

# IT Support & POS Troubleshooting Lab

## 1. Network Diagram

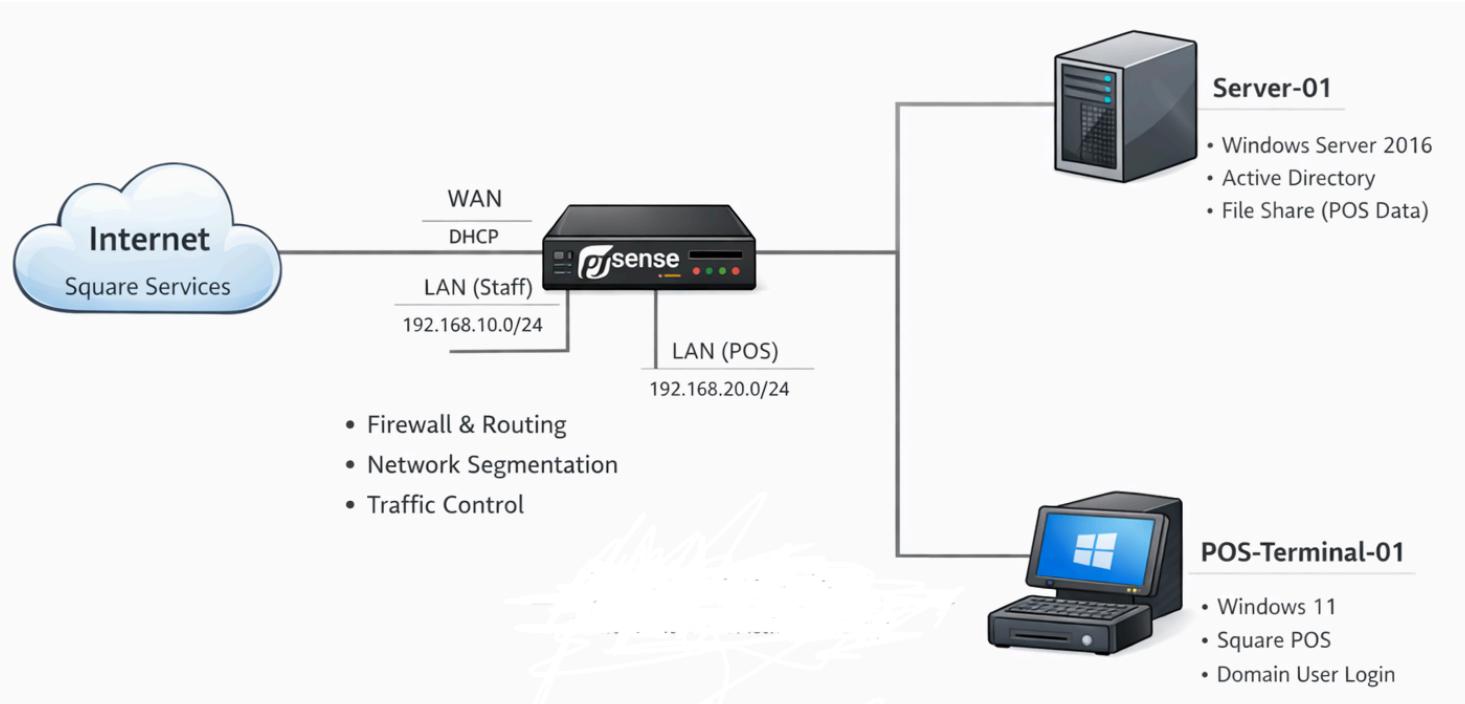


Figure 1: Logical network diagram of a retail environment showing a POS terminal communicating with an internal Windows Server through a pfSense firewall with segmented networks.

## 2. Objective

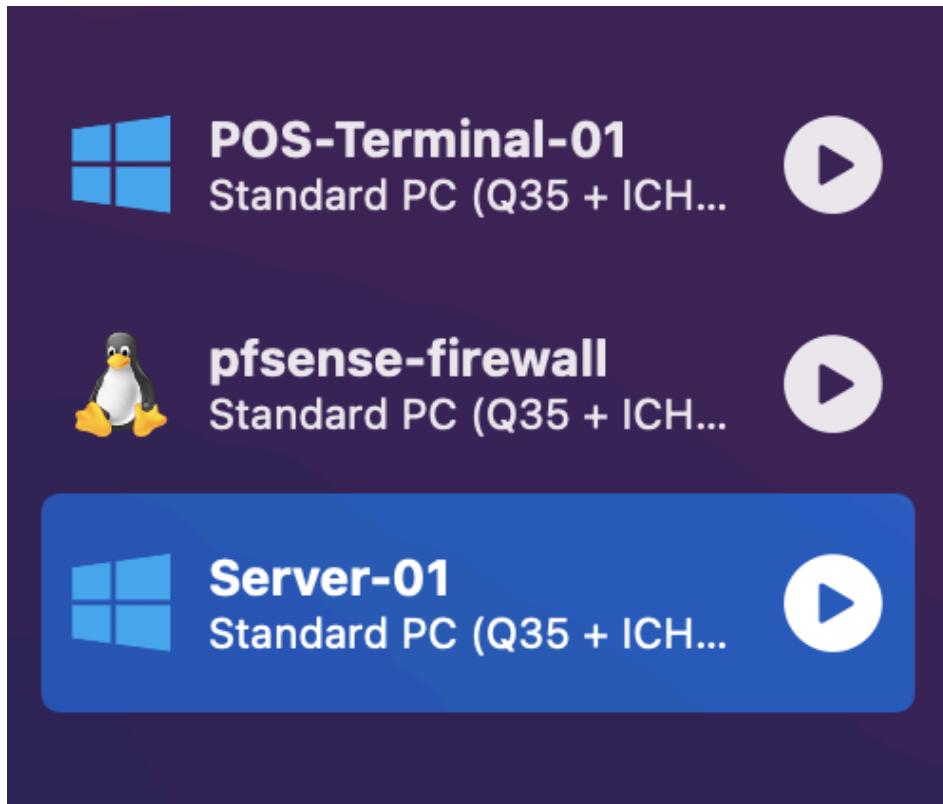
The objective of this lab was to simulate a real-world retail IT support environment similar to those used in payments and POS. The lab focuses on Level 1 IT support responsibilities, including user support, device connectivity, basic networking, access control, and issue escalation.

This lab was designed to reflect the responsibilities of an IT Support Officer supporting merchants in retail environments.

## 3. Lab Environment Overview

## Hardware / Platform

- Host machine: macOS (Intel)
- Virtualisation: UTM

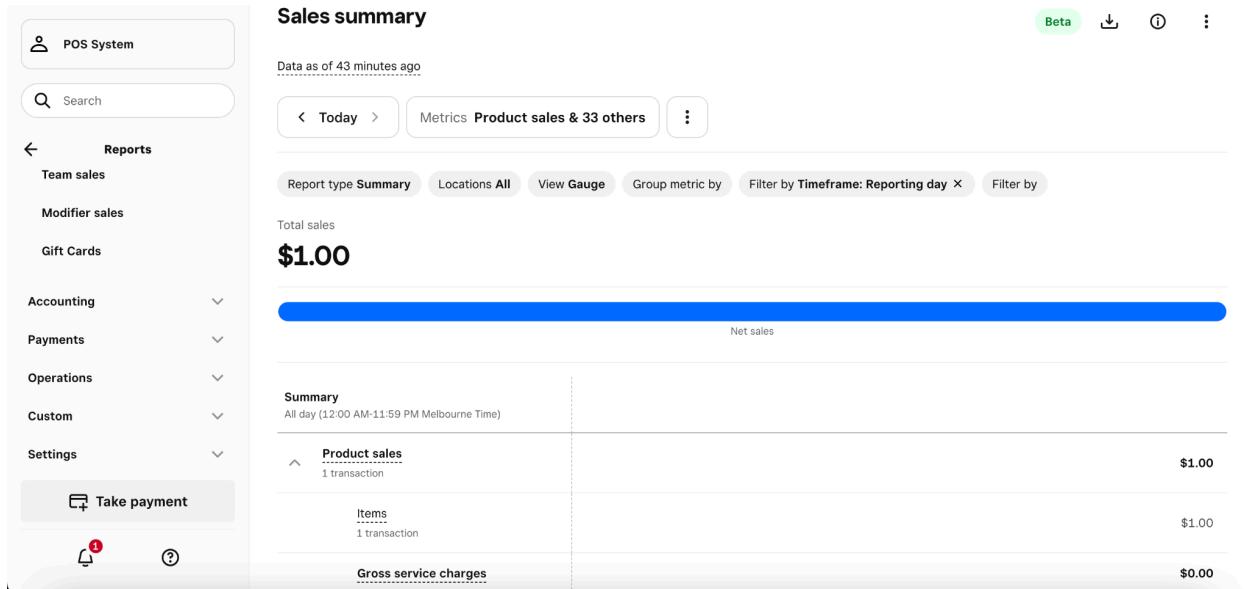


## Virtual Machines

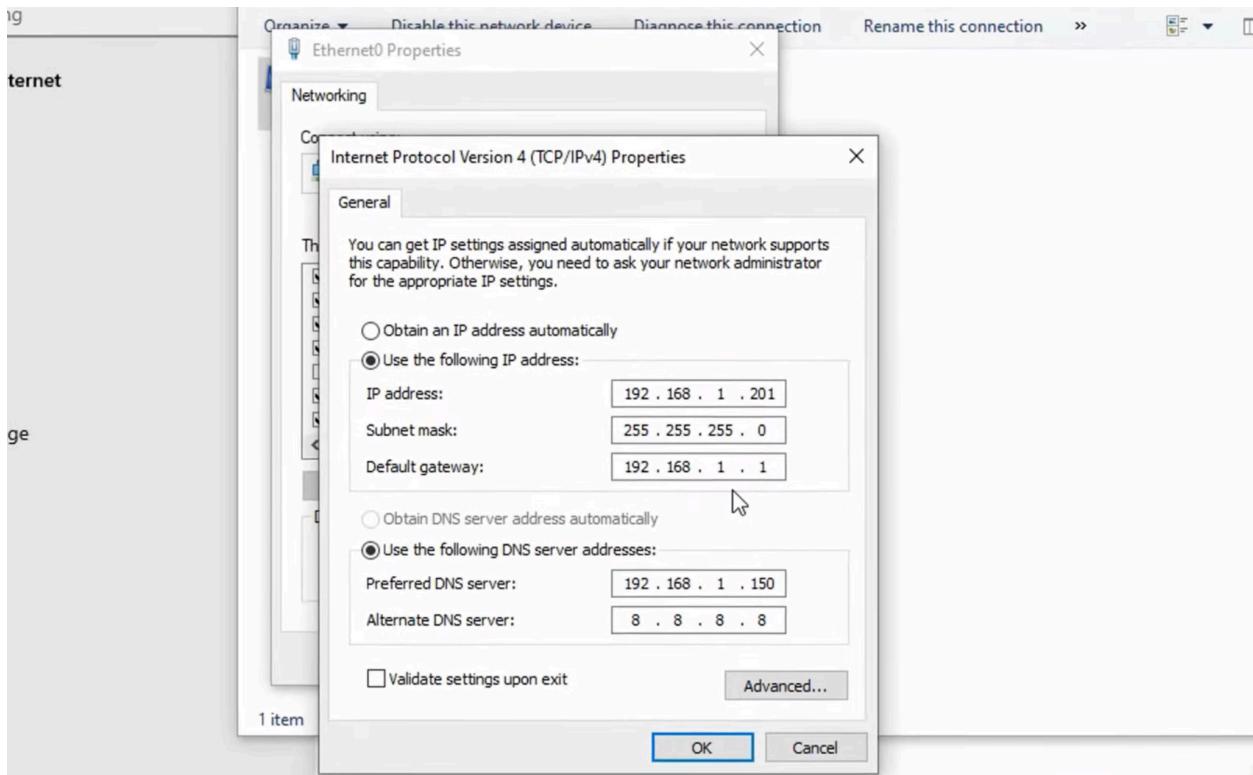
<i>System</i>	<i>Purpose</i>
<b>Server-01</b>	Windows Server (Active Directory, file services, authentication)
<b>POS-Terminal-01</b>	Windows 11 POS workstation
<b>pfSense-Firewall</b>	Network segmentation, gateway, firewall

## 4. Network Architecture

- POS terminals connect through the firewall to internal services



- Server-01 acts as:
  - Domain Controller
  - Authentication source
  - Back-office resource server



- pfSense simulates:

- Retail network edge
- Connectivity control
- Fault isolation

States	Protocol	Source	Port	Destination	Port	Gateway	Queue	Schedule	Description	Actions
✓ 1/444 KIB	*	*	*	LAN Address	80 22	*	*	*	Anti-Lockout Rule	
Internet Access										
✗ ✓ 35 / 598.74 MIB	IPv4 TCP/UDP	LAN net	*	*	Browsing	*	none			
✗ ✓ 0 / 0 KIB	IPv4 ICMP any	LAN net	*	*	*	*	none			
✗ ✓ 0 / 0 B	IPv4 *	LAN net	*	*	*	*	none		Default allow LAN to any rule	
✗ ✓ 0 / 0 B	IPv6 *	LAN net	*	*	*	*	none		Default allow LAN IPv6 to any rule	

This mirrors real-world retail environments where POS devices rely on central services and stable network connectivity.

## 5. Troubleshooting Demo

### ***Issue 1: POS Cannot Connect to Internet***

Symptoms:

- Transactions failing
- POS offline message

Troubleshooting steps:

- Checked network connectivity (IP address)
- Verified pfSense LAN interface
- Tested DNS resolution

Resolution:

- Corrected firewall rule / restored connectivity

Outcome:

- POS transactions successful

## ***Issue 2: POS Cannot Access Shared Folder***

Symptoms:

- Sales file not syncing

Troubleshooting:

- Checked credentials
- Verified permissions on Server-01

Resolution:

- Corrected NTFS/share permissions

```
sales-summary-2026-09-01.csv
"Sales summary - Summary
All day (12:00 AM-11:59 PM Melbourne Time)","
"Product sales","$1.00"
"Items","$1.00"
"Gross service charges","$0.00"
>Returns","$0.00"
"Discounts & comps","$0.00"
"Net sales","$1.00"
"Deferred sales","$0.00"
"Gift card sales","$0.00"
"Taxes","$0.00"
"Gross sales","$1.00"
"Tips","$0.00"
"Total sales","$1.00"
"Total payments collected","$1.00"
"Cash","$1.00"
"Fees","$0.00"
"Net total","$1.00"
"Total number of sales","1"
"Sales transactions","1"
"Item sales transactions","1"
"Service charges transactions","0"
"Returns transactions","0"
"Discounts transactions","0"
"Comps transactions","0"
"Gift card sales transactions","0"
"Taxes transactions","0"
"Tips transactions","0"
"Total sales transactions","1"
"Total payments collected transactions","1"
```

## ***Issue 3: Slow or Unstable Network***

Symptoms:

- Lag during POS operation

Troubleshooting:

- Checked pfSense interface stats
- Identified packet loss

Resolution:

- Restarted service / reconfigured interface

## 6. Ticketing & Documentation (Example)

*Ticket ID: INC-001*  
*Customer: Retail Demo Store*  
*Issue: POS unable to process transactions*  
*Priority: High*  
*Steps Taken:*  
- Verified network connectivity  
- Checked firewall rules  
- Tested DNS resolution  
*Resolution:*  
- Restored LAN-to-WAN rule on pfSense  
*Outcome:*  
- POS transactions restored  
*Status: Resolved*

## 7. Key Skills Demonstrated

<b><i>Job Requirement</i></b>	<b><i>Lab Evidence</i></b>
Level 1 IT support	POS workstation troubleshooting
POS & back-office systems	Centralised server + shared resources
Network troubleshooting	pfSense firewall & connectivity issues
User support	Step-by-step simulated merchant issues
Ticket logging & escalation	Documented issue resolution
Retail environment exposure	POS-style architecture

## 8. Outcome

This lab provided hands-on experience supporting systems commonly used in retail and payments environments. It reinforced core IT support fundamentals and improved confidence in troubleshooting real-world issues faced by merchants.