# **Virtual Machine Requirements for NA IT Management System**

**Project Name: National Assembly IT Inventory System**

**Developed by: Sri Krishna Devi & Zainab Shakeel**

**Internship Program: National Assembly of Pakistan**

**Date: 31-07-2025**

## 1. Objective

This document outlines the recommended Virtual Machine (VM) specifications and software dependencies required to host the National Assembly IT Management System. The system is designed to manage the digital issuance of IT assets, inventory, employee records, and departmental operations securely and efficiently.

## 2. Recommended VM Specifications

|  |  |  |
| --- | --- | --- |
| Component | Specification | Justification |
| CPU | 4–8 vCPUs (Intel Xeon / AMD EPYC) | To support multiple internal users and handle backend processing |
| RAM | 16–32 GB DDR4 | Ensures stable operations, especially for database and concurrent sessions |
| Storage | 512–1024 GB SSD (preferably NVMe) | For storing application files, logs, backups, and inventory data |
| Operating System | Ubuntu 22.04 LTS | Optimized for server environments and secure for web stack |
| Network | 1 Gbps Ethernet | Ensures smooth communication, especially during asset file uploads and inventory sync |

## 3. Software Stack & Dependencies Analysis

**Frontend: React.js (Vite), Tailwind CSS**

- Status: IMPLEMENTED- Modern React 19 with Vite build tool

- Features: Responsive UI, component-based architecture, fast development server

- Current Implementation: React 19, Vite, Tailwind CSS 4, React Router, Axios

**Backend: Node.js (v18+), Express.js**

-Status: IMPLEMENTED- Express.js 5 with comprehensive API structure

- Features: RESTful APIs, middleware support, error handling

- Current Implementation: Express.js 5, CORS, JSON parsing, modular routes

**Database: MySQL**

-Status: IMPLEMENTED - MySQL 8 with comprehensive schema

**Authentication: Role-based access (Admin/Operator/ Management), JWT**

- Status: IMPLEMENTED - JWT + bcryptjs with role-based permissions

- Features: Admin/Operator/Management roles, secure token authentication

- Current Implementation: JWT, bcryptjs, role-based access control