

Course Outline



Course Name: HCIA – Huawei Certified ICT Associate Datacom V2.0

Course Code : HW-HCIA-DATC

DURATION	LEVEL	TECHNOLOGY	DELIVERY METHOD	TRAINING CREDITS
10 Days	Novice	Datacom	ILT/VILT Theoretic & Hands on Practice	Huawei Voucher

Introduction

HCIA-Datacom V2.0 includes the following content: data communication network basics, Ethernet technology basics, IP technology basics, network security and services, data center network basics, WLAN technology basics, network O&M and troubleshooting, and typical campus networking solutions. Passing the HCIA-Datacom V2.0 certification demonstrates that participants have systematically understood and mastered the foundational knowledge and related technologies required for datacom networks, data center networks, and WLANs. It also validates their ability to deploy, maintain, and troubleshoot small- and medium-sized campus networks. With the HCIA-Datacom V2.0 certification, participants are qualified for roles such as network engineer in the datacom network field.

Audience Profile

- Individuals who want to become data communication engineers.
- Professionals who want to obtain the HCIA-Datacom certification.
- Engineers who need to master basic datacom knowledge and develop capabilities in small- and medium-sized network planning and design, deployment implementation, and O&M optimization.

- IT professionals who want to build foundational data communication engineering skills.

Prerequisites

- Be familiar with PC operations.
- Have a basic understanding of IT technologies and networking concepts.

Course Objectives

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

- Understand data communication networks.
- Differentiate between network device 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 the 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, types, negotiation process, and 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 and explain how routers select optimal routes.
- Identify and interpret the contents of a routing table and 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, typical networking scenarios, working principles, and perform basic OSPF configuration.
- Describe the advantages of IPv6 over IPv4, IPv6 packet headers, IPv6 address types, ICMPv6 functions, and IPv6 address autoconfiguration fundamentals.
- Describe ACL fundamentals, understand ACL types and characteristics, and complete basic ACL configurations.
- Describe AAA concepts and application scenarios, and complete basic AAA configurations.
- Explain the relationship between transport-layer and application-layer protocols, and describe TCP and UDP application scenarios.
- Understand the fundamentals of FTP, Telnet, and SSH, including the SSH configuration method.
- Understand the technical background, classification, implementation, and application scenarios of NAT.
- Describe the composition and development history of data centres and the development phases of data centre networks.
- Describe the requirements and related network technologies of data centre networks in general-purpose and intelligent computing scenarios.
- Describe WLAN definitions, basic concepts, technical principles, 802.11 protocol differences, Wi-Fi generations, networking modes, application scenarios, AP onboarding, STA access, and WLAN service configuration.
- Understand the functions, implementation mechanisms, and application scenarios of network management protocols.
- Describe the working principles of SNMP and the differences between NETCONF and RESTCONF.
- Understand the challenges faced in traditional network O&M, programming language categories, Python coding conventions, and use Python Paramiko to log in to network devices.
- Describe general methods for network troubleshooting and troubleshoot common faults, including IP address acquisition failures, VLAN communication failures, ping failures, AP onboarding failures, and wireless terminal access failures.
- Grasp campus network definitions, typical architecture, planning and design methods, deployment and implementation methods, O&M and optimization concepts, and independently set up a campus network.

Course Content

Data Communication Network Basics

- 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 Technology Basics

- 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 Technology Basics

- 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

Network Security and Services

- 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

- 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 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 O&M and Troubleshooting

- 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

- Typical Campus Networking Solution
 - Basic Concepts of Campus Networks
 - Practices in Campus Network Projects

Associate Certification & Exam

This course prepares delegates to take the HCIA-Datacom associate certification exam H12-811, validating proficiency in the planning, design, deployment, O&M, and optimization of small- and medium-sized campus networks.

You need to pass the following exam to obtain the certificate:

- HCIA-Datacom
- Exam Code: H12-811
- Exam Type: Written examination
- Exam Format: Single-answer questions, multiple-answer questions, true or false, short response items, and drag and drop items.