

The Serverless Landscape & Event Driven Futures

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This presentation is available at:

<https://github.com/cncf/presentations>

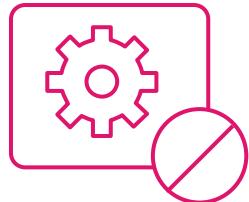


Arun Gupta
Principal Technologist
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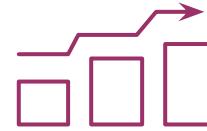


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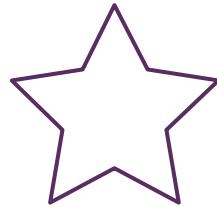
Serverless means...



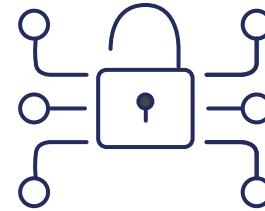
No infrastructure provisioning,
no management



Automatic scaling



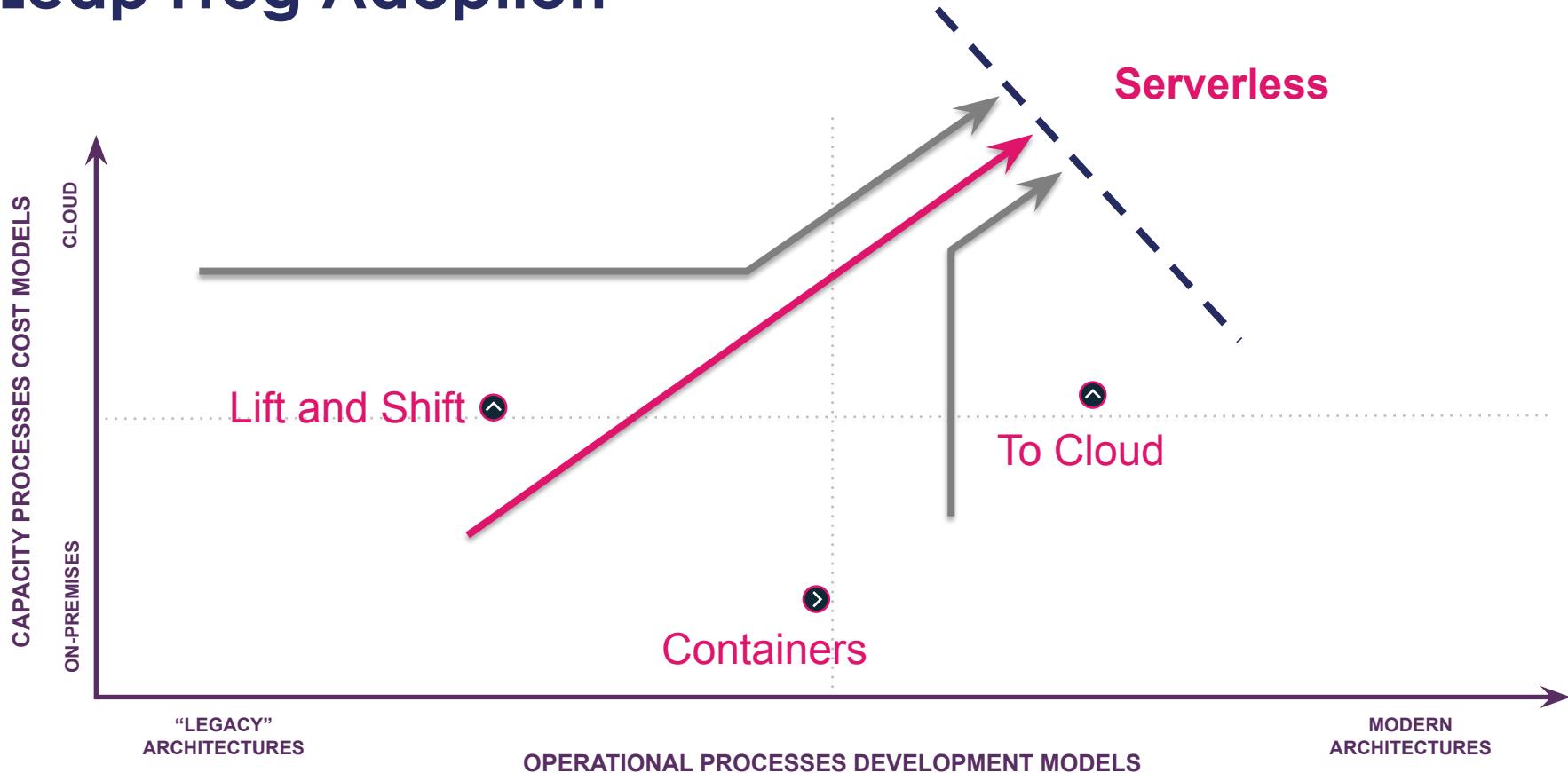
Pay for value



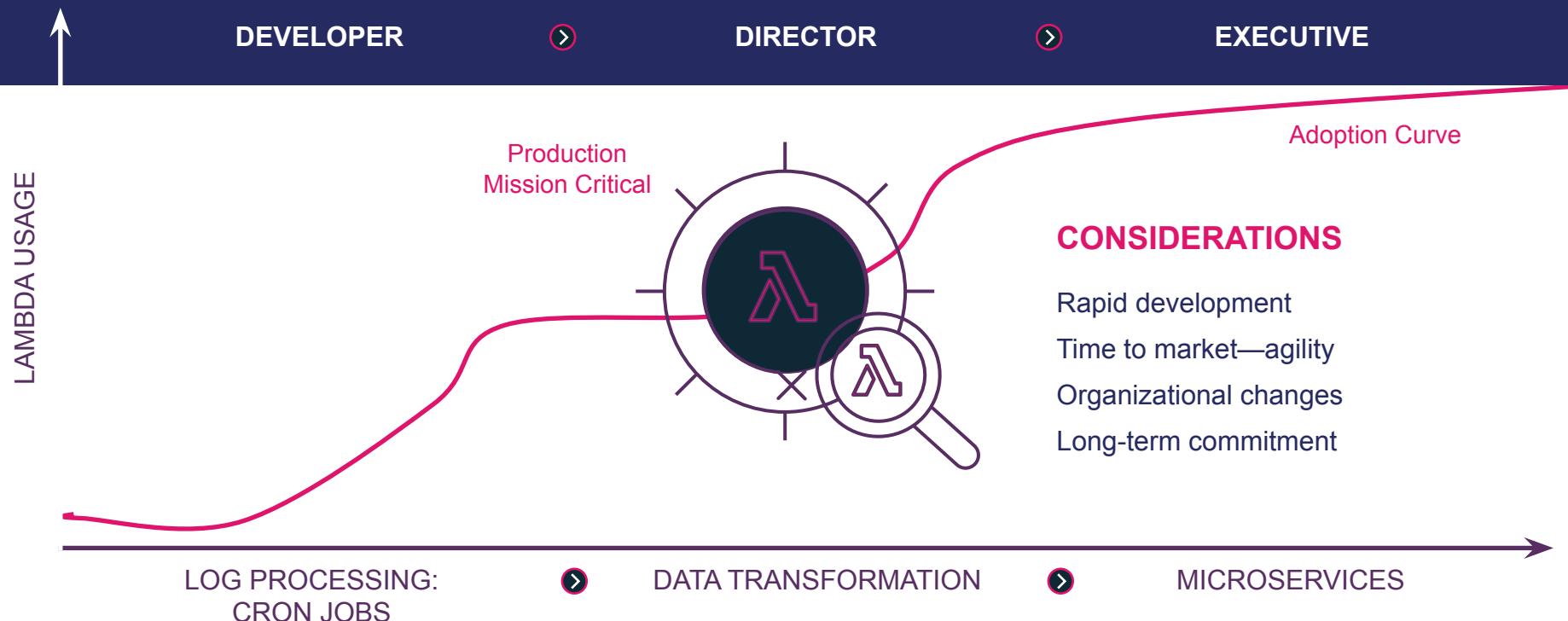
Highly available



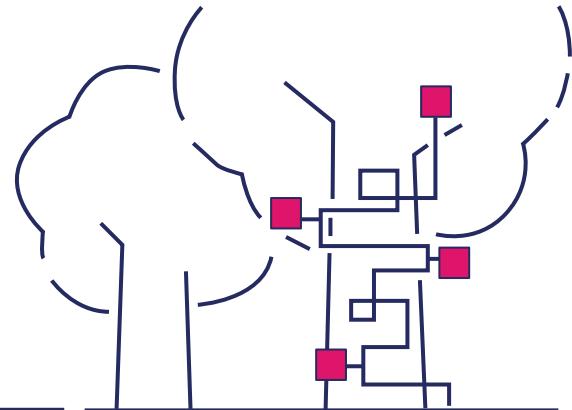
Leap Frog Adoption



Organic Serverless Adoption



Incremental Refactoring

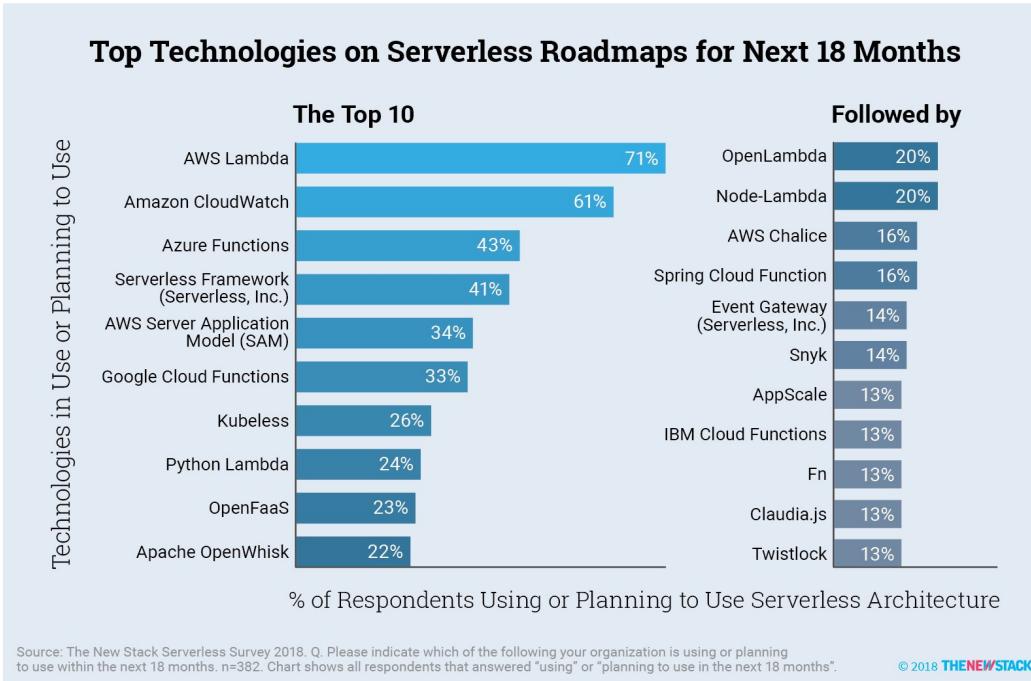


THE STRANGLER PATTERN

Moving **monolithic** applications to **microservices** by gradually creating events and **APIs** for various components on of the legacy application



Serverless Roadmaps



AWS Lambda



Languages in AWS Lambda

Natively supported



AWS Open Source



<https://github.com/awslabs/aws-lambda-cpp-runtime>



<https://github.com/awslabs/aws-lambda-rust-runtime>

Partner supported



elixir



OFFERED
BY
ALERT LOGIC



OFFERED
BY
STACKERY



OFFERED
BY
BLU AGE™



Solid™
OFFERED
BY
NODESOURCE®



Custom
Runtimes



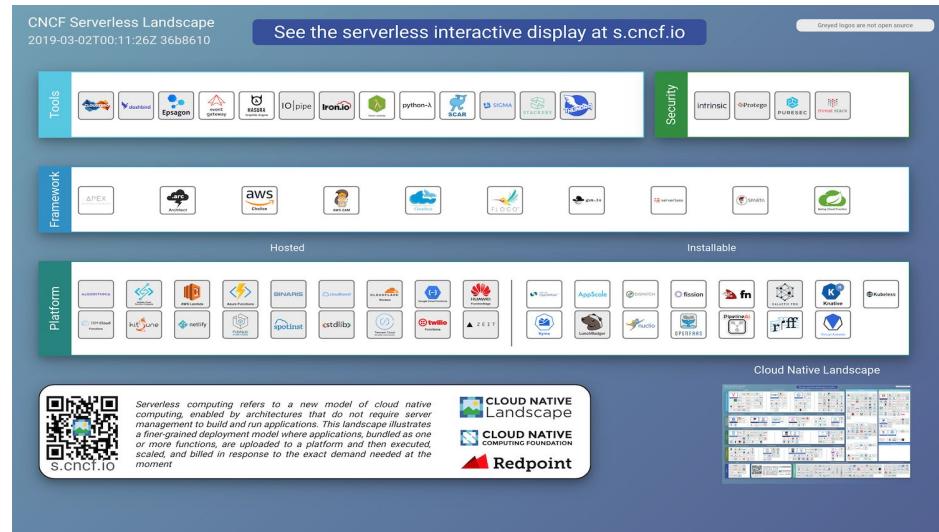
Serverless in CNCF

Decomposing Serverless

- Serverless [Working Group](#) published an influential [whitepaper](#)
- Since then the CNCF TOC agreed to have the working group continue its work and develop the [CloudEvents](#) specification. That work is being done in a separate github repo: [CloudEvents](#)
- In addition to [CloudEvents](#) specification, the Serverless WG has agreed to form a sub working group to work on a separate stream called "Event Function Workflow". This work is being done in the [Workflow](#) directory.

Serverless Landscape

The Serverless Landscape s.cncf.io tracks all projects and products in the space



See the interactive landscape at l.cncf.io

App Definition and Development



Streaming & Messaging



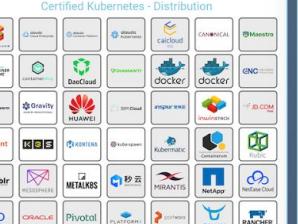
Application Definition & Image Build



Continuous Integration & Delivery



Platform



Observability and Analysis



Orchestration & Management



Scheduling & Orchestration

Coordination & Service Discovery

Service Proxy

API Gateway

Service Mesh

Certified Kubernetes - Hosted



Logging



Tracing



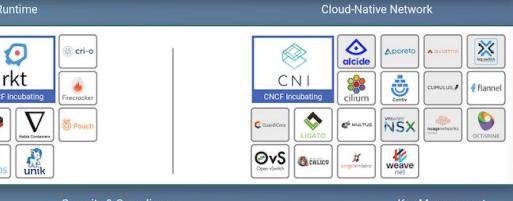
Chaos Engineering



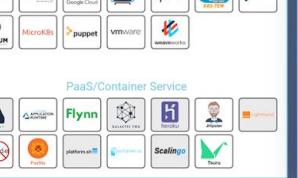
Serverless



Runtime



Cloud-Native Storage



Automation & Configuration

Container Registry

Security & Compliance

Key Management

PaaS/Container Service



Provisioning



Kubernetes Certified Service Provider



Cloud



Special



Add your product to the landscape

[Cloud native](#) projects with at least 300 GitHub stars that clearly fit in an existing category are generally included. Put the project in the single category where it best fits. We generally will only list a company's product in one box, to represent its major or best-known offering. We occasionally make exceptions for large companies.

Please open a pull request with edits to [landscape.yml](#).

For the logo, you can either upload an SVG to the hosted_logos directory or put a URL as the value, and it will be fetched.

Netlify will generate a staging server for you to preview your updates.

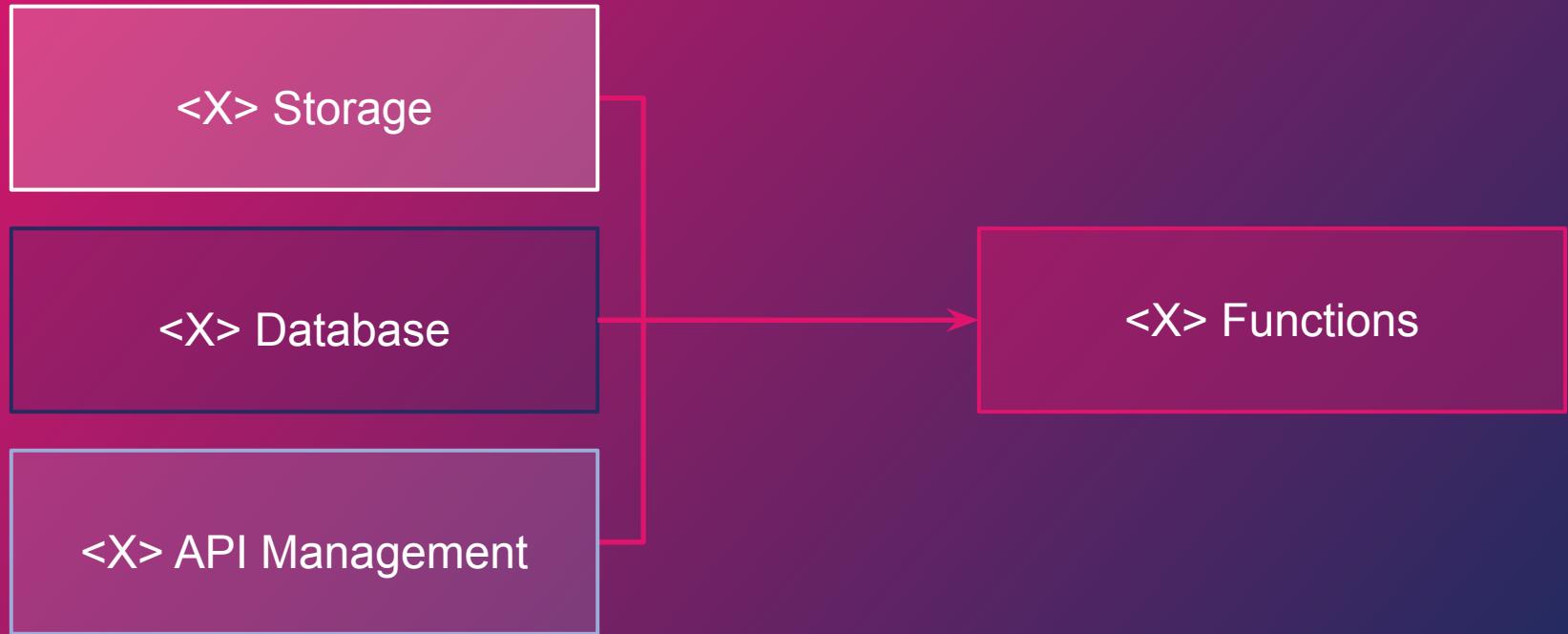
Please check that the logo and information appear correctly

Add LGTM to the pull request confirming your review and requesting a merge.

```
1  landscape:
2    - category:
3      name: Cloud
4      subcategories:
5        - subcategory:
6          name: Public
7          items:
8            - item:
9              name: Alibaba Cloud
10             homepage_url: 'https://us.alibabacloud.com/'
11             logo: 'https://www.cncf.io/wp-content/uploads/2017/06/alibaba-cloud-01.svg'
12             twitter: 'https://twitter.com/alibaba_cloud'
13             crunchbase: 'https://www.crunchbase.com/organization/alibaba-cloud'
14           - item:
15             name: Amazon Web Services
16             homepage_url: 'https://aws.amazon.com/'
17             logo: amazon-web-services.svg
18             twitter: 'https://twitter.com/awscloud'
19             crunchbase: 'https://www.crunchbase.com/organization/amazon-web-services'
20           - item:
21             name: Baidu AI Cloud
22             homepage_url: 'https://cloud.baidu.com/'
23             logo: 'https://www.cncf.io/wp-content/uploads/2017/12/baidu-ai-cloud.svg'
24             crunchbase: 'https://www.crunchbase.com/organization/baidu'
25           - item:
```



Business Logic between services for <X> cloud



Business Logic Across Cloud



CloudEvents - Why?



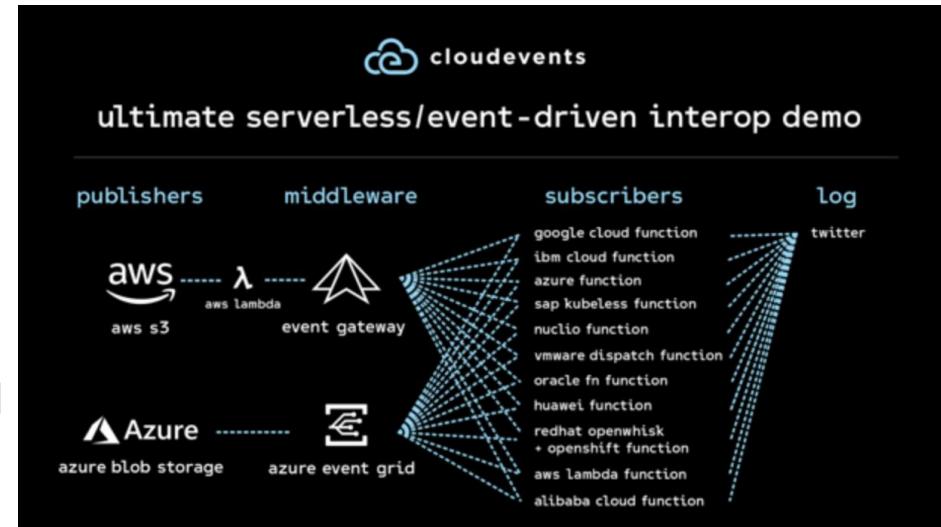
cloudevents

Problem we're trying to solve

- We live in a multi-cloud and multi-service world
- Events within a cloud are well known but going across clouds need more standardization on the messages

Some driving use cases

- How do you transit events between clouds and services?
- Be able to route events efficiently Without knowing the actual payload
- Well known format for transmitting metadata about events



CloudEvents - How?

Goals

- Define common metadata across events
- Define well known format for metadata w/o concern for exact event payload
 - For popular formats and transports
- Leave the event business logic format & processing to the application
- Facilitate integrations across platforms
- First step towards portability and interop of functions

TOC approved as a Sandbox project in December 2017

- Result of the CNCF Serverless WG's Whitepaper Recommendations



CloudEvents - Adoption & Plans

Adoption

- Microsoft, Serverless.com, SAP and others have support
- Knative - basis for eventing infrastructure
 - Transport/data agnostic filtering

Plans

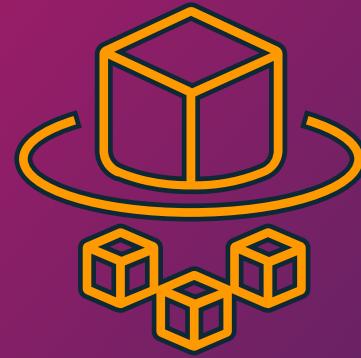
- Complete spec & SDK work
- Potential Incubator status
- Shift focus back to Serverless WG
 - Workflow specification
 - Other potential areas of interop



What about Containers?



CLOUD NATIVE
COMPUTING FOUNDATION



AWS Fargate



Fargate configurations

| CPU (vCPU) | Memory Values (GB) |
|------------|--------------------------------------|
| 0.25 | 0.5, 1, 2 |
| 0.5 | Min 1GB, max 4GB, in 1GB increments |
| 1 | Min 2GB, max 8GB, in 1GB increments |
| 2 | Min 4GB, max 16GB, in 1GB increments |
| 4 | Min 8GB, max 30GB, in 1GB increments |



Knative: Serverless using Kubernetes

Kubernetes-based platform to build, deploy and manage serverless workloads

Idiomatic developer experience

*Ops

Django, Ruby-on-Rails, Spring

Components

Build

Serving

Eventing



What about infrastructure?



What is Firecracker?



Firecracker

Open source virtualization technology (microVM)

Security and isolation of traditional VMs

Speed and density of containers

Developed at Amazon



Benefits of Firecracker



Security from the ground up

KVM-based virtualization



Speed by design

<125ms to launch 150 microVMs per second/host



Scale and efficiency

<5MB memory footprint per microVM



Foundational technology

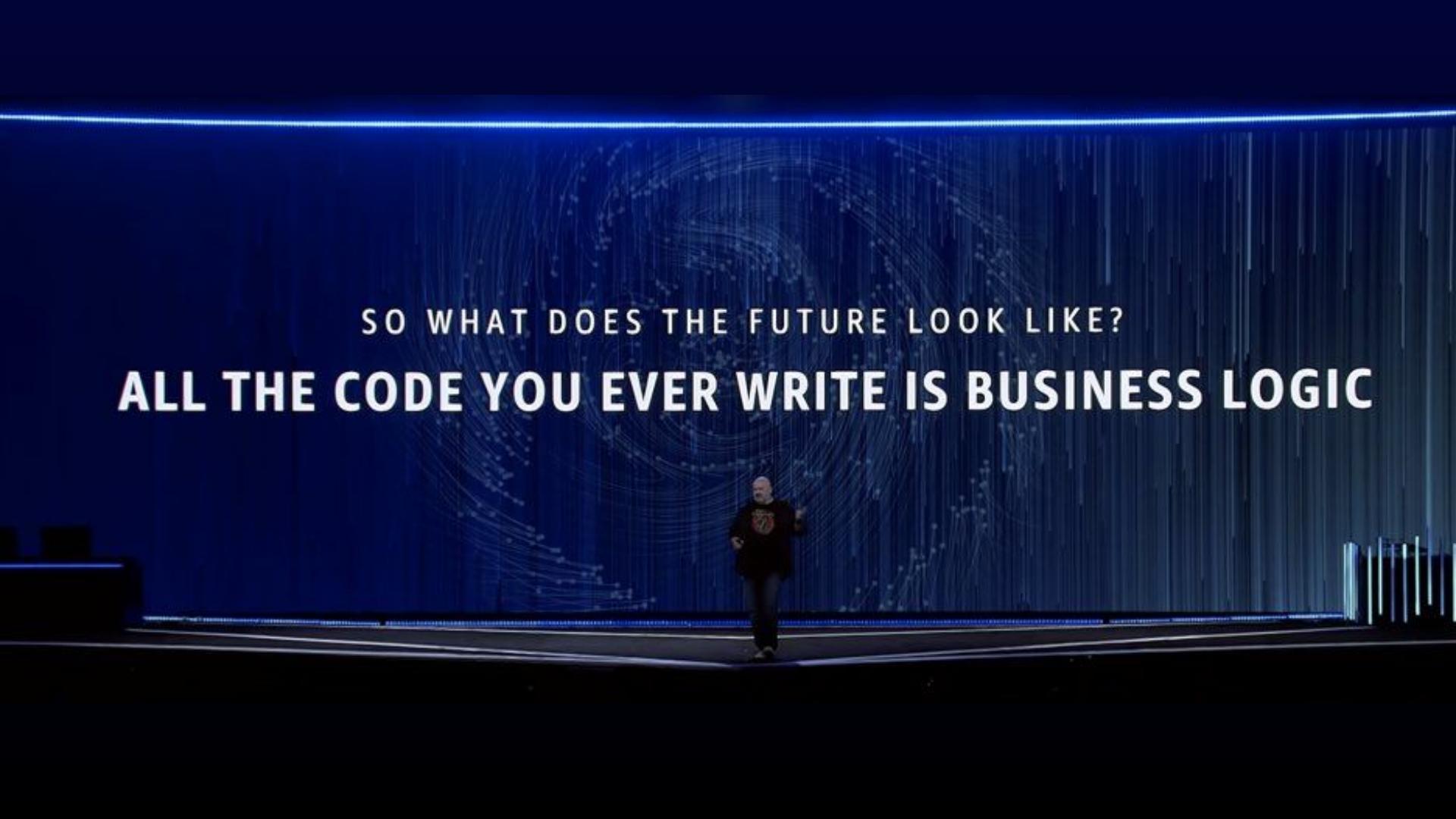


containerd



Firecracker





SO WHAT DOES THE FUTURE LOOK LIKE?
ALL THE CODE YOU EVER WRITE IS BUSINESS LOGIC

How to get involved?

- **Start building** serverless apps and functions
- **Update the CNCF serverless landscape** anytime, all the time
- **Join** Serverless working group
- **Join** Serverless email channel
- **Join** Serverless weekly call : Thursdays @ 12-1pm ET / 9-10am PT
- **Available** git repo: <https://github.com/cloudevents>
- **Join** mailing list: <https://lists.cncf.io/g/cncf-cloudevents/topics>
- **Join** #cloudevents and #serverless Slack channel under CNCF's Slack workspace
- **Share use cases, pain points** of your organizations use of serverless in production
- **Reach out** to Doug Davis, IBM co-chair of CNCF Serverless WG, CNCF CloudEvents WG and/or Mark Peek, VMWare



Thank you!



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This presentation is available at:
<https://github.com/cncf/presentations>