

H0LK6S Deploying the Mobile-First Campus using ArubaOS-Switches

Course Summary

Description

This course introduces network professionals to the basic features of modern networks such as VLANs, redundancy technologies such as MSTP, Backplane Stacking, link aggregation technologies like LACP, static IP routing, and dynamic routing with OSPF, ACL's, Multicast, and an introduction to BGP. The learner will experience both theory and hands on experience utilizing real hardware for lab exercises through our remote lab facility. The learner will configure and monitor ArubaOS-Switch products using open standard technologies. You will work with layer 2 technologies, such as Multiple Instance Spanning Tree (MSTP) and Link-Aggregation (Trunks). You will also learn about Backplane Stacking. Layer 3 technologies, such as static routes, Open Shortest Path First (OSPF) with Multi-Area implementations, and Border Gateway Protocol (BGP), along with multicast solutions leveraging Protocol independent Multicast (PIM) both dense and sparse modes.

Objectives

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

- Protect devices with local and remote authentication using telnet, SSH, web, and SNMP access
- Navigate the ArubaOS-Switch CLI and manage the flash file system
- Upgrade the ArubaOS-Switch switch operating system
- Configure VLANs on ArubaOS-Switches
- Implement basic routing on directly connected VLANs or links
- Configure a ArubaOS-Switches for DHCP server and DHCP relay
- Interpret ArubaOS-Switches logs
- Understand how different varieties of spanning tree are implemented on ArubaOS-Switches
- Configure multiple spanning tree and apply STP security features
- Differentiate between static and dynamic link aggregation
- Configure and troubleshoot link aggregation on ArubaOS-Switches
- Identify applications for static and dynamic routing
- Configure single-area OSPF routing
- Understand the basic operation of HPE's Backplane Stacking technologies
- Configure and verify a simple backplane stacking topology
- Differentiate applications for two- and three-tier network designs
- Identify an appropriate VLAN design based on a given scenario
- Based on a given scenario, choose appropriate link types and redundancy solutions
- Use best practices for IP addressing and OSPF routing when implementing a network design

Topics

- Introduction
- Basic Setup
- Protecting Management Access
- Management of Software and Configurations
- VLANS
- IP Services
- Spanning Tree
- Link Aggregation
- Backplane Stacking
- IP Routing
- OSPF (Multi-area and external area)
- ACLs
- QoS
- BGP
- Multicast

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Course Summary (cont'd)

Audience

This course is designed for IT professionals who will deploy and manage networks based on HPE's ArubaOS-Switches.

Prerequisites

Prior to taking this course, students should possess experience with networking and common LAN protocols.

Duration

Five days

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Course Outline

- I. Introduction**
 - A. HPE Introduction
 - B. Network Design Introduction
- II. Basic Setup**
 - A. Connect your management station to the console port on an ArubaOS-Switch and access the CLI
 - B. Navigate the CLI
 - C. Configure basic settings, such as the hostname and IP address for VLAN 1
 - D. Verify your configuration settings
- III. Protecting Management Access**
 - A. Implement basic protection using local and remote authentication
 - B. Implement remote management with Telnet, SSH, Web, and SNMP access
 - C. RBAC (Role Based Access Control). Configuration and Verification
- IV. Management of Software and Configurations**
 - A. Describe the switch bootup process
 - B. Upgrade the switch operating system
 - C. Manage switch configuration files
- V. VLANS**
 - A. Understanding the use of VLANs and the VLAN types
 - B. Understanding VLAN port types
 - C. Configuring VLANs on ArubaOS-Switches
 - D. Implementing basic VLAN routing on directly connected VLANs or links
- VI. IP Services**
 - A. DHCP server and DHCP relay
 - B. NTP
 - C. Logging
 - D. DNS
- VII. Spanning Tree**
 - A. Explain how RSTP operates and enhances the original 802.1D standard
 - B. Explain the implementation of PVST+
 - C. Configure MSTP and use MSTP to provide load sharing
 - D. Configure STP security features
- VIII. Link Aggregation**
 - A. Identify problems and limitations of STP in load sharing
 - B. Differentiate between static and dynamic link aggregation
 - C. Describe how the Link Aggregation Control Protocol works (LACP)
 - D. Configure and troubleshoot link aggregation on ArubaOS-Switches.
- IX. Backplane Stacking**
 - A. Describe how switches in a backplane stack operate as one virtual switch
 - B. Describe the three topologies supported with backplane stacking and the roles members play in the stack
 - C. Explain how backplane stacking handles stack fragments
 - D. VSF Virtual Switch Framework Overview
 - E. Building and Maintaining VSF
 - F. Steps to Building VSF
 - G. Steps to verify VSF
 - H. VSF Split: MAD
 - I. VSF Detection Protocols
- X. IP Routing**
 - A. Describe VLANs, routing, and static routing
 - B. Describe dynamic routing with RIP and OSPF
 - C. Explain single area OSPF configuration

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Course Outline (cont'd)

XI. OSPF (Multi-area and external area)

- A. Deploy ArubaOS-Switches in single-area and multi-area OSPF systems
- B. Use area definitions and summaries to create efficient and scalable multiple area designs
- C. Advertise routes to external networks in a variety of OSPF environments
- D. Promote fast, effective convergence during a variety of failover situations
- E. Use virtual links as required to establish non-direct connections to the backbone
- F. Implement OSFP authentication

XII. ACLs

- A. Define ACL and identify the criteria by which ACLs select traffic
- B. Configure ACLs on ArubaOS-Switches based switches to select given traffic
- C. Apply static ACLs to interfaces to meet the needs of a particular scenario
- D. Examine an ACL configuration and determine the action taken on specific packets

XIII. QoS

- A. Configure ArubaOS-Switches to honor the appropriate QoS marks applied by other devices
- B. Create a QoS policy that assigns a specified class of traffic to a priority queue
- C. Select and implement an appropriate strategy for queue scheduling

- D. Implement traffic policing policies that enforce the negotiated committed information rate (CIR), committed burst size (CBS), peak information rate (PIR), and excessive burst size (EBS) for a specified class of traffic
- E. Respond to congestion in advance by applying the appropriate traffic shaping and Weighted Random Early Detection (WRED) policies
- F. Determine the QoS mark that an HPE switch will assign to specific outbound traffic and, if necessary, adjust the mark

XIV. BGP

- A. Establish and monitor eBGP sessions between your routers and Internet Service Provider (ISP) routers
- B. Advertise an IP block to multiple ISP routers
- C. Filter BGP routes as required for a dual-homed ISP connection
- D. Configure a BGP router to advertise a default route in OSPF or to redistribute and aggregate BGP routes, as appropriate

XV. Multicast

- A. Route multicast traffic using PIM-DM or PIM-SM
- B. Select and configure RPs based on particular environmental needs such as redundancy and efficient operation
- C. Minimize unnecessary multicast flooding