Module Summary

- Cisco SONA is the enterprise framework for implementing intelligent networks and maps business requirements to network requirements.
- The design methodology under PPDIOO includes these tasks:
  - Identifying customer requirements
  - Characterizing the existing network and sites
  - Designing the network topology and solutions
- The result of network characterization is a summary report describing the health of the network.
- Top-down design facilitates network design.

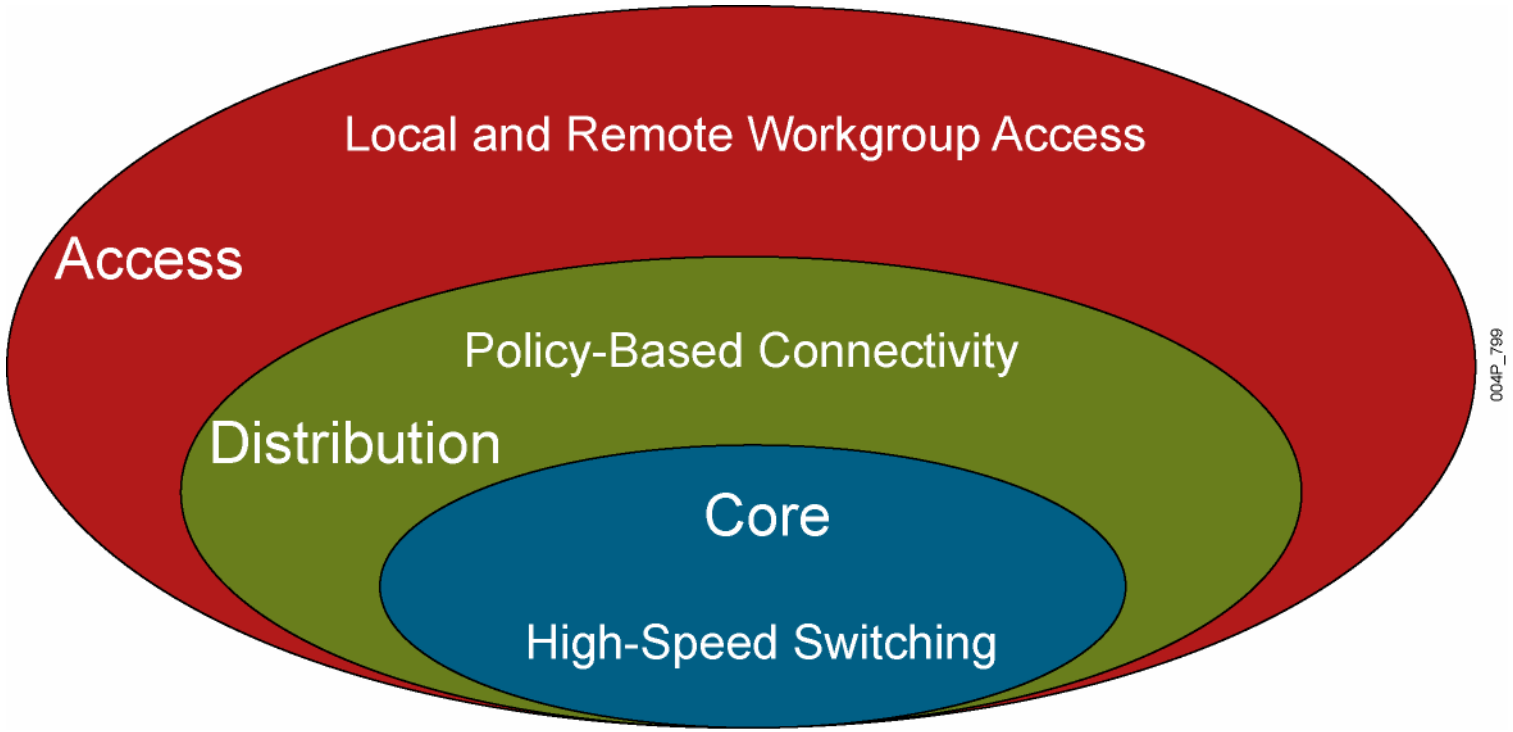
Structuring and Modularizing the Network

Designing for Cisco Internetwork Solutions (DESGN) v2.0

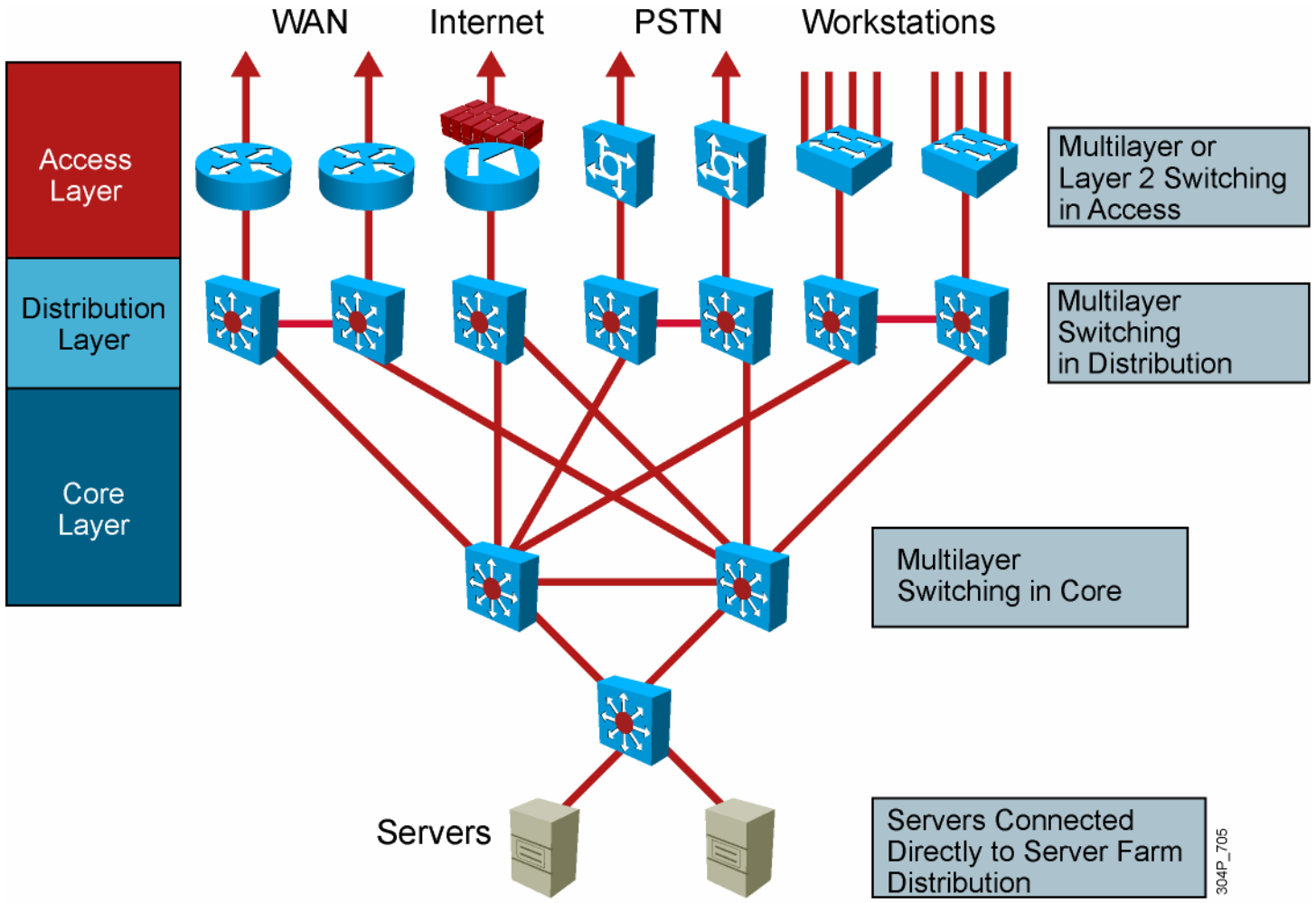
Designing the Network Hierarchy

Structuring and Modularizing the Network

Layers in the Hierarchical Model



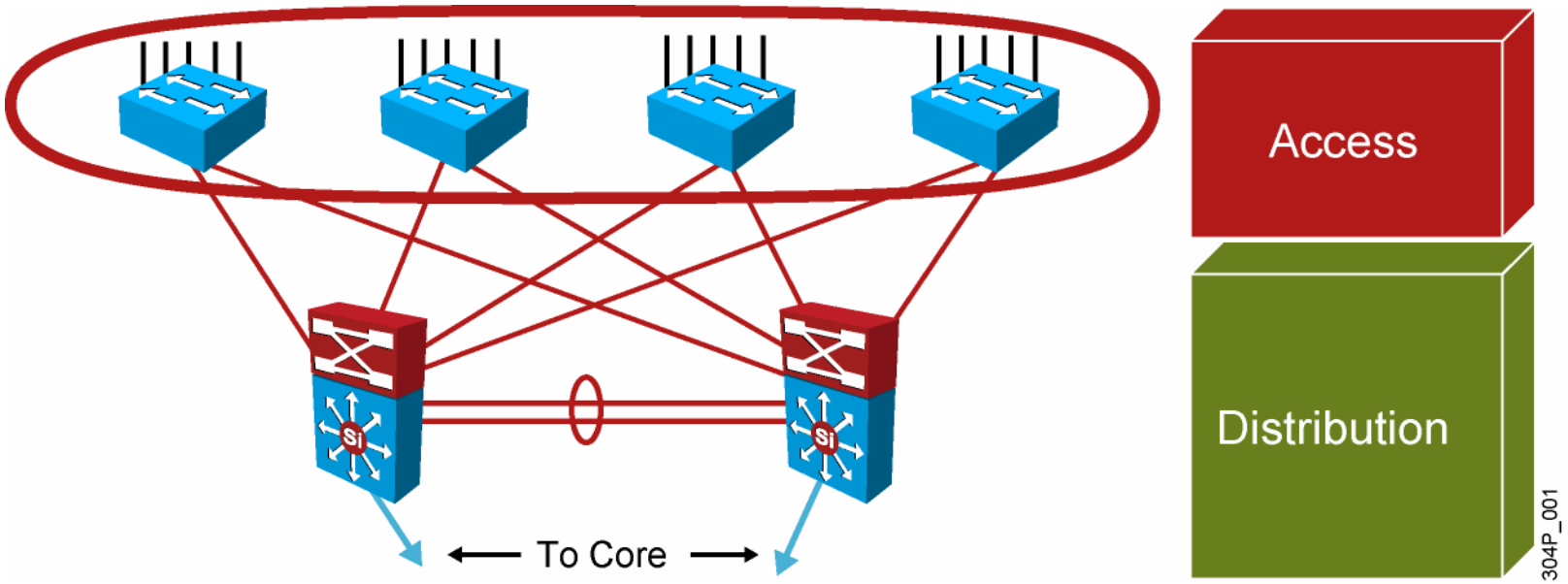
Example: Hierarchical Network



Access Layer

- Concentration point at which clients access the network
- Layer 2 switching in the access layer: Defines a single broadcast domain
- Multilayer switching in the campus access layer: Optimally satisfies the needs of a particular user through routing, filtering, authentication, security, or quality of service
- Multilayer switching in the WAN access layer: Helps control WAN costs using dial-on-demand routing (DDR) and static routing

Example: Access Layer Connectivity in the Campus LAN



- Workstations are attached to VLANs with Layer 2 switches.
- Recommended practice: Implement one VLAN (IP subnet) per access switch.
- Access switches connect Layer 3 links (if only one VLAN per access switch) or via VLAN trunk.
- If needed, distribution routers route between VLANs.

Distribution Layer

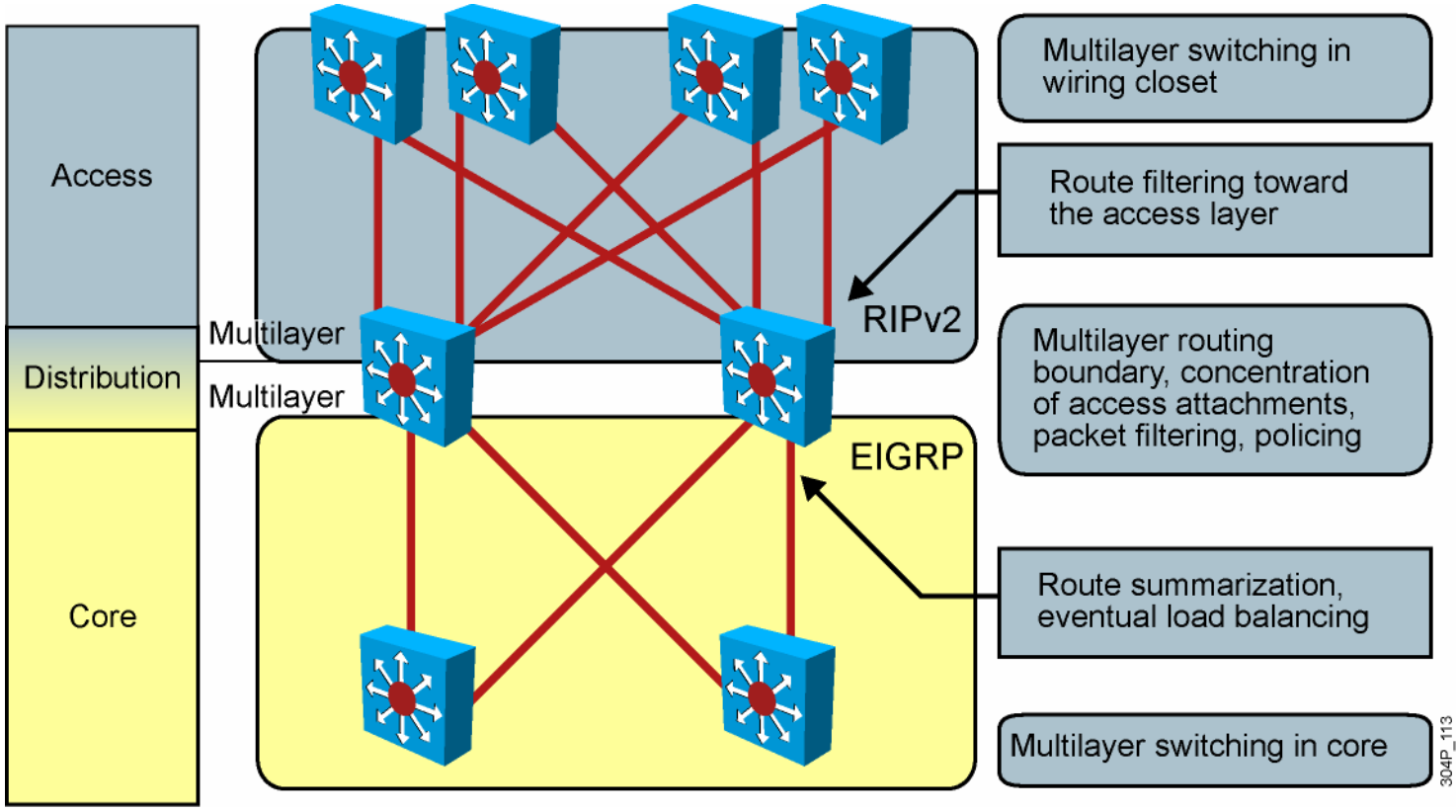
Provides multilayer switching between access and core layers:

- Provides media transitions
- Aggregates bandwidth by concentrating multiple low-speed access links into a high-speed core link
- Determines department or workgroup access
- Provides redundant connections for access devices

Implements policy-based decisions:

- Filtering by source or destination address
- Filtering on input or output ports
- Hiding internal network numbers by route filtering
- Static routing
- Security
- Quality of service mechanisms

Example: Distribution Layer in the Routed Campus Network



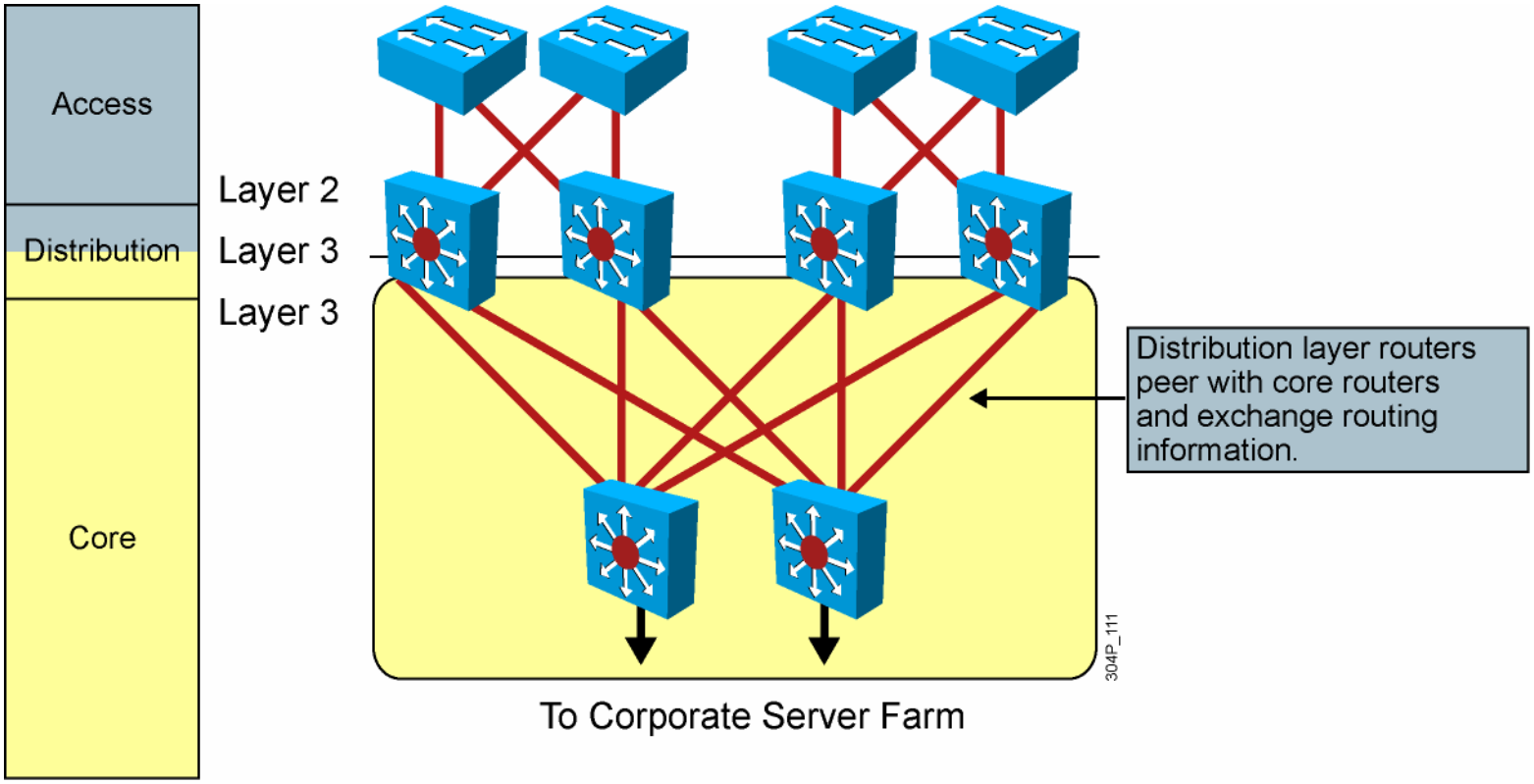
Core Layer

The function of the core layer is to provide fast and efficent data transport that:

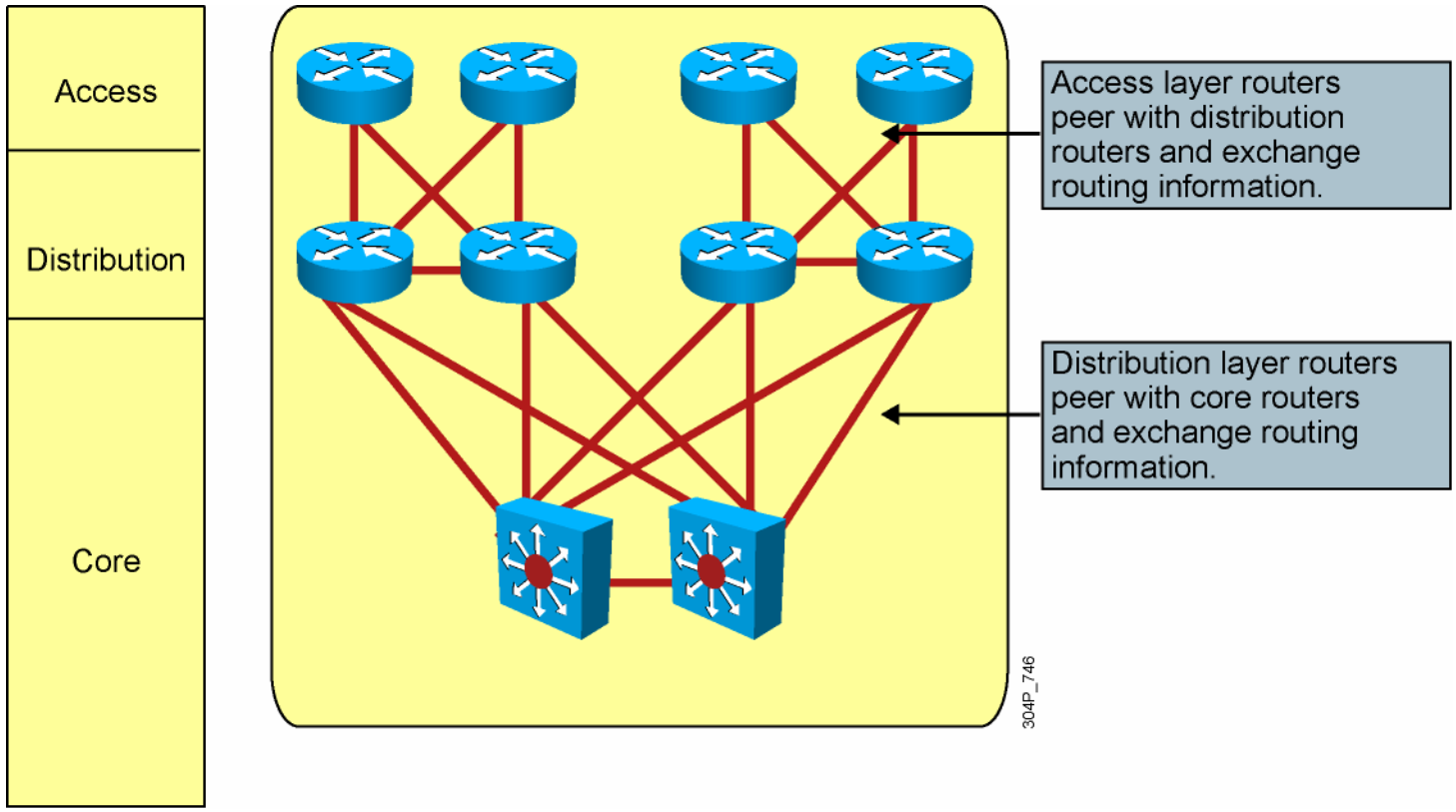
- Forms a high-speed backbone with fast transport services
- Provides redundancy and fault tolerance
- Offers good manageability

Note: Core layer should avoid packet manipulation for filtering or access list checking.

Example: Multilayer Switching in the Campus Core



Example: Routing in the WAN Network



Summary

- The hierarchical network model provides a modular view of a network, making it easier to design and build a network.
- The purpose of the access layer is to grant end-user access to network resources.
- The distribution layer provides aggregation for the access layer devices and uplinks to the core layer. It is also used to enforce policy within the network.
- The core layer provides a high-speed, highly available backbone designed to switch packets as fast as possible.