DevOps Capstone Project

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Slightly Techie School (Cohort 4)

Project Overview

A simple DevOps setup that utilizes a number of services to create a workflow that incorporates:

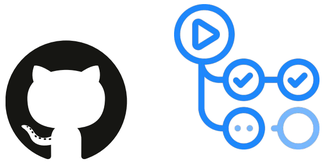
- Infrastructure as code
- Configuration management
- Containerization
- Service orchestration
- Monitoring
- CI/CD.

Architecture

Traefik

OpenSSH

Docker/Dockerhub



Github/Github Actions

Monitoring Stack

Grafana

Prometheus

Node exporter

Alertmanager

cAdvisor

Infrastructure Setup

OpenSSH

Artificats

/home/user/.ssh/config

```
Host winston-aws-vm
     User ubuntu
     Hostname ec2-51-21-190-239.eu-north-1.compute.amazonaws.com
     IdentityFile /home/winst/.ssh/winston-aws-vm-key
```

Provisioning with Ansible


```
- hosts: main
  roles:
    - hostname
    - essentials
    - security
    - kerneltweaks
    - docker
    - traefik
    - monitoring
```

hostname

essentials

security

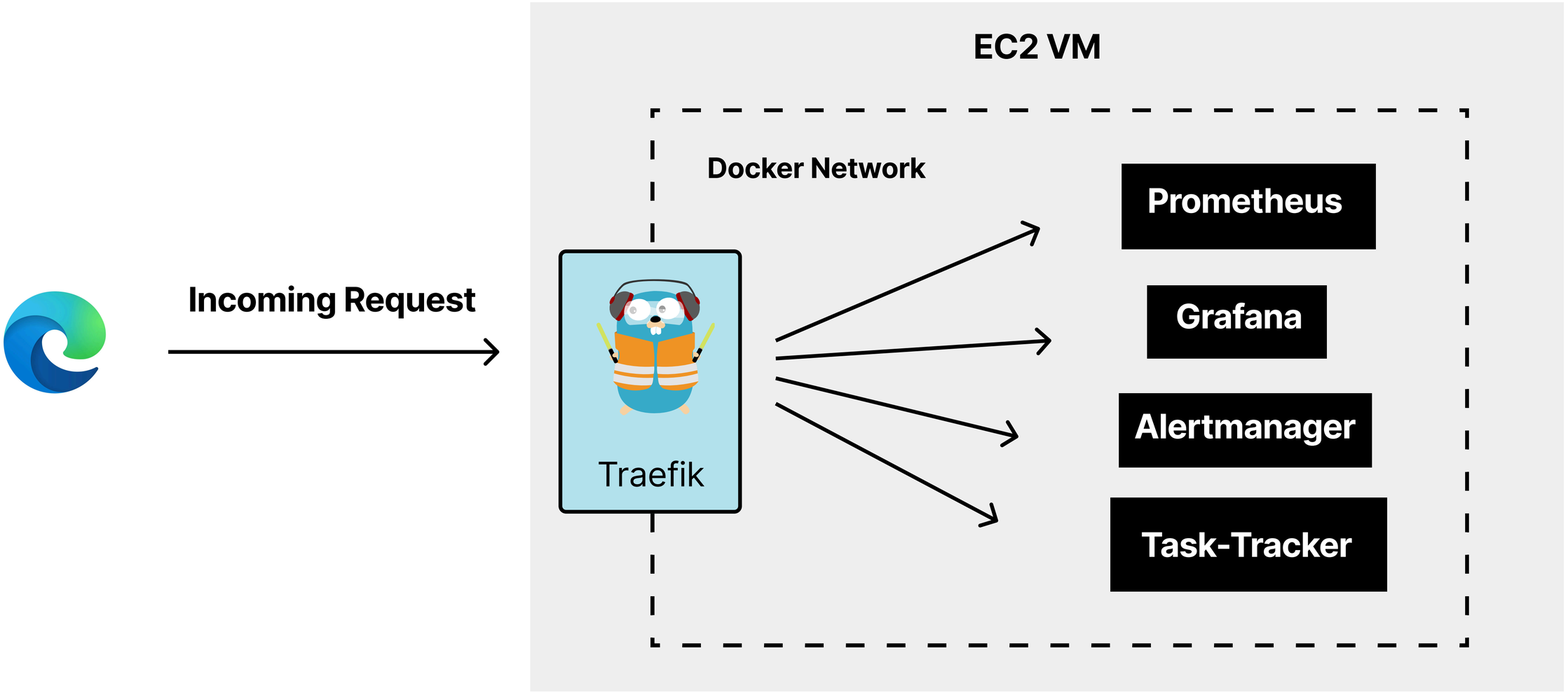
kerneltweaks

docker

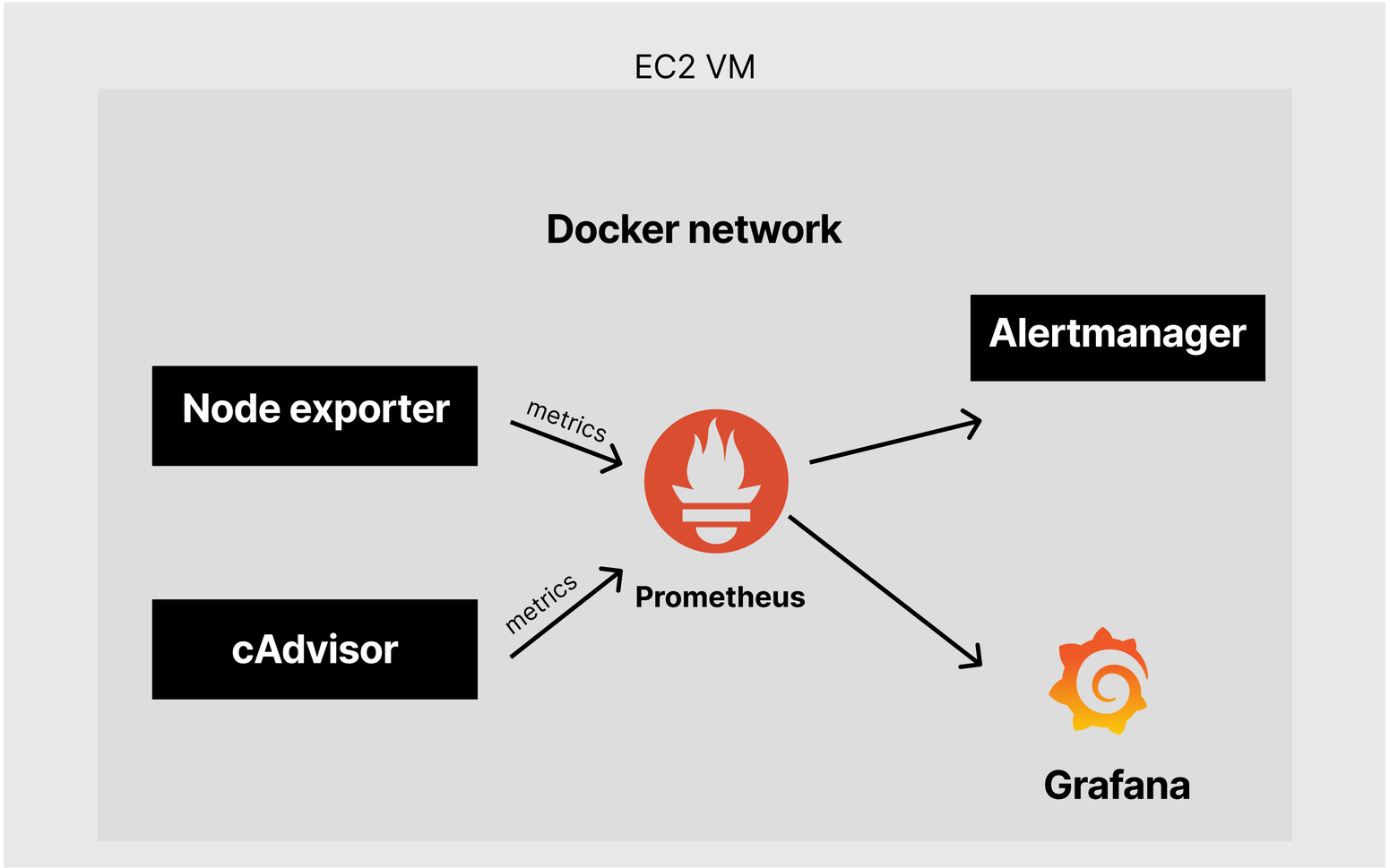
traefik

monitoring

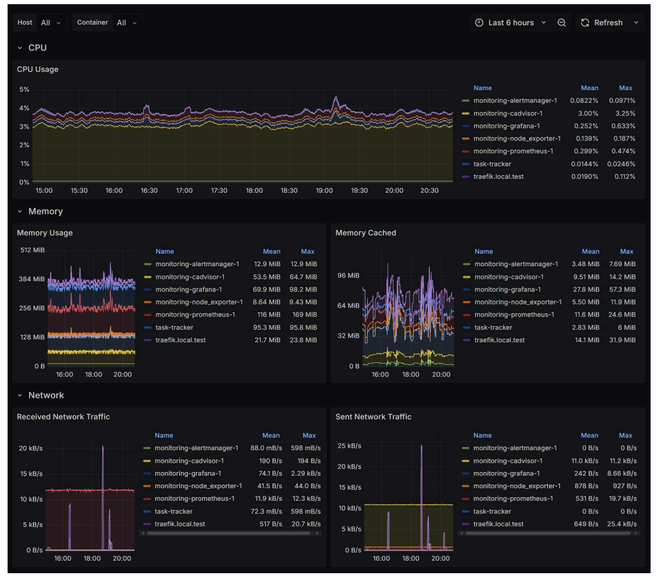
Service Routing with Traefik



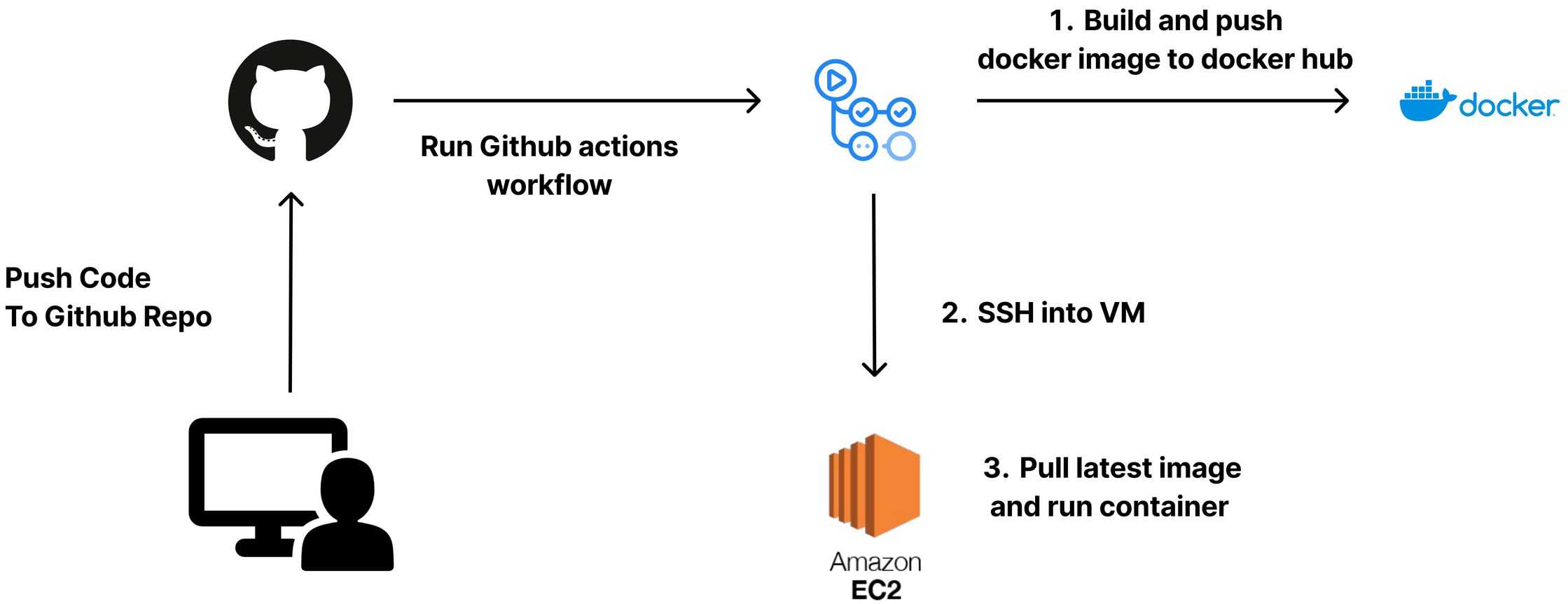
Monitoring Stack



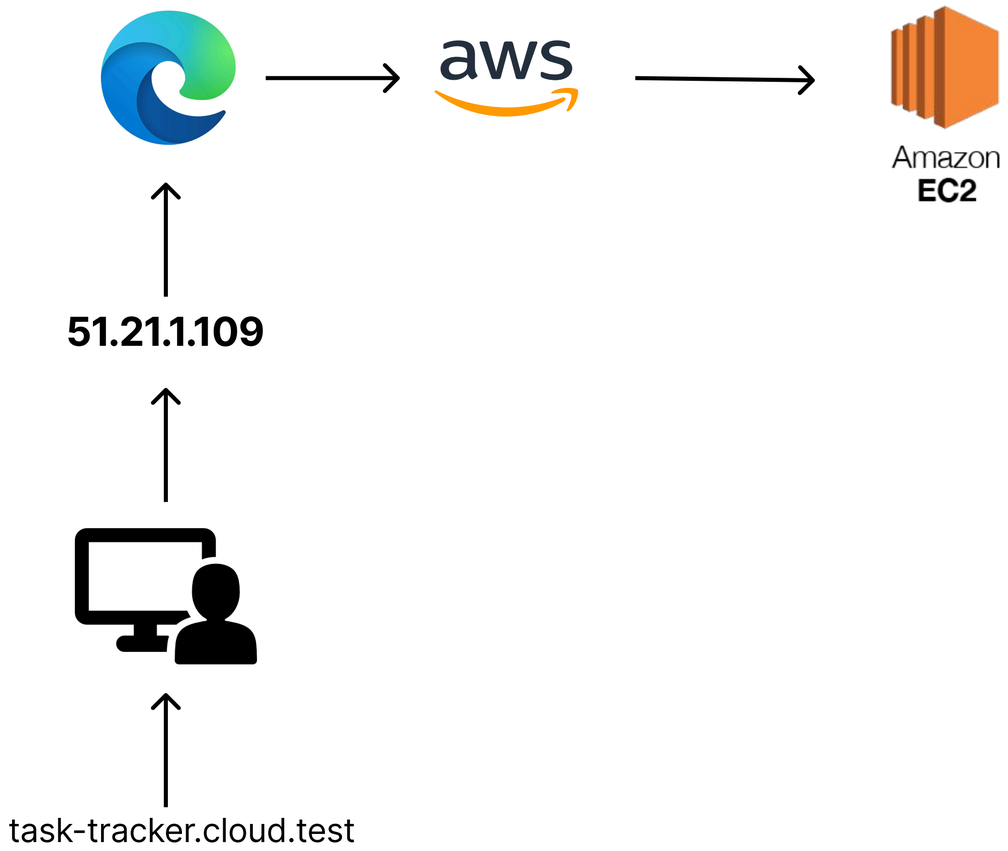
Sample



CI/CD with Github Actions



Local DNS Mapping



Artificats

/etc/hosts

```
51.21.190.239 traefik.local.test
51.21.190.239 task-tracker.cloud.test
51.21.190.239 alertmanager.cloud.test
51.21.190.239 grafana.cloud.test
51.21.190.239 prometheus.cloud.test
```

🎯Outcome

1. Successfully automated the provisioning of a production-like server environment.
2. Deployed a containerized application with minimal downtime.
3. Real-time monitoring provided insight into system health.
4. CI/CD pipeline enabled seamless code deployment directly from GitHub.
5. Infrastructure as Code via Ansible promotes repeatability and scalability.

✅ Further Improvements

- TLS via Let’s Encrypt
- Adding automated backups for disaster recovery
- Load balancing for improved availability
- Alerting for better mean time to recovery
- Automation of VM creation in ansible for easy replication (IAC)

Thank You