

# City Network Simulation Report



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# **1 Introduction**

This project involves designing and simulating a city-wide network using Cisco Packet Tracer. The aim is to model an efficient, scalable, and secure network that connects various components within a city environment. The network must handle various types of data traffic while ensuring performance, reliability, and security.

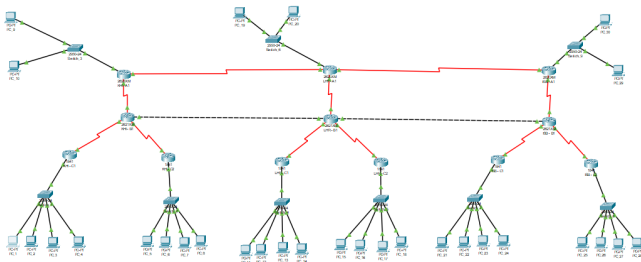
## 2 Project Objective

The key objectives of this project include:

- Designing a scalable network for a city with multiple locations and users.
- Ensuring secure communication between network devices.
- Implementing routing protocols to optimize data flow.
- Using Cisco Packet Tracer to simulate and validate the network design.

This section covers the design and architecture of the network. The network consists of multiple nodes, including routers, switches, servers, and end-user devices. The city is divided into multiple regions, each connected to a central network backbone.

### 3 Network Diagram



### 4 Devices Used

Device Type	Model	Quantity
Routers	1841	12
Switches	2950-24	9
End Devices	PC-PT	30

Table 1: Devices used in the network

## **5 IP Addressing Scheme**

The network uses an organized IP addressing scheme based on subnets for each segment of the network:

## **6 Routing Configuration**

We have used dynamic routing protocols to allow for efficient data routing between different nodes. The routing protocol chosen for this project is DHCP, due to its scalability.

## **7 Access Control Lists (ACLs)**

To protect the network from unauthorized access, ACLs were implemented to restrict traffic based on IP addresses.

## **8 Firewalls**

A firewall was placed at the network's edge to monitor and filter incoming and outgoing traffic based on security rules.

## 9 Testing and Validation

Various tests were conducted to validate the functionality and performance of the network, such as:

- **Ping Tests:** To verify connectivity between different devices and sub-nets.
- **Packet Loss and Latency:** Monitored to ensure network reliability.
- **Bandwidth Utilization:** Evaluated to ensure the network can handle expected data loads.



## 10 Conclusion

In conclusion, this project successfully designed and implemented a city-wide network using Cisco Packet Tracer. The network is robust, scalable, and secure, meeting the objectives of the project. The simulation demonstrates that all network components function as expected.