

# BGP - Configuring BGP on Cisco Routers v3.2

In this comprehensive course, you will gain in-depth knowledge of BGP, the routing protocol that is one of the underlying foundations of the Internet. You will explore the theory of BGP, configuration of BGP on Cisco IOS routers, and detailed troubleshooting information.

Our enhanced hands-on labs provide you with the skills needed to configure and troubleshoot BGP networks in both enterprise and service provider environments. You'll also learn BGP network design issues and usage rules for various features as well as how to design and implement efficient, optimal, and trouble-free BGP networks.

## Prerequisites

- CCNA
- ENCOR

## Follow-On Courses

- MPLS - Implementing Cisco MPLS v2.3
- QOS - Implementing Cisco Quality of Service

## Course Outline

### 1. BGP Overview

- Session Establishment
- Path Attributes
- Route Processing
- Basic Configuration
- Monitoring and Troubleshooting

### 2. BGP Transit Autonomous Systems

- Working with a Transit AS
- Interacting with IBGP and EBGP in a Transit AS
- Forwarding Packets in a Transit AS
- Configuring a Transit AS
- Monitoring and Troubleshooting IBGP in a Transit AS

### 3. Route Selection Using Policy Controls

- Multihomed BGP Networks
- Employing AS Path Filters
- Filtering with Prefix Lists
- Outbound Route Filtering
- Applying Route Maps as BGP Filters
- Implementing Changes in BGP Policy

#### 4. Route Selection Using Attributes

- BGP Route Selection with Weights
- BGP Local Preference
- AS-Path Prepending
- BGP Multi-Exit Discriminator (MED)
- Addressing BGP Communities

#### 5. Customer-to-Provider Connectivity with BGP

- Customer-to-Provider Connectivity Requirements
- Implementing Customer Connectivity Using Static Routes
- Connecting a Multihomed Customer to Single or Multiple Service Providers

#### 6. Scaling Service Provider Networks

- Scaling IGP and BGP in Service Provider Networks
- Designing Networks and Route Reflectors
- Configuring and Monitoring Route Reflectors
- Configuring and Monitoring Confederations

#### 7. Optimizing BGP Scalability

- Improving BGP Convergence
- Limiting the Number of Prefixes Received from a BGP Neighbor
- Implementing BGP Peer Groups
- BGP Route Dampening

### Labs

#### Lab 1: Network Setup

- Establish physical connectivity between routers
- Configure IP addressing
- Enable an Interior Routing Protocol
- Verify routing

#### Lab 2: Configuring EBGP Peerings

- Create two EBGP peerings
- Advertise networks into BGP
- Redistribute your IGP into BGP
- Examine the effects of BGP auto-summarization
- Summarize routes to your neighbor

#### Lab 3: Configuring IBGP Peerings

- Configure an IBGP peering with another edge router
- Peering with loopback interfaces
- Examine effect of BGP synchronization

- Discover BGP next-hop behavior
- Examine the effects of multihoming on path selection

#### Lab 4: Using AS-Path Filters and Regular Expressions

- Filter updates to external routers
- Manipulate path selection using AS-path filters and regular expressions

#### Lab 5: Using Prefix Lists

- Filter advertised AS routes using prefix lists

#### Lab 6: Soft Reconfiguration and Route Refresh

- Monitor and verify the actions of BGP Route Refresh
- Configure BGP soft inbound reconfiguration

#### Lab 7: Configuring the Weight Attribute

- Configure a second BGP peering for each router
- Set a weight value for routes received from each EBGP neighbor
- Monitor the resulting path choice

#### Lab 8: Configuring the Local Preference Attribute

- Use the Local Preference attribute to control BGP path selection

#### Lab 9: AS-Path Prepending

- Configure AS-Path Prepending to make one path into your AS look more attractive than the other

#### Lab 10: Configuring the Multi-Exit Discriminator (MED) Attribute

- Use the MED attribute to influence the BGP path selection by routers in neighboring systems

#### Lab 11: Using the Community Attribute

- Configure the community attribute in setting local preference BGP policies

#### Lab 12: Becoming a Service Provider

- Configure your AS as a service provider
- Configure full-mesh IBGP
- Determine appropriate filters for routing updates to and from your customer
- Configure and apply filters

#### Lab 13: Using Route Reflectors

- Configure a hierarchical route reflector structure
- Examine the effects of route reflectors on routing updates

#### Lab 14: Using Confederations

- Divide your AS into confederations
- Configure intra- and inter-confederation peerings
- Configure peering with external neighbors
- Examine the effects of confederation on routing updates

#### Lab 15: Monitoring and Tuning BGP Resource Use

- Examine the effects of BGP session establishment and route updates on router resources
- Examine how timers speed BGP convergence
- Set a maximum prefix value

#### Lab 16: Using Peer Groups

- Place neighboring BGP routers into peer groups
- Apply policy configuration to peer groups

#### Lab 17: Using Route Dampening

- Configure and apply route dampening to external peers
- Monitor the results when that peer's routes flap