Lab Practical #08: Network Infrastructure Survey

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Aim

Study and survey institute network infrastructure, identify network types, and document devices and cables used.

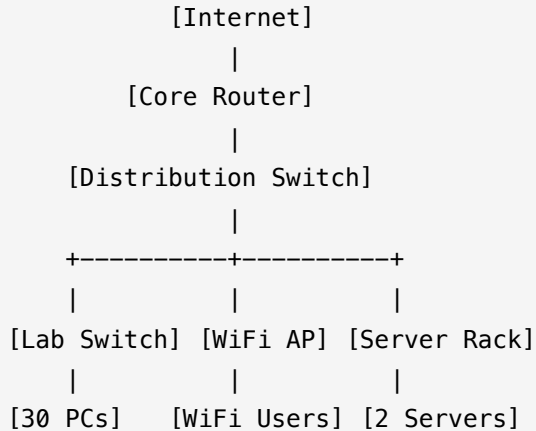## Network Type Identification

Primary Network: Hierarchical Star Topology with Wireless Integration

Classification:

- **LAN:** Building/floor networks
- **WLAN:** Campus-wide Wi-Fi
- **MAN:** Inter-building connectivity
- **WAN:** Internet connection

CS Department Network Design

Topology Diagram

```
          [Internet]
              |
       [Core Router]
              |
    [Distribution Switch]
              |
    +----------+----------+
    |          |          |
[Lab Switch] [WiFi AP] [Server Rack]
    |          |          |
[30 PCs]   [WiFi Users] [2 Servers]
```

Device Inventory

Network Equipment

Device Type	Model	Quantity	Location
Core Router	Cisco ASR 1001-X	1	Server Room
Core Switch	Cisco Catalyst 3850	3	Each Building
Access Switch	Cisco SG350-28P	24	Computer Labs
Wireless AP	Cisco AIR-AP2802I	45	Throughout Campus
Desktop PCs	Various	480	Labs

Cable Infrastructure

Cable Type	Usage	Distance	Standard
Fiber Optic	Backbone	100m-2km	1000BASE-LX
Cat 6A UTP	Desktop connections	100m max	Gigabit Ethernet

Cable Type	Usage	Distance	Standard
Cat 6 UTP	Access layer	100m max	Gigabit Ethernet

VLAN Configuration

VLAN	Subnet	Purpose
10	192.168.10.0/24	Faculty
20	192.168.20.0/24	Students
30	192.168.30.0/24	Servers
40	192.168.40.0/24	WiFi

Network Services

- **DHCP:** Automatic IP assignment
- **DNS:** Internal domain resolution
- **RADIUS:** Wireless authentication

- **VLAN Segmentation:** Security isolation

Performance Specifications

  - **Internet:** 1 Gbps fiber connection
  - **Core Network:** 10 Gbps backbone
  - **Access Layer:** 100 Mbps per port
  - **Coverage:** 3 buildings, 2000+ users

Conclusion

Institute uses hierarchical star topology with wireless integration. Network serves 2000+ users across 3 buildings with 150+ devices, fiber backbone, and comprehensive VLAN segmentation for security and performance.

Summary:

  - **Network Type:** Hierarchical Star + Wireless
  - **Total Devices:** 150+ (switches, routers, APs)
  - **Cable Types:** Fiber backbone + Cat6A access

- **User Capacity:** 2000+ concurrent users

Date: August 23, 2025

1. **Network Type:** Hierarchical Star with Wireless Integration
2. **Total Network Devices:** 150+ active devices
3. **Cable Types:** Fiber optic backbone, Cat6A/Cat6 copper access
4. **Coverage Area:** 3 buildings, 12 floors, 50+ rooms
5. **User Capacity:** 2000+ concurrent users
6. **Internet Bandwidth:** 1 Gbps dedicated connection

Date: August 23, 2025