

Network Upgrade Plan Proposal

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	Overview	Issues
1. The Present Network	<p>Listed below are the current configurations which consist of:</p> <ul style="list-style-type: none">- One router (Router 0) is the main router connected to the internet (ISP).- There are currently three branches: Server, IT, and HR. These branches are the departments. Each departments are connected to a Switch.- We only have 1 PC that is connected to each department switch.- In the Server department, there is only one server: File Server.	<p>Listed below are issues that are addressed:</p> <ul style="list-style-type: none">- No VLANs. Employees can only communicate with each other physically.- One Server. devoid of redundancy which can lead to system failures and heavy traffic.- Growth Restrictions. Current configurations and setup are not suited for possible future growth.- No Public Server. The network has no DMZ, which is useful for external-facing services. An additional Web Server can be of great help.
2. Conditions (Present Needs and/or Current Network Issues)	The client is looking for a capable network that could work with no problem. Here are the features:	NA

	<ul style="list-style-type: none"> - Utilization of VLANs for network traffic (isolation) - The inclusion of network communication between different departments (inter-VLAN routing). - The ability of each department to use and implement the Internet - Creating a well-built DMZ for public servers (Web Server). - Promoting adaptability and scalability for possible growth in the future. - There is no VLAN implementation, meaning employees are unable to communicate via their end devices (PCs). - No backup server, immediate failure on the server 	
3. New Network Design	<p>Here are the features of the enhanced network design:</p> <ul style="list-style-type: none"> - Router-on-a-Stick setup for inter-VLAN routing on Router 0. - Main Switch to connect other department switches. - A DMZ Router to be connected to the Main Router for securing servers. 	<ul style="list-style-type: none"> - I was unable to set up the DMZ for Router 1.

	<ul style="list-style-type: none"> - A well-organized and named VLANs for each department (switches): <ul style="list-style-type: none"> - Server Department (VLAN 10); IT Department (VLAN 20); Engineering Department (VLAN 30); Marketing Department (VLAN 40); Human Resources Department (VLAN 50). - Each VLANs have their assigned IP addresses, subnets, and default gateways. - Trunk connection between the five switches and the Main Router for VLAN tagging. - Two more additional servers are added namely: Backup and File. - Adding Marketing and Engineering as new Departments. - VLAN 10 (192.168.10.0/24, 255.255.255.0) - VLAN 20 (192.168.20.0/24, 255.255.255.0) - VLAN 30 (192.168.30.0/24, 255.255.255.0) 	
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	<ul style="list-style-type: none"> - VLAN 40 (192.168.40.0/24, 255.255.255.0) - VLAN 50 (192.168.50.0/24, 255.255.255.0) 	
4. Packet Tracer Implementation	<p>The Packet Tracer simulation includes:</p> <ul style="list-style-type: none"> - Complete VLAN setup on each of the switches. - Router-on-a-Stick is set up on Router 0. - Static routing for Router 0 with Router 1. - To ensure connectivity, ping command was used to test communication between end devices. 	
5. Future Upgrade	<p>Future upgrades should consider:</p> <ul style="list-style-type: none"> - A possible wireless access point (WAP) for handheld electronics and individuals. - The addition of PCs and other network/end devices given the projected growth of the company. - Configuring redundancy for routers and servers and even firewalls. 	

6. Cost Estimation	<p>The following factors are used to determine the cost of the enhanced network:</p> <ul style="list-style-type: none"> - One additional router (the DMZ router and the main router) = $3,000 \times 1$ (Cisco ISR4331) = \$3,000 - The main switch and department switches make up the six switches = $\\$2,000(?) \times 6$ (Cisco Catalyst 3560-CX) = \$12,000 - 12 more PCs for workstations (4 per department) = \$1,000 (Dell XPS) $\times 12$ = \$12,000 - There are four new servers: main server, backup, domain, and web. $=5,000$ (Dell PowerEdge) $\times 4$ = \$20,000 - Other expenses include labor, cables (Cat6 and Fiber Cable), and installation fees. \$1000 (estimate) - Total: An estimated \$48,000 in expenses for the upgrade. 	
7. Report and Documentation	<p>This document has all the necessary details and instructions for a proper network upgrade plan/process. It is simple yet concise with clarity and</p>	

8. Complexity and Advanced Features

The use of VLANs for traffic segmentation is one way the network exhibits complexity.

- The utilization of VLANs demonstrates an understanding of network traffic and traffic segmentation.
- Router-on-a-Stick is implemented for inter-VLAN routing.
- A DMZ is built for public services.
- Outbound connection is ensured by static routing.