



1. Exercises, Quizzes, Flashcards & Glossary

Number of Questions

2. Expert Instructor-Led Training

3. ADA Compliant & JAWS Compatible Platform

4. State of the Art Educator Tools

5. Award Winning Learning Platform (LMS)

6. Chapter & Lessons

Syllabus

Chapter 1: Introduction

Chapter 2: IPv4 Addressing—How It Works

Chapter 3: How to Subnet IPv4 Addresses

Chapter 4: Variable Length Subnet Masking (VLSM)

Chapter 5: Route Summarization

Chapter 6: IPv6 Addressing—How It Works

Chapter 7: Cables and Connections

Chapter 8: The Command-Line Interface

Chapter 9: Configuring a Switch

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Chapter 11: VLAN Trunking Protocol and Inter-VLAN Communication

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Videos and How To

## 1. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

## 2. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

### 3. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

### 4. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**
  1. Best Postsecondary Learning Solution
  
- **2015**
  1. Best Education Solution
  2. Best Virtual Learning Solution
  3. Best Student Assessment Solution
  4. Best Postsecondary Learning Solution
  5. Best Career and Workforce Readiness Solution
  6. Best Instructional Solution in Other Curriculum Areas
  7. Best Corporate Learning/Workforce Development Solution
  
- **2016**
  1. Best Virtual Learning Solution
  2. Best Education Cloud-based Solution
  3. Best College and Career Readiness Solution
  4. Best Corporate / Workforce Learning Solution
  5. Best Postsecondary Learning Content Solution

6. Best Postsecondary LMS or Learning Platform
7. Best Learning Relationship Management Solution

- **2017**

1. Best Overall Education Solution
2. Best Student Assessment Solution
3. Best Corporate/Workforce Learning Solution
4. Best Higher Education LMS or Learning Platform

- **2018**

1. Best Higher Education LMS or Learning Platform
2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**

1. Best Virtual Learning Solution
2. Best Content Authoring Development or Curation Solution
3. Best Higher Education Learning Management Solution (LMS)

- **2020**

1. Best College and Career Readiness Solution
2. Best Cross-Curricular Solution
3. Best Virtual Learning Solution

## 5. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

# Syllabus

## Chapter 1: Introduction

- Private Addressing Used in This Course
- Who Should Read This Course
- Optional Sections
- Organization of This Course

## Chapter 2: IPv4 Addressing—How It Works

- What Are IPv4 Addresses Used For?
- What Does an IPv4 Address Look Like?
- Network and Subnetwork Masks
- Ways to Write a Network or Subnet Mask
- Network, Node, and Broadcast Addresses
- Classes of IPv4 Addresses
- Classless Addressing
- Lessons Learned

## Chapter 3: How to Subnet IPv4 Addresses

- Subnetting a Class C Network Using Binary
- Subnetting a Class B Network Using Binary
- Binary ANDing

#### Chapter 4: Variable Length Subnet Masking (VLSM)

- IP Subnet Zero
- VLSM Example

#### Chapter 5: Route Summarization

- Example for Understanding Route Summarization
- Route Summarization and Route Flapping
- Requirements for Route Summarization

#### Chapter 6: IPv6 Addressing—How It Works

- IPv6: A Very Brief Introduction
- What Does an IPv6 Address Look Like?
- Reducing the Notation of an IPv6 Address
- Prefix Length Notation
- IPv6 Address Types

## Chapter 7: Cables and Connections

- Connecting a Rollover Cable to Your Router or Switch
- Using a USB Cable to Connect to Your Router or Switch
- Terminal Settings
- LAN Connections
- Serial Cable Types
- Which Cable to Use?
- ANSI/TIA Cabling Standards

## Chapter 8: The Command-Line Interface

- Shortcuts for Entering Commands
- Using the Tab Key to Complete Commands
- Console Error Messages
- Using the Question Mark for Help
- enable Command
- exit Command
- end Command
- disable Command

- logout Command
- Setup Mode
- Keyboard Help
- History Commands
- terminal Commands
- show Commands
- Using the Pipe Parameter ( | ) with the show or more Commands
- Using the no and default Forms of Commands

## Chapter 9: Configuring a Switch

- Help Commands
- Command Modes
- Verifying Commands
- Resetting Switch Configuration
- Setting Host Names
- Setting Passwords
- Setting IP Addresses and Default Gateways
- Setting Interface Descriptions
- The mdix auto Command

- Setting Duplex Operation
- Setting Operation Speed
- Managing the MAC Address Table
- Configuration Example

## Chapter 10: VLANs

- Creating Static VLANs
- Assigning Ports to VLANs
- Using the range Command
- Configuring a Voice VLAN
- Verifying VLAN Information
- Saving VLAN Configurations
- Erasing VLAN Configurations
- Configuration Example: VLANs

## Chapter 11: VLAN Trunking Protocol and Inter-VLAN Communication

- Dynamic Trunking Protocol (DTP)
- Setting the VLAN Encapsulation Type
- VLAN Trunking Protocol (VTP)

- Verifying VTP
- Inter-VLAN Communication Using an External Router: Router-on-a-Stick
- Inter-VLAN Communication on a Multilayer Switch Through a Switch Virtual Interface
- Inter-VLAN Communication Tips
- Configuration Example: Inter-VLAN Communication

## Chapter 12: Spanning Tree Protocol

- Spanning Tree Protocol Definition
- Enabling Spanning Tree Protocol
- Changing the Spanning-Tree Mode
- Configuring the Root Switch
- Configuring a Secondary Root Switch
- Configuring Port Priority
- Configuring the Path Cost
- Configuring the Switch Priority of a VLAN
- Configuring STP Timers
- Configuring Optional Spanning-Tree Features
- Enabling the Extended System ID

- Verifying STP
- Troubleshooting Spanning Tree Protocol
- Configuration Example: PVST+
- Spanning-Tree Migration Example: PVST+ to Rapid-PVST+

## Chapter 13: EtherChannel

- EtherChannel
- Configuration Example: EtherChannel

## Chapter 14: Cisco Discovery Protocol (CDP) and Link Layer Discovery Protocol (LLDP)

- Cisco Discovery Protocol
- Configuring CDP
- Verifying and Troubleshooting CDP
- CDP Design Tips
- Link Layer Discovery Protocol (802.1AB)
- Configuring LLDP (802.1AB)
- Verifying and Troubleshooting LLDP

## Chapter 15: Configuring a Cisco Router

- Router Modes

- Entering Global Configuration Mode
- Configuring a Router Name
- Configuring Passwords
- Password Encryption
- Interface Names
- Moving Between Interfaces
- Configuring a Serial Interface
- Assigning an IPv4 Address to a Fast Ethernet Interface
- Assigning an IPv4 Address to a Gigabit Ethernet Interface
- Assigning IPv6 Addresses to Interfaces
- Creating a Message-of-the-Day Banner
- Creating a Login Banner
- Mapping a Local Host Name to a Remote IP Address
- The no ip domain-lookup Command
- The logging synchronous Command
- The exec-timeout Command
- Saving Configurations
- Erasing Configurations

- The write Command
- Verifying Your Configurations Using show Commands
- EXEC Commands in Configuration Mode: The do Command
- Configuration Example: Basic Router Configuration

## Chapter 16: Static Routing

- Configuring an IPv4 Static Route
- Static Routes and Recursive Lookups
- The permanent Keyword
- Floating Static Routes in IPv4 and Administrative Distance
- Configuring an IPv4 Default Route
- Verifying IPv4 Static Routes
- Configuration Example: IPv4 Static Routes
- Configuring an IPv6 Static Route
- Floating Static Routes in IPv6
- Configuring an IPv6 Default Route
- Verifying IPv6 Static Routes

## Chapter 17: Open Shortest Path First (OSPF)

- OSPFv2 Versus OSPFv3
- Configuring OSPF
- Using Wildcard Masks with OSPF Areas
- Loopback Interfaces
- Router ID
- DR/BDR Elections
- Timers
- Verifying OSPFv2 Configurations
- Troubleshooting OSPFv2
- Configuration Example: Single-Area OSPF

## Chapter 18: DHCP

- Configuring a DHCP Server on an IOS Router
- Using Cisco IP Phones with a DHCP Server
- Verifying and Troubleshooting DHCP Configuration
- Configuring a DHCP Helper Address
- Configuring a DHCP Client on a Cisco IOS Software Ethernet Interface
- Configuration Example: DHCP

## Chapter 19: Network Address Translation (NAT)

- Private IP Addresses: RFC 1918
- Configuring Dynamic NAT: One Private to One Public Address Translation
- Configuring PAT: Many Private to One Public Address Translation
- Configuring Static NAT: One Private to One Permanent Public Address Translation
- Verifying NAT and PAT Configurations
- Troubleshooting NAT and PAT Configurations
- Configuration Example: PAT

## Chapter 20: Configuring Network Time Protocol (NTP)

- NTP Configuration
- NTP Design
- Securing NTP
- Verifying and Troubleshooting NTP
- Setting the Clock on a Router
- Using Time Stamps
- Configuration Example: NTP

## Chapter 21: Layer Two Security Features

- Setting Passwords on a Switch

- Configuring Static MAC Addresses
- Configuring Switch Port Security
- Configuring Sticky MAC Addresses
- Verifying Switch Port Security
- Recovering Automatically from Error-Disabled Ports
- Verifying Autorecovery of Error-Disabled Ports
- Configuring DHCP Snooping
- Configuring Dynamic ARP Inspection (DAI)
- Configuration Example: Switch Security

## Chapter 22: Managing Traffic Using Access Control Lists (ACLs)

- Access List Numbers
- Using Wildcard Masks
- ACL Keywords
- Creating Standard ACLs
- Applying Standard ACLs to an Interface
- Verifying ACLs
- Removing ACLs

- Creating Extended ACLs
- Applying Extended ACLs to an Interface
- The established Keyword
- The log Keyword
- Creating Named ACLs
- Using Sequence Numbers in Named ACLs
- Removing Specific Lines in Named ACLs Using Sequence Numbers
- Sequence Number Tips
- Including Comments About Entries in ACLs
- Restricting Virtual Terminal Access
- Tips for Configuring ACLs
- IPv6 ACLs
- Verifying IPv6 ACLs
- Configuration Examples: IPv4 ACLs
- Configuration Examples: IPv6 ACLs

## Chapter 23: Device Monitoring and Hardening

- Device Monitoring
- Configuration Backups

- Implementing Logging
- Device Hardening

## Chapter 24: Configuring and Securing a WLAN AP

- Initial Setup of a Wireless LAN Controller (WLC)
- Monitoring the WLC
- Configuring a VLAN (Dynamic) Interface
- Configuring a DHCP Scope
- Configuring a WLAN
- Defining a RADIUS Server
- Exploring Management Options
- Configuring a WLAN Using WPA2 PSK

## Chapter 25: Appendix A: How to Count in Decimal, Binary, and Hexadecimal

- How to Count in Decimal
- How to Count in Binary
- How to Count in Hexadecimal
- Representing Decimal, Binary, and Hexadecimal Numbers

## Chapter 26: Appendix B: How to Convert Between Number Systems

- How to Convert from Decimal to Binary
- How to Convert from Binary to Decimal
- How to Convert from Decimal IP Addresses to Binary and from Binary IP Addresses to Decimal
- How to Convert from Hexadecimal to Binary
- How to Convert from Binary to Hexadecimal
- How to Convert from Decimal to Hexadecimal
- How to Convert from Hexadecimal to Decimal

## Chapter 27: Appendix C: Binary/Hex/Decimal Conversion Chart

You can't stay away! Get

 3187 Independence Drive  
Livermore, CA 94551,  
United States



+1-415-763-6300



support@ucertify.com



www.ucertify.com