**- Yash Mangla**

**Problem Statement:**

Network Load Balancer (NLB) is a type of load balancer that helps distribute incoming network traffic across multiple servers

**Reason/Motivation to choose the topic:**

A **load balancer** acts as the “traffic cop” sitting in front of your servers and routing client requests across all servers capable of fulfilling those requests in a manner that maximizes speed and capacity utilization and ensures that no one server is overworked, which could degrade performance. If a single server goes down, the load balancer redirects traffic to the remaining online servers. When a new server is added to the server group, the load balancer automatically starts to send requests to it.

**Objective and scope of the project**

Reduce the load on the server by distributing the incoming traffic across multiple targets

**Methodology (including a summary of the project)**

**Sockets**

A socket is a communications connection point (endpoint) that you can name and address in a network. Socket programming shows how to use socket APIs to establish communication links between remote and local processes.

**Connection-Oriented Socket Programming**

In a connection-oriented client-to-server model, the socket on the server process waits for requests from a client. To do this, the server first establishes (binds) an address that clients can use to find the server. When the address is established, the server waits for clients to request a service.

**Threshold**

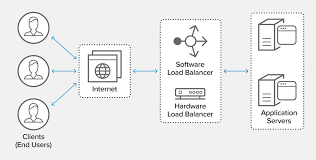
We have set a threshold value for connection establishment of 10s if the request delayed for more then this then the client request shifted to another server.

**Threading**

Threading is a useful technique in socket programming for building high-performance networked applications that can handle multiple client connections simultaneously.

In a multi-threaded socket programming model, the server creates a new thread for each incoming client connection. Each thread runs independently and handles the client's requests, freeing up the server's main thread to listen for incoming client connections.

This approach allows the server to handle multiple client connections simultaneously, improving the application's responsiveness and scalability.

****

**Features:**

Network Load Balancer (NLB) is a type of load balancer that helps distribute incoming network traffic across multiple servers-

1. High availability: NLB can detect and route traffic to healthy backend servers, ensuring that traffic is always being handled by available servers.
2. Scalability: NLB can handle large amounts of traffic and scale up or down as needed..
3. TCP and UDP support: NLB can handle both Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) traffic, making it versatile in handling different types of traffic.
4. Static IP support: NLB can be configured with a static IP address, making it easier to manage and integrate with other network components.

**Conclusion:**

In conclusion, Network Load Balancer (NLB) is a powerful tool for distributing incoming network traffic across multiple servers. It provides high availability, scalability, security, and support for both TCP and UDP traffic. NLB is cost-effective and can be used in a variety of scenarios, including web applications, database servers, media streaming, and e-commerce. NLB is an essential component for any organization that wants to improve the performance, availability, and scalability of its network infrastructure.