MARKA: A Microservice Architecture-Based Application, Performance Comparison Between Docker Swarm and Kubernetes

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Presenter Resume

GÖKER CEBECİ

- From Edirne, TURKEY
- Works on web development more than 10 years
- Senior Web Developer at evet.com
- PhD Student at Computer Engineering in Yildiz Technical University
- LinkedIn: https://www.linkedin.com/in/gokercebeci/
- GitHub: https://github.com/gokercebeci
Research Interests

- Software Development and Architecture
- Code Quality
- Reusability
- NLP
- Machine Learning

GÖKER CEBECİ

CURRENT PROJECTS

- [https://kodkafa.com](https://kodkafa.com)
- [https://github.com/kodkafa/fern-stack](https://github.com/kodkafa/fern-stack)

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Outline

- MARKA Application
- Test Scenario
- Docker Swarm and Kubernetes Test Results
- Discussion
MARKA Application

MARKA.CLUB

- What is “MARKA”?  
- Culture of drinking black tea  
- MARKA is a token in Turkish

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MARKA Application

- Web based loyalty application
- 6 microservices, 1 DB (MongoDB), 1 front-end
- HTTP communication
- ReactJS
- Node.js
MARKA.CLUB (Front-End)

MARKA.CLUB

- ReactJS
- [https://marka.club](https://marka.club)
- login/register by roles
- create codes/use codes by roles
API Gateway

- Communicates all of microservices and front-end.
- Provides communication between each other
Authentication Service

MARKA.CLUB

- Registration and login service
User Service

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- The service keeps the user information
  - name
  - email etc.
- and user role
  (company or customer)
Code Service

- Generates the codes
- Cannot use own code

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**Transaction Service**

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- Keeps the code transaction information

MARKA.CLUB (FRONT-END)

API GATEWAY

AUTHENTICATION SERVICE  USER SERVICE  CODE SERVICE  TRANSACTION SERVICE  QR (IMAGE) GENERATOR SERVICE

MONGODB

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QR Generator Service

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- Turns a hash code to a QR code image
Database

- MongoDB
- Each service communicates with its own collection
Test Scenario

- Test tool: JMeter
- Test without an orchestrator (TWO)  
  *(without any container)*
- Docker Swarm
- Kubernetes
- Docker Desktop
Test Scenario

MARKA.CLUB

- Simulation of all steps (real life)
- Load test for 10, 20, 50, 100, 200, 400 and 500 users
Test Results

MARKA.CLUB

Docker Swarm

- 10 users: 52 seconds
- 20 users: 1 minute 42 seconds
- 50 users: 4 minutes 7 seconds
- 100 users: 6 minutes 53 seconds
- 200 users: 12 minutes 18 seconds
- 400 users: 34 minutes 51 seconds
- 500 users: 44 minutes 16 seconds

Kubernetes

- 10 users: 51 seconds
- 20 users: 1 minute 6 seconds,
- 50 users: 2 minutes 36 seconds
- 100 users: 5 minutes 40 seconds
- 200 users: 12 minutes 20 seconds
- 400 users: 40 minutes 25 seconds
- 500 users: 48 minutes 33 seconds
Discussion

- TWO failed more than 50 users
- Docker Swarm is worse than Kubernetes in fewer users
- Docker Swarm is better than Kubernetes in a lot of users
- 3 replicas for each of them
Thank You

ANY QUESTION?

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