Apache
OpenWhisk

How it Works and How You Can Benefit

Carlos Santana, IBM
@csantanapr
Agenda

1. Evolution of serverless
2. What is serverless aka FaaS?
3. Bluemix: What is it?
4. OpenWhisk: What is it & what’s new?
5. What is serverless good for?
6. Q&A
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Evolution of serverless

Increasing focus on business logic

Decreasing concern (and control) over stack implementation
Evolution of serverless

Runs code **only** on-demand on a per-request basis

Serverless deployment & operations model

No servers

Just code
Evolution of serverless

Runs code **in response** to events

Event-programming model
Evolution of serverless

FaaS market is growing quickly

Source: FaaS Market - Global Forecast to 2021 - study by MarketsAndMarkets (http://www.marketsandmarkets.com/)
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Bluemix is built on 4 key open compute technologies: **OpenWhisk**, Cloud Foundry, Docker, and OpenStack.

It extends each of these with a growing number of services, robust DevOps tooling, integration capabilities, and a seamless developer experience.
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What is OpenWhisk?

FaaS platform to execute code in response to events
FaaS platform to execute code in response to events

Available as

**Open Source via Apache Incubation**

openwhisk.org
github.com/apache/incubator-openwhisk
FaaS platform to execute code in response to events

Also available as managed service on IBM Bluemix

bluemix.net/openwhisk
OpenWhisk

Concepts

- Source (events)
- Triggers (response)
- Rules
- Actions (code)
- Results
Supported Languages

Multi-language Support

- JS/NodeJS 6
- Swift 3
- Java
- Docker
- Python 3
- New

Community Efforts

- Go
- Scala
- ... (ellipsis)
- Rust
- ... and anything that runs on a Docker Container
Support for different invocation models

Blocking

Non-blocking

Periodic
Supports higher-level programming constructs

Chaining/Sequencing

Parameter Binding

Default Parameters
- Default Name
- Default Value

Action 1
Action 2
Event Provider

Open event emitter (consumer ecosystem)

Open interface for event emitters
Event Provider

- Periodic
- Cloudant/CouchDB
- Message Hub/Kafka (binary data)
- Github
- Mobile Push
- IBM App Connect
Granular pricing

Pay only for the exact time your actions run. When an action is not invoked, it’s not in memory, so you don’t pay anything.
Reduce Costs

Time an action was running * memory allocated to action

$ 0.000017 per GBs
Free tier: 400000 GBs
IBM Bluemix OpenWhisk

Cloudant

Integration Service

NGINX

Controller

kafka

Consul

ELK-Stack

Monitoring

Invoker

Invoker

Invoker

Invoker
API Gateway support

Allows to map API endpoints to OpenWhisk actions. API Gateway takes care of security, control (e.g. rate limiting), mediation, parameter mapping, schema validation & supports different verbs.

github.com/apache/incubator-openwhisk-apigateway
What is OpenWhisk good for?

Serverless microservice APIs/backend

Web actions

Gives you full control over HTTP request/response from within an action

Another way to invoke an action is via our newest web action capabilities. Those OpenWhisk actions quickly enable you to build web based applications. Allowing backend logic which your web application can access anonymously without requiring an OpenWhisk authentication key. It is up to the action developer to

$ wsk action update hello --web true
ok: updated action hello
Kong plug-in for OpenWhisk

Allows to use Kong as an alternative open & vendor-agnostic API Gateway

What is OpenWhisk good for?

Serverless microservice APIs/backend

Next Generation RESTful API Management
Improved Serverless Framework support

Allows to package all puzzle pieces of a serverless application into a single project and deploy it in a vendor-agnostic way.

Now available: v0.6
Bringing OpenWhisk to Realtime Applications

Integration with PubNub®

Allows OpenWhisk to work with today’s stream-based applications; stream data to/from OpenWhisk and leverage PubNub BLOCKS for lightweight compute in the network.
Community efforts to integrate with open tools

- VS Code
- NodeRED
- Jupyter Notebooks
- XCode
- ...
DEMO
Behind the scenes: It’s about containers

Basically, OpenWhisk is based on Docker… but we added some smartness to meet our performance goals…
wsk action invoke ≈
docker run
Start container

docker run

Initialize

/init

Run

/run

cold container
OpenWhisk & Containers

Start container
```
docker run
```

Initialize
```
/init
```

Run
```
/run
```

pre-warmed container
OpenWhisk & Containers

Start container:
docker run

Initialize:
/run

Warm container
Performance is king…

cold container  pre-warmed container  warm container

faster
Container abstraction & more

Already added support for **Docker Compose**…
Container abstraction & more

Adobe adding support for Mesos…
Container abstraction

Community currently working on adding support for Kubernetes…

https://github.com/openwhisk/openwhisk/issues/2089
https://github.com/openwhisk/openwhisk/issues/1402
Container abstraction

This **ecosystem** allows you…

… to run short running scalable functions in a serverless fashion and

… longer running processes on a containerized infrastructure also forming the basis for the said serverless platform
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What is serverless good for?

OpenWhisk allows you to build up an **entirely serverless** application architecture.
What is serverless good for?

Volatile workload that can be split in smaller short-running pieces.

Suited for sporadic as well as heavy load scenarios.
Users and Integrators

Clients
- SiteSpirit
- Santander
- articoolo
- BIGVU
- GreenQ
- MAGENTIQ
- The Weather Company
- ADVISOR

Partners
- Adobe
- Apache Software Foundation
- Altoros
- Nepente
- Miracle Systems
- Swaggerhub
- PubNub
Data processing


10x faster
90% less cost
Data processing

Less cost ≤$2 for all paper checks processed within 1 year

Santander

Routing number
Deposit from account number
What do our customers do with OpenWhisk?

Articoolo
http://articoolo.com/

Stop wasting your time, let us do the writing for you!
EASY AS 1, 2, 3

1. INSERT YOUR TOPIC
2. SIT BACK AND RELAX WHILE THE MAGIC WORKS
YOUR ARTICLE IS READY
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Learn more

Commercial offering home: bluemix.net/openwhisk

Open-source offering home: openwhisk.org

Slack: slack.openwhisk.org
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