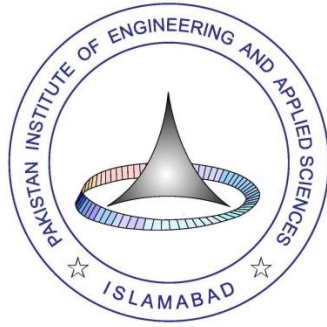


*Pakistan Institute of Engineering and Applied Sciences, Islamabad*  
*Department of Computer and Information Science*



# Internet Application Development

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*Lab Assignment no. 07*

*Submitted By*

*Huma Amin*

*Session (21-25)*

### **Question 01:**

Develop a Dell Xeon based server specification?

### **Answer:**

*“Model: Dell PowerEdge R740”*

#### **Processor:**

- Dual Intel Xeon Gold 6254 3.1GHz, 18 cores, 36 threads each

(or any other Xeon Gold or Platinum series processor depending on specific requirements and budget)

#### **Memory:**

- 256GB DDR4 ECC Registered RAM (16 x 16GB DIMMs)

(Memory capacity can be adjusted based on specific needs)

#### **Storage:**

- 2 x 480GB SSD (RAID 1) for OS and critical applications
- 8 x 2TB 7.2K RPM SAS HDD (RAID 10) for data storage

(Storage configuration can be customized based on storage requirements and performance needs)

#### **Network:**

- Dual-port 10 Gigabit Ethernet NIC

#### **Expansion Slots:**

- 6 x PCIe Gen3 slots (Allows for additional expansion cards such as network adapters, storage controllers, or GPU accelerators)

**Power Supply:**

- Dual redundant 750W power supplies

**Management:**

- Integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller

**Operating System:**

- Choice of Windows Server, Linux, or VMware vSphere (license not included)

**Chassis:**

- Form Factor: 2U Rackmount
- Dimensions (H x W x D): 8.73 cm x 44.40 cm x 68.40 cm (3.44 in x 17.49 in x 26.93 in)
- Weight: Starting at 29.48 kg (65 lbs.) with 8 x 2TB 7.2K RPM SAS HDDs

**Warranty:**

- Standard Warranty: Dell typically offers a 3-year Basic Hardware Warranty with Next Business Day Onsite Service.
- Optional Warranty Upgrades: Customers can choose to extend the warranty to 4 or 5 years or opt for additional services such as ProSupport or ProSupport Plus for enhanced support options, including 24/7 technical support and faster response times.

**Question 02:**

What are the different RAID levels and corresponding applications?

**Answer:****1. RAID 0 (Striping):**

- **Applications:** Suitable for environments where performance is critical, but data redundancy is not necessary, such as gaming PCs or video editing workstations.

## **2. RAID 1 (Mirroring):**

- **Applications:** Ideal for environments where data integrity and redundancy are paramount, such as critical database servers, financial systems, or small business servers.

## **3. RAID 5 (Striping with Distributed Parity):**

- **Applications:** Suitable for environments where a balance of performance and redundancy is required, such as file servers, email servers, or medium-sized business applications.

## **4. RAID 6 (Striping with Dual Parity):**

- **Applications:** Recommended for environments where data integrity and fault tolerance are critical, such as large-scale storage systems, virtualization platforms, or enterprise-level databases.

## **5. RAID 10 (Mirrored-Striping):**

- **Applications:** Ideal for high-performance environments that require both redundancy and speed, such as database servers, virtualization hosts, or high-transactional databases.

### **Question 03:**

Make a comparison of HDD vs SSD?

### **Answer:**

#### **Speed:**

- **HDDs:** Relatively slower in terms of data access and transfer speeds due to mechanical components and spinning platters.
- **SSDs:** Much faster data access and transfer speeds due to lack of moving parts and reliance on flash memory technology. SSDs typically offer significantly faster read and write speeds compared to HDDs.

**Durability and Reliability:**

- HDDs: Prone to mechanical failure and damage from shocks, vibrations, and wear over time.
- SSDs: More durable and reliable as they have no moving parts. SSDs are less susceptible to physical damage and are generally more resilient to shocks and vibrations.

**Power Consumption:**

- HDDs: Typically consume more power due to the need to spin the disk platters and move read/write heads.
- SSDs: Generally, consume less power as they do not require moving parts to operate, making them more energy-efficient, especially for laptops and mobile devices.

**Noise:**

- HDDs: Produce noticeable noise during operation due to spinning disks and moving read/write heads.
- SSDs: Silent operation as they do not have any moving parts, making them ideal for noise-sensitive environments such as recording studios or quiet office settings.

**Form Factor and Weight:**

- HDDs: Typically, larger, and heavier due to the mechanical components and spinning disks.
- SSDs: Smaller and lighter as they do not require bulky mechanical components, making them ideal for slim laptops, ultrabooks, and portable devices.

**Price per GB:**

- HDDs: Generally, offer lower cost per gigabyte compared to SSDs, making them a more economical choice for high-capacity storage needs.
- SSDs: Higher cost per gigabyte compared to HDDs, but prices have been decreasing steadily over time as SSD technology matures and becomes more widespread.

**Lifespan:**

- HDDs: Typically have a shorter lifespan compared to SSDs due to mechanical wear and tear.
- SSDs: Generally, have a longer lifespan as they are not susceptible to mechanical failures, although the lifespan can be affected by factors such as write endurance and cell degradation over time.