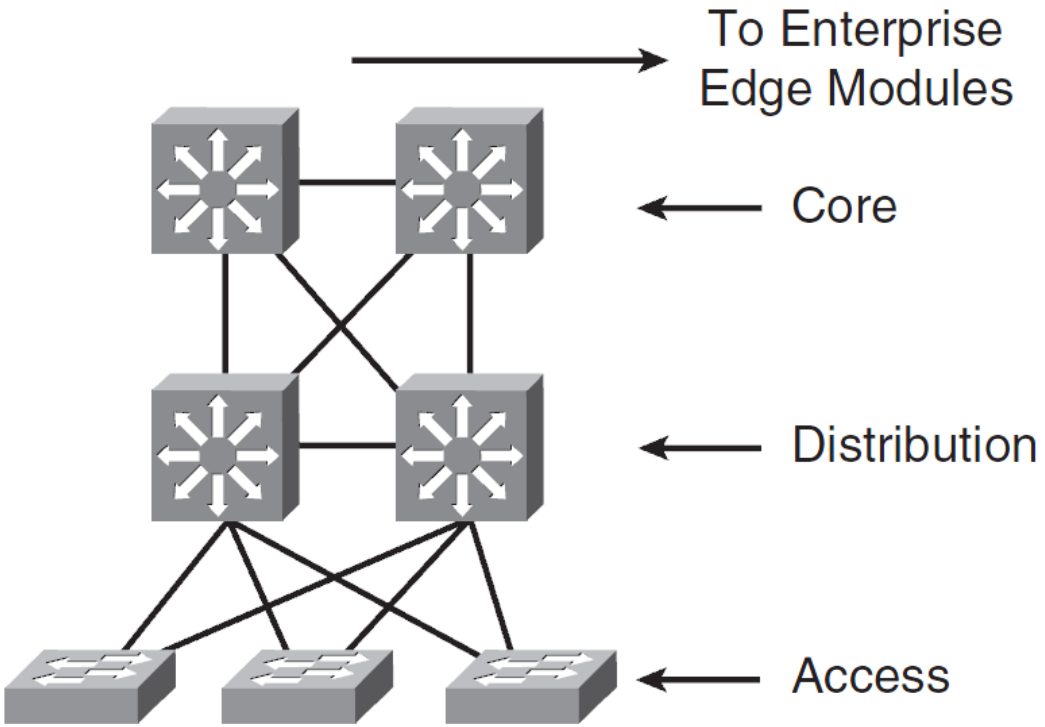
Chapter 2

Hierarchical Network Models

- **Cost savings**
- **Ease of understanding**
- **Modular network growth**
- **Improved fault isolation**



Chapter 2

Core Layer

The core layer is the network's high-speed switching backbone that is crucial to corporate communications. The core layer should have the following characteristics:

- **Fast transport**
- **High reliability**
- **Redundancy**
- **Fault tolerance**
- **Low latency and good manageability**
- **Avoidance of slow packet manipulation caused by filters or other processes**
- **Limited and consistent diameter**
- **Quality of service (QoS)**

Chapter 2

Distribution Layer

The network's distribution layer is the isolation point between the network's access and core layers. The distribution layer can have many roles, including implementing the following functions:

- **Policy (for example, ensuring that traffic sent from a particular network is forwarded out one interface while all other traffic is forwarded out another interface)**
- **Redundancy and load balancing**
- **QoS**
- **Security filtering**
- **Address or area aggregation or summarization**
- **Departmental or workgroup access**
- **Broadcast or multicast domain definition**
- **Routing between virtual LANs (VLAN)**
- **Media translations (for example, between Ethernet and Token Ring)**
- **Redistribution between routing domains (for example, between two different routing protocols)**
- **Demarcation between static and dynamic routing protocols**

Chapter 2

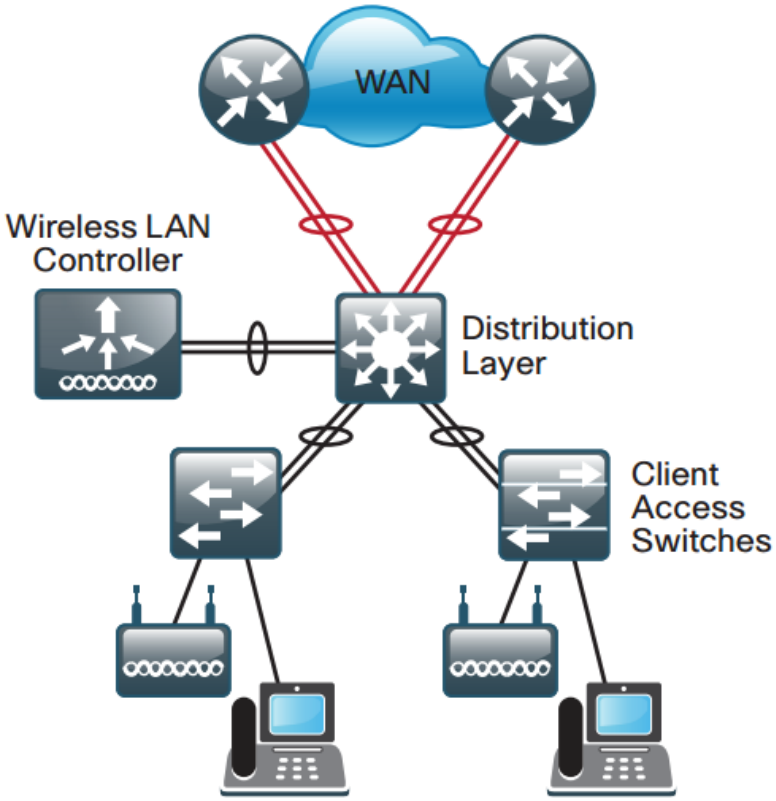
Access Layer

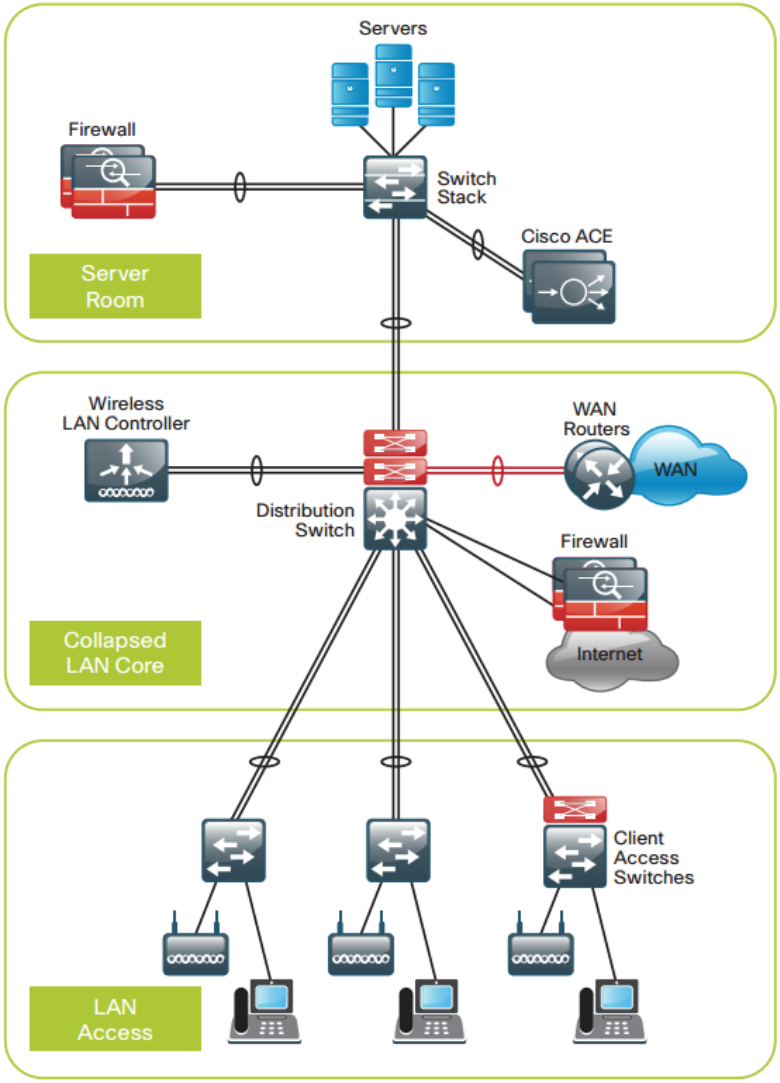
The access layer provides user access to local segments on the network. The access layer is characterized by switched and shared-bandwidth LAN segments in a campus environment. Microsegmentation using LAN switches provides high bandwidth to workgroups by reducing collision domains on Ethernet segments. Some functions of the access layer include the following:

- **Port security**
- **Broadcast suppression**
- **QoS**
- **Address Resolution Protocol (ARP) inspection**
- **Virtual access control lists (VACL)**
- **Spanning tree**
- **Trust classification**
- **Power over Ethernet (PoE)**

Chapter 2

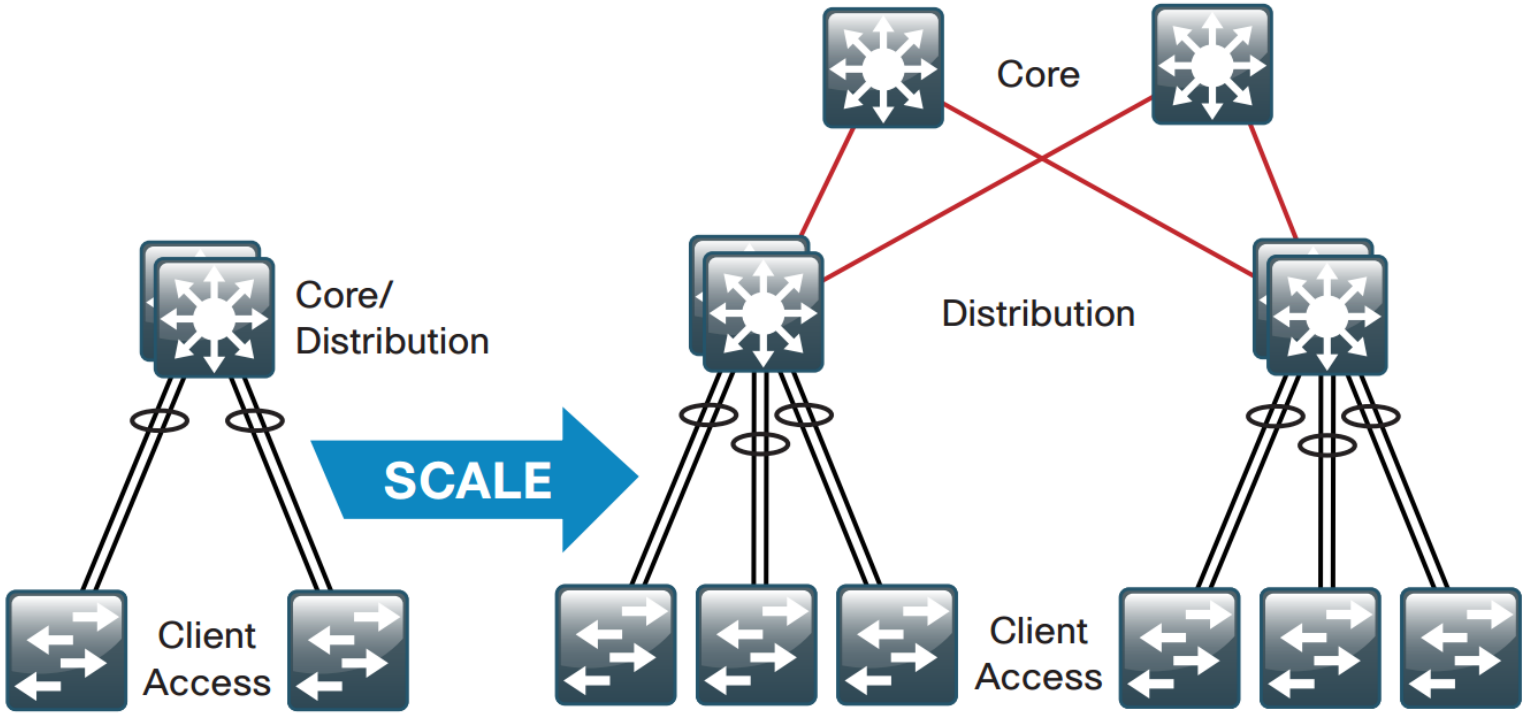
2-Tier design





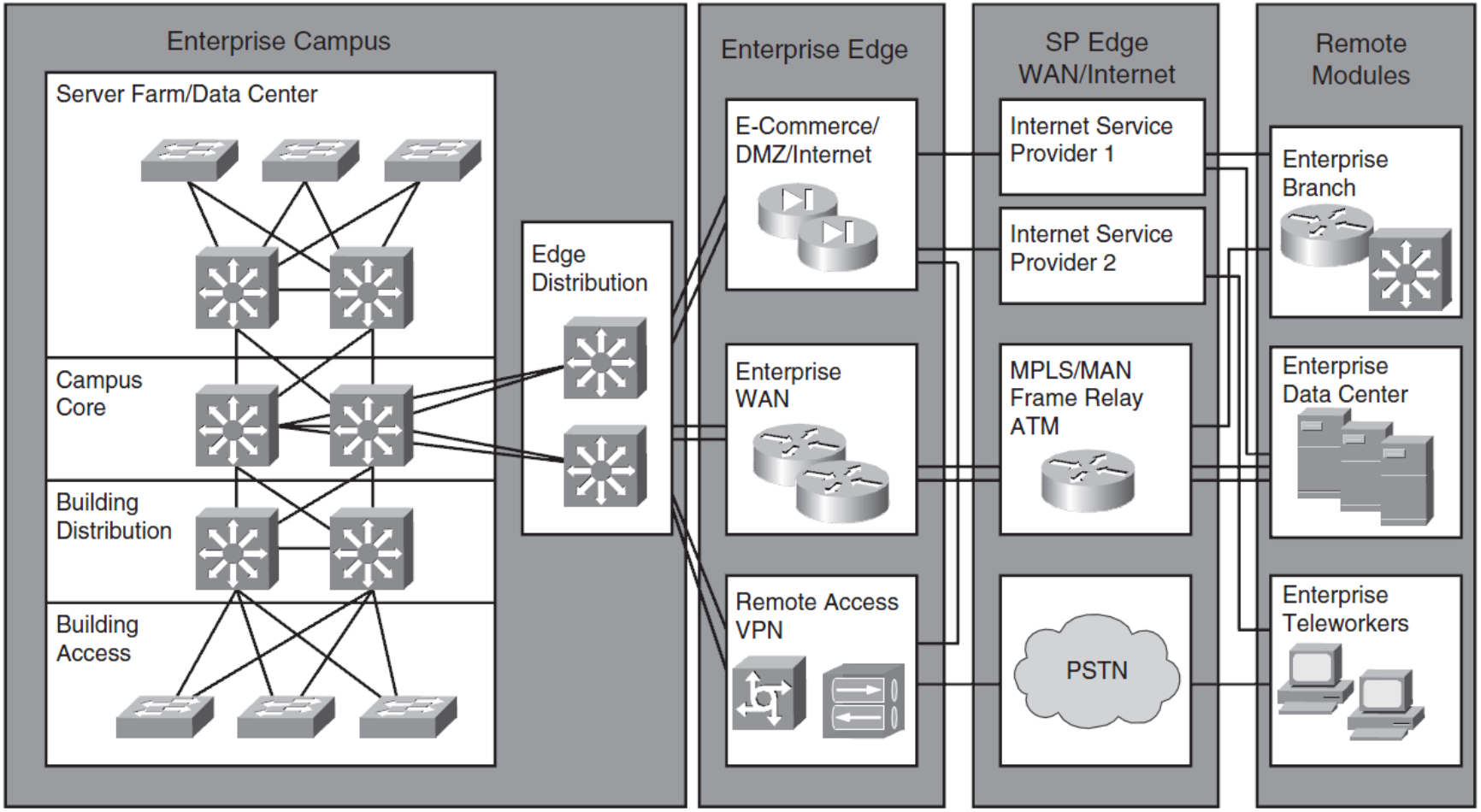
Chapter 2

2/3-Tier design



Chapter 2

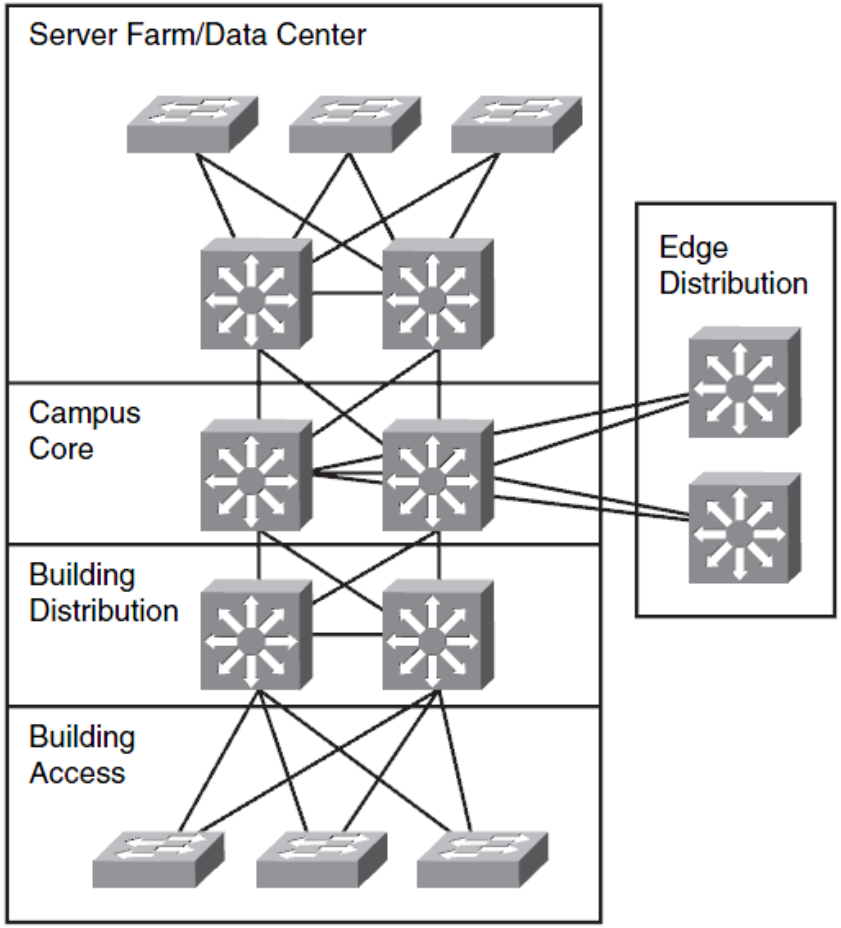
Cisco Enterprise Architecture Model



Chapter 2

Enterprise Campus Module

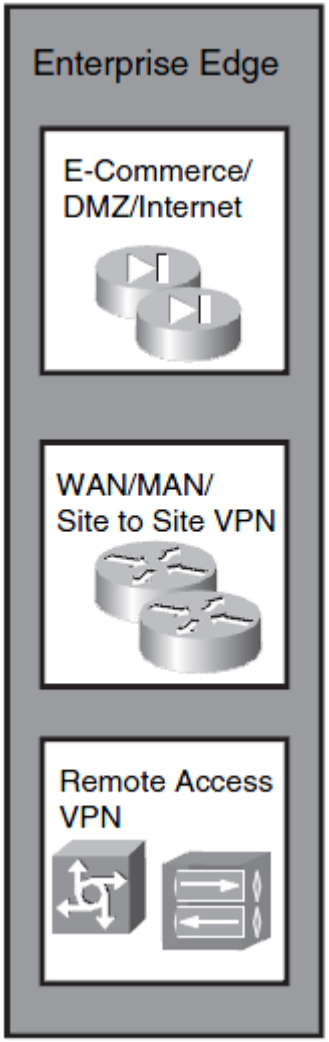
- **Campus core**
- **Building distribution**
- **Building access**
- **Edge distribution**
- **Server farm/data center**



Chapter 2

Enterprise Edge Module

- **E-commerce networks and servers**
- **Internet connectivity and DMZ**
- **VPN and remote access**
- **Enterprise WAN**



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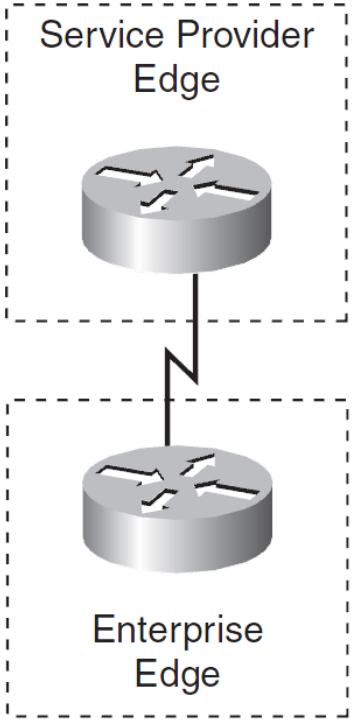
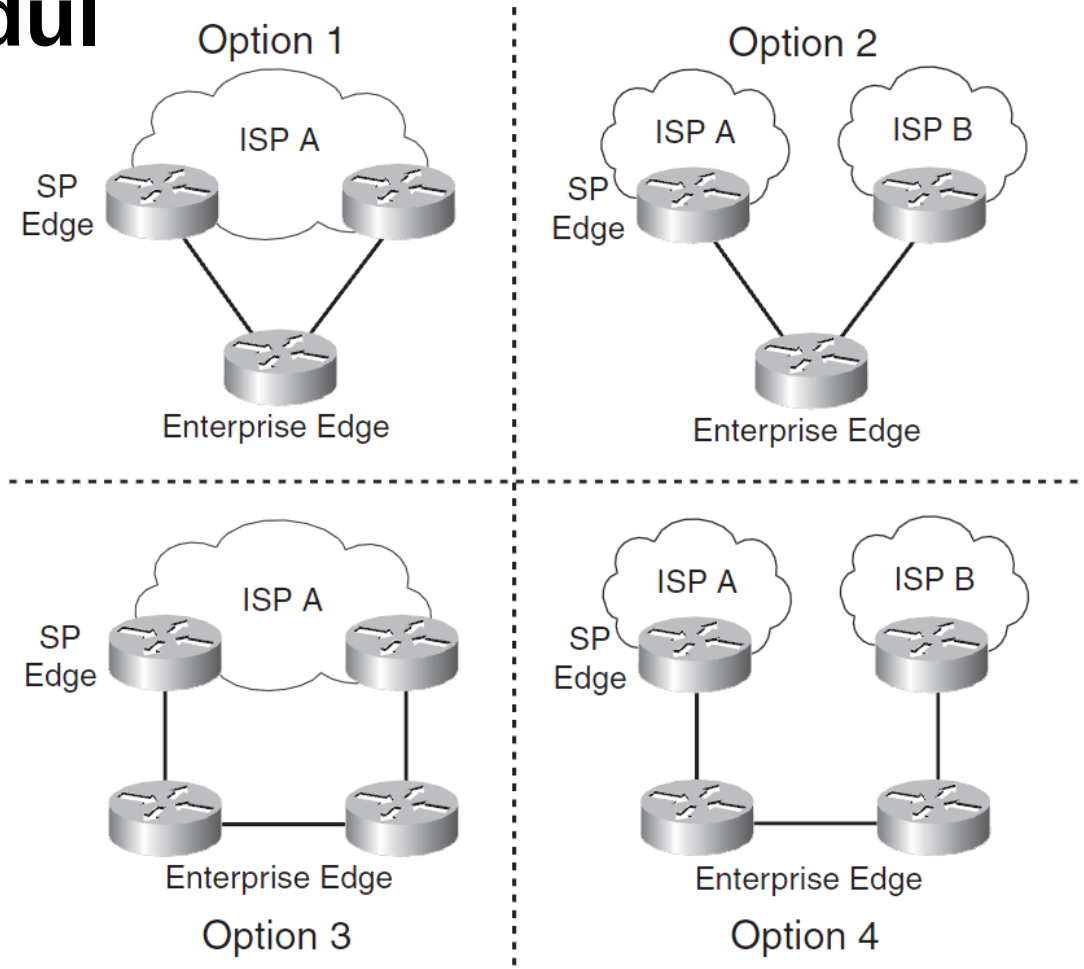
Chapter 2

Internet Edge Modul



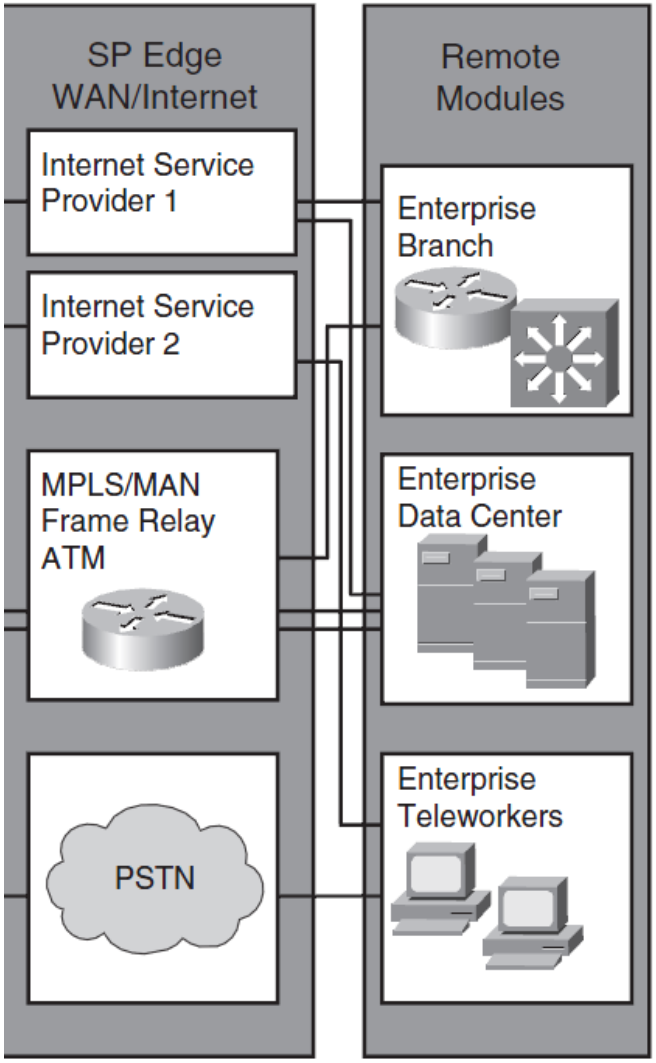


- **Option 1—Single router, dual links to one ISP**
- **Option 2—Single router, dual links to two ISPs**
- **Option 3—Dual routers, dual links to one ISP**
- **Option 4—Dual routers, dual links to two ISPs**

Chapter 2

Remote Modules

- **Enterprise Branch Module**
- **Enterprise Data Center Module**
- **Enterprise Teleworker Module**



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Chapter 2

Network Availability

- Workstation-to-router redundancy in the building-access layer
- Server redundancy in the server farm module
- Route redundancy within and between network components
- Media redundancy in the access layer

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Chapter 2

Workstation-to-Router Redundancy

- **ARP**
- **Explicit configuration**
- **ICMP Router Discovery Protocol (RDP)**
- **RIP**
- **HSRP**
- **Global Load Balancing Protocol (GLBP)**

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Chapter 2

Server Redundancy

- Clusters
- Data replication
- CallManger Clusters
- EtherChannel

Chapter 2

Route Redundancy

- **Load Balancing**
  - **–Route Protocol support**
  - **–EtherChannel**
- **Increasing availability**
  - **–Consistent bandwidth**
  - **–Faster convergence**
  - **–Equal-cost paths**

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Chapter 2

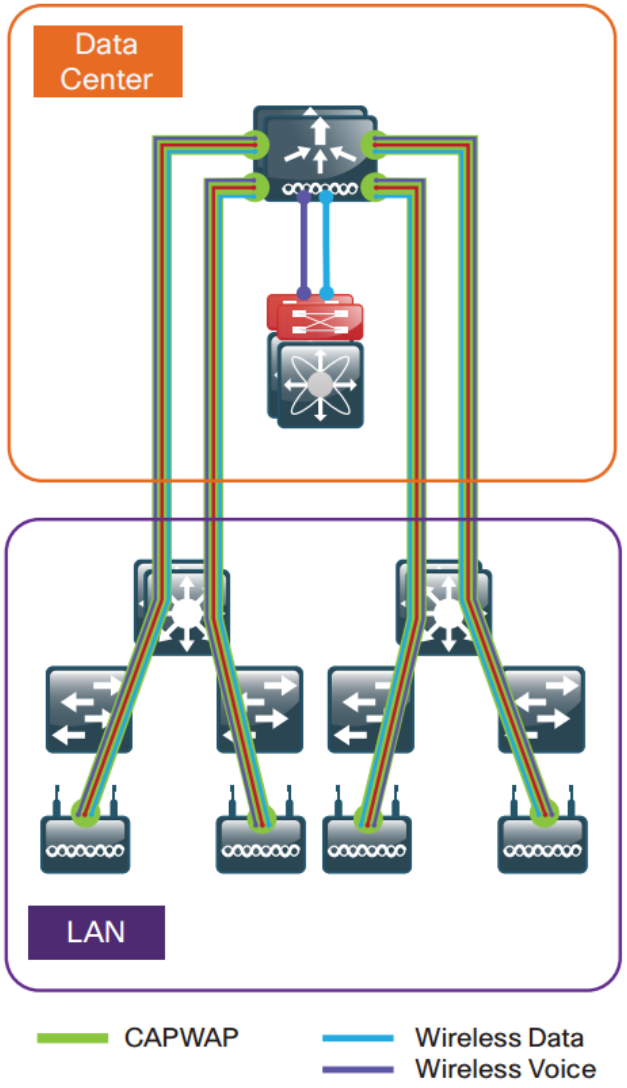
Media Redundancy

- Spanning-Tree
- Floating static routes
- 2-way connections

Chapter 2

Wireless in a LAN

- Use Centralized WLCs
- Tunnel User traffic
- Centralized configuration



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Chapter 2

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