# Networking Plan: The Final Project


In Partial fulfillment of the requirements in

IT 3 /L: Networking 1

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# Introduction

## Background of the Study

In the modern world, a reliable and well-structured network is critical for ensuring that employees, departments, and multiple office locations can stay connected and operate effectively. With the increasing use of digital tools, cloud services, and the rise of remote work, businesses must rely on robust network infrastructures that enable communication, data sharing, and access to resources from anywhere. A company's network needs to be able to support a growing number of devices, users, and departments while maintaining efficiency and security. For organizations with multiple sites and departments, the ability to connect all locations seamlessly and securely is essential to keep business operations running smoothly. This network design must take into account not just the current needs but also the company's future growth and the increasing demand for more flexible, secure, and scalable network solutions.

The company in this study is expanding its operations across three different sites, each with one server and three departments. Each department has 10 wired LAN clients and 5 wireless devices that require consistent and reliable network access for day-to-day operations. Employees rely heavily on access to shared applications, internal websites, and communication tools, making an efficient network crucial to support productivity and collaboration. The wireless devices, in particular, allow employees to remain mobile within the department or site, ensuring flexibility and adaptability in their work. As the company continues to grow, its networking needs will evolve, requiring a design that can scale to accommodate additional devices, departments, or even new sites without sacrificing performance.

This study aims to design a network that addresses the needs of the company by providing a reliable, secure, and scalable solution. The network will ensure that each department at every site is connected to the server and can easily communicate with other sites, fostering collaboration and resource sharing. Additionally, the design will incorporate Virtual Local Area Network (VLAN) and other security measures to protect sensitive data and manage network traffic effectively between departments. With the growth of digital tools and remote work, it's important that the network not only handles wired devices but also provides strong wireless connectivity for mobile devices. The network must be flexible enough to adapt to new technologies and growing demands as the company evolves.

The network plan will consider how to balance the use of wired and wireless technologies to ensure all devices are connected efficiently. It will also ensure that the system is secure by protecting against unauthorized access while allowing employees to work effectively across sites.

The design will address key elements such as network traffic management, hardware selection, and security configuration, all while maintaining cost-effectiveness and ease of maintenance. As the company grows, the network must be able to handle an increasing number of devices and more complex tasks without compromising speed or security. The success of this project will depend on its ability to provide a stable, secure, and high-performance network that meets both current and future needs, enabling employees to stay connected and productive.

**Research Objectives:**

1. To create a network that connects all departments within each site and enables smooth communication between sites, ensuring employees can easily access resources and collaborate.
2. To implement security measures, such as virtual local area network (VLAN)segmentation and secure communication protocols, to protect sensitive data and ensure safe network operations across all sites and departments.
3. To design a scalable network that can accommodate additional devices, new departments, and potential new sites as the company expands, without compromising performance or security.
4. To balance the use of wired and wireless connectivity, ensuring that all devices, whether wired or wireless, can operate effectively and efficiently in a variety of environments.

## Network Diagram

The network diagram illustrates how the network for a company with three sites and multiple departments is organized. It shows how devices, servers, and other network components are connected to ensure smooth communication and efficient operation across the company. This visual representation helps in understanding how data flows between different departments, sites, and devices. Each site has its own network, and within each site, the departments are connected using star topology. In this setup, each department's devices connect to a central switch, making the network easy to manage and troubleshoot. The central switches at each site are connected to the servers, ensuring seamless communication between departments within each site. The diagram also includes the use of VLANs (Virtual Local Area Networks), which help manage network traffic and enhance security by isolating different departments from each other. This structure ensures efficient data flow while providing flexibility for future growth and scalability as the company expands. Overall, the network diagram is a crucial tool for understanding the design, ensuring smooth network operation, and providing a clear structure for troubleshooting and future upgrades.

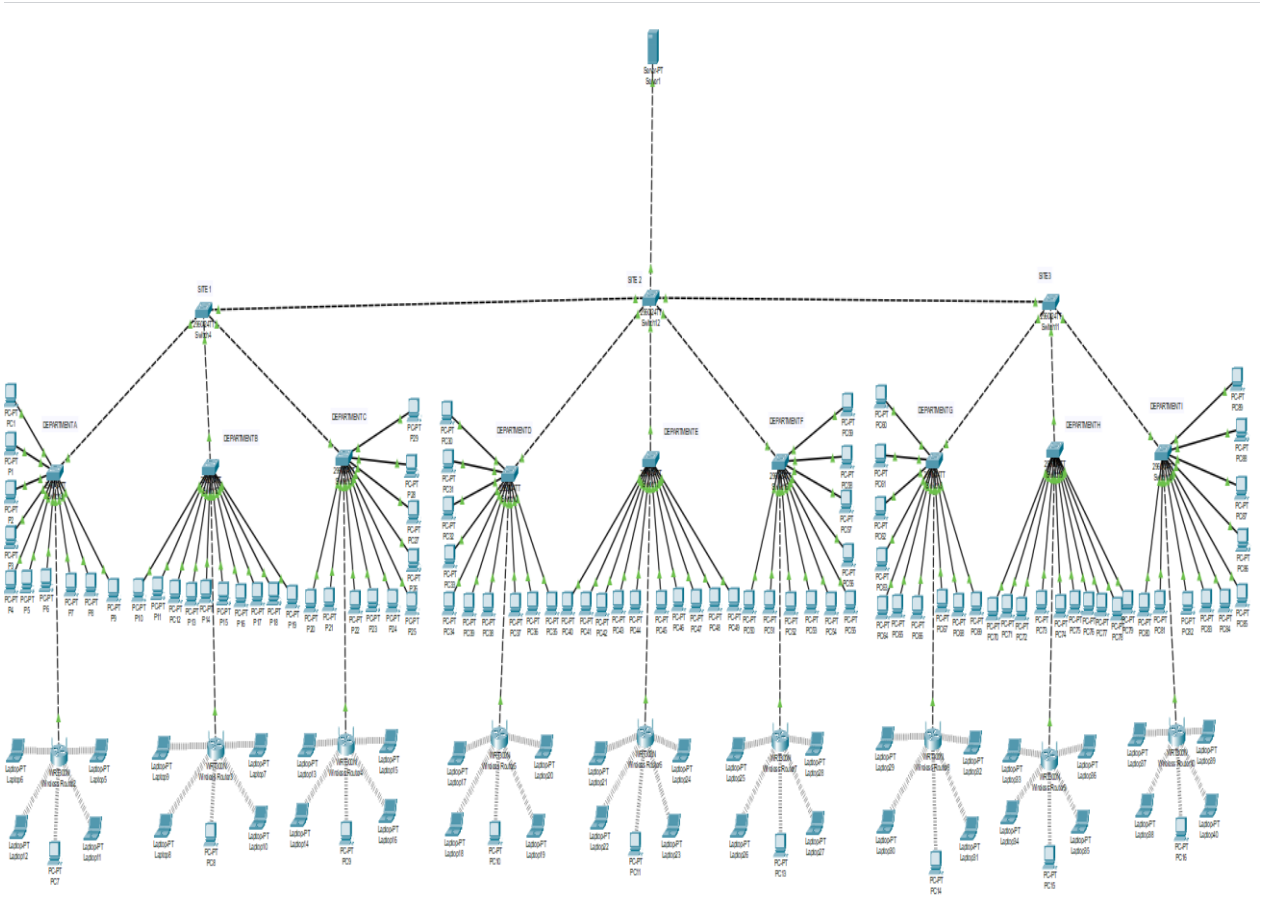

***Figure 1. Showing the networking diagram of the study***

**Network Topology**

In this networking plan, star topology is ideal for connecting the devices within each department to a central device (like a switch). Each device in a department, including wired LAN clients and wireless access points, is connected to a central switch. The central switch then connects to the core switch or server, forming a hub-and-spoke design. This setup ensures that if a device or connection fails, only the affected device is impacted, while the rest of the network remains functional. It also simplifies network management and troubleshooting, as each device has a direct connection to the central switch. Additionally, this topology is highly scalable, allowing for easy expansion as more devices or departments are added to the network.

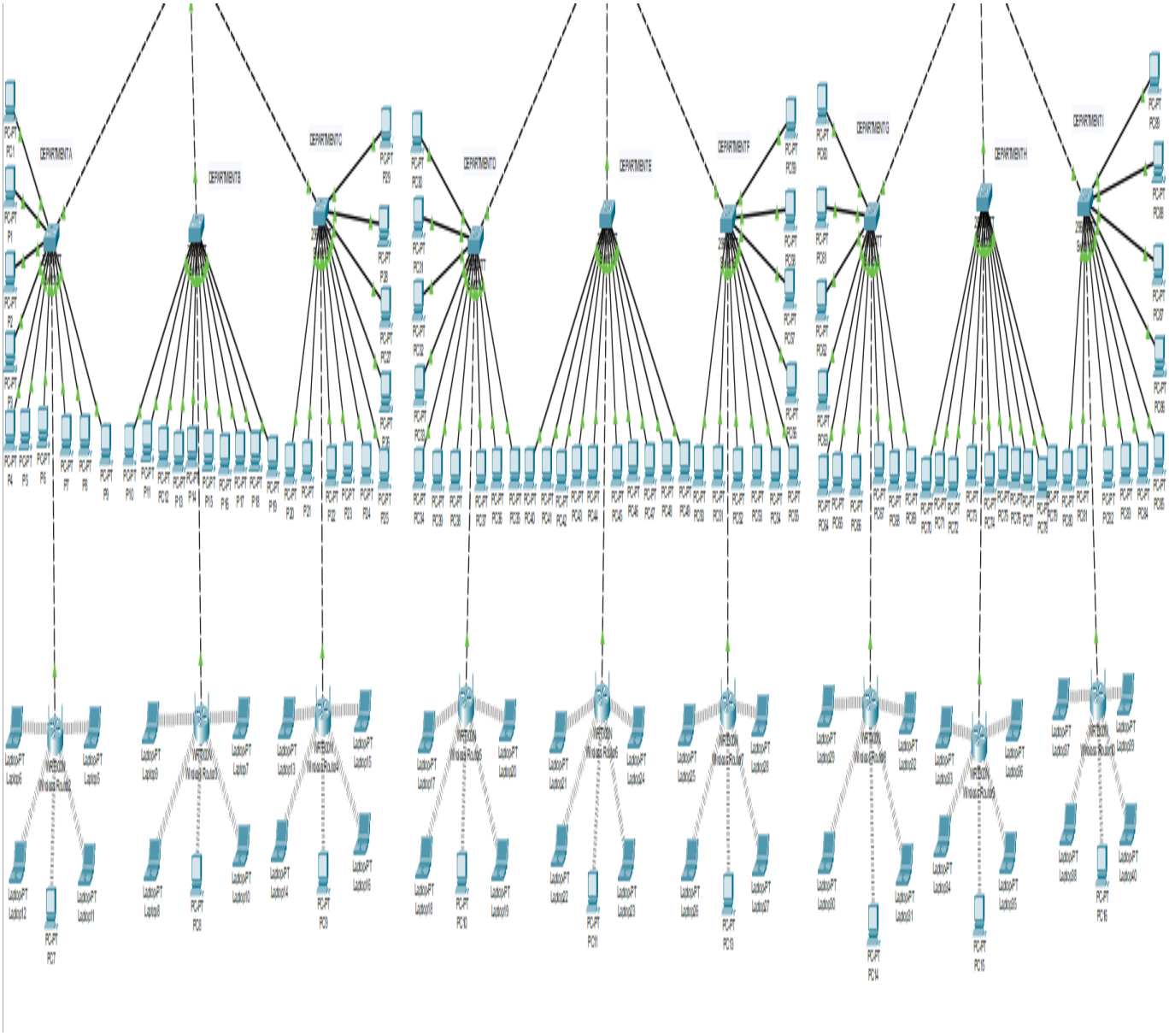

***Figure 2. Showing the networking topology of the study***

## Conclusion

In conclusion, the proposed network plan ensures a reliable, secure, and scalable infrastructure for the company's growth across multiple sites and departments. By combining wired and wireless connectivity, it will facilitate smooth communication, data sharing, and resource access while protecting sensitive information through security measures like virtual local area networks (VLANs). The network is designed to accommodate future expansion, allowing for the addition of new devices, departments, or sites without compromising performance. With careful management of network traffic, hardware selection, and security, this design provides a strong foundation for collaboration, productivity, and secure operations, helping the company adapt to future challenges and continue its growth.

Cisco Activity File Below ⬇

Cisco activity.pkt