

Study guide by ExamNotes.net

Cisco Internetwork Design

Test Information

Exam	CID V3 – Cisco Internetwork Design
Time Limit	Approx 2 Hours
Passing Score	755
Questions	100
Test Format	Form Based – Can't mark for review
Certification	If all prerequisites are met: CCDP

Abstract

“This Study Guide will begin to guide you in preparing for the Cisco exam 640-025, Cisco Internetwork Design 3.0. This exam will cover a wide range of technology and topics and should be taken after the CCDA, BCRAN, BCSN and BCMSN tests. This Test will cover all topics in the other exams as well as touching on Security, ATM and SNA fundamentals”

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What to Know

- Cisco's Hierarchical Design
- TCP/IP Network Design
- TCP/IP Addressing Design
- OSPF Design
- IGRP/EIGRP Design
- Desktop Protocol Design
- Desktop Design Overview
- IPX Design
- Appletalk Design
- Windows Networking Design
- WAN Design
- WAN Design Overview
- T-Carrier Design
- Frame Relay Design
- X25 Design
- Remote Access Design
- ATM/SMDS WAN Design
- WAN Design with StrataCom Switches
- SNA Design Overview

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Study Tips

- DO not take this test lightly. The test covers a lot of information.
- DO not rely on one source of study to prepare you for this exam. The recommended path is to take the CCDA (DCN – Designing Cisco Networks) course and then the BCRAN, BCSN, and BCMSN tests (or Foundations) and then end with this exam.
- Make sure you use the links provided to aid your studies. Like most of Cisco's tests, a lot of your information to study from is free and available on their web site. Use this as a supplement to aid your studies.
- Do not solely rely on this or any study guide alone.

Links and Resources

Links: (It is highly recommended that you visit these links)

- [Career Certifications Homepage](#)
- [Exam Objectives](#)
- [Internetworking Technology Overview](#)
- [Internetworking Design Basics](#)
- [Designing Large-Scale IP Internetworks](#)
- [Designing SRB Internetworks](#)
- [Designing SDLC, SDLLC, and QLLC Internetworks](#)
- [Designing APPN Internetworks](#)
- [Designing DLSw+ Internetworks](#)
- [Designing ATM Internetworks](#)
- [Designing Packet Service Internetworks](#)
- [Designing DDR Internetworks](#)
- [Designing ISDN Internetworks](#)
- [Designing Switched LAN Internetworks](#)
- [Designing Internetworks for Multimedia](#)
- [Subnetting an IP Address Space](#)

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Important Links for Switching and VLANS right from the CCIE design track

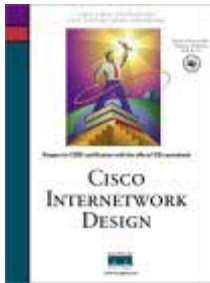
- Cisco IOS Software Documentation
- AIW - Sources Of Architecture Softcopy Documentation
- SNA-IP Integration Products
- Data Link Switching (DLSw)
- Cisco DLSw
- SNA Features
- Configuring SNA Frame Relay Access Support
- Bridging Basics
- Ethernet
- VLANs
- Configuring VTP and Virtual LANs
- Configuring VLANs
- Token Ring VLANs and Related Protocols
- Virtual LAN Routing
- Configuring Routing between VLANs with ISL Encapsulation
- Configuring VLAN Trunks and Fast Ethernet and Gigabit Ethernet Ports
- Configuring FastEtherChannel and GigabitEtherChannel
- Configuring Spanning Tree
- Token Ring Switching
- Token Ring Inter-Switch Link (TRISL)
- Configuring Token Ring Inter-Switch Link
- 3900 Token Ring ISL Configuration
- Catalyst 5000 Command Reference (5.2)
- Configuring STUN
- STUN for Front End Processors
- e-nable the WAN
- CIP Installation and Configuration

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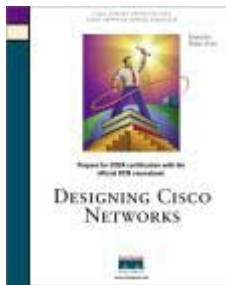
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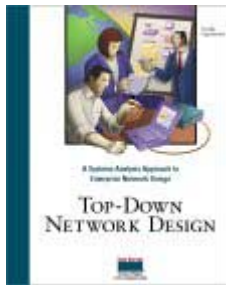
Books:



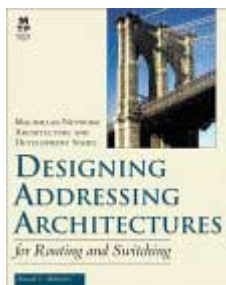
This book focuses on the exam objectives and follows them tightly



This was a prerequisite to get to this level. You should have used it for the CCDA



This was also a prerequisite to get to this level. You should have used it for the CCDA



This is a great book to focus on addressing architectures

These books are recommended for your study. All are good and cover many specific topics that are addressed in the CID Exam

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CID Exam Notes

Hierarchical Design

Cisco provides us with a model to follow when we design and implement networks. Quite simply, it is a 3-tier model that has defined duties or tasks that happen at each tier.

For this exam, you need to have mastered the concept of a 3-tier design that had first been brought to you at the CCDA level

A hierarchical network design includes the following three layers:

- The backbone (core) layer that provides optimal transport between sites
- The distribution layer that provides policy-based connectivity
- The access layer that provides workgroup/user access to the net

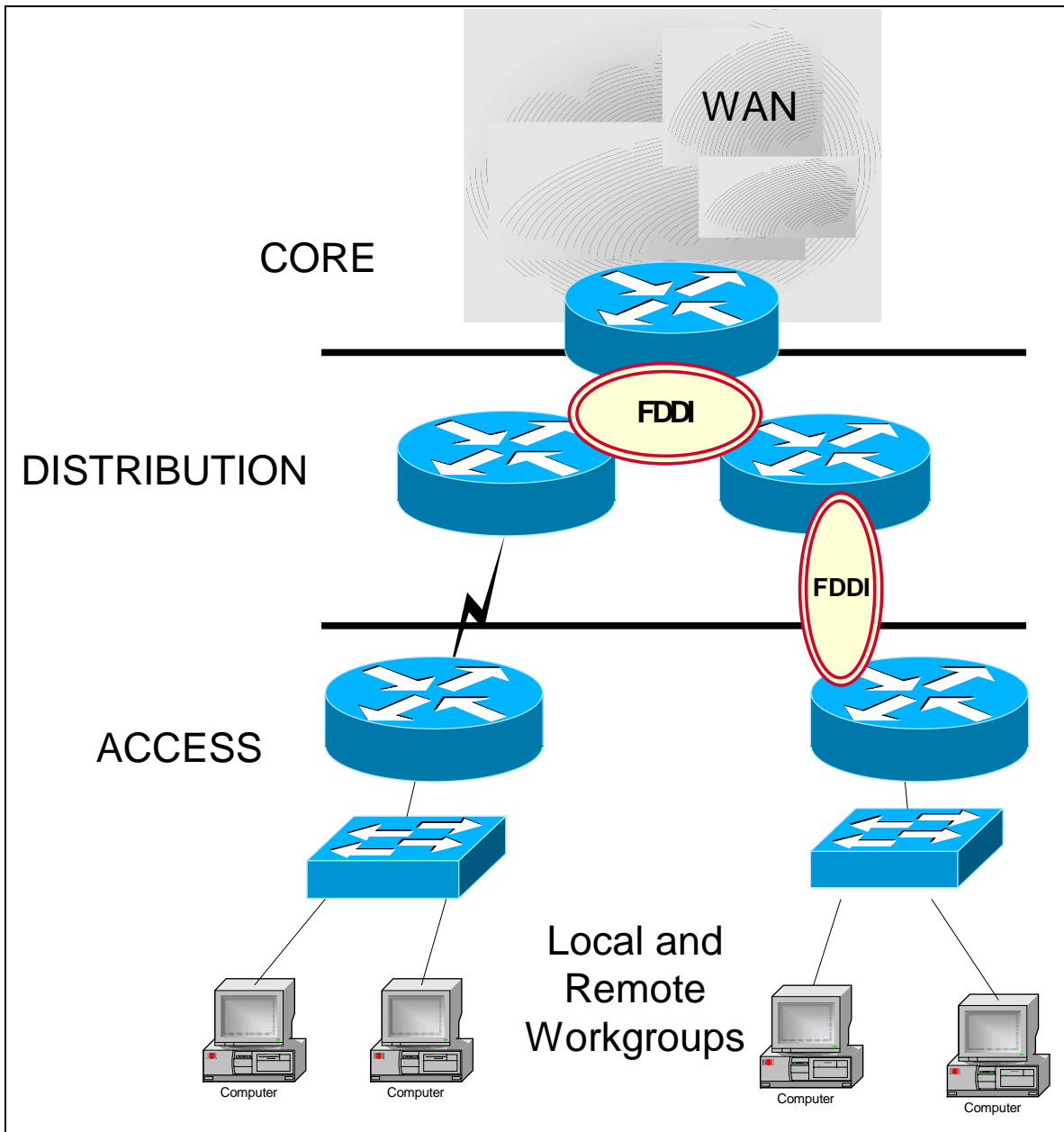
This is it briefly so to speak but we can break it down further

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Lets look at it in a diagram:



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Let us break down the layers a little more:

The Core layer

- High-speed switching backbone and should be designed to switch packets as fast as possible
- This layer of the network should not perform any packet manipulation, such as access lists and filtering, that would slow down the switching of packets

The Distribution Layer

- The distribution layer of the network is the demarcation point between the access and core layers and helps to define and differentiate the core
- The purpose of this layer is to provide boundary definition and is the place at which packet manipulation can take place
- In the campus environment, the distribution layer can include several functions, such as the following:
 - Address or area aggregation
 - Departmental or workgroup access
 - Broadcast and multicast domain definition
 - Virtual LAN (VLAN) routing
 - Any media transitions that need to occur
 - Security - Policies
- In the non-campus environment, the distribution layer can be a redistribution point between routing domains or the demarcation between static and dynamic routing protocols
- It can also be the point at which remote sites access the corporate network
- The distribution layer can be summarized as the layer that provides policy-based connectivity

The Access Layer

- The access layer is the point at which local end users are allowed into the network
- This layer may also use access lists or filters to further optimize the needs of a particular set of users
- In the campus environment, access-layer functions can include the following:

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- Shared bandwidth
- Switched bandwidth
- MAC layer filtering
- Microsegmentation
- In the non-campus environment, the access layer can give remote sites access to the corporate network via some wide-area technology, such as Frame Relay, ISDN, or leased lines

Routing Protocol Design and Configuration

OSPF Design

Everything you need to know about OSPF Design:

- [Designing & Implementing an OSPF Network](#)
- [Configuring OSPF on Cisco Routers](#)
- [Case Study: Designing an OSPF Frame Relay Network](#)

Design Routing protocols:

- [Configuring On-Demand Routing](#)
- [Configuring RIP](#)
- [Configuring IGRP](#)
- [Configuring OSPF](#)
- [Configuring IP Enhanced IGRP](#)
- [Configuring Integrated IS-IS](#)
- [Configuring BGP](#)
- [Configuring IP Routing Protocols-Independent Features](#)
- [Configuring IP Multicast Routing](#)

Desktop Protocol Design And Configuration

IP Design

- [Assign IP Addresses to Network Interfaces](#)
- [Configure Address Resolution Methods](#)
- [Enable IP Routing](#)
- [Enable IP Bridging](#)
- [Enable Integrated Routing and Bridging](#)
- [Configure a Routing Process](#)
- [Configure Broadcast Packet Handling](#)
- [Configure Network Address Translation \(NAT\)](#)
- [Monitor and Maintain IP Addressing](#)

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IPX Design

An IPX network address consists of a network number and a node number expressed in the format *network.node*

Network Numbers:

- The network number identifies a physical network
- It is a 4-byte (32-bit) quantity that must be unique throughout the entire IPX Internetwork
- The network number is expressed as hexadecimal digits
- The maximum number of digits allowed is eight

The Cisco IOS software does not require that you enter all eight digits; you can omit leading zeros

Node Numbers:

- The node number identifies a node on the network
- It is a 48-bit quantity, represented by dotted triplets of four-digit hexadecimal numbers
- If you do not specify a node number for a router to be used on WAN links, the Cisco IOS software uses the hardware Media Access Control (MAC) address currently assigned to it as its node address
- This is the MAC address of the first Ethernet, Token Ring, or FDDI interface card. If there are no valid IEEE interfaces, then the Cisco IOS software randomly assigns a node number using a number that is based on the system clock

IPX Address Example

The following is an example of an IPX network address:

5B.0000.0B00.FFFF

- [Enable IPX Routing](#)
- [Configure IPX Enhanced IGRP](#)
- [Configure NLSP](#)
- [Configure Next Hop Resolution Protocol](#)
- [Configure IPX and SPX over WANs](#)
- [Control Access to IPX Networks](#)
- [Tune IPX Network Performance](#)
- [Shut Down an IPX Network](#)
- [Configure IPX Accounting](#)
- [Monitor and Maintain the IPX Network](#)

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Appletalk Design

AppleTalk Addresses:

An AppleTalk address consists of a network number and a node number expressed in decimal in the format *network.node*

Network Numbers:

- The network number identifies a network, or cable segment
- A network is a single logical cable
- Although the logical cable is frequently a single physical cable, bridges and routers can interconnect several physical cables

The network number is a 16-bit decimal number that must be unique throughout the entire AppleTalk Internetwork

AppleTalk Phase 1 Network Numbers:

- In AppleTalk Phase 1, networks are identified by a single network number that corresponds to a physical network
- In AppleTalk Phase 1, the network number 0 is reserved

AppleTalk Phase 2 Network Numbers:

- In AppleTalk Phase 2, networks are identified by a cable range that corresponds to one or more logical networks
- In Phase 2, a single cable can have multiple network numbers
- A cable range is either one network number or a contiguous sequence of several network numbers in the format start-end
- In AppleTalk Phase 2, the network number 0 is reserved

Node Numbers:

- The node number identifies the node, which is any device connected to the AppleTalk network
- The node number is an 8-bit decimal number that must be unique on that network

AppleTalk Phase 1 Node Numbers:

- In AppleTalk Phase 1, node numbers 1 through 127 are for user nodes, node numbers 128 through 254 are for servers, and node numbers 0 and 255 are reserved

AppleTalk Phase 2 Node Numbers:

- In AppleTalk Phase 2, you can use node numbers 1 through 253 for any nodes attached to the network

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- Node numbers 0, 254, and 255 are reserved

AppleTalk Address Example

The following is an example of an AppleTalk network address:

2.35

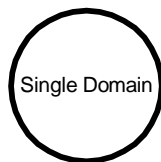
- Enable AppleTalk Routing
- Control Access to AppleTalk Networks
- Configure the Name Display Facility
- Set Up Special Configurations
- Configure AppleTalk Control Protocol for Point-to-Point Protocol
- Tune AppleTalk Network Performance
- Configure AppleTalk Enhanced IGRP
- Configure AppleTalk Interenterprise Routing
- Configure AppleTalk over WANs
- Monitor and Maintain the AppleTalk Network
- Enable AppleTalk Routing
- Configure an Interface for AppleTalk
- Select an AppleTalk Routing Protocol
- Configure Transition Mode
- Enable Concurrent Routing and Bridging
- Configure Integrated Routing and Bridging

Windows Networking Design

For this exam, you have to have some basic knowledge of how to implement Microsoft technologies into your design. The heaviest hit areas are Desktop protocols and Domain design. You need to know your Domain Models:

Single Domain Model

The Single Domain Model is for Small Organizations



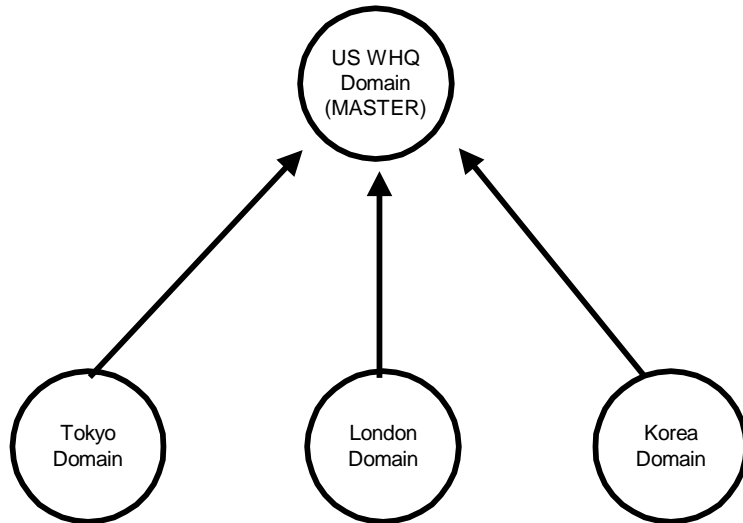
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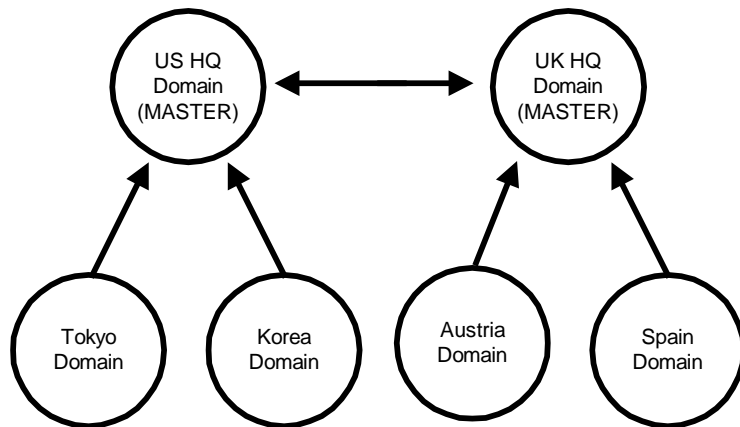
Master Domain Model

All other Domains TRUST a Single Master Domain



Multiple Master Domain Model

All Resource Domains TRUST the respective Master Domain and the 2 Master Domains TRUST each other



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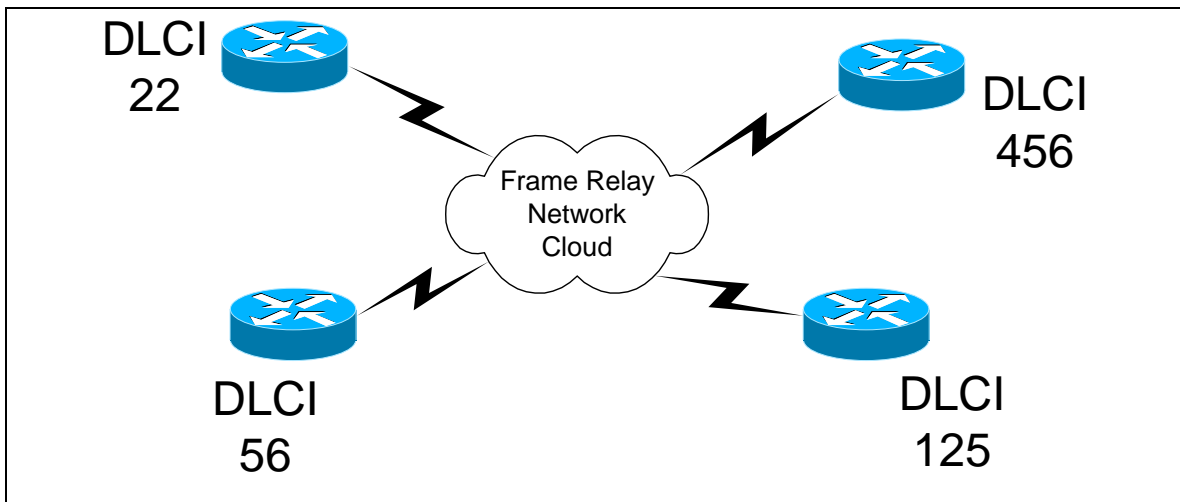
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WAN Design

Frame Relay Design

- Frame Relay is a high-performance WAN protocol that operates at the physical and data link layers of the OSI reference model
- Frame Relay originally was designed for use across Integrated Services Digital Network (ISDN) interfaces as well as many other types
- Frame Relay provides connection-oriented data link layer communication and this means that a defined communication exists between each pair of devices and that these connections are associated with a connection identifier
- This service is implemented by using a Frame Relay virtual circuit, which is a logical connection created between two data terminal equipment (DTE) devices across a Frame Relay packet-switched network



Links for Design:

- [Designing Large-Scale IP Networks](#)
- [Scalable ISDN Backup Strategy for Large OSPF Networks](#)
- [OSPF Design Guide](#)
- [Designing and Implementing OSPF Networks](#)

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X25 Design

- X.25 is designed to operate effectively regardless of the type of systems connected to the network
- It is typically used in the packet-switched networks (PSNs) of common carriers, such as the telephone companies
- Subscribers are charged based on their use of the network
- X.25 Has error checking because it operates at Layer 3

Links for Design:

- [X.25 Configuration Guide](#)
- [X.25 Command Reference](#)

ATM and WAN Design with StrataCom Switches

- Asynchronous Transfer Mode (ATM) is an International Telecommunication Union- Telecommunication Standardization Sector (ITU-T) standard for cell relay wherein information for multiple service types, such as voice, video, or data, is conveyed in small, fixed-size cells
- ATM networks are connection oriented
- ATM is a cell-switching and multiplexing technology that combines the benefits of:
 - **Circuit switching** - guaranteed capacity and constant transmission delay
 - **Packet switching** - flexibility and efficiency for intermittent traffic
- It provides scalable bandwidth from a few megabits per second (Mbps) to many gigabits per second (Gbps).
- Because of its asynchronous nature, ATM is more efficient than synchronous technologies, such as time-division multiplexing (TDM)
- ATM transfers information in fixed-size units called cells:
 - Each cell consists of 53 octets, or bytes
 - The first 5 bytes contain cell-header information, and the remaining 48 contain the "payload"
 - Small fixed-length cells are well suited to transferring voice and video traffic because such traffic is intolerant of delays that result from having to wait for a large data packet to download, among other things

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Links for design:

- [Designing ATM Internetworks](#)
- [Role of ATM in Internetworks](#)
- [Different Types of ATM Switches](#)
- [ATM Overview](#)
- [LANE Implementation](#)
- [Role of Stratm Technology](#)
- [Cisco ATM WAN Products](#)

Network Design Methodology

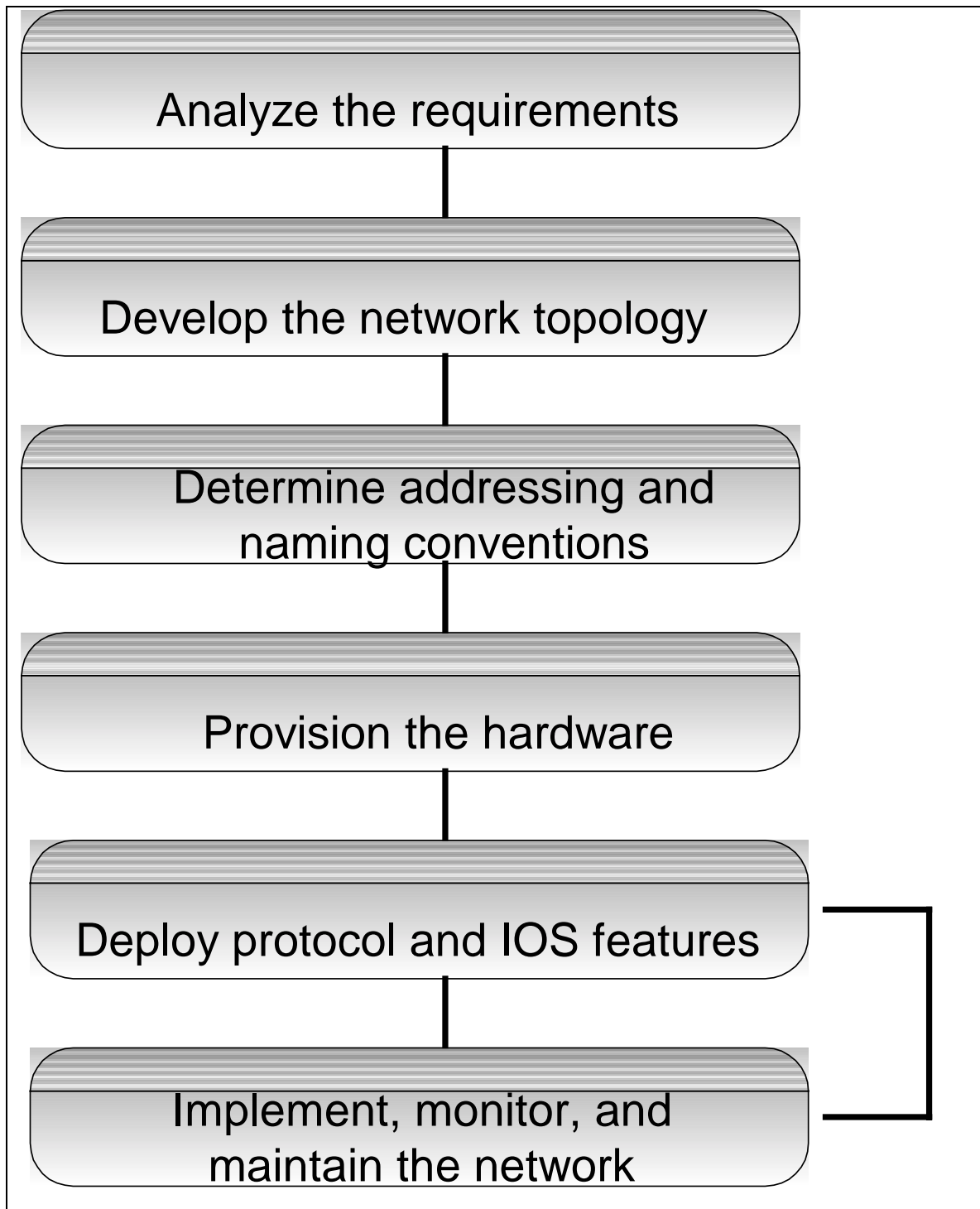
Six common steps can be used to design your network:

1. Analyze the requirements
2. Develop the network topology
3. Determine addressing and naming conventions
4. Provision the hardware
5. Deploy protocol and IOS features
6. Implement, monitor, and maintain the network

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Network Design and Case Studies info

- Introduction
- Internetworking Design Basics
- Designing Large-Scale IP Internetworks
- Designing SRB Internetworks
- Designing SDLC, SDLLC, and QLLC Internetworks
- Designing APPN Internetworks
- Designing DLSw+ Internetworks
- Designing ATM Internetworks
- Designing Packet Service Internetworks
- Designing DDR Internetworks
- Designing ISDN Internetworks
- Designing Switched LAN Internetworks
- Designing Internetworks for Multimedia
- RIP and OSPF Redistribution
- Dial-on-Demand Routing
- Increasing Security on IP Networks
- Integrating Enhanced IGRP into Existing Networks
- Reducing SAP Traffic in Novell IPX Networks
- UDP Broadcast Flooding
- STUN for Front-End Processors
- Using ISDN Effectively in Multiprotocol Networks
- Using HSRP for Fault-Tolerant IP Routing
- LAN Switching
- Multicasting in IP and AppleTalk Networks
- Scaling Dial-on-Demand Routing
- Subnetting an IP Address Space
- IBM Serial Link Implementation Notes
- SNA Host Configuration for SRB Networks
- SNA Host Configuration for SDLC Networks
- Broadcasts in Switched LAN Internetworks

Please use all links and references to aid in your studies

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