Preview: IT4150 : Internetworking Architectures 1

Syllabus

Course Overview

This course helps you develop an understanding of the design and integration of multiprotocol networks to form an internetworking architecture for a Cisco-based network. Topics include:

- Designing Cisco-based physical infrastructures.
- Implementing strategies for expanding networks.
- Deploying security components and services within a Cisco-based design.
- Designing basic Cisco wireless infrastructures.

In this course, you gain the skills needed to configure Cisco equipment as you examine the cost, compatibility, expandability, security, and future requirements associated with designing internetworks.

Technology Resources

This Capella course offers real-world, hands-on labs provided by Practice-Labs.com. These labs offer guided practice in performing tasks related to achieving course competencies and completing assessments. If you require the use of assistive technology or alternative communication methods to participate in these activities, contact Disability Services to request accommodations.

Course Resources
Disability Services

Course Competencies **(Read Only)**

To successfully complete this course, you will be expected to:

1. Plan a strategy for designing and employing a small Cisco-based LAN infrastructure that solves an organizational problem.
2. Configure Cisco-based wireless services, protocols, and devices.

3. Design a small internetworking infrastructure using Cisco technologies.
4. Troubleshoot Cisco-based services, protocols, and security devices.
5. Communicate effectively and professionally.

Course Prerequisites

Prerequisite(s): Completion of or concurrent registration in IT3355 and IT3358.

Syllabus >> Course Materials

Required

The materials listed below are required to complete the learning activities in this course.

Integrated Materials

Many of your required books are available via the VitalSource Bookshelf link in the courseroom, located in your Course Tools. Registered learners in a Resource Kit program can access these materials using the courseroom link on the Friday before the course start date. Some materials are available only in hard-copy format or by using an access code. For these materials, you will receive an email with further instructions for access. Visit the Course Materials page on Campus for more information.

Book

Odom, W. (2016). *CCENT/CCNA ICND1 100-105 official cert guide.* Indianapolis, IN: Cisco Press. ISBN: 9781587205804.

Library

The following required readings are provided in the Capella University Library or linked directly in this course. To find specific readings by journal or book title, use Journal and Book Locator. Refer to the Journal and Book Locator library guide to learn how to use this tool.

- Khan, A. (2006). Project scope management. *Cost Engineering, 48*(6), 12–16.
- Skillsoft. (2018). *ICND2 3.0: Configuring ACLs* [Video].

- Skillsoft. (2018). *ICND2 3.0: Configuring and verifying EIGRP* [Video].
- Skillsoft. (2018). *ICND2 3.0: Configuring and verifying OSPFv3* [Video].
- Skillsoft. (2018). *ICND2 3.0: Configuring multiarea OSPFv2* [Video].
- Skillsoft. (2018). *ICND2 3.0: Configuring OSPFv2* [Video]. null
- Skillsoft. (2018). *ICND2 3.0: Implementing EIGRP* [Video].
- Skillsoft. (2018). *ICND2 3.0: OSPFv2 operations* [Video].
- Skillsoft. (2018). *ICND2 3.0: Routing protocols* [Video].
- Skillsoft. (2018). *ICND2 3.0: Spanning tree configuration and verification* [Video].
- Skillsoft. (2018). *ICND2 3.0: Spanning tree overview*[Video].
- Skillsoft. (2018). *ICND2 3.0: Switch aggregation and threat mitigation* [Video].
- Skillsoft. (2018). *ICND2 3.0: Trunking overview*[Video].
- Skillsoft. (2018). *IINS 3.0: Configuring Cisco IPS* [Video].
- Skillsoft. (2018). *IINS 3.0: IPS deployment configuration* [Video].
- Skillsoft. (2018). *IINS 3.0: IPSec site-to-site VPN* [Video].
- Skillsoft. (2018). *IINS 3.0: Threat mitigation for email, Web, and endpoints* [Video].
- Skillsoft. (2018). *IINS 3.0: Zone-based firewall configuration* [Video].
- Skillsoft. (2019). *DESGN 3.0: Campus Design* [Video].
- Skillsoft. (2019). *DESGN 3.0: Campus design part 2* [Video].
- Skillsoft. (2019). *DESGN 3.0: Enterprise network WAN and Edge* [Video].
- Skillsoft. (2019). *DESGN 3.0: Voice and video design considerations* [Video].
- Skillsoft. (2019). *DESGN 3.0: Wireless LAN design* [Video].
- Skillsoft. (2019). *ICND2 3.0: Configuring trunking* [Video].

Suggested

The following materials are recommended to provide you with a better understanding of the topics in this course. These materials are not required to complete the course, but they are aligned to course activities and assessments and are highly recommended for your use.

Optional

The following optional materials are offered to provide you with a better understanding of the topics in this course. These materials are not required to complete the course.

External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- https://practice-labs.com/Help-support.aspx

Projects

Project >> Final LAN Infrastructure Proposal

Project Overview

The course project takes a problem-based, case-based approach to learning the course material. You will apply the main concepts presented each week to create a component of a plan that meets an organizational need in a business setting. As you work to create a Cisco-based network infrastructure design, you will discuss alternatives for design choices, make design decisions about network components, and implement the selected alternatives in the final design.

If you work in the IT field, you may use your own organization as a setting for your project as long as your completed assignments meet the scoring guide criteria. Communicate with your instructor in Unit 1 for approval.

Scenario

EverGreen Financial specializes in financial products and services. Its local office, with only 20–30 employees, needs a basic Cisco network. Evergreen has hired Geekorologist, Inc., to design a local area network (LAN) infrastructure. Geekorologist is a medium-sized information technology (IT) services company serving a range of clients from small to large, mostly in the private sector. For this project, Geekorologist consultants will work to better understand and implement the necessary project objectives, while interacting with EverGreen employees onsite.

Here is a list of the individuals with a role in this project:

- **Pat Lobos**. Pat, the Geekorologist project manager, is an experienced Cisco networking specialist. Pat gives the project assignments and helps consultants think through commands and certain situations.
- **Edmund**. Edmund is a long-time networking consultant hired by Geekorologist. Edmund is a creative thinker who challenges authority. He prefers his job because of its late hours (which means no traffic and free rein at the local all-night taco stand) and reduced interaction with people. He likes to play devil's advocate and always has an opinion about the work other people are doing. But he can be a bit lazy sometimes and does not prioritize well. Other consultants sometimes have to cover for his unfinished work and blunt handling of interpersonal conflicts.
- **William Bunt.** William is the building manager at the EverGreen site. He is a hawk about maintaining the building's integrity and will look over the shoulders of Geekorologist consultants at all times to make sure the Cisco installation work is not interfering with his building's Internet connection and wiring. William is often overbearing and feels it is his right to walk into and out of the office condos that his customers rent, whenever he pleases.
- **Albert Ross.** Albert is the local EverGreen technical operations manager. This small outpost in the company is Albert's domain. He has some basic networking skills, but Cisco is an entirely new realm for

him. He is protective of his office's network because he knows the value of up-time and employees being able to stay connected to the larger company.

- **Dirk.** An IT engineer, Dirk is a fresh recruit to EverGreen IT. He was hired by Albert when Albert had to find somewhere to spend some of his department budget and needed an extra hand. Dirk is willing to please Albert and work hard, but he often researches things on his own and tries to insert himself when he does not understand the material.
- **Surbhi.** Surbhi, the EverGreen project coordinator, presented the project to Geekorologist. She checks in to make sure things are progressing and tries to corral the EverGreen employees who tend to get in the project's way.

Your Role

You are a consultant for Geekorologist, which hires consultants like you on a short-term basis to fulfill small projects. You are routinely contacted by Geekorologist to complete Cisco networking projects. You have been assigned to the project by Pat, the Geekorologist project manager, to participate in EverGreen's internetwork rollout. You will get EverGreen employees situated with their new equipment and support them until their technical operations manager, Albert, can take over the day-to-day Cisco administration tasks. You will check in and give Pat updates on progress.

Requirements

The project is broken down into unit components. You will receive feedback on each component and use it to update your designs for the final project submission. This feedback will include evaluation of how well you have articulated a design that is clearly and directly tied to business needs and user requirements.

You will complete hand-on labs in each unit, which will help you learn to administer, design, and configure a network. You will gather information from the labs and from the scenarios presented in the unit discussions, which ask you to apply concepts from the course to business scenarios.

Introduction

This unit focuses on the fundamental Cisco devices and concepts of a small LAN. You will explore network devices, review the open systems interconnection (OSI) and transmission control protocol/Internet protocol (TCP/IP) models that you were introduced to in earlier courses, and be introduced to today's communication protocols and architectures.

In the lab this week, you will learn how to configure a Cisco device by exploring the basic command line interface of a Cisco switch.

This week, you will also begin your course project by developing a scope document for your organization. Review the project description in addition to the unit assignment.

Learning Activities

u01s1 - Studies

Readings

Complete the following:

- Odom, W. (2016). *CCENT/CCNA ICND1 100-105 official cert guide.* Indianapolis, IN: Cisco Press.
  - These chapters provide an introduction to networks and network devices, providing the advantages and disadvantages of various strategies. The chapters explore the OSI and TCP/IP models of communication and explain the relationship between these models and Cisco network components and services.
    - Review Chapter 1, "Introduction to TCP/IP Networking," pages 14–37.
    - Review Chapter 2, "Fundamentals of Ethernet LANs," pages 38–59.
    - Read Chapter 3, "Fundamentals of WAN," pages 60–77.
    - Read Chapter 4, "Fundamentals of IPv4 Addressing and Routing," pages 78–101.
- Khan, A. (2006). Project scope management. *Cost Engineering, 48*(6), 12–16.
  - Use this resource to help you plan your course project.

Skillsoft Videos

The following self-paced tutorials are time intensive, but you can use them as a supplement throughout the duration of the course.

- Skillsoft. (2018). *ICND2 3.0: Spanning tree overview*[Video].
  - Running time: 01:34:00.

- Skillsoft. (2018). *ICND2 3.0: Spanning tree configuration and verification* [Video].
  - Running time: 00:53:00.
- Skillsoft. (2019). *DESGN 3.0: Enterprise network WAN and Edge* [Video].
  - Running time: 01:02:00.

Optional – Microsoft Visio

The course project requires you to create a project plan. You can create the project plan using Microsoft Visio or Excel. You can access Visio as follows, if desired.

1. Visit Capella's Microsoft Azure for Education (Formerly Microsoft Imagine) page for instructions on obtaining free Microsoft software.
2. Identify the version of MS Visio that is compatible with your operating system.
3. Download and install.

Optional – Microsoft Tutorials

This course requires you to complete assignments using Microsoft products, including MS Visio. Capella University supplies optional tutorials for these software products. Go to the Microsoft Office Software page to access these resources.

u01s2 - Software Preparation and Technology Access

In this course, you will be using software and technology that is needed to complete designated activities and assignments. There is no additional cost for this software and technology. Some software packages will be made available to you at no additional cost through Capella's subscription with Microsoft, while other software packages are available for free download through open-source licensing.

Capella University requires learners to meet certain minimum computer requirements. Please note that some software required for a course may exceed these minimum requirements. Check the requirements for the software you may need to download and install to make sure it will work on your device. Most software will require a Windows PC. If you use a Mac, refer to Installing a Windows Virtual Environment.

The software and technologies below are strongly recommended to support you in completing the course objectives. If you have access to other tools that you believe may still meet the requirements of this course, please discuss your selected alternatives with your instructor.

If you use assistive technology or any alternative communication methods to access course content, please contact Disability Services with any access-related questions or to request accommodations.

For this course, follow the instructions provided through the links below to download and install software or register for an account, as required.

Practice Labs

This Capella course offers real-world, hands-on labs provided by Practice Labs in many of the units of this course. Click the Practice Labs Orientation link in this unit to access an introductory lab.

u01v1 - Practice Labs Orientation: Module Zero – Basics

This lab is designed to familiarize you with the Practice Labs platform. This is a great time to ensure that you can access the labs without any technical difficulty.

Click the linked title heading above to access the hands-on lab.

Course Resources
Practice Labs Orientation: Module Zero – Basics

u01s3 - Course Preparation

Bloom's Taxonomy – Enhance Your Critical Thinking Skills

Critical thinking is an important skill to cultivate for both your coursework and professional development. Many learners do not initially realize that there are different ways of thinking and levels of depth in understanding. Bloom's taxonomy provides a structure to help conceptualize these different levels. Awareness of different ways to approach information helps you move beyond basic understanding to more effectively analyze, evaluate, and synthesize important concepts. It also helps you to clarify expectations and provide an appropriate level of response for your coursework. Review this Bloom's Taxonomy presentation to see how the levels are defined and to explore how this can help in your academic and professional work.

Capella University Library

Being able to identify, analyze, and synthesize information is a critical skill. Many resources are readily available online, but it is important to use appropriate and high quality information to support academic and professional activities. This process includes not only locating information but also ensuring that the information is sound, appropriate, and worthy of academic use. Welcome to Library Guides provides guidance for accessing and using the rich resources available in the Capella University Library and beyond.

Here are a few Capella University Library resources:

- Tour the Library.
- Get Critical Search Skills.
- How Do I Find Peer-Reviewed Articles?

The Writing Center

Visit The Writing Center for a variety of tools to help you improve your written communication and presentation skills. You may also send papers to the Smarthinking Tutoring service, to receive feedback and revision suggestions prior to submitting assignments.

Here are a few Writing Center resources:

- APA Style and Format.
- University Policy 3.01.01: Academic Integrity and Honesty [PDF].

Campus Resources

The following resources for learners are commonly used in Capella courses:

- Academic Skills.
- Career Center.
- Research & Scholarship.

u01a1 - LAN Infrastructure Deployment Scope

Preparation

Complete the hands-on lab activities for this week. You will submit a lab report for the following labs with your assignment:

- Configure and Verify Switching Concepts.
- Interface Configuration and Cabling.
- Compare Static and Dynamic Routing.

- Configure and Verify RIPv2 for IPv4.
- Configure and Verify DHCP and DNS.

Research the LAN infrastructure deployment scope and strategies to find at least three references from articles, books, or websites to support your paper.

Instructions

Before beginning an IT project, you must have a solid understanding of the organization and the project needs. After gathering this information, develop an initial scope document and proposal for deploying a Cisco infrastructure that meets the following criteria:

- Submit fully completed lab reports that document the specified configuration of Cisco devices.
- Describe a project organization's size, location, organizational user, and network.
    - Describe your organization in detail. Include information relative to its size, location, and other background.
    - Review the existing network infrastructure.
- Identify the main business problems and requirements, including information relative to the organizational user, organizational systems, and network requirements.
    - Discuss any and all improvements you believe are appropriate to improve the cost and efficiency of managing the network.
- Describe considerations for architecture, topology, device selection and placement, and protocols based on business needs and user requirements.
- Identify the key decision makers and stakeholders and those individuals included in the requirements analysis of project related to the deployment of a virtual infrastructure.
- Analyze the risks and benefits of deploying a Cisco-based LAN infrastructure.

Submission Requirements

- **Deliverables:** Submit a printed lab report for each completed lab and a Word document for the assignment.
- **Writing:** Write with few spelling, grammatical, or mechanical errors.
- **Number of sources:** Include three references from articles, books, or websites.
- **Reference format:** Follow APA style and formatting guidelines for resources and citations.

Course Resources

APA Style and Format

u01d1 - Network Models in Real Scenarios

Anthony is an intern for JAXRUN Consulting, an enterprise network-support consulting firm based in Pittsburgh, Pennsylvania. He is currently enrolled in a Cisco Enterprise Network Engineering course at Capella University. During the first week of class, he learns about the OSI and TCP/IP network communication models. Being the passionate student that he is, Anthony wants to find out exactly how to apply these models in the real world. The next day at work, he pulls aside a few of the Cisco consultants and asks them how they use the OSI and TCP/IP models in completing their day-to-day tasks.

Assume that you are a Cisco support consultant for JAXRUN. Answer the following questions:

- How important is understanding the OSI and TCP/IP models for a Cisco network engineer?
- How does a Cisco network engineer use the OSI and TCP/IP models in real-world tasks?

Response Guidelines

Respond to at least two other learners' posts. Do you agree with their points or have anything to add?

Course Resources
Undergraduate Discussion Participation Scoring Guide

u01v2 - Hands-On Lab: Configure and Verify Switching Concepts

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u01v3 - Hands-On Lab: Interface Configuration and Cabling

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
https://practice-labs.com/Help-support.aspx

u01v4 - Hands-On Lab: Compare Static and Dynamic Routing

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u01v5 - Hands-On Lab: Configure and Verify RIPv2 for IPv4

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u01v6 - Hands-On Lab: Configure and Verify DHCP and DNS

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Unit 2 >> Cisco Device Configuration and Placement

Introduction

Last week, you learned about all of the major internetworking technologies, systems, skills, and tools in use in modern network-based computer networks. The reading also provided a clear description of today's LAN communications, protocols, and architectures. This week, you will apply this knowledge by creating a physical design of a LAN infrastructure.

In the reading for this week, you will learn how to use and work with Cisco catalyst switches and Cisco routers connected in LAN environments—those found in small and medium network sites. This unit and the labs will also further enhance your understanding of network architectures, giving you the basic knowledge to select, connect, configure, verify, and troubleshoot various Cisco networking devices.

Learning Activities

u02s1 - Studies

Readings

Complete the following:

- Odom, W. (2016). *CCENT/CCNA ICND1 100-105 official cert guide.* Indianapolis, IN: Cisco Press.
    - These chapters provide an introduction to starting up and configuring Cisco-based switches and routers. The chapters explore initial setup parameters for main Cisco devices.
        - Review Chapter 6, "Using the Command-Line Interface," pages 126–145
        - Review Chapter 8, "Configuring Basic Switch Management," pages 166–189.
        - Read Chapter 9, "Configuring Switch Interfaces," pages 190–211.
        - Read Chapter 12, "Troubleshooting Ethernet LANs," pages 270–298.

Skillsoft Self-Paced Tutorials

The following self-paced tutorials are time intensive, but they can be used as a supplement throughout the duration of the course.

- Skillsoft. (2019). *DESGN 3.0: Wireless LAN design* [Video].
  - Running time: 01:20.
- Skillsoft. (2019). *DESGN 3.0: Voice and video design considerations* [Video].
  - Running time: 00:54.
- Skillsoft. (2018). *ICND2 3.0: Switch aggregation and threat mitigation* [Video].
  - Running time: 01:02.
- Skillsoft. (2018). *ICND2 3.0: Routing protocols* [Video].
  - Running time: 01:42.

u02a1 - Wireless Infrastructure Design Plan

Preparation

Complete the following hands-on labs in this unit. You will submit the lab reports with your assignment.

- Configuring and Verifying VLANs.
- Configure, Verify, and Troubleshoot Inter-VLAN Routing.
- Device Maintenance Procedures.

Research wireless infrastructure design and include at least three references from articles, books, or websites to support your paper.

Prepare to use Visio or other software of your choice to complete a diagram that describes your physical topology.

Instructions

Based on the overall project scope you developed in the previous unit, you will start building the technical portion of your project. In this unit, you will provide a design for a physical wireless Cisco-based LAN infrastructure, which includes a diagram and a paper.

- Submit fully completed lab reports that document the specified configuration of wireless devices.
- Design a physical wireless that is appropriate for a chosen organization.
  - Correlate your discussion and design with the organization description you provided last week.
  - Create a diagram that displays a site plan from a physical design perspective. Include design components relative to topology, device selection, and placement choices.

- Analyze a physical infrastructure for a LAN infrastructure design, providing appropriate rationale for the chosen topology and device placement.
- Describe the router frame transmission and flow of a wireless infrastructure.
- Design a wireless network segmentation and switching strategy to support a secure infrastructure.
    - Include benefits and risks of these strategies.
- Identify the components in each layer of the Cisco Three-Layer Hierarchical Model.
- Describe wireless device and infrastructure configuration activities that contributed to finding a solution for a physical wireless LAN infrastructure.
- Describe device configuration troubleshooting activities
    - Explain the role that these activities played in developing a wireless infrastructure design plan.

Submission Requirements

- **Deliverables:** Submit a printed lab report for each lab and a Word document for the assignment.
- **Writing:** Use communication style and vocabulary appropriate for the target audience.
- **Number of Sources:** Include three references from articles, books, or websites.
- **Reference Format:** Follow APA style and formatting guidelines for resources and citations.

Course Resources

APA Style and Format

u02d1 - Router Client Connectivity

Maz, a technician for Fantasy Games, has been asked to configure a router for a client. With the help of the network administrator, Maz connects the router to the client's network. Unfortunately, it is not working. Fantasy Games calls you in to consult on the matter. What troubleshooting steps would you recommend Maz take in order to find the solution to this problem?

Response Guidelines

Read the posts and respond to at least two peers. Consider your answers to the questions above and compare them to your peers' answers.

- Were they similar? How so?
- What other steps did your peers identify for troubleshooting this issue? Do you agree?

Course Resources

Undergraduate Discussion Participation Scoring Guide

u02v1 - Hands-On Lab: Configuring and Verifying VLANs

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u02v2 - Hands-On Lab: Configure, Verify, and Troubleshoot Inter-VLAN Routing

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u02v3 - Hands-On Lab: Device Maintenance Procedures

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Unit 3 >> Complex Networks Device Configuration

Introduction

This unit will introduce you to the use of advanced routing strategies in implementing scalability for Cisco routers connected to LANs and wide area networks (WANs). You get an overview of what protocols network administrators and network engineers of medium-to-large network sites implement in their networks.

One of the main goals of this unit is to give you an idea of how to dramatically increase the number of routers and sites using these techniques and various network protocols, instead of redesigning the network when additional sites or wiring configurations are added.

Learning Activities

u03s1 - Studies

Readings

Complete the following:

- Odom, W. (2016). *CCENT/CCNA ICND1 100-105 official cert guide.* Indianapolis, IN: Cisco Press.
  - These chapters cover advanced device configuration topics, including DNS configuration, IP addressing schemes, RIP, IGRP, and EIGRP.
    - Review Chapter 11, "Implementing Ethernet Virtual LANs," pages 242–269.
    - Review Chapter 17, "Operating Cisco Routers," pages 384–401.
    - Read Chapter 20, "DHCP and IP Networking on Hosts" pages 470–497.
    - Read Chapter 24, "Troubleshooting IPv4 Routing" pages 564–585.

Skillsoft Self-Paced Tutorials

The following tutorials are time-intensive, but can be used as a supplement throughout the duration of the course.

- Skillsoft. (2018). *ICND2 3.0: Configuring ACLs* [Video].
  - Running time: 01:42:00.
- Skillsoft. (2018). *IINS 3.0: IPS deployment configuration* [Video].
  - Running time: 01:08:00.
- Skillsoft. (2018). *IINS 3.0: Configuring Cisco IPS* [Video].
  - Running time: 00:55:00.
- Skillsoft. (2018). *IINS 3.0: Threat mitigation for email, Web, and endpoints* [Video].
  - Running time: 01:16:00.

- Skillsoft. (2018). *IINS 3.0: IPSec site-to-site VPN* [Video].
  - Running time: 01:01:00.
- Skillsoft. (2018). *IINS 3.0: Zone-based firewall configuration* [Video].
  - Running time: 00:45:00.
- Skillsoft. (2019). *DESGN 3.0: Campus design* [Video].
  - Running time: 00:59:00.
- Skillsoft. (2019). *DESGN 3.0: Campus design part 2* [Video].
  - Running time: 00:59:00.

u03a1 - WAN Network Deployment Plan

Preparation

Complete the hands-on lab activities for this week. You will submit a lab report for each of the following labs with your assignment:

- Configure, Verify, and Troubleshoot Interswitch Connectivity.
- Configuring and Verifying NTP Operation.
- Configure and Verify Device Management.

Research WAN network deployment to find at least three references from articles, books, or websites to support your paper.

Instructions

The main goal for this assignment is to define your strategy for expanding upon your existing LAN design, creating a workable WAN network for your organization. Your WAN network deployment plan should involve at least two separate locations. Include a discussion of the strategies and techniques you would apply in expanding upon your existing LAN, along with a network diagram of your newly proposed WAN network. Assume the facility is up and running with everything you need to install and configure the network devices.

Your completed assignment should meet the following criteria:

- Submit fully completed lab reports that document the specified configuration of WAN devices.
- Design a WAN topology that is appropriate for a specific organization.
  - Continue to use the organization you selected at the beginning of the course.
- Compare and contrast nonroutable, routed, and routable protocols, describing the role that each would play in the expansion of a LAN network.
- Create a WAN diagram that displays an appropriate WAN routing strategy for two distant LAN locations.

- Analyze a physical WAN design, providing a rationale for the chosen topology and device placement.
- Design a DHCP strategy to support a LAN/WAN network infrastructure.
- Describe device configuration activities, defining the specific role of these activities in finding a solution for designing a WAN deployment.
- Describe device configuration troubleshooting activities, outlining the role of these activities in finding a solution for designing a WAN deployment.

Submission Requirements

- **Deliverables:** Submit a printed lab report for each completed lab and a Word document for the assignment.
- **Writing:** Integrate multiple sources in support of analysis and recommendations.
- **Number of Sources:** Include three references from articles, books, or websites.
- **Reference Format:** Follow APA style and formatting guidelines for resources and citations.

Course Resources

APA Style and Format

u03d1 - Network Connectivity

Fantasy Games has an issue with network connectivity on one of their Cisco routers. They cannot ping other devices connected to the same network or servers within the same subnet. Fantasy Games uses DHCP for IP addressing for clients and static IPs for routers, switches, and servers.

Before this issue, they were unable to use www.fg.com to access the Web server. The router that hosts all these devices is using the open shortest path first (OSPF) protocol, configured using virtual local area networks (VLANs). The business has asked you to figure out the problem and to present a solution. Prepare an explanation as you would for someone who is not familiar with technical terms:

- List the issues identified in the scenario.

Your response must include:

- What the network connectivity problem is.
- How the OSPF protocol is affecting the issue.
- Recommendation for replacing OSPF, if you think it is the main cause of the issue. If not, what might be the main cause?
- How the protocols work to access a Web page.

Use at least one reference to prepare your explanation and solution. All references must be in APA format. Post your initial response to this discussion.

Response Guidelines

Read the posts and respond to a peer. Reviewing their recommendation, complete the following:

- Consider the clarity and correctness of the proposed solution.
- Identify any concerns in the proposal to correct the issues. Explain.
- Describe your suggestion to overcome those concerns.
- Briefly compare your solution to your peer's solution. What are the similarities and differences in the solutions?
- Explain how the differences would affect the end results.

Course Resources
Undergraduate Discussion Participation Scoring Guide
APA Style and Format

u03v1 - Hands-On Lab: Configure, Verify, and Troubleshoot Interswitch Connectivity

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Configure, Verify, and Troubleshoot Interswitch Connectivity

u03v2 - Hands-On Lab: Configuring and Verifying NTP Operation

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Configuring and Verifying NTP Operation

u03v3 - Hands-On Lab: Configure and Verify Device Management

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Configure and Verify Device Management

Unit 4 >> Securing a Cisco LAN

Introduction

This unit's topic, securing your Cisco networks, is a must-have in the area of internetworking. Network administrators and network engineer consultants require a lot of knowledge to master the topic.

This unit will also introduce you to the router configuration applications in Cisco IOS software, which allow users to secure Cisco IOS router networks. By the end of this unit, you will understand how to secure your networks using Cisco routers, switches, IP addresses, and policies. Topics such as Cisco PIX firewalls, VLANs, and Cisco access control lists will also be covered.

Learning Activities

u04s1 - Studies

Readings

Complete the following:

- Odom, W. (2016). *CCENT/CCNA ICND1 100-105 official cert guide.* Indianapolis, IN: Cisco Press.
  - These chapters offer information about security management techniques for a Cisco environment. Readers will learn to use firewalls, VLANs, access lists, and policy to increase the availability, confidentiality, and security of a Cisco-based network infrastructure.
    - Review Chapter 21, "Subnet Design," pages 504–527.
    - Review Chapter 26, "Advanced IPv4 Access Control List," pages 614–641.
    - Read Chapter 34, "Device Security Features," pages 802–819.

Skillsoft Self-Paced Tutorials

The following tutorials are time intensive, but you can use them as a supplement throughout the duration of the course.

- Skillsoft. (2018). *ICND2 3.0: Implementing EIGRP* [Video].
  - Running time: 01:23:00.
- Skillsoft. (2018). *ICND2 3.0: Configuring and verifying EIGRP* [Video].
  - Running time: 01:28:00.
- Skillsoft. (2018). *ICND2 3.0: OSPFv2 operations* [Video].
  - Running time: 01:02:00.
- Skillsoft. (2018). *ICND2 3.0: Configuring OSPFv2* [Video].
  - Running time: 00:54:00.
- Skillsoft. (2018). *ICND2 3.0: Configuring multiarea OSPFv2* [Video].
  - Running time: 01:38:00.
- Skillsoft. (2018). *ICND2 3.0: Configuring and verifying OSPFv3* [Video].
  - Running time: 00:58:00.

u04a1 - Security Deployment Plan

Preparation

Complete the hands-on lab activities for this week. You will submit a lab report for the following labs with your assignment:

- Configure, Verify, and Troubleshoot Port Security.
- Configure and Verify Standard Access Lists.

Research security for Cisco-based LAN infrastructure to find at least three references from articles, books, or websites to support your paper.

Instructions

You have developed the project scope in Unit 1, built the overall physical Wireless plan in Unit 2, and shared your overall WAN network design in Unit 3. In this unit, you will design a secure infrastructure for your entire Cisco-based LAN infrastructure. Assume that the facility is up and running with everything you need to install and configure the network devices. Provide a written description and a diagram that describes your security strategies and topology.

Your completed plan should meet the following criteria:

- Submit fully completed lab reports that document the specified configuration of security devices.
- Design a security deployment infrastructure plan for a chosen organization.
    - Make it clear that your design correlates with the organization description.
- Create a security infrastructure diagram that displays topology and hardware selections.
    - Include changes relative to topology, VLAN segmentation, hardware selection, and hardware placement choices.
- Analyze the security infrastructure design, providing a rationale for the chosen topology and device placement.
- Design an IP addressing scheme, access list, and subnet to support a secure infrastructure
- Describe device configuration activities, defining the role of these activities in finding a solution for designing a security deployment.
- Describe device configuration troubleshooting activities, defining the role of these activities in finding a solution for designing a security deployment.

Submission Requirements

- **Deliverables:** Submit a printed lab report for each completed lab and a Word document for the assignment.
- **Writing:** Write with few spelling, grammatical, or mechanical errors.
- **Number of Sources:** Include three references from articles, books, or websites.
- **Reference Format:** Follow APA style and formatting guidelines for resources and citations.

Course Resources

APA Style and Format

u04d1 - Security Policy

Imagine you are part of a team that will develop and implement security policies and procedures for the Cisco routers and switches within the business. How will this be done? Include the following in your response:

- The access to those devices must be limited to only specific network administrators.
- Include policies and procedures that should be in place to handle accounts for temporary employees. This includes using generic accounts.

Use at least one reference to support your answers.

Response Guidelines

Read the posts and respond to at least two peers. Consider your answer to the question above and compare to your peers' answers.

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u04v1 - Hands-On Lab: Configure, Verify, and Troubleshoot Port Security

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Configure, Verify, and Troubleshoot Port Security

u04v2 - Hands-On Lab: Configure and Verify Standard Access Lists

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Configure and Verify Standard Access Lists

Unit 5 >> Cisco Wireless LAN

Introduction

This week, you will be introduced to Cisco wireless infrastructures and technologies. As part of your lab experience in this unit, you will configure a wireless controller and learn about the different wireless components that make up a wireless infrastructure.

You will also finalize your project this week by revising and compiling all previous documents into one final project proposal.

Learning Activities

u05s1 - Studies

Readings

Complete the following:

- Odom, W. (2016). *CCENT/CCNA ICND1 100-105 official cert guide.* Indianapolis, IN: Cisco Press.
    - This chapter provides an introduction to networks and network devices, providing the advantages and disadvantages of various infrastructure strategies.
        - Review Chapter 10, "Analyzing Ethernet LAN Designs," pages 218–241.

- Review Chapter 30, "Implementing IPv6 Addressing on Routers," pages 704–727.
- Review Chapter 33, "Device Management Protocols," pages 778–801.

Skillsoft Self-Paced Tutorials

The following tutorial is time intensive, but you can use it as a supplement throughout the duration of the course.

- Skillsoft. (2018). *ICND2 3.0: Trunking overview* [Video].
  - Running time: 01:06:00.
- Skillsoft. (2019). *ICND2 3.0: Configuring trunking* [Video].
  - Running time: 00:56:00.

u05a1 - Final LAN Infrastructure Proposal

Preparation

Complete the hands-on lab activities for this week. You will submit a lab report for the following labs with your assignment:

- Configure and Verify NAT.
- Cisco IOS Troubleshooting Tools.

Instructions

The final project submission combines revised versions of the previous assignments into one final Cisco-based LAN proposal and adds a wireless infrastructure deployment plan. Incorporate instructor feedback and the lab reports completed in this unit. Remove all conceptual definitions from previous assignments to assure that the final document reflects a professional proposal.

Your assignment should meet the following criteria:

- Submit fully completed lab reports that document the specified configuration of Cisco infrastructure devices.
- Create a project scope document that details business requirements, IT goals, and project parameters for the given scenario.
- Create a physical design that represents business needs. using design diagrams and a detailed written analysis.
- Evaluate the expansion needs of a LAN, using design diagrams and written analysis.
- Design a security strategy that is represented using design diagrams.
- Design a wireless strategy that is represented using design diagrams and a written analysis.

Submission Requirements

- **Deliverables:** Submit a printed lab report for each completed lab and a Word document for the assignment.
- **Writing:** Use writing style and vocabulary appropriate for the audience.
- **Number of Sources:** Include three references from articles, books, or websites.
- **Reference Format:** Follow APA style and formatting guidelines for resources and citations.

Course Resources

APA Style and Format

u05d1 - Reflection

Discuss your experience in this course.

- What you have learned in this course?
- How might the information benefit you in the future?
- How would you rate your experience using the virtual resource portal practice labs and practice exams offered in this course?

Response Guidelines

Read the posts and respond to at least two peers. Consider your answers to the questions above and compare them to your peers' answers.

Course Resources

Undergraduate Discussion Participation Scoring Guide

u05v1 - Hands-On Lab: Configure and Verify NAT

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Configure and Verify NAT

u05v2 - Hands-On Lab: Cisco IOS Troubleshooting Tools

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

Course Resources
Cisco IOS Troubleshooting Tools