Monolith To Microservices
Phase II

Monolithic application architecture

UI (JSF)

User Management and Access Control Management

Accounting

Companies & Projects

Holidays

Utilities

Reports

Publications

Bulletin

WAR

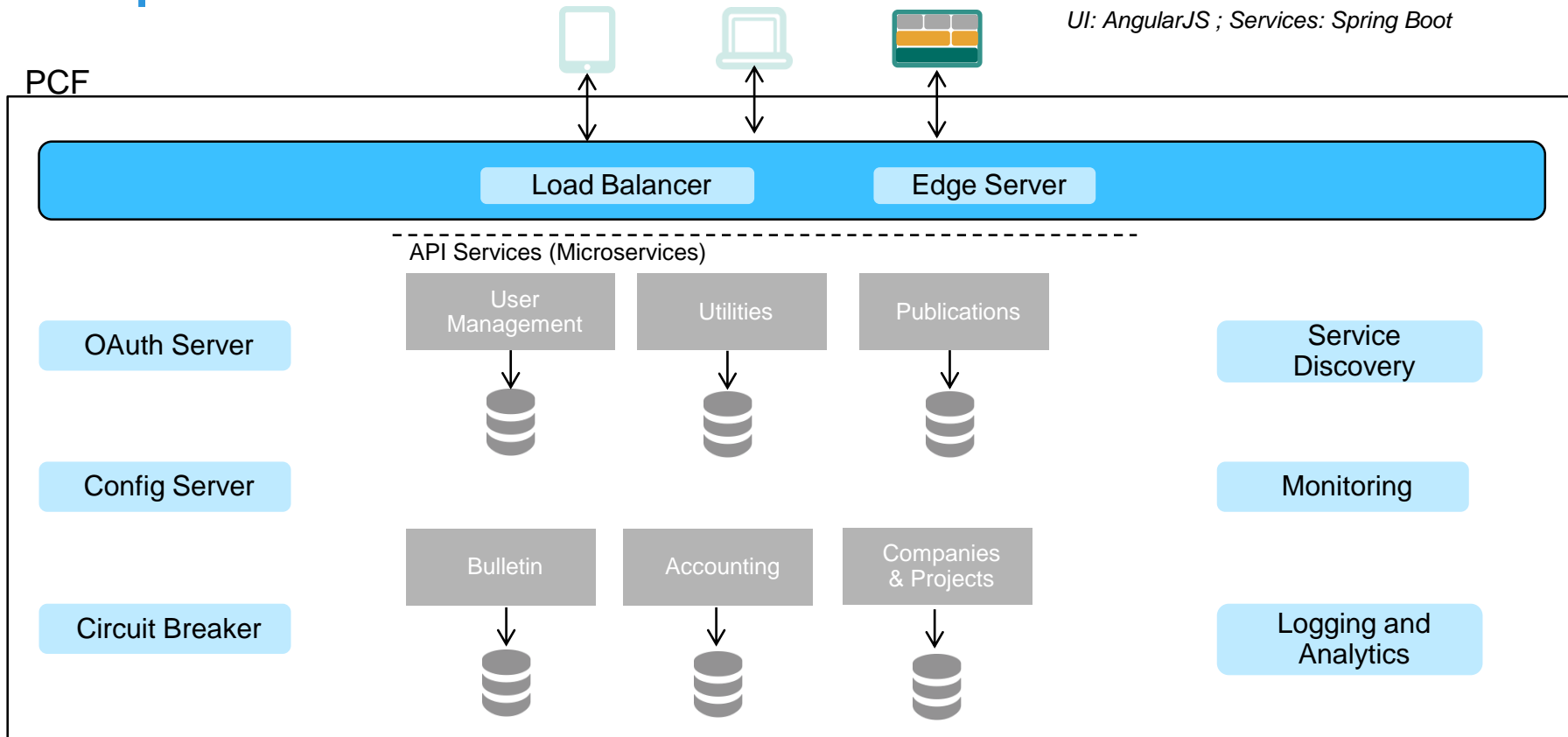Application Properties

Tomcat

MySQL
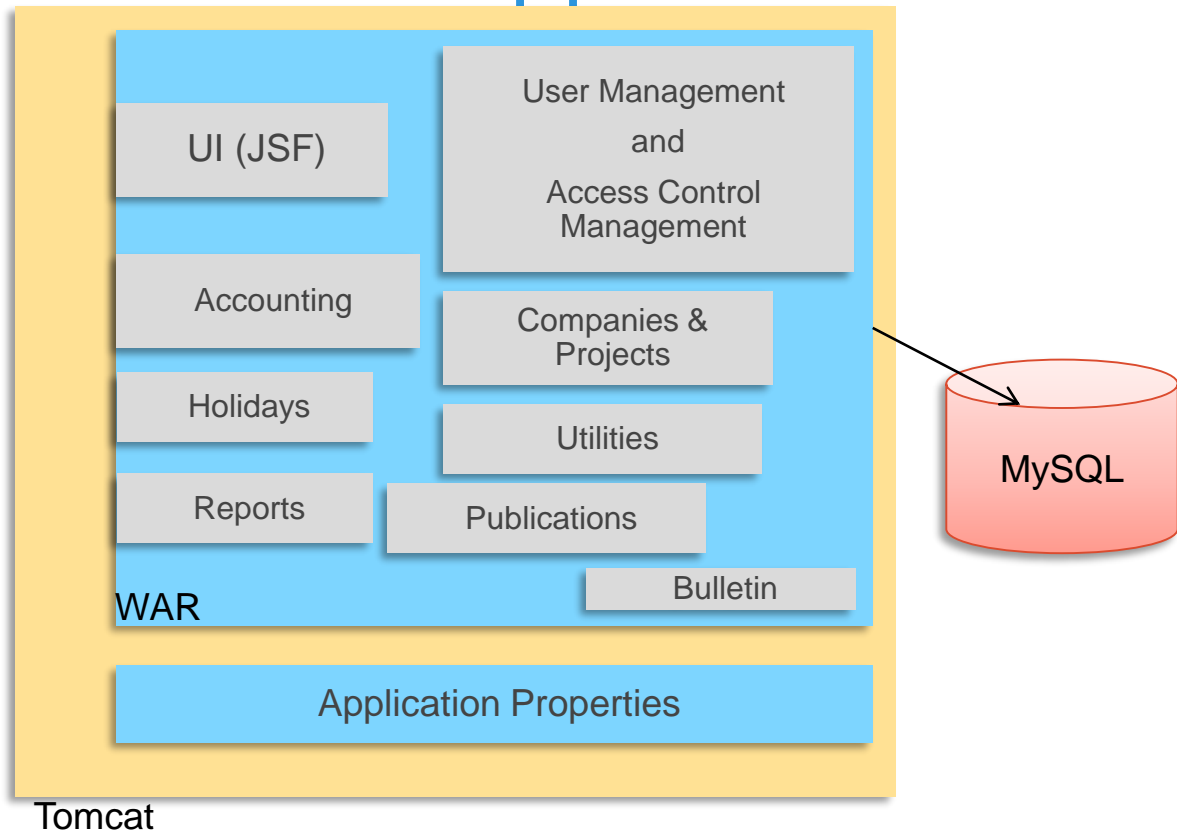
Disadvantages:

➢ Overloaded web container

➢ Difficult in scaling the app

➢ Hard to maintain

➢ Tightly coupled features

➢ Overloaded database

➢ CI/CD is difficult

➢ Single point of failure

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Proposed Microservice architecture
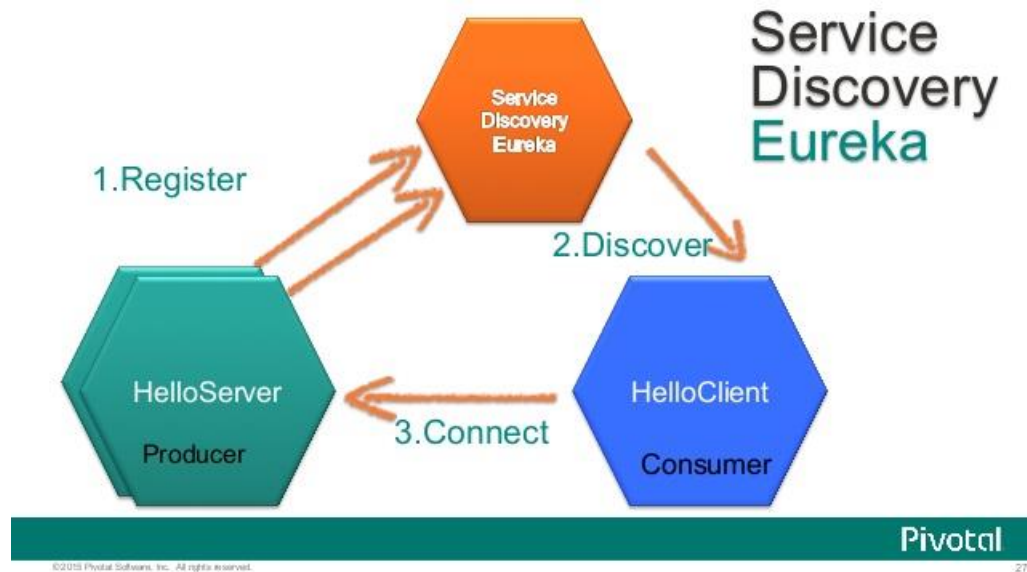
UI: AngularJS ; Services: Spring Boot

PCF

| Load Balancer | Edge Server |

API Services (Microservices)

OAuth Server

User Management

Utilities

Publications

Service Discovery

Config Server

Monitoring

Circuit Breaker

Bulletin

Accounting

Companies & Projects

Logging and Analytics

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12 Factors

The 12 Factors

- Codebase ✔
- Dependencies ✔
- Config ✔
- Backing services ✔
- Build, release, run ✔
- Processes

- Port binding ✔
- Concurrency
- Disposability
- Dev/prod parity ✔
- Logs ✔
- Admin processes

Discovery Service - Eureka

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Edge Service - Zuul

Capabilities:

1. Routing

2. Security

3. Filtering

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Edge Service - Zuul

Security - OAuth Enabled – Spring Security

Client credentials grant flow
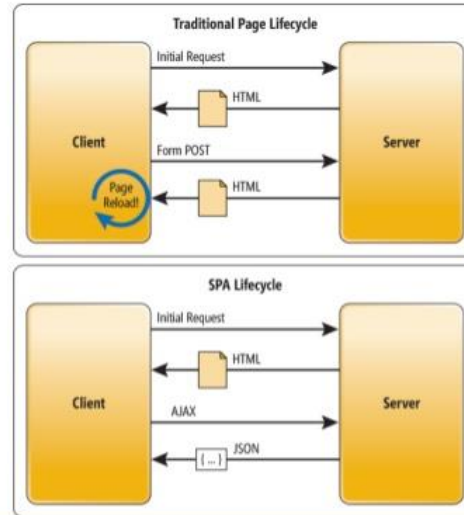
Client Credentials flow
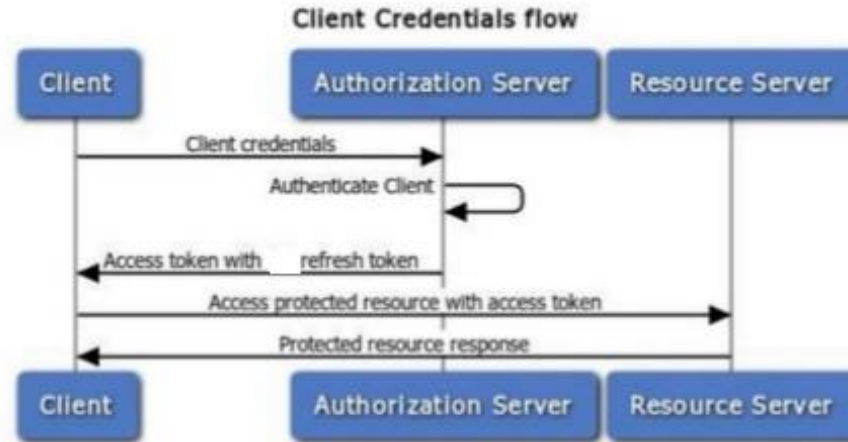
Log Correlation - Spring Cloud Sleuth

Capabilities:

1. Adds trace ids (per request) and span ids (component based) to the logs

2. Ability to provide sampling rate

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User Interface – Angular JS

SPA – SINGLE PAGE APPLICATION

SINGLE PAGE APPLICATION

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User Interface – Angular JS

Advantages of Angular JS:

1. **Two-way data-binding**

2. **Directives**

3. **Client side MVC framework**

4. **Dependency Injection**

5. **Supports consistent UX on various devices (mobile, tablets)**

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Challenges faced

Challenge	How did we resolve it
Angular 2 library file inclusion (Lack of CDNs)	By packaging the dependencies into the Jar.
CORS issues while accessing services from UI	By applying filters on the Edge Server (Zuul)
HTTP 403 (Forbidden) error while performing OAuth token validation from Microservices	Disable CSRF security check on Oauth server

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Next Steps

1. Role based authentication by using JWT Token

2. Data migration

3. Implement metering of services for Cloud based pay per use model

4. Explore and apply modern Application development techniques
   a. Web sockets
   b. Reactive Programming (Explore Akka streams, Reactive Java)
   c. Serverless computing

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THANK YOU

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