# Nginx Load Balancer on Windows for High-Availability System

This project demonstrates setting up an Nginx load balancer on Windows using a round-robin algorithm to distribute HTTP requests across multiple backend servers, ensuring high availability and balanced load distribution for improved reliability.

## Project Overview

The goal of this project was to set up an Nginx load balancer on Windows to manage traffic between two Spring Boot applications running on different ports. Nginx was configured to use a round-robin method to alternate requests, thus balancing the load between the servers.

## Key Steps Implemented

* • Installed Nginx on Windows and verified successful installation.
* • Configured the nginx.conf file to define upstream servers (two Spring Boot applications) and set up the load balancing configuration.
* • Set up the load balancer to listen on port 9085, routing requests to backend servers on ports 8083 and 8084.
* • Utilized a round-robin algorithm for request distribution, ensuring an even load across both servers.
* • Validated the configuration by successfully receiving alternating responses from each server when accessing the load balancer.

## Configuration Details

The following is the configuration used in nginx.conf:

http {  
 upstream backend\_servers {  
 server 127.0.0.1:8083;  
 server 127.0.0.1:8084;  
 }  
   
 server {  
 listen 9085;  
 server\_name localhost;  
   
 location / {  
 proxy\_pass http://backend\_servers;  
 proxy\_set\_header Host $host;  
 proxy\_set\_header X-Real-IP $remote\_addr;  
 proxy\_set\_header X-Forwarded-For $proxy\_add\_x\_forwarded\_for;  
 proxy\_set\_header X-Forwarded-Proto $scheme;  
 }  
 }  
}

## Sample Output

After configuring Nginx, the following outputs confirm load balancing:  
C:\nginx-1.27.2> curl http://localhost:9085/  
Hello from server1  
C:\nginx-1.27.2> curl http://localhost:9085/  
Hello from server2  
C:\nginx-1.27.2> curl http://localhost:9085/  
Hello from server1  
C:\nginx-1.27.2> curl http://localhost:9085/  
Hello from server2

## Project Benefits

* • Demonstrates the ability to configure and manage load balancing on Windows using Nginx.
* • Improves application reliability and availability by balancing load across multiple servers.
* • Provides experience in backend infrastructure setup, essential for handling production-grade traffic.