CCNP BCMSN Quick Reference Sheets

Exam 642-812

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- The Evolving Network Model
- VLAN Implementation
- Spanning Tree
- InterVLAN Routing
- Layer 3 Redundancy
- Using Wireless LANs
- VoIP in a Campus Network
- Campus Network Security

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Icons Used in This Book


Router


7507 Router


Multilayer Switch with Text


Multilayer Switch


Communication Server


Switch


Internal Firewall


IDS


Web Browser


Database


App Server

The Evolving Network Model

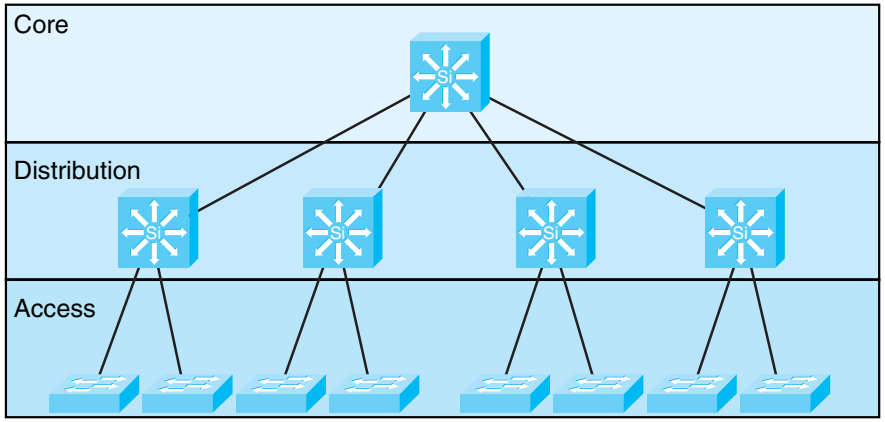
Cisco has developed specific architecture recommendations for Campus, Data Center, WAN, branches, and telecommuting. These recommendations add specific ideas about how current technologies and capabilities match the network roles within an enterprise.

Each of these designs builds on a traditional hierarchical design and adds features such as security, Quality of Service (QoS), caching, and convergence.

The Hierarchical Design Model

Cisco has used the three level *Hierarchical Design Model* for years. This older model provided a high-level idea of how a reliable network might be conceived, but it was largely conceptual because it did not provide specific guidance. Figure 1-1 is a simple drawing of how the three-layer model might have been built out. A distribution layer-3 switch would be used for each building on campus, tying together the access-switches on the floors. The core switches would links the various buildings together.

FIGURE 1-1 THE HIERARCHICAL DESIGN MODEL



The hierarchical design model divides a network into three layers:

- Access—End stations attach to VLANs.
  - — Clients attach to switch ports.
  - — VLAN assigned/broadcast domains established.
  - — Built using low-cost ports.
- Distribution—Intermediate devices route and apply policies.
  - — VLANs terminated, routing between.
  - — Policies applied, such as route selection.
  - — Access-lists.
  - — Quality of Service (QoS).

- Core—The backbone that provides a high-speed path between distribution elements.
  - — Distribution devices are interconnected.
  - — High speed (there is a lot of traffic).
  - — No policies (it is tough enough to keep up).

Later versions of this model include redundant distribution and core devices, and connections that make the model more fault-tolerant. A set of distribution devices and their accompanying access layer switches are called a switch block.

Problems with the Hierarchical Design Model

This early model was a good starting point, but it failed to address key issues, such as:

- Where do wireless devices fit in?
- How should Internet access and security be provisioned?
- How to account for remote-access, such as dial-up or virtual private network (VPN)?
- Where should workgroup and enterprise services be located?

Enterprise Composite Network Model

The newer Cisco model—the Enterprise Composite Model—is significantly more complex and attempts to address the major shortcoming of the Hierarchical Design Model by expanding the older version and making specific recommendations about how and where certain network functions should be implemented. This model is based on the principles described in the Cisco Architecture for Voice, Video, and Integrated Data (AVVID).

The Enterprise Composite Model is broken up into three large sections:

- Enterprise Campus—The portion of the design that is like the old hiearchical model.
- Enterprise Edge—The connections to the public network.
- Service Provider Edge—The different public networks that are attached.

The first section, the Enterprise Campus, looks like the old Hierarchical model with some added details. The Enterprise Campus is shown in Figure 1-2. It features six sections:

- Campus Backbone—The center of the network, like the old “core”.
- Building Distribution—Intermediate devices that route from the core to access devices.

CHAPTER 1

THE EVOLVING NETWORK MODEL

- Building Access—Connections for end systems.
- Management—Command, control, and auditing features.
- Edge Distribution—A distribution layer out to the WAN.
- Server Farm—For Enterprise services.

The Enterprise Edge (shown in Figure 1-3) details the connections from the campus to the Wide Area Network and includes:

- E-Commerce—Externally accessible services that have ties to internal data stores.
- Internet Connectivity—Connectivity to outside services.
- Remote Access—Dial and VPN.
- WAN—Internal links.

FIGURE 1-2 THE ENTERPRISE CAMPUS

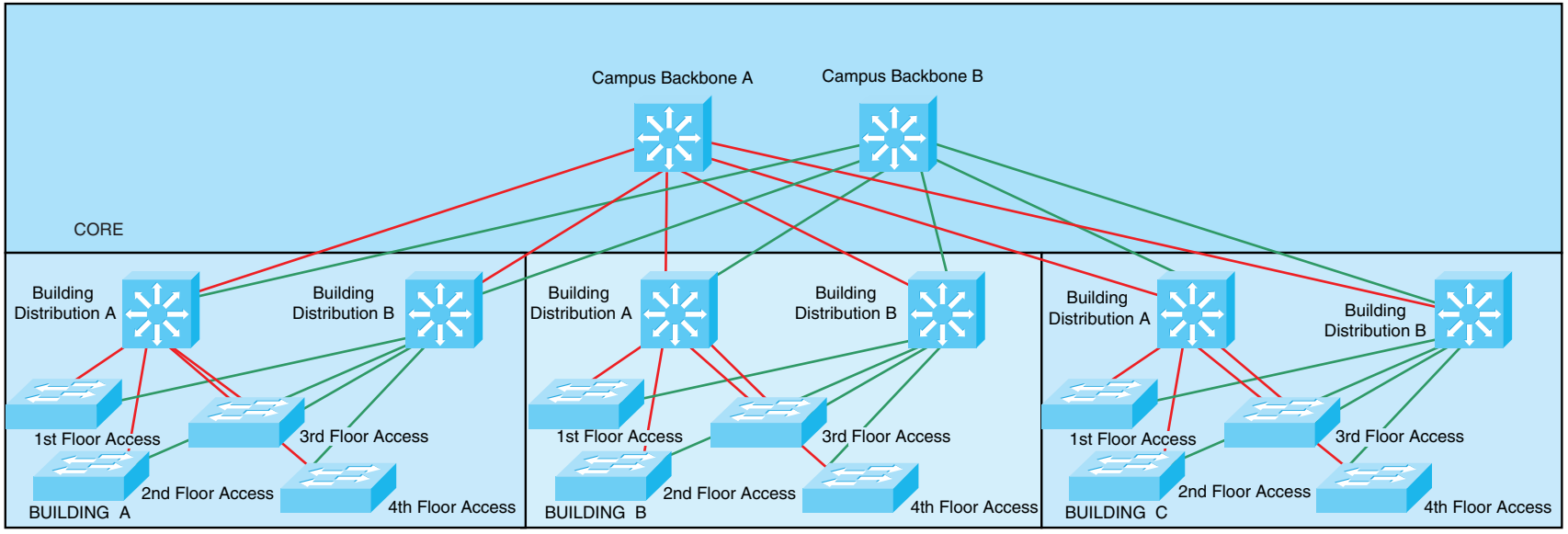


FIGURE 1-3 THE ENTERPRISE EDGE