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# System Selection Document

## Scenario & Problem Domain

Your team is a MSP and has been selected by a growing technology company, that is in need of a network upgrade to support its expanding workforce and enhance data security. The company has 20 employees in a new satellite office, working in different departments, including Sales and Marketing, Research and Development, and IT Management.

The CEO has emphasized the importance of a secure and efficient network infrastructure that enables seamless communication between the office and the company's central server on the corporate home network. Additionally, the company wants to implement measures to safeguard data, improve collaboration through file shares, ensure business continuity with a robust backup solution, and establish an IT onboarding policy.

## Project Objectives:

## Network Design and Topology:

- Objective:
  - Design a network topology that optimizes communication between the office and the central server.
  - Consider the physical layout of the office space and the placement of virtual machines representing computers in different departments.

**-AWS EC2 Instance: Deployment of a central server using AWS EC2.**

**-AWS Virtual Private Gateway: Setup and configuration of an AWS-managed Virtual Private Gateway for routing.**

**-Subnet Configuration: Creation of VLANs or separate subnets for each department within the satellite office network.**

## VPN Setup: Site-to-Site (Ipsec) Amazon.

- Objective:
  - Build a site-to-site VPN tunnel between the office router (virtual machine) and the home company's central server (virtual machine).
  - Alter at least one parameter compared to what was performed in class (e.g. router used, VPN protocol used, introducing a cloud component, etc.).
  - Ensure that the VPN connection is secure, reliable, and allows for encrypted data transfer.
  - Demonstrate successful access to a file server, Active Directory, or other network resource on the other end of the tunnel.
  - **IPsec in combination with L2TP (checking today to see if this is viable)**

## Backup Solution: AWS S3 + AWS Backup

- Objective:
  - Develop a backup solution that includes both on-site and off-site components.
  - Schedule regular backups to ensure data integrity and quick recovery in case of data loss.

**-Backup Policy: Document outlining the backup schedules, including frequency and data retention policies.**

**-Backup Implementation Proof: Evidence of successful backup configuration and test restoration of data.**

## File Shares: AWS File server instances

- Objectives:
  - Set up separate file shares in the central server based on departments to facilitate collaboration among virtual machines.
  - Mount the file shares to the corresponding workstations.
  - Implement access controls to ensure data security and privacy.
  - **File Share Accessibility: Demonstrated file share mounting on departmental workstations.**
  - **Access Control Documentation: Detailed access control policies and configurations for each file share.**

## Security Measures: Pfsense on one side and AWS on the other

- Objectives:

- Implement firewalls, antivirus solutions, and other security measures to protect the network from cyber threats.
- Implement traffic monitoring and logging:
  - Monitor all traffic entering or exiting the Corporate Home Network.
  - Apply sensible log retention and backup policies.
  - Differentiate between regular network traffic and VPN traffic.

**-Firewall Implementation Report: Documentation of firewall rules and policies in place.**

**-Antivirus Confirmation: Confirmation of installation and update policy for antivirus solutions on all servers and client machines.**

**-Traffic Monitoring Setup: Evidence of traffic monitoring and logging setup, including sample logs differentiating between regular and VPN traffic.**

## Client Company and Org Chart

- Objective:
  - Use your favorite AI tool to generate a fictional client company, acquired company and org chart. This is your opportunity to be creative!
  - Use this org chart to populate the Active Directory in the next portion.

## Frodo Tech (20 employees)

### Executive Team

- CEO: Aragorn (Isildur's heir, strong leadership qualities)
- COO: Gandalf (Wise strategist, experienced in different fields)
- CFO: Galadriel (Elf with long history and knowledge of resources)

### Departments

- **Quest Management**
  - Director: Frodo Baggins (Ring-bearer, understands the core mission)
  - Risk Management: Samwise Gamgee (Loyal and cautious, mitigates risk)
  - Acquisitions: Merry & Pippin (Enthusiastic and resourceful)
  - Research & Development: Legolas (Keen eyesight, helps scout new opportunities)
- **Security & Defense**

- Director: Gimli (Strong and skilled warrior, defends the company)
- Elite Guard: Boromir (Powerful fighter, protects key assets)
- Intelligence: Elrond (Leader of Rivendell, gathers valuable information)
- Negotiations: Bard the Bowman (Diplomatic and skilled archer)
- **Public Relations & Marketing**
  - Director: Bilbo Baggins (Charismatic hobbit, promotes a welcoming image)
  - Event Planning: Arwen (Elegant and graceful, creates positive experiences)
  - Brand Management: Treebeard (Wise and ancient, fosters a strong company culture)
  - Social Media: Celeborn (Well-connected elf, spreads awareness)
  - Youth advocate: Doug (GenZ, into anime, comes to work whenever...)
- **Finance & Administration**
  - Director: Theoden King (Experienced leader, manages resources effectively)
  - Accounting: Gloin (Dwarven accountant, meticulous and detail-oriented)
  - Human Resources: Eowyn (Compassionate and strong, cares for employee well-being)
  - Legal: Elrond (Wise and fair, ensures ethical practices)

## Partnering with Elven Enterprises for MSP

Elven Enterprises:

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Try AI prompts like:

- "Build me a fictional org chart, including an executive team and at least 4 different roles in each department, using movie characters."
- "Can you add an additional smaller company that is being acquired by the above org chart?"
- "Can you give me a short description about the acquired company?"

- "How do I structure an AWS VPC to fit this org chart?"
- "Which subnets should be public and private?"

## Windows Server Deployment and Domain Controller Setup:

- Objectives:
  - Develop scripts (PowerShell or other scripting language) to automate the deployment of a Windows Server (Virtual Machine).
    - Minimum operations this script should perform:
      - Fully standup all requisite services to make the server into a DC.
      - Assign the Windows Server VM a static IPv4 address and a DNS. Note the difference between a *reserved IP* and a *static IP*.
      - Rename the Windows Server VM.
      - Installs AD-Domain-Services.
      - Create an AD Forest, Organizational Units (OU), and users.
  - Configure the server to act as both a DNS server and a Domain Controller.
  - Integrate the new server into the existing network infrastructure.

## Virtual Machine Deployment:

- Objectives:
  - Deploy virtual machines for the server, router, and three computers representing different departments:
    - Corporate Home Office (Virtual Machine - Router)
    - Satellite Office (Virtual Machine - Router)
    - IT Resources (Virtual Machine - Server)
    - Sales and Marketing (Virtual Machine - Computer 1)
    - Research and Development (Virtual Machine - Computer 2)
    - IT Management (Virtual Machine - Computer 3)

## IT Onboarding Policy:

- Objectives:
  - Compose thorough SOPs for each of the following:
    - How will network account needs be handled for employees being onboarded?
    - How will network account needs be handled for employees being terminated?
    - How will you monitor network traffic?
    - How will you manage change to the network (such as hardware, software, or configuration changes) while minimizing network disruptions and downtime?

- How will you manage and maintain network security?

## Documentation:

- Objectives:
  - Create comprehensive documentation that covers the following:
    - Network design
    - Configurations
    - Virtual machine deployments
    - Scripting details

The documentation should serve as a reference for future maintenance and upgrades.

- What other possible vulnerabilities is your team concerned about? Does your team have any additional suggestions or solutions to any oversight?

## Stretch Goal

Your client company has been wanting to move their physical infrastructure to the cloud and this is the perfect opportunity to build it out in AWS! If your team has time, reach for this stretch goal by meeting the following requirements:

- Decide which departments in your org chart need public or private subnets.
  - Create a description of the department and why it needs to be private or public.
  - Document your reasoning for each design choice either in a Google Doc linked in a repo or in a markdown file.
- Draw out your team's proposed AWS VPC topology solution
  - Don't forget to include IP addresses!
- Build out your team's AWS VPC solution in the cloud!
  - Make the necessary connections and configurations to meet your client company's needs, including the newly acquired company.
- Hint: In an AWS environment, you could deploy a Windows Server instance within a VPC and use Active Directory as the user management system for those instances.

Tip: You can use AI tooling to help you generate storylines to validate your infrastructure design choices.