

Java Microservices with Spring Cloud: Developing Services

INTRODUCTION TO MICROSERVICES, SPRING BOOT,
AND SPRING CLOUD



Richard Seroter

SENIOR DIRECTOR OF PRODUCT, PIVOTAL

@rseroter



Overview



Why are microservices architectures popular?

Core characteristics of microservices

Questions about microservices architecture

Microservices scaffolding with Spring Cloud

Catalog of Spring Cloud projects

What is Spring Boot?

Goals, prerequisites for the course

Summary



“Loosely coupled service oriented architecture with bounded context.”

Adrian Cockcroft, Battery Ventures



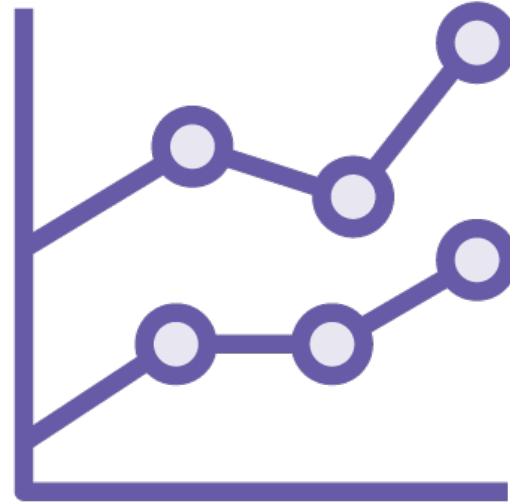
Why Are Microservices Architectures Popular?



**Desire for faster
changes**



**Need for greater
availability**



**Motivation for
fine-grained
scaling**



**Compatible with
a DevOps
mindset**



Core Characteristics of Microservices

**Components
exposed as
services**

**Tied to a specific
domain**

Loosely coupled

**Built to tolerate
failure**

**Delivered
continuously via
automation**

**Built and run by
independent
teams**



Questions About a Microservices Architecture

How do I find my service if URIs can change?

Should every app be turned into a set of microservices?

How am I supposed to ship changes continuously?

What if my team isn't arranged for DevOps?

How do services maintain consistent configurations, at scale?

How do I keep a poor-performing service from taking everything down?

Is there one single tech stack for these systems?

What's the right way to secure services?

How do I troubleshoot problems?

Isn't a monolith just simpler?



Microservices Scaffolding with Spring Cloud



Released March 2015

Build common distributed systems patterns

Open source software

Optimized for Spring apps

Run anywhere

Includes NetflixOSS technology



Catalog of Spring Cloud projects

Spring Cloud Config	Git-backed configuration server
Spring Cloud Netflix	Suite for service discovery, routing, availability
Spring Cloud Consul	Service discovery with Consul
Spring Cloud Security	Simplify OAuth 2.0 flows
Spring Cloud Sleuth	Distributed tracing
Spring Cloud Stream	Message bus abstraction
Spring Cloud Task	Short-lived, single-task microservices
Spring Cloud Dataflow	Orchestration of data microservices
Spring Cloud Zookeeper	Service discovery and configuration with Zookeeper
Spring Cloud for AWS	Exposes core AWS services to Spring developers
Spring Cloud Spinnaker	Multi-cloud deployment
Spring Cloud Contract	Stubs for service contracts



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What Is Spring Boot?



- Offers opinionated runtime for Spring
- Convention, not configuration
- “Opinions” can be overridden
- Handles boilerplate setup
- Simple dependency management
- Embeds app server in executable JAR
- Built in endpoints for health metrics

Demo



Reviewing the Spring INITIALIZR site

Looking at Spring Tool Suite

Creating a Spring Boot project

Reviewing the POM file

Editing the application.properties file

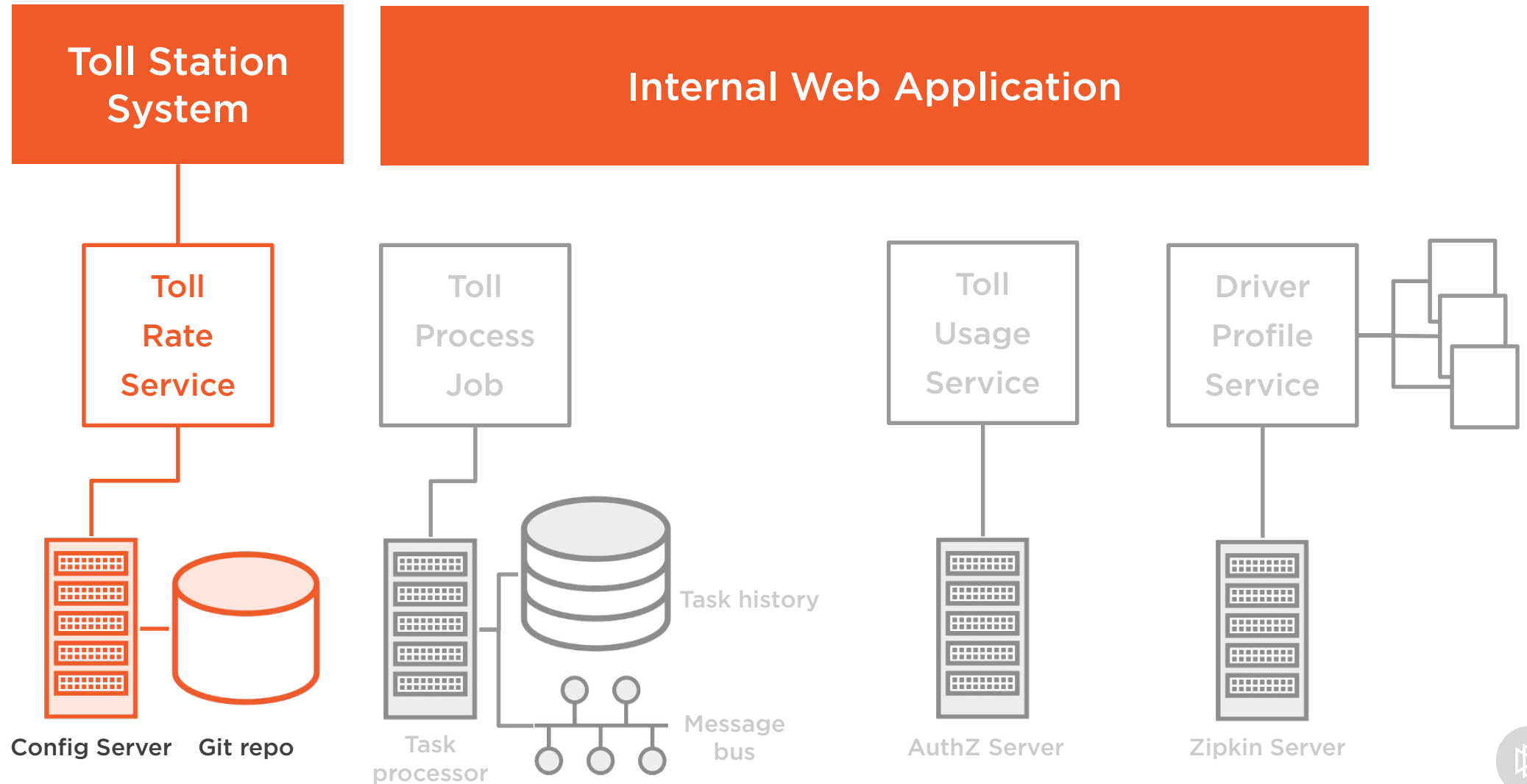
Adding a REST endpoint

Starting and running an application

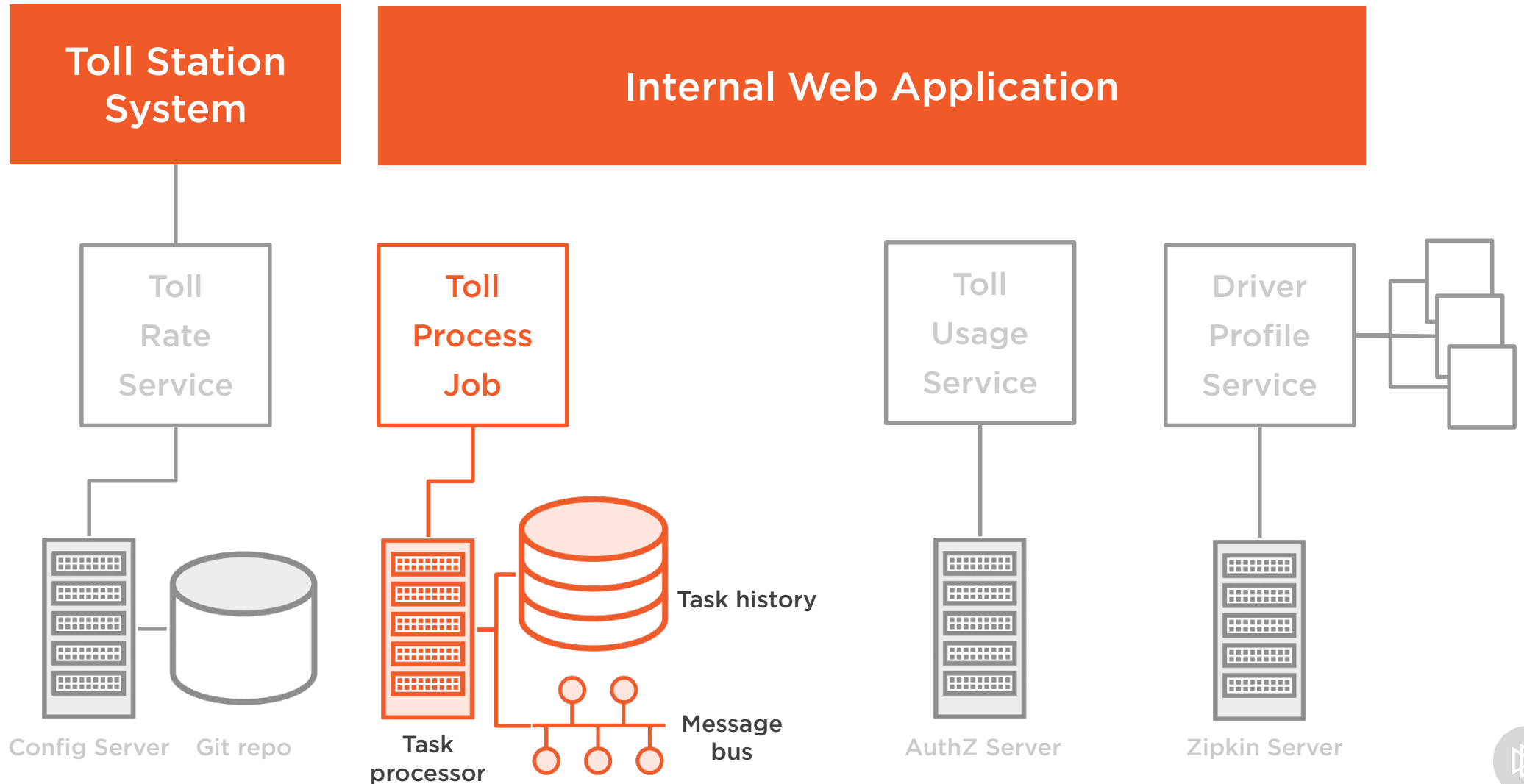
Viewing the Actuator endpoints



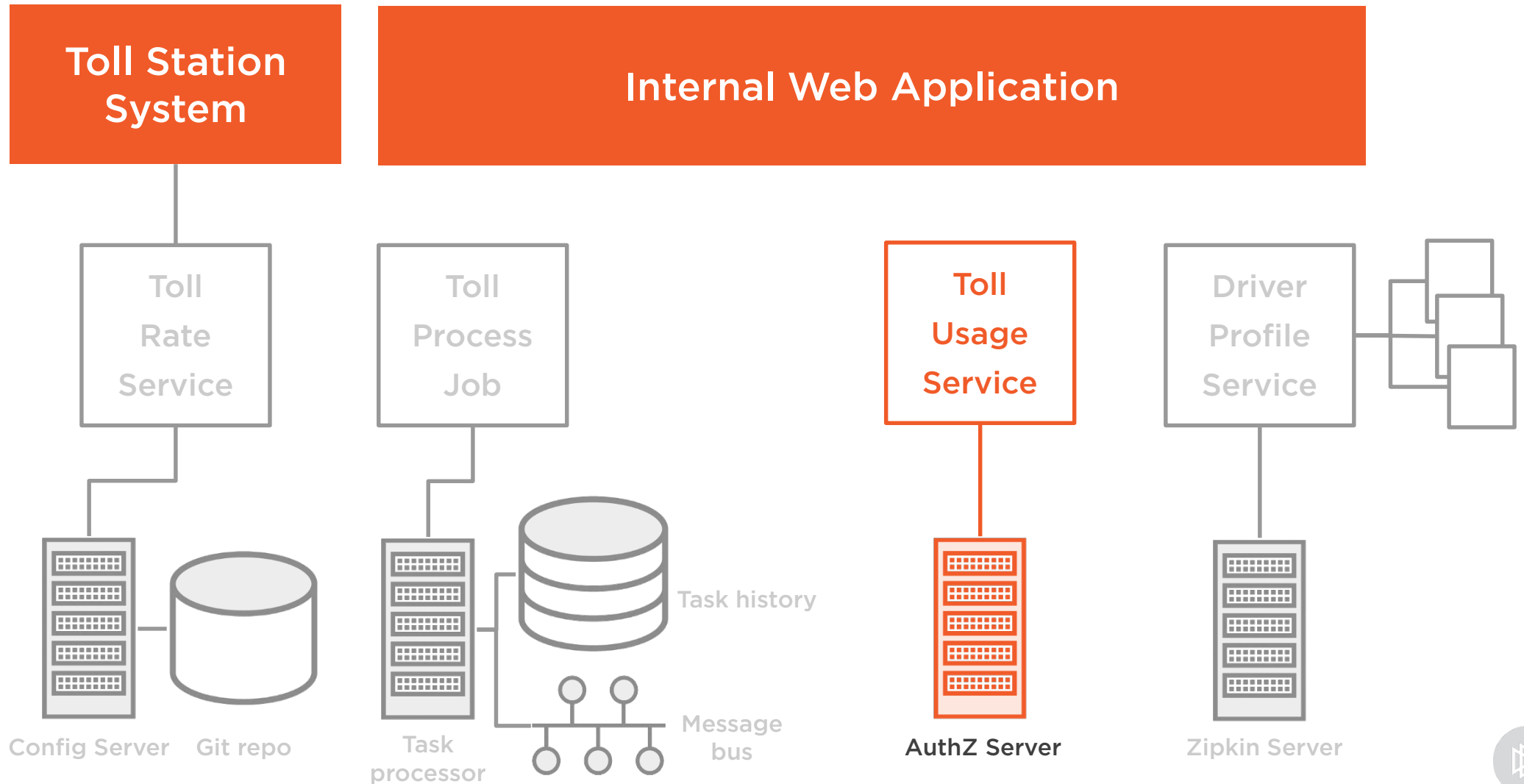
App for the Course – Toll Station System



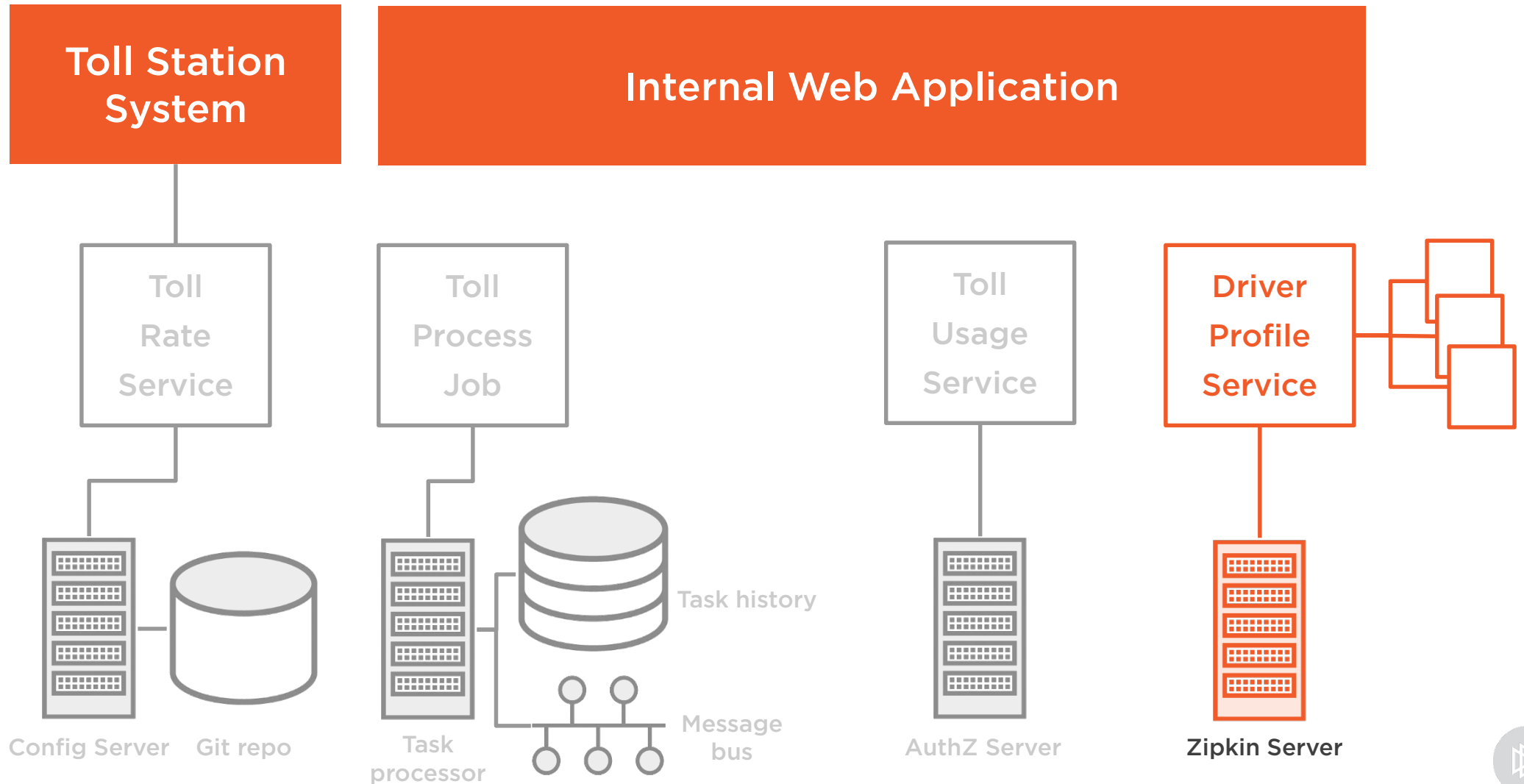
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App for the Course – Toll Station System



Goals for This Course

Understand modern
microservices patterns

Get comfortable starting
Spring Boot and Spring Cloud
projects

Explore the core capabilities
of Spring Cloud

Learn how to configure and
extend Spring Cloud



Course Prerequisites



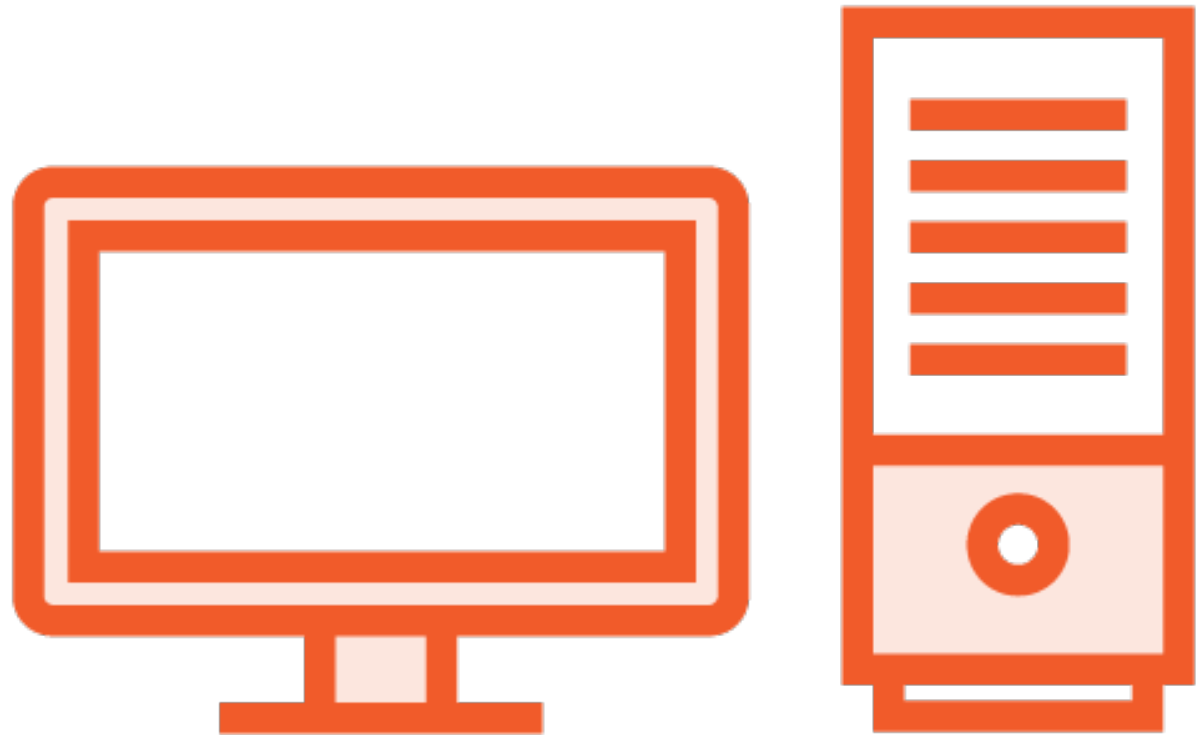
Base knowledge of Java and OOP

Familiarity with Spring framework

Run a Java-friendly IDE for coding

Access to a MySQL and RabbitMQ env.

Spring Tool Suite
Maven build manager
Vagrant
Postman
GitHub account



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