# VMware Virtual Network Architecture

In this project, I designed and deployed a **multi-VM virtual network infrastructure** using **VMware Workstation** to simulate a small-scale enterprise environment. The system integrates **core IT services, centralized authentication, and modern orchestration tools**.

## 1. Infrastructure Layer

- **VMware Workstation Host** ( laptop/desktop).
- Virtual switches:
    - **VMnet8 (NAT)** → provides Internet access.
    - **VMnet1 (Host-only)** → internal private LAN.

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## 2. Core Services Layer

- **OpenBSD VM** → *DNS + LDAP Server*
    - Centralized user authentication.
    - Resolves hostnames for all other VMs.
    - Acts as the "identity backbone."
- **Failsafe user** on each VM for redundancy.

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## 3. Application Services Layer

- **FreeBSD VM** → *Mail Server*
    - Handles SMTP/IMAP.
    - Uses LDAP for login credentials.
- **Rocky Linux VM** → *NFS Server*
    - Provides shared storage.

- ○ Uses LDAP for access control.

- **Ubuntu VM** → *Web Server & Kubernetes*

   - ○ Hosts applications or websites.

   - ○ Uses LDAP for authentication.

   - ○ Master Node

- **Solaris VM** → *Centralized Login & Automation*

   - ○ Runs automation tools (e.g., Ansible).

   - ○ Manages deployments and user provisioning across all VMs.

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## 4. Access Layer

- **Users/Admins** authenticate via LDAP (on OpenBSD).

- Each VM supports:

   - ○ **LDAP user login** (centralized).

   - ○ **Failsafe local account** (backup).

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## 5. Tables & Diagrams

| VM Name | OS | Role | IP Address | Users |
|---------|-----|------|------------|-------|
| OpenBSD | OpenBSD | DNS + LDAP Server | 192.163.88.1 | LDAP Directory + Failsafe local user |
| FreeBSD | FreeBSD | Mail Server (LDAP Auth) | 192.163.88.2 | LDAP user + Failsafe |
| Rocky | Rocky Linux | NFS Server (LDAP Auth) | 192.163.88.3 | LDAP user + Failsafe |

| Ubuntu | Ubuntu | Web Server & Kubernetes Master (LDAP Auth) | 192.163.88.4 | LDAP user + Failsafe |
|--------|--------|---------------------------------------------|--------------|----------------------|
| Solaris | Solaris | Centralized Login & Automation | 192.163.88.5 | LDAP user + Failsafe |