CCIE Service Provider v4 Bootcamp

SSID: Aloft
Room: 101
File Share: http://ine.co/sp20170109

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
- **bmcgahan@ine.com**
  - @brianmcgahan
  - linkedin.com/in/bmcgahan

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**
  - Introduction
  - Assessment Lab
- **Tuesday - Friday**
  - Assessment Lab Review
  - Technology Discussion and Examples
- **Saturday**
  - Troubleshooting
- **Sunday**
  - Review

CCIE Service Provider v4 Blueprint

- **Written exam blueprint**
  - http://www.cisco.com/go/ccie > Service Provider > Written Exam v4.0 Information
- **Lab exam blueprint**
  - http://www.cisco.com/go/ccie > Service Provider > Lab Exam v4.0 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 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?