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Automated Deployment with Monitoring

Introduction

The following case study will explain in detail how to establish a CI/CD pipeline using Jenkins for a simple web application, which would be deployed on an Amazon EC2 instance. We will also extend this setup by implementing Nagios for monitoring the application availability, enabling the detection of any possible downtime or issues as soon as they arise.

Problem Statement

Automation of deploying a web application will help in improving efficiency and reducing chances of human error throughout deployment. Secondly, it is important to put in place the monitoring that will update on application health and performance.

Technologies Used

- **Jenkins**: An open-source automation server that facilitates CI/CD.
- **Amazon EC2**: A cloud computing service that provides scalable computing capacity.
- **Nagios**: A powerful monitoring system that enables organizations to identify and resolve IT infrastructure issues.
- **Vercel**: A platform for frontend developers, used here for analytics and monitoring the application's performance and usage.
- **Docker:** Containerization for consistent deployment for our web app.

Implementation Steps

1. **Setting Up the Environment**:
    - Provision an EC2 instance where the web application will be deployed.
    - Install necessary software and dependencies on the EC2 instance.

2. **Jenkins Configuration**:
    - Install Jenkins on a dedicated server or the EC2 instance itself.
    - Create a new pipeline job in Jenkins that will:
        - Clone the web application repository.
        - Build the application.
        - Deploy the built application to the EC2 instance using SSH.

3. **Nagios Installation and Configuration**:
    - Install Nagios on a separate server or the same EC2 instance.
    - Configure Nagios to monitor the HTTP status of the deployed web application.

4. **Vercel Analytics Integration**:
    - Integrate Vercel for tracking user interactions and performance metrics.
    - Use the data gathered from Vercel to inform future deployments and enhancements.

5. **Testing the Pipeline**:
    - Trigger a build in Jenkins to deploy the application.
    - Verify the deployment by accessing the web application through a browser.

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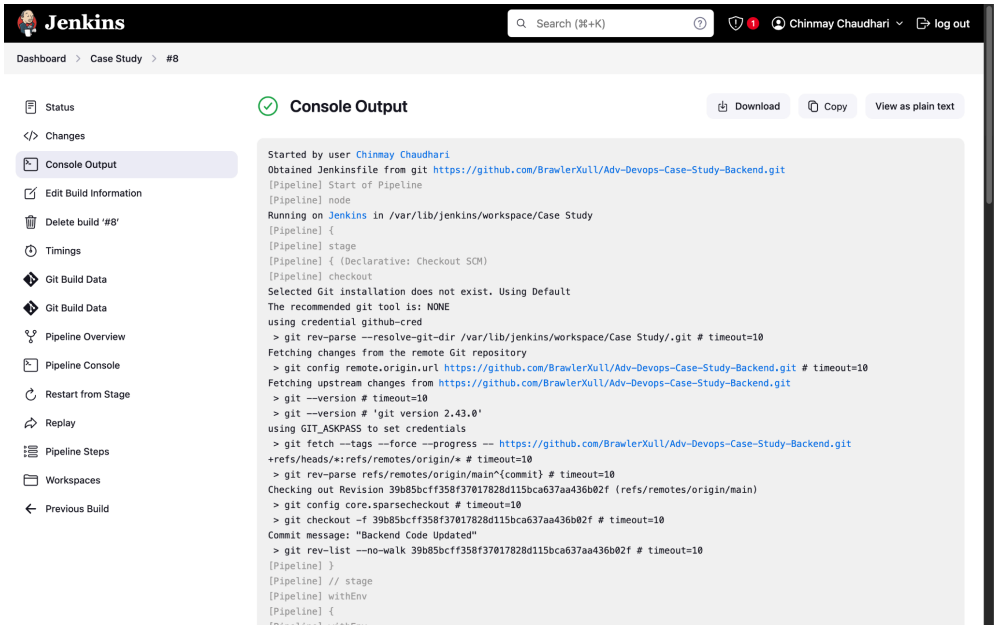
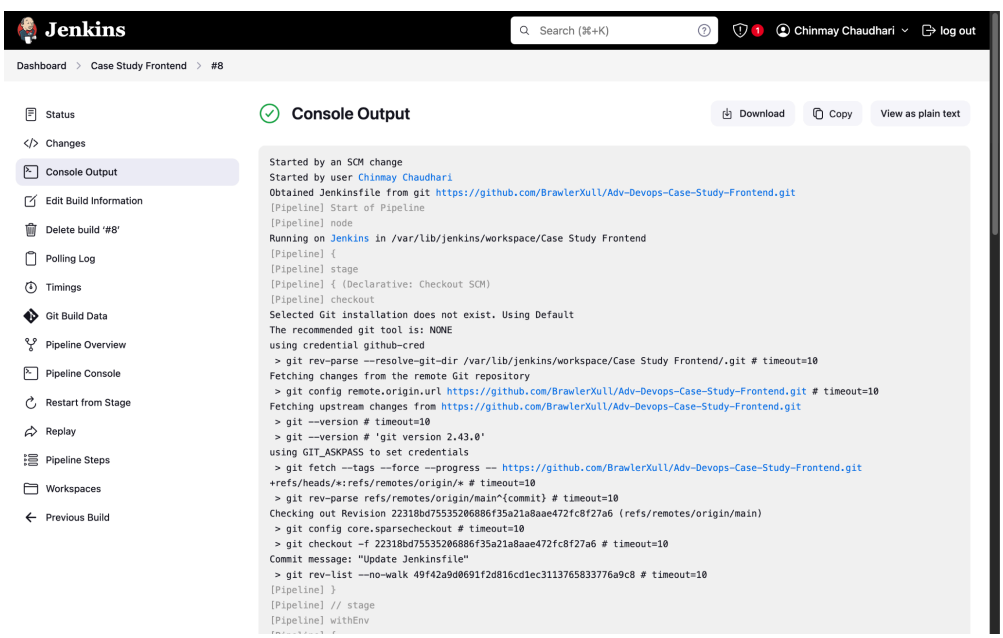
Part I - Backend

Setup a Jenkins Pipeline to automate the process of deployment of our web app's backend



Part II - Frontend

Setup a Jenkins Pipeline to automate the process of deployment of our web app's frontend.



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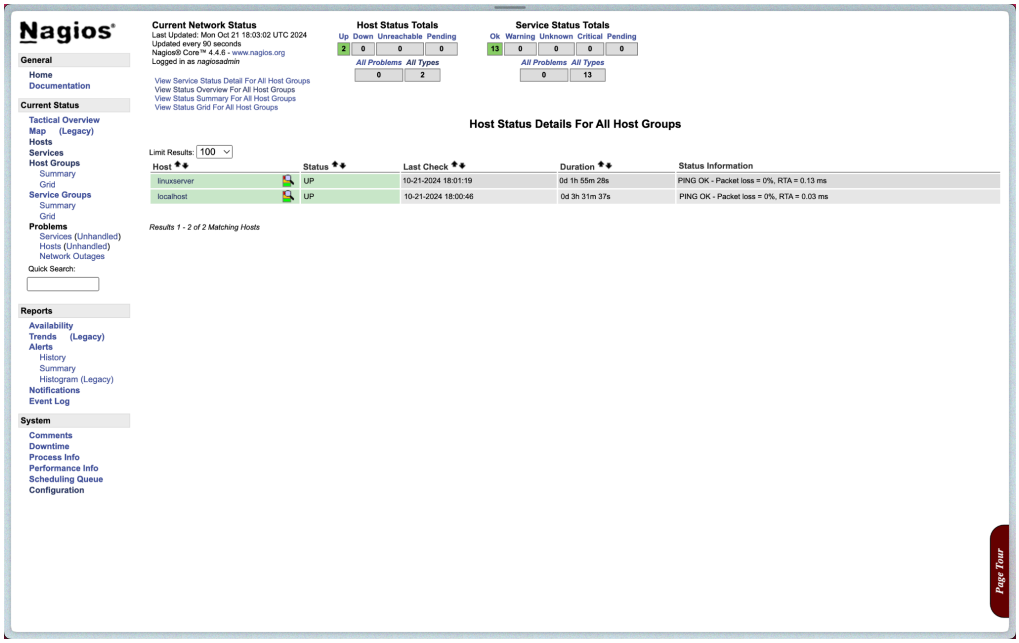
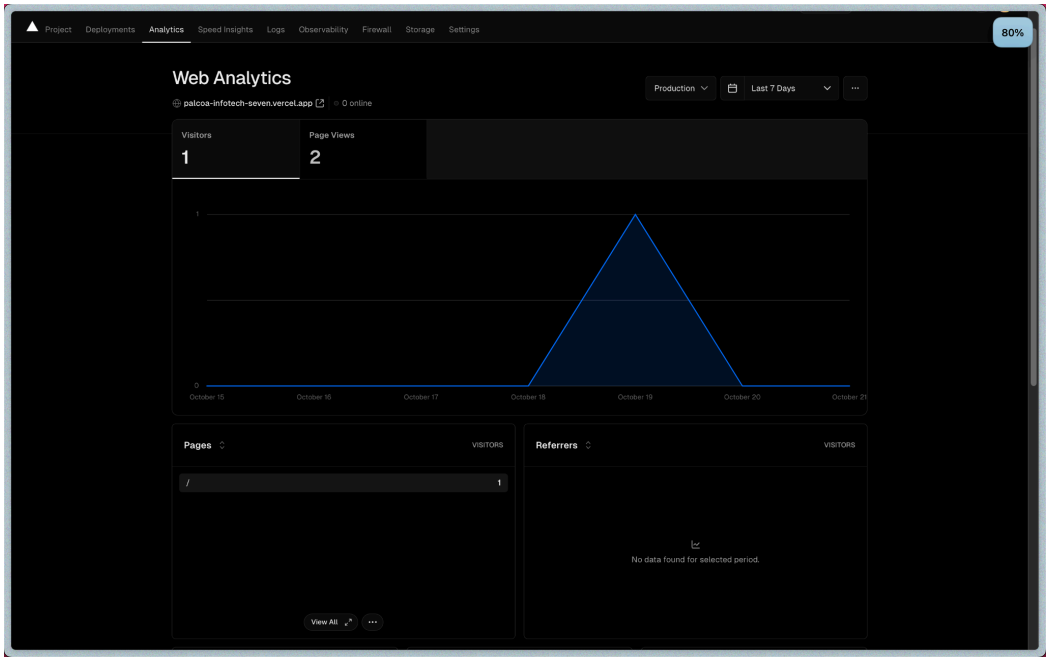
Part III - Nagios

Install Nagios and go to hosts section so see the running webapps



Part IV - Additional Integration (Mini Project)

Login to vercel using your github account and setup the analytics for our webapp.



Outcome

Once this CI/CD pipeline is successfully implemented, the web application deployment will be smooth and agile since the time taken from development to production would be minimized. Moreover, Nagios monitoring provides instant visibility of an application's status in order for proactive issue management to take place.

Conclusion

In this following Experiment we learnt the below things

1. Setting up the Jenkins pipeline for deployment of web applications.
2. Using SCM Pipeline script while setting up the jenkins pipeline.
3. Integrating Nagios for Real Time monitoring of our web server.
4. Setting up custom config files for our Nagios project.
5. Integrating Vercel to view analytics of our frontend project.