

Course ID

**BGP**

Course Duration

**1 day**

Course Title

**BGP: An Intensive Tutorial**

**Related Courses**

- MPLS: Integrated Routing with End-to-End QoS for the Next Generation Networks (2-3 days, MPLS)
- MPLS: A Short Tutorial (1 day, MPLS1D)
- Multimedia Applications: IMS, SIP, and VoIP (2 days, MULTIMEDIA)
- IP-Based Systems: TCP/IP and Mobile IP (2-3 days, IPSYS)
- IMS: The Technology, Applications, and Challenges (2 days, IMS)
- Internetworking with TCP/IP Version 6 (2-3 days, IPV6)
- State-of-the-art of VoIP Technology for Professionals, Managers, and Executives (1 day, VOIP-EXEC)
- VoIP Security (2 days, VOIPSEC)
- Principles of Network Security: CompTIA Security+ and US DoD Directive 8570.1 (3-4 days, NETSEC)
- ATM: A Survival Course (3 days, ATM)
- Wireless Network Structure, Operation, and Technologies (3 days, WIRELESSNET)

**Aimed At**

Those who need a short but intensive technical introduction to BGP.

**Group Size**

5-25

**Prerequisites**

You should know the basics of routing and be familiar with OSPF.

**Course in a Nutshell**

Border Gateway Protocol (BGP) is the core routing protocol of the Internet. This one-day tutorial provides an intensive discussion of the BGP architecture and operation, transit autonomous systems, route selection using policy controls and attributes, implementation of customer-to-provider connectivity, considerations related to the scaling of service provider networks, optimization of scalability, and deployment considerations. Upon course completion, you will have solid knowledge of this important member of the family of IP routing protocols.

**Customize It!**

We can customize this course to your particular needs, usually at little-to-no additional cost, by adding or omitting topics included, shortening or expanding coverage, or making other changes as requested. We can also teach this course in combination with one of our two courses on MPLS, listed under Related Courses.

- Outline the overall structure of BGP
- Describe the BGP transit autonomous systems
- Describe route selection in BGP using policy controls
- Describe route selection in BGP using attributes
- Describe how to provide customer-to-provider connectivity in BGP
- Explain considerations related to the scaling of service provider networks
- Discuss how to optimize scalability in BGP
- Summarize the deployment and management issues for BGP

## Course Outline

- An Overview of BGP
  - Introduction to BGP
  - BGP Session Establishment
  - BGP Path Attributes
  - BGP Route Processing
  - Basic BGP Configuration
  - Monitoring and Troubleshooting BGP
- 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
- Route Selection Using Policy Controls
  - Using Multi-homed BGP Networks
  - Employing AS Path Filters
  - Filtering with Prefix Lists
  - Using Outbound Route Filtering
  - Applying Route Maps as BGP Filters
  - Implementing Changes in BGP Policy
- Route Selection Using Attributes
  - Influencing BGP Route Selection with Weights
  - Setting BGP Local Preference
  - Using AS-Path Prepending
  - Understanding BGP Multi-Exit Discriminator (MED)
  - Addressing BGP Communities
- Customer-to-Provider Connectivity with BGP
  - Understanding Customer-to-Provider Connectivity Requirements
  - Implementing Customer Connectivity Using Static Routes

- Connecting a Multi-homed Customer to a Single Service Provider
- Connecting a Multi-homed Customer to Multiple Service Providers
- Scaling Service Provider Networks
  - Scaling IGP and BGP in Service Provider Networks
  - Introduction to Route Reflectors
  - Designing Networks and Route Reflectors
  - Configuring and Monitoring Route Reflectors
  - Introducing Confederations
  - Configuring and Monitoring Confederations
- Optimizing BGP Scalability
  - Improving BGP Convergence
  - Limiting the Number of Prefixes Received from a BGP Neighbor
  - Implementing BGP Peer Groups
  - Using BGP Route Dampening
- Deployment and Management Issues
- Conclusion: Recap, Q/A, and Evaluation

### **How You Will Learn**

- You will learn from someone who is knowledgeable and experienced in BGP, MPLS, and other routing protocols and technologies.
- He/she will teach this class as an interactive lecture, with ample opportunity for participation and discussion of issues that interest you the most.
- If you already know something BGP or related protocols, we will build on that. If your background is less technical, we will review the necessary routing fundamentals before proceeding with the class, using examples and analogies to simplify the complex topics.
- You will receive a copy of the instructor presentation for review and reference after the class.

*Revised*

*June 4f, 2007*