Solutions Manual for Scaling Networks 1st Edition by Lab Manual
Full Download: https://downloadlink.org/p/solutions-manual-for-scaling-networks-1st-edition-by-lab-manual/

Scaling Networks Lab Manual

Instructor's Answer Key

Cisco Networking Academy

Cisco Press
800 East 96th Street
Indianapolis, Indiana 46240

Full download all chapters instantly please go to Solutions Manual, Test Bank site: TestBankLive.com

Scaling Networks Lab Manual
Instructor's Answer Key
Cisco Networking Academy

Copyright © 2014 Cisco Systems, Inc.

Published by:
Cisco Press
800 East 96th Street
Indianapolis, IN 46240 USA

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from the publisher, except for the inclusion of brief quotations in a review.

Printed in the United States of America

First Printing December 2013

ISBN-13: 9780133476347

ISBN-10: 0133476340

Warning and Disclaimer

This book is designed to provide information about Scaling Networks. Every effort has been made to make this book as complete and as accurate as possible, but no warranty or fitness is implied.

The information is provided on an "as is" basis. The authors, Cisco Press, and Cisco Systems, Inc. shall have neither liability nor responsibility to any person or entity with respect to any loss or damages arising from the information contained in this book or from the use of the discs or programs that may accompany it.

The opinions expressed in this book belong to the author and are not necessarily those of Cisco Systems, Inc.

Trademark Acknowledgments

All terms mentioned in this book that are known to be trademarks or service marks have been appropriately capitalized. Cisco Press or Cisco Systems, Inc., cannot attest to the accuracy of this information. Use of a term in this book should not be regarded as affecting the validity of any trademark or service mark.

This book is part of the Cisco Networking Academy® series from Cisco Press. The products in this series support and complement the Cisco Networking Academy curriculum. If you are using this book outside the Networking Academy, then you are not preparing with a Cisco trained and authorized Networking Academy provider.

For more information on the Cisco Networking Academy or to locate a Networking Academy, please visit www.cisco.com/edu.

Feedback Information

At Cisco Press, our goal is to create in-depth technical books of the highest quality and value. Each book is crafted with care and precision, undergoing rigorous development that involves the unique expertise of members from the professional technical community.

Readers' feedback is a natural continuation of this process. If you have any comments regarding how we could improve the quality of this book, or otherwise alter it to better suit your needs, you can contact us through email at feedback@ciscopress.com. Please make sure to include the book title and ISBN in your message.

We greatly appreciate your assistance.

Publisher	**Paul Boger**
Associate Publisher	**Dave Dusthimer**
Business Operations Manager, Cisco Press	**Jan Cornelssen**
Executive Editor	**Mary Beth Ray**
Managing Editor	**Sandra Schroeder**
Project Editor	**Seth Kerney**
Editorial Assistant	**Vanessa Evans**
Cover Designer	**Mark Shirar**
Compositor	**TnT Design, Inc.**

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCDE, CCENT, Cisco Eos, Cisco HealthPresence, the Cisco logo, Cisco Lumin, Cisco Nexus, Cisco StadiumVision, Cisco TelePresence, Cisco WebEx, DCE, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn and Cisco Store are service marks; and Access Registrar, Aironet, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, iQuick Study, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0812R)

Contents

Chapter 1 — Introduction to Scaling Networks 1
1.0.1.2 Class Activity – Network by Design 1
1.2.1.8 Lab – Selecting Switching Hardware 4
1.3.1.1 Class Activity – Layered Network Design Simulation 9
Chapter 2 — LAN Redundancy 14
2.0.1.2 Class Activity – Stormy Traffic 14
2.1.2.10 Lab – Building a Switched Network with Redundant Links 16
2.3.2.3 Lab – Configuring Rapid PVST+, PortFast, and BPDU Guard 37
2.4.3.4 Lab – Configuring HSRP and GLBP 69
2.5.1.1 Class Activity– Documentation Tree 91
Chapter 3 — Link Aggregation 96
3.0.1.2 Class Activity – Imagine This 96
3.2.1.4 Lab – Configuring EtherChannel 98
3.2.2.4 Lab – Troubleshooting EtherChannel 125
3.3.1.1 Class Activity – Linking Up 155
Chapter 4 — Wireless LANs 157
4.0.1.2 Class Activity – Make Mine Wireless 157
4.1.2.10 Lab – Investigating Wireless Implementations 159
4.4.2.3 Lab – Configuring a Wireless Router and Client 162
4.5.1.1 Class Activity – Inside and Outside Control 178
Chapter 5 — Adjust and Troublshoot Single-Area OSPF 182
5.0.1.2 Class Activity – DR and BDR Elections 182
5.1.1.9 Lab - Configuring Basic Single-Area OSPFv2 184
5.1.2.13 Lab - Configuring OSPFv2 on a Multiaccess Network 216
5.1.5.8 Lab - Configuring OSFPv2 Advanced Features 231
5.2.3.3 Lab – Troubleshooting Basic Single-Area OSPFv2 and OSPFv3 258
5.2.3.4 Lab – Troubleshooting Advanced Single-Area OSPFv2 293
5.3.1.1 Class Activity – OSPF Troubleshooting Mastery 309

Chapter 6 — Multiarea OSPF 312
6.0.1.2 Class Activity – Leaving on a Jet Plane 312
6.2.3.8 Lab - Configuring Multiarea OSPFv2 315
6.2.3.9 Lab - Configuring Multiarea OSPFv3 341
6.2.3.10 Lab – Troubleshooting Multiarea OSPFv2 and OSPFv3 362
6.3.1.1 Class Activity – Digital Trolleys 395
Chapter 7 — EIGRP 401
7.0.1.2 Class Activity – Classless EIGRP 401
7.2.2.5 Lab – Configuring Basic EIGRP for IPv4 403
7.4.3.5 Lab – Configuring Basic EIGRP for IPv6 421
7.5.1.1 Class Activity – Portfolio RIP and EIGRP 440
Chapter 8 — EIGRP Advanced Configurations and Troubleshooting 444
8.0.1.2 Class Activity – EIGRP – Back to the Future 444
8.1.5.5 Lab – Configuring Advanced EIGRP for IPv4 Features 446
8.2.3.6 Lab – Troubleshooting Basic EIGRP for IPv4 and IPv6 470
8.2.3.7 Lab – Troubleshooting Advanced EIGRP 501
8.3.1.1 Class Activity – Tweaking EIGRP 521
Chapter 9 — IOS Images and Licensing 527
9.0.1.2 Class Activity – IOS Detection 527
9.3.1.1 Class Activity – Powerful Protocols 530
9.3.1.2 – EIGRP Capstone Project 537
9.3.1.3 – OSPF Capstone Project 556

About This Lab Manual

Scaling Networks Lab Manual contains all the labs and class activities from the Cisco Networking Academy course of the same name. It is meant to be used within this program of study.

More Practice

If you would like more practice activities, combine your Lab Manual with the new *CCNA Routing and Switching Practice and Study Guide* ISBN: 9781587133442

Other Related Titles

CCNA Routing and Switching Portable Command Guide ISBN: 9781587204302 (or eBook ISBN: 9780133381368)

Scaling Networks Companion Guide ISBN: 9781587133282 (or eBook ISBN: 9780133476408)

Scaling Networks Course Booklet ISBN: 9781587133244

Command Syntax Conventions

The conventions used to present command syntax in this book are the same conventions used in the IOS Command Reference. The Command Reference describes these conventions as follows:

- **Boldface** indicates commands and keywords that are entered literally as shown. In actual configuration examples and output (not general command syntax), boldface indicates commands that are manually input by the user (such as a **show** command).
- *Italic* indicates arguments for which you supply actual values.
- Vertical bars (|) separate alternative, mutually exclusive elements.
- Square brackets ([ ]) indicate an optional element.
- Braces ({ }) indicate a required choice.
- Braces within brackets ([{ }]) indicate a required choice within an optional element.

Chapter 1 — Introduction to Scaling Networks

1.0.1.2 Class Activity – Network by Design (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objective

Explain the need to design a hierarchical network that is scalable.

Instructor Note: This activity can be completed by individuals or groups of two students. It can then be shared with another individual, group, class, or the instructor.

Scenario

Your employer is opening a new, branch office.

You have been reassigned to the site as the network administrator where your job will be to design and maintain the new branch network.

The network administrators at the other branches used the Cisco three-layer hierarchical model when designing their networks. You decide to use the same approach.

To get an idea of what using the hierarchical model can do to enhance the design process, you research the topic.

Resources

- World Wide Web access
- Word processing software

Directions

Step 1: Use the Internet to find information and take notes about the Cisco three-layer hierarchical model. The site should include information about the:

a. Access layer

b. Distribution layer

c. Core layer

Step 2: In your research, make sure to include:

a. A simple definition of each hierarchical layer

b. Three concise facts about each layer

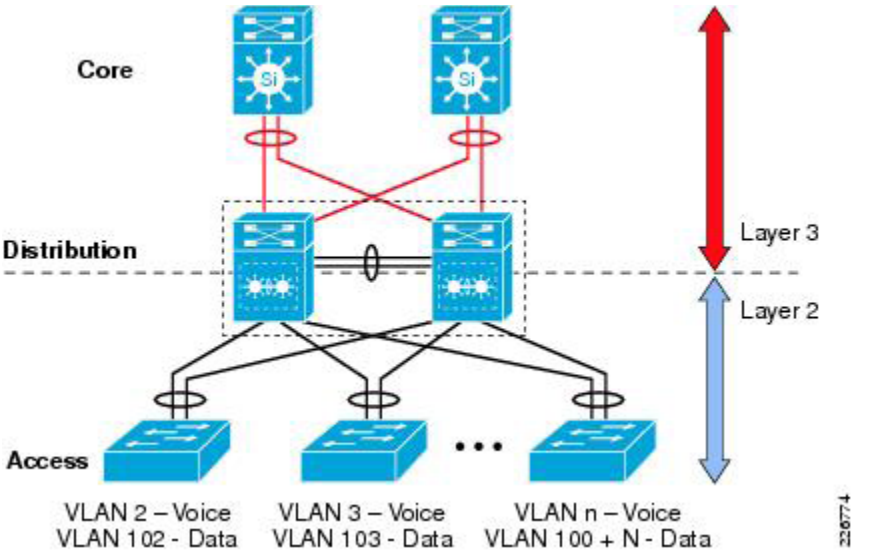
c. Network device capabilities needed at each layer

d. A detailed graphic that shows a full, three-layer hierarchical model design

Step 3: Create a simple table to organize and share your research with another student, group, the class, or instructor.

Suggested Activity Example Solution: (information based on The Cisco Three-Layered Hierarchical Model and LAN Design)

Access Layer	
Definition	This hierarchical layer connects local clients to the network. It is sometimes called the desktop layer.
Facts	At this level: • Network equipment works with the distribution and core layers to send and receive transmissions from clients and users. • Collision domains are created using switches. • Switches can be configured to filter MAC addresses and share bandwidth.
Network Device Features	• Port security • VLANs functionality • Fast Ethernet/Gigabit Ethernet transmissions • Power over Ethernet (PoE) • Link aggregation • Quality of service (QoS)
Distribution Layer	
Definition	This hierarchical layer provides policy-based, decision-making network connectivity to the access layer below it and the core layer above it.
Facts	At this level: • Firewalls and access lists can be placed. • Link aggregation can occur. • Broadcast and multicast domain boundaries are created.
Network Device Features	• Layer 3 support • High forwarding rate • Gigabit Ethernet/10 Gigabit Ethernet • Redundant components • Security policies/access control lists • Link aggregation • Quality of service (QoS)
Core Layer	
Definition	This hierarchical layer is the backbone of the network. It includes high-powered routers and switches that use high-speed cabling, such as fiber optics. The main function of this layer is reliable delivery of network packets.
Facts	At this level: • All other layers of the hierarchical design model are supported. • Load balancing is desired as an integral service. • Efficient, fast, reliable data paths ensure fast network transmissions.
Network Device Features	• Layer 3 support • Very high forwarding rate • Gigabit Ethernet/10 Gigabit Ethernet • Redundant components • Link aggregation • Quality of service (QoS)

Three-Layer Hierarchical Design Graphic	

Identify elements of the model that map to IT-related content:

- Network design
- Cisco three-layer hierarchical model
- Access layer
- Distribution layer
- Core layer

1.2.1.8 Lab – Selecting Switching Hardware (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objectives

Part 1: Explore Cisco Switch Products

Part 2: Select an Access Layer Switch

Part 3: Select a Distribution/Core Layer Switch

Background / Scenario

As a Network Engineer, you are part of a team that selects appropriate devices for your network. You need to consider the network requirements for the company as they migrate to a converged network. This converged network supports voice over IP (VoIP), video streaming, and expansion of the company to support a larger customer base.

For a small- to medium-sized company, Cisco hierarchical network design suggests only using a two-tier LAN design. This design consists of an access layer and a collapsed core/distribution layer. Network switches come in different form factors, and with various features and functions. When selecting a switch, the team must choose between fixed configuration or modular configuration, and stackable or non-stackable switches.

Based on a given set of requirements, you will identify the Cisco switch models and features to support the requirements. The scope of this lab will limit the switch models to campus LAN only.

Required Resources

PC with Internet access

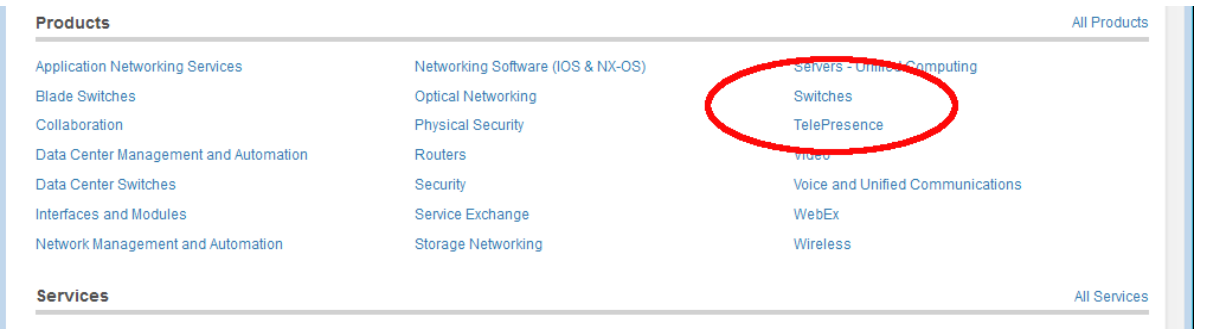
Part 1: Explore Cisco Switch Products

In Part 1, you will navigate the Cisco website and explore available switch products.

Step 1: Navigate the Cisco website.

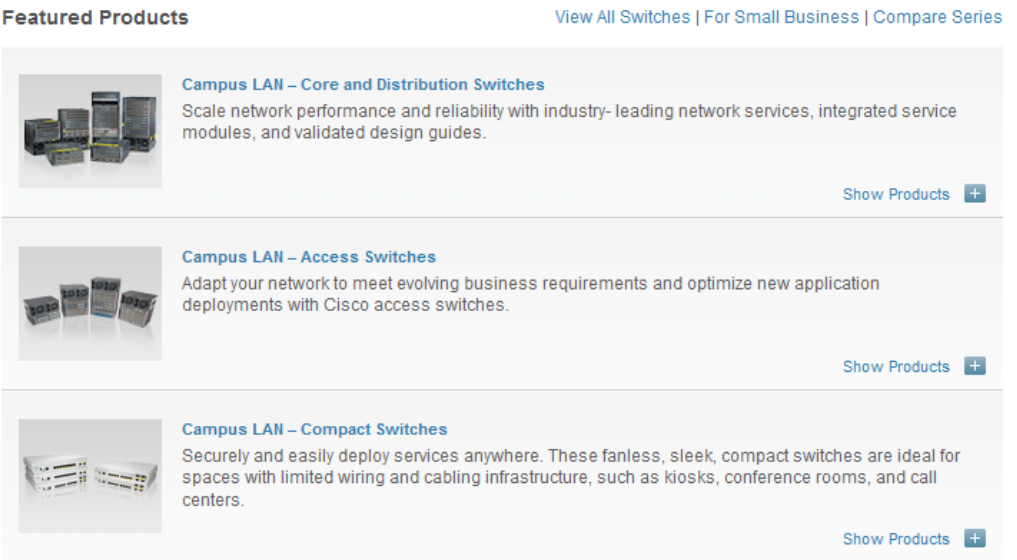
At www.cisco.com, a list of available products and information about these products is available.

a. From the home page, click **Products & Services** > **Switches**.



Step 2: Explore switch products.

In the Feature Products section, a list of different categories of switches is displayed. In this lab, you will explore the campus LAN switches. You can click different links to gather information about the different switch models. On this page, the information is organized in different ways. You can view all available switches by clicking **View All Switches**. If you click **Compare Series**, the switches are organized by types: modular vs. fixed configuration.



a. Click the heading **Campus LAN – Core and Distribution Switches**.

List a few models and some of features in the table below.

Model	Uplink Speed	Number of Ports/Speed	Other Features
Catalyst 4500-X	8 x 10 GE (hot swap module)	Up to 40 1G/10G ports	hot swappable power supplies, cooling fans and network modules, 1 RU, QoS, Fixed configuration
Catalyst 4500E	1G or 10G	Up to 196 1G ports and up to 100 10G ports	PoE+, hot swappable power supplies, cooling fans and network modules, Modular configuration

b. Click the heading **Campus LAN – Access Switches**.

List a few models and some of features in the table below.

Model	Uplink Speed	Number of Ports/Speed	Other Features
Catalyst 2960	2x1GE uplink	8, 24, and 48 FE ports	PoE+, advanced QoS, rate-limiting, ACLs, IPv6, multi-cast, Fixed configuration
Catalyst 3560-X and 3750-X	4x1GE or 10GE uplink ports (op-tional)	12, 24, and 48 FE/GE ports	QoS, PoE+, hot swappable power supplies, cooling fans and network modules, Stack-Power and StackWise, Fixed configuration

c. Click the heading **Campus LAN – Compact Switches**.

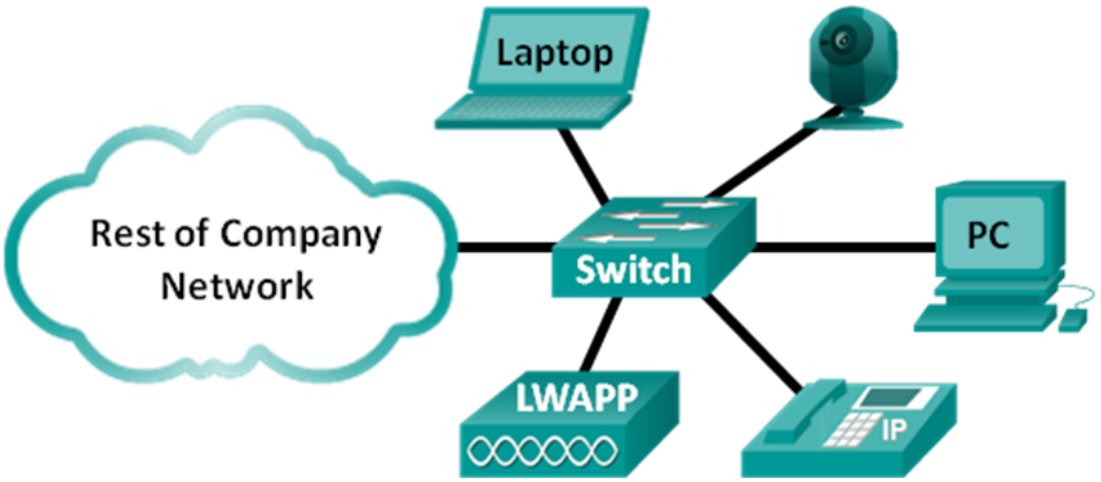
List a few models and some of features in the table below.

Model	Uplink Speed	Number of Ports/Speed	Other Features
Catalyst 3560-C	2x1GE uplink	8-12 FE/GE ports	Collocate with users, PoE+, Fixed configuration
Catalyst 2960-C	2x1GE uplink	8-12 FE/GE ports	Collocate with users, PoE / PoE pass-through, Fixed configuration

Part 2: Select an Access Layer Switch

The main function of an access layer switch is to provide network access to end user devices. This switch connects to the core/distribution layer switches. Access switches are usually located in the intermediate distribution frame (IDF). An IDF is mainly used for managing and interconnecting the telecommunications cables between end user devices and a main distribution frame (MDF). There are typically multiple IDFs with uplinks to a single centralized MDF.

An access switch should have the following capabilities: low cost per switch port, high port density, scalable uplinks to higher layers, and user access functions and resiliency. In Part 2, you will select an access switch based on the requirements set by the company. You have reviewed and become familiar with Cisco switch product line.



a. Company A requires a replacement access switch in the wiring closet. The company requires the switch to support VoIP and multicast, accommodate future growth of users and increased bandwidth usage. The switch must support a minimum of 35 current users and have a high-speed uplink. List a few of models that meet those requirements.

_____

_____

Answers will vary. 2960-S or 3560-X with 48 port capacity and at least two 1G/10G uplinks

b. Company B would like to extend services to a conference room on an as-needed basis. The switch will be placed on the conference room table, and switch security is a priority.

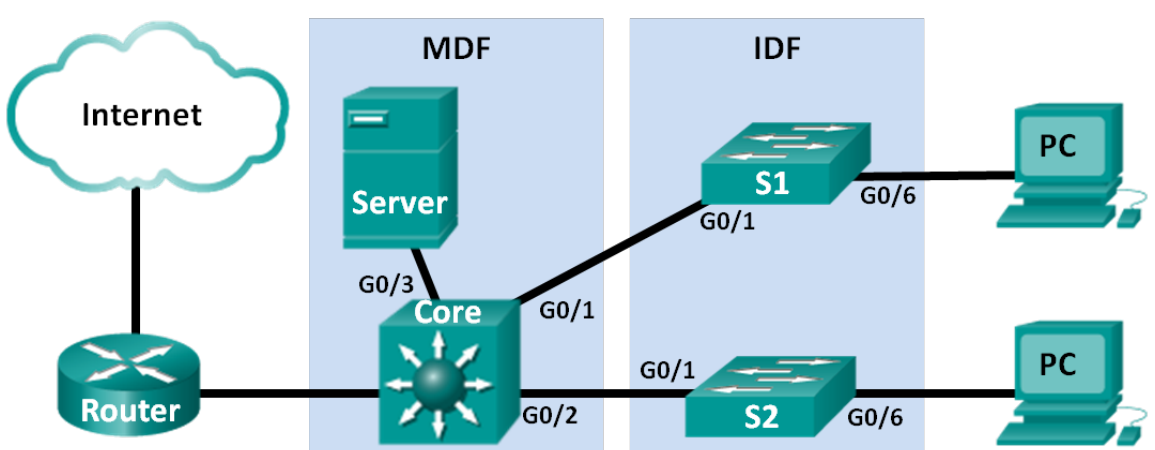
_____

_____

Answers will vary. A Compact LAN switch such as the 2960-C

Part 3: Select a Distribution/Core Layer Switch

The distribution/core switch is the backbone of the network for the company. A reliable network core is of paramount importance for the function of the company. A network backbone switch provides both adequate capacity for current and future traffic requirements and resilience in the event of failure. They also require high throughput, high availability, and advanced quality of service (QoS). These switches usually reside in the main wiring closet (MDF) along with high speed servers, routers, and the termination point of your ISP.



a. Company C will replace a backbone switch in the next budget cycle. The switch must provide redundancy features to minimize possible downtime in the event that an internal component fails. What features can accommodate these requirements for the replacement switch?

Answers will vary. Hotswappable power supplies, cooling fans and network modules, redundant power supplies, StackWise and StackPower

b. Which Cisco Catalyst switches would you recommend?

Answers will vary.3750-X, 4500-X, 4500-E

c. As Company C grows, high speed, such as 10 GB Ethernet, up to 8 uplink ports, and a modular configuration for the switch will become necessary. Which switch models would meet the requirement?

Answers will vary. 4500, 6500

Reflection

What other factors should be considered during the selection process aside from network requirements and costs?

Space/form factor, power consumption, modular upgrade, longevity of switch, IOS features for the switch

Solutions Manual for Scaling Networks 1st Edition by Lab Manual
Full Download: https://downloadlink.org/p/solutions-manual-for-scaling-networks-1st-edition-by-lab-manual/

1.3.1.1 Class Activity – Layered Network Design Simulation (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objective

Explain the need to design a hierarchical network that is scalable.

Instructor Note: This activity can be completed by individual students or groups of two students. It can then be shared with another individual, group, class, or the instructor.

Scenario

As the network administrator for a very small network, you want to prepare a simulated-network presentation for your branch manager to explain how the network currently operates.

The small network includes the following equipment:

- One Cisco 2911 series router
- One Cisco 3560 switch
- One Cisco 2960 switch
- Four user workstations (PCs or laptops)
- One printer

Resources

- Packet Tracer software

Directions

Step 1: Create a simple network topology using Packet Tracer software. Place the devices at the appropriate levels of the Cisco three-layer hierarchical model design, including:

a. One Cisco 2911 series router

b. One Cisco 3560 switch

c. One Cisco 2960 switch

d. Four user workstations (PCs or laptops)

e. One printer

Step 2: Using Packet Tracer's drawing tool and indicate the hierarchical layers with different color coding and labels:

a. Access layer

b. Distribution layer

c. Core layer

Full download all chapters instantly please go to Solutions Manual, Test Bank site: TestBankLive.com