# An Architecture Case Study of a Learning Management System (LMS) for a University

NTU_CE7 Module 1.9 Assignment

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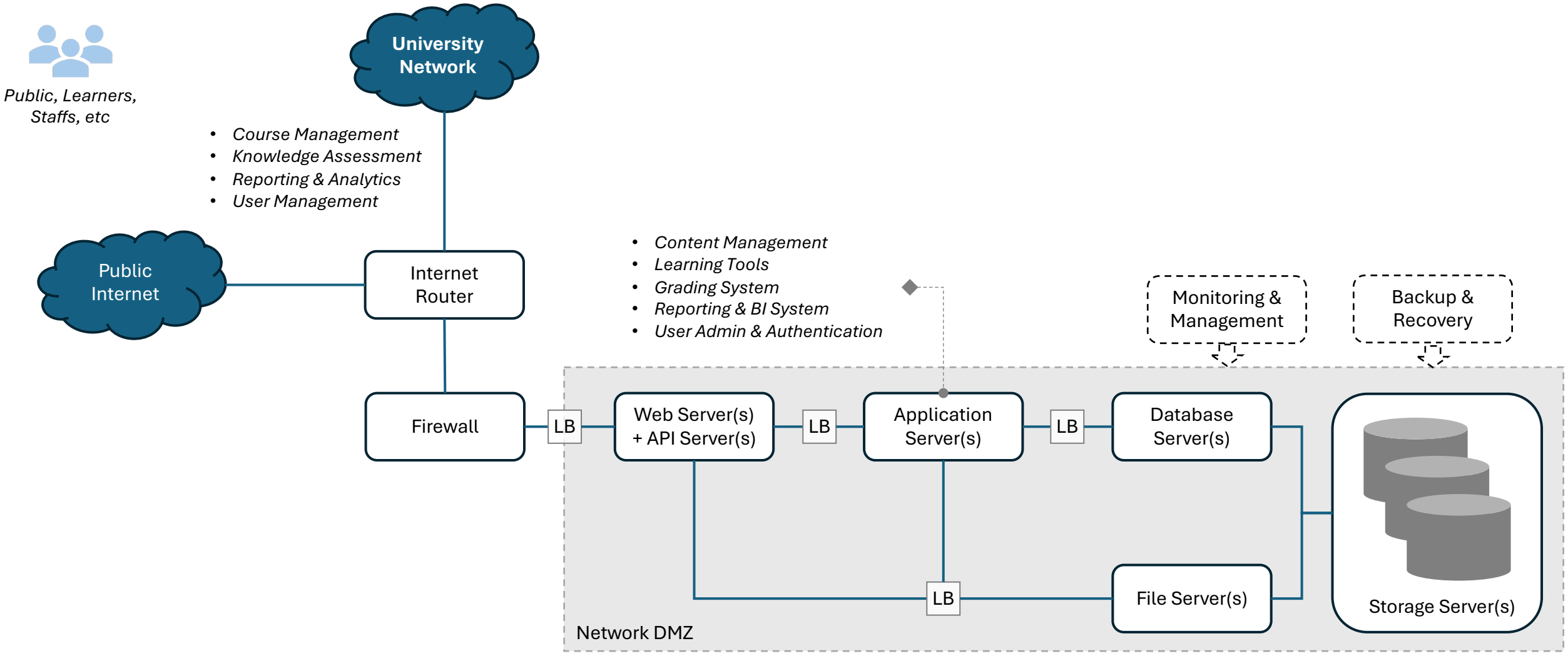
# System Architecture Overview of an LMS




*LB denotes Load Balancer

# Example Server Requirements

- **Application Server:**
  - **Type:** Virtualized server (VM) with Linux or MS Windows Server
  - **Configuration:**
    - Multiple CPU cores (e.g., 8+ cores)
    - Sufficient RAM (e.g., 32GB+)
    - SSD storage for fast access
- **Database Server:**
  - **Type:** Virtualized server (VM) with Linux or MS Windows Server
  - **Configuration:**
    - Multiple CPU cores (e.g., 8+ cores)
    - Large RAM capacity (e.g., 64GB+)
    - High-performance SSD storage

**VM using either VMware vSphere or Microsoft Hyper-V*

# Example Server Requirements

- **Web Server:**
  - **Type:** Virtualized server (VM) with Linux or MS Windows Server
  - **Configuration:**
    - Multiple CPU cores (e.g., 4+ cores)
    - Sufficient RAM (e.g., 16GB+)
    - SSD storage
- **File Server (for storing course materials):**
  - **Type:** Virtualized server (VM) with Linux or MS Windows Server or Network Attached Storage (NAS)
  - **Configuration:**
    - Multiple CPU cores (e.g., 4+ cores)
    - Adequate RAM (e.g., 16GB+)
    - RAID-configured HDDs or SSDs for storage resilience and speed

# The Highs of Server Virtualization

- High Performance
  - Resource Optimization
  - Isolation
  - Live Migration
- High Scalability
  - Horizontal Scaling
  - Resource Flexibility
- High Availability (HA)
  - Fault Tolerance
  - Disaster Recovery
  - HA Clusters

*Other Additional Benefits are:*

- *Simplified management of servers – centralized admin and provisioning tasks*
- *Better costs savings - HW costs, energy consumption*
- *Easier and faster testing and development*

# Assignment Research Sources:


1. *https://syndicode.com/blog/how-to-build-a-learning-management-system/*
2. *https://www.techtarget.com/searchitoperations/tip/10-benefits-of-server-virtualization-for-businesses*
3. *https://edusasha.com/the-guide-to-everything-elearning/elearning-infrastructure-and-architecture/*