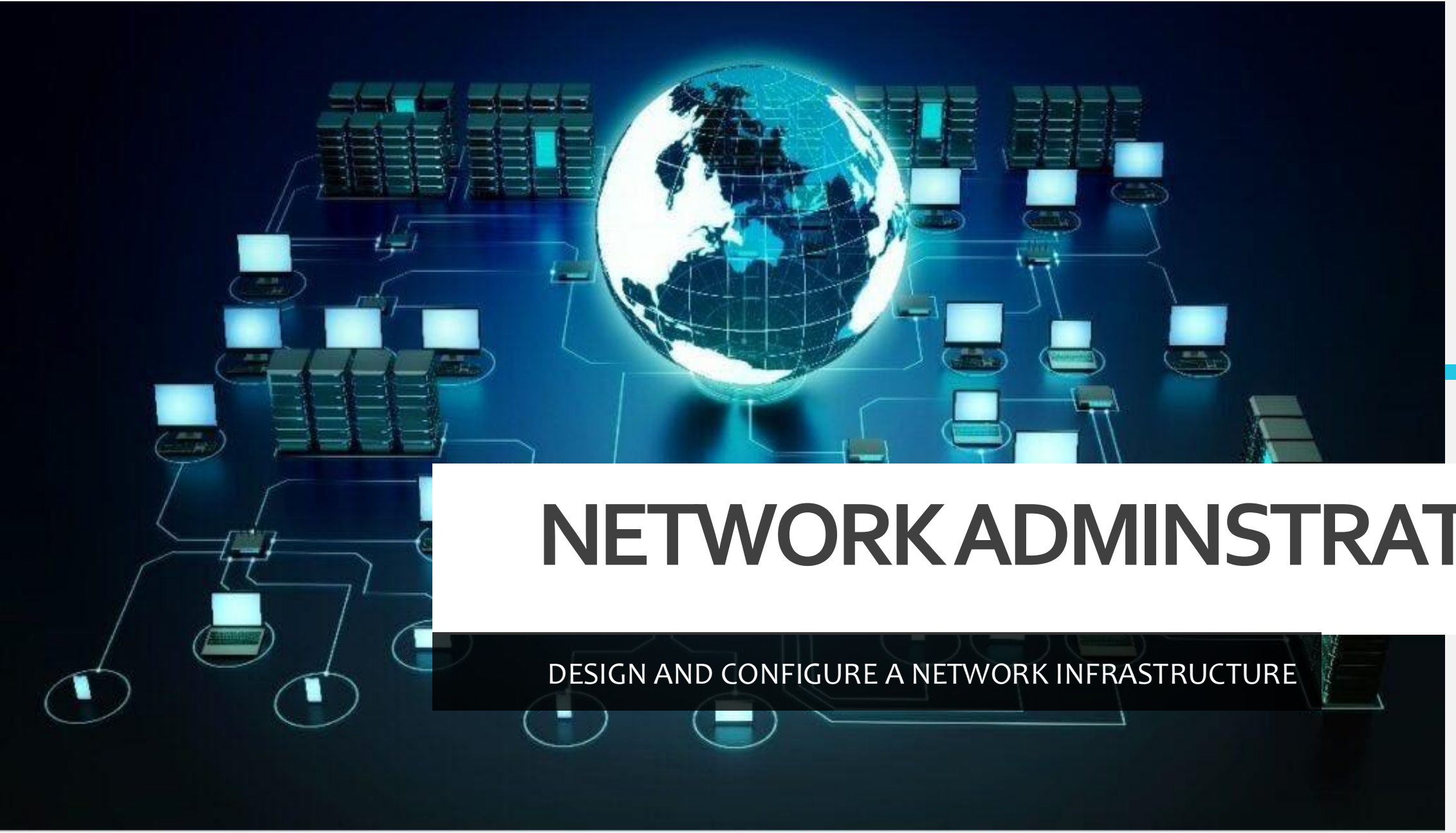


NETWORK ADMINSTRATION

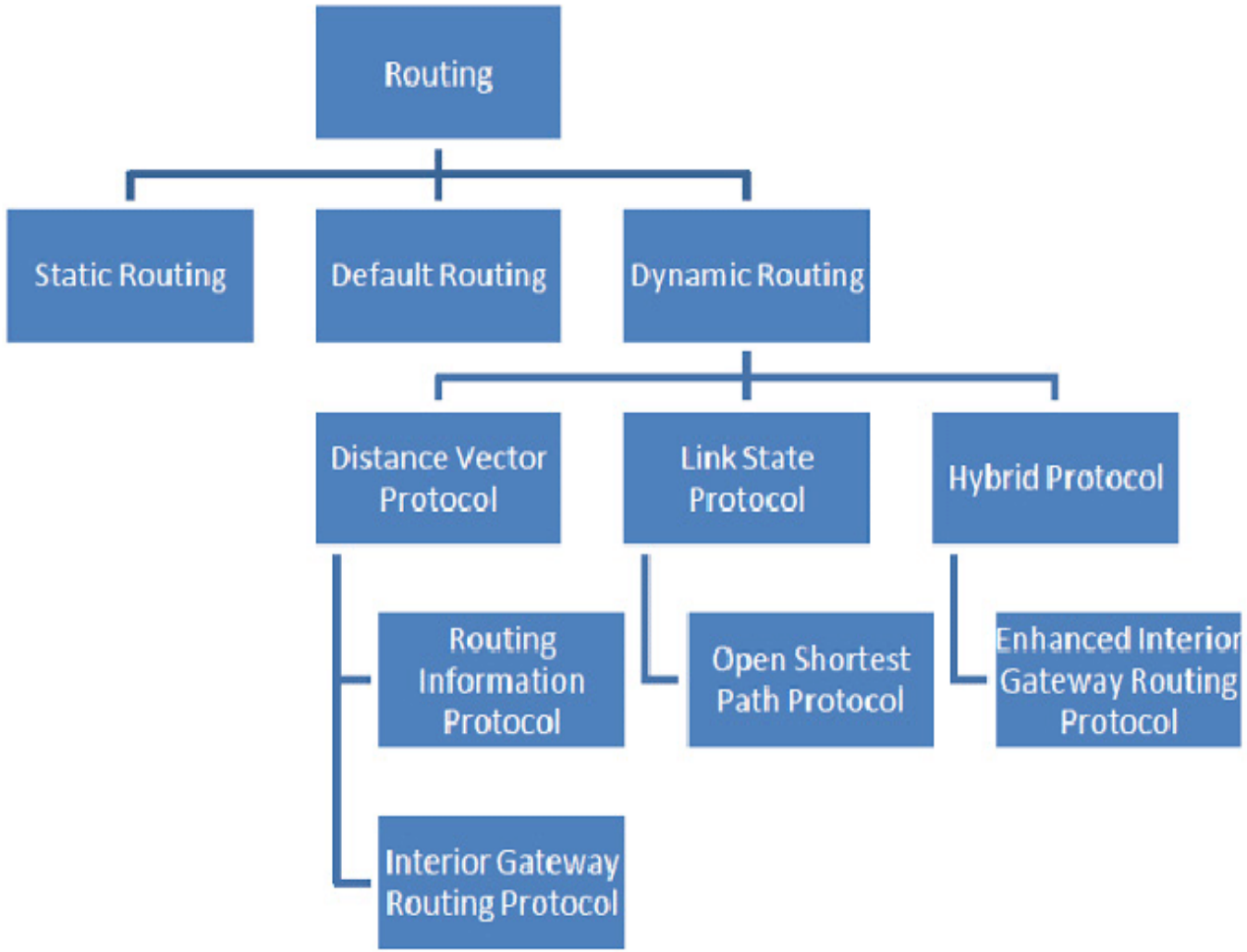
DESIGN AND CONFIGURE A NETWORK INFRASTRUCTURE

NETWORK ARCHITECTURE

"Enterprise Network Design and Simulation: OSPF Areas, BGP, and VLANs in Action"

Practical Demonstration

- Design a network with multiple departments, each in a separate VLAN.
- Implement OSPF for internal routing and BGP for external connectivity.
- Configure DHCP and DNS servers for dynamic IP assignment and name resolution



Routing Protocols Overview

- **OSPF (Open Shortest Path First):**

Link-state routing protocol suitable for large and complex networks.

- **EIGRP (Enhanced Interior Gateway Routing Protocol):**

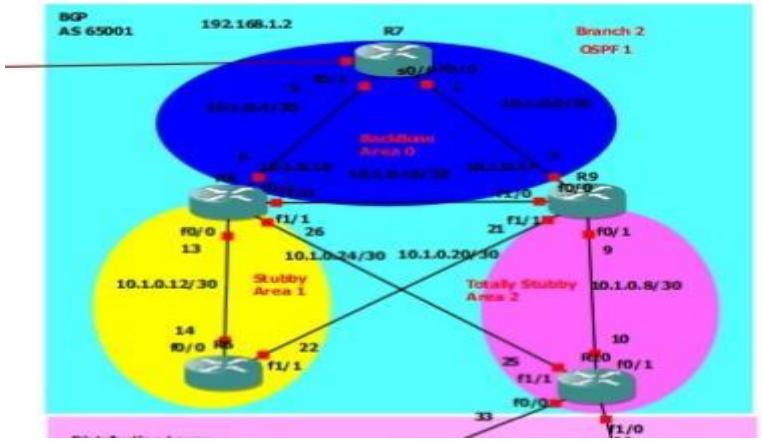
Cisco proprietary hybrid routing protocol combining features of distance-vector and link-state protocols.

- **BGP (Border Gateway Protocol):**

Path-vector protocol used for routing between autonomous systems on the internet

OSPF

Open Shortest Path First



Single-Area OSPF:

- Simplified OSPF configuration where all routers are in the same area.
- Useful for smaller networks.

Multi-Area OSPF:

- Divides the network into multiple areas to optimize routing and reduce overhead.
- Area 0 (Backbone Area) connects all other areas.

OSPF Areas

- **Backbone Area (Area 0):** Central area through which all other areas must connect.
- **Stub Area (Area 1):** Does not receive external route advertisements.
- **Totally Stubby Area (Area 2):** Further restricts routing information to reduce overhead.

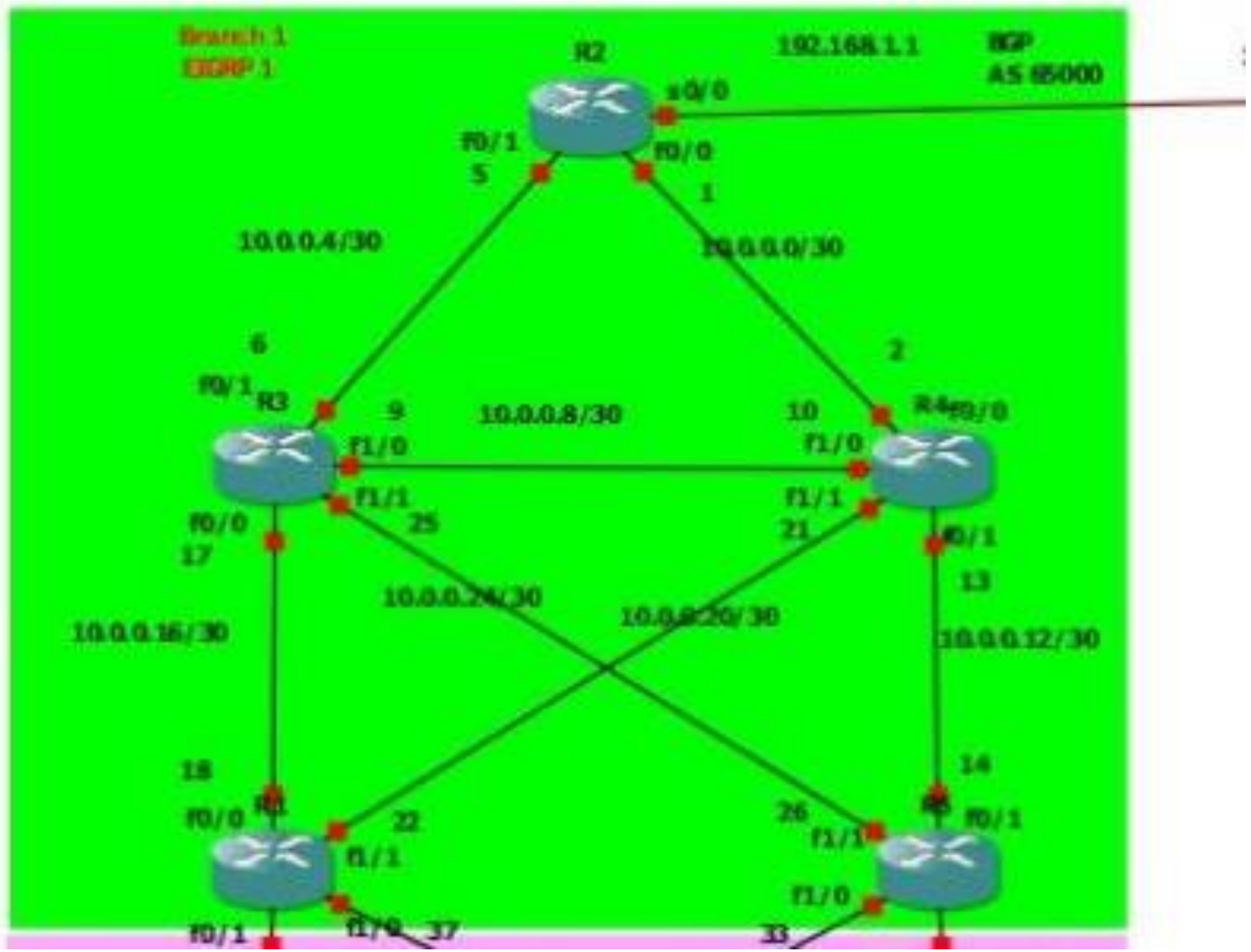
EIGRP Configuration

- **Features:**
- Fast convergence and efficient use of bandwidth.
- Uses DUAL (Diffusing Update Algorithm) for route computation.

BGP

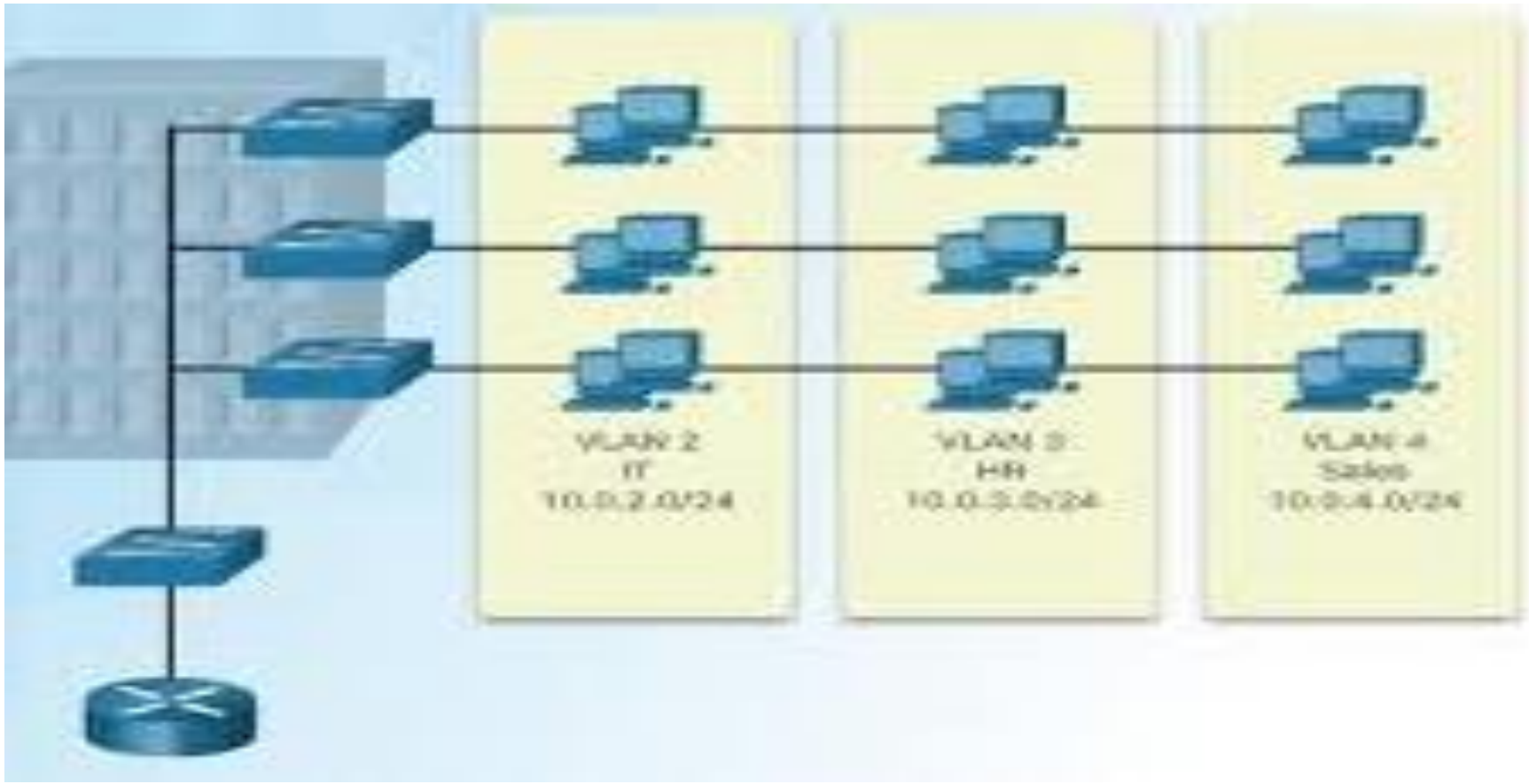
Use Case:

- Routing between different organizations or ISPs.



Network Segmentation with VLANs

- **Virtual LANs (VLANs)** segregate network traffic for improved performance and security.



VLAN Configuration:

A switch configuration showing multiple VLANs for different departments.

A logical group of devices on one or more physical LANs that are configured to communicate as if they were on the same physical LAN — even if they are on different switches.

LAST BUT NOT LEAST
OUR TOPOLOGY