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开放性思维

Apache OpenWhisk 101

A Cloud-Native, Open Source, Serverless
Platform Incubating at the ASF

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Agenda

- What is serverless computing ?
- What is Apache OpenWhisk ?
- Apache OpenWhisk programming model
- Apache OpenWhisk community



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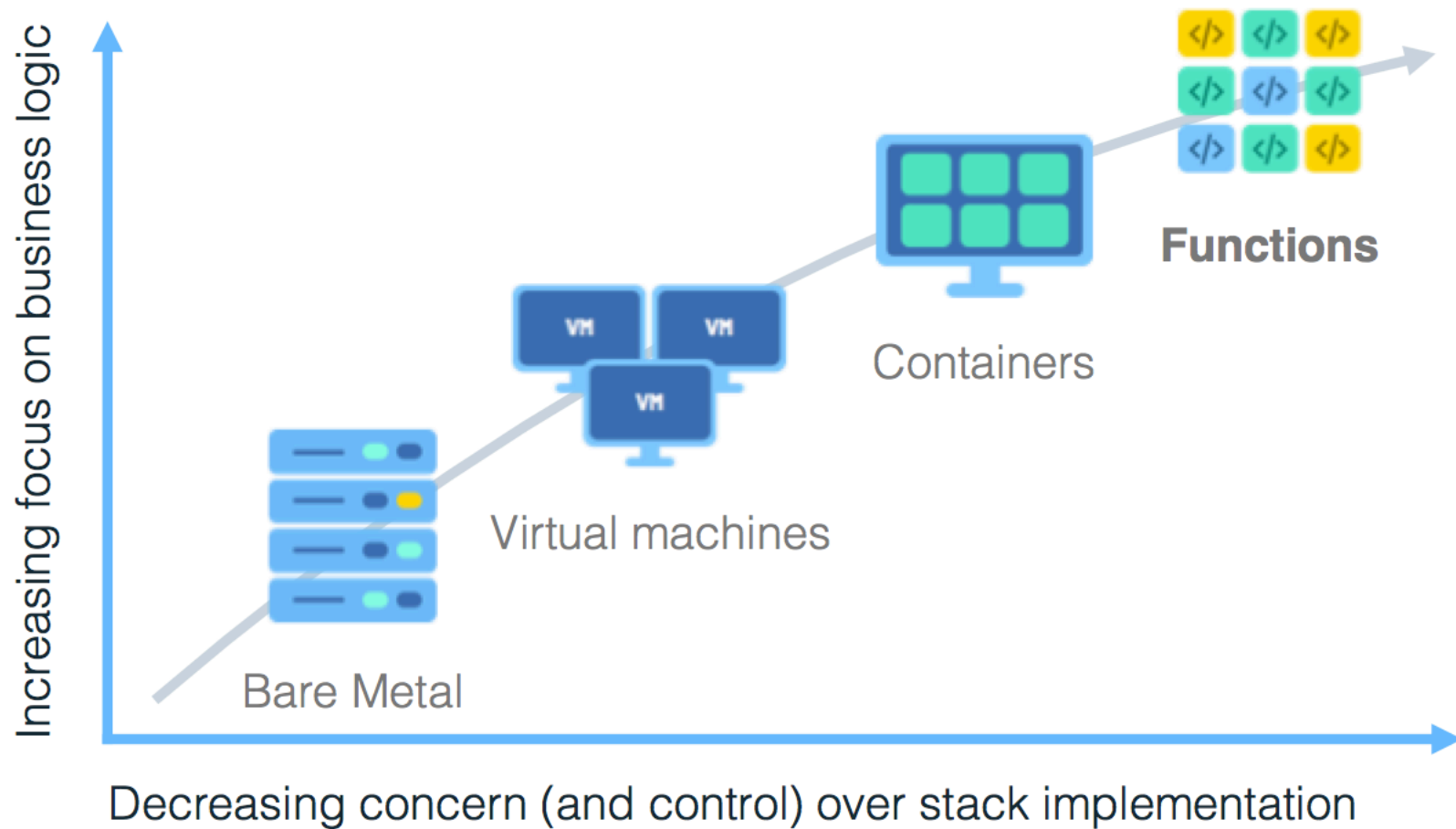
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What is serverless computing?

Serverless developers focus more on code, less on infrastructure



What is serverless computing?

Serverless = { **Functions as a Service**
Backend as a Service

- **Functions-as-a-Service (FaaS)**
 - Small units of code are executed as needed as discrete actions, scaling without the need to manage servers or any other underlying infrastructure.
 - Event-driven computing. Functions that are triggered by events or HTTP requests.
- **Backend-as-a-Service (BaaS)**
 - third-party API-based services replace core subsets of functionality in an application
 - Those APIs are provided as a service that auto-scales and operates transparently

Benefits of serverless

- Zero server ops
 - No provisioning, updating, and managing server infrastructure.
 - Flexible Scalability
- No compute cost when idle

Emerging workloads are a good fit for event-driven programming



Execute logic in response to database change



Perform analytics on sensor input messages



Provide cognitive computing via chatbots



Schedule tasks performed for a short time



Invoke autoscaled APIs and mobile backends



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What is Apache OpenWhisk ?

Apache OpenWhisk is ...



A serverless, open source cloud platform that executes functions in response to events at any scale.

Apache OpenWhisk offers:



- **Apache Software Foundation (ASF)**
 - *True, community-driven open source (Apache 2 License)*
- **Proven on IBM Cloud**
 - *Exact, same code in open source*

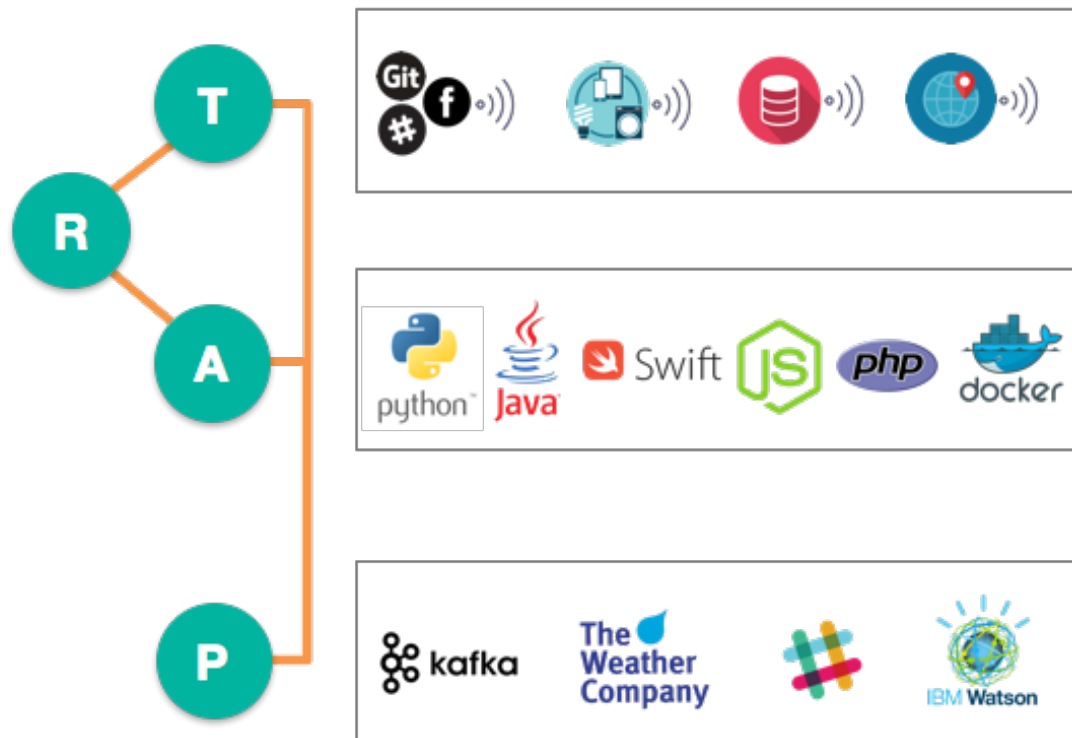


Developers work with triggers, actions, rules, and packages

Data sources define events they emit as **Triggers**.

Developers map **Actions** to **Triggers** via **Rules**.

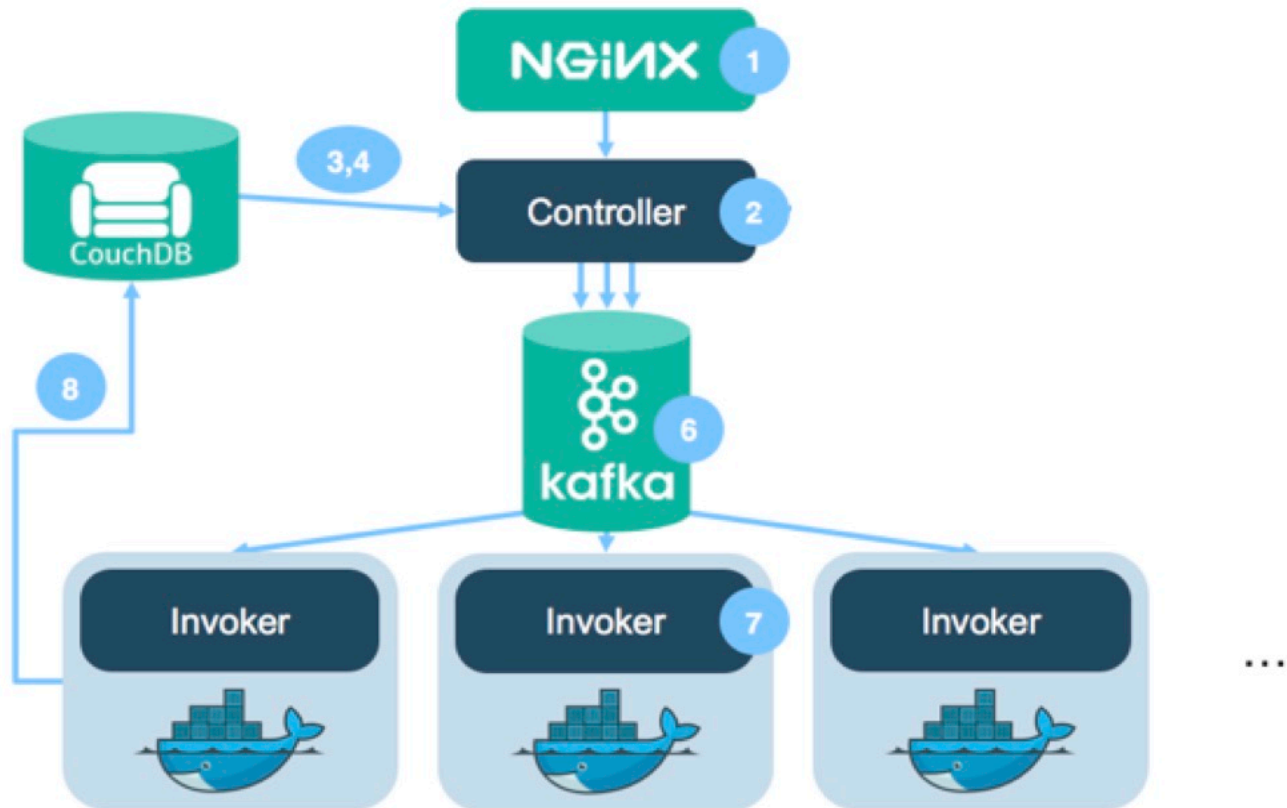
Packages provide integration with external services.



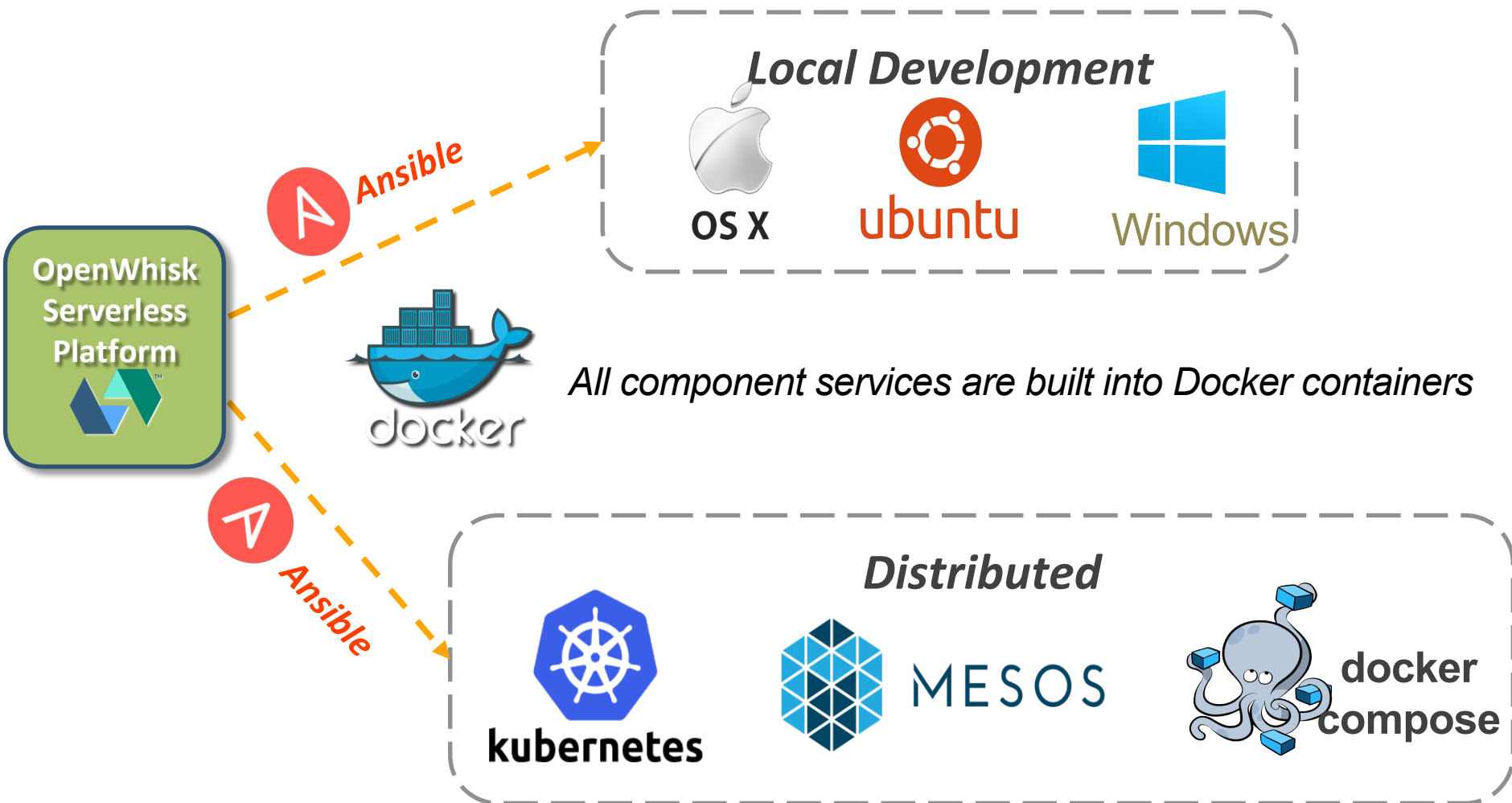
Built on solid open source foundations



Apache Incubator



Has many deployment options



Proven by IBM Cloud Functions

- Functions
- Getting Started
 - Overview
 - Pricing
 - Concepts
 - Integrations
 - CLI
 - iOS SDK
 - API Key
 - Documentation
- Actions
- Triggers
- Monitor
- Logs
- APIs

Getting Started with IBM Cloud Functions

IBM Cloud Functions (based on Apache OpenWhisk) is a Function-as-a-Service (FaaS) platform which executes functions in response to incoming events and costs nothing when not in use. [Learn More](#)

[Start Creating](#) [Download CLI](#)

What's New:

- Updated Action runtimes: NodeJS 8, Swift 4
- Compliance: New ISO certifications ([ISO 27001](#), [ISO 27017](#), [ISO 27018](#))
- Get started quickly with Templates: [Try it now](#)
- Available in new datacenter: Frankfurt, Germany (see the Region selector)
- New logging service integration (see the **Logs** link in the left navigation)
- Increased maximum execution time for Actions: 10 minutes



<https://console.bluemix.net/openwhisk/>



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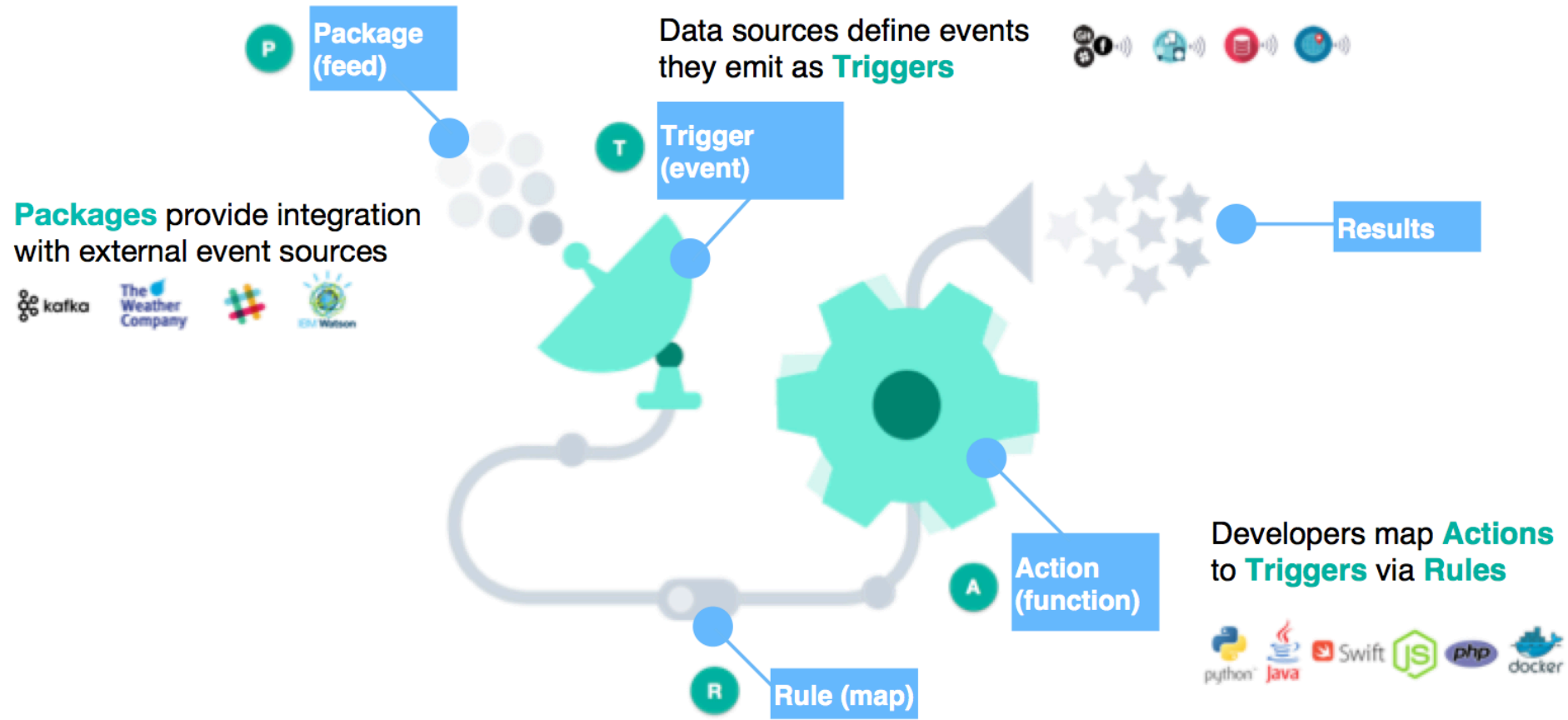
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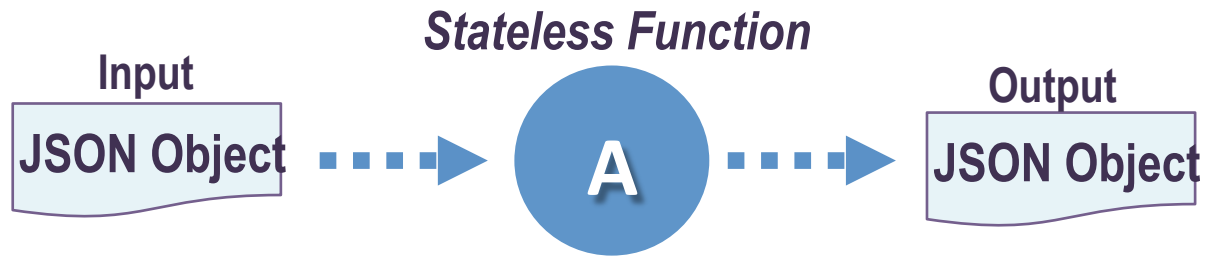
Apache OpenWhisk programming model

Event driven programming model



Action

A Action : *A stateless, relatively short-running function invoked as an event handler.*



Goal: *An Action's run time is measured in milliseconds,
... well under the defaulted maximum of 5 minutes*

Trigger

T Trigger :

*The named channel for a **class of events**.*

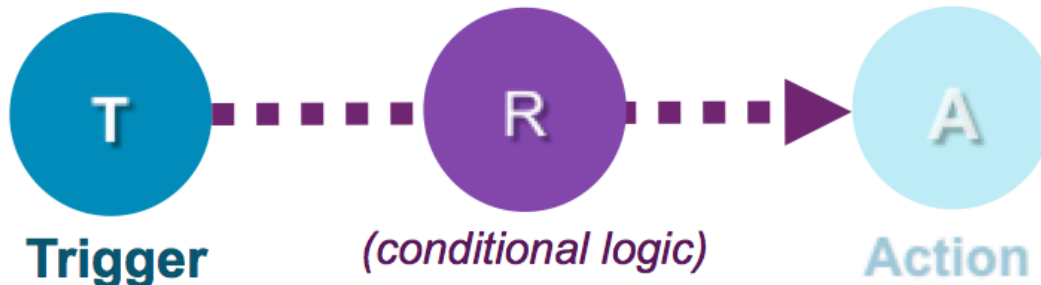
Triggers represent the events (and their data) themselves without any concept of how they were generated.



Note: In a pub-sub system, a trigger could be viewed as a message topic.

R Rule :

*A mapping from a **Trigger** to an **Action** which may contain simple conditional logic.*

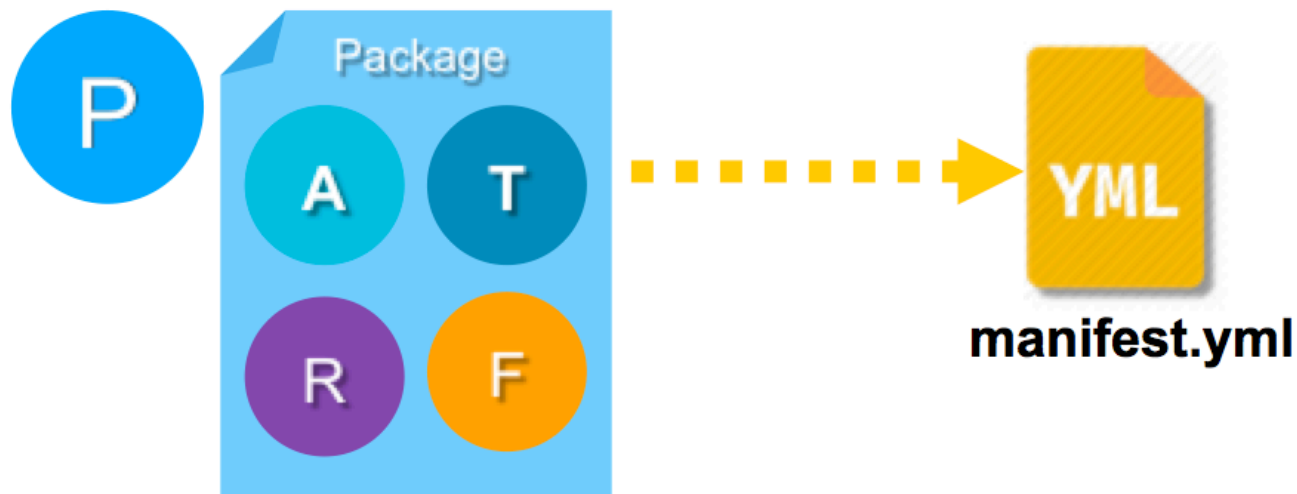


Note: OpenWhisk evaluates incoming events (that belong to a **Trigger**) and invokes the assigned **Action** (event handler) associated by the **Rule**.

Package

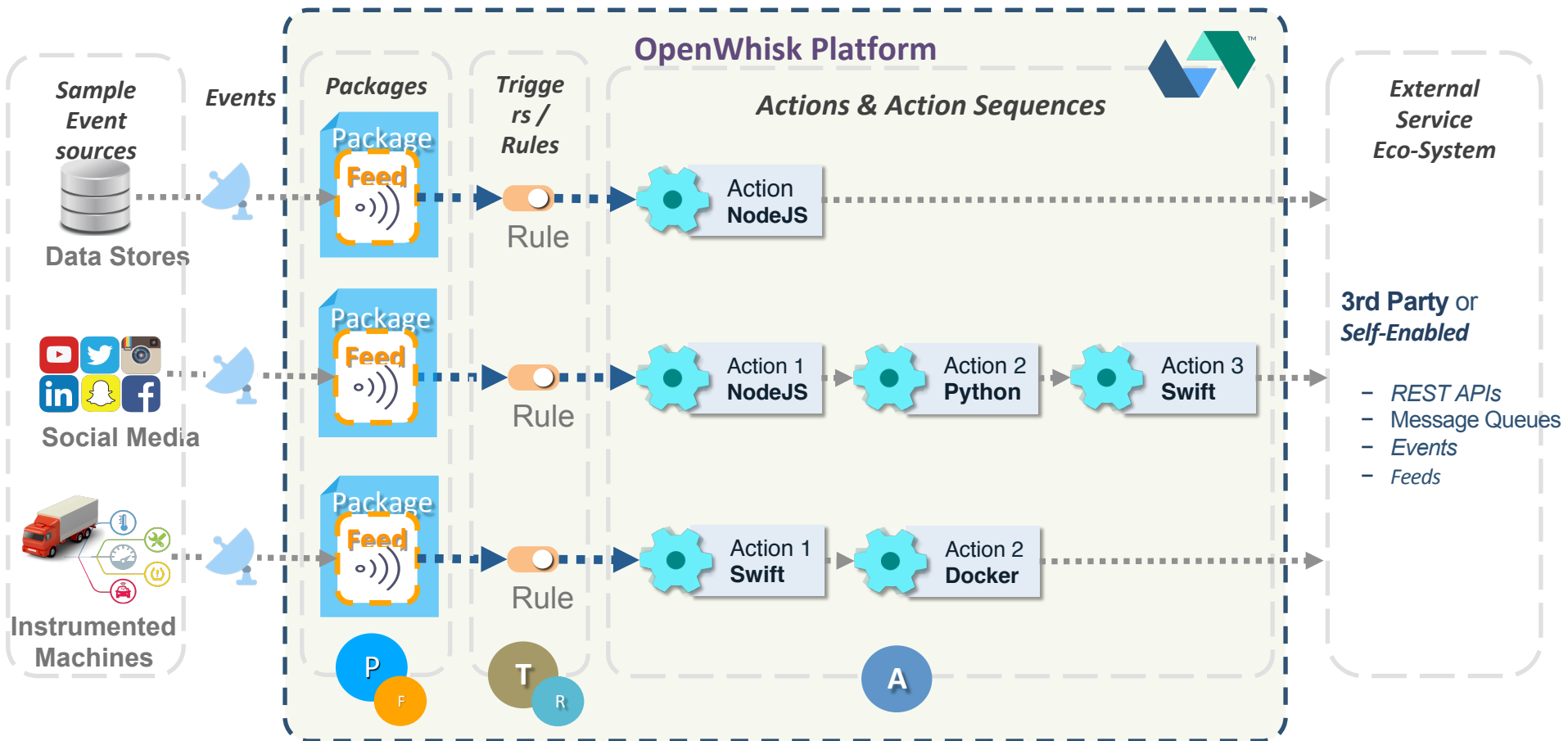
P Package:

A named, shared collection of (Namespaced) Actions, Triggers, Feeds, Rules, ...



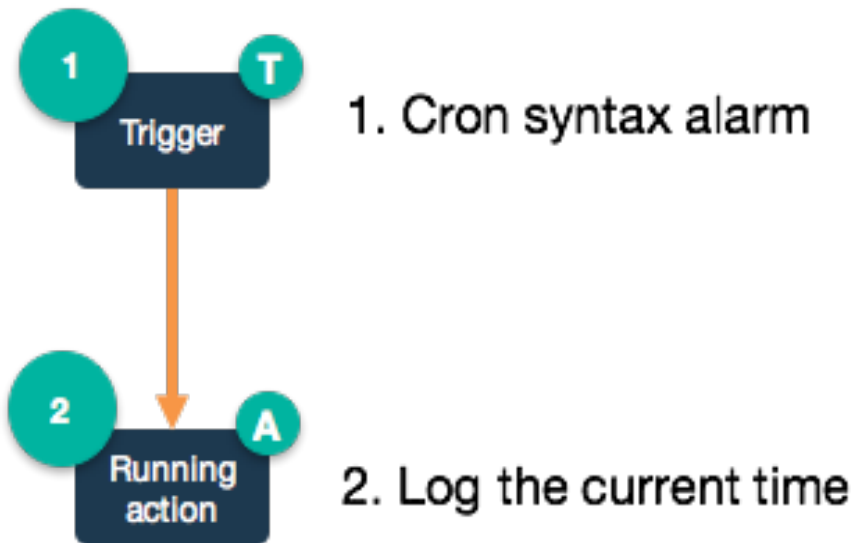
*Note: Designed as a first-class entity in the OpenWhisk Model, being used by new Whisk Deploy tool (“**wskdeploy**”) for 1-click Deployments*

Event-Trigger-Rule-Action Processing



Demo1: Your first action, trigger and rule

```
function main(params) {  
  var date = new Date();  
  console.log("Invoked at: " + date.toLocaleString());  
  return { message: "Invoked at: " + date.toLocaleString() }  
}
```



```
$ wsk activation poll
```

```
$ wsk action create handler handler.js
```

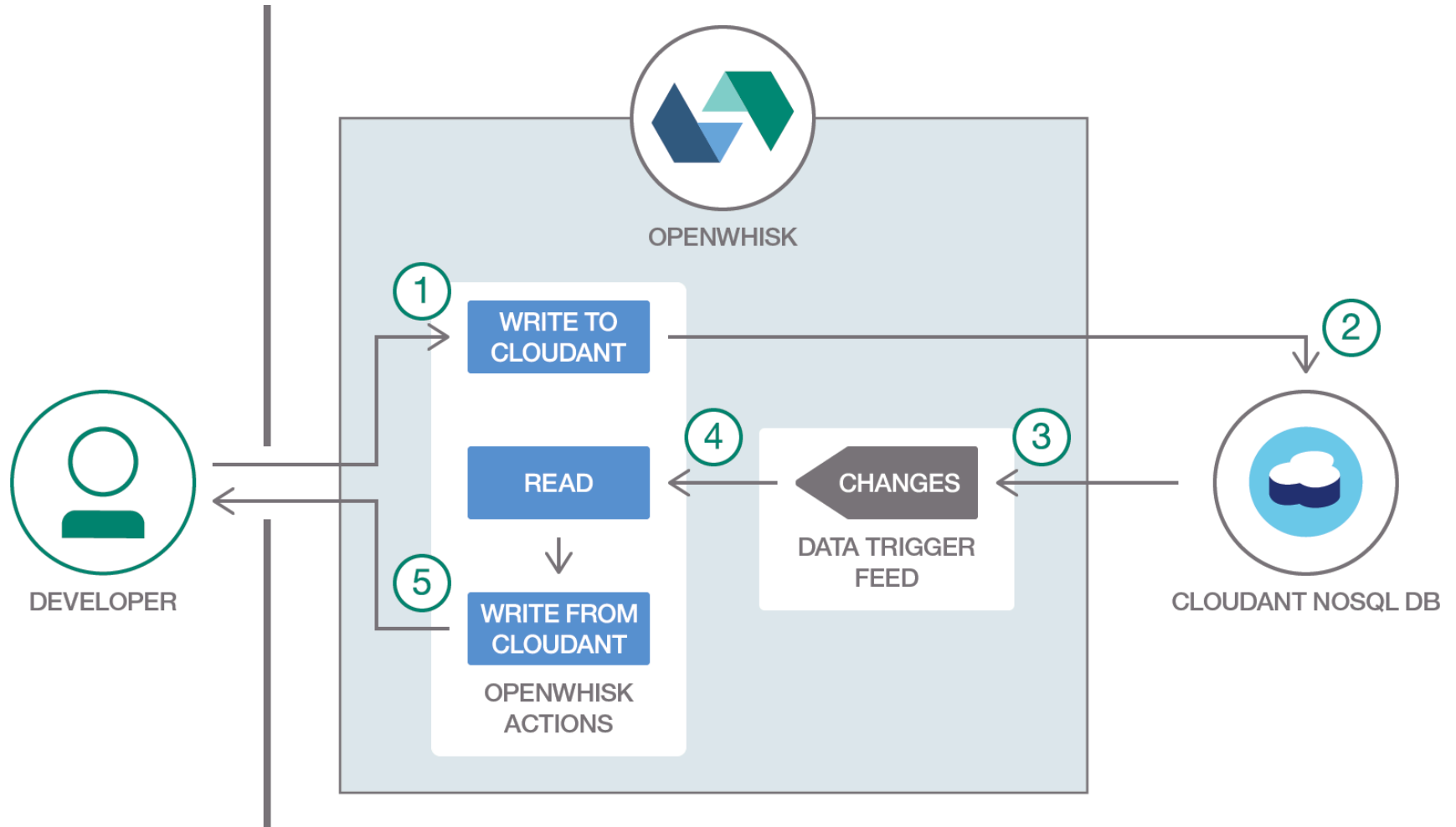
```
$ wsk action invoke --blocking handler
```

```
$ wsk trigger create every-20-seconds \  
--feed /whisk.system/alarms/alarm \  
--param cron "*/20 * * * * *" \  
--param maxTriggers 15
```

```
$ wsk rule create \  
invoke-periodically \  
every-20-seconds \  
handler
```

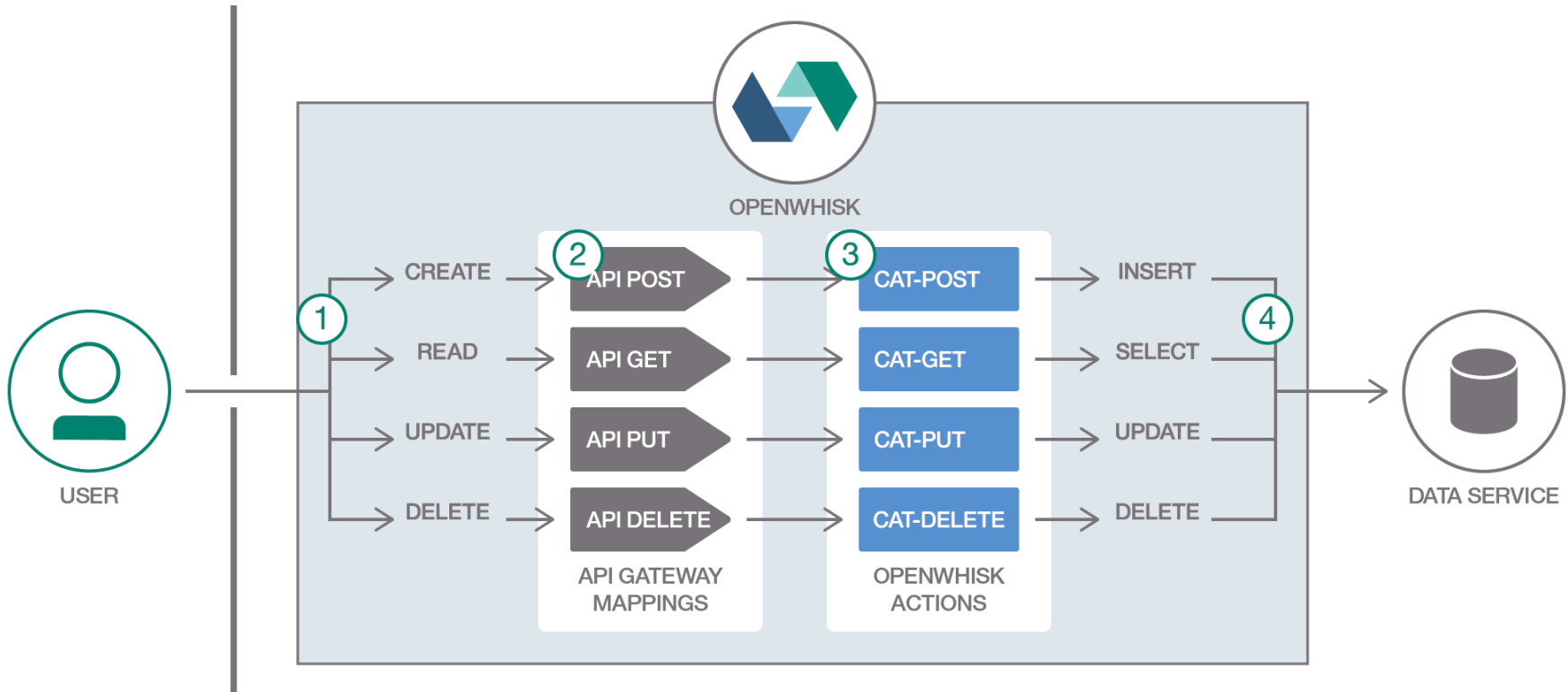
<https://github.com/IBM/ibm-cloud-functions-action-trigger-rule>

Demo2: Database change triggered action



<https://github.com/IBM/ibm-cloud-functions-cloudant-trigger>

Demo3: HTTP API request triggered action



<https://github.com/IBM/ibm-cloud-functions-rest-api-trigger>



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Apache OpenWhisk community

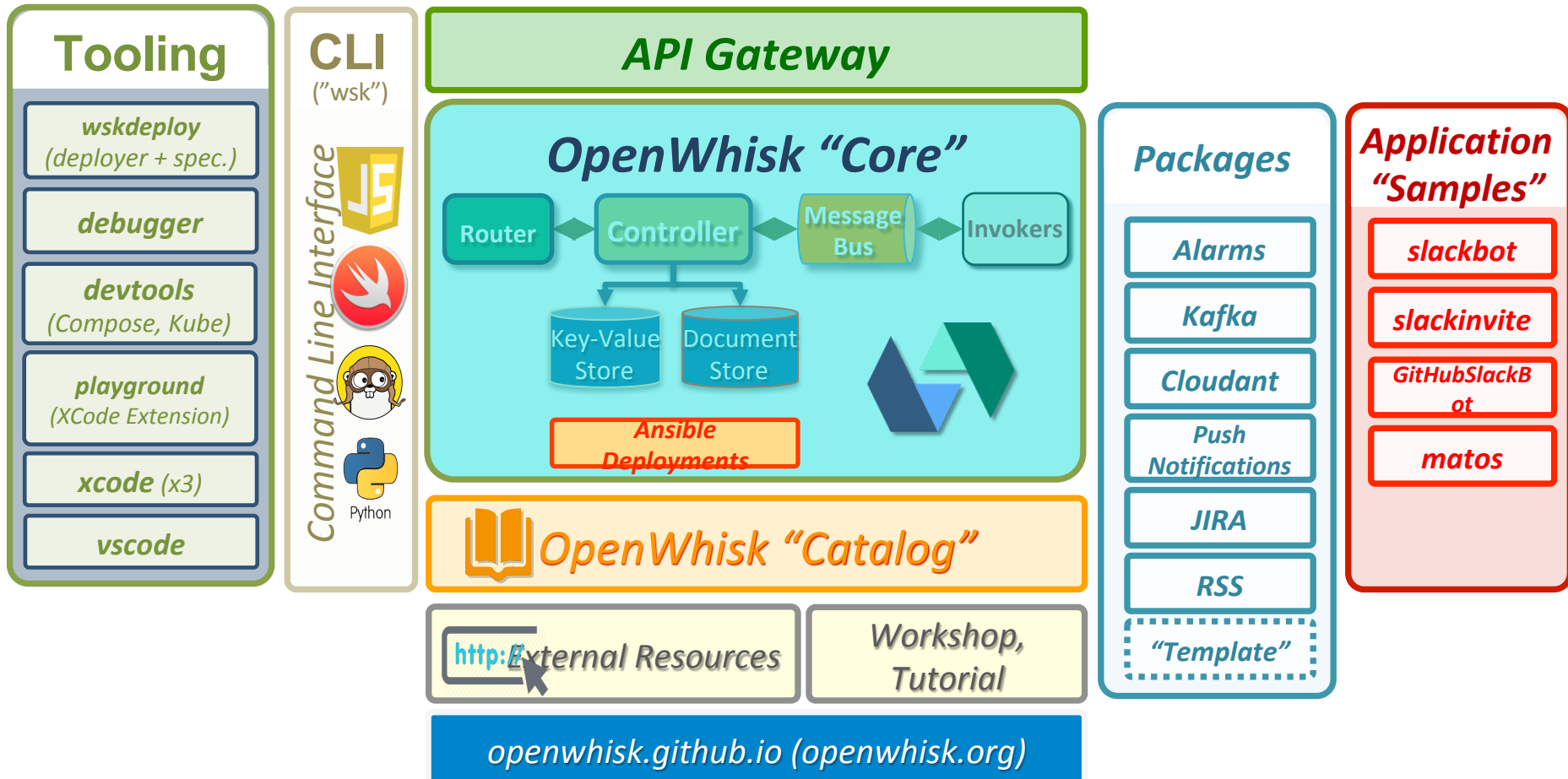
The Apache OpenWhisk community is growing



Apache Incubator

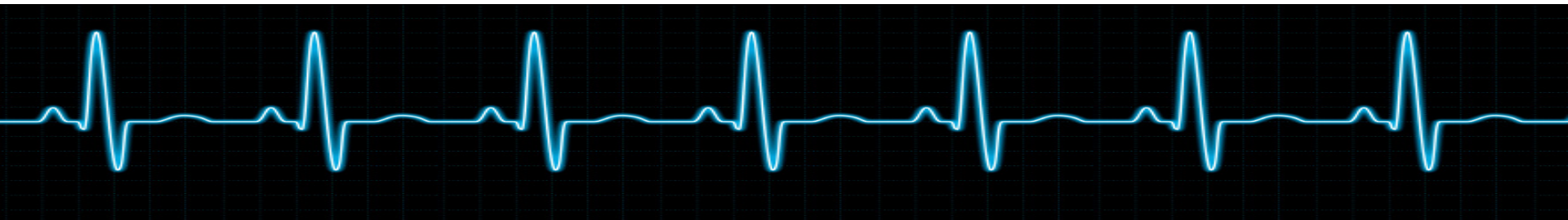


Apache OpenWhisk ecosystem



OpenWhisk Project Vital Statistics

- **GitHub** (*"Core" Repo.*)
 - **Stars**
 - **3285**: <https://github.com/apache/incubator-openwhisk/stargazers>
 - *and growing ~10-20 per week on average*
 - **Stats**
 - **626 forks** <https://github.com/apache/incubator-openwhisk/network>
 - **Contribution Graphs:**
<https://github.com/apache/incubator-openwhisk/graphs/contributors>
 - **120+ Contributors** (*all repos.*)
 - *Working on the first release 0.9 in Apache*



Get started

Delivered as
Open source via Apache
openwhisk.org

Managed OpenWhisk with
IBM Cloud Functions
console.bluemix.net/openwhisk/

 [github.com/apache?
q=openwhisk](https://github.com/apache?q=openwhisk)

 slack.openwhisk.org

 twitter.com/openwhisk

 medium.com/openwhisk

 [dev@openwhisk.incubator.
apache.org](mailto:dev@openwhisk.incubator.apache.org)



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