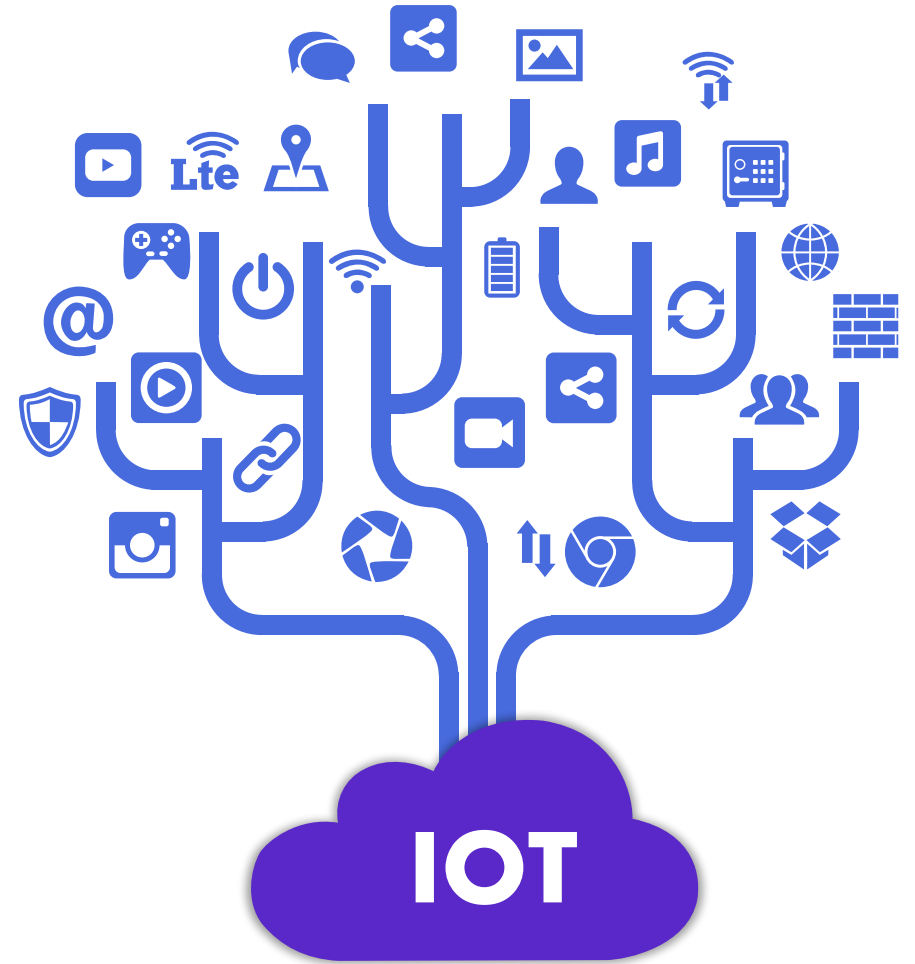


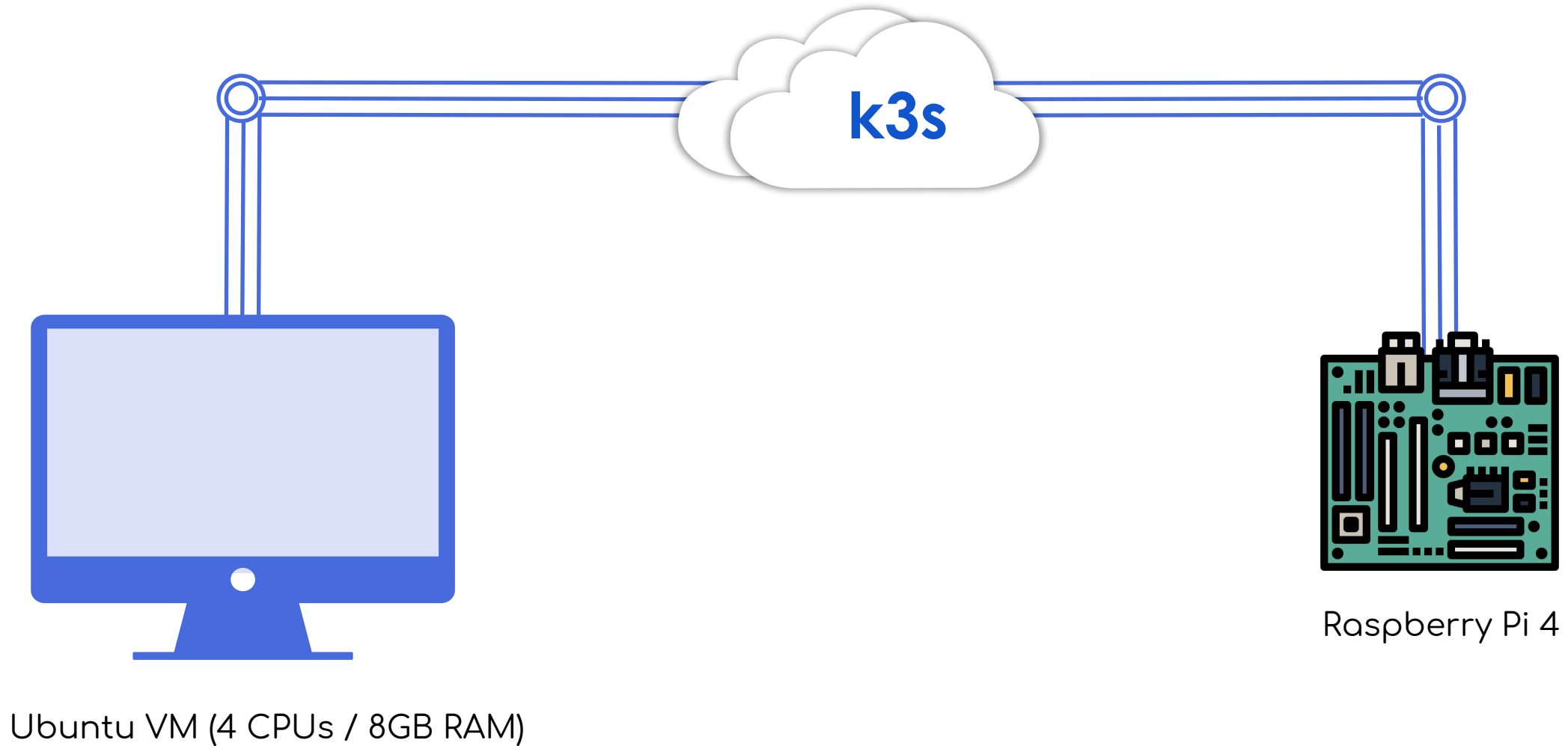
# Openwhisk Composer

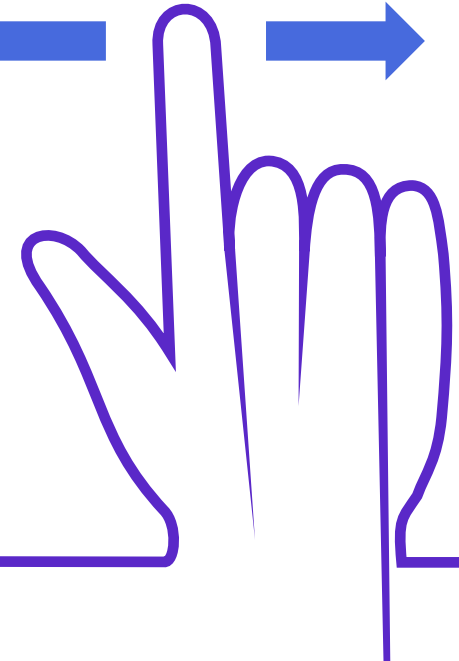
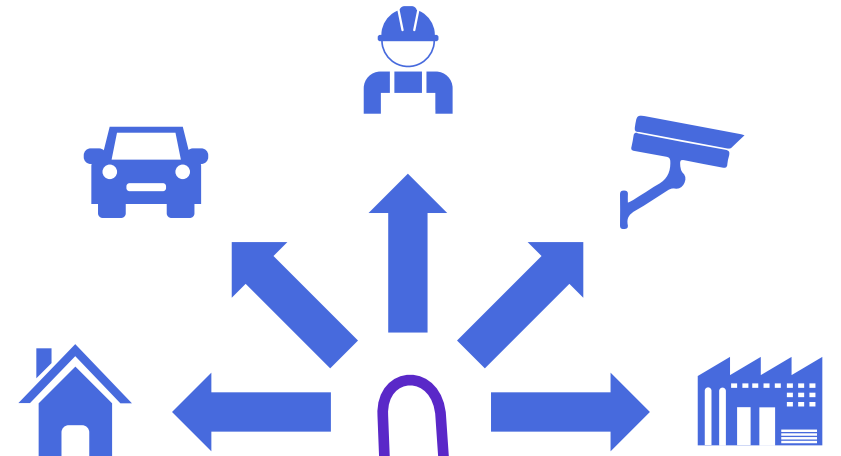
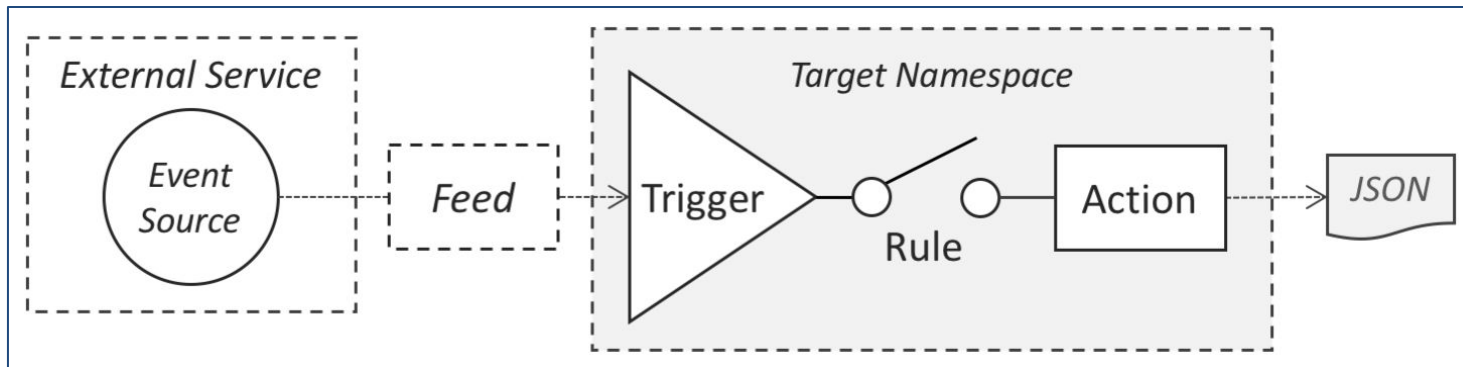


Γιάννος Γαβριηλίδης  
5ο έτος ΗΜΜΥ ΕΜΠ



# My\_Cluster





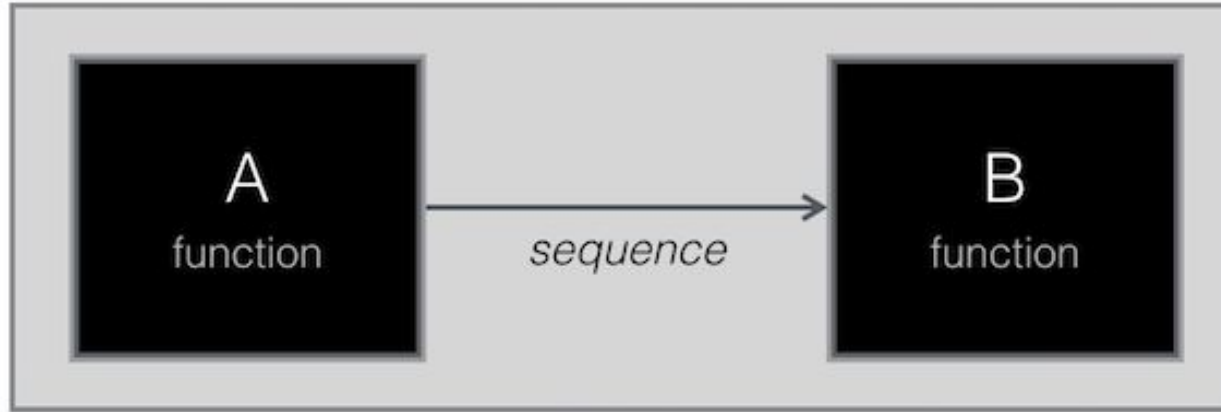
```

giannos@giannos:~$ kubectl get pods -n openwhisk -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE              NOMINATED NODE   READINESS
owdev-wskadmin                      1/1     Running   0           23h   10.42.0.79    giannos           <none>           <none>
owdev-apigateway-bccbbcd67-9d65x    1/1     Running   0           23h   10.42.0.80    giannos           <none>           <none>
owdev-gen-certs-m6lm4               0/1     Completed 0           23h   10.42.0.85    giannos           <none>           <none>
owdev-redis-6c58d6b547-7485m        1/1     Running   0           23h   10.42.0.96    giannos           <none>           <none>
owdev-grafana-5ffd9c5b4f-bq7sn      1/1     Running   0           23h   10.42.0.91    giannos           <none>           <none>
owdev-prometheus-server-0           1/1     Running   0           23h   10.42.0.98    giannos           <none>           <none>
owdev-couchdb-545657f577-gcvlk      1/1     Running   0           23h   10.42.0.101   giannos           <none>           <none>
owdev-zookeeper-0                   1/1     Running   0           23h   10.42.0.100   giannos           <none>           <none>
owdev-kafka-0                       1/1     Running   0           23h   10.42.0.95    giannos           <none>           <none>
owdev-user-events-68984b8d9c-n2rm9  1/1     Running   1           23h   10.42.0.83    giannos           <none>           <none>
owdev-init-couchdb-wb47d            0/1     Completed 0           23h   10.42.0.81    giannos           <none>           <none>
owdev-controller-0                  1/1     Running   0           23h   10.42.0.82    giannos           <none>           <none>
owdev-alarmprovider-57cbbc6f9b-x9g2g 1/1     Running   0           23h   10.42.0.94    giannos           <none>           <none>
owdev-nginx-54cd774b7c-2bwbp        1/1     Running   0           23h   10.42.0.92    giannos           <none>           <none>
owdev-kafkaprovider-54645b468-gng9g  1/1     Running   0           23h   10.42.0.86    giannos           <none>           <none>
owdev-install-packages-xwpmk        0/1     Completed 0           23h   10.42.0.84    giannos           <none>           <none>
owdev-invoker-0                     1/1     Running   0           22h   10.42.1.34    raspberry-giannos <none>           <none>
wskowdev-invoker-00-2-prewarm-nodejs10 1/1     Running   0           22h   10.42.1.36    raspberry-giannos <none>           <none>
wskowdev-invoker-00-4-prewarm-nodejs10 1/1     Running   0           9h    10.42.1.39    raspberry-giannos <none>           <none>

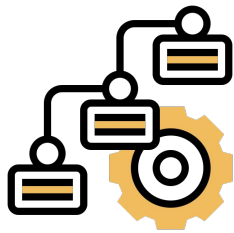
giannos@giannos:~$ wsk -i action invoke hello --result
{
  "payload": "Hello, World!"
}

giannos@giannos:~$ wsk -i action invoke hello --result --param name Giannos
{
  "payload": "Hello, Giannos!"
}

```



Sequences as a form of composition to construct data pipelines, where the result of one function becomes the input of another.



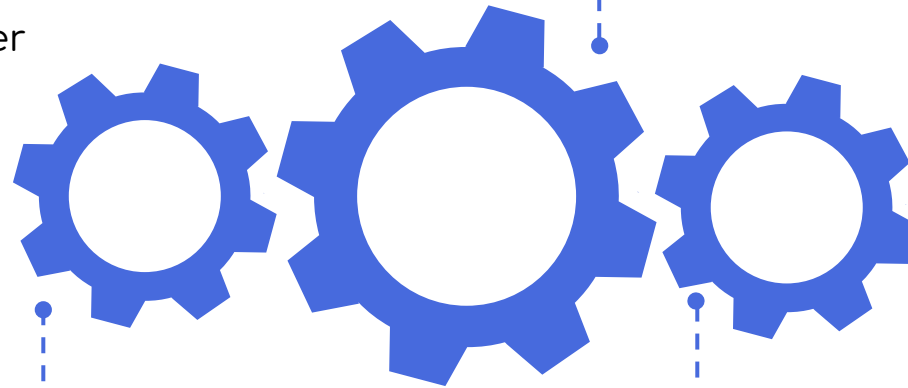
## Composing Sequences of Actions

Multiple actions, even implemented in different languages, may be composed together to create a longer processing pipeline called a sequence. A sequence can be treated as a single action in terms of its creation and invocation.

# Openwhisk Composer

..."*Composer* is a new programming model for building serverless applications that compose functions, APIs and services..."

A simple mechanism to chain together a sequence of functions, APIs and services.



## Handling

A sequence can be managed as a single action in terms of creation and invocation.

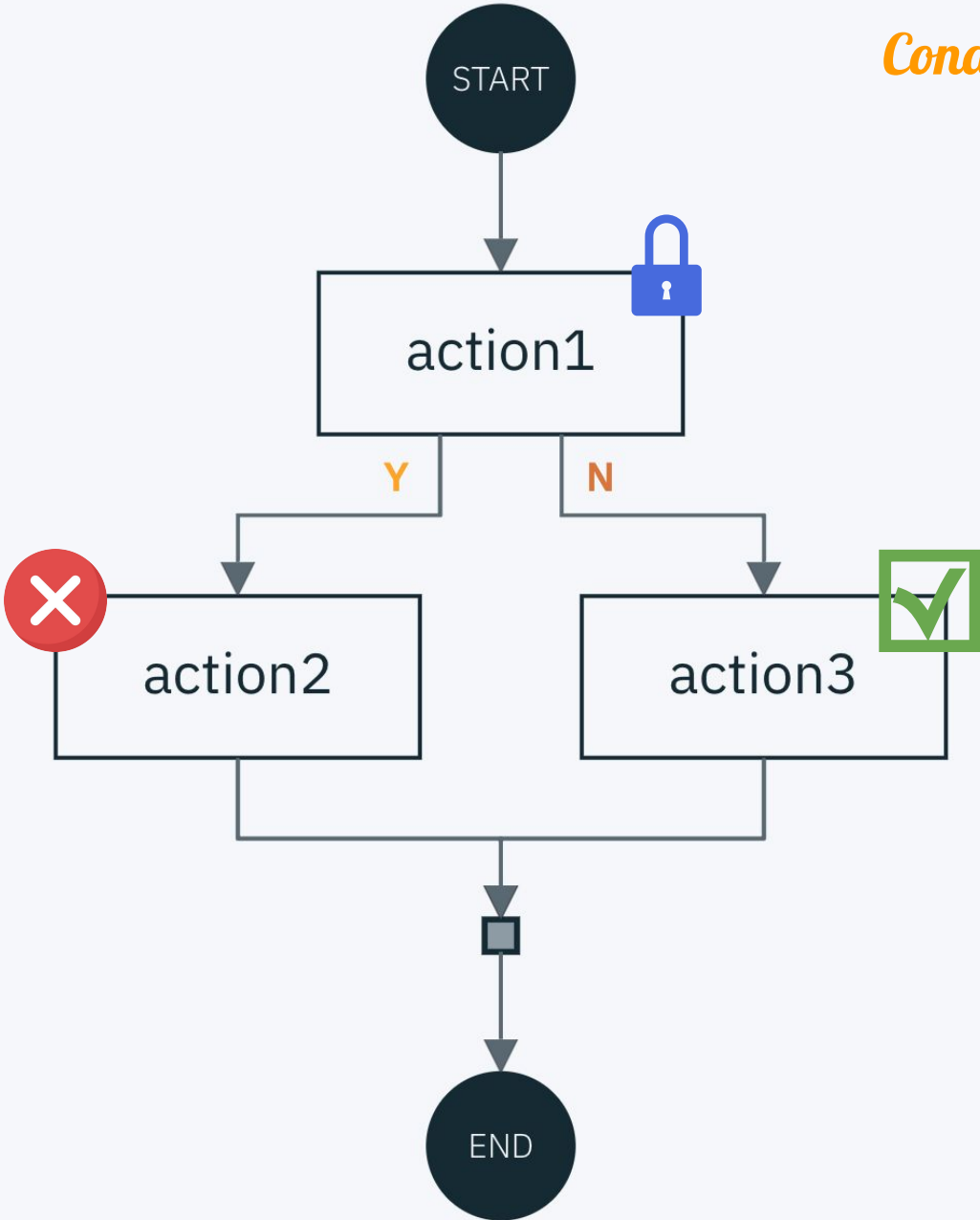
## Pay as you go

No "double billing" (the composition waits for the result of each function it calls, and hence must pay for the wait time)

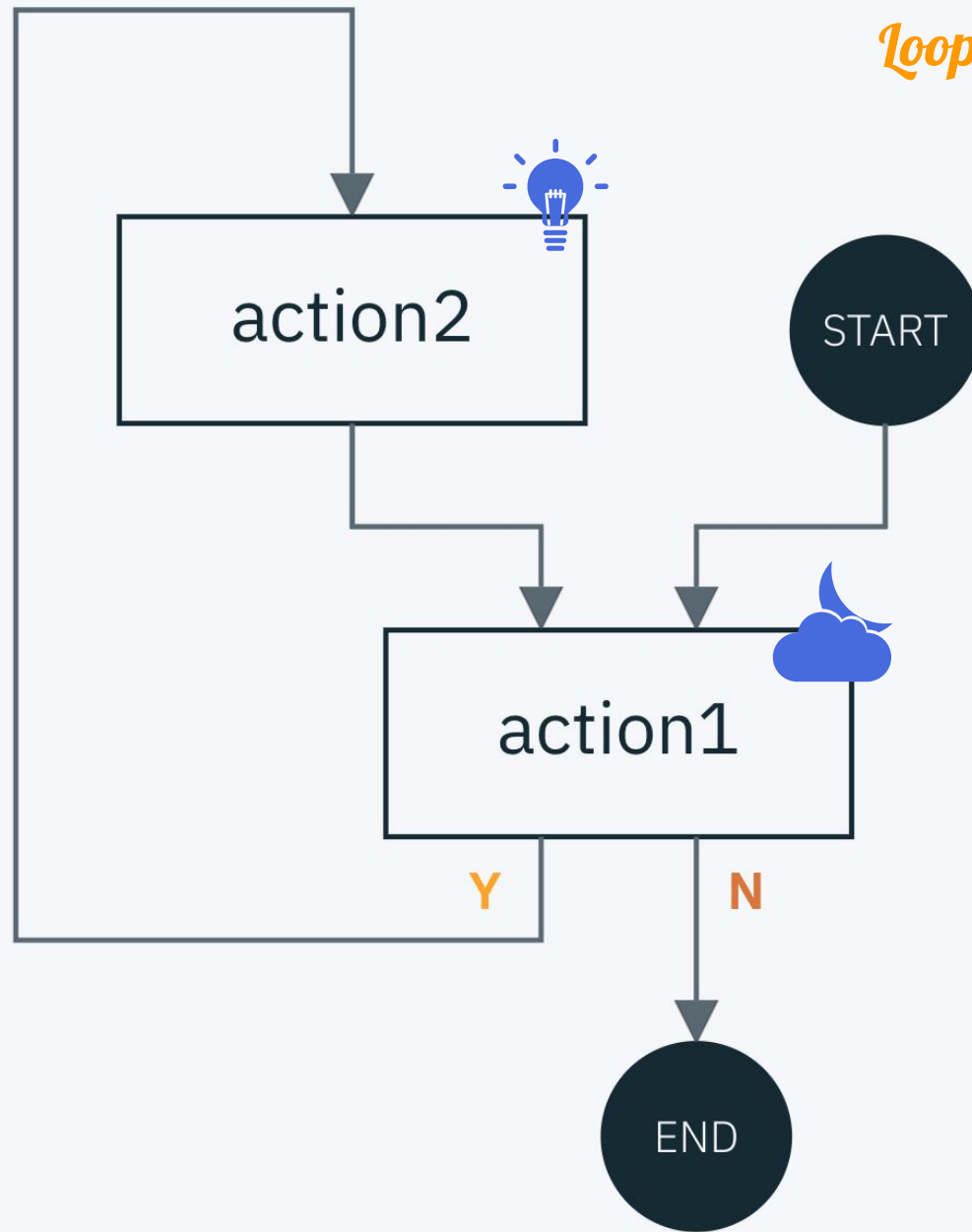
## Programming Languages

Write in your preferred language but the composer library is currently available in Node.js and Python (?)

*Conditional branching*

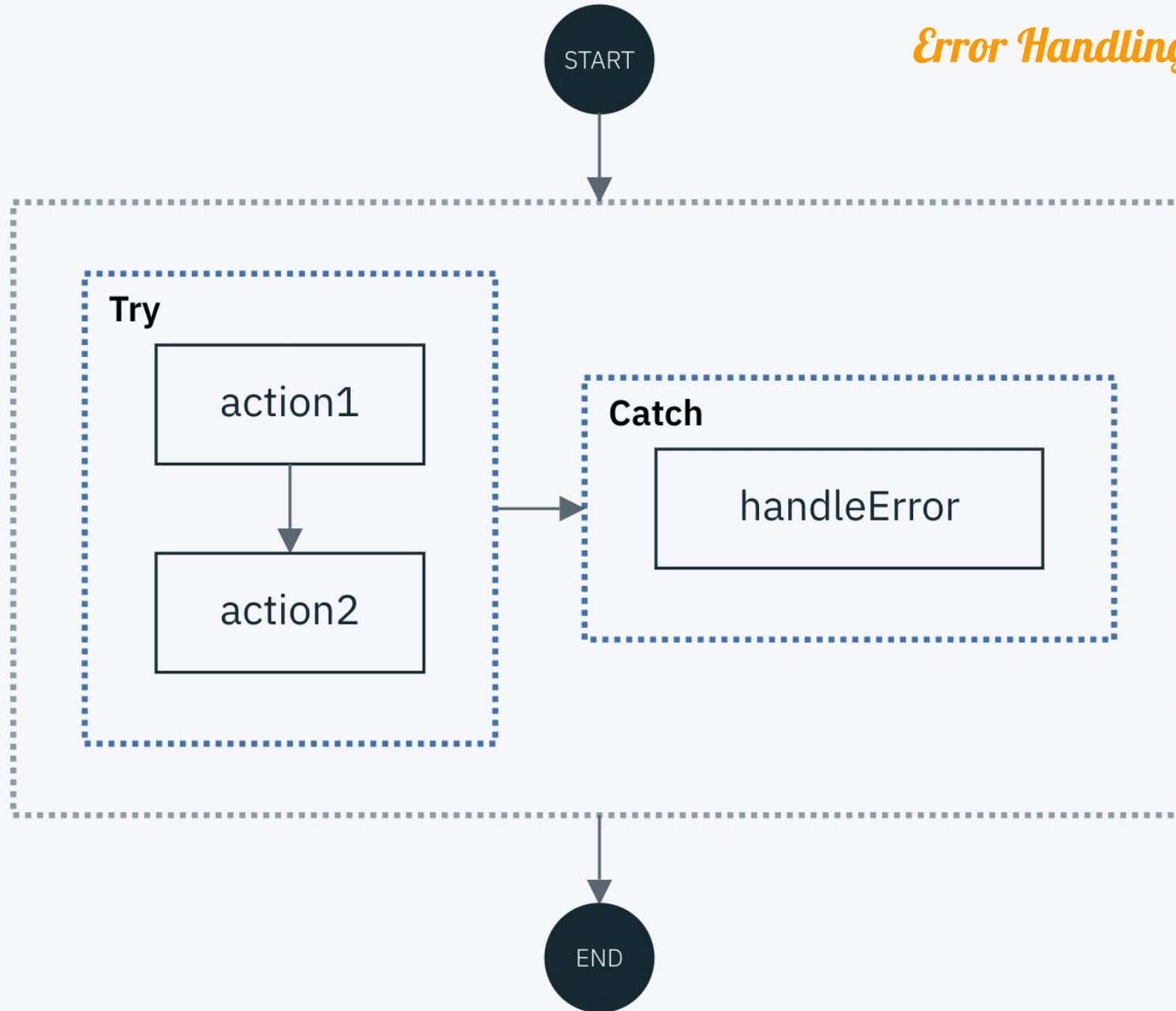


*Loops*





## *Error Handling*



```
giannos@giannos:~$ wsk action invoke demo -p password passw0rd -i
ok: invoked /_/demo with id 6f8e4a0cc08242e88e4a0cc082a2e847
giannos@giannos:~$ wsk activation result 6f8e4a0cc08242e88e4a0cc082a2e847 -i
{
  "message": "failure"
}
giannos@giannos:~$ wsk action invoke demo -p password abcl23 -i
ok: invoked /_/demo with id 8e3a3bed9c8542faba3bed9c85e2faaf
giannos@giannos:~$ wsk activation result 8e3a3bed9c8542faba3bed9c85e2faaf -i
{
  "message": "success"
}
giannos@giannos:~$
```

# Benchmark-ing

## **Benchmarks**

Tools that help developers take measurements like latency, throughput, CPU usage etc of their application or product.

## **Benchmark used**

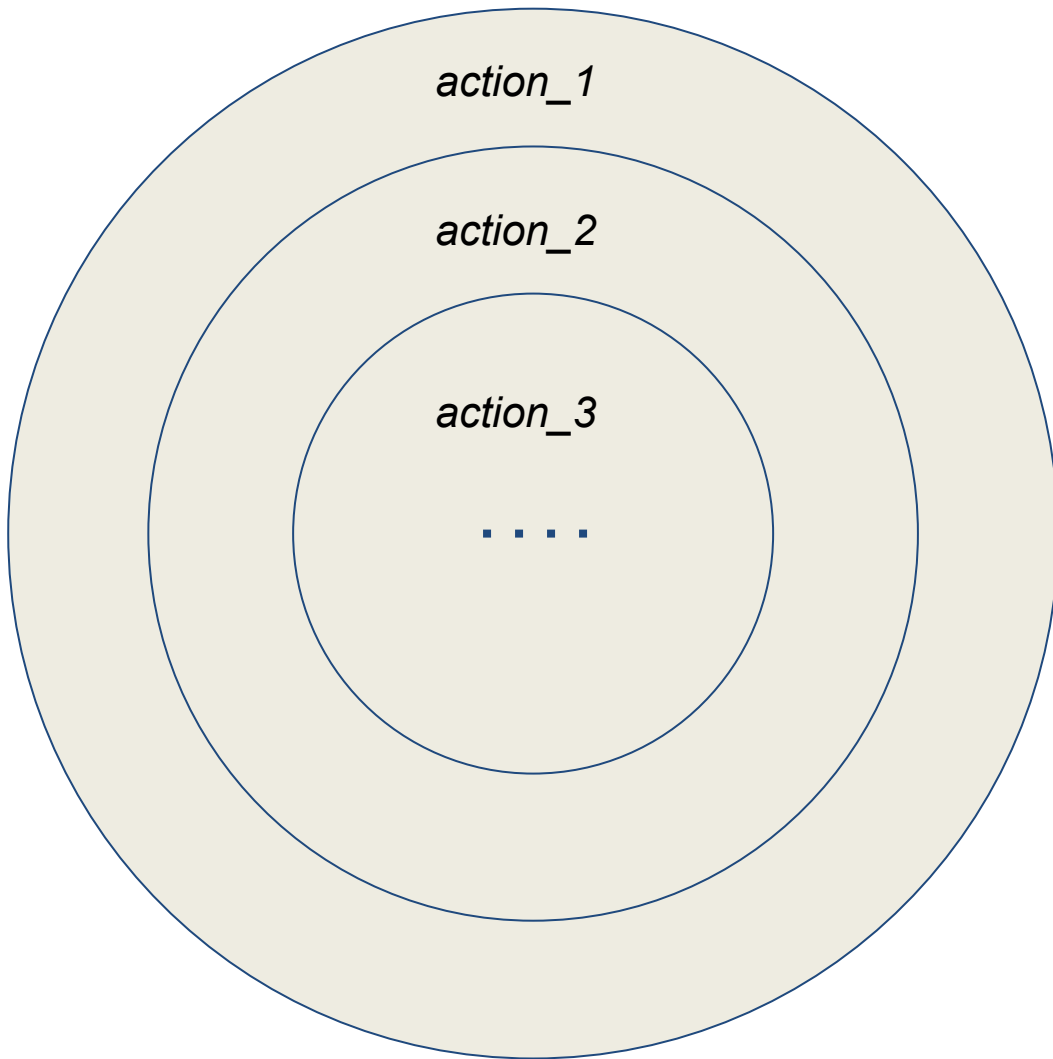
*Testcase#3* from benchmark suite:  **ServerlessBench**

## **Measurements**

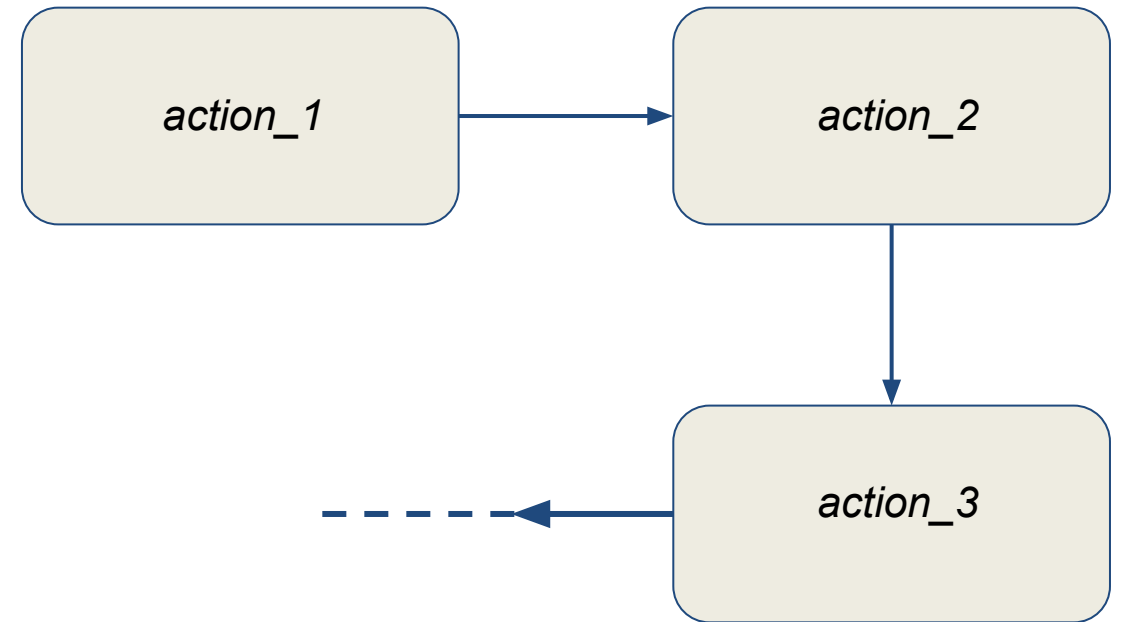
Latency in nested and chained sequenced action invocations



# Nested Sequence



# Chained Sequence

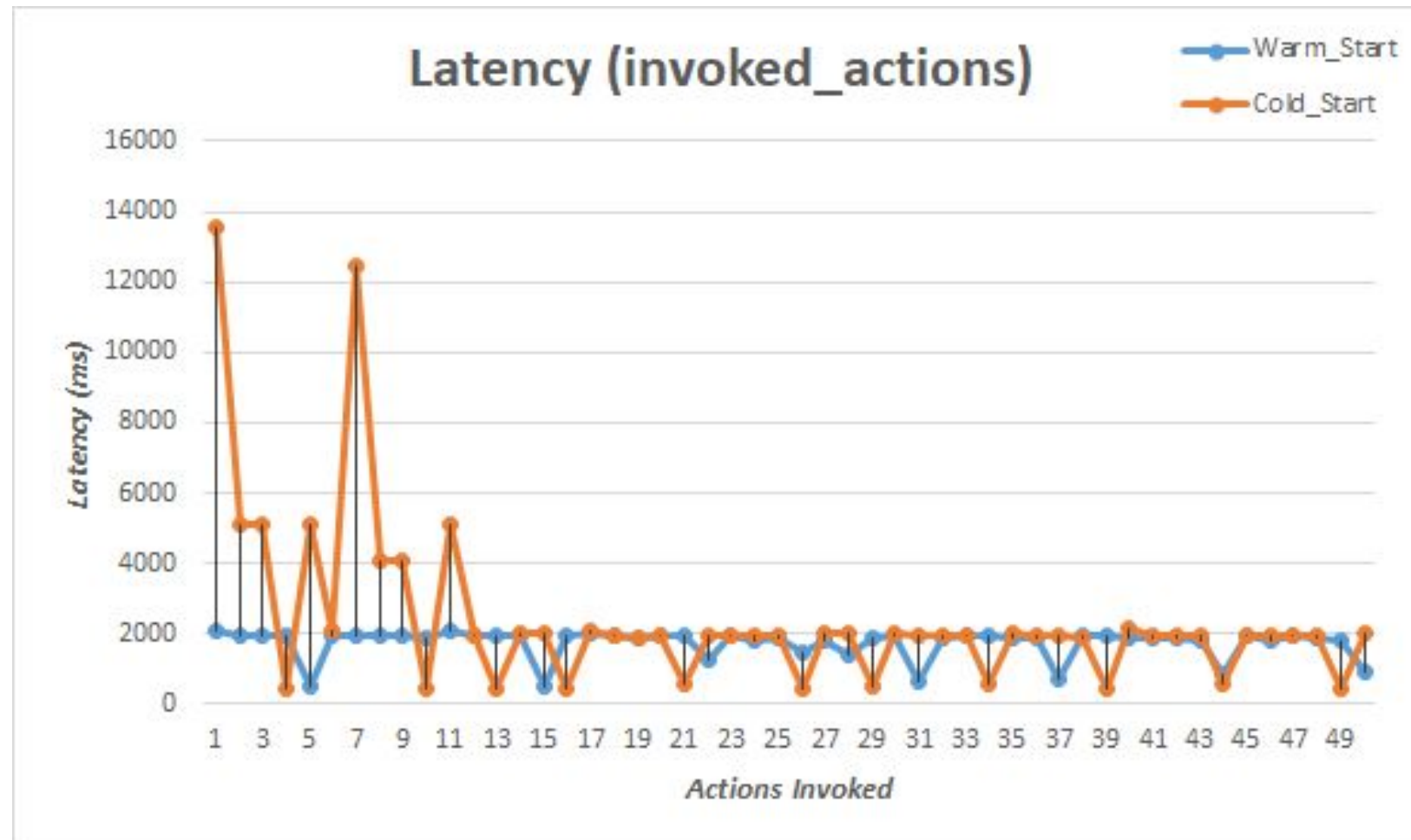


# Benchmarking Results

## Latency Mean Values



Nested	3648.5 (ms)
Chained_warm	1735.68 (ms)
Chained_cold	2781.577 (ms)



# Open Source Serverless Cloud Platform

## What is Apache OpenWhisk?

Apache OpenWhisk is an open source, distributed **Serverless** platform that executes functions (fx) in response to events at any scale. OpenWhisk manages the infrastructure and scaling using Docker containers so you can focus on building amazing applications.

The OpenWhisk logic (called actions) is scheduled and executed on demand or from a trigger, along with a deployment model.

README.md

## Apache OpenWhisk Composer

build passing license Apache 2.0 join slack

Composer is a new programming model for composing cloud functions built on [Apache OpenWhisk](#). With Composer, developers can build even more serverless applications including using it for IoT, with workflow orchestration, conversation services, and devops automation, to name a few examples.

Composer synthesizes OpenWhisk [conductor actions](#) to implement compositions. Compositions have all the attributes and capabilities of an action, e.g., default parameters, limits, blocking invocation, web export.

This repository includes:

- the [composer](#) Node.js module for authoring compositions using JavaScript,
- the [compose](#) and [deploy commands](#) for compiling and deploying compositions,
- [documentation](#), [examples](#), and [tests](#).

## Installation

Composer is distributed as Node.js package. To install this package, use the Node Package Manager:

```
npm install -g openwhisk-composer
```

README.md

## OpenWhisk Deployment on Kubernetes

license Apache-2.0 build failing join slack

Apache OpenWhisk is an open source, distributed Serverless platform that executes functions (fx) in response to events at any scale. The OpenWhisk platform supports a programming model in which developers write functional logic (called Actions) in any supported programming language, that can be dynamically scheduled and run in

 + 9

Contributors 10



Languages



Packages

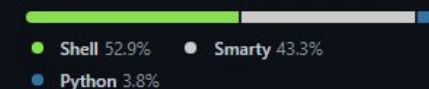
No packages published

Contributors 53



+ 42 contributors

Languages





Any questions?

Thank you!