

## 1. Overview & Architecture

Grafana is a web UI that runs on port 3000 by default. On EC2, you'll:

- 1) Launch an EC2 instance (Ubuntu, Amazon Linux, or RHEL/CentOS).
- 2) Open security group port 3000 (or use Nginx reverse proxy on 80/443).
- 3) Install Grafana from the official repository.
- 4) Start and enable grafana-server (systemd).
- 5) Sign in at <http://<EC2-Public-IP>:3000> (default admin/admin) and change password.
- 6) (Optional) Put Nginx + Let's Encrypt in front for HTTPS.

## 2. Prerequisites (Do This First)

### A) AWS Account & Permissions

- IAM user/role with EC2 access.
- Key pair (.pem) to SSH into the instance (or Session Manager).

### B) Choose Region & AMI

- Ubuntu 22.04 LTS (recommended for beginners) OR
- Amazon Linux 2023 / Amazon Linux 2 OR
- RHEL/CentOS Stream 9

### C) Security Group (SG)

- Inbound: TCP 22 from your IP (SSH)
- Inbound: TCP 3000 from your IP (or 0.0.0.0/0 for quick tests – not recommended)
- (If using Nginx HTTPS) TCP 80 and 443

### D) Connect

- SSH: `ssh -i <key.pem> ubuntu@<Public-IP> # Ubuntu`
- SSH: `ssh -i <key.pem> ec2-user@<Public-IP> # Amazon Linux / RHEL`

### 3. Ubuntu/Debian – Install Grafana OSS (Recommended)

#### 1) Update and base tools:

```
sudo apt-get update  
sudo apt-get install -y apt-transport-https software-properties-common wget gpg
```

#### 2) Add Grafana GPG key and repository:

```
wget -q -O - https://packages.grafana.com/gpg.key | sudo gpg --dearmor -o  
/usr/share/keyrings/grafana.gpg  
echo "deb [signed-by=/usr/share/keyrings/grafana.gpg] https://packages.grafana.com/oss/deb stable  
main" | sudo tee /etc/apt/sources.list.d/grafana.list
```

#### 3) Install and start Grafana:

```
sudo apt-get update  
sudo apt-get install -y grafana  
sudo systemctl daemon-reload  
sudo systemctl enable --now grafana-server
```

#### 4) Verify service:

```
systemctl status grafana-server --no-pager
```

#### 5) Access:

Open <http://<EC2-Public-IP>:3000>

Default credentials: admin / admin (you'll be prompted to set a new password)

#### 4. Amazon Linux 2023 / Amazon Linux 2 – Install Grafana OSS

Create the repo file and install Grafana.

1) Base tools:

```
# AL2023
```

```
sudo dnf install -y wget
```

```
# AL2
```

```
sudo yum install -y wget
```

2) Create repo file:

```
sudo tee /etc/yum.repos.d/grafana.repo > /dev/null <<'EOF'
```

```
[grafana]
```

```
name=grafana
```

```
baseurl=https://packages.grafana.com/oss/rpm
```

```
repo_gpgcheck=1
```

```
enabled=1
```

```
gpgcheck=1
```

```
gpgkey=https://packages.grafana.com/gpg.key
```

```
sslverify=1
```

```
EOF
```

3) Install Grafana:

```
# AL2023
```

```
sudo dnf clean all && sudo dnf install -y grafana
```

```
# AL2
```

```
sudo yum clean all && sudo yum install -y grafana
```

4) Start and enable service:

```
sudo systemctl daemon-reload
```

```
sudo systemctl enable --now grafana-server
```

5) Verify:

```
systemctl status grafana-server --no-pager
```

6) Access:

```
http://<EC2-Public-IP>:3000 (admin/admin at first login)
```

## 5. RHEL/CentOS Stream 9 – Install Grafana OSS

### 1) Base tools:

```
sudo dnf install -y wget
```

### 2) Repo file:

```
sudo tee /etc/yum.repos.d/grafana.repo > /dev/null <<'EOF'
[grafana]
name=grafana
baseurl=https://packages.grafana.com/oss/rpm
repo_gpgcheck=1
enabled=1
gpgcheck=1
gpgkey=https://packages.grafana.com/gpg.key
sslverify=1
EOF
```

### 3) Install and start:

```
sudo dnf clean all && sudo dnf install -y grafana
sudo systemctl daemon-reload
sudo systemctl enable --now grafana-server
systemctl status grafana-server --no-pager
```

### 4) Access:

```
http://<EC2-Public-IP>:3000 (admin/admin)
```

## 6. Configure Security Group & (Optional) Instance Firewall

### A) Security Group (in AWS Console → EC2 → Security Groups)

- Add inbound rule: TCP 3000 from your IP (or 0.0.0.0/0 for testing).
- If using Nginx/HTTPS, also open TCP 80 and 443.

### B) Instance Firewall (if enabled)

- Ubuntu (UFW): `sudo ufw allow 3000/tcp`
- RHEL/AL firewalld: `sudo firewall-cmd --add-port=3000/tcp --permanent && sudo firewall-cmd --reload`

## 7. First Login & Basic Hardening

### 1) First Login

- Browse: `http://<EC2-Public-IP>:3000`
- User: admin Pass: admin (you will be asked to set a new password)

### 2) Change Admin Password

- Immediately set a strong password.

### 3) Optional: Bind to localhost if using Nginx proxy

- Edit `/etc/grafana/grafana.ini` → set `http_addr = 127.0.0.1` (then restart grafana-server)

### 4) Backups

- Config: `/etc/grafana/grafana.ini`
- SQLite DB: `/var/lib/grafana/grafana.db`
- Grafana home: `/usr/share/grafana`
- Back up `grafana.ini` and `grafana.db` regularly.

## 8. Add a Data Source (Examples)

In Grafana → Settings (gear icon) → Data sources → Add data source.

### A) Prometheus (common choice)

- Install `node_exporter` on EC2 (metrics), run Prometheus server, then add Prometheus URL in Grafana.
- Quick test (prometheus on same VM): `http://localhost:9090`

### B) CloudWatch

- Attach an IAM role with `CloudWatchReadOnlyAccess` to the EC2 or configure AWS credentials.
- Add CloudWatch data source in Grafana; select region/namespace.

### C) Other Sources

- MySQL/PostgreSQL, Loki, InfluxDB, Elasticsearch, etc.



## 9. Optional: Put Nginx + HTTPS (Let's Encrypt) in Front

Recommended for production and exposing to the internet.

Ubuntu steps (example):

1) Install Nginx:

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

2) Configure reverse proxy (server block):

```
sudo tee /etc/nginx/sites-available/grafana.conf > /dev/null <<'EOF'
```

```
server {  
    listen 80;  
    server_name YOUR_DOMAIN_OR_IP;  
  
    location / {  
        proxy_pass http://127.0.0.1:3000;  
        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;  
    }  
}
```

EOF

```
sudo ln -s /etc/nginx/sites-available/grafana.conf /etc/nginx/sites-enabled/grafana.conf
```

```
sudo nginx -t && sudo systemctl reload nginx
```

3) (Optional) Bind Grafana to localhost:

```
Edit /etc/grafana/grafana.ini → set http_addr = 127.0.0.1; sudo systemctl restart grafana-server
```

4) Get a free TLS cert (Let's Encrypt):

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

```
sudo certbot --nginx -d YOUR_DOMAIN # follow prompts
```

5) Auto-renewal:

```
sudo systemctl status certbot.timer
```

```
# Certificates typically live in /etc/letsencrypt/live/YOUR_DOMAIN/
```

## 10. Upgrades, Logs & Troubleshooting

### A) Upgrade Grafana

- Ubuntu/Debian: `sudo apt-get update && sudo apt-get install -y grafana`
- Amazon Linux/RHEL: `sudo dnf/yum update -y grafana`

### B) Service Control

- Start: `sudo systemctl start grafana-server`
- Stop: `sudo systemctl stop grafana-server`
- Restart: `sudo systemctl restart grafana-server`
- Enable on boot: `sudo systemctl enable grafana-server`

### C) Logs

- Service logs: `sudo journalctl -u grafana-server -f`
- Nginx logs: `/var/log/nginx/access.log` and `error.log`

### D) Common Issues

- Port blocked: check SG, NACL, and instance firewall (ufw/firewalld).
- Wrong bind address: verify `http_addr` in `/etc/grafana/grafana.ini`.
- Time sync: install `chrony` or `systemd-timesyncd` to avoid dashboard time drift.
- High CPU/RAM: reduce dashboard refresh rates; resize instance; enable Prometheus remote storage.

## 11. Clean Uninstall (if needed)

Ubuntu/Debian:

```
sudo systemctl disable --now grafana-server  
sudo apt-get remove --purge -y grafana  
sudo rm -rf /etc/grafana /var/lib/grafana /var/log/grafana
```

Amazon Linux/RHEL:

```
sudo systemctl disable --now grafana-server  
sudo dnf/yum remove -y grafana  
sudo rm -rf /etc/grafana /var/lib/grafana /var/log/grafana
```

## Appendix: Sample EC2 Launch (Console)

- 1) EC2 → Launch Instance → Name: grafana-ec2
- 2) AMI: Ubuntu 22.04 LTS (or Amazon Linux 2023)
- 3) Instance type: t3.small (start small; upgrade later)
- 4) Key pair: Create/new download .pem
- 5) Network: default VPC; Auto-assign public IP: Enable
- 6) Security group:
  - SSH (22) from your IP
  - HTTP (80) from 0.0.0.0/0 (if using Nginx)
  - HTTPS (443) from 0.0.0.0/0 (if using TLS)
  - Grafana (3000) from your IP (or temporarily open to test)
- 7) Storage: 20 GB gp3 (adjust as needed)
- 8) Launch, then connect via SSH once status checks pass.