



# CCNA Discovery: Designing and Supporting Computer Networks



## Overview of Case Studies

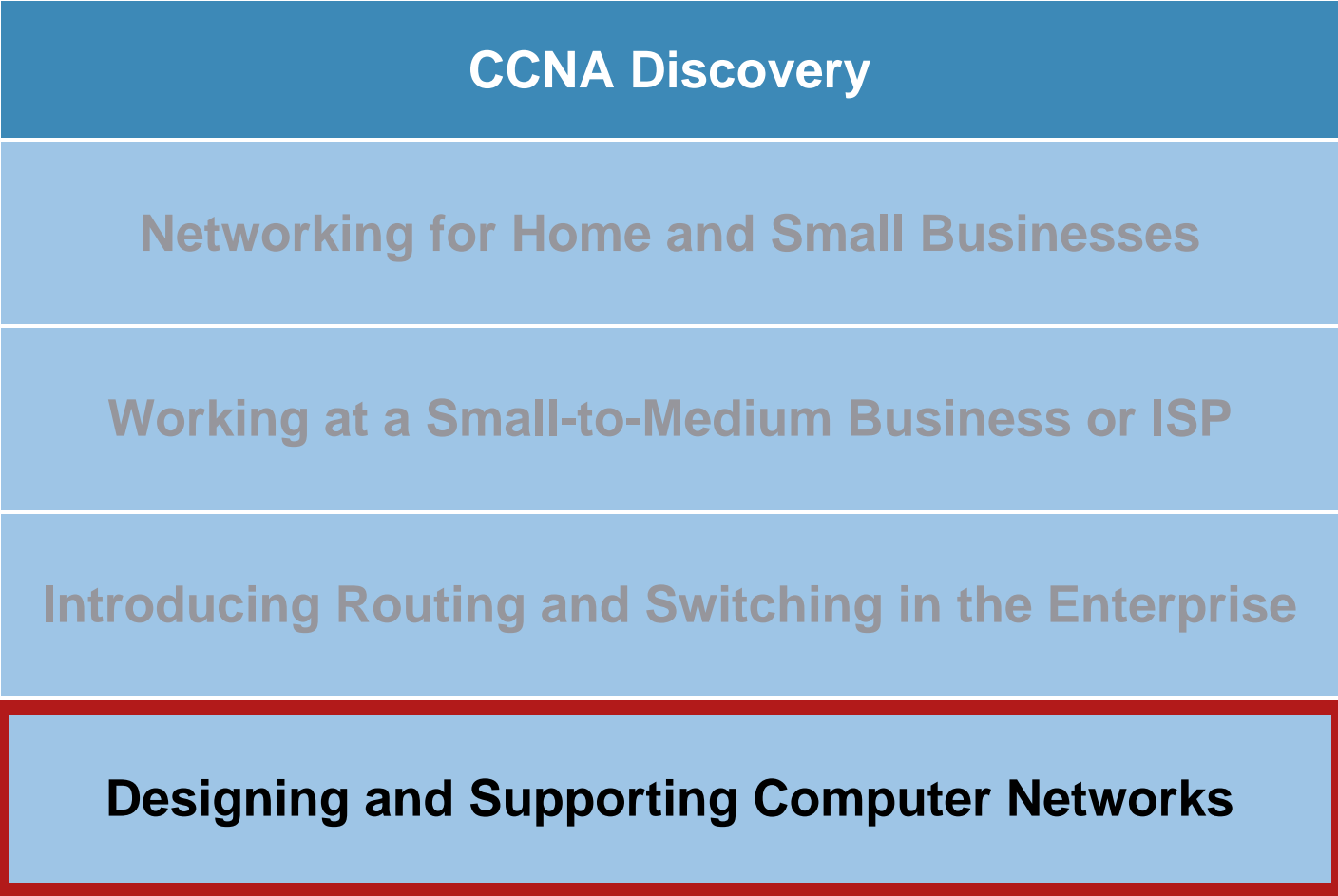
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# CCNA Discovery Course Sequence

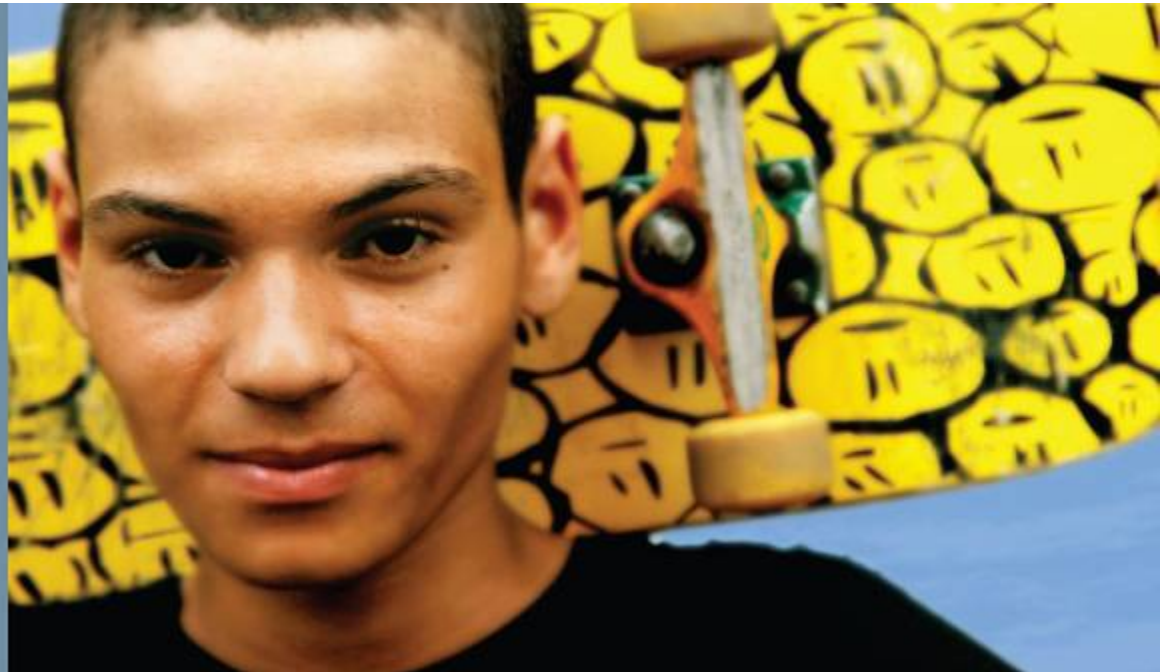




# Courses/Jobs/Certifications

Course	Jobs	Certification
Discovery 1 - Networking for Home and Small Businesses	<ul style="list-style-type: none"><li>▪ Home Network Installer</li><li>▪ Small Business Installer</li></ul>	
Discovery 2 - Networking at a Small-to-Medium-Sized Business or an ISP	<ul style="list-style-type: none"><li>▪ Entry-Level Network Technician</li><li>▪ Entry-Level Computer Technician (with ITE PC)</li><li>▪ Entry-Level Help Desk Technician</li></ul>	CCENT
Discovery 3 - Introducing Routing and Switching in the Enterprise	<ul style="list-style-type: none"><li>▪ Network Technician</li><li>▪ Desktop Support Technician</li><li>▪ Help Desk Technician</li><li>▪ Computer Technician (with ITE PC)</li></ul>	
Discovery 4 - Designing and Supporting Computer Networks	<ul style="list-style-type: none"><li>▪ Entry-Level Presales Support</li><li>▪ Entry-Level Network Design</li></ul>	CCNA

# CCNA Discovery: Designing and Supporting Computer Networks





# Designing and Supporting Computer Networks

## Course Objectives:

- Gather customer requirements
- Design a simple Internetwork using Cisco technology
- Design an IP addressing scheme to meet LAN requirements
- Create an equipment list to meet LAN design requirements
- Create and present a proposal to a customer
- Install and configure a prototype Internetwork
- Obtain and upgrade Cisco IOS® software in Cisco devices



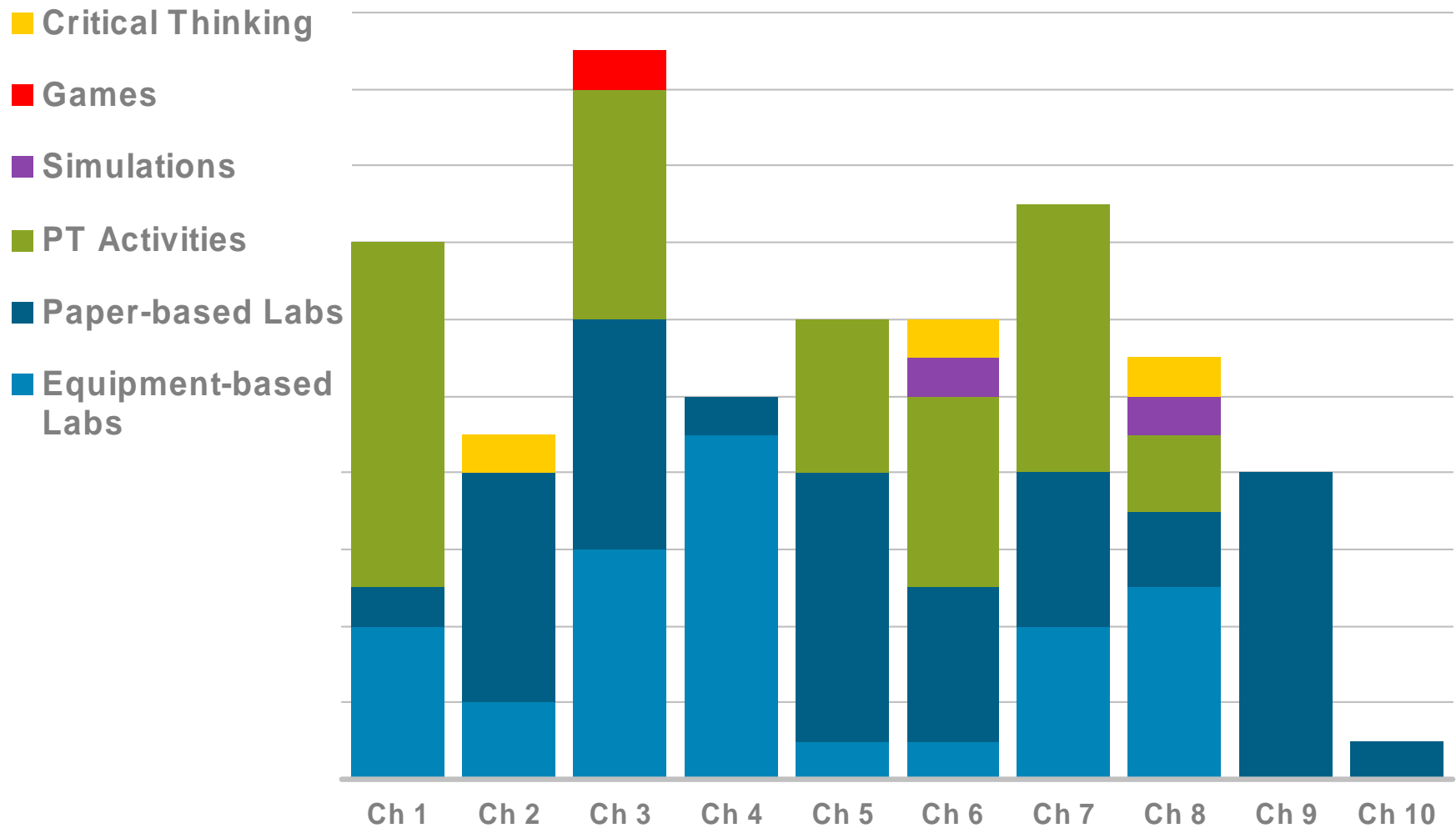
# Designing and Supporting Computer Networks

This course provides the foundations for good network design

- Labs and activities are based on network scenarios
- Special focus is placed on entrepreneurial skills
- Packet Tracer and hands-on activities support the content throughout this course
- Each scenario includes identifying risks and weaknesses and a troubleshooting activity to fix or redesign a problem network



# 111 Labs, Activities, and more





# The Challenging Topic: Network Design

- The Challenge:

Engage younger learners in a course that introduces concepts that at first may seem very theoretical and paper-based without enough action

- The Solution:

A theme that is relevant and engaging globally

Something everyone can relate to

Something common but can generate excitement

- **The approach is “different” but very cool!**



# Something ... Like Sports!





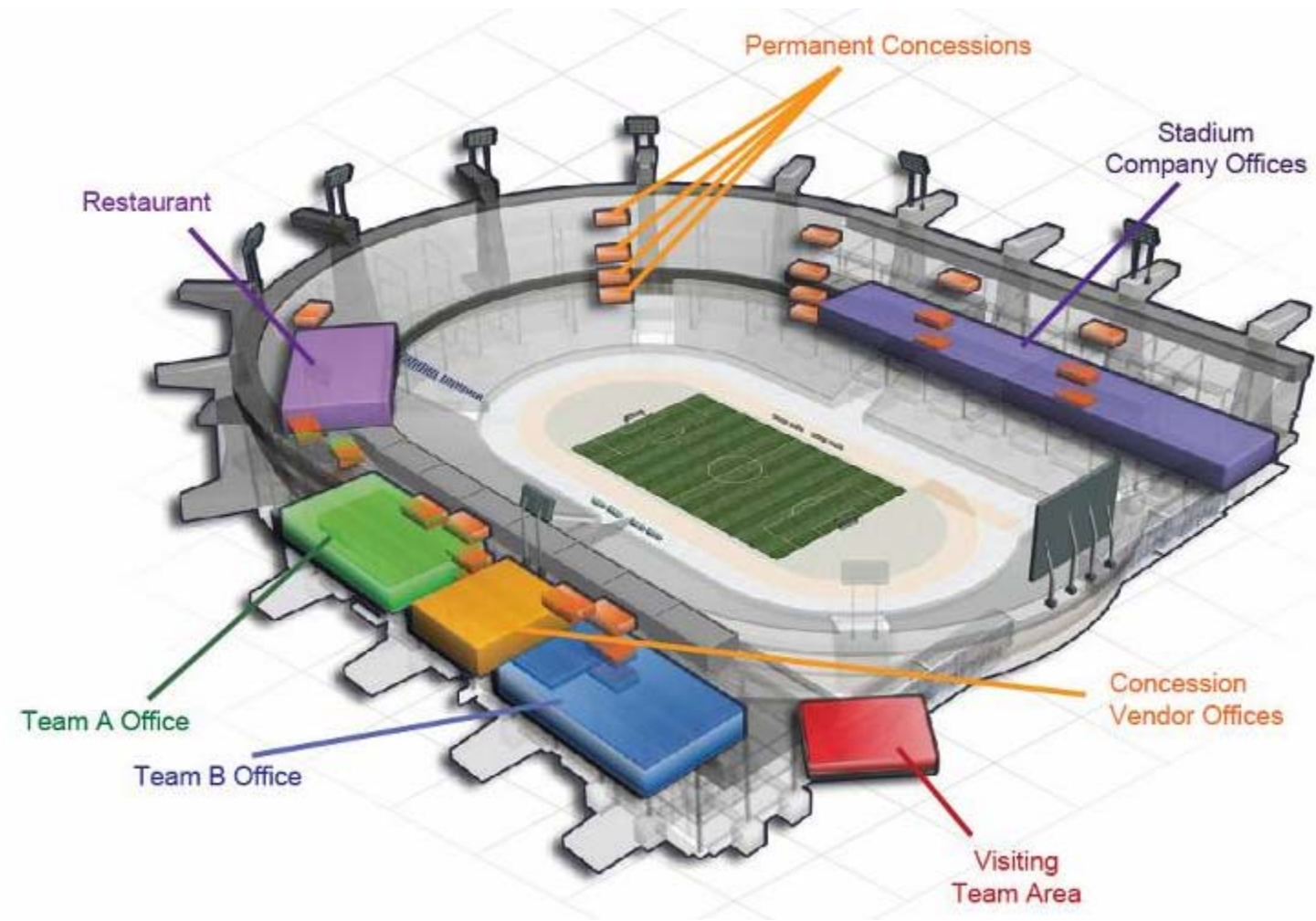
# StadiumCompany Case Study



## ... A Network Upgrade Design Project

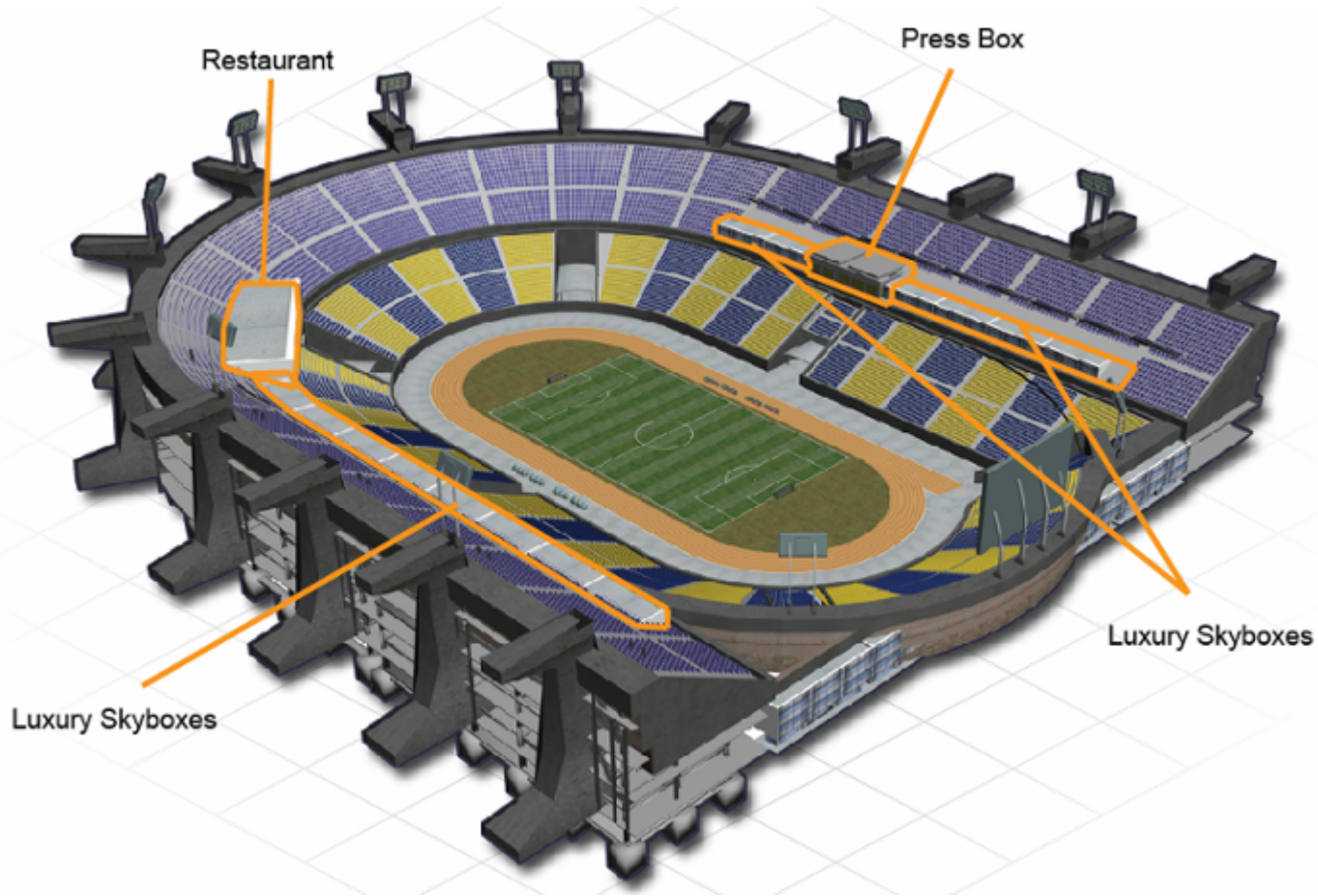


# ... Developed Throughout the Course ...





# Discussed and Designed ...



# ... The Ultimate Networked Sports Stadium



# The StadiumCompany Case Study

A Packet Tracer Case Study that explores:

- 3 Layer Design Model (Access, Distribution, Core)
- Range of IP services (Voice, Transactions, Video)
- Data Center
- LAN Technologies
- WAN Technologies
- Network Security
- Wireless and Mobile Networks
- VPN and Remote Access
- ... in a design and customer focused context





# Upgrading StadiumCompany Network

StadiumCompany Management outlines a three-phase project

1. Contract NetworkingCompany to prepare a network design requirements document.
  2. Issue a contract for the detailed network design
  3. Issue a contract for installation and implementation of the network upgrade
- In general, the StadiumCompany design project is used in the main text, media and PT activities



# FilmCompany Provides Video Services

StadiumCompany is also in the process of negotiating a contract with FilmCompany

- FilmCompany is a film production company located in the nearby major city
- FilmCompany will be responsible for producing, filming and delivering high quality video for download from the stadium website
- StadiumCompany management is also requiring FilmCompany to produce live video displays during the sporting events and concerts held at the stadium



# The FilmCompany Case Study

- A hands-on lab case study
- Applies the design requirements of the StadiumCompany case study on a much smaller scale
  - Examination of an existing network topology
  - Development of a Project Proposal to upgrade the network
  - Design and prototyping of the network design
  - Presentation of the Project Proposal for customer approval




# Job Shadow at the NetworkingCompany

- The students will learn the skills needed to plan and design the StadiumCompany network upgrades
- The students' new design skills enable them to support the NetworkingCompany team in planning and designing similar upgrades for the smaller FilmCompany network
- The network design portfolio they create throughout this course will enable them to develop and present their network upgrade proposal to the FilmCompany management team



# Introduction of Case Studies

<p>2 Gathering Network Requirements 2.0 Chapter Introduction</p>	<p>CCNA Discovery Designing and Supporting Computer Networks</p> 
<p>2.0.1 Introduction</p>	<p>1 2</p>

In this chapter you are introduced to StadiumCompany, a sports facility management company that manages a stadium located outside of a major city. StadiumCompany needs to upgrade its existing computer network to provide state-of-the-art services. To do this, StadiumCompany management outlines a three-phase project. In the first phase, StadiumCompany is contracting with NetworkingCompany, a local Cisco business partner, to prepare a network design requirements document. In the second phase, the stadium management plans to issue a contract for the detail network design. Once the design is completed, the final phase will be the installation and implementation of the network upgrade.

StadiumCompany is also in the process of negotiating a contract with FilmCompany, a film production company located in the nearby major city. FilmCompany will be responsible for producing, filming and delivering high quality video for download from the stadium website. StadiumCompany management is also requiring FilmCompany to produce live video displays during the sporting events and concerts held at the stadium.

As you job shadow the NetworkingCompany team, you will learn the skills needed to plan and design the StadiumCompany network upgrades. Your new design skills enable you to support the NetworkingCompany team plan and design similar upgrades for the smaller FilmCompany network. The network design portfolio you create during this work assignment will enable you to develop and present your network upgrade proposal to the FilmCompany management team.

In general, the StadiumCompany design project is used in the main text, media and PT activities. The FilmCompany design project is completed in the hands-on labs.

Click the buttons to download the StadiumCompany and FilmCompany stories.

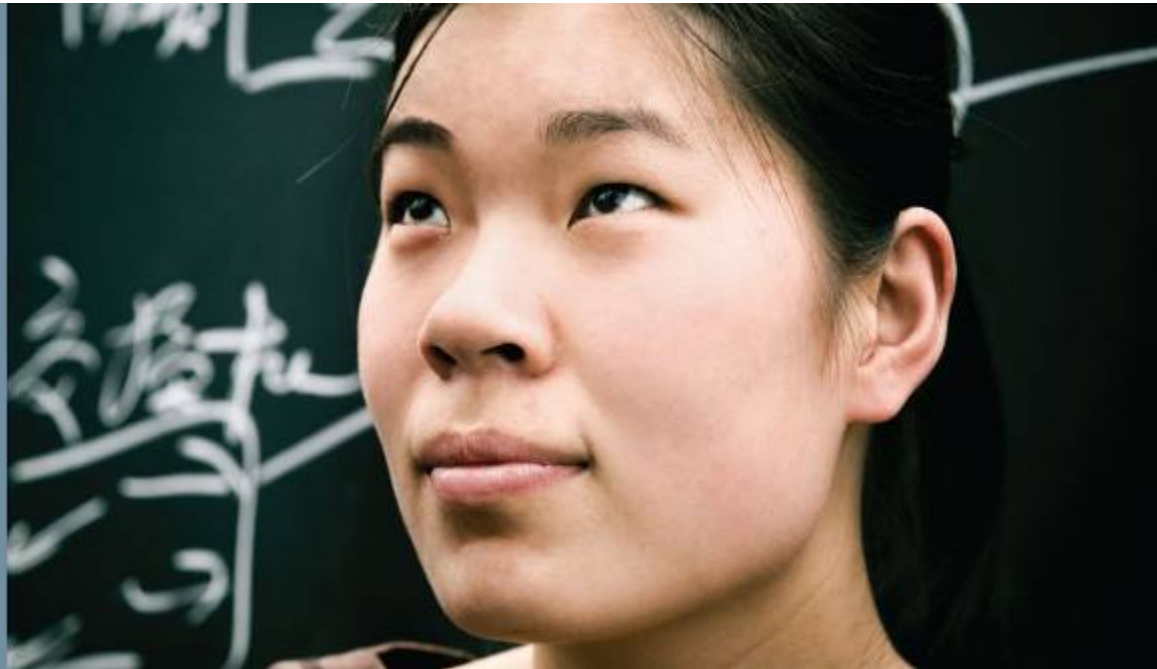
Download StadiumCompany Story

Download FilmCompany Story

2.0.1.2

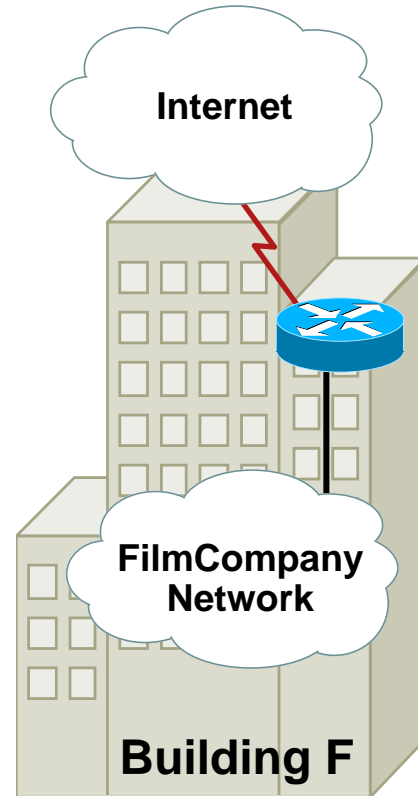
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# FilmCompany Story





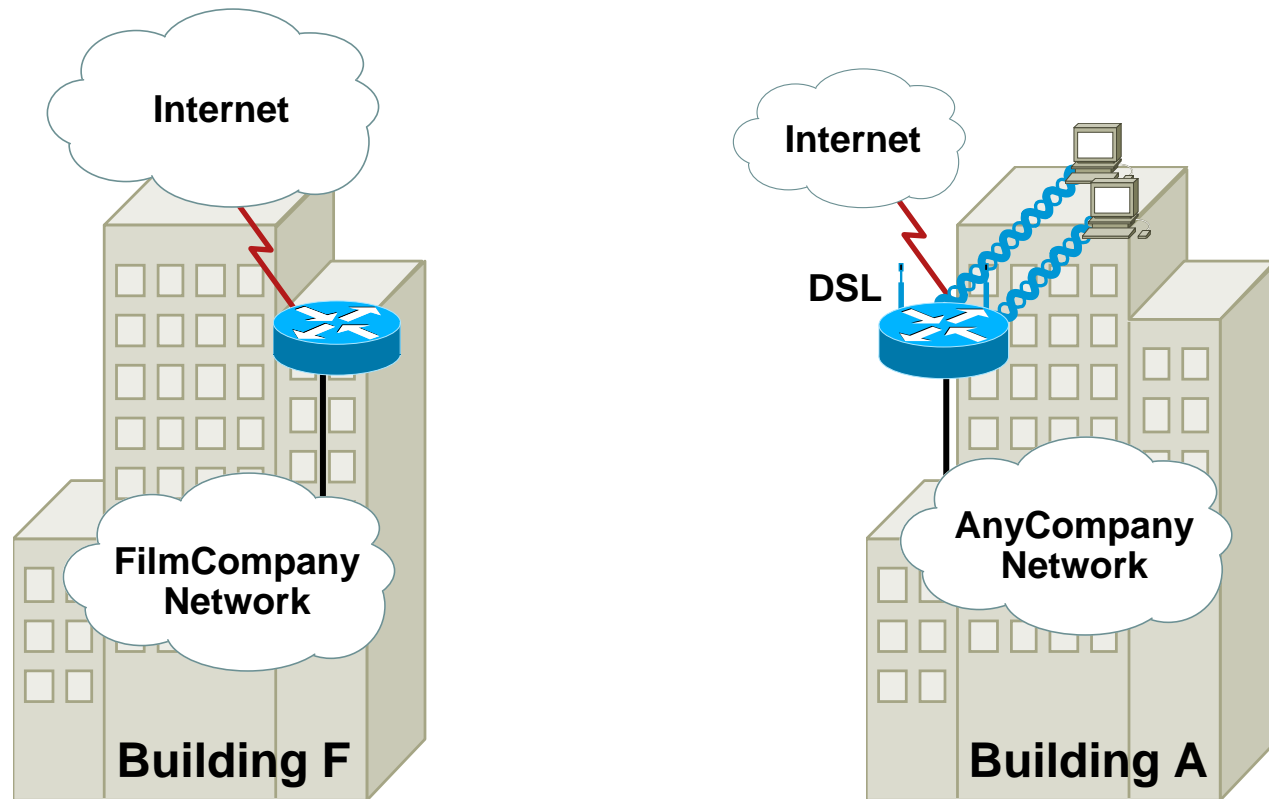
# FilmCompany Story



- FilmCompany will produce, film and deliver high quality video for download from the stadium website for the StadiumCompany



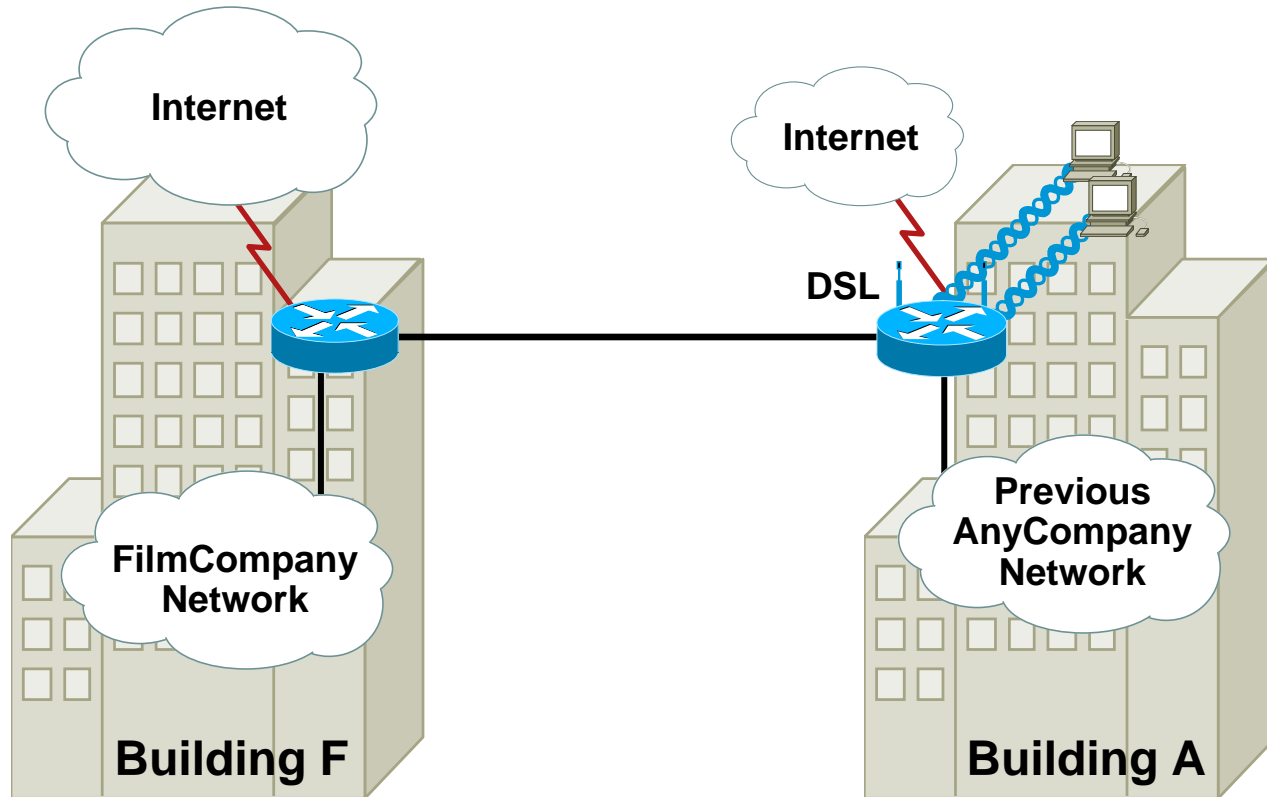
# FilmCompany Purchases AnyCompany



- FilmCompany purchased AnyCompany, a smaller video firm with production expertise in sports videos



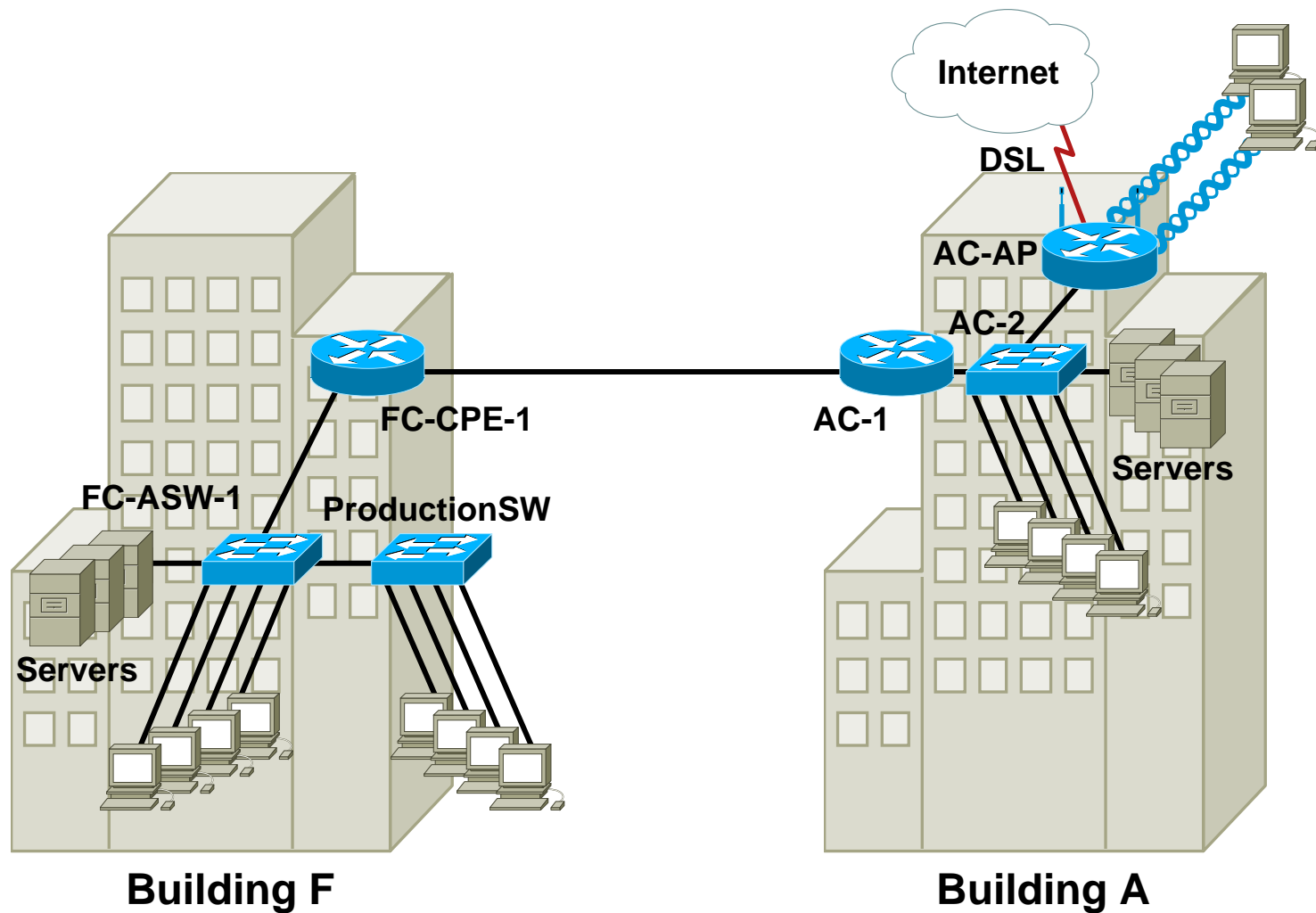
# A LAN Connects the Buildings



- FilmCompany purchased AnyCompany, a smaller video firm with production expertise in sports videos



# Redesign the FilmCompany Network





# Read FilmCompany Story

- What are the FilmCompany's concerns?
- What are the FilmCompany's business goals?
- What is the staff and personnel situation of the FilmCompany?
- What are the FilmCompany's constraints and requirements?
- How will the FilmCompany measure customer satisfaction?



# Discuss FilmCompany Story



# Discuss FilmCompany Story

1. Data traffic expected to increase by 80%
2. Possibly consider connecting directly to the StadiumCo network; must be a fast and reliable connection
3. High network availability with redundant links and technology
4. Wireless network access at the stadium and at Building A and Building F
5. QoS to support video applications
6. High network reliability with network monitoring and security  
Block all unauthorized network intrusions

# FilmCompany Labs





## Lab 2.1.3 Creating a Project Plan

- Lab objectives:
  - Describe the Plan Phase of the network lifecycle
  - Create a checklist with outcomes for the Plan Phase of the network lifecycle
- Acting as the network designers, students are to begin to develop a network project plan
- For the Plan Phase, perform a site and operations assessment of the FilmCompany Network
- From the assessment the Project Plan checklist is created and it becomes part of the FilmCompany portfolio
- The details of the project and its implementation will be developed in forthcoming labs



# Results of Labs Between 2.1.3 and 5.2.4

- Project plan checklist
- Network user structure
- Network organization diagram
- Project prioritized business goals checklist
- Project prioritized technical requirements checklist
- Project constraints checklist
- Network device tables
- Network topology diagram
- Router features and expansion options
- Site visit plan
- Design requirements document
- Current network document
- Priority queue requirements for FilmCompany network
- Projected applications document for FilmCompany network
- Diagram traffic flows
- FilmCompany RFP response document
- Core layer diagram

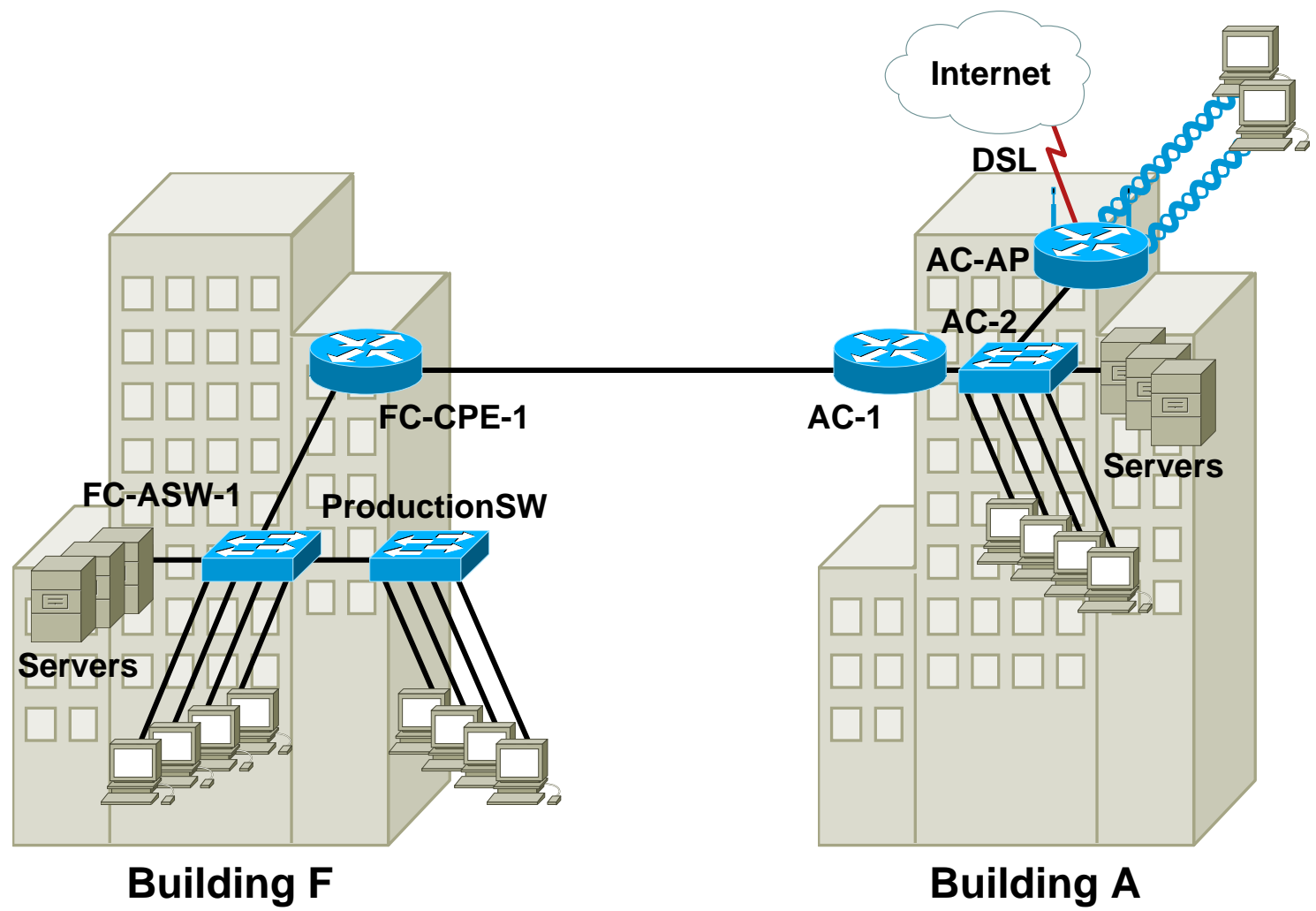


## Lab 5.2.4 Creating a Diagram

- Lab objective:
  - Design and diagram the new FilmCompany LAN
- Using word processing software, detail the following;
  - Design requirements
  - Existing equipment and their possible upgrades
  - Selected LAN devices
  - Redundancy plan
- Using a graphic program, create the new LAN design based on the elements listed
- Packet Tracer is well-suited for this lab

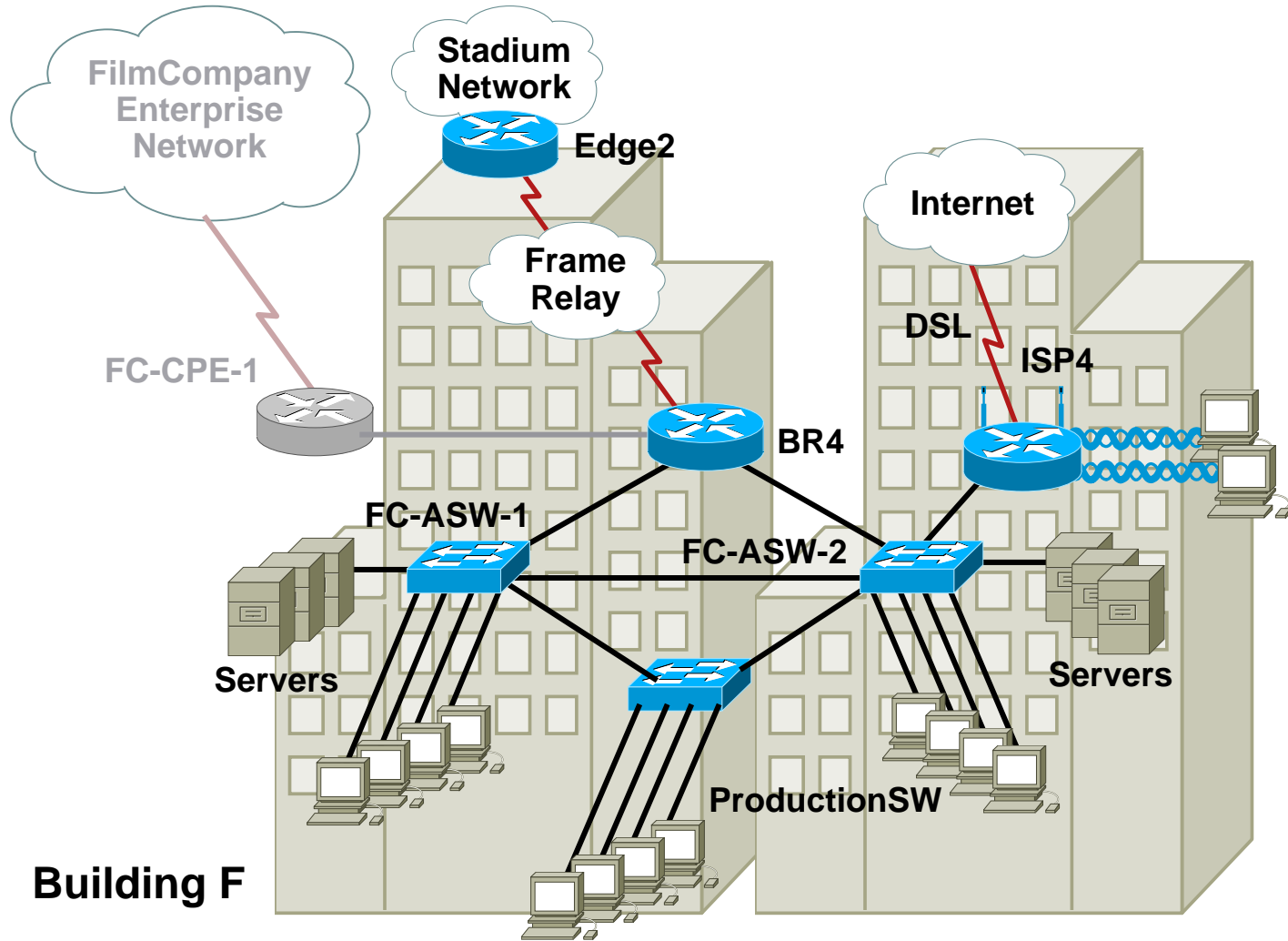


# FilmCompany Branch Layout





# Proposed FilmCompany Physical Layout





# Results of Labs Between 5.2.4 and 6.2.5

- WLAN diagram
- Firewall rule set



# Lab 6.2.5 Creating Addressing Plan

- Lab objective:
  - Document the address assignment within the FilmCompany network
- One of a series of labs in which students design the IP addressing scheme for the new FilmCompany network
  1. Determining an IP Addressing Scheme (Lab 6.2.1)
  2. Determining the Number of IP Networks (Lab 6.2.2)
  3. Creating an Address Allocation Spreadsheet (Lab 6.2.5)
- In this lab, students will create an Address Allocation table using a spreadsheet program



Network Names	Network Address	Lowest Host Address	Highest Host Address	Broadcast Address
Voice	192.168.0.0 /24	192.168.0.1	192.168.1.254	192.168.1.255
Support	192.168.1.0 /25	192.168.1.1	192.168.1.126	192.168.1.127
Production	192.168.1.128 /25	192.168.1.129	192.168.1.254	192.168.1.255
Future	192.168.2.0 /25	192.168.2.1	192.168.2.126	192.168.2.127
Null	192.168.2.128 /25	192.168.2.129	192.168.2.254	192.168.2.255
Administrative	192.168.3.0 /26	192.168.3.1	192.168.3.62	192.168.3.63
Mobile	192.168.3.64 /26	192.168.3.65	192.168.3.126	192.168.3.127
Peripherals	192.168.3.128 /26	192.168.3.129	192.168.3.190	192.168.3.191
Web_access	192.168.3.192 /28	192.168.3.193	192.168.3.206	192.168.3.207
Default	192.168.3.208 /28	192.168.3.209	192.168.3.222	192.168.3.223
Management	192.168.3.224 /28	192.168.3.225	192.168.3.238	192.168.3.239
net_admin	192.168.3.240 /28	192.168.3.241	192.168.3.254	192.168.3.255



# LAN Design Test Plan and Labs

- Lab 7.2.2 Creating a Test Plan for the Campus Network
  - Create a test plan to verify the FilmCompany network design
- Lab 7.2.5 Testing the FilmCompany Network
  - Execute the test plan
- Lab 7.2.6 Analyzing Results of Prototype Test
  - Analyze the results of the testing
- A LAN Design Test Plan document is provided as a template to use in completing this series of labs
- In most organizations, this type of activity is done by a team of people, consisting of the account manager, network designer, systems engineers, and field engineers



# Consider This

- The purpose of the practice portion of this session is to provide the instructor with the experience of working through some of the FilmCompany Case Study
- While working through this practice, you should consider your classes and various ways you will teach this material
- Are there potential challenges and obstacles to be mindful of when using these labs?
- What additional support and/or explanation would be helpful to include?



# Assignment

- Using the following resources:
  - LAN Design Test Plan document
  - The topology diagram created in Lab 5.2.4
  - The IP address spreadsheet created in Lab 6.2.5
- Work through:
  - Lab 7.2.2 Creating a Test Plan for the Campus Network
    - Be sure to create all three test plans
  - Lab 7.2.5 Testing the FilmCompany Network
  - Lab 7.2.6 Analyzing Results of Prototype Test

# Discussion





## Discussion

Now that you have experienced some of the FilmCompany Case Study Labs:

- What retooling training should be offered to existing CCNA instructors?
- How does the flow of this course impact student instruction?
- Are there potential challenges and obstacles to be mindful of when using these labs in instructor training?
- What additional support and/or explanation would be helpful to include?
- What additional resources would you require?

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