, Basic SSM Concepts, Bidirectional PIM. RP discovery, Anycast RP Features, MSDP.
Part VII Designing Optimum Enterprise Network Security
Designing Security Services and Infrastructure Protection Network Security Zoning, Designing Infrastructure Protection.
Designing firewall & IPS solutions: Firewall architectures, virtualized firewalls. Case Study: Application Tier separation, Case Study: Firewalls in a Data Center, Case Study: Firewall High Availability, IPS Architectures, Case Study: Secure Campus Edge Design (Internet and Extranet Connectivity).
IP Multicast Security: Multicast Security Challenges, Multicast Network Security Considerations.
Designing Network Access Control Solutions: IEEE 802.1X, EAP, 802.1X supplicants, 802.1X phased deployment, Case Study: Authorization Options.
Part VIII Design scenarios
Design Case Studies: 1: Enterprise Connectivity, 2: Enterprise BGP with Internet Connectivity, 3: IPv6, 4: Data Center Connectivity, 5: Resilient Enterprise WAN, 6: Secure Enterprise Network, 7: QoS in the Enterprise Network.