Implementing A Cisco Multicast Infrastructure

Varighet: 5 Days       Kurskode: ICMI

Beskrivelse:

In this course, you will learn how infrastructures are multicast enabled to support the efficiency of multicast business applications and services. Learn to identify Cisco products and protocols required to implement multicast solutions in both local and wide area networks within your enterprise and beyond. You will implement services at each layer of the network to obtain membership to multicast groups in a working environment. Our hands-on labs will give you access to several multicast applications and troubleshooting tools.

Målgruppe:

Engineers responsible for designing, implementing, and troubleshooting IP multicast-enabled networks; IT personnel who may implement streaming voice/video/data services in an enterprise, including ISPs and those in financial service enterprises, the health care industry, or cable TV companies; those preparing for the CCIE practical exam

Agenda:

- What You’ll Learn
  - Source Specific Multicast
  - IP Multicast Application Types
  - Bidirectional PIM
  - Basic Model of IP Multicast
  - Configuring Redundant Rendezvous Points Using Anycast MSDP, Auto RP, or BSR
  - IP Multicast Addressing
  - Combining Anycast RP and Auto-RP
  - Multicast Distribution Trees and Protocol Types
  - Multicast Scoping Including Using Administratively Scoped Zones
  - Reporting Group Membership
  - Multicast Security, High Availability, and Reliability
  - IP Multicasting MAC-Layer Addresses and Switch Forwarding
  - Multicast over NBMA Networks
  - IGMP Snooping Implementation
  - Tunneling Multicast over Unicast Networks
  - PIM Dense Mode Configuration and Troubleshooting
  - Multicast with VPNs and MPLS
  - PIM Sparse Mode Configuration and Troubleshooting
  - Interdomain Multicast with MBGP and MSDP Configuration

Forkunnskaper:

Experience with and ability to configure Cisco routers and LAN Switches. CCNA + BSCI knowledge or equivalent.
ICMI

1. IP Multicast Foundation
   - Overview and Outline
   - Chapter Objectives
   - IP Multicast Benefits and Caveats
   - IP Multicast Application Types
   - The Basic Model of IP Multicast
   - IP Multicast Addressing
   - Multicast Sessions - Directory Services
   - Summary
   - Review Questions

2. Function of a Multicast Network
   - Overview and Outline
   - Chapter Objectives
   - Functions of Multicast-Enabled Networks
   - Multicast Distribution Trees and Protocol Types
   - Reporting Group Membership
   - Summary
   - Review Questions

3. Multicast LAN Switch Operation
   - Overview and Outline
   - Chapter Objectives
   - Multicast MAC-Layer Addresses and Switch Forwarding
   - Constraining Multicast Streams on LAN Switch Ports
   - IGMP Snooping Implementation
   - Summary
   - Review Questions

4. PIM Dense Mode
   - Overview and Outline
   - Chapter Objectives
   - PIM Dense Mode Overview
   - PIM Dense Mode Details
   - PIM Dense Mode Configuration and Troubleshooting
   - Summary
   - Review Questions

5. PIM Sparse Mode
   - Overview and Outline
   - Chapter Objectives
   - PIM Sparse Mode Overview
   - PIM Sparse Mode Details
   - PIM Sparse Mode Configuration and Troubleshooting
   - Summary
   - Review Questions

6. PIM-SM Variants
   - Overview and Outline
   - Chapter Objectives
   - PIM-SM Variants
   - PIM Sparse Mode
   - PIM Dense Mode
   - Multicast LAN Switch Operation
   - Summary
   - Review Questions

   - Overview and Outline
   - Chapter Objectives
   - Advanced Multicast Engineering - Security
   - Advanced Multicast Engineering - High Availability
   - What is Reliable IP Multicast?
   - Pragmatic General Multicast
   - Summary
   - Review Questions

10. WAN, VPN, and MPLS for Multicast
    - Overview and Outline
    - Chapter Objectives
    - Multicast over NBMA Networks
    - Tunneling Multicast over Unicast Networks
    - Multicast with VPNs and MPLS
    - Summary
    - Review Questions

11. Interdomain Multicast with MBGP and MSDP
    - Overview and Outline
    - Chapter Objectives
    - Basic Overview Interdomain Multicast Routing
    - MBGP Configuration
    - MSDP Configuration
    - Summary
    - Review Questions

Appendix A. Cisco Security Appliance Command
Appendix B. PGM Configuration
Appendix C. MSDP RPF Rules

Labs
We have developed additional in-depth labs that complement those recommended by Cisco. The network core contains a 3550 switch and six routers in a pod and there may be up to two pods. Our ICMI labs aren't demos-they provide the tools and real-world scenarios for hands-on practice and learning. All configuration, monitoring, and debugging is done by you.

Lab 1: Multicast Applications and Addressing
Utilize PC multicast applications such as SDR, Whiteboard, Audio, and Video tools to create and view session announcements, join existing multicast groups, understand multicast session parameters and options,

Lab 3: IGMP Configuration and Operation
Configure IGMP and PIM on the routers and monitor them with IOS commands. Identify addresses used for Session Announcement Protocol, and router interfaces will join a group. Monitor the effects of IGMP Snooping on the 3350 switch in this lab.

Lab 4: PIM Dense Mode Configuration
Configure PIM on all routers. Baseline the network with no multicast source and no receivers. Initialize the multicast source, set router interfaces to join the group with no receivers, and observe dense mode impact on RPF. Then, you'll compare the network with PIM Dense Mode running to the baseline. Using IOS debug and show commands, you will analyze the following PIM Dense Mode events:

PIM Pruning and Grafting
Join/Prune
Grafting
PIM Assert
PIM Multicast Forwarding Table Timers

Lab 5: Sparse Mode Configuration
Configure PIM Sparse Mode on the routers. Make topology changes with PIM Sparse Mode configuration, observe the shared tree, and analyze it with receivers, no source, and then with a source. Learn to identify the switchover from shared tree to shortest path tree.

Lab 6: Source Specific Multicast and Bi-Directional PIM
Configure, monitor, and troubleshoot PIM Source Specific Multicast and Bi-Directional PIM. Apply your knowledge of the IGMP and PIM Sparse mode in a real situation and explore the troubleshooting tools needed in simple IP multicast solutions.

Lab 7: Redundant Rendezvous Points
Configure, monitor, and troubleshoot Redundant Rendezvous Points configured statically with MSDP and with Auto-RP. Apply your knowledge of PIM Sparse mode, MSDP, and Auto-RP in a real situation and explore the troubleshooting tools needed in IP multicast solutions. Also, explore configuration using Static MSDP and Auto-RP together.

Lab 8: IP Multicast Administrative Scoping
Configure, monitor, and troubleshoot Administrative Scoping via TTL and Multicast Address.
Overview and Outline
Chapter Objectives
Source Specific Multicast
Bidirectional PIM
Bidirectional PIM Basic Configuration
Bidirectional PIM Designated Forwarders
Bidirectional PIM Mroute Forwarding State (*, G)
Bidirectional PIM Phantom BiDir RPs
Summary
Review Questions

7. Redundant Rendezvous Points

Overview and Outline
Chapter Objectives
Configuring Redundant Rendezvous Points Using MSDP
Redundant RP Configuration and Recommendations
Configuring Redundant Rendezvous Points Using Auto RP
Configuring Redundant Rendezvous Points Using BSR
Combining Anycast RP and Auto-RP
Tuning RP Operations
Summary
Review Questions

8. Administrative Scoping and Filtering of Multicast

Overview and Outline
Chapter Objectives
Multicast Scoping
Using Administratively Scoped Zones
Summary
Review Questions

Lab 2: Setup and Configuration
Wire the lab and utilize the Cisco IOS to configure each router in the student group for initial operation. You'll also set up each PC in the group. To get the idea about IGMP and how it works, you will observe the periodic sending of IGMP packets in your network before and after the receivers announce their presence and when they decide to leave the multicast group.

Lab 9: Tunneling Multicast over a Unicast Network
Configure and troubleshoot multicast tunneling over unicast links. Apply lessons learned in the class to design, configure, and troubleshoot real-world scenarios where ISPs or WAN connections are not multicast enabled.

Ytterligere informasjon:

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