

The background of the image is a vibrant, abstract painting. It features a large, central figure with a wide, toothy smile and a prominent mustache. The figure has a textured, reddish-brown skin tone. It wears a pair of dark sunglasses and a patterned shirt with shades of brown, tan, and beige. The background is filled with various abstract shapes and colors, including a large blue circle on the right side and several smaller, colorful circles and dots scattered across the composition.

# THE BIG CLOUD NATIVE FAAS LEBOWSKI

# #WHOAMI



**MARIO-LEANDER REIMER**  
**PRINCIPAL SOFTWARE ARCHITECT. @QWARE**

- ICH BIN EIN BERLINER!
- SENIOR DEVELOPER & ARCHITECT
- #CLOUDNATIVENERD
- OPEN SOURCE ENTHUSIAST

[HTTP://GITHUB.COM/LREIMER](http://github.com/lreimer)

[HTTP://SPEAKERDECK.COM/LREIMER](http://speakerdeck.com/lreimer)

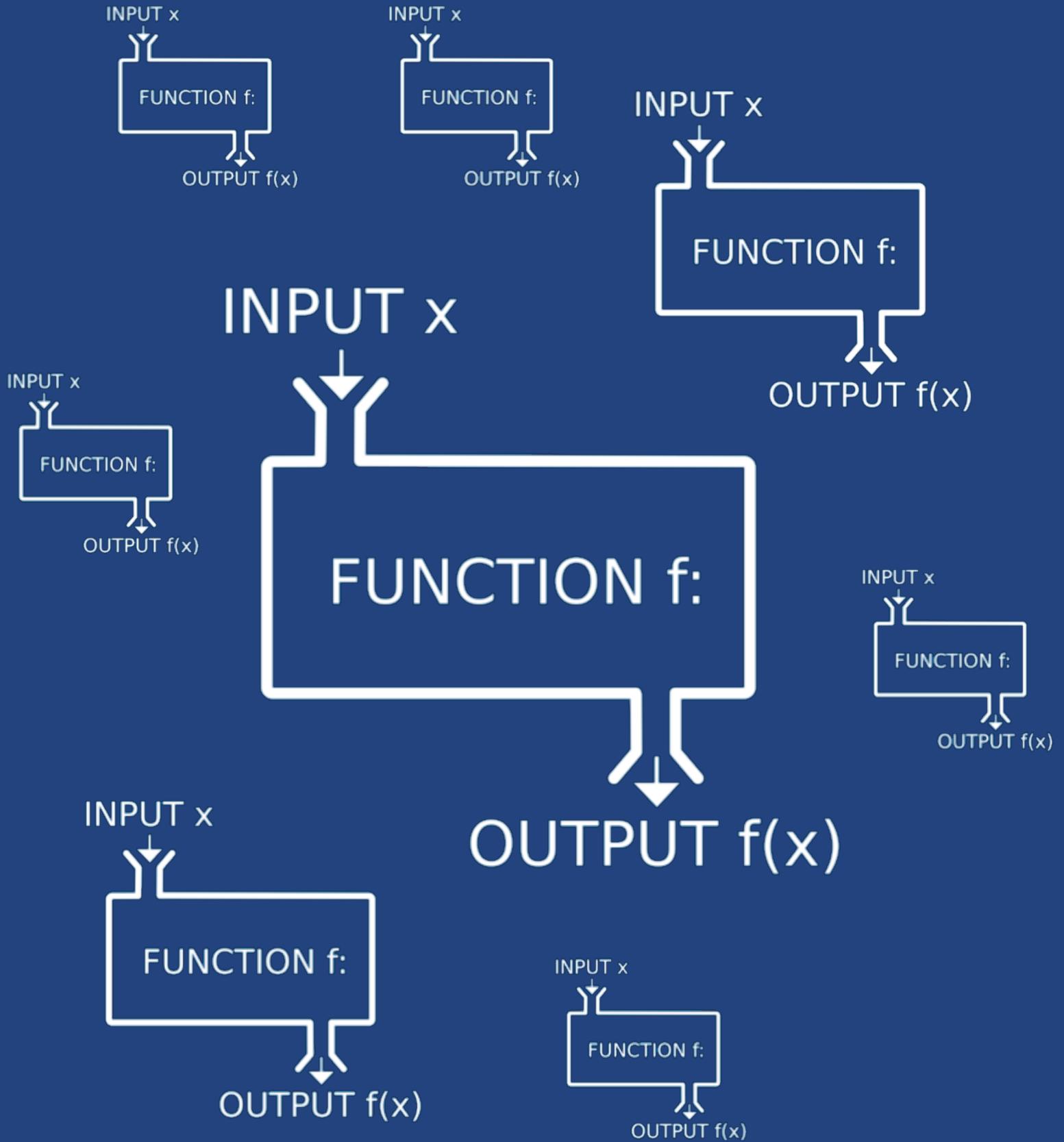
**SERVERLESS IS THE NEXT  
LOGICAL EVOLUTION  
IN CLOUD NATIVE SOFTWARE DEVELOPMENT.**

**SERVERLESS** COMPUTING REFERS TO A **NEW MODEL** OF CLOUD NATIVE COMPUTING, ENABLED BY **ARCHITECTURES** THAT DO **NOT REQUIRE SERVER MANAGEMENT** TO BUILD AND RUN APPLICATIONS. IT LEVERAGES A **FINER-GRAINED DEPLOYMENT** MODEL WHERE APPLICATIONS, BUNDLED AS **ONE OR MORE FUNCTIONS**, ARE UPLOADED TO A **PLATFORM** AND THEN **EXECUTED**, **SCALED**, AND **BILLED** IN RESPONSE TO THE **EXACT DEMAND** NEEDED AT THE MOMENT.<sup>1</sup>

<sup>1</sup>[HTTPS://LANDSCAPE.CNCF.IO/](https://landscape.cncf.io/)

# FUNCTIONS

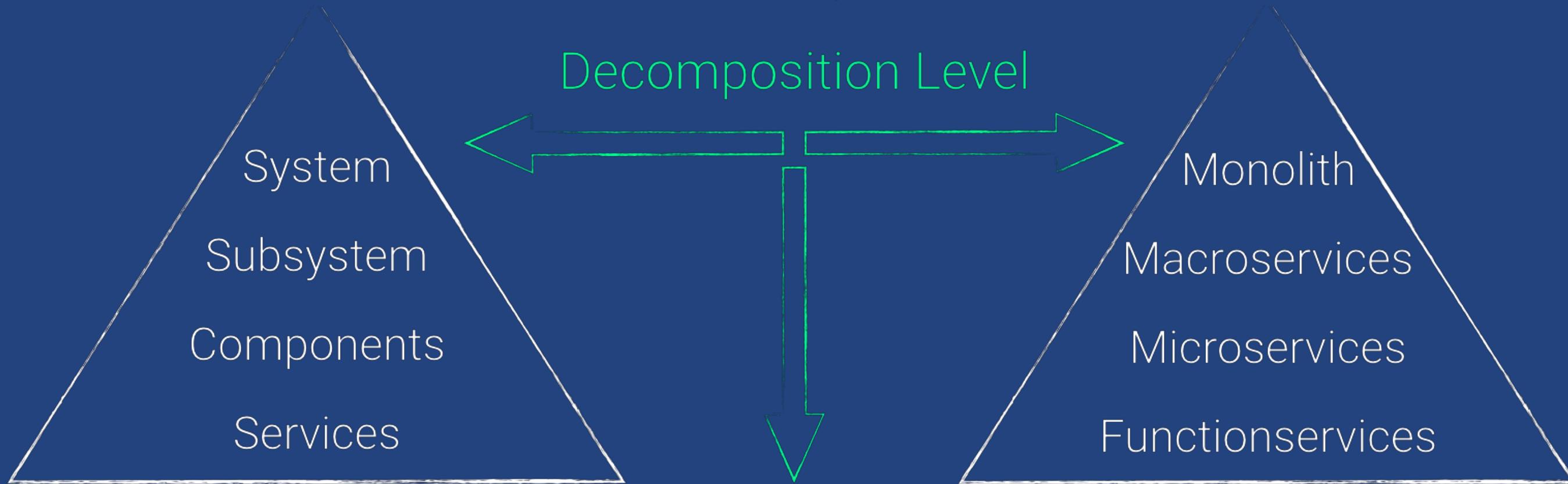
AS PREFERRED SERVERLESS APPLICATION  
PROGRAMMING MODEL.



# Dev Components



# Ops Components



## Decomposition Trade-Offs

- + More flexible to scale
- + Runtime isolation (crash, slow-down, ...)
- + Independent releases, deployments, teams
- + Higher resources utilisation
- Distribution debt: Latency, Consistency
- Increased infrastructure complexity
- Increased troubleshooting complexity
- Increased integration complexity

**EVENT-DRIVEN ARCHITECTURE  
ENABLES LOOSELY COUPLED REACTIVE  
SOFTWARE COMPONENTS AND SERVICES.**<sup>2</sup>

<sup>2</sup>[HTTPS://CLOUDEVENTS.IO](https://cloudevents.io)

Tools



SecuritY



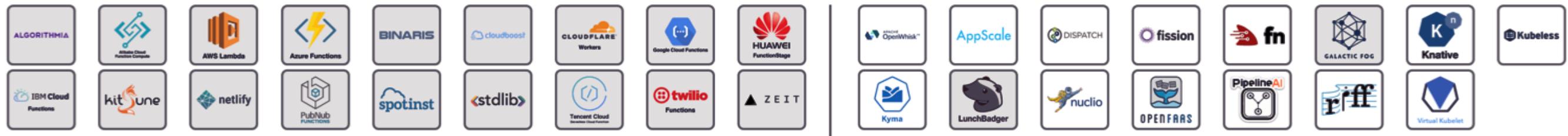
Framework



Hosted

## Installable

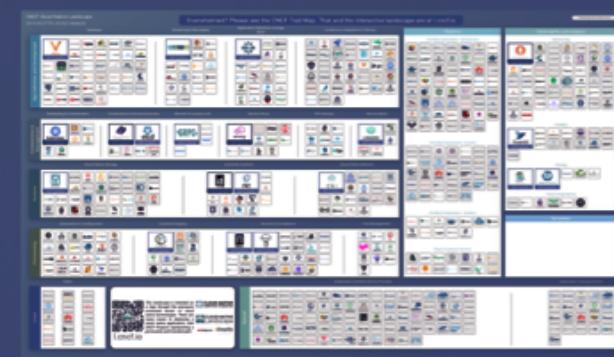
Platform



## Cloud Native Landscape



*Serverless computing refers to a new model of cloud native computing, enabled by architectures that do not require server management to build and run applications. This landscape illustrates a finer-grained deployment model where applications, bundled as one or more functions, are uploaded to a platform and then executed scaled, and billed in response to the exact demand needed at the moment*



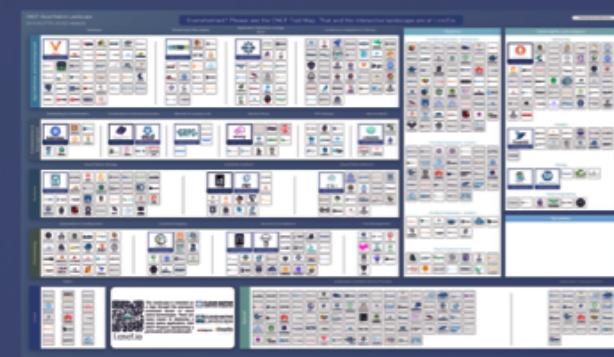
# MY CRITERIA TO CHOOSE THE IDEAL FAAS PLATFORM

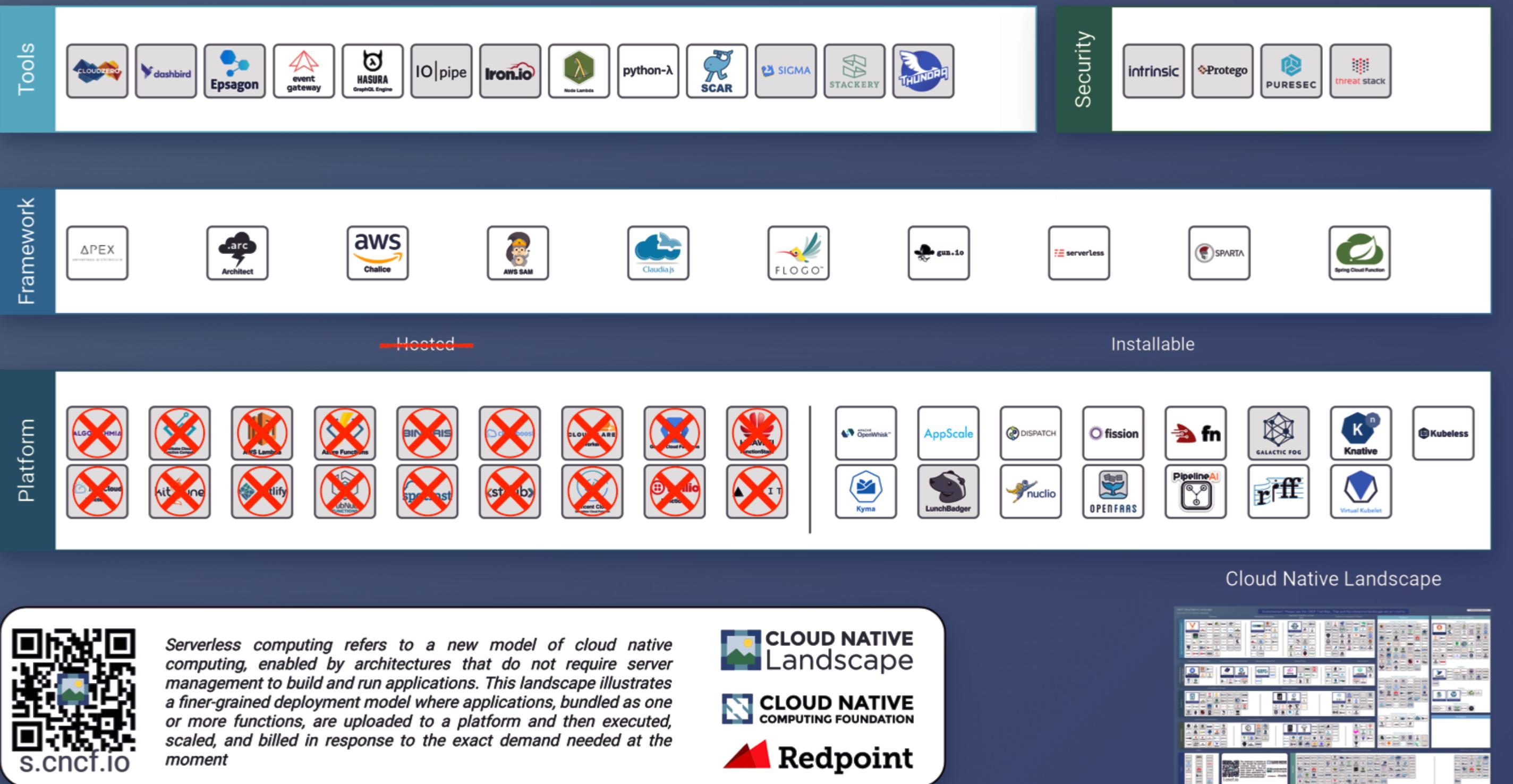
- **OPEN SOURCE** - NO INITIAL \$\$\$ AND NO VENDOR LOCK-IN PLEASE
- **MATURITY** - GOOD AND ACTIVE COMMUNITY. LITTLE ISSUES. FREQUENT RELEASES
- **USE CASES** - GENERAL PURPOSE. ENTERPRISE. BIG DATA. AI. EDGE COMPUTING
- **APPROACHABLE** - QUICK START AND SUFFICIENT DOCUMENTATION
- **LANGUAGE RUNTIMES** - PLEASE MORE THAN JAVASCRIPT!
- **DEVELOPER FRIENDLY** - TOOLS & FRAMEWORKS. LOCAL RUNTIME. TESTING. IDE SUPPORT
- **OPERABILITY** - EASY SETUP. SUPPORTED PLATFORMS. TECHNOLOGY FOOTPRINT
- **INTEGRATION** - SUPPORTED TRIGGERS. INFRASTRUCTURE. PLUGINS. STANDARDS
- **PERFORMANCE** - GOOD STARTUP PERFORMANCE AND THROUGHPUT

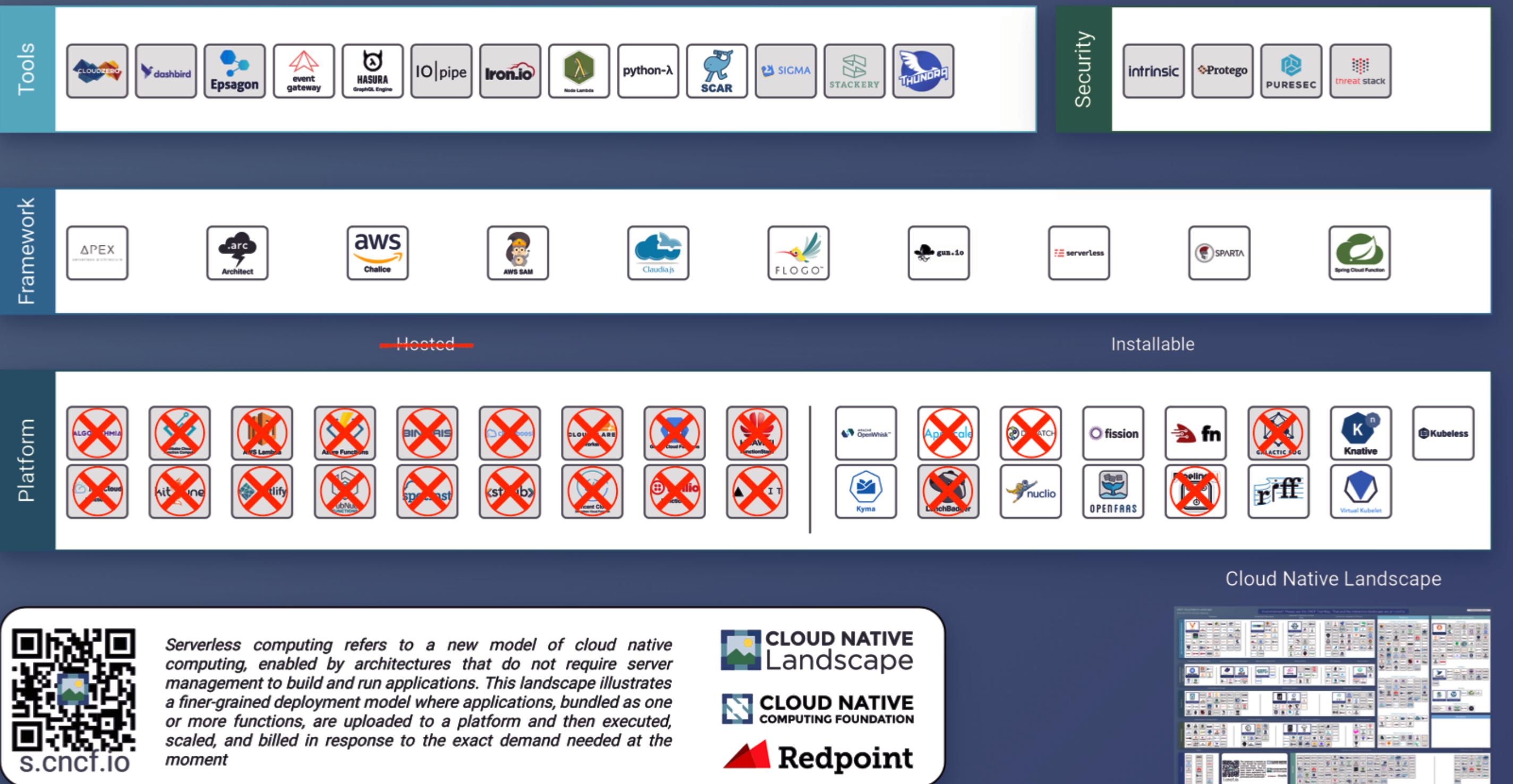


Serverless computing refers to a new model of cloud native computing, enabled by architectures that do not require server management to build and run applications. This landscape illustrates a finer-grained deployment model where applications, bundled as one or more functions, are uploaded to a platform and then executed, scaled, and billed in response to the exact demand needed at the moment

 **CLOUD NATIVE**  
Landscape  
 **CLOUD NATIVE**  
COMPUTING FOUNDATION  
 **Redpoint**







Tools



COOL CITY



Framework



Hosted

## Installable

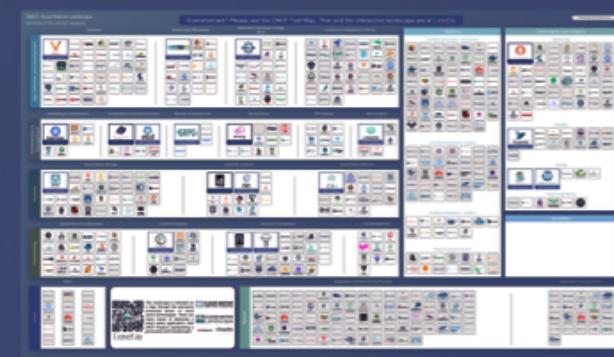
Platform



Cloud Native Landscape



*Serverless computing refers to a new model of cloud native computing, enabled by architectures that do not require server management to build and run applications. This landscape illustrates a finer-grained deployment model where applications, bundled as one or more functions, are uploaded to a platform and then executed scaled, and billed in response to the exact demand needed at the moment*



# PUT KNATIVE, RIFF AND KYMA ON YOUR RADAR!

## - KNATIVE

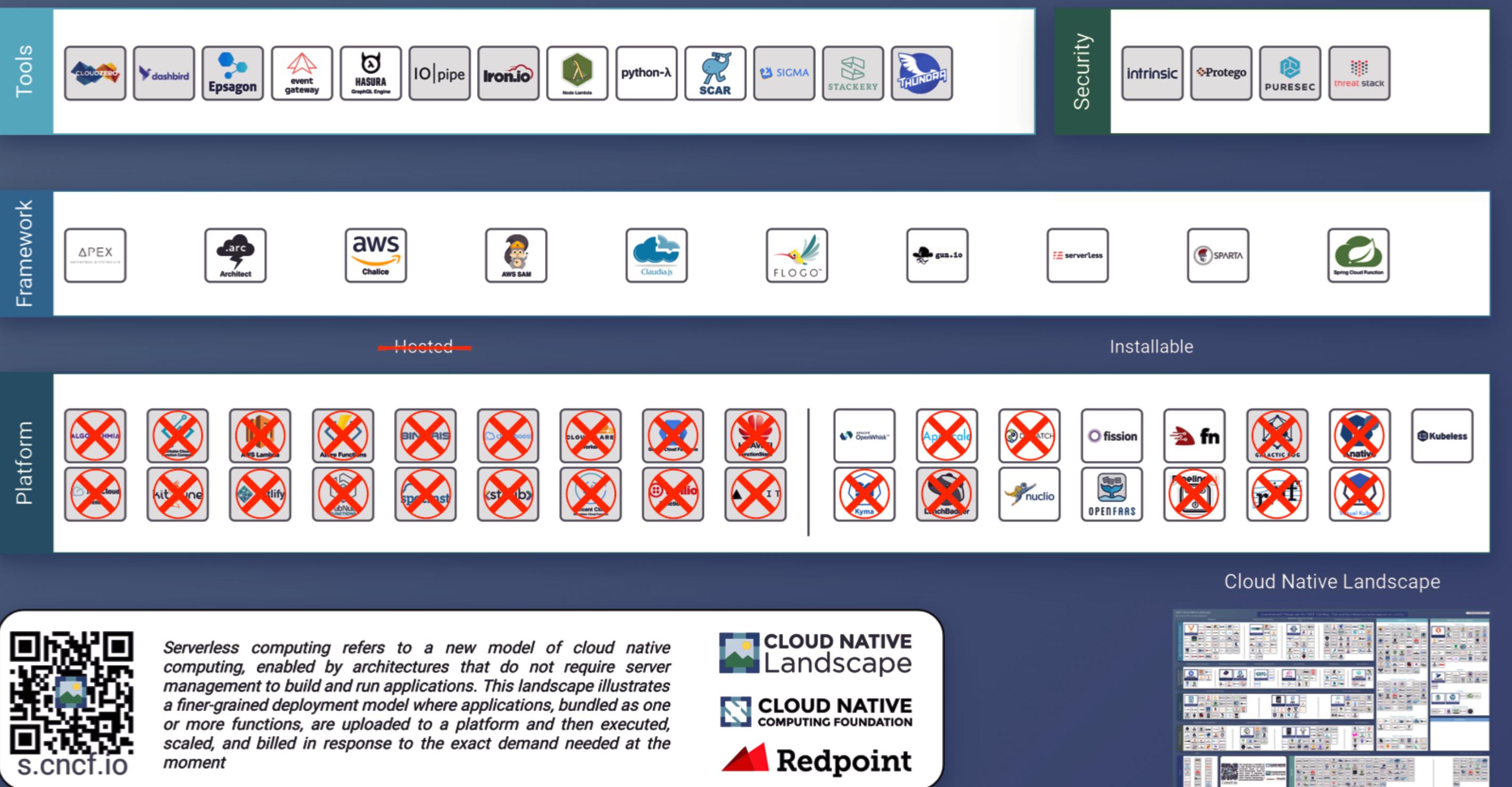
- K8S BASED PLATFORM TO BUILD, DEPLOY AND MANAGE SERVERLESS WORKLOADS
- BUILD FOR CLOUD-NATIVE SOURCE-TO-CONTAINER ORCHESTRATION
- SERVING FOR A SCALE-TO-ZERO REQUEST DRIVEN COMPUTE MODEL, LEVERAGES ISTIO
- EVENTING PROVIDES COMPOSABLE PRIMITIVES TO ENABLE LATE-BINDING EVENT SOURCES AND EVENT CONSUMERS

## - RIFF

- PROVIDES AND INTEGRATES BASIC FAAS PLATFORM INFRASTRUCTURE COMPONENTS, CURRENTLY V0.2.0
- COMBINES CLOUD NATIVE BUILDPACKS WITH KNATIVE SERVING AND KNATIVE EVENTING

## - KYMA

- FULL BLOWN SERVERLESS PLATFORM WITH MANY COMPONENTS, CURRENTLY V0.8
- PLANS TO MIGRATE KUBELESS BASED SERVERLESS COMPONENT TO KNATIVE AND ISTIO





OPENFAAS



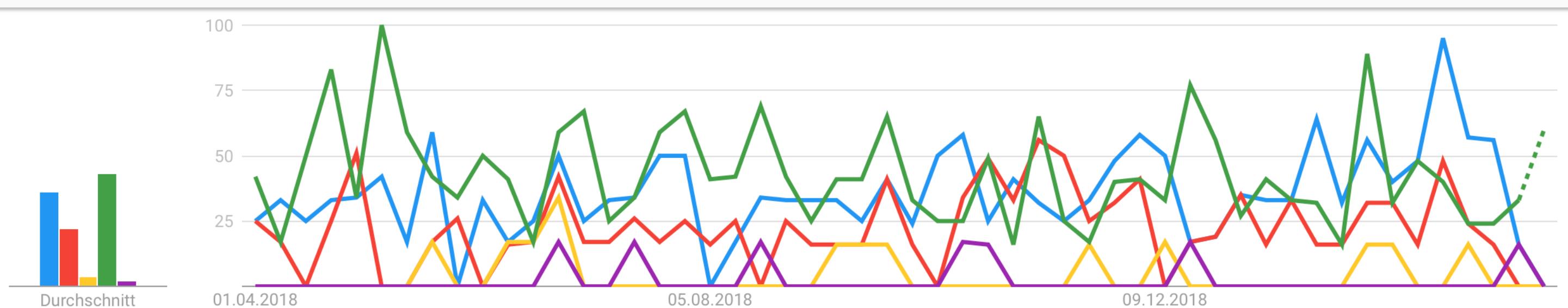
## OUR MAIN CONTENDERS

- **OPENWHISK**  
[HTTPS://OPENWHISK.APACHE.ORG](https://openwhisk.apache.org)
- **FISSION**  
[HTTPS://FISSION.IO](https://fission.io)
- **FN PROJECT**  
[HTTP://FNPROJECT.IO](http://fnproject.io)
- **KUBELESS**  
[HTTPS://KUBELESS.IO](https://kubeless.io)
- **NUCLIO**  
[HTTPS://NUCLIO.IO](https://nuclio.io)
- **OPENFAAS**  
[HTTPS://WWW.OPENFAAS.COM](https://www.openfaas.com)

# THE OPEN SOURCE FAAS FRAMEWORK QUICK CHECK<sup>3</sup>

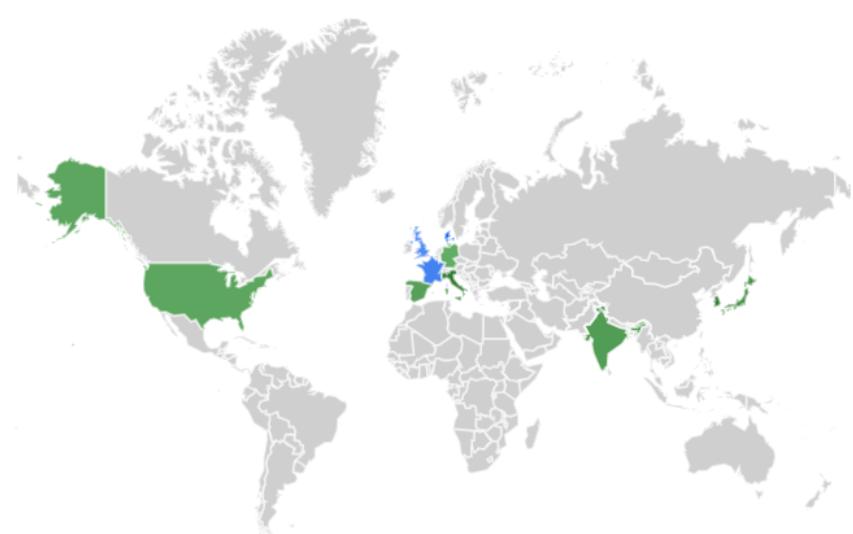
LICENSE	INCEPTION	CONTRIBUTOR	RELEASES	STARS	ISSUES	BUILD
OPENWHISK	APACHE-2.0	FEB 14. 2016	147	1	3.901	392 (20 BUGS) 
FN PROJECT	APACHE-2.0	MAY 30. 2016	76	1.039	3.882	118 (15 BUGS) 
FISSION	APACHE-2.0	AUG 14. 2016	76	34	4.196	223 (6 BUGS) 
KUBELESS	APACHE-2.0	NOV 13. 2016	75	40	4.431	114 (0 BUGS) 
OPENFAAS	MIT	DEC 18. 2016	97	87	13.678	68 (0 BUGS) 
NUCLO	APACHE-2.0	JUN 04. 2017	36	50	2.558	32 (1 BUGS) 

<sup>3</sup> DATA FROM MAR 28, 2019. GITHUB STATS TAKEN FROM MAIN REPO ONLY.



### Compared breakdown by region

openfaas kubeless fnproject OpenWhisk  
fission serverless



Sortieren: Interesse an "openfaas"

1	Dänemark	
2	Frankreich	
3	Vereinigtes Königreich	
4	Spanien	
5	Deutschland	

LANGUAGE	USE CASES	GENERATION	PLATFORMS	RUNTIMES	TRIGGERS
FISSION	GO	ENTERPRISE	2ND	K8S	GO, PYTHON, NODEJS, JAVA/JVM  CRON, HTTP, NATS, AZURE QUEUE STORAGE, KAFKA, KUBEWATCH
KUBELESS	GO	ENTERPRISE	2ND	K8S	NODEJS, JAVA, GO, JVM, PYTHON, PHP, RUBY, .NET CORE, BALLERINA, VERT.X  CRON, HTTP, NATS, KINESIS, KAFKA
OPENFAAS	GO	ENTERPRISE, IOT	1ST	K8S, DOCKER	GO, C#, JAVA8, DOCKERFILE, NODEJS, PHP, PYTHON, RUBY  HTTP, CRON, KAFKA, AWS SNS, S3, CLOUDEVENTS, IFTTT, REDIS, MQTT, NATS
NUCIO	GO	ENTERPRISE, IOT	2ND	DOCKER, K8S, AWS, GCP	.NET CORE, GO, JAVA, NODEJS, PYTHON, SHELL  CRON, EVENTHUB, HTTP, KAFKA, KINESIS, NATS, RABBITMQ, MQTT
OPENWHISK	SCALA	ENTERPRISE, HOSTED?	2ND	K8S, MESOS, DOCKER, OPENSIFT	NODEJS, SWIFT, JAVA, GO, SCALA, PYTHON, PHP, JIRA, BLuemix PUSH, RUBY, .NET CORE, BALLERINA  CLOUDANT, RSS, KAFKA, SLACK, GITHUB
FN PROJECT	GO	ENTERPRISE, HOSTED?	1ST	DOCKER, K8S	JAVA, GO, NODEJS, PYTHON, RUBY  HTTP

	INSTALLATION	SCHEDULER	DOCS	USAGE	ECOSYSTEM	PERFORMANCE
<b>FISSION</b>	HELM (2 CHARTS)	<b>K8S NATIVE</b>	WEB, README	QUICK START, EXAMPLES, CLI	SDK, WORKFLOW, ISTIO	800 REQ/SEC
<b>NUCLO</b>	K8S YAML	<b>K8S NATIVE</b>	WEB, README	QUICK START, EXAMPLES, CLI	SDK, JUPYTHON	1076 REQ/SEC
<b>OPENFAAS</b>	HELM, DOCKER COMPOSE YAML	<b>K8S NATIVE</b>	WEB, README	QUICK START, EXAMPLES, CLI	RASPBERRY PI	439 REQ/SEC
<b>KUBELESS</b>	K8S YAML, HELM (INCUBATOR)	<b>K8S NATIVE</b>	WEB, README	QUICK START, EXAMPLES, CLI	SDK, ISTIO, SERVERLESS FRAMEWORK	945 REQ/SEC
<b>OPENWHISK</b>	HELM	<b>CUSTOM</b> 😞	WEB, README	QUICK START, EXAMPLES, CLI	SERVERLESS FRAMEWORK	NOT TESTED
<b>FN PROJECT</b>	HELM	<b>CUSTOM</b> 😞	README	QUICK START, EXAMPLES, CLI	SDK, GRAAL VM	48 REQ/SEC

# FUNCTION AS A SERVICE DEMO



A scene from the movie Pulp Fiction. Jules Winnfield (Bruce Willis) is on the left, looking towards the camera with a slight smile. Vincent Vega (John Travolta) is in the center, looking back over his shoulder with a surprised expression. Butch Coolidge (Sam Rockwell) is on the right, also looking back over his shoulder. They are in a bar setting with a counter and various items in the background.

**WELL DUDE. WHICH ONE SHOULD I CHOOSE?**

# FISSION AND NUCLIO ARE HIDDEN GEMS.

- FISSION CURRENTLY IS THE MOST COMPLETE PLATFORM.
- NUCLIO IS VERY FAST, LIGHTWEIGHT AND HAS SUPPORT FOR MANY TRIGGERS. PROMISING ROADMAP.
- OPENFAAS IS VERY POPULAR. CURRENTLY IT IS THE ONLY ONE WITH SUPPORT FOR ARM DEVICES.
- KUBELESS IS LIGHTWEIGHT AND SIMPLE.

# FORK ME

[HTTPS://GITHUB.COM/LREIMER/THE-BIG-FAAS-LEBOWSKI](https://github.com/lreimer/the-big-faas-lebowski)

[HTTPS://GITHUB.COM/LREIMER/RASPI-SWARM-BOX](https://github.com/lreimer/raspi-swarm-box)

