

## **Experiment :- 1**

### **2CSOE77 Web Technology**

**Aim :** Study of Internet Protocol Model, Internet Protocol and Web servers.

#### **Internet Protocol (IP)**

Internet Protocol (IP) is a set of rules that governs the exchange of data packets across networks, enabling devices to communicate over the internet. It assigns unique addresses to devices and manages packet routing, ensuring reliable data delivery between connected systems. In terms of IP there are two versions of logical address, IPV4 & IPV6. IPv4 uses 32-bit addresses, limiting available addresses and requiring NAT for widespread use. IPv6 uses 128-bit addresses, providing ample addresses and simplifying routing.

#### **Types of Internet Protocols :**

- **IPv4 (Internet Protocol version 4):** The older version, using 32-bit addresses, which are running out due to the growth of the internet.
- **IPv6 (Internet Protocol version 6):** The newer version, using 128-bit addresses, designed to address the limitations of IPv4 and provide a much larger address space for future growth.
- **TCP (Transmission Control Protocol):** TCP provides reliable, connection-oriented communication by managing the delivery and ordering of data packets between devices over IP networks.
- **UDP (User Datagram Protocol):** UDP sends data packets, known as datagrams, without establishing a formal connection or ensuring delivery confirmation. While this lack of reliability can lead to faster transmission, it may result in lost or out-of-order packets
- **ICMP (Internet Control Message Protocol):** ICMP primarily used for diagnostic and error reporting purposes in IP networks. ICMP messages are typically generated by network devices, like routers, to provide feedback about network conditions or issues.

#### **Web Servers:**

Web servers are foundational components of web technology. They receive and respond to HTTP requests from web clients, delivering static and dynamic content like HTML, CSS, images, and scripts. Servers use configuration files to set security, caching, and compression parameters. They enable hosting of websites and applications, supporting user interactions and data exchange.

**Internet Information Services (IIS):**

Internet Information Services (IIS) is a web server software developed by Microsoft for hosting websites and web applications on Windows servers. It supports various protocols like HTTP, HTTPS, FTP, and SMTP. IIS offers features like dynamic content generation, security controls, load balancing, and integration with ASP.NET for building robust web solutions. It's a popular choice for enterprises due to its seamless integration with Windows Server environments, providing a platform for hosting and managing web-based services.

**Key features of IIS:**

1. **Web Hosting:** IIS efficiently hosts websites and applications, managing HTTP and HTTPS requests, delivering content, and supporting various web technologies.
2. **Security:** IIS offers authentication mechanisms, SSL/TLS support for secure communication, and URL filtering to protect against threats and unauthorized access.
3. **ASP.NET Integration:** IIS seamlessly integrates with ASP.NET, Microsoft's web application framework, enabling the development of dynamic and interactive web applications.
4. **Application Pools:** It isolates web applications within separate application pools, enhancing stability and resource management by preventing one application from affecting others.
5. **Management Tools:** IIS provides user-friendly management interfaces, such as IIS Manager and PowerShell commands, allowing administrators to configure, monitor, and troubleshoot web server settings and applications.