Eclipse MicroProfile with Thorntail (formerly WildFly Swarm)

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EVOLUTION OF MICROSERVICES (2014 - ?)

Application Logic

> Client-side Load Balancing
> Service Registration
> Circuit Breaker
> Distributed Tracing

Support Services

> Smart Routing
> API Management
> Caching Service
> Configuration
> Messaging
> SSO
> Registry

2014

NETFLIX
Ribbon

Config Server

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WHAT WE ARE HEARING FROM CUSTOMERS

1. Cloud and microservices distributed architectures leads to the need for multiple runtimes, frameworks and languages

2. Microservices and distributed application development is hard. Need a platform that can abstract away complexity and simplify development.

3. While enterprise developers want choice of runtime/framework, the enterprise needs a way to standardize, support, and plan

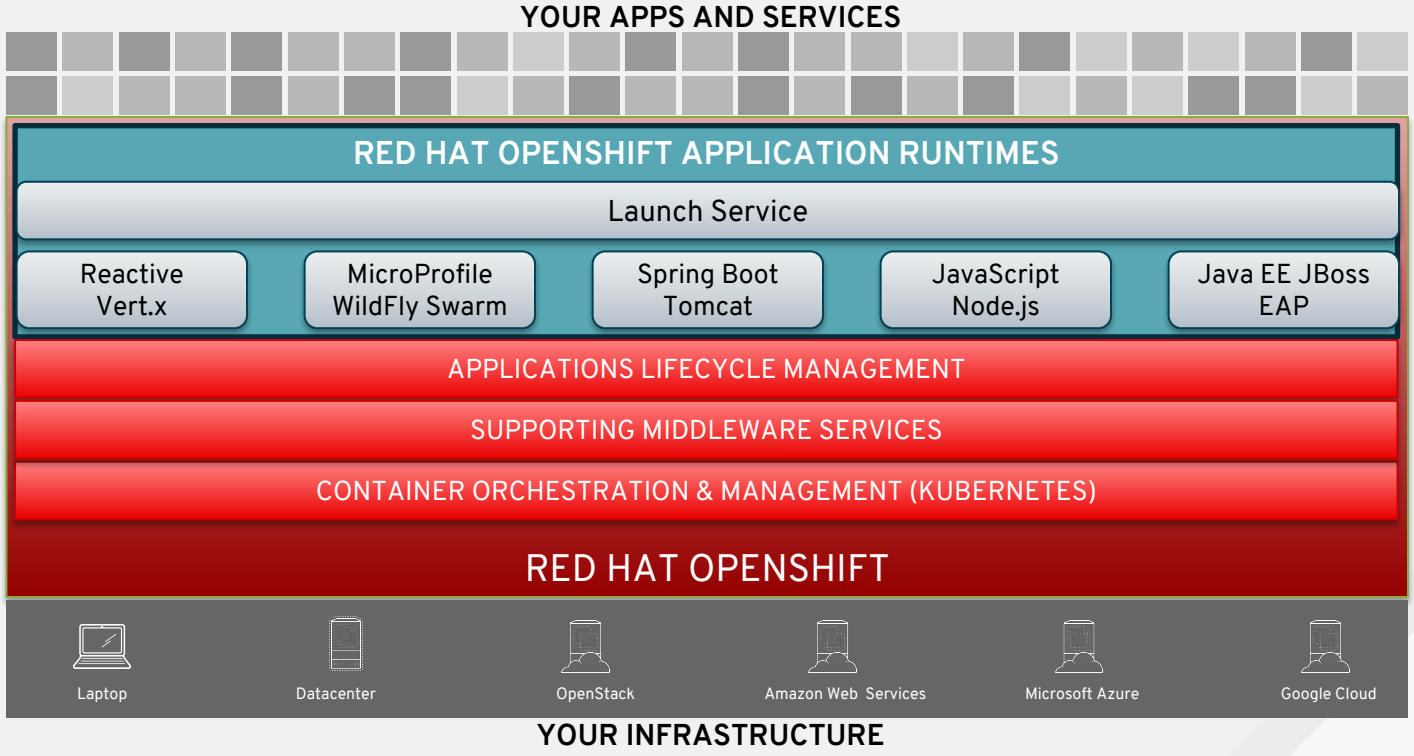
4. Cannot just turn off or replace existing(legacy) apps. Need modernization ramp to harvest more value from existing apps.

5. Do not want cloud lock-in and restricted to specific application framework, architecture style, languages etc.

RED HAT OPENSHIFT APPLICATION RUNTIMES

Providing curated set of integrated runtimes and frameworks *that standardizes Cloud Native App*

- ✓ Simplified development
- ✓ Strategic flexibility
- ✓ DevOps automation



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EVOLUTION OF MICROSERVICES (2014 - Current)

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RED HAT OPENSHIFT Container Platform

> Registry
> Configuration
> Server-side Load Balancing

HYSTRIX
DEFEND YOUR APP

NETFLIX OSS
Zuul

ZIPKIN

2014 → Current

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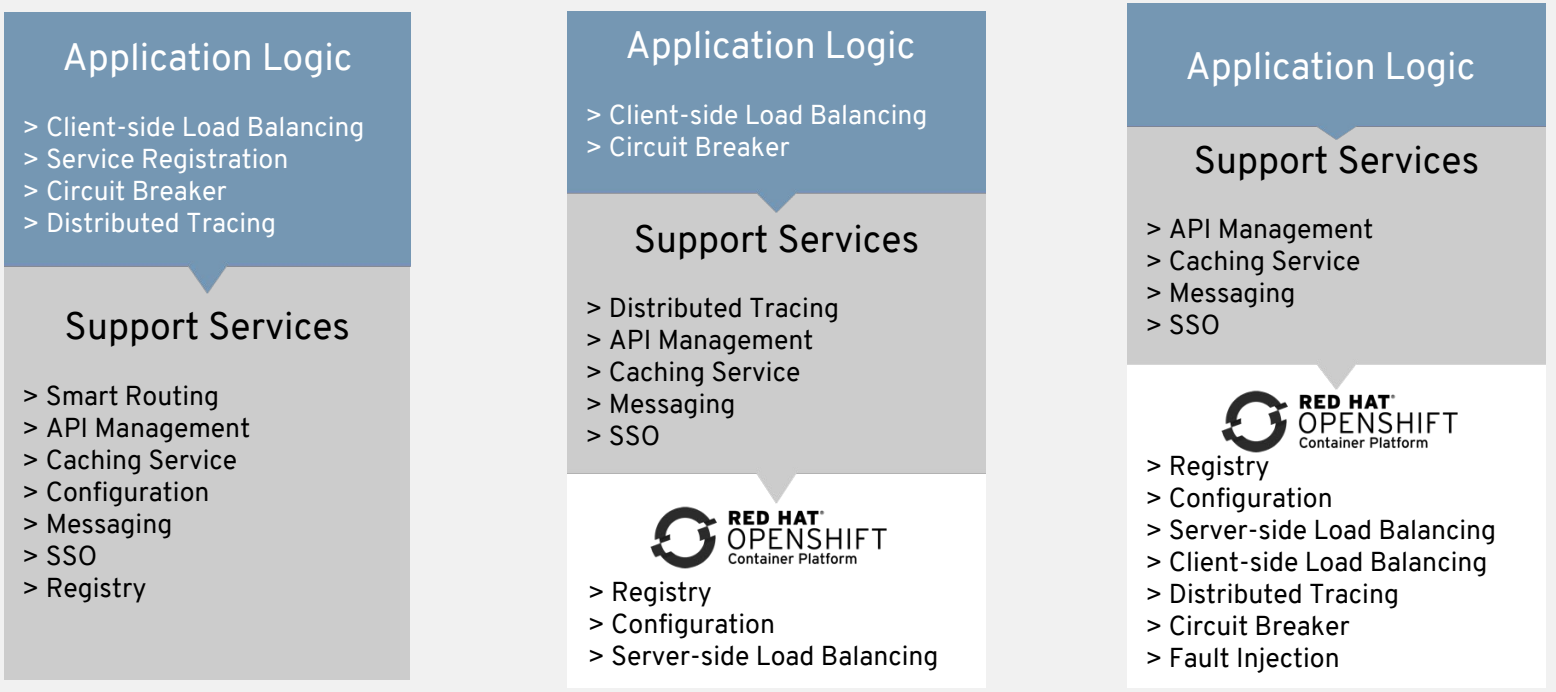
EVOLUTION OF MICROSERVICES (NEAR FUTURE)



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For Java EE, how does this change how I write my code?

Architecture vs API vs Implementation

Microservices is an architectural approach

Jakarta ~~Java~~ EE and MicroProfile are specifications enabling innovation on implementation

Jakarta ~~Java~~ EE applications can be built as collaborating microservices on a lightweight runtime

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MICROPROFILE™

OPTIMIZING ENTERPRISE JAVA

- Defines **open source** Java **microservices** specifications
- Industry Collaboration - Red Hat, IBM, Payara, Tomitribe, London Java Community, SouJava, Oracle, Hazelcast, Fujitsu, SmartBear...
- **WildFly Swarm** is **Red Hat's** implementation
- Minimum footprint for Enterprise Java cloud-native services (v1.3) :

JSON-P 1.0	Common Annotations	JWT Propagation	Config	OpenAPI	REST Client
CDI 1.2	JAX-RS 2.0	Fault Tolerance	Metrics	Open Tracing	Health Check

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Thorntail (formerly WildFly Swarm)

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What’s Thorntail?

- Formerly WildFly Swarm
- Rename process in community
- New name announced last week
- Rename work still to be done

Demo

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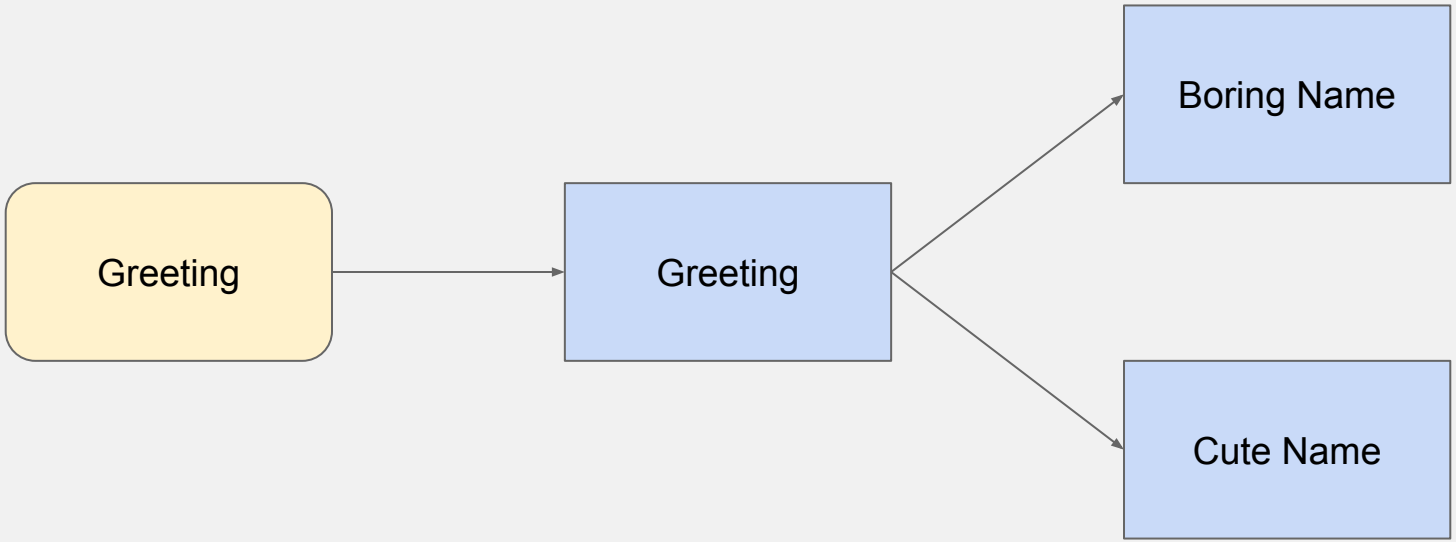
What's in the Demo?

- Showcases Eclipse MicroProfile specifications
- Three services: Greeting, Boring Name, Cute Name

https://github.com/kenfinnigan/RedHatSummit-2018

What's in the Demo?



Eclipse MicroProfile

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Roadmap

- January 2018 - 1.3
  - MP 1.2 + OpenTracing + OpenAPI + Type Safe REST Client
- June 2018 - 1.4/2.0
  - MP 1.4
    - Updates to Config, JWT Propagation, Fault Tolerance, OpenTracing
  - MP 2.0
    - MP 1.4 + Java EE 8 base for CDI, JAX-RS, JSON-P, (+JSON-B?)

Config

```
@Inject
@ConfigProperty(name = "myapp.default-name")
private String defaultName;
```

Health Check

```
@Health
@ApplicationScoped
public class GoodHealthCheck implements HealthCheck {
    public HealthCheckResponse call() {
        return HealthCheckResponse
                .named("MyHealthCheck")
                .withData("someKey", "aValue")
                .up()
                .build();
    }
}
```

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Metrics

- @Counted
- @Gauge
- @Metered
- @Timed

Metrics

```
@Counted(name = "hCount",
         absolute = true,
         description = "# calls to /myendpoint",
         monotonic = true)
@GET
@Path("/myendpoint")
Public Response myEndpoint {}
```

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Open API

- @OpenAPIDefinition
- @Operation
- @APIResponse
- @Content
- @Parameter

Open API

```
@OpenAPIDefinition(info = @Info(
        title = "My REST Application",
        version = "1.0"
))
@Operation(
      operationId = "getSomething",
      summary = "Get some data over REST"
)
```

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Fault Tolerance

- @Asynchronous
- @Retry
- @Fallback
- @Timeout
- @CircuitBreaker
- @Bulkhead

Fault Tolerance

```
@Retry(maxRetries = 2)
@Fallback(fallbackMethod = "greetingFallback")
public Response greeting() {}

public Response greetingFallback() {
  return Response.ok()
    .entity(new Greeting("Greetings from a
fallback")).build();
}
```

Type Safe REST Client

- Define interface of external service. As JAX-RS would
- RestClientBuilder instead of JAX-RS ClientBuilder

Type Safe REST Client

```
@Path("/api")
public interface CuteNameService {
    @GET
    @Produces(MediaType.TEXT_PLAIN)
    @Path("/name")
    String getName();
}
```

Type Safe REST Client

```
CuteNameService service =

        RestClientBuilder.newBuilder()

            .baseUrl(new URL(NAME_SERVICE_URL))

            .build(CuteNameService.class);


String name = service.getName();
```

Open Tracing

- Add `jaeger-core` dependency to activate
- @Traced for fine grain control
- Set jaeger configuration

JWT Propagation

```
@Inject
private JsonWebToken jwtPrincipal;

@Inject
@Claim(standard = Claims.raw_token)
private ClaimValue<String> rawToken;
```

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Thorntail

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Thorntail Rename

- “org.wildfly.swarm” -> “io.thorntail”
- 2018.6.0 -> 2.0.0.Final
- Update documentation, examples, etc
- Follow Google Group community for updates

Not current WildFly Swarm!

Thorntail Roadmap

- 2.0.0.Final release in June
- PoC -> Thorntail 4.x [timing tbd]
- JDK 10 / 11 support
- Java EE 8 / Jakarta EE
- MicroProfile 1.4 / 2.0

QUESTIONS

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