

Huawei Certified ICT Associate Datacom 2.0

Course Objectives

On completion of this program, the participants will be able to:

- Understanding Data Communication Networks
- Differentiate network devices of different types and understand their basic functions.
- Understand the network reference model and common standard protocols.
- Master the processes of data encapsulation and decapsulation.
- Master the login methods for network devices and basic operations of the command line interface.
- Manage file systems and configuration files.
- Describe basic Ethernet concepts.
- Distinguish MAC address types.
- Describe the process of creating a MAC address entry.
- Describe the working principles of switches.
- Understand the background of VLAN technology.
- Identify the VLAN to which data belongs.
- Master different VLAN assignment methods.
- Describe the forwarding process of VLAN frames on a network.
- Master basic VLAN configurations.
- Describe the causes and problems of Layer 2 loops on a campus switched network.
- Describe the basic concepts and working principles of STP.
- Distinguish STP and RSTP and describe the improvements of RSTP over STP.
- Complete basic STP configurations.
- Describe the functions of link aggregation.
- Describe the types of link aggregation.
- Understand the negotiation process of an Eth-Trunk in LACP mode.
- Describe common application scenarios of link aggregation.
- Describe the main protocols of the network layer.
- Describe the concept and classification of IPv4 addresses and special IP addresses.
- Subnet the network based on service requirements.
- Describe the fundamentals of DHCP.
- Describe the fundamental working principles of routers.
- Explain how routers select optimal routes.
- Identify and interpret the contents of a routing table.
- Describe the process of route forwarding.
- Understand and apply inter-VLAN communication methods.
- Describe the advantages and classification of dynamic routing protocols.
- Explain OSPF fundamental concepts and typical networking scenarios.

- Explain the working principles of OSPF.
- Perform basic OSPF configuration.
- Describe the advantages of IPv6 over IPv4.
- Describe the format of an IPv6 packet header.
- Describe IPv6 address types.
- Describe the functions of ICMPv6.
- Describe the fundamentals of IPv6 address autoconfiguration.
- Describe the fundamentals of ACLs.
- Understand the types and characteristics of ACLs.
- Complete basic ACL configurations.
- Describe the basic concepts of AAA.
- Describe the application scenarios of AAA.
- Complete basic AAA configurations.
- Explain the relationship between transport-layer protocols and application-layer protocols.
- Describe the differences in application scenarios of TCP and UDP.
- Understand the fundamentals of FTP.
- Understand the fundamentals of Telnet.
- Understand the fundamentals and configuration method of SSH.
- Understand the technical background of NAT.
- Understand the classification and implementation of NAT.
- Understand the scenarios in which each type of NAT is applied.
- Describe the composition and development history of DCs.
- Describe the development phases of DCNs.
- Describe the requirements and related network technologies of DCNs in general-purpose computing scenarios.
- Describe the requirements and related network technologies of DCNs in intelligent computing scenarios.
- Describe the definition of WLAN.
- Describe the basic concepts of WLAN.
- Describe the common technical principles of WLAN.
- Describe the differences between 802.11 protocols.
- Describe the development of Wi-Fi generations.
- Describe basic WLAN concepts.
- Describe WLAN networking modes.
- Describe WLAN networking application scenarios.
- Describe the AP onboarding process.
- Describe the STA access process.
- Understand how to configure WLAN services.
- Understand the functions of network management protocols.
- Understand the similarities and differences between the implementation mechanisms and application scenarios of different network management protocols.
- Describe the working principles of SNMP.
- Describe the differences between NETCONF and RESTCONF.
- Understand the challenges faced in traditional network O&M.
- Describe the major categories of programming languages.
- Understand Python coding conventions.
- Use Python paramiko to log in to network devices.

- Describe general methods for network troubleshooting.
- Understand how to troubleshoot common network faults, such as the failure to obtain an IP address, failure to communicate within a VLAN, failure to ping each other, failure for an AP to go online, and failure for a wireless terminal to access the network.
- Grasp the definition of campus networks.
- Understand the typical networking architecture of a campus network.
- Learn the planning and design methods of a small campus network.
- Master the deployment and implementation methods of a small campus network.
- Comprehend the concepts of O&M and optimization of a small campus network.
- Independently set up a campus network.

Audience

- Personnel who want to become datacom engineers
- Personnel who want to obtain HCIA-Datacom certification

Prerequisites

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

Course Outline

- **Data Communication Network Basics**
 - Data Communication Network
 - Data Communication Network Devices
 - Data Communication Process
 - Network Engineering and Network Engineers
- **Network Reference Models**
 - Applications and Data
 - Network Reference Models and Standard Protocols
 - Data Communication Process
- **Network Device Operating Systems**
 - Operating System Overview
 - Logging In to Network Devices
 - Configuring Network Devices
- **Ethernet Switching Basics**
 - Overview of the Ethernet Protocol
 - Overview of Ethernet Frames
 - Working Principles of Ethernet Switches
- **VLAN Fundamentals and Configuration**
 - What Is a VLAN?
 - Basic Concepts of VLANs
 - VLAN Application
 - VLAN Configuration Examples

- **STP Fundamentals and Configuration**
 - Overview of STP
 - Basic Concepts of STP
 - Working Principles of STP
 - Basic STP Configuration
 - Advanced Spanning Tree Protocols
- **Ethernet Link Aggregation**
 - Basic Concepts of Link Aggregation
 - Link Aggregation in Manual Mode
 - Link Aggregation in LACP Mode
 - Link Aggregation Configuration Examples
- **IP Address and Configuration**
 - Network Layer Protocols
 - Introduction to IPv4 Addresses
 - Subnetting
 - ICMP
 - Fundamentals and Configuration of DHCP
- **IP Routing Basics**
 - Overview of IP Routing
 - Direct Routes
 - Static Routes
 - Advanced Routing Features
- **OSPF Fundamentals and Configuration**
 - Overview of OSPF
 - Working Principles of OSPF
 - Typical OSPF Configuration
- **IPv6 Address and Configuration**
 - Overview of IPv6
 - ICMPv6
 - IPv6 Address Autoconfiguration
 - IPv6 Address Configuration Example
- **ACL Fundamentals and Configuration**
 - ACL Overview
 - Fundamentals of ACL
 - ACL Configuration Examples
- **AAA Fundamentals and Configuration**
 - AAA Overview
 - Deploying AAA
 - Configuration Examples for AAA
- **Network Services and Applications**
 - Overview of Network Services
 - FTP for File Transfer
 - Telnet for Remote Login
 - SSH

- **NAT Fundamentals and Configuration**
 - Overview of NAT
 - Source NAT
 - Destination NAT
 - Bidirectional NAT
- **Data Center Network Basics**
 - What Is a DC
 - DC Development and Evolution
 - General-Purpose Computing DCN
 - Intelligent Computing DCN
 - Dual-Track Architecture of DCs
- **WLAN Technology Basics**
 - WLAN Overview
 - Basic WLAN Concepts
 - Key WLAN Technologies
 - Introduction to 802.11 Standards
- **WLAN Networking Architecture**
 - WLAN Networking Overview
 - WLAN Networking Architecture
 - WLAN Networking Application Scenarios
- **WLAN Fundamentals and Configuration**
 - WLAN Fundamentals
 - WLAN Service Configuration Procedure
 - WLAN Service Configuration Examples
- **Network Device Management**
 - Basic Concepts of Network Management
 - SNMP
 - NETCONF
 - RESTCONF
 - Introduction to iMaster NCE
- **Network Programming and Automation**
 - Introduction to Network Programming and Automation
 - Overview of Programming Languages and Introduction to Python
 - Introduction to Paramiko APIs
 - Example for Network Programming Using Paramiko
- **Network Troubleshooting**
 - Overview of Network Troubleshooting
 - Common Network Troubleshooting Cases
- **Typical Campus Networking Solution**
 - Basic Concepts of Campus Networks
 - Practices in Campus Network Projects

Associated Certifications

HCIA-Datacom (Huawei Certified ICT Associate-Datacom)

Course Duration

5 days

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