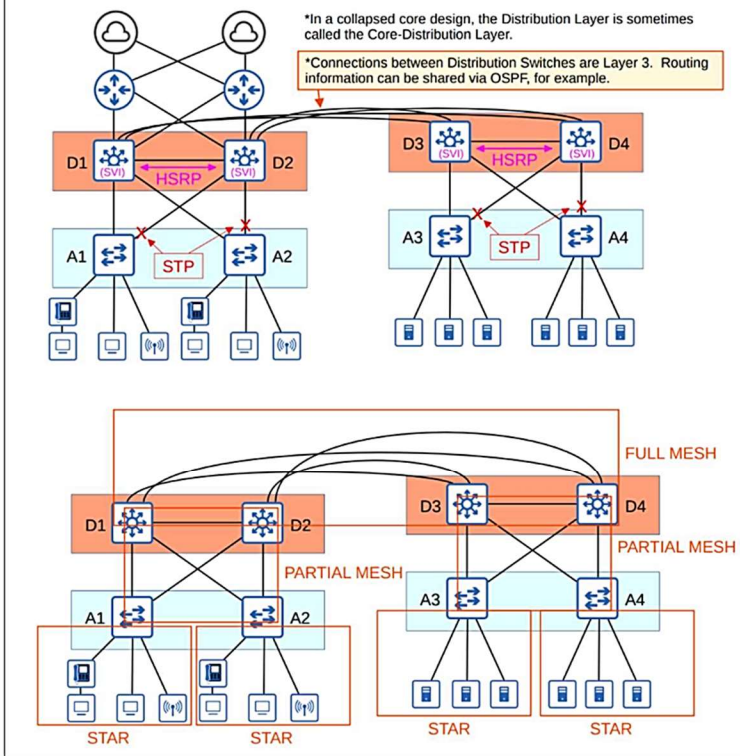
1.2.a 2,3 tier

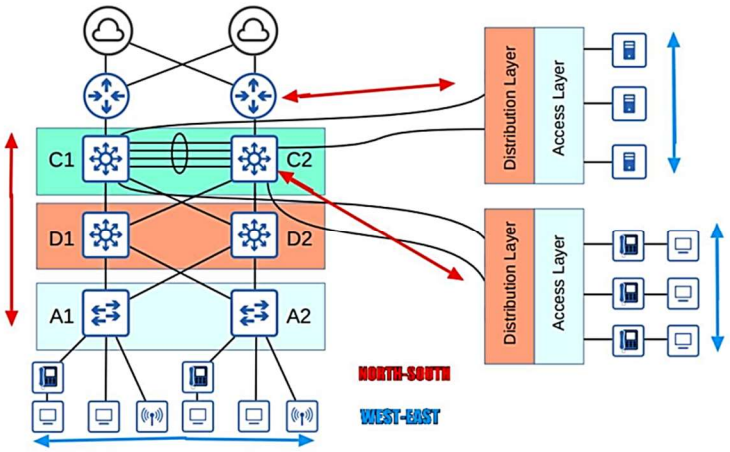
Two-Tier LAN:

- The two-tier LAN design consists of two hierarchical layers:
  - → **Access Layer**
  - → **Distribution Layer**
- Also called a 'Collapsed Core' design because it omits a layer that is found in the Three Tier design: the **Core Layer**
- **Access Layer:**
  - → the layer that end hosts connect to (PCs, printers, cameras, etc.)
  - → typically Access Layer Switches have lots of ports for end hosts to connect to
  - → QoS marking is typically done here
  - → Security services like port security, DAI, etc are typically performed here
  - → switchports might be PoE-enabled for wireless APs, IP phones, etc.
- **Distribution Layer:**
  - → aggregates connections from the Access Layer Switches
  - → typically is the border between Layer 2 and Layer 3
  - → connects to services such as Internet, WAN, etc.



Three-Tier LAN:

- **Access Layer:**
  - → the layer that end hosts connect to (PCs, printers, cameras, etc.)
  - → typically Access Layer Switches have lots of ports for end hosts to connect to
  - → QoS marking is typically done here
  - → Security services like port security, DAI, etc are typically performed here
  - → switchports might be PoE-enabled for wireless APs, IP phones, etc.
- **Distribution Layer: *sometimes called Aggregation Layer**
  - → aggregates connections from the Access Layer Switches
  - → typically is the border between Layer 2 and Layer 3
  - → connects to services such as Internet, WAN, etc. *in a two-tier design
- **Core Layer:**
  - → Connects Distribution Layers together in large LAN networks
  - → The focus is speed ('fast transport')
  - → CPU-intensive operations such as security, QoS marking/classification, etc. should be avoided at this Layer
  - → Connections are all Layer 3. No spanning-tree!
  - → Should maintain connectivity throughout the LAN even if devices fail



Spine-Leaf Architecture:

- There are some rules about Spine-Leaf architecture:
  - → Every Leaf switch is connected to every Spine switch.
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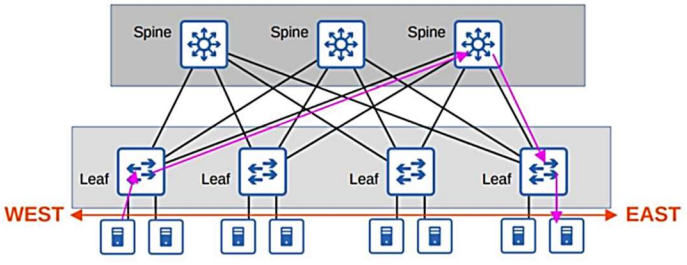
  - → Leaf switches do not connect to other Leaf switches.
  - → Spine switches do not connect to other Spine switches.
  - → End hosts (servers etc.) only connect to Leaf switches.
- The path taken by traffic is randomly chosen to balance the traffic load among the Spine switches.
- Each server is separated by the same number of 'hops' (except those connected to the same Leaf), consistent latency for East-West traffic.



1.2.c Spine-leaf (aka Clos architecture)

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Cisco ACI architecture uses the Spine-leaf architecture.