

What is Cloud Native and why should I care?

Alexis Richardson

CNCF TOC Chair & CEO Weaveworks

Kubecon - 30 March 2017



**CLOUD NATIVE
COMPUTING
FOUNDATION**

A home for these amazing projects that enable modern applications



CoreDNS



Fluentd



gRPC



Kubernetes



Linkerd



OpenTracing



Prometheus



containerd



rkt

CNCF = Open Source Cloud Computing *for Applications*

We curate & promote a trusted tool kit for modern architectures

Non-profit, part of the Linux Foundation & funded by sponsors

SPEED
FREEDOM
TRUST

Netflix pioneered the concept of cloud native as a practical tool

Are You Designing Systems That Are:

- Web-scale
- Global
- Highly-available
- Consumer-facing

- Cloud Native

AWS re:Invent

◀ 2 of 29 ▶

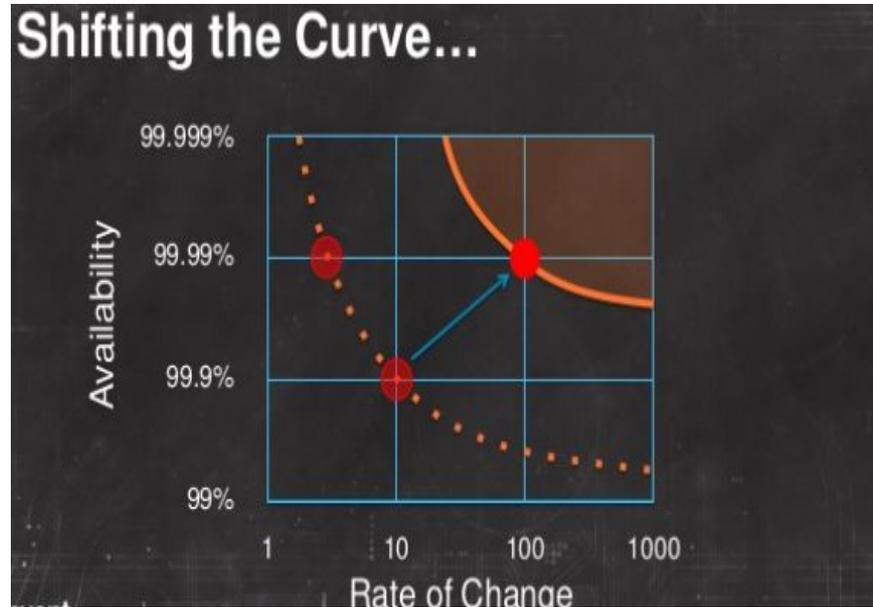


Netflix Development Patterns for Scale,
Performance & Availability (DMG206) | AWS
re:Invent 2013

1,590 views

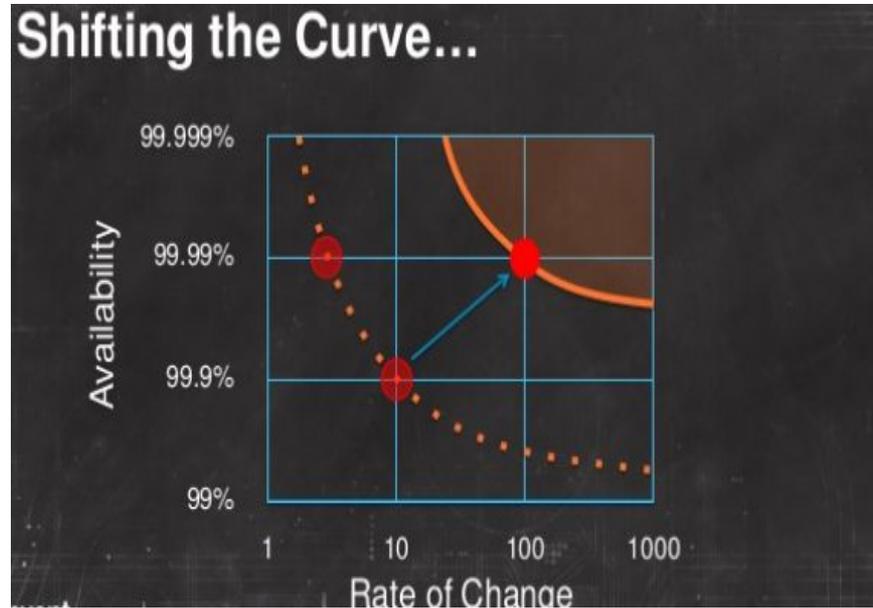
<https://www.slideshare.net/AmazonWebServices/dmg206>

Netflix wanted SPEED and ACCESS at SCALE



<https://www.slideshare.net/AmazonWebServices/dmg206>

Netflix wanted SPEED and ACCESS at SCALE



<https://www.slideshare.net/AmazonWebServices/dmg206>

Must Read!

Cloud native powers a whole industry today



Can anyone be like Netflix?



Maybe we can dream :-)



The *Need for Speed*. This is real.

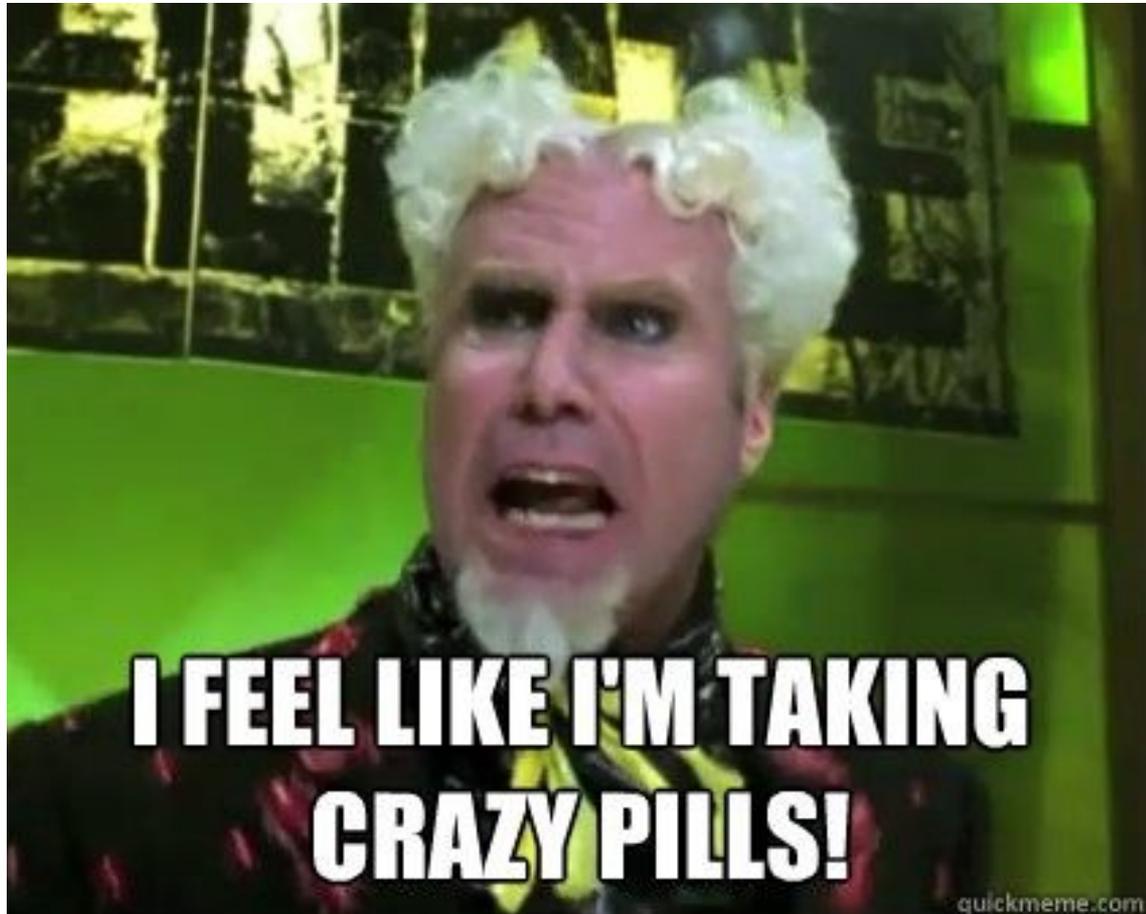
Figure 1

Comparison of IT performance metrics between high¹ and low performers

	2015 (<i>Super High vs. Low</i>)	2014 (<i>High vs. Low</i>)
Deployment Frequency	30x	30x
Deployment Lead Time	200x	200x
Mean Time to Recover (MTTR)	168x	48x
Change Success Rate	60x	3x

So what is it about Cloud
Native that helps me go fast

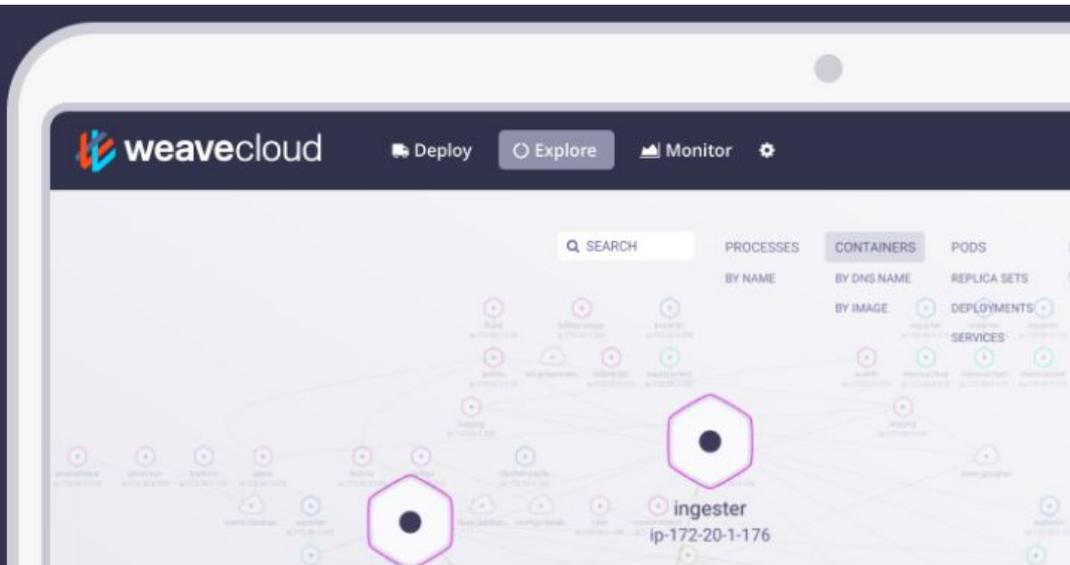
To learn more
@Weaveworks we
experimented on
our own product



Simplifying delivery for cloud-native development

Built on open source software, Weave Cloud is software-as-a-service that allows DevOps teams to connect, monitor and deploy containers and microservices.

[WATCH DEMO](#)



Our business needs @Weave

Speed

Work on app fast and not on infra, integration & plumbing (eg Kube-Prometheus)

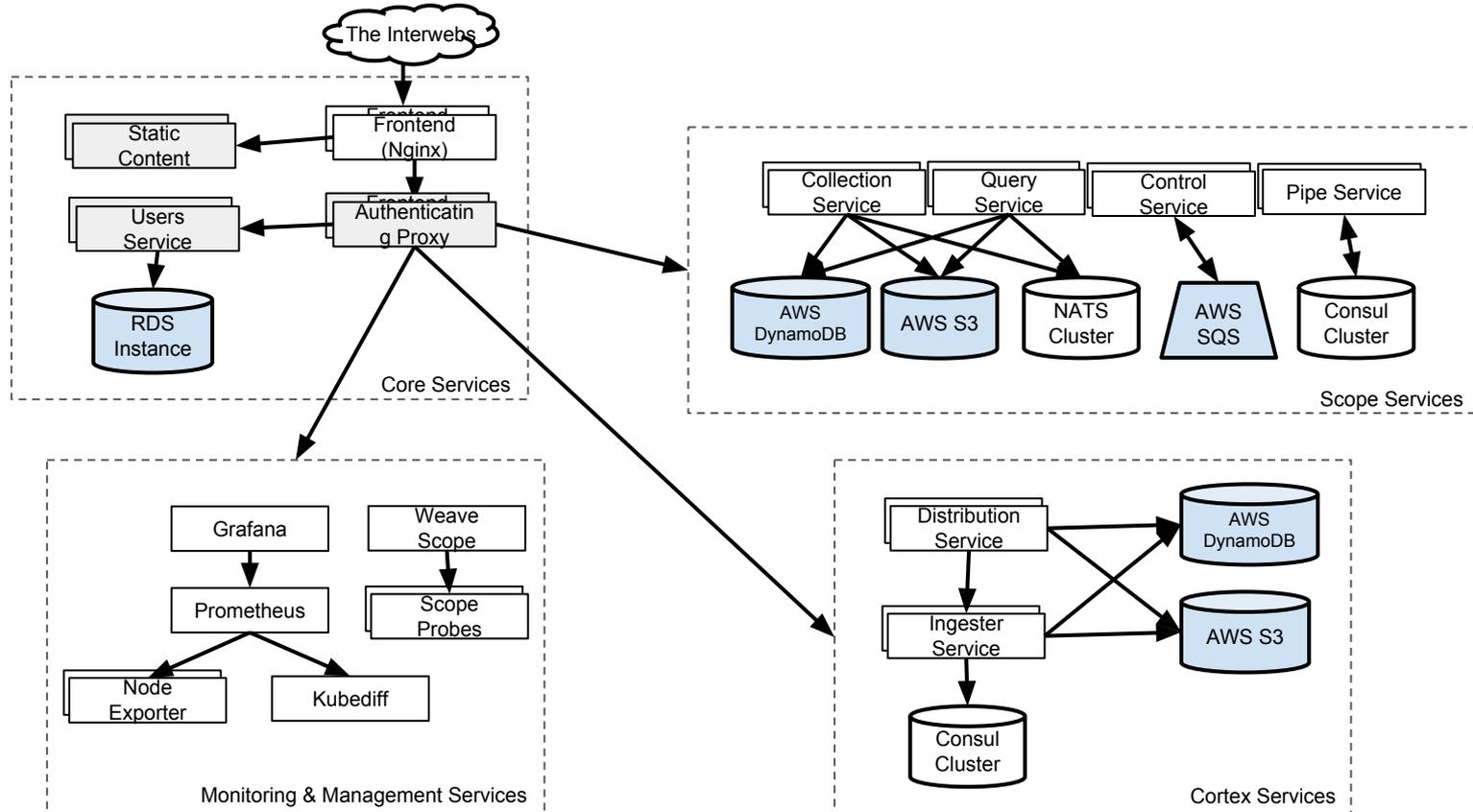
Freedom

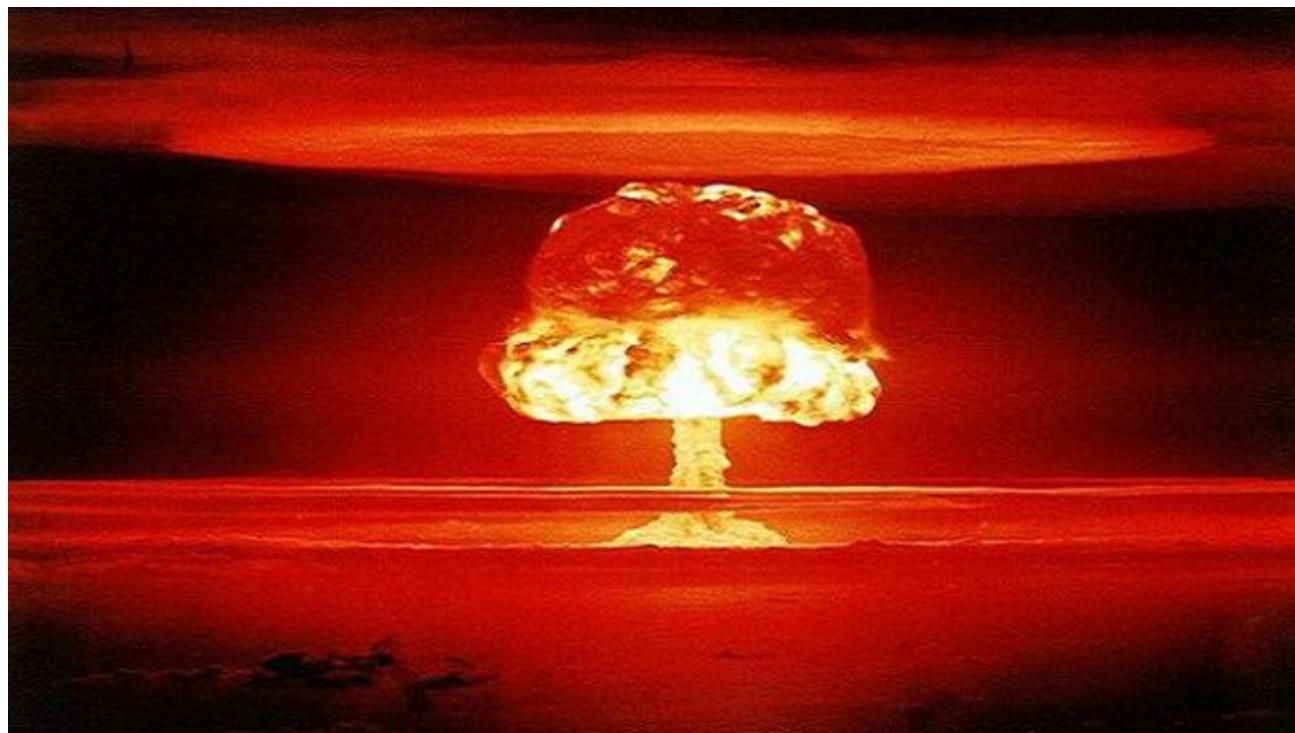
Want out app to run anywhere - OpenSource, not AmazonSource

Trust

24/7 uptime, fast recovery, scale any component independently

NOT one pattern. NOT only “12 factor”





Our technical needs @Weave

Automation

Orchestration, pipelines

Packaging

Containerised deployment

Modern practices

Microservices, monitoring, logging,

Cloud Native is **Patterns**



If Cloud Native is **Patterns**

→ Which OSS Tools can we trust?

Tools you can trust



CoreDNS
Registry



Fluentd
Logging



gRPC
Transport



Kubernetes
Orchestration



Linkerd
Routing



OpenTracing
Tracing



Prometheus
Monitoring



containerd



rkt

Cloud Native Landscape

v0.9.4

Application Definition & Development

Databases Amazon Aurora, MySQL, PostgreSQL, Oracle Database, CockroachDB, MongoDB, Redis, Aerospike, YugabyteDB, Dgraph, CockroachDB, Redis, Aerospike, YugabyteDB, Dgraph, CockroachDB, Redis, Aerospike, YugabyteDB, Dgraph	Data Warehouse BigQuery, Snowflake, Amazon Redshift, Databricks, Google Cloud BigQuery, Snowflake, Amazon Redshift, Databricks	Streaming Kafka, Amazon Kinesis, Apache Flink, Amazon Kinesis, Apache Flink	Languages & Frameworks JS, Angular, React, Python, Java, PHP, .NET, Node.js, Ruby, Go, Kotlin, Swift, Kotlin, Swift, Kotlin, Swift	SCM GitHub, GitLab, Bitbucket	Registry Services Docker Hub, Quay, JFrog Artifactory, Sonatype	Application Definition Kubernetes, Helm, Terraform, Ansible, Puppet, Chef, SaltStack	CI / CD Jenkins, Travis CI, CircleCI, GitHub Actions, GitLab CI, Jenkins, Travis CI, CircleCI, GitHub Actions, GitLab CI	Services as Code Stripe, Twilio, Algolia, Segment, Mapbox, Auth0, Checkr, Keen IO, SendGrid, Snyte, Shopify, Imgi, Plaid	API management Mulesoft, Apigee, Tyk, Kong, Ascale, Okana, Trajio, WSO2, Zapier
---	--	---	--	---	---	--	--	--	---

Orchestration & Management

Scheduling & Orchestration Kubernetes, Mesos, Nomad, AWS ECS	Coordination & Service Discovery etcd, Consul, CoreDNS, Apache ZooKeeper, Registrator, SkyDNS, Netflix OSS	Service Management NGINX, Istio, GRPC, Weaveflux, Envoy, Turbine Labs, Netflix OSS, Avi, Vamp, Backplane
--	--	--

Runtime

OS CoreOS, Photon, Rancher, Snappy	Cloud-Native Storage Amazon S3, MinIO, Ceph, Rook, GlusterFS, iQuazio, SolidFire, OpenStack SDS, Ceph, Datera, Quobyte, Scality	Container Runtime ContainerD, Docker, Rkt, HyperKit, LXD, OpenShift Container Engine	Cloud-Native Network Weave, Calico, Cilium, Flannel, Contiv, VMware, Aviatrix, CNV, OpenContrail, Axiata, VMware, Aviatrix, CNV, OpenContrail, Axiata
--	---	--	---

Provisioning

Infrastructure Automation Terraform, Ansible, Chef, Puppet, SaltStack, Redspread, BOSH, CoreOS, CloudFormation	Host Management / Tooling Ansible, Chef, Puppet, SaltStack	Secure Images Aqua, Anchore, Clair, Twistlock
--	--	---

Infrastructure

Amazon Web Services, Microsoft Azure, Google Cloud Platform, Alibaba Cloud, Oracle Cloud, DigitalOcean, OpenStack, Packet, VMware, Fujitsu

Platforms

Platforms / Container Services: Docker, Kubernetes, OpenShift, Red Hat OpenShift, VMware Tanzu, Pivotal Cloud Foundry, IBM Cloud OpenShift, SAP Business Technology Platform, SAP S/4HANA Cloud, SAP Fiori, SAP SuccessFactors, SAP Fieldglass, SAP Ariba, SAP Concur, SAP Customer Experience, SAP Commerce Cloud, SAP S/4HANA Cloud, SAP Fiori, SAP SuccessFactors, SAP Fieldglass, SAP Ariba, SAP Concur, SAP Customer Experience, SAP Commerce Cloud

Observability & Analysis

Monitoring: Prometheus, Grafana, ELK Stack, Splunk, Datadog, New Relic, AppDynamics, Dynatrace, Solaris, Nagios, Zabbix, InfluxDB, Graphite, Prometheus, Grafana, ELK Stack, Splunk, Datadog, New Relic, AppDynamics, Dynatrace, Solaris, Nagios, Zabbix, InfluxDB, Graphite

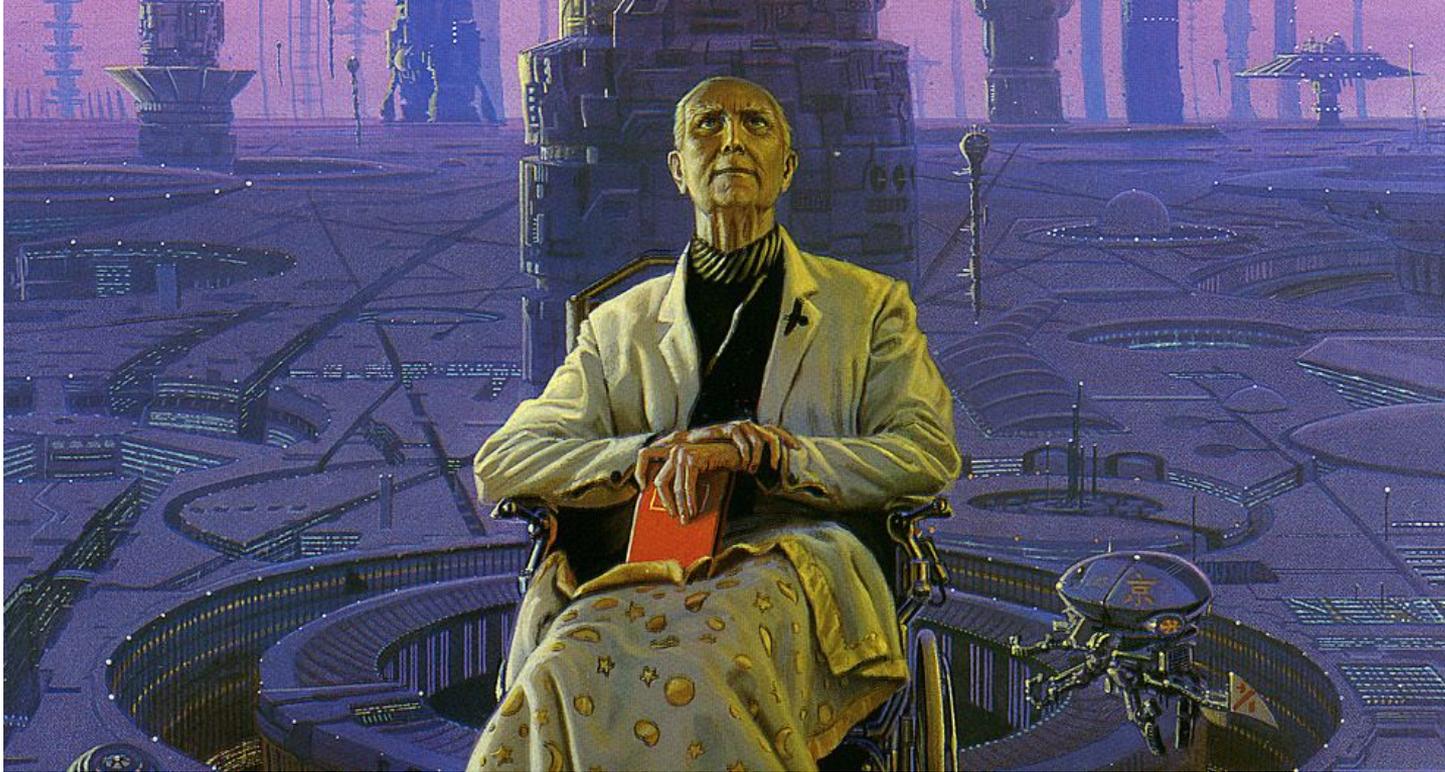
Current CNCF Projects

Prospective CNCF Projects

OSS is great ... why do we
need a **Foundation?**

**from SPEED
to FREEDOM
& TRUST**

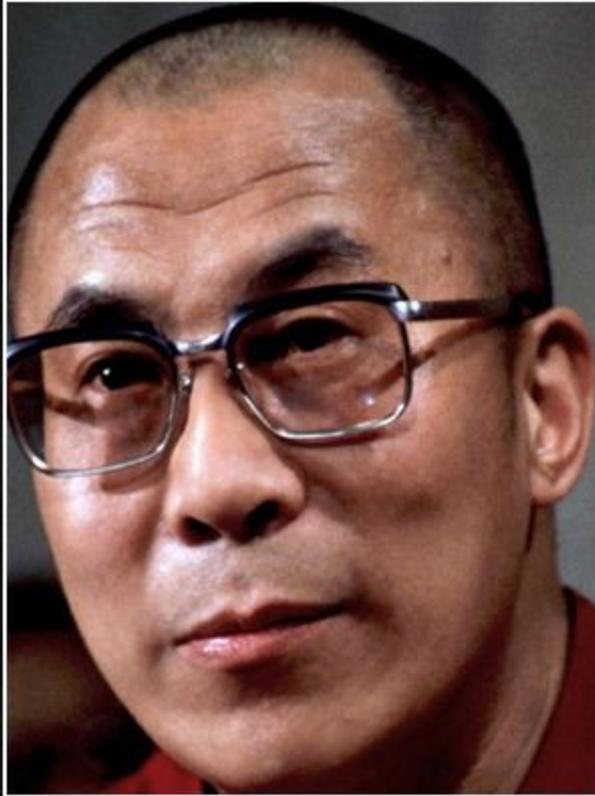
..a benevolent technocracy run by civilised robots?



..a federation of collaborating powers?



..a confluence of karmic forces?



You use force, you create fear. Fear destroys trust. Trust is the basis of harmony. The hardliner believes harmony and unity can be brought by force. That's totally unscientific, totally wrong.

— *Dalai Lama* —

AZ QUOTES

The Linux Foundation

Safeguards Linux for the long term

Provides a nexus for collaboration and trust

Is an ubiquitous open source brand

Good for customers & the community!

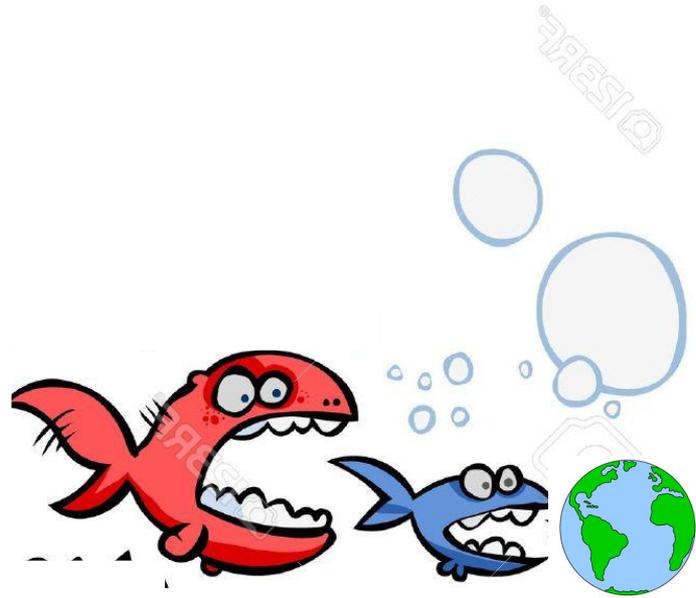
The LF is great because it makes it easy to bring together collaborators for projects like a common tool kit for cloud native applications → enter the CNCF

**from TRUST
to FREEDOM**

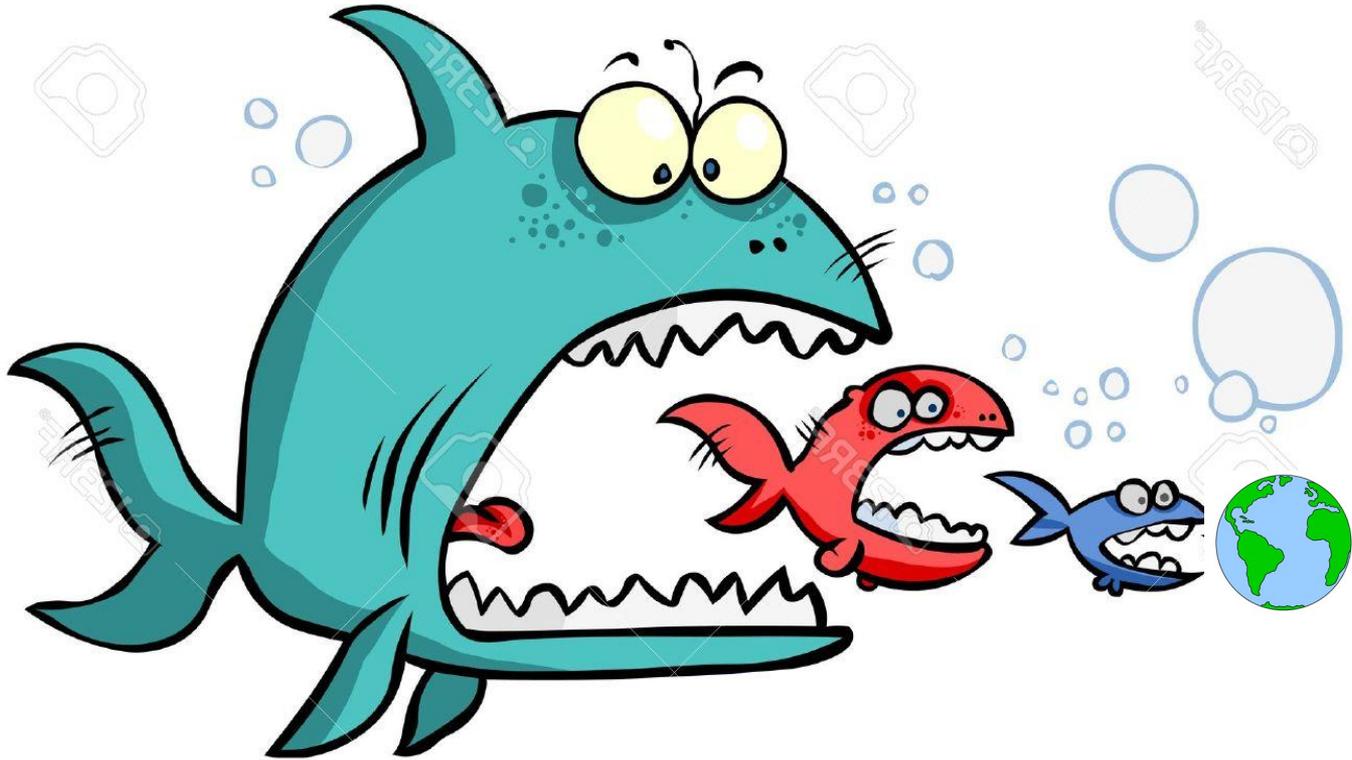
Software is eating the world



Open source is eating software



Cloud is eating open source



We risk Cloud Lock In



No lock in

Common open source cloud software → Anyone can use

United Nations → Docker + Google + IBM + eBay + ...?

Enable competition & user choice → “No kingmakers”

Common Open Source

is not proprietary

Common Standards?

Common ~~Standards~~ Projects

CNCF is “projects first”

Interoperability helps users

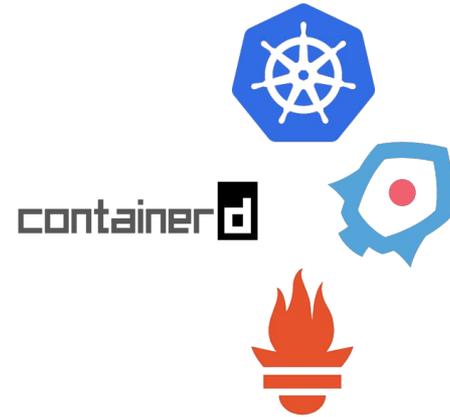
→ Speed

Choice is good - eg rkt,containerd

→ Freedom

High quality projects that work well alone or together

→ Trust



CNCF helps developers and end users

Education

Help you get started quickly with common examples & tools

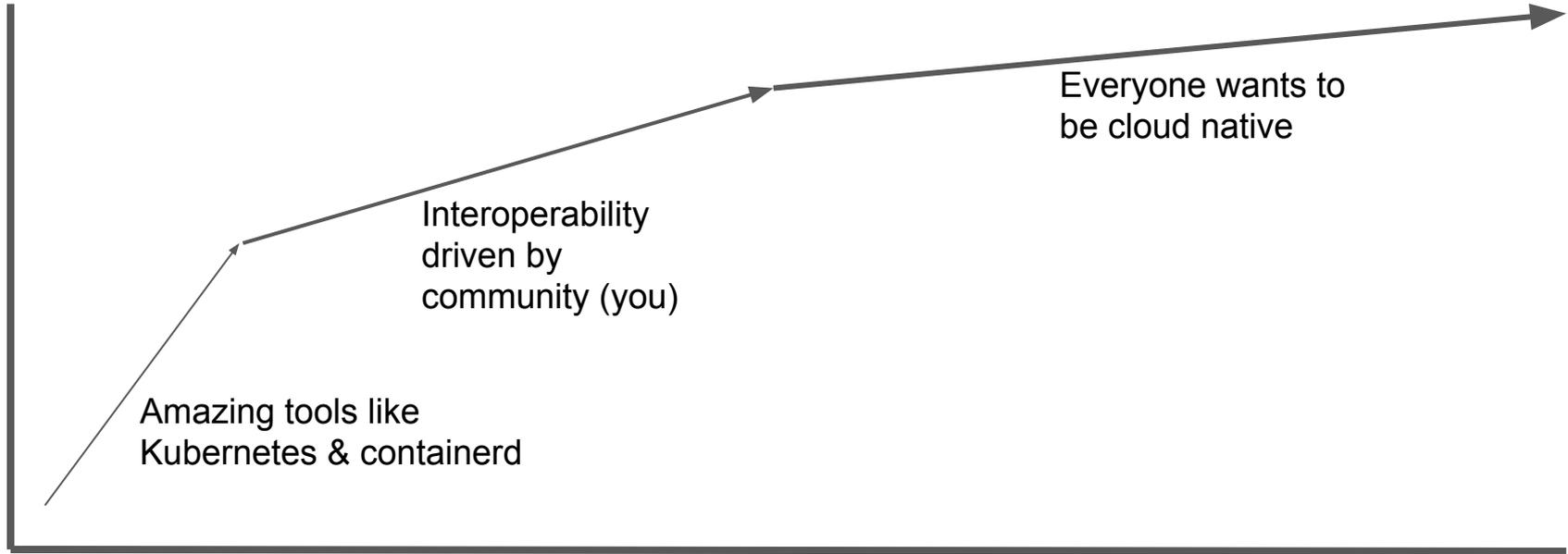
Promotion

And clear trusted guidance to wide audience

Infrastructure

And project support services

Our future



SPEED
FREEDOM
TRUST