

Implementing Network Virtualization

5 Day Course

Locations: Mex, D.F.

Date:

Who Needs to Attend

Engineers responsible for designing, implementing, and troubleshooting Network virtualization processes and selection technology work together more efficiently to meet increased service levels.

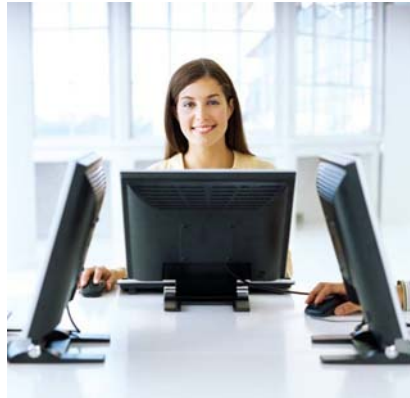
Audience Prerequisites

Experience with and ability to configure routers and LAN switches.

Network professionals with a good working knowledge of TCP/IP protocols.

Experience with basic ability to configure routers and LAN switches security features.

CCNA (recommended but not required).



Network Virtualization course provides design guidance for virtualized enterprise networks and arms network architects with the background necessary to make sound technological choices in the face of different business requirements. As a means of introduction, Network Virtualization lays out the fundamentals of enterprise network design.

Table of Contents

Chapter 1 Business Drivers Behind Enterprise

- Network Virtualization
- Why Virtualize?
- Visitors, Partners, Contractors, and Quarantine Areas
- Regulatory Compliance
- Secure Service Areas
- Network Consolidation
- Acquisitions and Mergers
- Multitenant Enterprises
- Virtual Project Environment: Next-Generation Business Processes

Chapter 2 Designing Scalable Enterprise

- Networks
- Hierarchical Campus Design
- Virtualizing the Campus
- WAN Design
- WAN Provider Service Offerings
- WAN Architecture
- WAN Resiliency
- WAN Routing Considerations
- Securing the WAN
- WAN Virtualization

Chapter 3 Basic Virtualized Enterprise

- The Virtual Enterprise
- Transport Virtualization—VNs
- VLANs and Scalability
- Virtualizing the Routed Core
- The LAN Edge: Authentication and Authorization
- Central Services Access: Virtual Network Perimeter

Chapter 4 A Technologies Primer Virtualization:

- Theory
- Network Device Virtualization
- Layer 2: VLANs
- Layer 3: VRF Instances
- Layer 2 Again: VFI
- Virtual Firewall Contexts
- Data-Path Virtualization
- Layer 2: 802.1q Trunking
- Generic Routing Encapsulation
- IPsec
- L2TPv3
- Label Switched Paths
- Data-Path Virtualization Summary
- Control-Plane Virtualization—Routing Protocols
- VRF-Aware Routing
- Multi-Topology Routing

Chapter 5 Infrastructure Segmentation

- Architectures: Theory
- Hop to Hop
- Layer 3 H2H
- Single Address Space Alternatives
- H2H Summary
- Tunnel Overlay for L3VPN
- L3VPN Using GRE and IPsec Overlay
- Putting It All Together: DMVPN
- Tunnel Overlay for Layer 2 VPNs
- Layer 2 P2P Overlay Using L2TPv3
- Layer 2 P2P Overlay Using MPLS
- Layer 2 VPN MP2MP Using MPLS (VPLS)
- Peer-Based Model for Layer 3 VPNs
- RFC 2547bis the MPLS Way
- RFC 2547bis Forwarding-Plane Alternatives
- Inter-Autonomous System Connectivity Carrier
- Inter-Autonomous System Routing

Implementing Network Virtualization

Why virtualization?

Through virtualization, people, processes and technology work together more efficiently to meet increased service levels.

Virtualization approach and capabilities can help you achieve substantial, long-term benefits from virtualization, including reduced costs, increased agility, and greater energy efficiency.

Chapter 6 Infrastructure Segmentation

- Architectures: Practice
- Hop-to-Hop VLANs
- Layer 3 Hop to Hop
- Single Address Space Solutions
- Tunnel Overlay for Layer 3 VPNs
- GRE Tunnels
- Multipoint GRE Tunnels
- Mapping Traffic to Tunnels
- Resiliency and Routing Considerations
- Encryption Considerations
- Layer 3 VPNs
- RFC 2547bis the MPLS Way
- RFC 2547bis over L2TPv3
- RFC 2547bis over GRE
- IGP Best Practices
- BGP Best Practices: Route Reflectors
- Layer 2 VPNs
- Ethernet over MPLS

Chapter 7 Extending the Virtualized Enterprise

- over the WAN
- WAN Services
- IP Services
- Layer 2 Circuits
- P2P GRE
- Multipoint GRE
- Dynamic Multipoint VPN
- Extending Segmentation over the WAN
- MPLS over Layer 2 Circuits
- VRF-to-VRF Connections at the Autonomous System Border Routers
- MP-eBGP Exchange of Labeled VPN-IPv4 Routes Between Adjacent ASBRs
- Multihop MP-eBGP Between Remote Autonomous Systems
- Using MPLS over Layer 2 Circuits for Segmented Branch Aggregation
- Benefits and Drawbacks
- Contracting Multiple IP VPNs
- Using CsC for Segmented Branch Aggregation
- Benefits and Drawbacks
- MPLS over GRE
- Benefits and Drawbacks
- RFC 2547 VPNs over L2TPv3 Tunnels
- Benefits and Drawbacks
- VRFs Interconnected by a GRE or DMVPN
- Benefits and Drawbacks
- RFC 2547 VPNs over DMVPN

Chapter 9 Multicast in a Virtualized Environment

- Multicast Introduction
- Internet Group Management Protocol (IGMP)
- Multicast Routing
- Protocol Independent Multicast (PIM)
- VRFs and Multicast
- Multicast Sourced from an External IP Network
- Multicast Across VRFs (mVPN Extranet)
- mVPN Transport
- Global
- Tunnel Overlay
- mVPN
- Connecting the WAN

Chapter 10 Quality of Service in a Virtualized Environment

- QoS Models and Mechanisms: A Review
- Differentiated Services
- MPLS Quality of Service
- Tunnels and Pipes
- MPLS Traffic Engineering and Guaranteed Bandwidth
- DS-TE and Guaranteed Bandwidth
- Do I Really Need This in an Enterprise Network?
- QoS Models for Virtualized Networks
- One Policy per Group

Chapter 11 The Virtualized Access Layer

- Access Layer Switching
- Implementing Dynamic Authentication and Authorization
- Clientless Authentication
- Client-Based Layer 2
- Virtualizing the Access Layer
- Layer 3 Access