October - 2026

# NETWORK DESIGN & SECURITY



TechSafe Ltd.
IBM Cybersecurity Analyst
Final Project

# Corporate Network Design and Security Lab

A practical network planning, traffic analysis, and firewall configuration project

| PROJECT TYPE | SCENARIO | TOOLS |
|---|---|---|
| Educational project<br>Hands-on lab | TechSafe Ltd. | Wireshark<br>Microsoft Windows Defender Firewall |

## Project Overview

Designed a department-based network for the TechSafe Ltd. course scenario. Using the provided IP range, I calculated subnet addresses, masks, and usable host ranges for Administration, Sales, and IT. I then inspected HTTPS/TLS traffic in Wireshark and configured a Windows Defender Firewall outbound rule to block HTTP over TCP port 80. I tested the rule and documented the work with screenshots.

## Work Steps

| | |
|---|---|
| 01 Network diagram | Created a topology showing the router, switch, and department subnets. |
| 02 IPv4 subnetting | Calculated /26 subnet addresses, subnet masks, usable IP ranges, and broadcast addresses. |
| 03 Wireshark analysis | Inspected HTTPS/TLS traffic over TCP port 443. |
| 04 Firewall configuration | Configured an outbound rule to block HTTP traffic over TCP port 80. |
| 05 Verification | Tested the HTTP block and captured screenshots of the rule and the blocked connection. |

## Project Deliverables

| | |
|---|---|
| Network diagram - departmental topology | Subnet table - calculated IPv4 allocations |
| Wireshark capture - HTTPS/TLS traffic | Firewall evidence - HTTP rule and blocked-access test |

## Key Learnings

AppliedIPv4subnetting, network diagramming, packet traffic interpretation, outbound firewall rule configuration, and hands-on validation.

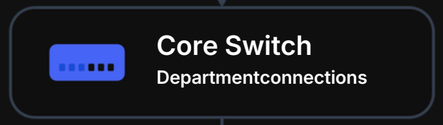
# TechSafe Ltd. - Network Topology

NETWORK DESIGN

DepartmentalIPv4segmentation | Courseproject

| PROVIDED NETWORK | DEPARTMENT SUBNETS | CAPACITY PER SUBNET |
|---|---|---|
| 198.51.100.0/24 | 3 x /26 | 64 total addresses \| 62 usable hosts |




## Administration — /26 SUBNET

| | |
|---|---|
| Network | 198.51.100.0/26 |
| Subnet mask | 255.255.255.192 |
| Usable hosts | 198.51.100.1 - 198.51.100.62 |
| Broadcast | 198.51.100.63 |

## Sales — /26 SUBNET

| | |
|---|---|
| Network | 198.51.100.64/26 |
| Subnet mask | 255.255.255.192 |
| Usable hosts | 198.51.100.65 - 198.51.100.126 |
| Broadcast | 198.51.100.127 |

## IT — /26 SUBNET

| | |
|---|---|
| Network | 198.51.100.128/26 |
| Subnet mask | 255.255.255.192 |
| Usable hosts | 198.51.100.129 - 198.51.100.190 |
| Broadcast | 198.51.100.191 |

Unassigned in this plan: 198.51.100.192/26

Address range follows the course scenario.

# TechSafe Ltd. - IPv4 Subnet Plan

Department-level address allocation for the course network design project

## Department Subnet Allocation

| Department | Network Address | CIDR Prefix | Subnet Mask | Usable IP Address Range | Broadcast Address | Total Addresses | Usable Hosts |
|---|---|---|---|---|---|---|---|
| Administration | 198.51.100.0 | /26 | 255.255.255.192 | 198.51.100.1 - 198.51.100.62 | 198.51.100.63 | 64 | 62 |
| Sales | 198.51.100.64 | /26 | 255.255.255.192 | 198.51.100.65 - 198.51.100.126 | 198.51.100.127 | 64 | 62 |
| IT | 198.51.100.128 | /26 | 255.255.255.192 | 198.51.100.129 - 198.51.100.190 | 198.51.100.191 | 64 | 62 |

## Plan Summary

| Provided Network | Subnet Design | Address Capacity |
|---|---|---|
| 198.51.100.0/24 | Three assigned /26 subnets | 64 total addresses and 62 usable hosts per subnet |

Unassigned block: 198.51.100.192/26 remains unallocated in this plan. The address range above is the one provided for the course scenario.

Addressing note: Each /26 subnet contains 64 total addresses: one network address, 62 usable host addresses, and one broadcast address. No default gateway addresses are specified in this plan.