



Configuring BGP of Cisco Routers (BGP)

COURSE OVERVIEW

Configuring BGP on Cisco Routers (BGP) v4.0 provides students with in-depth knowledge of Border Gateway Protocol (BGP), the routing protocol that is one of the 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 learners with the skills that they need 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 learners to design and implement efficient, optimal, and trouble free BGP networks.

WHO WILL BENEFIT FROM THIS COURSE?

Primary target audience:

- This course is intended primarily for network administrators, network engineers, network managers and systems engineers who would like to implement BGP.

Secondary target audience:

- This course is intended for network designers and project managers. The course is also recommended to all individuals preparing for BGP exam.

PREREQUISITES

To fully benefit from this course, students should have the following prerequisite skills and knowledge:

- Intermediate to advanced knowledge of Cisco IOS Software configuration
- Configuring and troubleshooting RIP, EIGRP, OSPF and IS-IS
- Skills and knowledge equivalent to those learned in:
 - Interconnecting Cisco Networking Devices v2.0, Part 1 (ICND1 v2.0) and Part 2 (ICND2 v2.0), or
 - Interconnecting Cisco Networking Devices: Accelerated Version 2.0 (CCNAX v2.0)
 - Implementing Cisco IP Routing (ROUTE v2.0)
 - Building Cisco Service Provider Next-Generation Networks Part 1 (SPNGN1) v1.2
 - Building Cisco Service Provider Next-Generation Networks Part 2 (SPNGN2) v1.2

COURSE OBJECTIVES

After completion of this course, students will be able to...

- Describe how to configure, monitor, and troubleshoot basic BGP to enable interdomain routing in a network scenario with multiple domains.
- Describe how to use BGP policy controls to influence the BGP route selection process in a network scenario in which you must support connections to multiple ISPs.



- Describe how to use BGP attributes to influence the route selection process in a network scenario where you must support multiple connections.
- Describe how to successfully connect the customer network to the Internet in a network scenario in which multiple connections must be implemented.
- Describe how to configure the service provider network to behave as a transit AS in a typical implementation with multiple BGP connections to other autonomous systems.
- Enable route reflection as possible solution to BGP scaling issues in a typical service provider network with multiple BGP connections to other autonomous systems.
- Describe the available BGP tools and features to optimize the scalability of the BGP routing protocol in a typical BGP network.

COURSE OUTLINE

Module 1: BGP Overview

- Lesson 1: Introducing BGP
- Lesson 2: Understanding BGP Path Attributes
- Lesson 3: Establishing BGP Sessions
- Lesson 4: Processing BGP Route
- Lesson 5: Configuring Basic BGP
- Lesson 6: Monitoring and Troubleshooting BGP
- Lesson 7: Module Summary
- Lesson 8: Module Self-Check

Module 2: BGP Transit Autonomous Systems

- Lesson 1: Working with Transit AS
- Lesson 2: Interacting with IBGP and EBGP in Transit AS
- Lesson 3: Forwarding Packets in Transit AS
- Lesson 4: Monitoring and Troubleshooting IBGP in Transit AS
- Lesson 5: Module Summary
- Lesson 6: Module Self-Check

Module 3: Route Selection Using Policy Controls

- Lesson 1: Using Multihomed BGP Networks
- Lesson 2: Employing AS Path Filters
- Lesson 3: Filtering with Prefix Lists
- Lesson 4: Using Outbound Route Filtering
- Lesson 5: Applying Route Maps as BGP Filters
- Lesson 6: Implementing Changes in BGP Policy
- Lesson 7: Module Summary
- Lesson 8: Module Self-Check

Module 4: Route Selection Using Attributes

- Lesson 1: Influencing BGP Route Selection with Weights
- Lesson 2: Setting BGP Local Preference
- Lesson 3: Using AS Path Prepending



- Lesson 4: Understanding BGP Multi-Exit Discriminators
- Lesson 5: Addressing BGP Communities
- Lesson 6: Module Summary
- Lesson 7: Module Self-Check

Module 5: Customer-to-Provider Connectivity with BGP

- Lesson 1: Understanding Customer-to-Provider Connectivity
- Lesson 2: Implementing Customer Connectivity Using Static Routing
- Lesson 3: Connecting a Customer to a Single Service Provider
- Lesson 4: Connecting a Multihomed Customer to Multiple Service Providers
- Lesson 5: Module Summary
- Lesson 6: Module Self-Check

Module 6: Scaling Service Provider Networks

- Lesson 1: Scaling IGP and BGP in Service Provider Networks
- Lesson 2: Introducing and Designing Route Reflectors
- Lesson 3: Configuring and Monitoring Route Reflectors
- Lesson 4: Module Summary
- Lesson 5: Module Self-Check

Module 7: Optimizing BGP Scalability

- Lesson 1: Improving BGP Convergence
- Lesson 2: Limiting the Number of Prefixes Received from a BGP Neighbor
- Lesson 3: Implementing BGP Peer Groups
- Lesson 4: Using BGP Route Dampening
- Lesson 5: Module Summary
- Lesson 6: Module Self-Check

LABS:

- Discovery 1: Configure Basic BGP
- Discovery 2: Announcing Networks in BGP
- Discovery 3: Implement BGP TTL Security Check
- Discovery 4: BGP Route Propagation
- Discovery 5: IBGP Full Mesh
- Discovery 6: BGP Administrative Distance
- Discovery 7: Configure Non-Transit Autonomous System
- Discovery 8: Filtering Customer Prefixes
- Discovery 9: Prefix-Based Outbound Route Filtering
- Discovery 10: Configure Route Maps as BGP Filters
- Discovery 11: Configure Per-Neighbor Weights
- Discovery 12: Configure and Monitor Local Preference
- Discovery 13: Configure Local Preference Using Route Maps
- Discovery 14: Configure AS Path Prepending
- Discovery 15: Configure MED
- Discovery 16: Configure Local Preference Using the Communities



- Discovery 17: Configure Route Reflector
 - Discovery 18: Configure BGP Route Limiting
 - Discovery 19: Configure BGP Peer Groups
 - Discovery 20: Configure BGP Route Dampening
 - Challenge 1: Configure a Basic BGP Network
 - Challenge 2: Configure a BGP Transit AS
 - Challenge 3: Configure BGP Using BGP Filtering
 - Challenge 4: Configure BGP Route Selection Using BGP Attributes
 - Challenge 5: Configure BGP Route Reflectors
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