

# Reverse Proxy & Load Balancer Setup with SSL (Nginx on EC2)

## 1. EC2 Architecture Overview

Role	Instance Name	Purpose
reverse_proxy	Nginx Load Balancer	Distributes traffic using round-robin
backend_server1	App Server	Handles app requests
backend_server2	App Server	Handles app requests
backend_server3	App Server	Handles app requests
monitoring	Prometheus+Grafana	Monitoring traffic, alerts, and logs
db_replica	Database	Holds replicated data (optional usage)

## 2. Nginx Setup on Reverse Proxy

```
sudo apt update -y
sudo apt install nginx -y
```

Round-Robin Load Balancer Config (/etc/nginx/sites-available/default):

```
upstream backend_servers {
    server 10.0.0.101;
    server 10.0.0.102;
    server 10.0.0.103;
}

server {
    listen 80;
    location / {
```

```
    proxy_pass http://backend_servers;
}
}
```

### 3. SSL/TLS: Certificate Preparation & Planning

---

Self-Signed Certificate (for testing):

```
openssl req -x509 -nodes -days 365 -newkey rsa:2048 \
-keyout /etc/ssl/private/nginx-selfsigned.key \
-out /etc/ssl/certs/nginx-selfsigned.crt
```

Let's Encrypt with Certbot:

```
sudo apt install certbot python3-certbot-nginx -y
sudo certbot --nginx
```

### 4. Certificate Management

---

Store in: /etc/ssl/private/ and /etc/ssl/certs/

Set permissions: `chmod 600 /etc/ssl/private/*.key`

Backup securely or use AWS ACM in prod.

Automate renewal: `sudo systemctl status certbot.timer`

### 5. Nginx HTTPS Configuration

---

Redirect HTTP to HTTPS:

```
server {
    listen 80;
```

```
server_name your-domain.com;

return 301 https://$host$request_uri;
}
```

#### SSL-enabled Block:

```
server {

    listen 443 ssl;

    server_name your-domain.com;

    ssl_certificate /etc/ssl/certs/nginx-selfsigned.crt;

    ssl_certificate_key /etc/ssl/private/nginx-selfsigned.key;

    location / {

        proxy_pass http://backend_servers;

    }

}
```

#### Checklist Before Proceeding:

- Generated/Installed SSL certs
- Configured Nginx for ports 80 & 443
- Tested HTTPS access
- Verified port 443 open in Security Group
- Documented cert storage & renewal process