BGP Configuring BGP on Cisco Routers 3.2

Course Summary

Description
The Configuring BGP on Cisco Routers (BGP) v3.2 course provides students with in-depth knowledge of BGP, the routing protocol that is one of the underlying foundations of the Internet and new-world technologies such as Multiprotocol Label Switching (MPLS). This curriculum covers the theory of BGP, configuration of BGP on Cisco IOS routers, detailed troubleshooting information and hands-on exercises that provide students with the skills needed to configure and troubleshoot BGP networks in customer environments. Different service solutions in the curriculum cover BGP network design issues and usage rules for various BGP features preparing students to design and implement efficient, optimal and trouble free BGP networks.

Objectives
At the end of this course, students will be able to:

- Given a network scenario with multiple domains, configure, monitor and troubleshoot basic BGP to enable inter-domain routing
- Given a network scenario where connections to multiple ISPs must be supported, use BGP policy controls to influence the route selection process with minimal impact on BGP route processing
- Given a network scenario where multiple connections must be supported, use BGP attributes to influence the route selection process
- Given customer connectivity requirements, implement the correct BGP configuration to successfully connect the customer's network to the Internet
- Given a typical service provider network with multiple BGP connections to other autonomous systems, enable the provider network to behave as a transit autonomous system
- Given a typical service provider network, identify common BGP scaling issues and enable route reflection and confederations as possible solutions to these issues
- Given a typical BGP network, use available BGP tools and features to optimize the scalability of the BGP routing protocol

Topics

- BGP Overview
- BGP Transit Autonomous Systems
- Route Selection Using Policy Controls
- Route Selection Using Attributes
- Customer-to-Provider Connectivity with BGP
- Scaling Service Provider Networks
- Optimizing BGP Scalability

Audience
Those who will benefit most from this course will be pre- and post sales technical engineers who are responsible for designing, implementing, or troubleshooting BGP networks.

Prerequisites

- Completion of Interconnecting Cisco Networking Devices (ICND) or Cisco Certified Networking Associate (CCNA)
- Completion of Building Scalable Cisco Internetworks (BSCI) or equivalent HSRP

Duration
Five days

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Course Outline

I. BGP Overview
- A. Introducing BGP
- B. Understanding BGP Path Attributes
- C. Establishing BGP Sessions
- D. Processing BGP Routes
- E. Configuring Basic BGP
- F. Monitoring and Troubleshooting BGP

II. BGP Transit Autonomous Systems
- A. Working with a Transit AS
- B. Interacting with IBGP and EBGP in a Transit AS
- C. Forwarding Packets in a Transit AS
- D. Configuring a Transit AS
- E. Monitoring and Troubleshooting IBGP in a Transit AS

III. Route Selection Using Policy Controls
- A. Using Multi-homed BGP Networks
- B. Employing AS-Path Filters
- C. Filtering with Prefix-Lists
- D. Using Outbound Route Filtering
- E. Applying Route-Maps as BGP Filters
- F. Implementing Changes in BGP Policy

IV. Route Selection Using Attributes
- A. Influencing BGP Route Selection with Weights
- B. Setting BGP Local Preference
- C. Using AS-Path Pre-pending
- D. Understanding BGP Multi-Exit Discriminators
- E. Addressing BGP Communities

V. Customer-to-Provider Connectivity with BGP
- A. Understanding Customer-to-Provider Connectivity Requirements
- B. Implementing Customer Connectivity Using Static Routing
- C. Connecting a Multi-homed Customer to a Single Service Provider
- D. Connecting a Multi-homed Customer to Multiple Service Providers

VI. Scaling Service Provider Networks
- A. Scaling IGP and BGP in Service Provider Networks
- B. Introducing Route Reflectors
- C. Designing Networks with Route Reflectors
- D. Configuring and Monitoring Route Reflectors
- E. Introducing Confederations
- F. Configuring and Monitoring Confederations

VII. Optimizing BGP Scalability
- A. Improving BGP Convergence
- B. Limiting the Number of Prefixes Received from a BGP Neighbor
- C. Implementing BGP Peer Groups
- D. Using BGP Route Dampening

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