Your Short Cut to Knowledge

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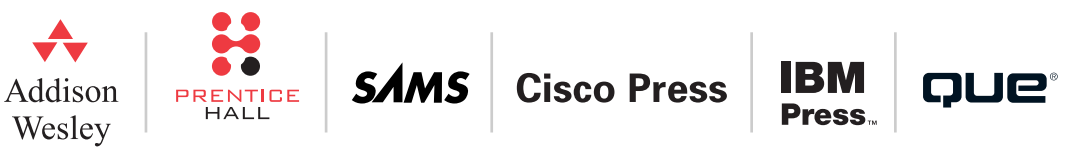


Icons Used in This Book


Router


7507 Router

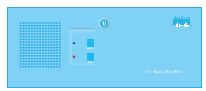

Multilayer Switch with Text


Multilayer Switch


Communication Server


Switch


Internal Firewall


IDS


Web Browser


Database


App Server

The Evolving Network Model

The Hierarchical Design Model

Cisco 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 didn't provide specific guidance. Figure 1-1 shows the Hierarchical Design Model.

FIGURE 1-1 Hierarchical Design Model

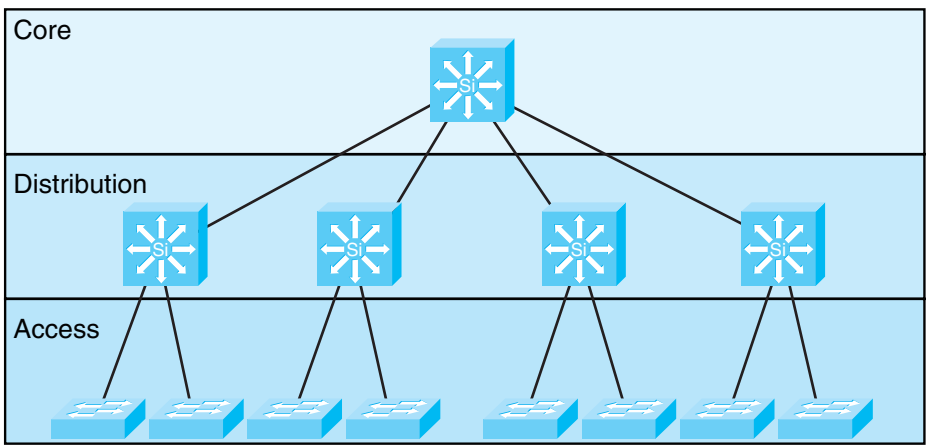
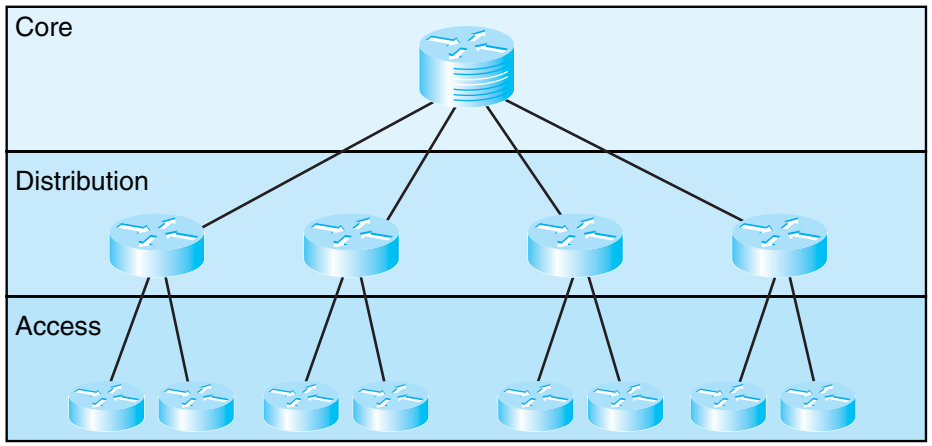


Figure 1-2 is a simple drawing of how the three-layer model might have been built out. A distribution layer-3 switch is used for each building on campus, tying together the access switches on the floors. The core switches link the various buildings together.

This same three-layer hierarchy can be used in the WAN with a central headquarters, division headquarters, and units.

FIGURE 1-2 Three-Layer Network Design



The layers break a network in the following way:

- Access layer—End stations attach to the network using low-cost devices.
- Distribution layer—Intermediate devices apply policies.
  - Route summarization
  - Policies applied, such as:
    - Route selection
    - Access lists
    - Quality of Service (QoS)

- Core layer—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, core devices, and connections, which make the model more fault-tolerant.

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 do you account for remote access, such as dial-up or 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 shortcomings 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).

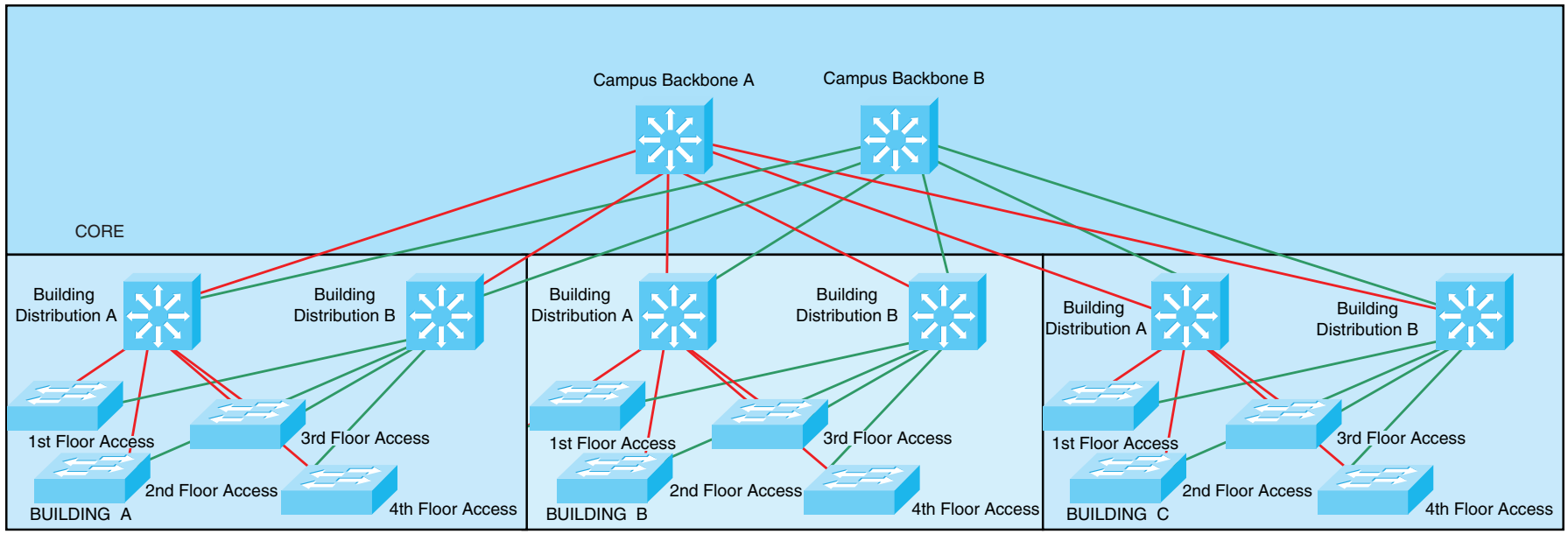
The Enterprise Composite Model (see Figure 1-3) is broken into three large sections:

- Enterprise Campus—Switches that make up a LAN
- Enterprise Edge—The portion of the enterprise network connected to the larger world.
- Service Provider Edge—The different public networks that are attached

The first section, the Enterprise Campus, looks like the old Hierarchical Design Model with added details. It features six sections:

- Campus Backbone—The core of the LAN
- Building Distribution—Links subnets/VLANs and applies policy
- Building Access—Connects users to network
- Management
- Edge Distribution—A distribution layer out to the WAN
- Server Farm—For Enterprise services

FIGURE 1-3 The Enterprise Composite Model



The Enterprise Edge, shown in Figure 1-4, details the connections from the campus to the WAN and includes:

- E-commerce
- Internet connectivity
- Remote access
- WAN

FIGURE 1-4 The Enterprise Edge