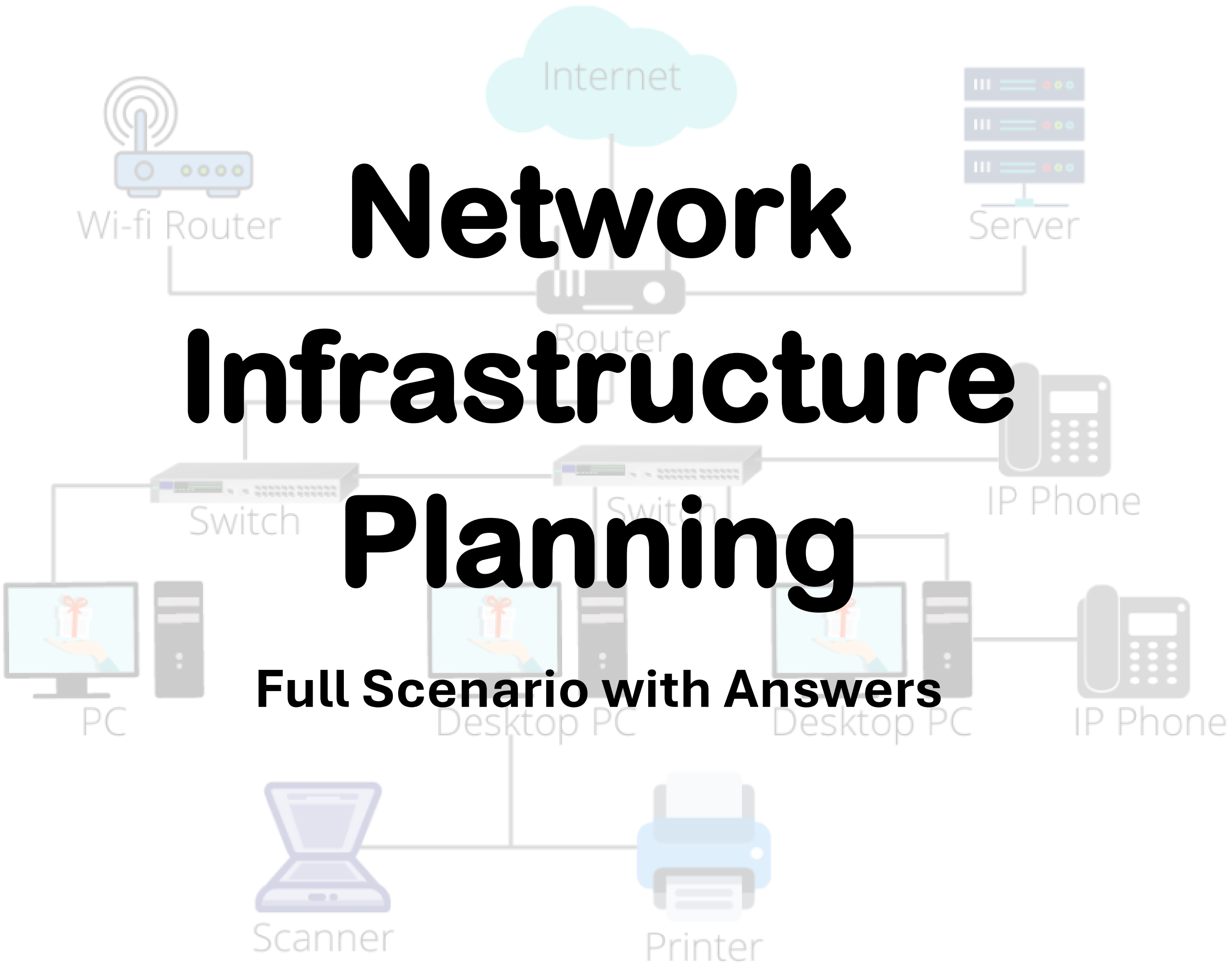
Code Academy أكاديميةالبرمجة مــكيــن Makeen

Network Infrastructure Planning

Full Scenario with Answers



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1. Business & Project Objectives

Q: What is the purpose of the network infrastructure?
A: We're setting up a new office and need a reliable network to support day-to-day operations, VoIP calls, cloud applications, and secure remote access.

2. Number & Type of Users

Q: How many users will be connected to the network?
A: Approximately 80 users, including full-time staff and contractors.

Q: Are they local, remote, or hybrid?
A: About 60 are on-site, and 20 work remotely on a regular basis.

3. Devices & Equipment

Q: What types of devices will be connected?
A: Desktops, laptops, IP phones, printers, smart TVs, and a few IoT devices for conference rooms.

Q: How many devices per user?
A: On average, each user will have 2–3 devices.

4. Network Services

Q: What services will the network support?
A: Email, cloud apps (Microsoft 365, Salesforce), VoIP, Zoom video conferencing, and file sharing.

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5. Performance Requirements

Q: What are the expected bandwidth requirements?
A: We're aiming for a minimum of 1 Gbps internet connection, with internal LAN speeds of 1 Gbps or higher.

Q: Any special performance concerns?
A: VoIP and video calls need low latency. We'd also like QoS implemented.

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6. Security Requirements

Q: What level of network security is required?
A: High. We need firewalls, endpoint protection, VLAN segmentation, and a VPN for remote access.

Q: NAC or 2FA?
A: Yes, we want 2FA for remote VPN access and basic NAC for controlling device access.

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7. Scalability & Growth

Q: Do you expect growth?
A: Yes, we expect to grow by 30–40 users in the next 2 years.

Q: Should infrastructure be scalable?
A: Absolutely, we want to avoid major rework later.

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8. Wired & Wireless Needs

Q: Do you need wired, wireless, or both?
A: Both. Wired for fixed workstations, wireless for laptops, visitors, and mobile use.

Q: Wireless coverage areas?
A: Entire office including meeting rooms, common areas, and entrance lobby.

Q: Wi-Fi standards?
A: Wi-Fi 6 preferred.

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9. Physical Environment

Q: What's the layout of the building?
A: Two floors, open office layout with some private offices and 3 meeting rooms. Server room is on the 2nd floor.

Q: Are there cable pathways or server rooms?
A: Yes, building has cable trays and a server room with A/C.

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10. Redundancy & Uptime

Q: Is redundancy required?
A: Yes, we want dual ISP connections and redundant core switches.

Q: What’s your uptime goal?
A: At least 99.9%, ideally higher.

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11. Monitoring & Management

Q: Do you require centralized management?
A: Yes, we want a unified dashboard for network monitoring and alerting.

Q: Who will manage the network?
A: Our internal IT team, but we may outsource tier-3 support.

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12. Budget & Timeline

Q: What is the estimated budget?
A: Around $80,000 for initial setup, excluding end-user devices.

Q: Project timeline?
A: We need everything up and running in 3 months.

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13. Compliance & Policies

Q: Any industry-specific compliance requirements?
A: Yes, we need to be GDPR compliant and follow ISO 27001 guidelines.

Q: Internet/data policies?
A: Yes, internet usage will be monitored, and we have data retention policies.

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14. Vendor & ISP Info

Q: Do you have an ISP?
A: Currently evaluating. Shortlisted AT&T Fiber and Comcast Business.

Q: Preferred equipment vendors?
A: Cisco preferred for switches and firewalls. Ubiquiti for Wi-Fi.

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15. Disaster Recovery & Backup

Q: Is there a disaster recovery plan?
A: We are drafting one. Network redundancy and off-site backups are a must.

Q: Do you require backup internet?
A: Yes, a 4G/5G failover connection would be ideal.

Here’s what you **must know before** answering or interpreting those questions:

🧠 1. Understand Networking Fundamentals

You need to know:

- **OSI model** and how data flows through a network
- **IP addressing**, subnets, DHCP, DNS
- **Routing vs. switching**
- **LAN, WAN, WLAN**, VLANs, and VPNs
- **Firewall basics** and ACLs
- **Wireless standards** (e.g., Wi-Fi 5/6/6E)

🏗️ 2. Know the Components of a Network Infrastructure

Before asking or answering, you should know what these are and how they work:

- **Core, distribution, and access layer switches**
- **Routers and firewalls**
- **Wireless access points and controllers**
- **Patch panels and structured cabling**
- **Racks, power (UPS), and cooling in server rooms**
- **WAN/ISP connections**

🔐 3. Security Best Practices

You should be familiar with:

- Network segmentation (VLANs, DMZs)
- VPN types and remote access solutions
- Firewall and UTM (Unified Threat Management) concepts
- Endpoint protection basics
- MFA (Multi-Factor Authentication) and NAC (Network Access Control)

📶 4. Wireless Design Knowledge

Understand:

- Site survey techniques (predictive, passive, active)
- Coverage vs. capacity planning
- Channel planning and interference
- Wireless security (WPA2, WPA3, captive portals)

📈 5. Business and Operational Context

You need to be able to understand **non-technical inputs** like:

- Business growth plans
- Compliance needs (e.g., HIPAA, PCI-DSS)
- User types (guest, staff, remote)
- Budget constraints and timelines
- Internal IT capabilities (who will manage the network)

🔧 6. Project Scoping and Estimation

Be ready to:

- Translate user counts into switch port requirements
- Estimate bandwidth needs based on services
- Suggest appropriate ISP packages
- Propose backup and disaster recovery solutions
- Create a basic bill of materials (BOM)

📊 7. Monitoring & Management Tools

Know the benefits of:

- SNMP monitoring (e.g., PRTG, SolarWinds)
- Centralized controller management (Meraki, UniFi, Cisco DNA)
- Log management and alerting systems

🎯 8. Communication Skills

Last but not least, you must:

- Translate technical language into business value
- Ask the right questions **without overwhelming the client**
- Present network designs clearly (using diagrams or Visio)