

# Network Upgrade Plan Proposal

Prepared by: Klarc Clarabal

McGill ID: 261243653

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

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

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

<p><b>6. Cost Estimation</b></p>	<p>The following factors are used to determine the cost of the enhanced network:</p> <ul style="list-style-type: none"> <li>- One additional router (the DMZ router and the main router) = 3,000x1 (Cisco ISR4331) = \$3,000</li> <li>- The main switch and department switches make up the six switches = \$2,000(?) x 6(Cisco Catalyst 3560-CX) = \$12,000</li> <li>- 12 more PCs for workstations (4 per department) = \$1,000 (Dell XPS) x 12 = \$12,000</li> <li>- There are four new servers: main server, backup, domain, and web. =5,000 (Dell PowerEdge) x 4 = \$20,000</li> <li>- Other expenses include labor, cables (Cat6 and Fiber Cable), and installation fees. \$1000 (estimate)</li> <li>- Total: An estimated \$48,000 in expenses for the upgrade.</li> </ul>	
<p><b>7. Report and Documentation</b></p>	<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>	

<b>8. Complexity and Advanced Features</b>	<p>The use of VLANs for traffic segmentation is one way the network exhibits complexity.</p> <ul style="list-style-type: none"><li>- The utilization of VLANs demonstrates an understanding of network traffic and traffic segmentation.</li><li>- Router-on-a-Stick is implemented for inter-VLAN routing.</li><li>- A DMZ is built for public services.</li><li>- Outbound connection is ensured by static routing.</li></ul>	
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