



CCIE Service Provider v4 Bootcamp

Instructor Introduction

» Brian McGahan, CCIE #8593 & CCDE 2013::13

- CCIE Routing and Switching - 2002
- CCIE Service Provider - 2006
- CCIE Security - 2007
- CCDE - 2013
- CCIE Data Center - 2013



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Student Introductions

- » What's your name?
- » Networking background?
- » Lab date scheduled?
- » What are you looking to get out of the class?
- » Students who are resitting class – Anything you want added to class or more focus on ?

Asking Questions

» Class Participation is Key

- The more you put into class the more you get out
- I'm here for your benefit, ask questions now!
- No actual lab questions per Cisco NDA

» Offline Questions

- Discussion Forum - <http://ieoc.com>
- INE Blog - <http://blog.ine.com>
- Feel free to email me - bmcgahan@ine.com

Class Timing

- » Meet at class around 9am
- » Discussion starts daily at 9:30am
- » Short breaks ~ hourly
- » Lunch break ~ noon
- » Discussion ends ~6pm
 - Rack access is 24/7
 - I am available during all class hours

Class Format

» Class is mixture of ~30% discussion ~70% hands-on labs

» Discussion

- Minimal slides, if any
- Mostly diagrams, packet flows, and hands-on examples

» Hands-on Labs

- Main class focus is hands-on implementation
- Rack access available 24/7 through any Internet connection

Class Objectives

» Understanding the Technologies

- Configuration
- Verification
- Troubleshooting

» Learning and applying a structured approach for CCIE Lab Strategy

- Overall Lab Strategy
- Individual Section Strategy
- Individual Task Strategy
- Time Management is Key!

» Ultimately you will need both: Accuracy and Speed!

Class Prerequisites

» In-depth knowledge of...

- Layer 2
 - Ethernet
- Layer 3
 - IPv4, IPv6, Routing Logic, RIP, EIGRP, OSPF, IS-IS, BGP, MPLS, Multicast
- Misc.
 - QoS, IOS Security, IOS Features & Management

» Main class focus is MPLS & L3VPN

- CCIE SP is essentially an IGP/BGP/MPLS exam

» CCIE SPv4 Adv. Tech. Class highly recommended

High Level Class Topic Flow

» Monday - Thursday

- Introduction
- Assessment Lab
- Assessment Lab Review
- Technology Discussion and Examples

» Friday

- Troubleshooting

» Saturday

- Full Scale Lab

» Sunday

- Full Scale Lab Review
- Final Review

CCIE Service Provider v4 Blueprint

» Written exam blueprint

- <http://www.cisco.com/go/ccie> > Service Provider > Written Exam v4.1 Information

» Lab exam blueprint

- <http://www.cisco.com/go/ccie> > Service Provider > Lab Exam v4.1 Information

Six SPv4 Topic Domains

- » All topic domains cover both IPv4 and IPv6
- » SP Architecture and Evolution
 - Device roles (P, PE, CE), XR architecture, platform virtualization
- » Core Routing
 - OSPFv2/v3, IS-IS, BGP, MPLS, TE, Multicast, QoS
- » Service Provider-Based Services
 - MPLS L2VPN, MPLS L3VPN, Overlay VPNs, Internet Service

Six SPv4 Topic Domains (cont.)

» Access and Aggregation

- PE-CE Routing/QoS/Multicast

» High Availability and Fast Convergence

- FRR, LFA, BGP PIC, LDP Session Protection

» SP Security, SP Operation and Management

- CoPP, Control Plane Authentication & Filtering, NetFlow, SNMP

SPv3 to SPv4 Blueprint Changes

» Key topics removed

- Packet over SONET (PoS)
- Serial (T1/E1 & T3/E3)
- Frame Relay
- ATM

SPv3 to SPv4 Blueprint Changes

» Key topics added

- PBB MAC in MAC (802.1ah)
- Resilient Ethernet Protocol (REP)
- Multicast Label Distribution Protocol (mLDP)
- Point-to-Multipoint Traffic Engineering (P2MP TE)
- Unified MPLS (Seamless MPLS)
- Ethernet VPN (EVPN)
- Provider Backbone Bridging EVPN (PBB-EVPN)
- Locator/ID Separation Protocol (LISP)
- mGRE (DMVPN)
- IPv6 NAT44/NAT64/6RD
- MPLS OAM & Ethernet OAM

SPv4 Exam Format Changes

» Previous SPv3 format

- Single 8 hour configuration section
- Troubleshooting built into initial configs

» New SPv4 format

- Three separate modules
 - Troubleshooting
 - Diagnostic
 - Configuration

SPv4 Troubleshooting Module

» 2 – 2.5 hours

- 30 minutes may be deducted from configuration

» ~ 10 troubleshooting tickets

- 2 – 4 points apiece
- Tickets are independent of each other
- Large topology separate from configuration

SPv4 Diagnostic Module

- » 1 hour fixed
- » ~ 3 tickets of ~ 4 questions apiece
 - Where is the problem occurring?
 - What is the cause of the problem?
 - What information do we need to correctly diagnose the problem?
- » Quickly sorting through the information is key for time management
 - Incident reports, show outputs, packet captures, etc.

SPv4 Configuration Module

» 4.5 – 5 hours

- 30 minutes may be assigned to Troubleshooting

» Similar to v3 exam format

- Large topology
- Lots of interdependencies
- Time management is key

Recommended Resources

» Recommended Books

- IP Routing on Cisco IOS, IOS XE, and IOS XR
- MPLS-Enabled Applications: Emerging Developments and New Technologies
- MPLS Configuration on Cisco IOS Software
- Interdomain Multicast Routing : Practical Juniper Networks and Cisco Systems Solutions

Recommended Resources

» Cisco Live Presentations

- BRKSPG-2904 - ASR-9000/IOS-XR Understanding forwarding, troubleshooting the system and XR operations
- BRKSPG-2724 - Network Function Virtualization (NFV) using IOS-XR
- BRKSPG-2051 - Evolution of Service Provider Edge Architectures
- BRKSPG-2202 - Deploying Carrier Ethernet Services on ASR 9000

Recommended Resources

» Cisco Live Presentations (cont.)

- BRKSPG-2209 - Designing Access Network With the ME3600X and ME3800X
- BRKSPG-2402 - Best Practices to Deploy High-Availability in Service Provider Edge and Aggregation Architectures
- BRKSPM-2008 - Unified MPLS Design and Deployment Case Study for Mobile Service Provider
- BRKIPM-3111 - Multipoint LDP
- BRKMPL-2333 - E-VPN & PBB-EVPN: the Next Generation of MPLS-based L2VPN

Recommended Resources

» Documentation

- www.cisco.com > Support > Configure
- Technology
 - FAQs
 - Standards
 - White Papers
 - Design Guides
 - Config Examples
- Products
 - Configuration Guides
 - Command Reference

Questions?