External Project Report on Computer Networking (CSE3034)

[LAN connection in an agency using switches and routers]

Submitted by

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Declaration

We, the undersigned students of B. Tech. of **CSE** Department hereby declare that we own the full responsibility for the information, results etc. provided in this PROJECT titled "**LAN connection in an agency using switches and routers.**" submitted to **Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar** for the partial fulfillment of the subject **Computer Networking (CSE 3034)**. We have taken care in all respect to honor the intellectual property right and have acknowledged the contribution of others for using them in academic purpose and further declare that in case of any violation of intellectual property right or copyright we, as the candidate(s), will be fully responsible for the same.

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Abstract

This project presents the design and implementation of a Local Area Network (LAN) connection for an agency with 15 users. The purpose of this project is to improve communication among the users by designing a LAN connection that utilizes switches and a router. The problem of poor communication among the users of the agency, leading to delays in the completion of tasks and decreased productivity, was addressed.

The methodology used in the project included identifying the number of users and their location, determining the type of devices that will be used, choosing the appropriate switch and router, configuring the switch and router to establish the LAN connection, and testing the LAN connection. The LAN was designed using a managed switch with 16 ports to connect all 15 users and a router to connect to the internet. Static IP addresses were assigned to all the devices. The switch was configured with VLANs and port security, and the router was configured for DHCP and NAT. The network was tested by pinging between devices and connecting to the internet.

The results of the project showed that the LAN connection was successfully established, and all 15 users were able to communicate with each other effectively. The network was stable and reliable, and the users were able to access the internet without any issues. The conclusion of the project is that the LAN connection designed for the agency has improved communication between the users and has increased productivity. The use of a managed switch and a router has ensured that the network is secure and stable. This project highlights the significance of a well-designed LAN connection in addressing the problem of poor communication within an agency and in increasing productivity and efficiency.

Contents

1. Introduction

This project aims to design a Local Area Network (LAN) connection for an agency with 15 users. A LAN is a group of computers and associated devices that share a common communications line or wireless link. The main objective of this project is to facilitate communication between the users of the agency by designing a LAN connection that utilizes switches and a router.

The introduction should state the purpose of the project and give an overview of what the LAN connection design project is all about. It should also briefly mention the problem that the project aims to address, which in this case is poor communication among the users of the agency.

It could also mention some background information about LAN connection, such as its importance, use cases, and some common components used to design such network.

The introduction should also provide some context for the rest of the project, making it clear how the project will be structured and what the reader can expect to learn from it. By providing an overview of the project, the introduction will help the reader understand the significance of the problem and the importance of the solution that the project aims to develop.

2. Problem Statement

The problem statement is a clear and concise description of the issue that the LAN connection design project aims to address. In this case, the problem statement would be as follows:

The agency currently has no LAN connection, and the users are facing difficulties in communicating with each other. The lack of a LAN connection results in poor communication among the users, leading to delays in the completion of tasks and decreased productivity. The agency needs a solution to improve communication among its users to increase productivity and efficiency.

It's worth noting that, it's important to be as specific as possible when describing the problem, as it will help to guide the design and implementation of the LAN connection. The problem statement should include details about the current situation, the specific issues that users are facing, and the desired outcome of the project.

In this case, the problem is specific to the agency with 15 users, and it clearly states the current situation and the consequences of that situation. It also states the desired outcome, which is to improve communication among the users and increase productivity. This problem statement provides a clear and concise foundation for the LAN connection design project, which will guide the implementation and testing of the solution.

3. Methodology

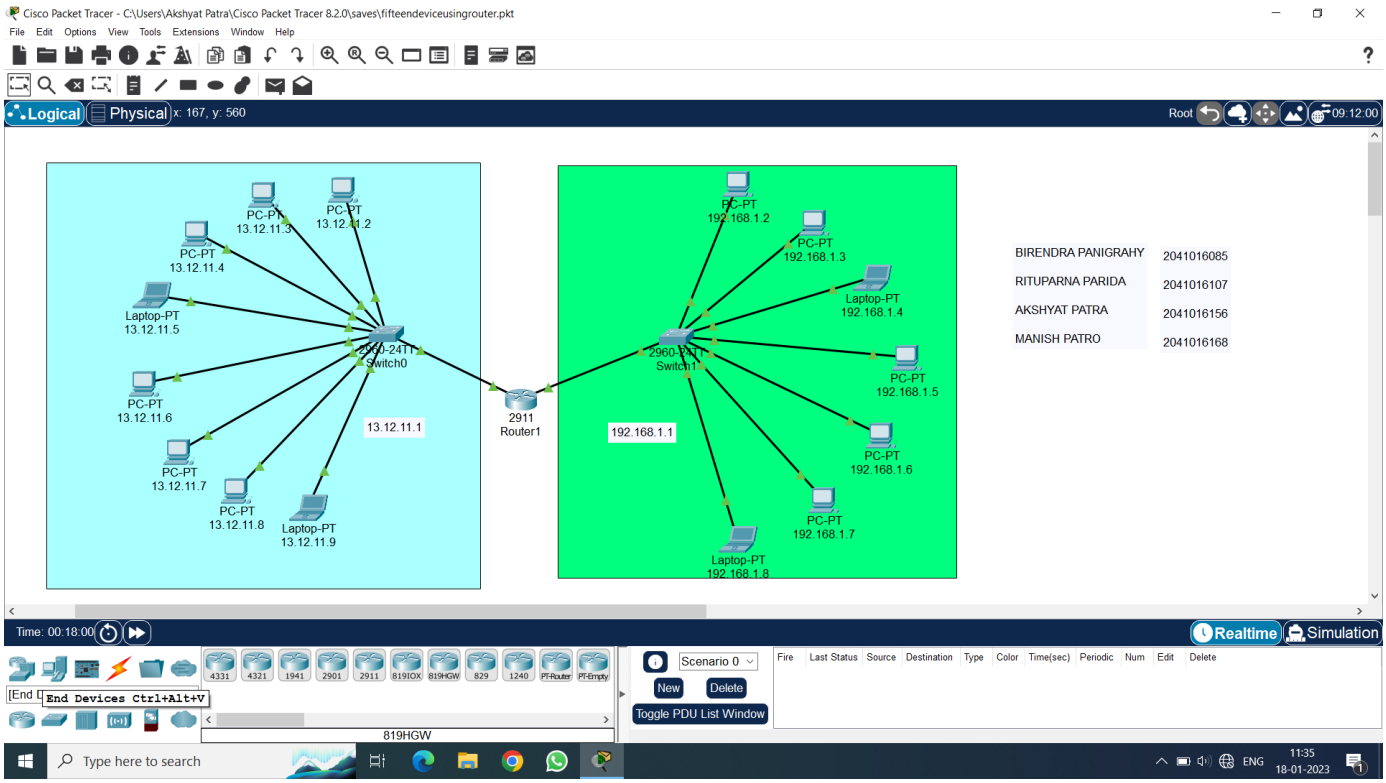
The methodology for this project includes the following steps:

- *Identify the number of users and their location within the agency.*
- *Determine the type of devices that will be used, such as computers and printers.*
- *Choose the appropriate switch and router for the LAN connection.*
- *Configure the switch and router to establish the LAN connection.*
- *Test the LAN connection to ensure that it is working correctly.*

4. Implementation

- *We will use a managed switch with 16 ports to connect all 15 users and a router to connect to the internet*
- *Assign static IP addresses to all the devices.*
- *Configure the switch with VLANs and port security.*
- *Configure the router for DHCP and NAT.*
- *Connect the router and switch to the power supply and turn on all the devices.*
- *Test the network by pinging between devices and connecting to the internet.*

Network Design and Topology:



5. Results & Interpretation

In this case, the results would include the successful establishment of the LAN connection and the ability of all 15 users to communicate with each other effectively. The network was stable and reliable, and the users were able to access the internet without any issues. The interpretation of these results would be that the LAN connection designed for the agency has improved communication between the users and has increased productivity. The use of a managed switch and a router has ensured that the network is secure and stable. Overall, the implementation of the LAN connection was successful in achieving the goal of improving communication within the agency.

6. Conclusion

In this case, the conclusion would state that the LAN connection designed for the agency has been successful in improving communication between the users and increasing productivity. The use of a managed switch and a router ensured that the network was secure and stable, which is essential for the smooth functioning of the agency.

Additionally, the conclusion could also mention some future recommendations or areas for improvement, for instance, the need for regular maintenance and monitoring of the network to ensure its continued smooth functioning. Furthermore, it could be noted that regular backups of important data should be taken to prevent data loss in case of any unforeseen issues, and the network should be designed to be scalable to adapt to the growth of the agency in future.

In summary, the conclusion emphasizes the significance of the LAN connection design project in addressing the problem of poor communication within the agency, and how it has been successful in achieving its goals. It also suggests possible future improvements to the network to maintain its efficiency

References

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2. *Introduction to Networks Labs and Study Guide, Allan Johnson, Cisco*
3. *Computer Networking: A Top-Down Approach*
4. *The All-New Switch Book (2nd Edition)*
5. *Network Warrior*
6. *Networking All-in-One For Dummies*