**DevOps Basics**

- IAC

- CI/CD

- Networking

- Cloud Networking

- Software Engineering

**Focus of the class**

1. Docker, Kubernetes & Microservice Design and scalability

2. Linux (Network namespace)

3. Kubernetes

4. Microservice

**User space**

User space is the memory space where normal user processes run (i.e., everything other than the kernel) The role of the kernel is to manage applications running in this space from messing with each other, and the machine.

**Kernel space**

Kernal space is the memory location where the code of the kernel is stored and executes under.

**Namespace**

Namespaces are a feature of the Linux kernel that partitions kernel resources such that one set of processes sees one set of resources while another set of processes sees a different set of resources.

Types of namespace

- Network namespace

- File namespace

**Web Server example**

**Socket binding**

**ARP**

Address Resolution Protocol (ARP) is a protocol or procedure that connects an ever-changing Internet Protocol (IP) address to a fixed physical machine address, also known as a media access control (MAC) address, in a local-area network (LAN).

When a new computer joins a LAN, it is assigned a unique IP address to use for identification and communication.

Packets of data arrive at a gateway, destined for a particular host machine. The gateway, or the piece of hardware on a network that allows data to flow from one network to another, asks the ARP program to find a MAC address that matches the IP address. The ARP cache keeps a record of each IP address and its matching MAC address. The ARP cache is dynamic, but users on a network can also configure a static ARP table containing IP addresses and MAC addresses.

ARP caches are kept on all operating systems in an IPv4 Ethernet network. Every time a device requests a MAC address to send data to another device connected to the LAN, the device verifies its ARP cache to see if the IP-to-MAC-address connection has already been completed. If it exists, then a new request is unnecessary. However, if the translation has not yet been carried out, then the request for network addresses is sent, and ARP is performed.

An ARP cache size is limited by design, and addresses tend to stay in the cache for only a few minutes. It is purged regularly to free up space. This design is also intended for privacy and security to prevent IP addresses from being stolen or spoofed by cyberattackers. While MAC addresses are fixed, IP addresses are constantly changing.

In the purging process, unutilized addresses are deleted; so is any data related to unsuccessful tries to communicate with computers not connected to the network or that are not even powered on.

**OSI Model**

1. Application

2. Presentation

3. Session

4. Transport

5. Network

6. Data Link

7. Physical







