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Agenda

- Motivations for Modern Architectures
 - Trend from 3D to 4D Architecture
 - The 4th Dimension is Change
 - Autonomy allows for Change
- Approaches and Frameworks
 - Spring and Related Frameworks
 - Autonomous Business Services
 - Steps to Fine-grained Autonomy
 - Examples
- How Pivotal helps Enterprises Transform
 - Application Infrastructure (Spring and Cloud Foundry)
 - Steel Toe Project for .Net

Motivations

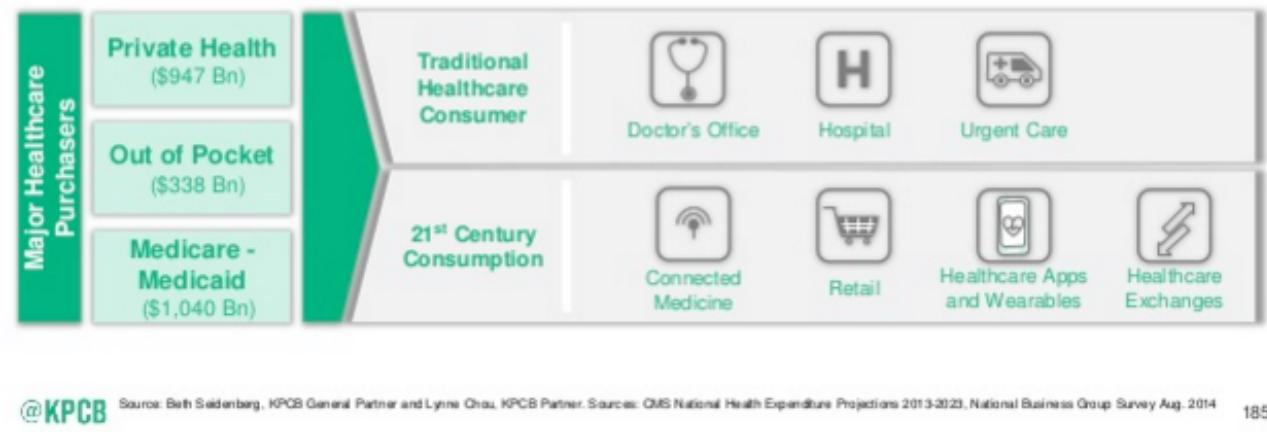
motivations

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US Healthcare in the 21st Century Purchase + Delivery Change Forever

ACA and Government Effects

- With Cadillac tax coming into effect in 2018, employers are moving towards offering high deductible health benefit plans
- 72% of employers offer at least 1 consumer directed health plan
- 30% of Medicare payments will be tied to quality or value by end of 2016 and 50% by end of 2018
- Effective Jan 2015, Medicare has separate payments for chronic care management for "non-face-to-face" care



#77 Mary Meeker

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General Partner, Kleiner Perkins Caufield & Byers

Age	56
Residence	Woodside, CA
Citizenship	United States
Marital Status	Single
Education	Master of Business Administration, Samuel Curtis Johnson Graduate School of Management; Bachelor of Arts / Science, DePauw University

Mary Meeker on Forbes Lists

#77 Power Women (2015)

#77 in 2014

#15 Midas (2015)

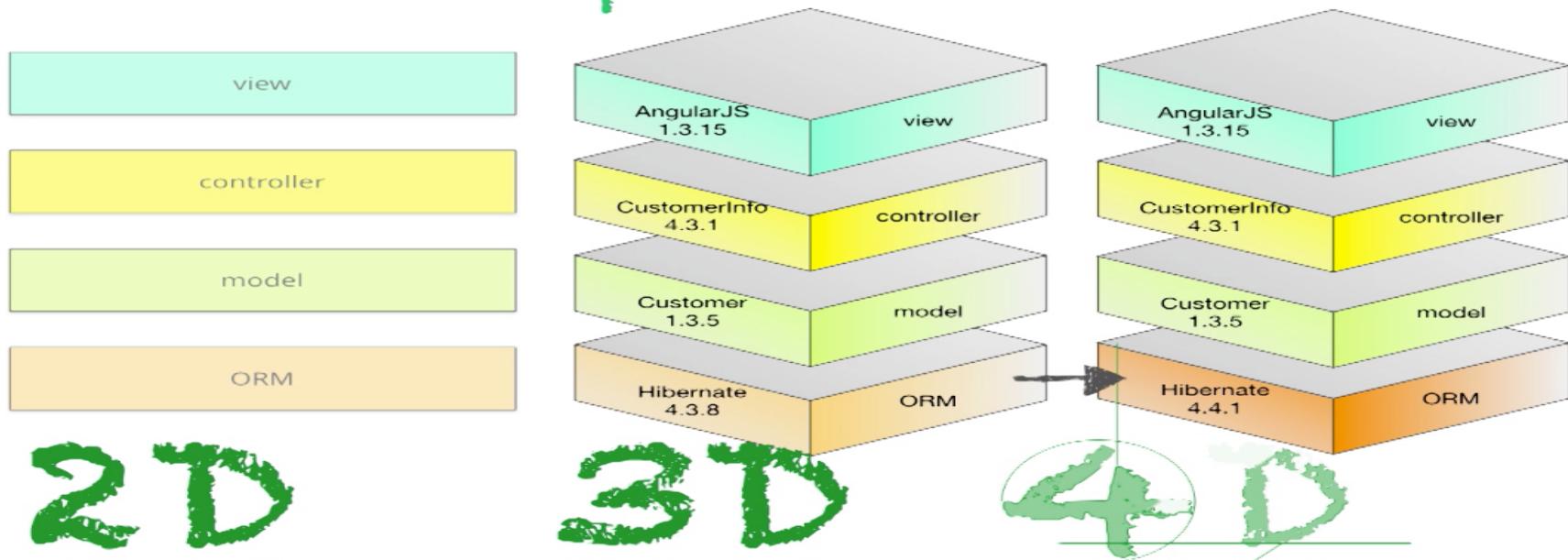


Queen of the Net Mary Meeker has been holding court in Silicon Valley since 2010, when she left Wall Street to join Kleiner Perkins Caufield & Byers as their growth-stage expert. She scored big last year from the splashy IPOs of

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Moving from 3D to 4D

Architecture is abstract
until operationalized.



By Neal Ford

Engineering Focusalways changes

Software + PCs

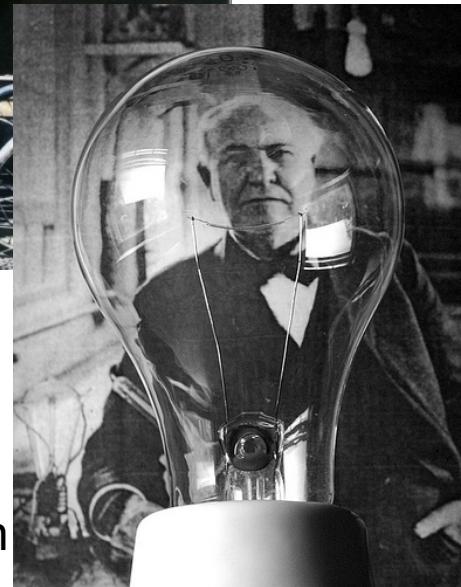
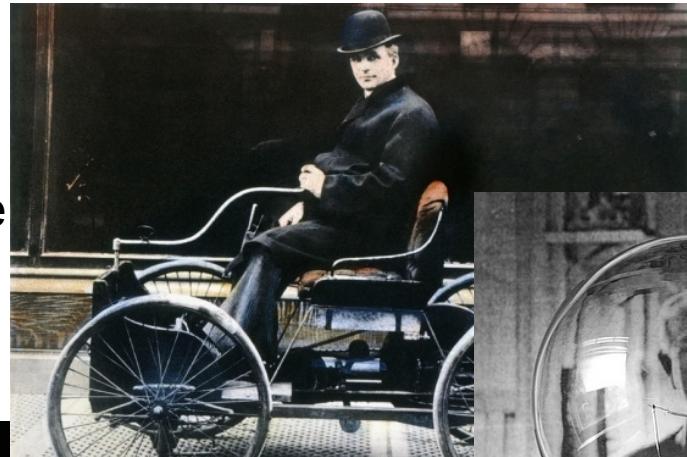


Mass
Production
+
Assembly Line

Apps + Phone

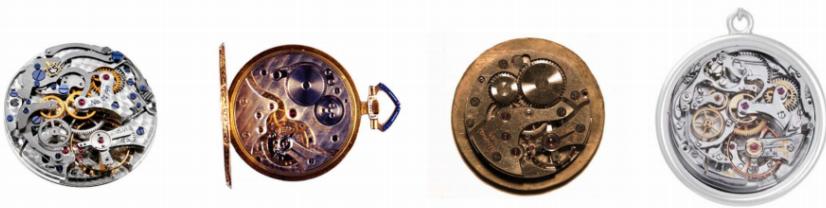


Electricity
+
Distribution



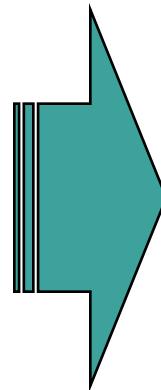
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New 4D Focus: Accelerate Innovation



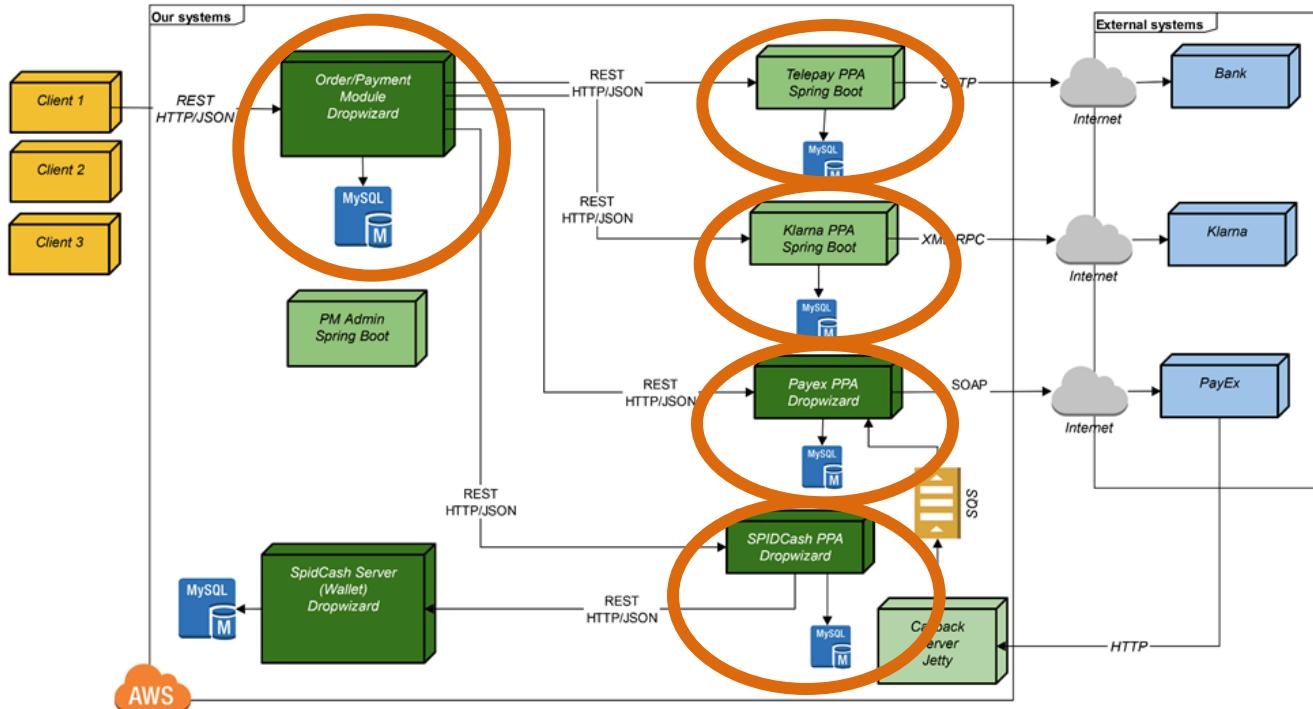
The right org/size, api contracts, & expectations

Organize For Autonomy



- Lowers Cost of Failure
- Reduces Friction
- Speeds Iteration
- High Frequency of Deployment

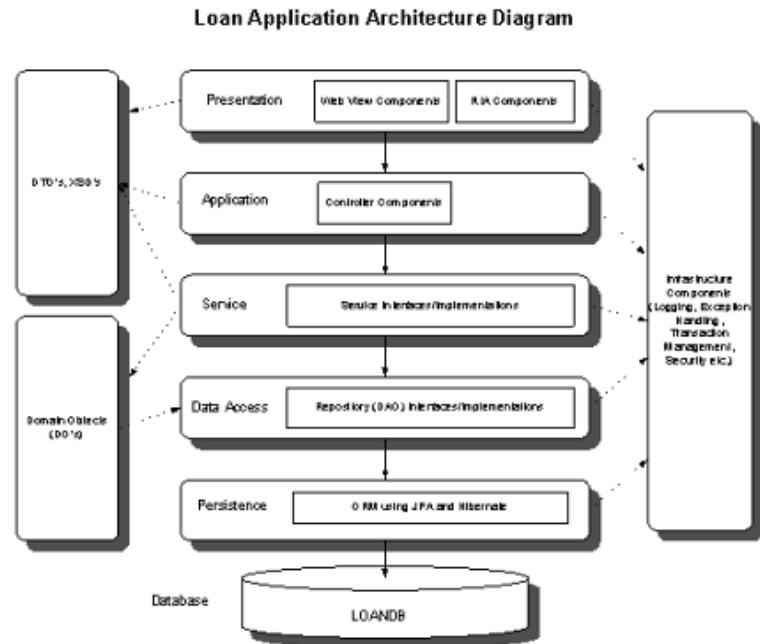
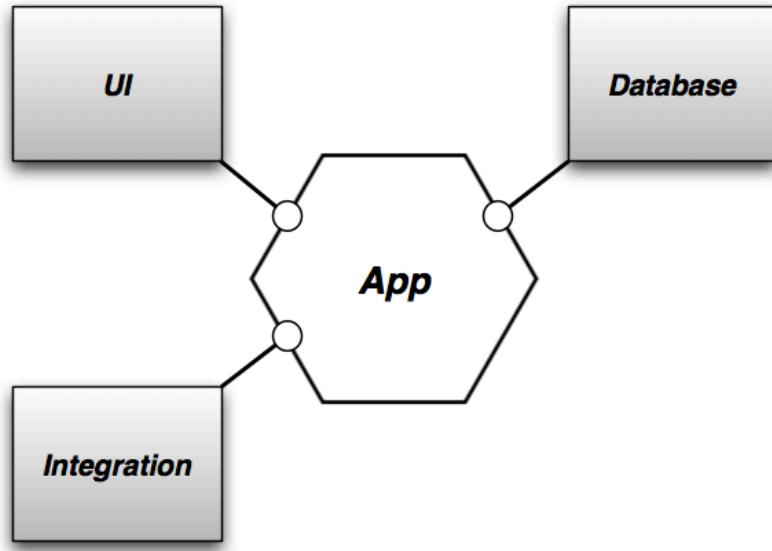
Architecture built for Autonomous Change



Comparison of Spring and Dropwizard - 2015

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“Life Preserver” Rather than a “Raft”



Hexagonal Architecture by Alistair Cockburn - 2005

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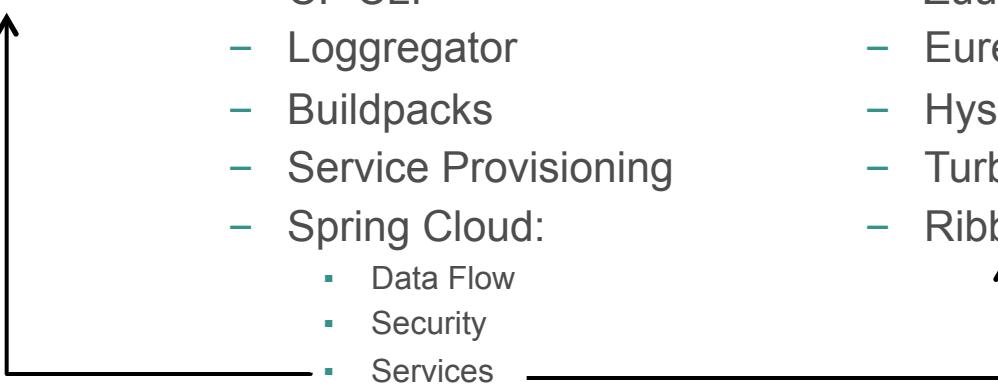
List of Avenues Opened up by Autonomy

- Blue- Green Deployment
- Polyglot Persistence and use of other new or special-purpose technologies
- Multi-Cloud Hosting
- Independent Scaling
- Anti-Fragility Patterns (Circuit-breaker, etc.)
- Testing in Production (multiple, simultaneous versioning)

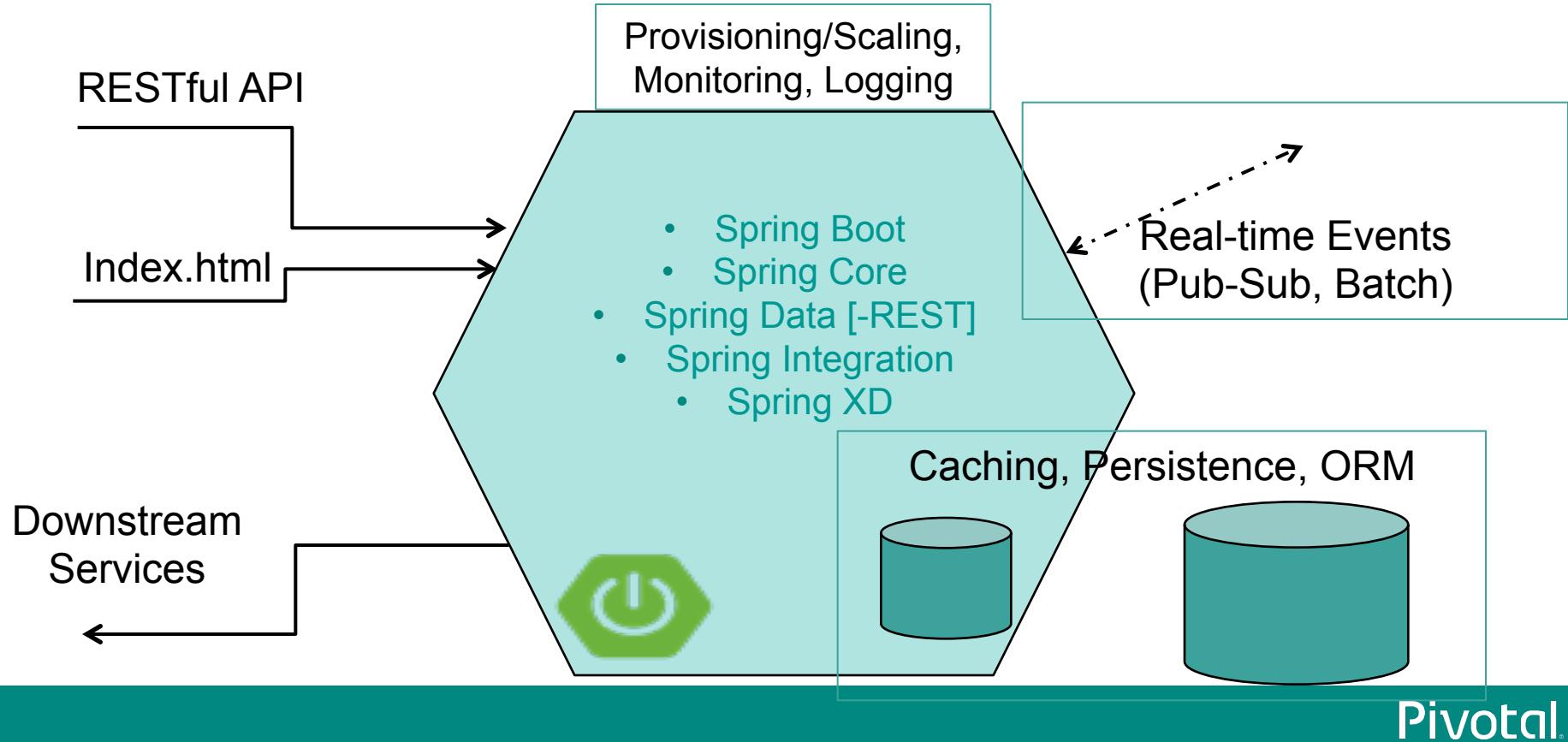
Approaches Abbildung

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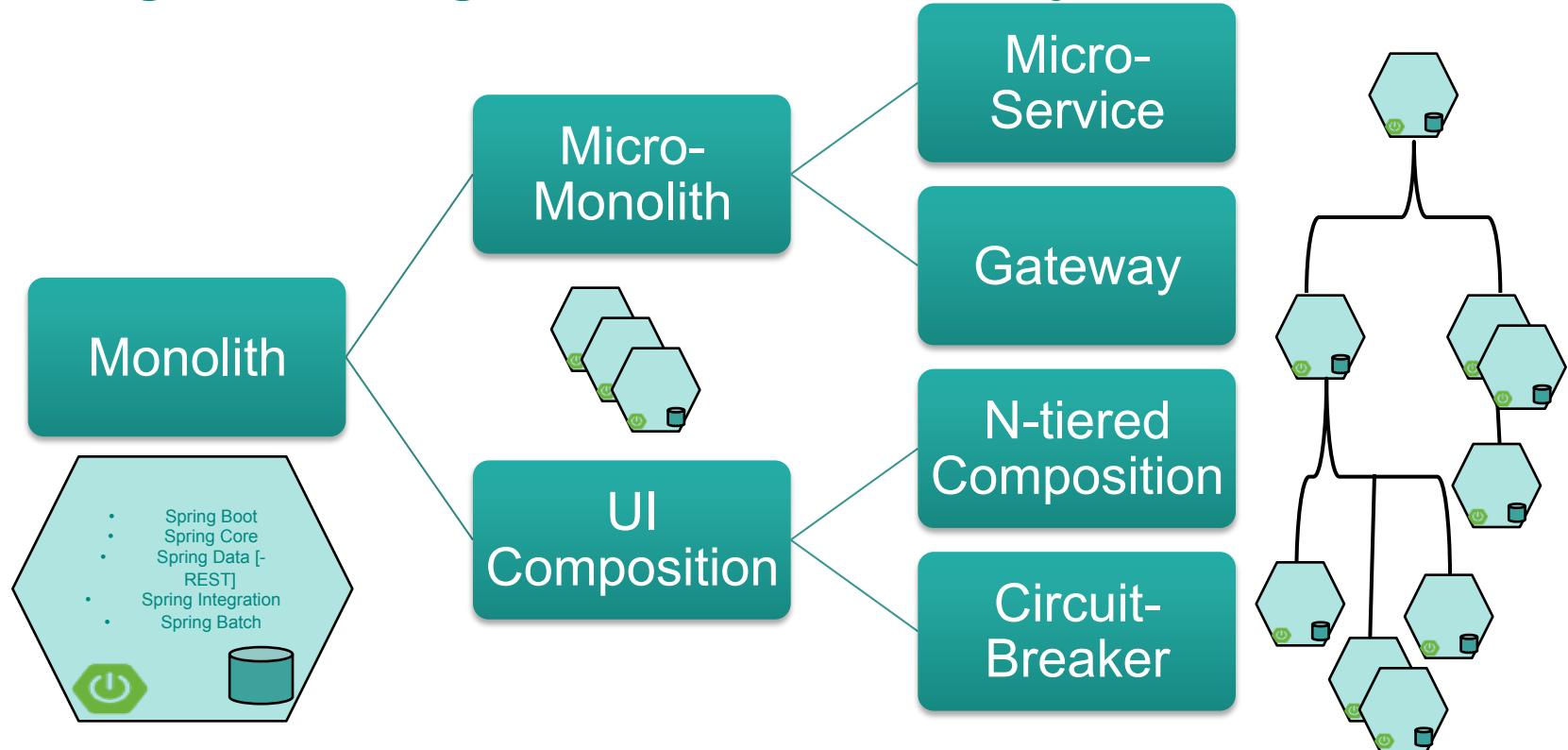
Recommended MicroService Frameworks

- .Net
 - Steel Toe project
 - Cloud Foundry for IAAS
 - CF CLI
 - Loggregator
 - Buildpacks
 - Service Provisioning
 - Spring Cloud:
 - Data Flow
 - Security
 - Services
 - Netflix OSS for REST API's
 - Zuul
 - Eureka
 - Hystrix
 - Turbine
 - Ribbon
- 

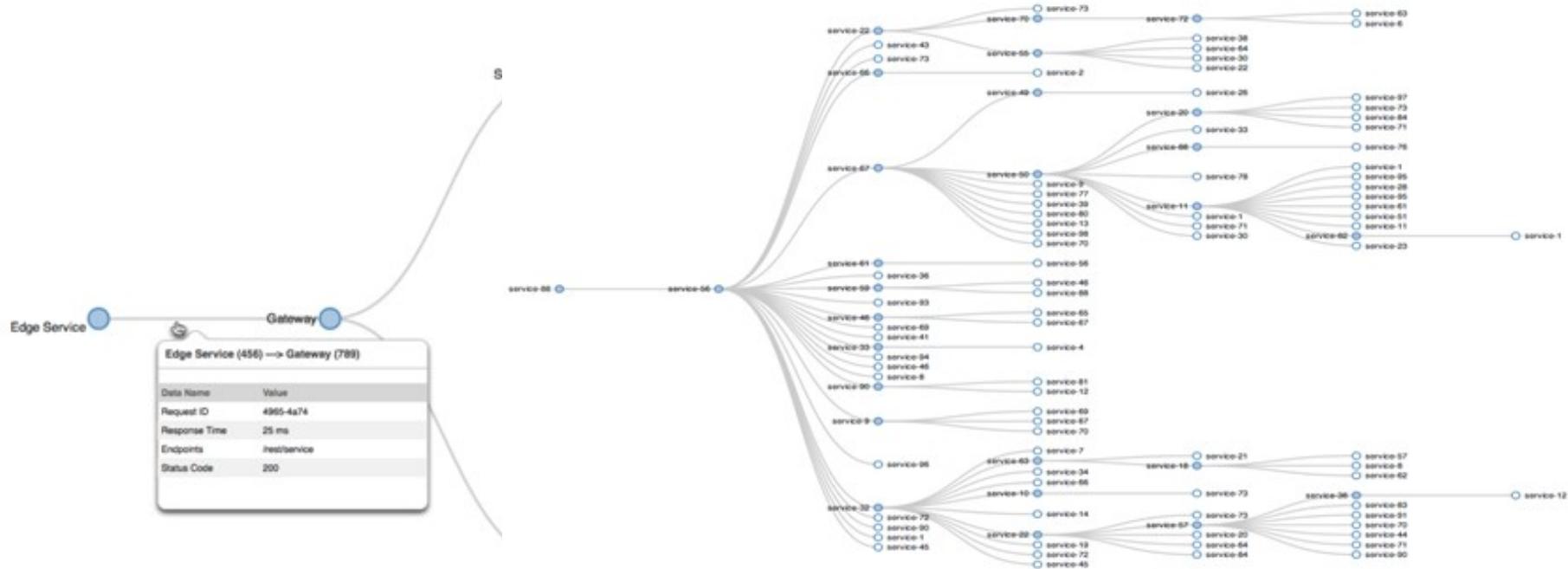
Autonomous Business Service



Evolving to fine-grained autonomy



Visualization of Autonomous Service Network

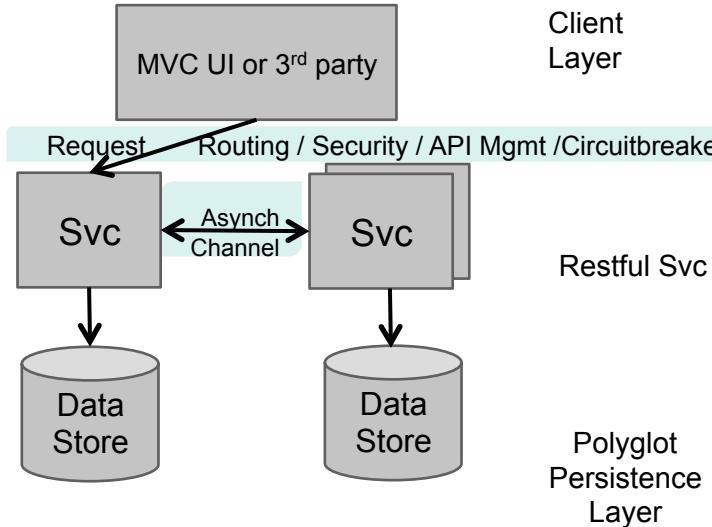


Netflix Presentation by Sudir Tonse 2014

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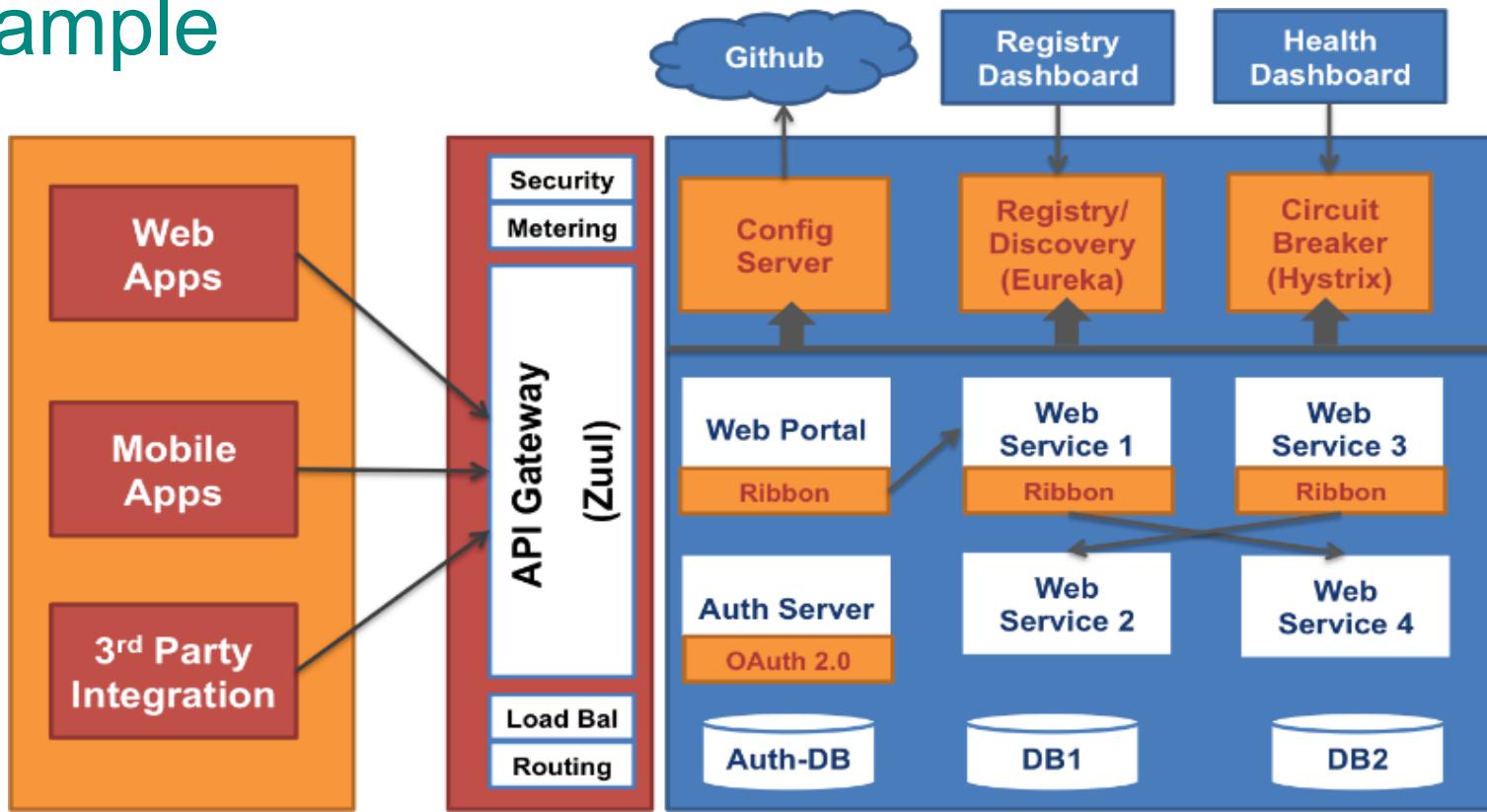
Application Service View

A view of how Application Services and other components interact



- Reference Architecture:
 - Restful MicroServices
- Recommended Frameworks:
 - Spring Boot
 - Spring Cloud
 - Spring Cloud Config
 - Spring Cloud Netflix / Apigee
 - Spring Cloud Bus / RabbitMQ
 - Spring Data REST
 - Spring Integration
 - Spring Security (OAUTH or SAML)
 - Vaadin (CRUD UI) / AngularJS

Example



Example by Anil Allewar (Synerzip) 2015

SteelToe

Project Mission

- <http://steeltoe.io/>
- To enable client parity in .NET for Spring Cloud/Netflix OSS products:
 - Config Server
 - Eureka
 - Hystrix



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SteelToe

Reading CF Service Bindings

```
public Startup(IHostingEnvironment env)
{
    // Set up configuration sources.
    var builder = new ConfigurationBuilder()
        .AddJsonFile("appsettings.json")
        .AddEnvironmentVariables()
        .AddCloudFoundry();

    Configuration = builder.Build();
}
```

SteelToe

Working with Spring Cloud Config Server

```
public Startup(IHostingEnvironment env)
{
    // Set up configuration sources.
    var builder = new ConfigurationBuilder()
        .AddJsonFile("appsettings.json")
        .AddEnvironmentVariables()
        .AddCloudFoundry()
        .AddConfigServer(env);

    Configuration = builder.Build();
}

public void ConfigureServices(IServiceCollection services)
{
    services.AddConfigServer(Configuration);
    services.AddMvc();
    services.Configure<ConfigServerData>(Configuration);
}
```

SteelToe

Project Roadmap

- Full Spring Cloud Config Server support
 - Vanilla config servers, pure open source, Spring Boot annotations
 - Authenticated access (OAuth) to PCF tile
- Eureka Client Support
 - Registration
 - Discovery
 - Heartbeats
- Circuit Breakers
 - Hystrix



Platform Runtime

Routing

Container Scheduling

Service Discovery

Configuration

Application Framework

12 Factor Apps

Microservices

RESTful Services

Circuit Breakers

Spring Boot

Ruby on Rails

Node.js

.NET

Logging & Metrics

Messaging

Operations

Zero Downtime Deployments

Failover & Recovery

Scaling

Security Patching

Platform Upgrades

Infrastructure



Services

Database

Big Data

Object Storage

Mobile

Build CI

User Provided

Platform with Apps + Data

