Advanced Services' Cisco IOS XR Software IPv4 Routing (XIPV4R) for Service Providers Version 3.5.2a

This intensive, four-day hands-on course provides Cisco service provider customers with an advanced look at popular IPv4 routing protocols supported in Cisco® IOS® XR Software Release 3.5.2. The XIPV4R course investigates the intricacies of Interior Gateway Protocol (IGP) operation with Open Shortest Path First (OSPF) and Intermediate System-to-Intermediate System (IS-IS) Protocol labs that engage the student in a detailed examination of the routing database and the effects of many protocol options. The complexities of large-scale routing using the Border Gateway Protocol (BGP) are then explored, with an emphasis on scaling large networks using route reflection and confederations.

Duration

Four days.

Target Audience

This course is for technical professionals who design, implement, and operate IPv4 routing protocols in a service provider network consisting of routers running Cisco IOS XR Software.

The following are considered the primary audience for this course:

- Network operations center (NOC) engineers
- Network and senior engineers
- Support engineers

Course Objectives

Upon completion of this course, you should be able to:

- Describe the basic unicast forwarding architecture and infrastructure
- Describe and apply basic routing and forwarding security
- Describe and examine bidirectional forwarding detection
- Explain nonstop forwarding operation
- Configure Routing Policy Language (RPL) sets and policies

- Design hierarchical and parameterized RPL policies
- Configure IS-IS Level 1 and Level 2 areas and verify operation
- Implement route redistribrution and summarization in IS-IS
- Configure a multiple area OSPF domain and verify operation
- Implement route redistribution with a route policy
- Configure autonomous systems with BGP route reflectors and as a confederation
- Configure external BGP between adjacent autonomous systems
- Implement BGP neighbor route policies
- Examine internal and external BGP operation

Course Prerequisites

Following are the prerequisites for this course.

- Students should have knowledge of the Cisco IOS XR Software configuration syntax to the extent covered in the Cisco CRS-1 Essentials or Cisco XR12000 Series Essentials course.
- Students attending this class should be able to establish, without assistance, a basic configuration for OSPF, IS-IS, and BGP as accomplished in the Cisco CRS-1 Essentials or Cisco XR12000 Series Essentials course labs.

To locate Cisco courses that cover the listed prerequisites, go to the Cisco Training & Events Webpage at www.cisco.com/web/learning/index.html.

Course Outline

The course outline is as follows:

- IPv4 Routing Architecture and Infrastructure
  - Data Packet Forwarding Infrastructure
  - Building the Forwarding Information
  - Routing Information Base Operation
  - Adjacency Information Base
  - Forwarding Information Base Operation
  - Bulk Content Downloader
  - Routing and Forwarding Protection Infrastructure
  - Keychain Management
  - Bidirectional Forwarding Detection
  - Nonstop Forwarding
  - Address Families
- Routing Policy Language
  - RPL Overview and Description
  - Routing Policy Processing
  - RPL-Specific CLI Commands
- IS-IS Routing in the Core
  - IS-IS Overview
  - Configuring IS-IS

- IS-IS Route Policy
- Verifying IS-IS Operation
- IS-IS Route Redistribution
- IS-IS Tuning
- Managing IS-IS Implementation

- OSPF Routing in the Core
  - OSPFv2 Overview
  - Configuring OSPFv2
  - Verifying OSPF Operation
  - Multiple Area OSPF Environment
  - Virtual Links
  - Multi-area Adjacencies
  - Route Redistribution into OSPF
  - OSPF Route Policy
  - Tuning OSPF
  - OSPF Processes
- BGP Routing Through the Core
  - BGP Overview
  - Configuring BGP
  - Configuration Groups
  - Examining BGP Operation
  - Internal BGP Scaling
  - BGP Route Policy
  - Distributed BGP
  - Session Recovery and Tuning

Lab Outline

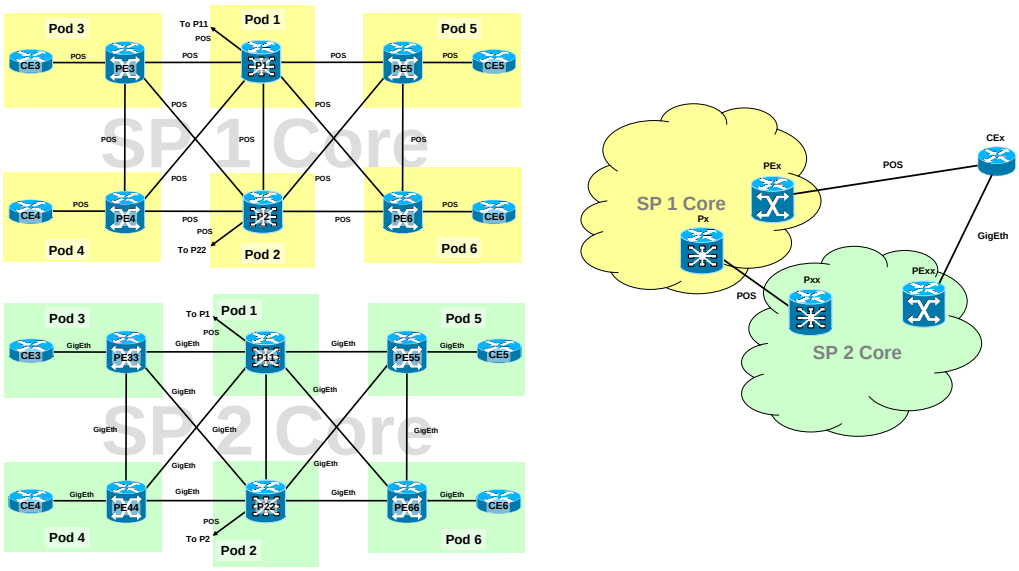
The lab outline is as follows:

- Examining Cisco IOS XR Software Routing Infrastructure
  Boot a static routed configuration in both cores and examine the routing environment.
- Routing Policy Language
  Design and configure a route policy to filter routes.
- Configuring IS-IS Routing
  Configure Core 2 routers as an IS-IS domain.
- Configuring OSPF Routing
  Configure Core 1 routers as a multiple area OSPF domain.
- Configuring BGP Routing
  Configure each core as a separate autonomous system running iBGP and interconnected with eBGP. Implement RPL route policies between autonomous systems.

Lab Topology

Figure 1 shows the lab topology that is used in this course.

Figure 1. Lab Topology of Cisco IOS XR Software IPv4 Routing for Service Providers



Registration Information

For more information about schedules and registration for this course, please contact aeskt_registration@cisco.com.

For More Information

For more information about Advanced Services Education course offerings, including custom training options, as well as Advanced Services Curriculum Planning Services and the Advanced Services Technical Knowledge Library (TKL), refer to the Advanced Services Education website at www.cisco.com/go/ase.

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