

The Serverless Landscape & Event Driven Futures

Dee Kumar, Vice President Product Marketing, CNCF

Arun Gupta, Principal Technologist, AWS

This presentation is available at:

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



CLOUD NATIVE
COMPUTING FOUNDATION

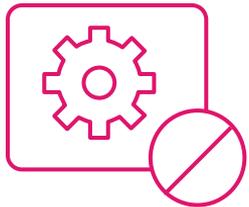


Arun Gupta
Principal Technologist
AWS
@arungupta



Dee Kumar
Vice President, Product
Marketing CNCF
@deesprinter

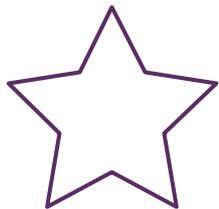
Serverless means...



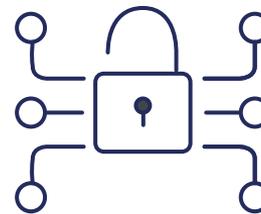
No infrastructure provisioning,
no management



Automatic scaling



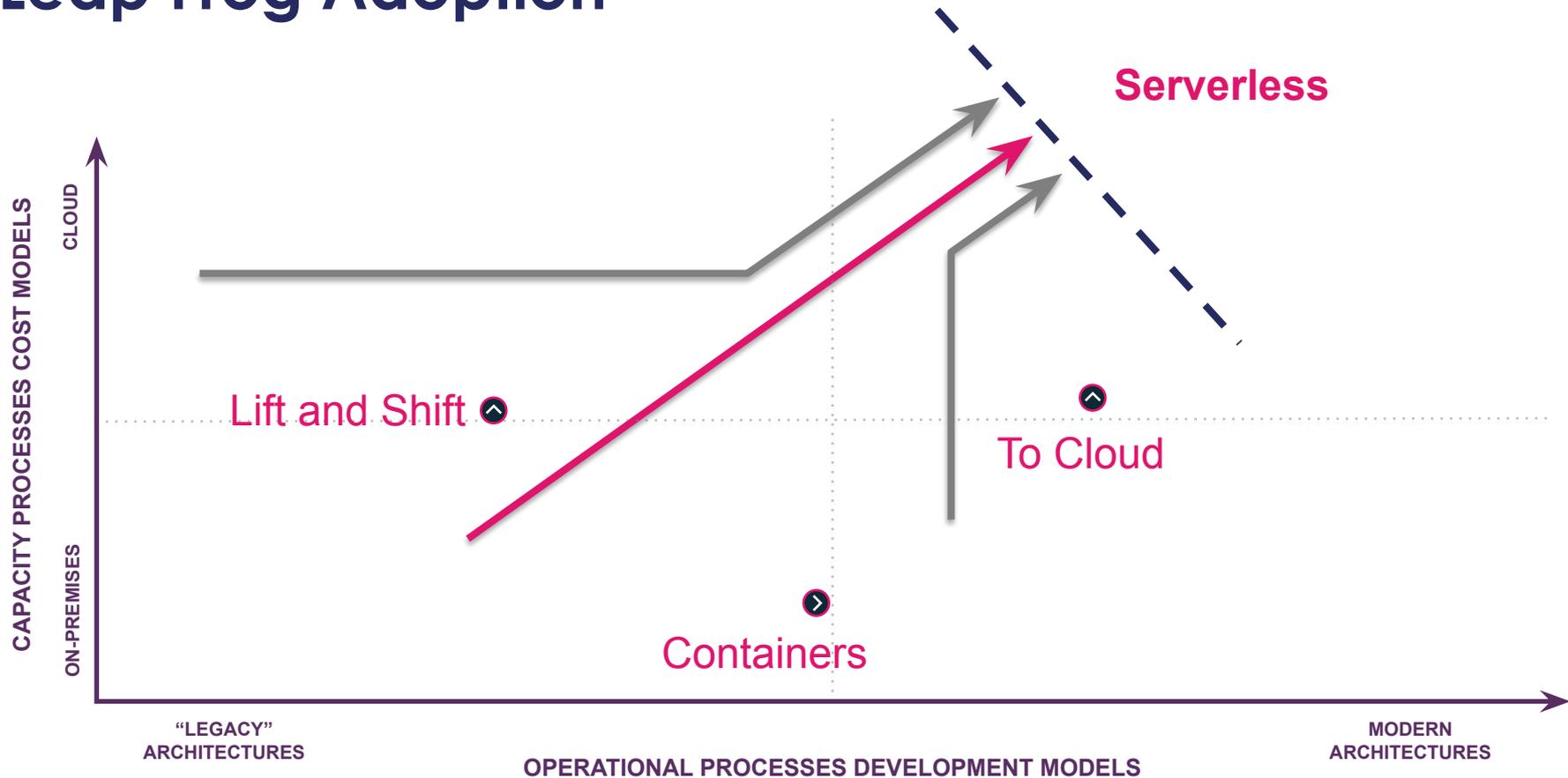
Pay for value



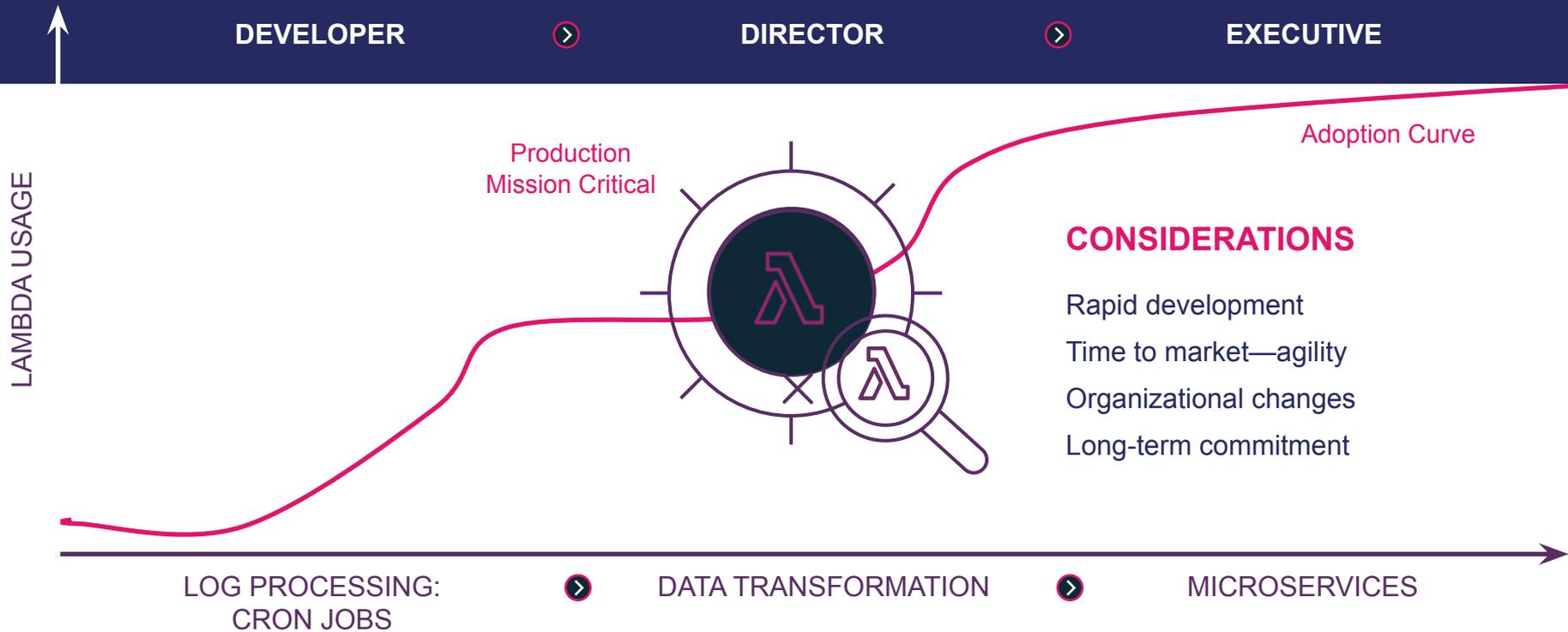
Highly available



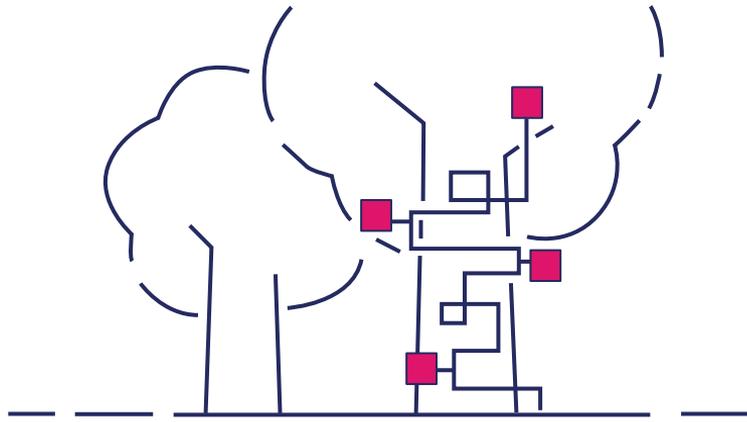
Leap Frog Adoption



Organic Serverless Adoption



Incremental Refactoring



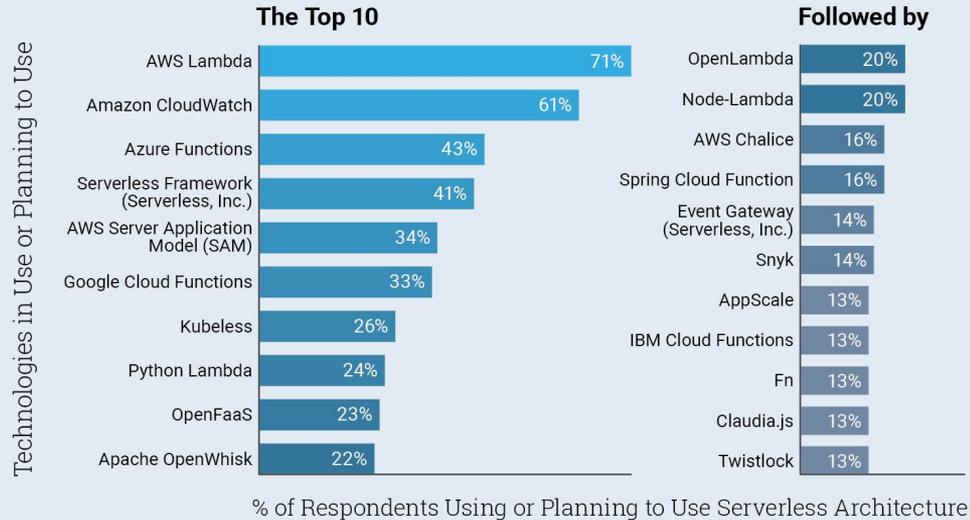
THE STRANGLER PATTERN

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



Serverless Roadmaps

Top Technologies on Serverless Roadmaps for Next 18 Months



Source: The New Stack Serverless Survey 2018. Q. Please indicate which of the following your organization is using or planning to use within the next 18 months. n=382. Chart shows all respondents that answered "using" or "planning to use in the next 18 months".

© 2018 THE NEW STACK



AWS Lambda



Languages in AWS Lambda

Natively supported



AWS Open Source



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



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

Partner supported



COBOL



OFFERED BY

ALERT LOGIC



OFFERED BY

STACKERY



OFFERED BY

BLUE AGE



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

The screenshot displays the CNCF Serverless Landscape website. At the top, it says "CNCF Serverless Landscape" with a timestamp "2019-03-02T00:11:26Z 36b8610" and a button to "See the serverless interactive display at s.cncf.io". Below this, there are three main categories: Tools, Framework, and Platform. The Tools category includes logos for AWS Lambda, Azure Functions, Epagon, AWS Step Functions, IOpipe, Iron.io, Python, SCAR, and others. The Framework category is divided into Hosted (APEX, AWS Lambda, Heroku, FaaS, FLOCCO, etc.) and Installable (Knative, etc.). The Platform category includes logos for various cloud providers and services like AWS, Azure, GCP, IBM, etc. At the bottom, there is a QR code for s.cncf.io, a definition of serverless computing, and logos for Cloud Native Landscape, Cloud Native Computing Foundation, and Redpoint. A small inset shows a "Cloud Native Landscape" dashboard.



App Definition and Development

Database

Streaming & Messaging

Application Definition & Image Build

Continuous Integration & Delivery

Orchestration & Management

Scheduling & Orchestration

Coordination & Service Discovery

Remote Procedure Call

Service Proxy

API Gateway

Service Mesh

Runtime

Cloud-Native Storage

Container Runtime

Cloud-Native Network

Provisioning

Automation & Configuration

Container Registry

Security & Compliance

Key Management

Cloud

Public

This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path.

l.cncf.io

CLOUD NATIVE COMPUTING FOUNDATION

CLOUD NATIVE LANDSCAPE

Redpoint Amplify PARTNERS

Special

Kubernetes Certified Service Provider

Platform

Certified Kubernetes - Distribution

Certified Kubernetes - Hosted

Certified Kubernetes - Installer

PaaS/Container Service

Serverless

Observability and Analysis

Monitoring

Logging

Tracing

Chaos Engineering

Kubernetes Training Partner

Kubernetes Certified Service Provider

Kubernetes Training Partner

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.

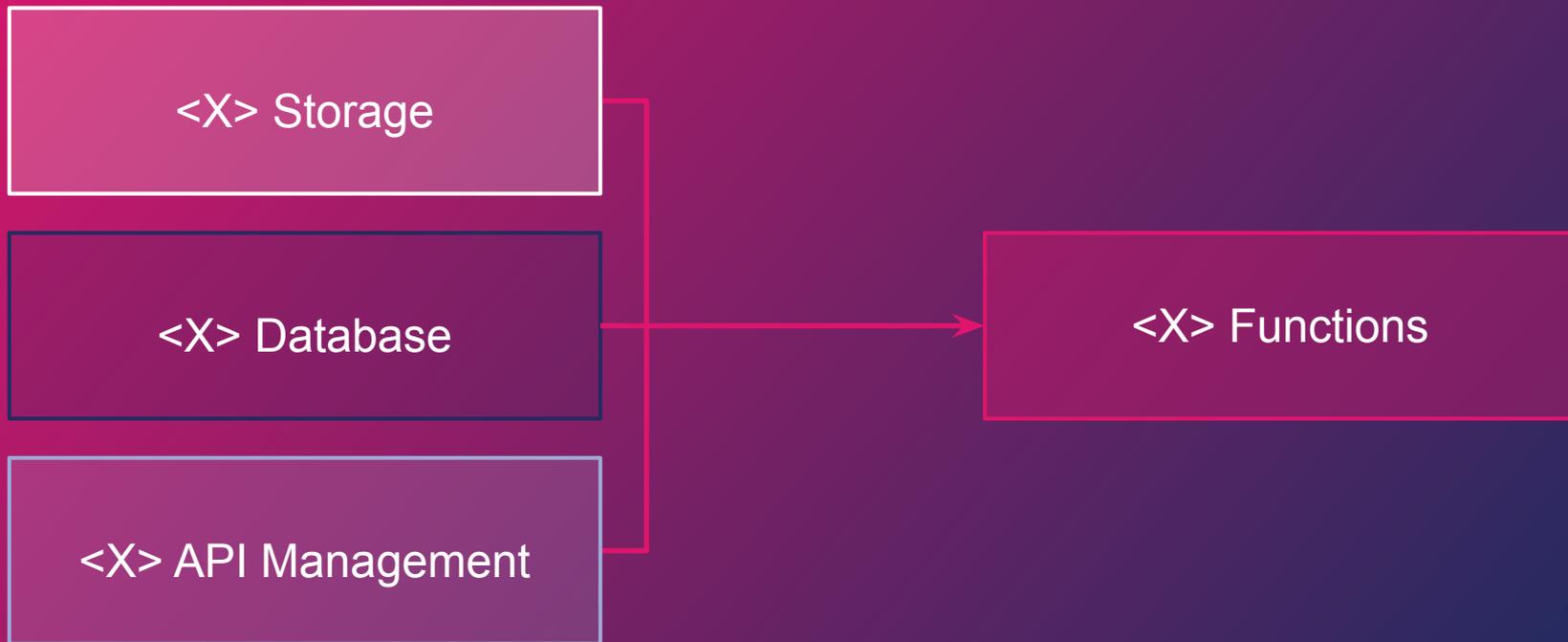
Please check that the logo and information appear correctly

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

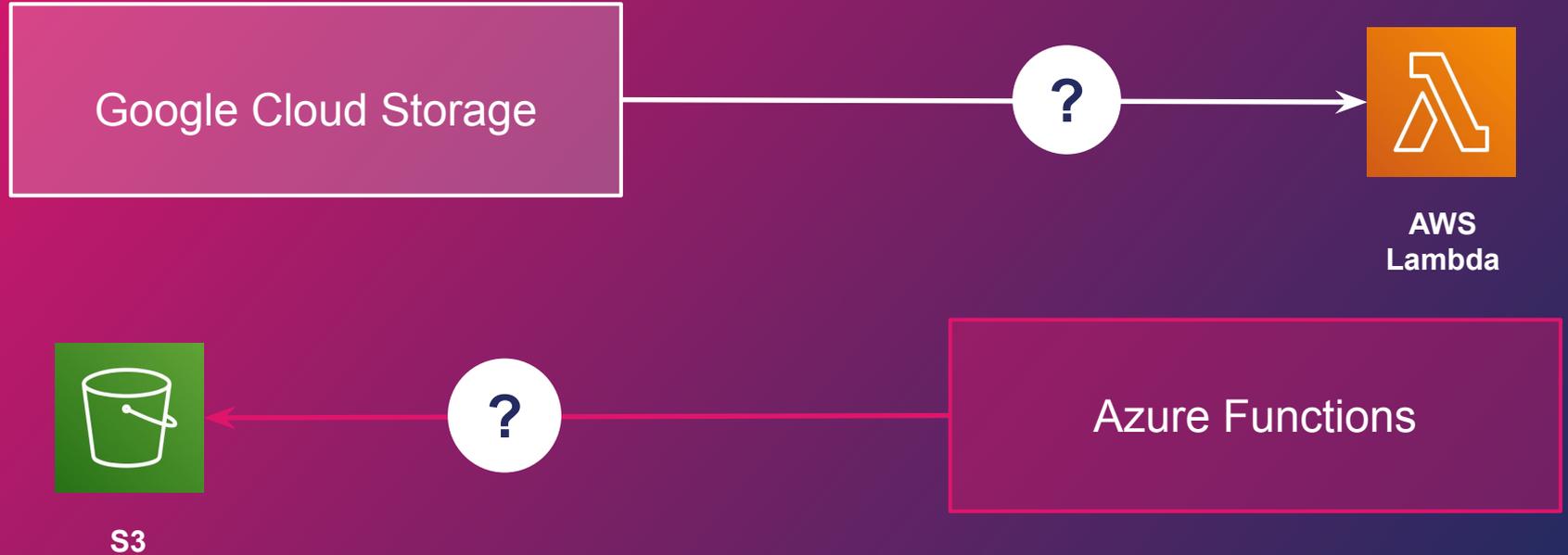
```
1 landscape:
2   - category:
3     name: Cloud
4     subcategories:
5     - subcategory:
6       name: Public
7       items:
8       - item:
9         name: Alibaba Cloud
10        homepage_url: 'https://us.alibabacloud.com/'
11        logo: 'https://www.cncf.io/wp-content/uploads/2017/06/alibaba-cloud-01.svg'
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?



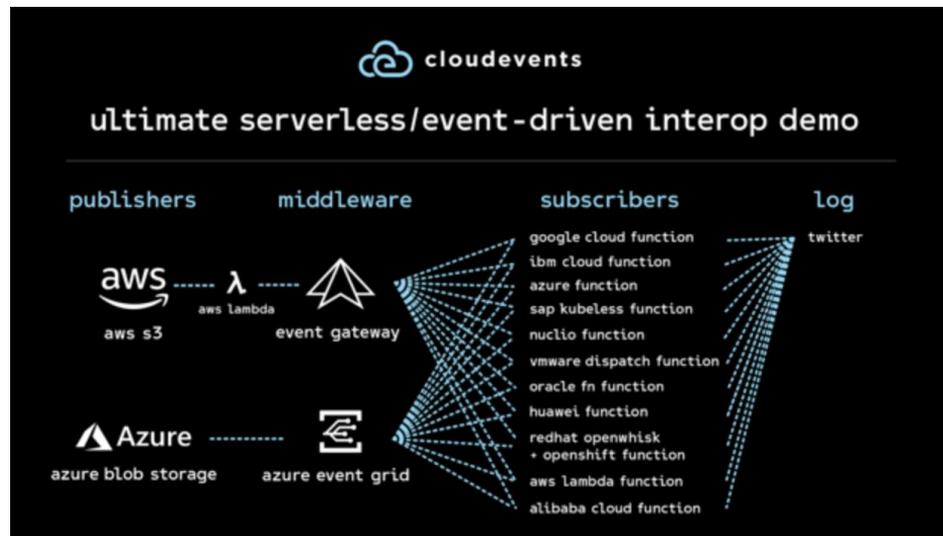
cloudevents

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

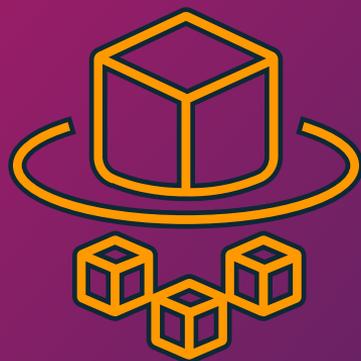
- Complete spec & SDK work
- Potential Incubator status
- Shift focus back to Serverless WG
 - Workflow specification
 - Other potential areas of interop



cloudevents



What about Containers?



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?



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



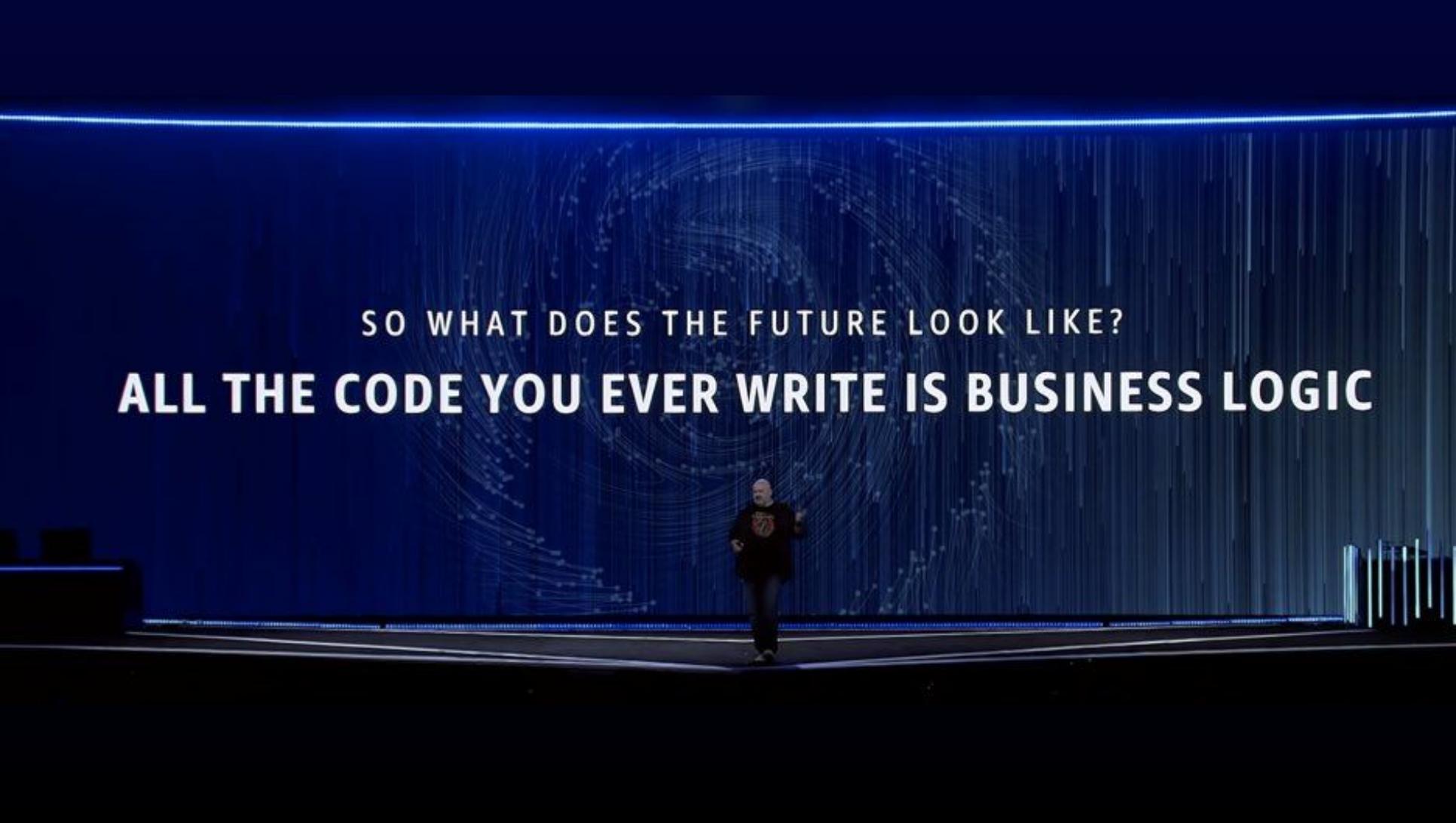
Scale and efficiency

<5MB memory footprint per microVM



Foundational technology



A person is standing on a stage in front of a large digital display. The display features a complex, abstract pattern of blue lines and dots, resembling a network or data visualization. The person is wearing a dark jacket and is gesturing with their hands. The stage is lit with blue light, and there are some vertical light bars on the right side.

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!



Arun Gupta

Principal,
Open Source Technologist AWS
@arungupta



Dee Kumar

Vice President, Product
Marketing CNCF
@deesprinter

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