Reactive Stream Processing with **WildFly Swarm** and **Apache Kafka**

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Who is Ken Finnigan?

- Project lead for WildFly Swarm
- Contributor to Eclipse MicroProfile
- Author of several books
- Twitter: **@kenfinnigan**


WildFly SWARM

Java EE

[EE4J]

Skills

Knowledge

Experience

Java EE
and
Microservices ???

What we're here for!

```
<plugin>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>wildfly-swarm-plugin</artifactId>
  <version>${version.wildfly-swarm}</version>
  <executions>
    <execution>
    <id>package</id>
      <goals>
        <goal>package</goal>
      </goals>
    </execution>
  </executions>
</plugin>
```

```
<dependency>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>jaxrs</artifactId>
</plugin>
```

Auto Detection

WildFly Swarm figures out what bits you *need*

- Servlet
- JAX-RS
- Monitor
- CDI
- MicroProfile
- JPA
- Swagger
- Transactions
- Naming
- Bean Validation
- Keycloak
- More…

```
<dependency>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>bom</artifactId>
  <version>${version.wildfly-swarm}</version>
  <type>pom<type>
  <scope>import</scope>
</plugin>
```

```
<dependency>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>jaxrs</artifactId>
</plugin>
```

Run it!

```
$ mvn wildfly-swarm:run
```

Package it!

```
$ mvn clean package
```

Run it!

```
$ java -jar myapp-swarm.jar
```

YAML

project-defaults.yaml

```
swarm:
  datasources:
    data-sources:
     MyDS:
        driver-name: h2
        connection-url:
jdbc:h2:mem:test;DB_CLOSE_DELAY=-1;DB_CLOSE_ON_EXIT=FALSE
        user-name: sa
        password: sa
```

What about

"microservicey stuff"

?!

Keycloak

```
<dependency>
  <groupId>org.wildfly.swarm</groupId>
  <artifactId>keycloak</artifactId>
</plugin>
```

define in project-defaults.yml

```
swarm:
  keycloak:
    secure-deployments:
      time.war:
        realm: service
        bearer-only: true
        auth-server-url: http://localhost:9090/auth
        ssl-required: external
        resource: time-service
        enable-cors: true
  deployment:
    time.war:
      web:
        security-constraints:
          - url-pattern: /*
            roles: [ time-access ]
```

Bottom line..

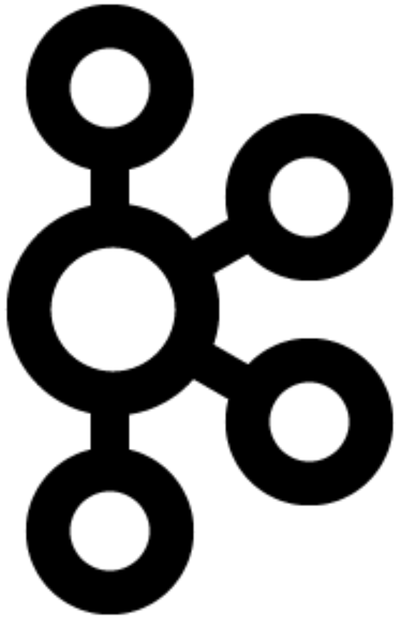
Java EE
is an
awesomely fantastic
way to write microservices.

MICROPROFILE™

OPTIMIZING ENTERPRISE JAVA

- Formed June 2016
- Releases
  - 1.0 - September 2016 (CDI, JAX-RS, JSON-P)
  - 1.1 - July 2017 (MP.io 1.0 + Config 1.0)
  - 1.2 - September 2017 (1.0 + Config 1.1, Fault Tolerance 1.0, JWT Propagation 1.0, Health Metrics 1.0, Health Check 1.0)

- **WildFly Swarm** is the Red Hat **implementation** of Eclipse MicroProfile
- Currently only complies with MicroProfile 1.0
- Work in progress for MicroProfile 1.2 compatibility



APACHE kafka™

A distributed streaming platform

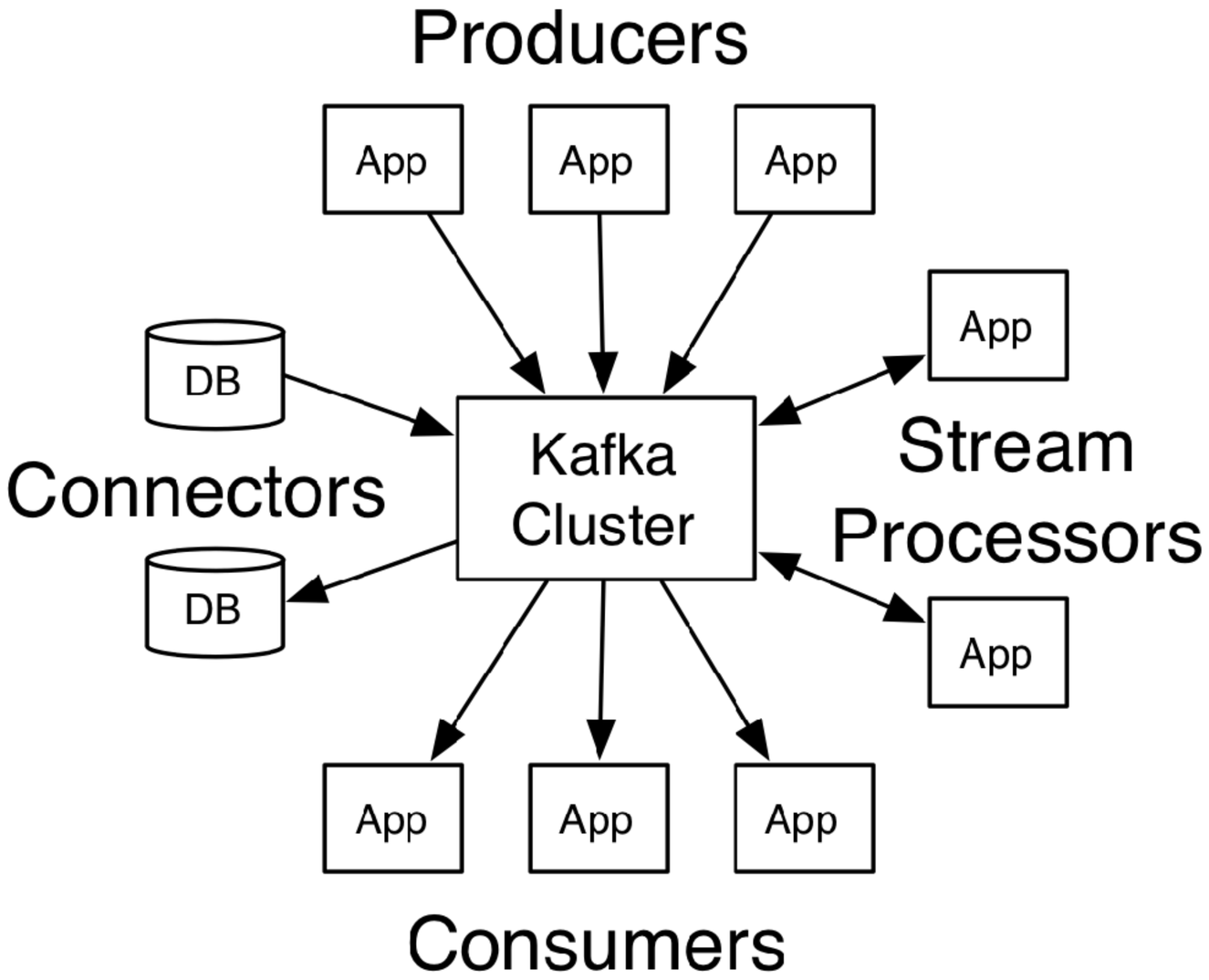
Event Ledger
Distributed
Redundant

A distributed commit log

Kafka Semantics

- Based off Messaging systems
  - Producers
  - Consumers
  - Topics

Four Parts to Kafka



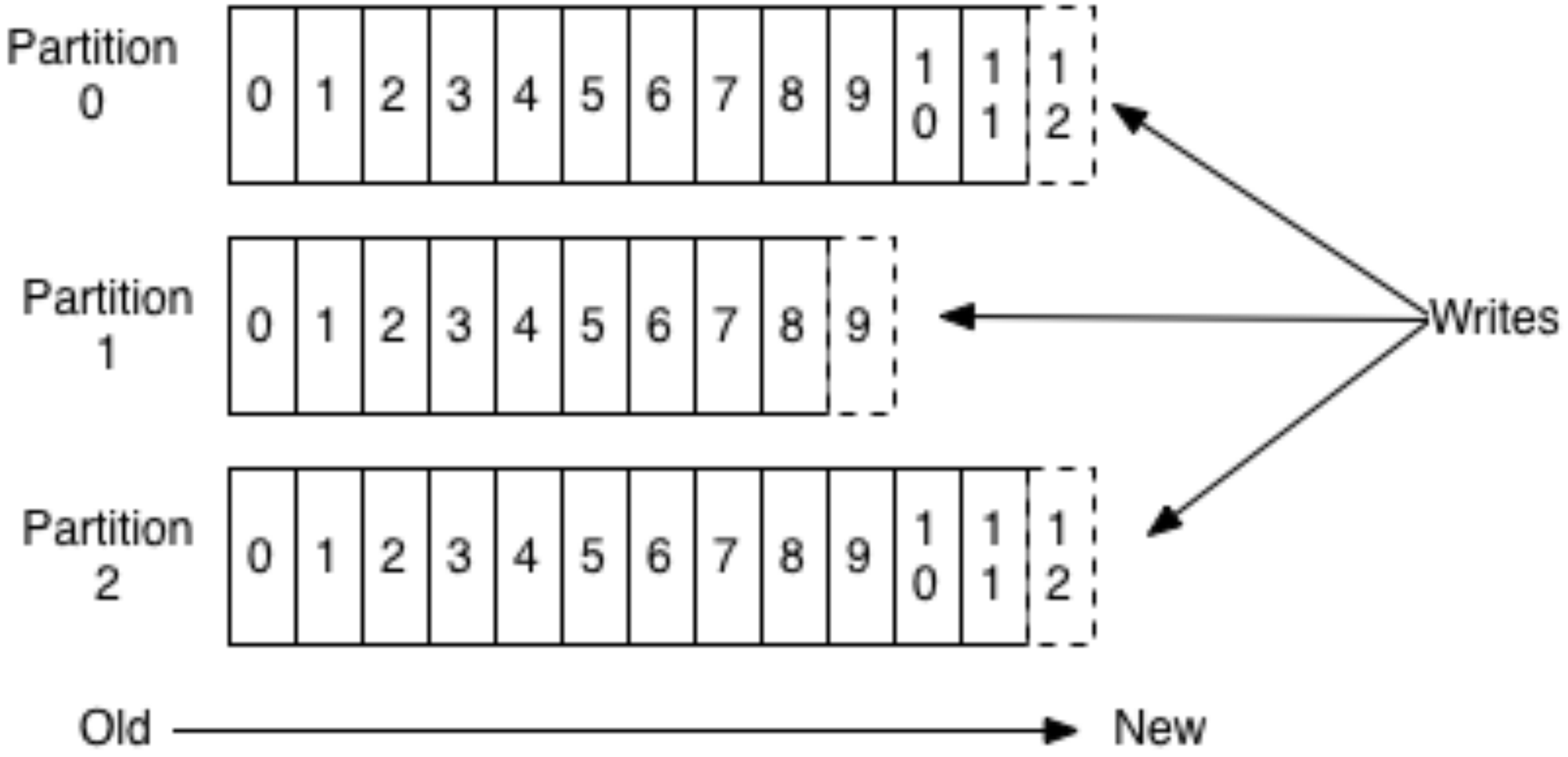
Kafka Record

- Consists of a Key / Value / Timestamp
- Each Record
  - Immutable
  - Persisted (up to a retention limit)

Kafka Topic

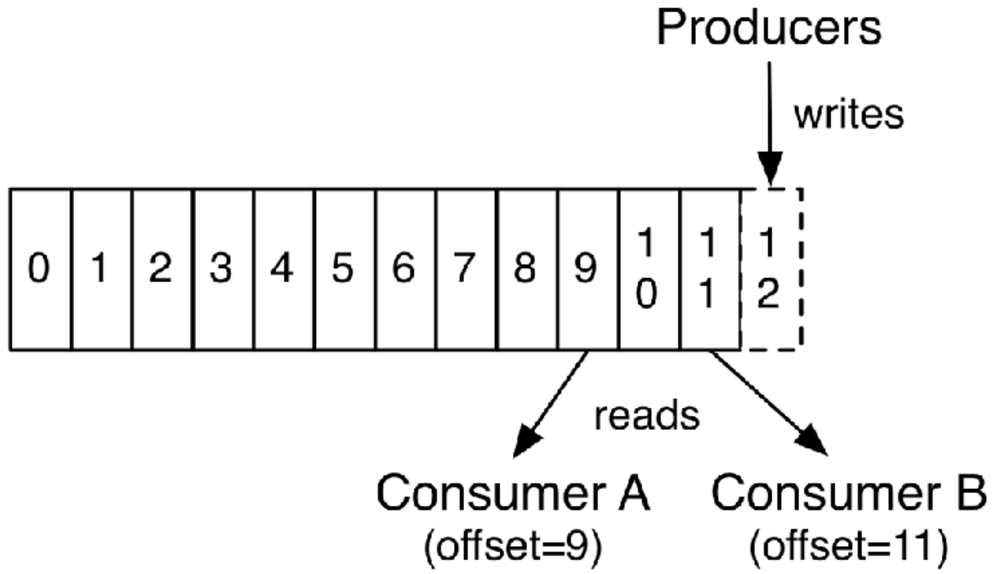
- Logical name for one or more data partitions
- Append Only
- Ordering within a partition guaranteed
  - Business key on Record is critical
- Offers Partition Replication for resiliency

Anatomy of a Topic



Kafka Consumers

- Reads Records from Topics
- Can start at any offset, inc. replay entire stream
- Consumer Groups are a logical grouping of Consumers
  - Ensures a Record is only read by a single Consumer within a Consumer Group
  - Provides load balancing



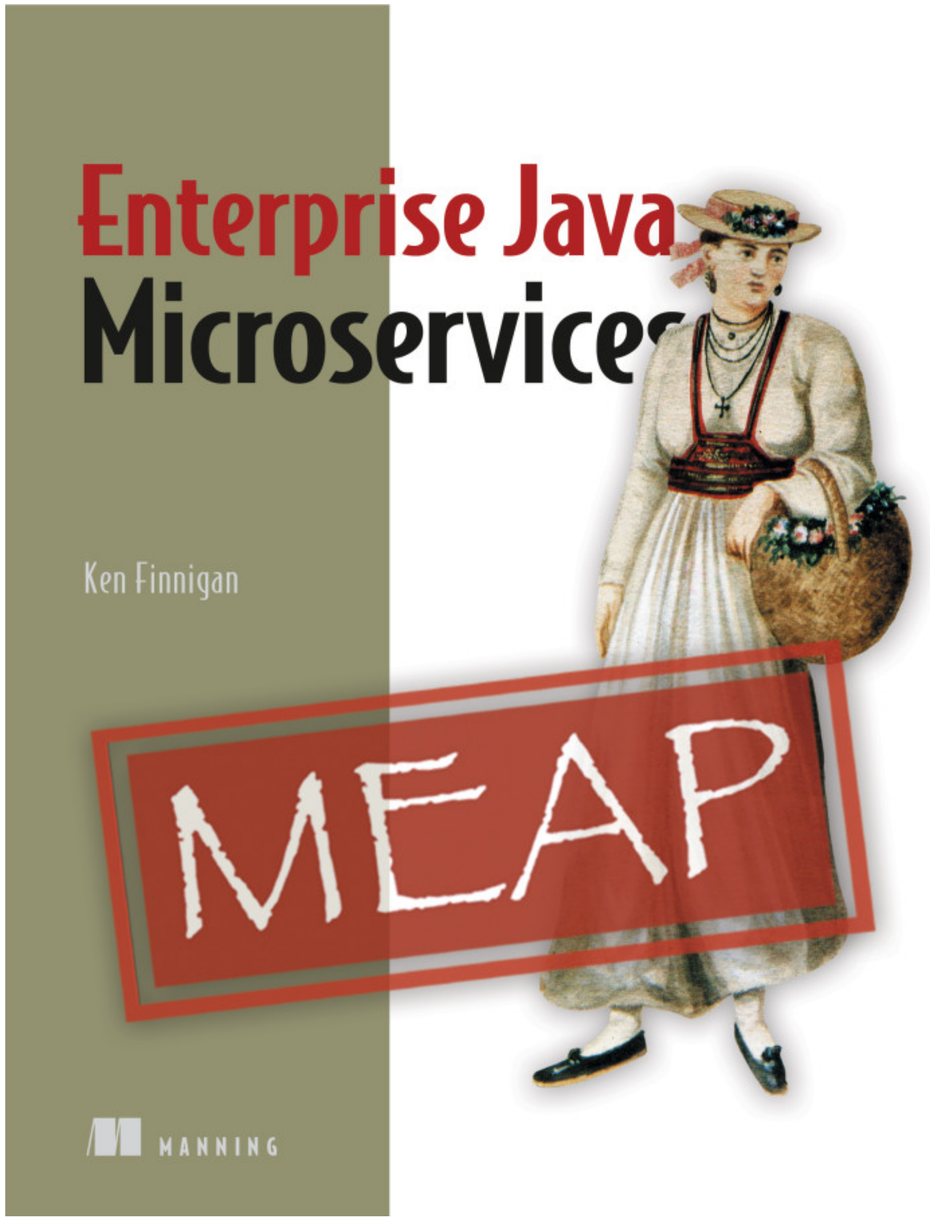
CDI Extension for Kafka

- Utilizes Kafka APIs underneath
- Removes boilerplate code for configuring Kafka
- Converts “pull” of Kafka API into “push” for CDI
- https://github.com/aerogear/kafka-cdi

Demo

Currently writing

https://www.manning.com/books/enterprise-java-microservices



WildFly Swarm Resources

http://github.com/wildfly-swarm/wildfly-swarm/

http://wildfly-swarm.io/

#wildfly-swarm on irc.freenode.net

issues.jboss.org/browse/SWARM

https://howto.wildfly-swarm.io/

https://reference.wildfly-swarm.io/

https://groups.google.com/forum/#!forum/wildfly-swarm

Questions?

Demo Code

https://github.com/kenfinnigan/javaone2017

Thanks!

If you want to chat,

come on down.