HCIA-Datacom v1

Objectives

After completing the training, you will be able to:

- Understand the definition of data communication and the capability model of data communication engineers.
- Understand the network reference model and the entire data communication process.
- Be familiar with the VRP system and be able to perform basic operations.
- Understand IPv4 address protocol and related concepts
- Understand the forwarding principles of Layer 3 devices such as routers and Layer 3 switches.
- Understand the concept of routing and use static route or OSPF to build a Layer 3 network.
- Understand basic Ethernet concepts and describe the functions and working principles of Layer 2 switching devices.
- Be familiar with common Ethernet protocols, such as VLAN, Spanning Tree Protocol , link aggregation and stacking.
- Configure ACLs and AAA to provide basic security solutions for the network.
- Be familiar with the NAT protocol and master the NAT configuration in different scenarios.
- Master the configuration of common services on enterprise networks, such as DHCP, FTP and Telnet.
- Understand basic WLAN concepts and complete basic configurations of small or medium-sized WLAN networks.
- Understand basic WAN concepts and WAN solutions such as MPLS and SR.
- Have general knowledge of basic concepts of enterprise network management.
- Be familiar with traditional network management and SDN-based network management solutions.
- Have a good command of IPv6 protocols and be able to build small-scale IPv6 networks
- Have a good command of the campus network construction process. Be able to independently construct small-sized campus networks
- Understand the basic concepts of SDN and programming automation and master the basics of Python.

Target Audience

Engineers who need to master basic datacom knowledge and capabilities, and have capabilities in small- and medium-sized network planning and design, deployment implementation, and O&M optimization.

Prerequisites

None.

Training Content

1. Data Communication and Network Basics
1.1 Data Communication Network Basics
    Basic Concepts of Data Communication
    Data Transfer Process
    Network Devices and Basic Functions
    Network Type and Topology Type
    Network Engineering
    Network Engineers
1.2 Network Reference Model
    What is Data and Data Transfer
    Common Standard Protocols
    Layered Model Concept
    Application Layer and Related Protocols
    Transport Layer and Related Protocols
    Network Layer and Related Protocols
    Data link Layer and Related Protocols
    Physical Layer and Related Protocols
    Data Transfer, Encapsulation and Decapsulation
1.3 Huawei VRP Basics
    Common Network Devices
    VRP Basics
    CLI Command Views
    Basic Commands and Function Keys of the CLI
2. Constructing an Interconnected IP Network
2.1 Network Layer Protocol and IP Addressing
    Network Layer Protocol
    Concept, Classification, and Special IP Addresses of IPv4
    IP Network and IP Subnet Calculation
    IP Network Address Planning
2.2 IP Routing Basics
    Basic Working Principles of Routers
    Routing Table Concepts
    Routing and Forwarding Features
    Static Route Configuration
2.3 OSPF Basics
    Basic Features of OSPF
    OSPF Application Scenarios

- Working Principle of OSPF
- Basic OSPF configurations

3. Constructing an Ethernet Switching Network

3.1 Ethernet Switching Basics

- Basic Concepts of Ethernet
- Concept of MAC Address
- Working Process and Principles of Layer 2 Switches
- Composition and Formation of a MAC Address Table

3.2 VLAN Principles and Configuration

- Background of VLAN
- Basic Concepts and Principles of VLAN
- VLAN Data Communication Process on a Layer 2 Network
- Basic VLAN Configuration

3.3 Spanning Tree Protocol

- Background of STP
- Basic Concepts and Working Principles of STP
- Basic Concepts of RSTP and Improvements Compared with STP
- Basic STP Configuration
- Other Layer 2 Loop Elimination Technologies

3.4 Ethernet Link Aggregation and Switch Stacking

- Basic Concepts of Link Aggregation
- Working Principles of Manual Link Aggregation
- Working Principles and Features of Link Aggregation in LACP Mode
- Basic Concepts of iStack and CSS

3.5 Implements Communication Between VLANs.

- Working Principles of Sub-interfaces
- Working Mechanism of Layer 3 Switches
- Sub-interface Configuration
- VLANIF Configuration

4. Network Security and Network Access Basics

4.1 ACL Principles and Configuration

- Basic Principles and Functions of ACLs
- Basic Structure and Matching Order of ACL Rules
- Usage of Wildcard mask
- Basic ACL Configuration

4.2 AAA Principles and Configuration

- Basic Principles and Application Scenarios of AAA
- Basic Configuration of the Local AAA

4.3 NAT Basics

Basic NFV Concepts
Huawei NFV Products and Solutions
10.2 Network Programming and Automation
Traditional Network O&M Status Analysis
Implementation of Network Automation
Programming Language
Python Coding Specifications
Implement Basic Automatic O&M Using Python telnetlib.
11. Typical Campus Network Architectures and Practices
11.1 Typical Networking Architecture and Cases
Campus Network Architecture
Campus Network Lifecycle
Campus Network Construction Cases
Campus Network Construction Practice