LAN Design

LAN Switching and Wireless – Chapter 1

Objectives

- Describe how a hierarchical network supports the voice, video and data needs of a small and medium-sized business.
- Match the appropriate Cisco switch to each layer in the hierarchical network design model.

Describe how a Hierarchical Network Supports the Needs of a Small & Medium-Sized Business

- Explain the benefits of the hierarchical network model

Benefits of a Hierarchical Network

Scalability
- Hierarchical networks can be expanded easily

Redundancy
- Redundancy at the core and distribution level ensure path availability

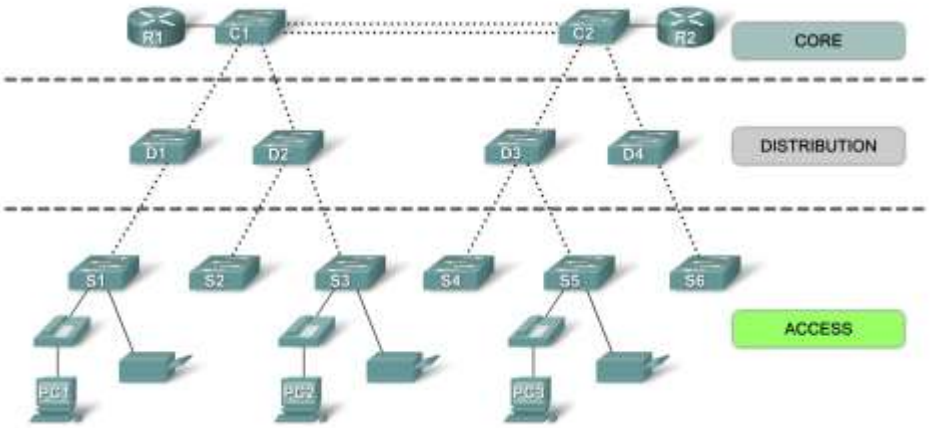
Performance
- Link aggregation between levels and high-performance core and distribution level switches allow for near wire-speed throughout the network

Security
- Port security at the access level and policies at the distribution level make the network more secure

Manageability
- Consistency between switches at each level makes management more simple

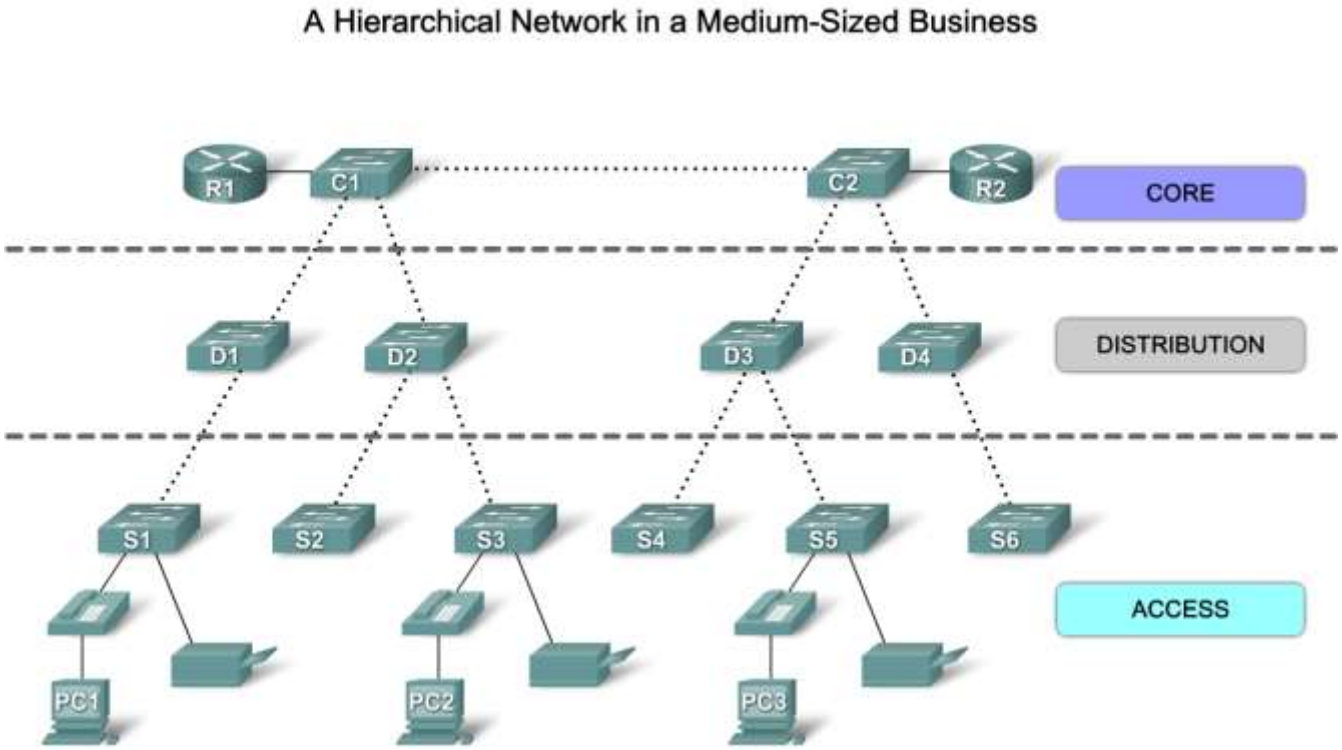
Maintainability
- The modularity of hierarchical design allows for the network to scale without becoming overly complicated

The Hierarchical Network Model



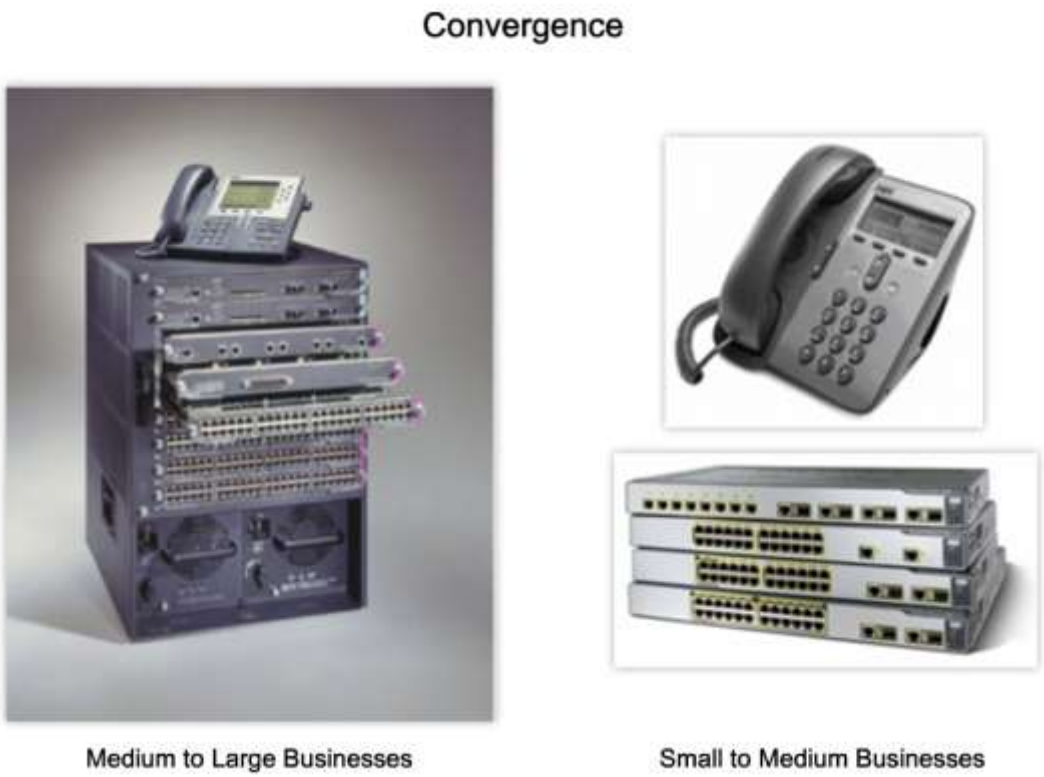
Describe how a Hierarchical Network Supports the Needs of a Small & Medium-Sized Business

- Describe the key principles of hierarchical network design



Describe how a Hierarchical Network Supports the Needs of a Small & Medium-Sized Business

- Describe the role of a converged network in supporting small and medium-sized (SMB) business voice, video, and data needs



Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the considerations used to select a switch for a hierarchical network

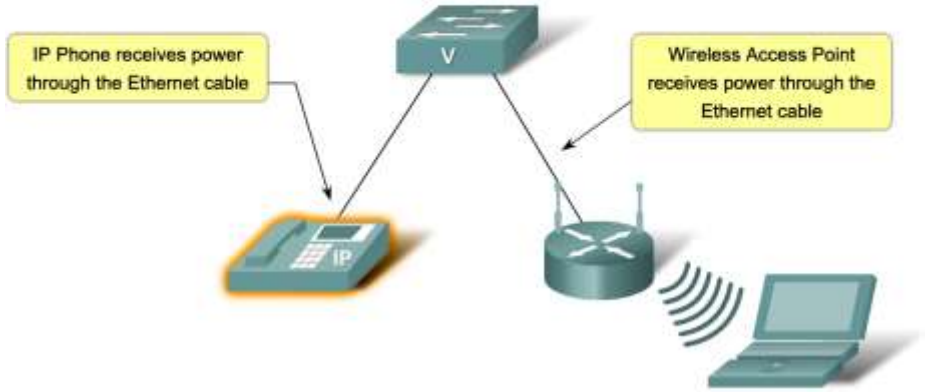
Port density is the number of ports available on a single switch.

24-port switch

48-port switch

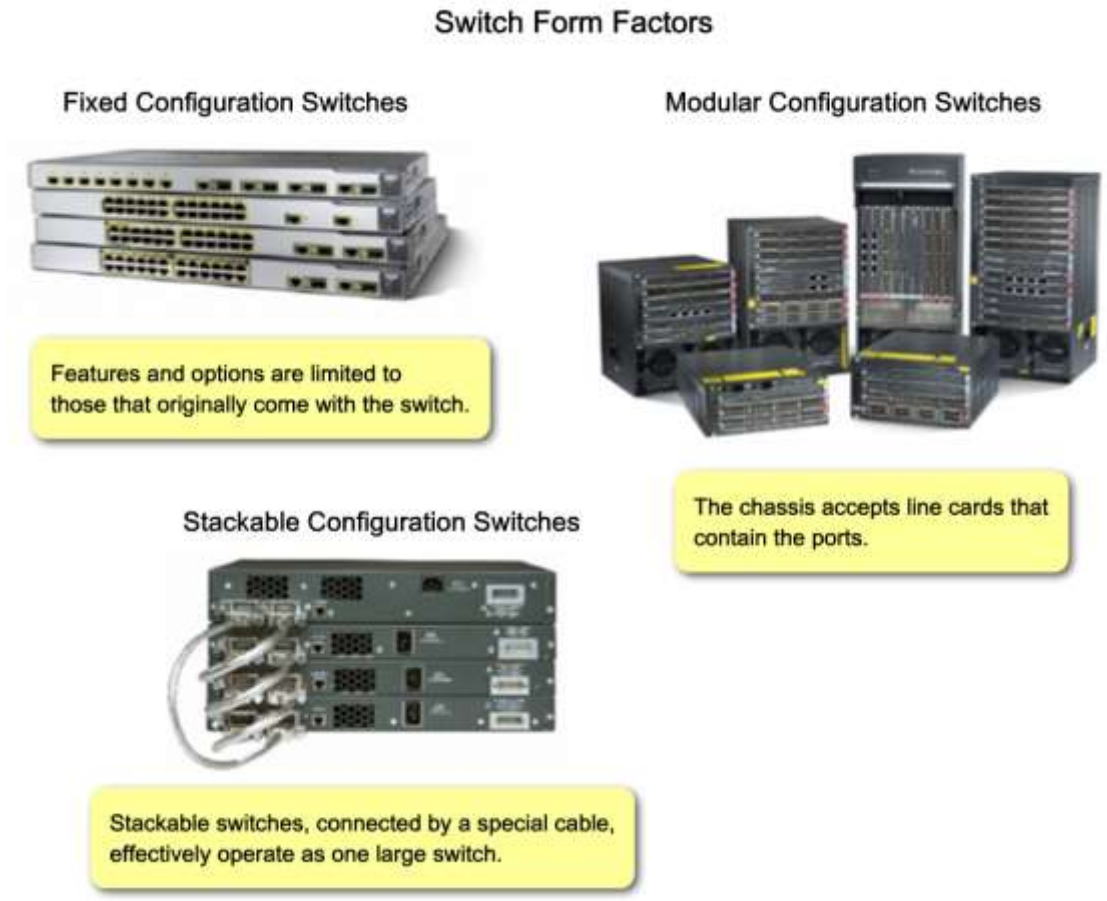
Modular switch with up to 1000+ ports

PoE and Layer 3 Functionality



Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the key features of switches that are used in hierarchical networks

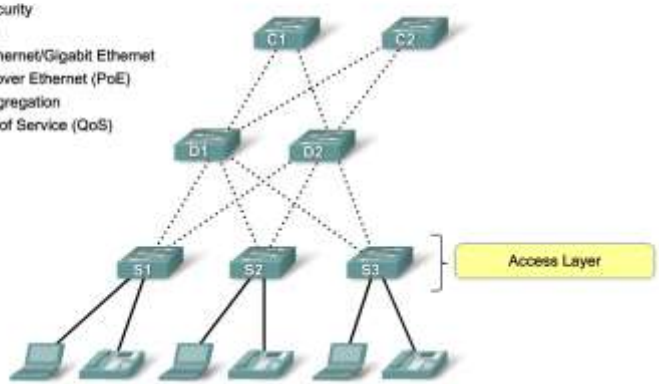


Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the switch features found in each level in a hierarchical network

Access Layer Switch Features

- Port security
- VLANs
- Fast Ethernet/Gigabit Ethernet
- Power over Ethernet (PoE)
- Link aggregation
- Quality of Service (QoS)



Distribution Layer Switch Features

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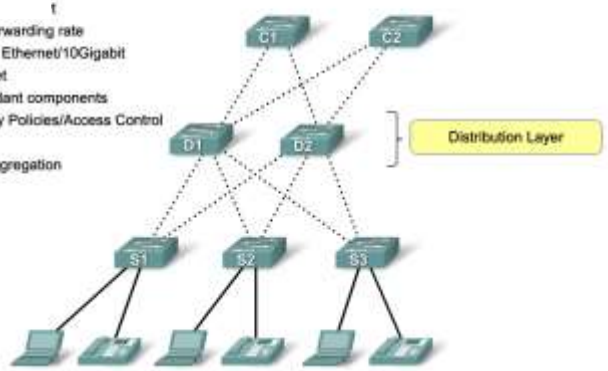
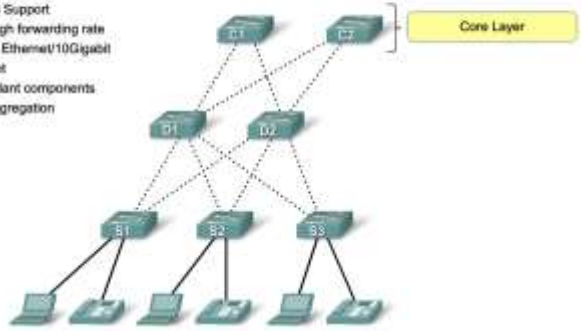
- High forwarding rate
- Gigabit Ethernet/10Gigabit Ethernet
- Redundant components
- Security Policies/Access Control Lists
- Link Aggregation
- QOS



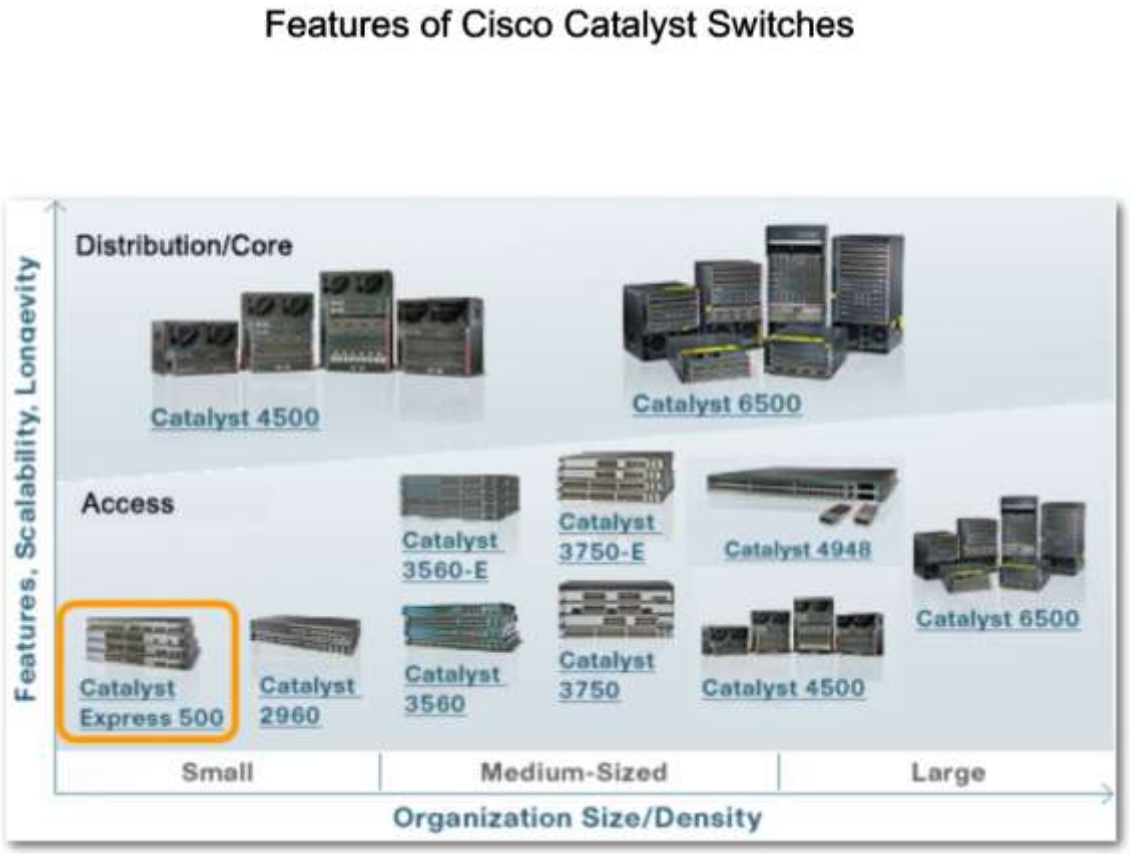
Core Layer Switch Features

- Layer 3 Support
- Very High forwarding rate
- Gigabit Ethernet/10Gigabit Ethernet
- Redundant components
- Link Aggregation
- QoS



Match the Appropriate Cisco Switch to each Layer in the Hierarchical Network Design Model

- Identify the Cisco switches used in SMB applications



Summary

- Hierarchical Design model addresses performance, scalability, maintainability & manageability issues.
- Traffic Analysis is used to monitor network performance.
- Hierarchical Design Model is composed of 3 layers:
  - Access
  - Distribution
  - Core
- Switches selected for each layer must meet the needs of each hierarchical layer as well as the needs of the business.