ﷻTRENDS | **Academy**
Learning | Evolving | Empowering

HCIA-Datacom

Duration: 10 Days

Prerequisites:

- Be familiar with PC operations.
- Basic understanding of IT technologies and network knowledge

Course 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.

Intended Audience:

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

Course Outline:

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
- Background of NAT
- NAT Classification and Technical Principles
- NAT Configuration in Different Scenarios

5.   Network Services and Applications

5.1   Network Services and Applications
- Principles of TFTP, FTP, DHCP, and HTTP
- Configuration of FTP and DHCP

6.   WLAN Basics

6.1   WLAN Overview
- Basic Concepts of WLAN and History of 802.11 Protocol suite
- WLAN devices
- WLAN Networking Mode
- WLAN Working Process
- Basic WLAN Configuration

7.   WAN Basics

7.1   WAN Technology Basics
- Basic WAN Concepts
- Common WAN Technologies
- Working Principles of PPP and PPPoE
- Configuring PPP and PPPoE
- Basic Concepts of MPLS/SR

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8. Network Management and O&M

8.1 Network Management and O&M
- Basic Concepts of the NMS and O&M
- Common NMS and O&M Methods and Tools
- Working Principle of SNMP
- SDN-based NMS and O&M Solution

9. IPv6 Basics

9.1 IPv6 Basics
- Comparison Between IPv6 and IPv4
- Basic Concepts of IPv6
- Format and Principle of the IPv6 Packet Header
- IPv6 Address Format and Address Type
- IPv6 Address Configuration Method and Procedure
- Static and Dynamic IPv6 Address Configuration
- IPv6 Static Route Configuration

10. SDN and Automation Basics

10.1 SDN and NFV Basics
- Basic SDN Concepts
- Huawei SDN Products and Solutions
- 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

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