

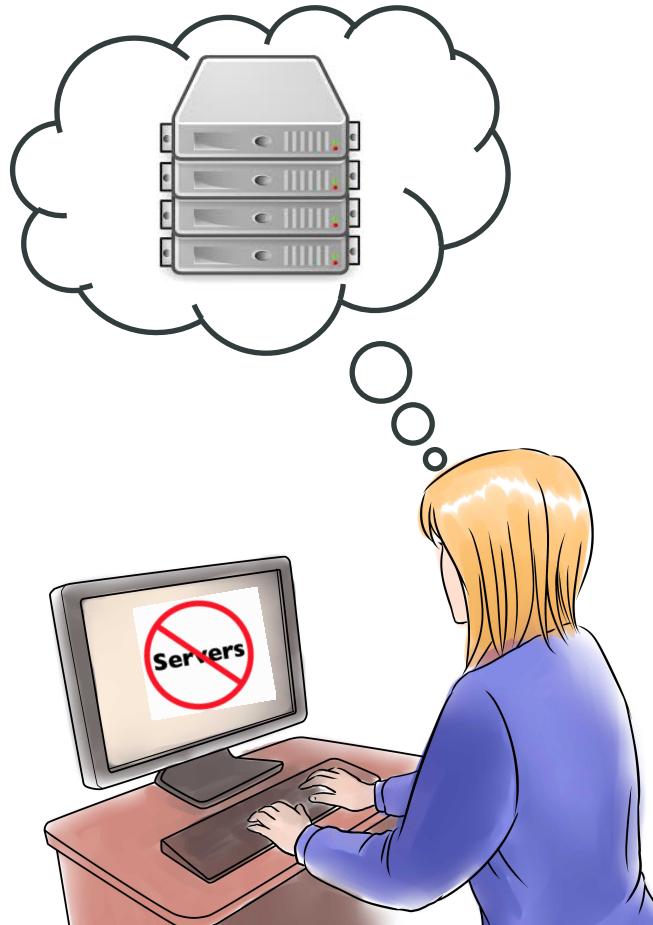
Going Serverless with IBM Functions and OpenWhisk

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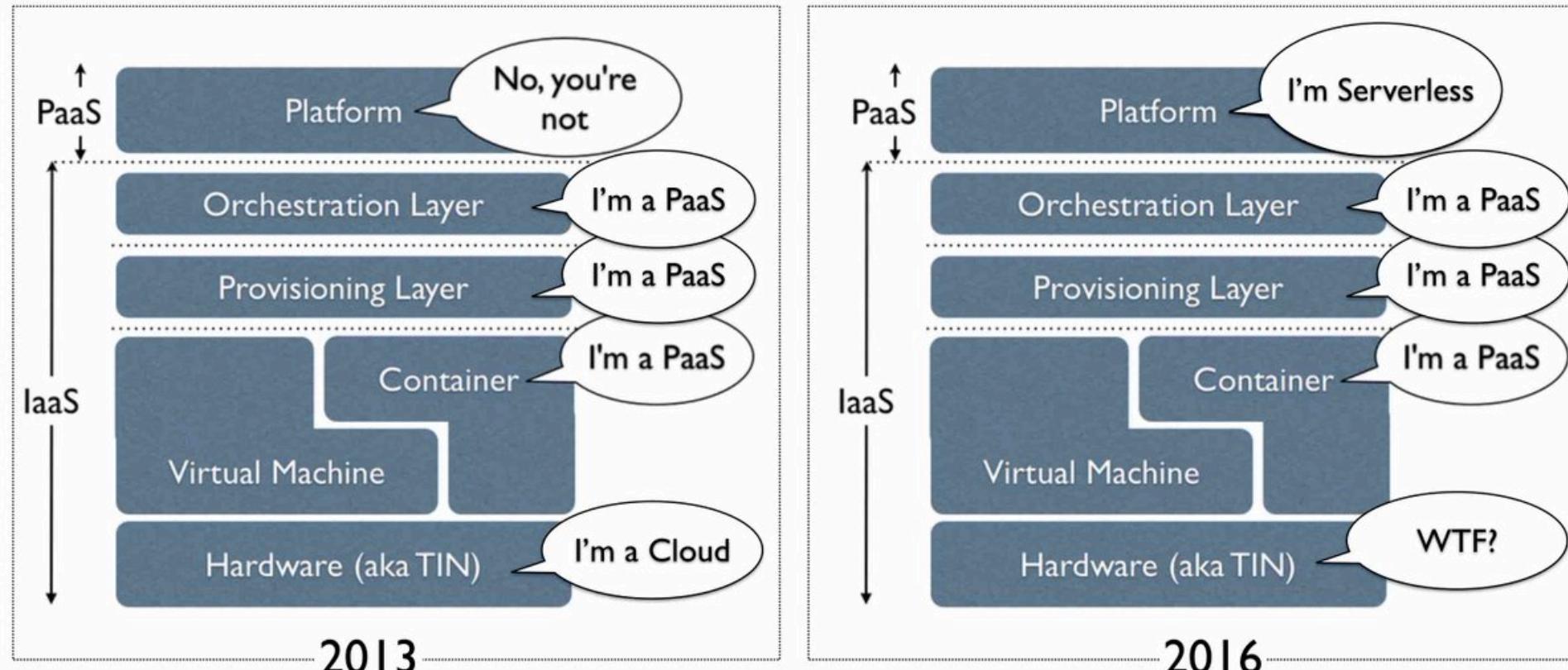


Serverless – really?

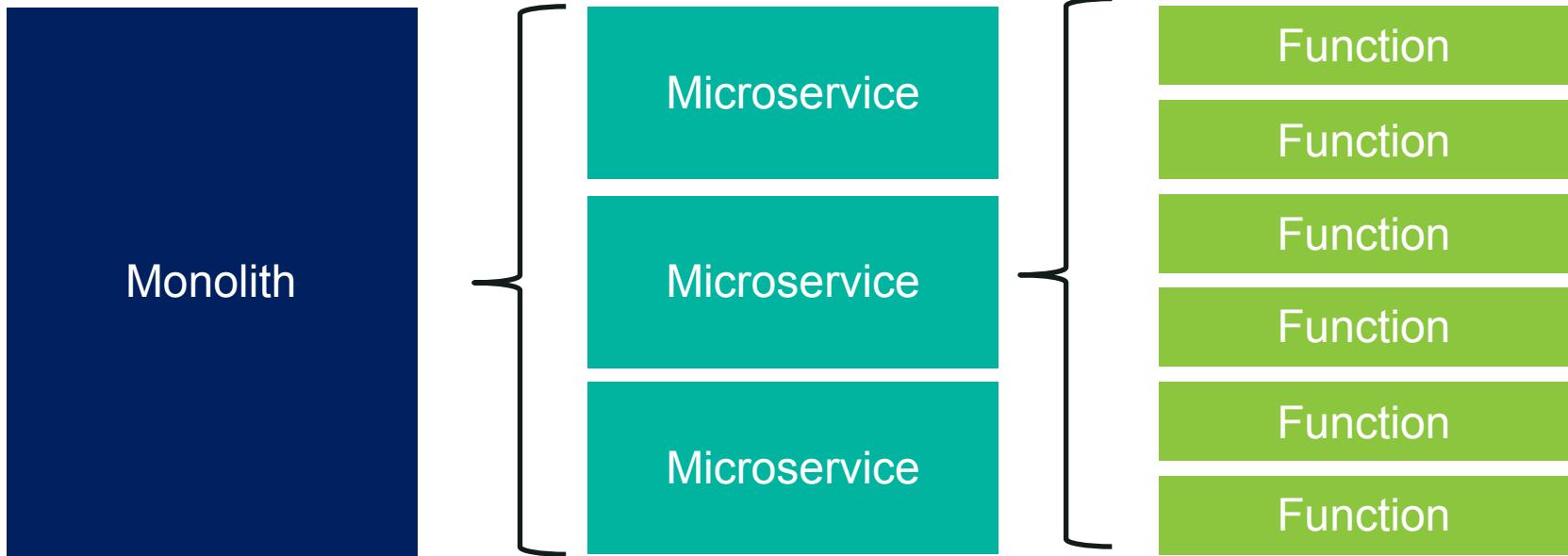
The phrase “serverless” doesn’t mean servers are no longer involved. It simply means that developers no longer have to think that much about them.



"Serverless" is a lousy name, it doesn't mean 'there are no servers' ... it means 'everyone nicked PaaS to mean stuff that wasn't PaaS'" – Simon Wardley



Functions as a Service (FaaS)



Serverless/FaaS implications

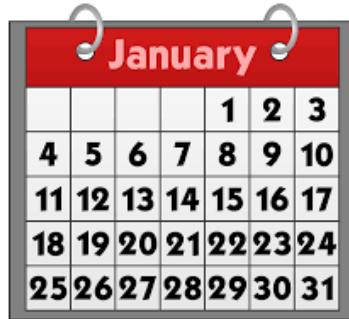
Technology implications

- ❑ No server to manage
- ❑ No OS to configure
- ❑ No middleware
- ❑ No worrying about scaling
- ❑ Over provisioning or under provisioning of resources eliminated
- ❑ Developer just focuses on coding

Cost implications

- ❑ Pay per request
- ❑ 0 requests = 0 cost

A brief history of provisioning compute units



Years
1994-2003

\$100,000's

Months
2003-2007

\$1,000's

Hours
2007-2015

\$100's

Seconds
2015+

\$0.01's

Apache OpenWhisk – serverless but with a lot more

Open Solution

Hosted on IBM Bluemix. Users can install to an environment they choose. Available on Github.



True Polyglot

Actions can be written in Node.js, Python, SWIFT, Java and Docker.



Open Event Source

Built-in event source for Kafka, Cloudant, Github etc.

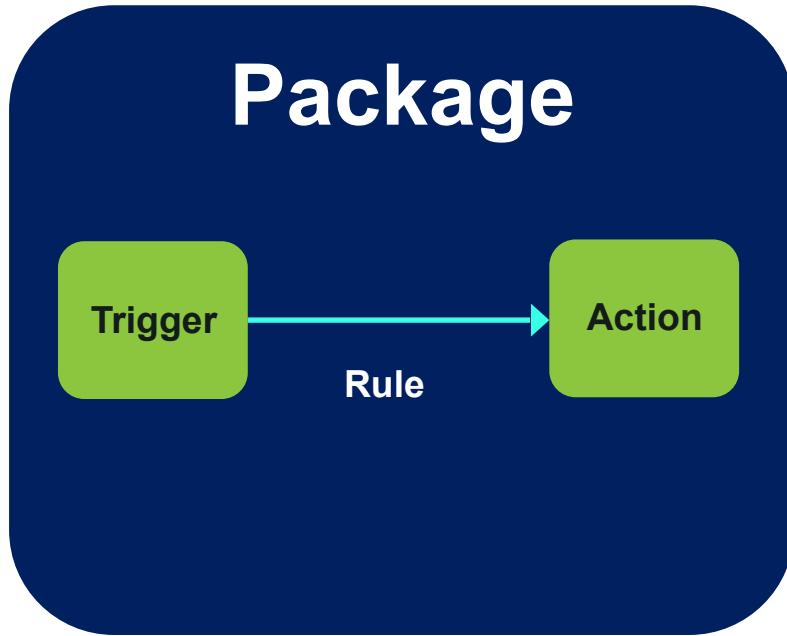


Rich Set of Services

System services like Watson and Weather are provided and ready to be invoked in an application.

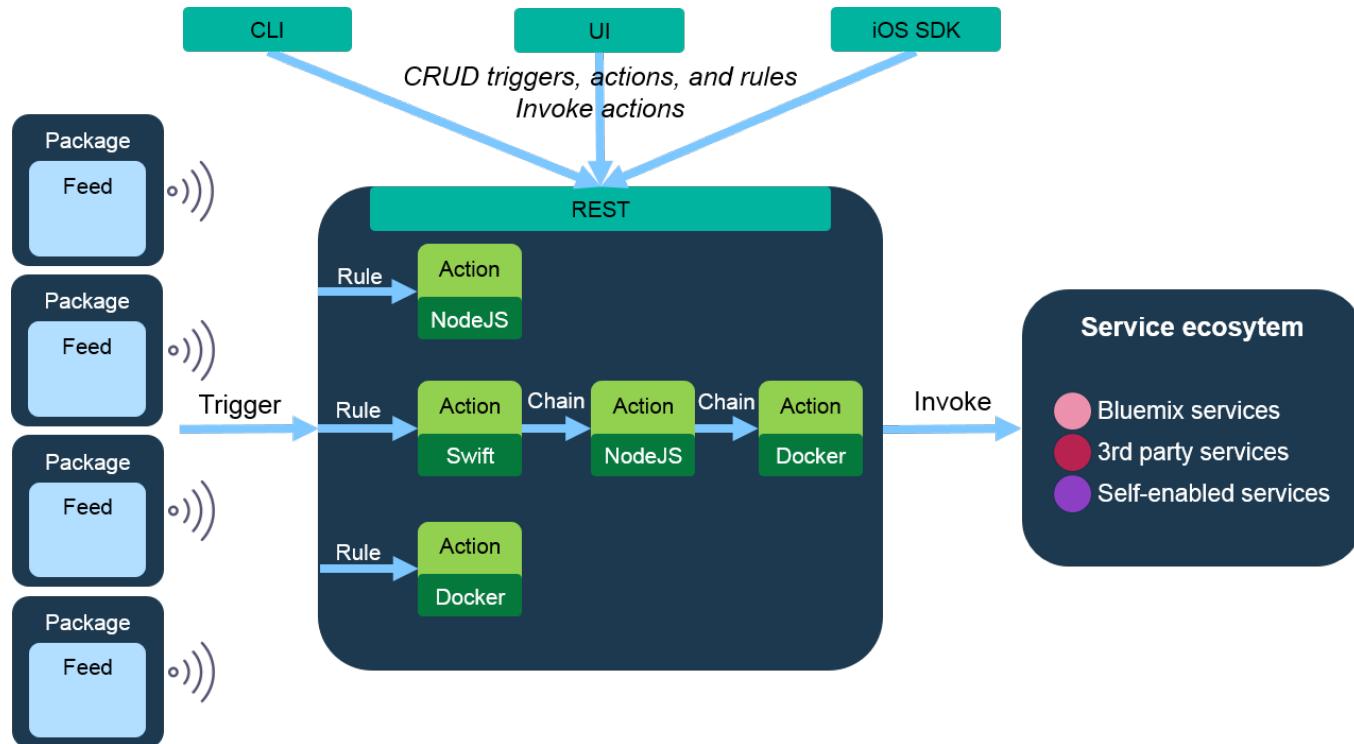


OpenWhisk Programming Model



- ❑ **Trigger:** a class of events (feed)
- ❑ **Action:** a stateless function (event handler)
- ❑ **Rule:** a mapping from a Trigger to an Action
- ❑ **Package:** a shared collection of Actions and Triggers

Apache OpenWhisk high level architecture



See: <https://console.ng.bluemix.net/docs/openwhisk/index.html#getting-started-with-openwhisk>

What is serverless good (and not so good) for?

Serverless is **good** for

*short-running
stateless
event-driven*



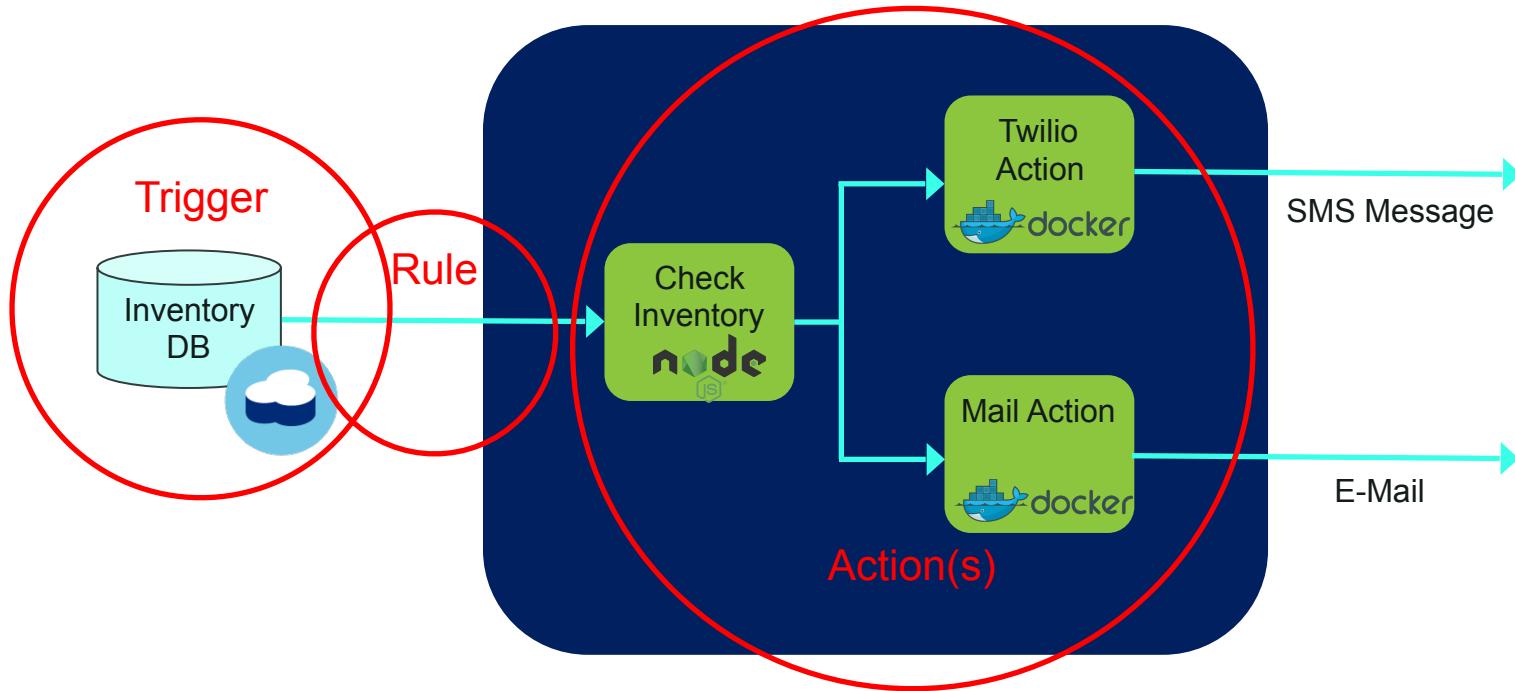
Serverless is **not good** for

*long-running
stateful
number crunching*



- Mobile backend as a service
- Microservice architecture
- Bots
- (Modest) stream processing
- Event driven processing, IoT
- Databases
- Video streaming
- Numerical simulation
- Heavy duty stream processing
- Deep learning training

Use case example: Send low inventory notification



IBM Functions

- ❑ IBM Cloud Functions (based on Apache OpenWhisk) is a Function-as-a-Service (FaaS) platform that runs in the IBM Cloud.
- ❑ Multiple programming language support
- ❑ Asynchronous computing
- ❑ Action chaining
- ❑ Integrated container support



Other serverless platforms



Cloud Functions from Google

Hosted on Google Cloud Platform.
Lightweight, event-based,
asynchronous compute solution.



Azure Functions from Microsoft

Hosted on Azure. Support for
JavaScript, C# and external
services like Dropbox.



Lambda from AWS

Hosted on AWS. Works with other
Amazon services such as S3
DynamoDB.



IronFunctions from Iron.io

Open source serverless app
platform that works on any cloud.
Written in Go packaged as Docker
containers.

IBM Functions versus AWS Lambda

Capability	Apache OpenWhisk	AWS Lambda
Public cloud	Yes, Bluemix	Yes, AWS
On-premise	Yes, download and install	No, only available as AWS service
Language support	Node.js, Python, Java, SWIFT, Docker	Node.js, Python, Java, C#
Event sources	OpenWhisk plus custom	Lambda only
Cognitive support	Watson services invoked as actions	API function call
Open Source	Yes, Apache	No, AWS proprietary
Actions chaining	Yes	No
Cost	\$0.000017/GB-Sec (400GB free/month)	\$0.0000002/invocation (1m free/month), \$0.00001667/GB-Sec, \$0.5/GB ingestion, \$0.03/GB archived

Learn more

- ❑ IBM Cloud Functions site <https://www.ibm.com/cloud-computing/bluemix/openwhisk>
- ❑ Apache OpenWhisk site <http://openwhisk.org>
- ❑ What makes serverless architectures so attractive? <https://developer.ibm.com/opentech/2016/09/06/what-makes-serverless-attractive/>
- ❑ OpenWhisk Developer Center (focuses on IBM open-source project) <https://developer.ibm.com/openwhisk/>
- ❑ OpenWhisk Blog <https://developer.ibm.com/openwhisk/blogs/>
- ❑ OpenWhisk on Github <https://github.com/openwhisk/openwhisk/>
- ❑ OpenWhisk official documentation on Github <https://github.com/openwhisk/openwhisk/blob/master/docs/README.md>
- ❑ What is Serverless Computing and Why is it Important <https://www.iron.io/what-is-serverless-computing/>
- ❑ Introducing OpenWhisk Made Easy <https://developer.ibm.com/clouddataservicesold/2016/04/27/introducing-openwhisk-microservices-made-easy/>

Thank you

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