Kubernetes IBMCloud SIG – Deep Dive
KubeCon Seattle 2018

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Agenda

- ❑ SIG overview
- ❑ SIG structure and activities
- ❑ Overview of IBM Clouds
  - ❑ IBM Cloud Kubernetes Service (IKS)
  - ❑ IBM Cloud Private (ICP)
- ❑ SIG contributions to the Kubernetes upstream
- ❑ Summary

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Overview

❑ A SIG for building, deploying, maintaining, supporting, and using Kubernetes on IBM Public and Private Clouds
  - IBM Cloud Kubernetes Service (IKS) and IBM Cloud Private (ICP)
  - Both participate in the CNCF Certified Kubernetes Conformance Program and are certified

❑ Many developers and leaders from IBM Cloud work openly in this group to determine the future of IBM Cloud team's involvement in the Kubernetes community

❑ You can follow the evolution of the IKS and ICP platforms with respect to Kubernetes and related CNCF projects

❑ You interact directly with the team that builds and operates IBM Cloud

❑ Created - April, 2018

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Structure

❑ Meet every other week
- Wednesdays at 14:00 EST. About 7-10 regular attendees
- Meeting recordings - https://bit.ly/sig-ibmcloud-videos

❑ SIG Leads
- Richard Theis (IKS)
- Khalid Ahmed (ICP)
- Sahdev Zala (OSS)

❑ Charter
https://github.com/kubernetes/community/blob/master/sig-ibmcloud/charter.md

❑ Join the SIG ML
https://groups.google.com/forum/#!forum/kubernetes-sig-ibmcloud

❑ Slack #sig-ibmcloud

❑ Read more about the SIG
https://github.com/kubernetes/community/tree/master/sig-ibmcloud

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Key Discussions in the SIG Meetings

❑ Brief presentations
- IBM Cloud Kubernetes Service (IKS) updates
  - Overview and demo of IKS
  - Kubernetes update strategy - supports 3 concurrent releases at any time (1.10->1.12 today)
  - Multi-Zone cluster support
- IBM Cloud Private (ICP) updates
  - Overview and demo of ICP
  - Scalability testing - <u>certified to 1000 nodes</u>. Incremental work - WIP.

❑ Discussion around community work
- SIG-Cloud-Provider integration
  - We are working on moving as a sub-project
- IBM Cloud Provider code public repo – investigating …
- SIG maintenance work
  - For example, creating charter
- Contributions from IBM Cloud developers (PR, Issues, Discussions..)

IBM Cloud Kubernetes Service (IKS)

A **managed Kubernetes service** providing an intuitive user experience with simplified cluster lifecycle management. Built-in **security and isolation** to enable rapid delivery of apps, while leveraging IBM Cloud Services including Weather data, IoT, Analytics, or **AI capabilities with Watson**. Available in six IBM regions WW, including **25+ datacenters**.

https://www.ibm.com/cloud/container-service

IKS: Kubernetes Releases

Kubernetes had **4** releases in **2018**. Are you staying current? Are users of IKS (or other cloud providers) staying current? Does **Kubernetes** need an **LTS**? Should Kubernetes **release speed** up or slow down? There are many question and concerns around this pace. Please contribute to the community discussions.

Release	Kubernetes GA	IKS GA	GA Delta	IKS Unsupported
1.7	June 28, 2017	September 19, 2017	83 days	June 21, 2018
1.8	September 27, 2017	November 8, 2017	41 days	September 22, 2018
1.9	December 13, 2017	February 8, 2018	57 days	December 27, 2018
1.10	March 26, 2018	May 1, 2018	36 days	TBD
1.11	June 26, 2018	August 14, 2018	49 days	TBD
1.12	September 27, 2018	November 7, 2018	41 days	TBD
1.13	December 3, 2018	TBD	TBD	TBD

IKS: Community Collaboration

❑ Networking
- Collaborating wtih RedHat/Tigera to push Egress/IPBlock Network Policy support to GA in 1.12:
https://github.com/kubernetes/features/issues/366
https://github.com/kubernetes/features/issues/367

❑ Scalability
- Allow changes in etcd settings to improve cluster creation and reduce monitoring overload
https://github.com/coreos/etcd-operator/pull/1945

❑ Storage
- Flex volume resize and flex volume metric support
- IBM Cloud Object Storage plugin
https://github.com/IBM/ibmcloud-object-storage-plugin

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IKS: Kubernetes Controller Manager (KCM)

Kubernetes cluster architecture **without** cloud controller manager
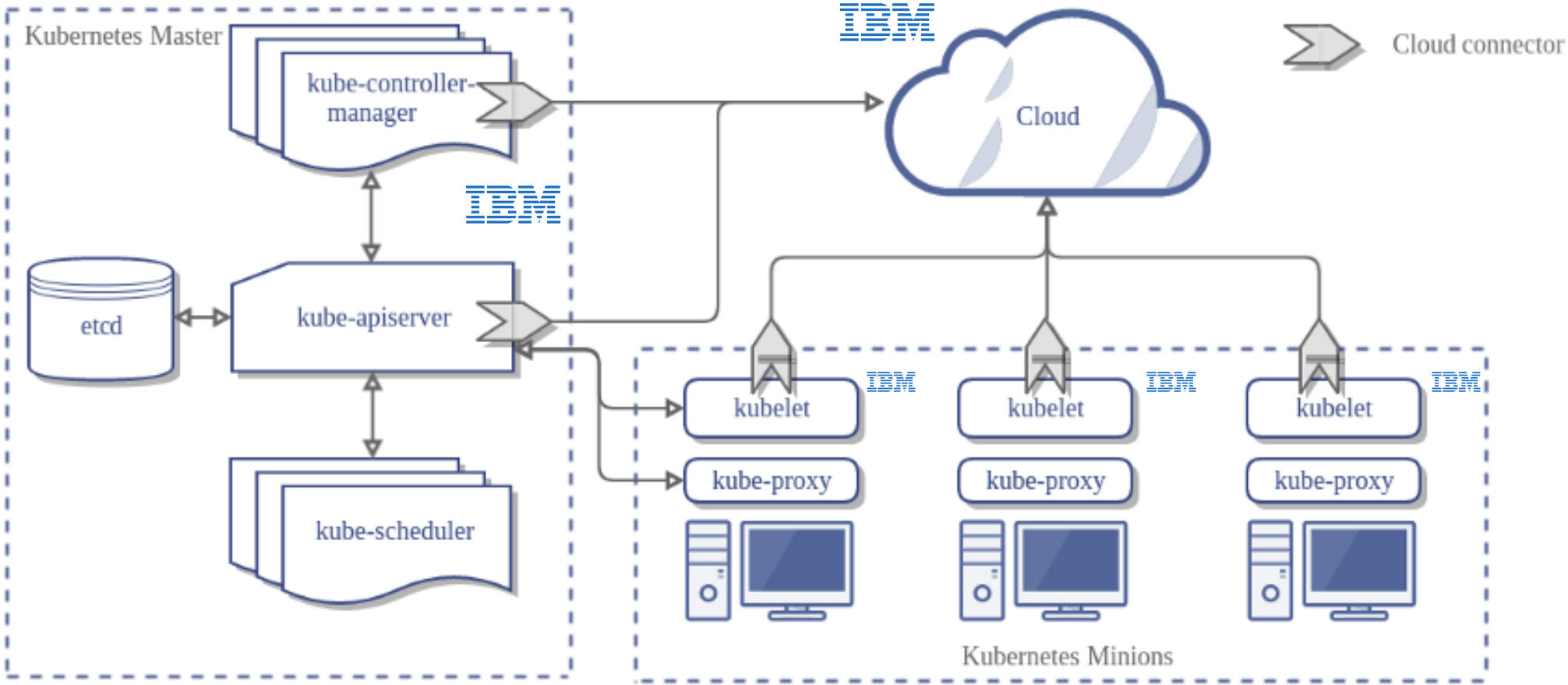
IKS: Cloud Provider Interfaces with KCM

❑ Load Balancer
- Implements in-cluster load balancers leveraging Kubernetes resources
- Manages VIP using keepalived
- In-cluster routing via kube-proxy
- Version 1.0 is iptables based LB
- Version 2.0 is IPVS based LB

❑ Instances (i.e. Nodes)
- Basic implementation, IKS node bootstrapping manages instances

❑ Zones
- Stub implementation, IKS node bootstrapping manages zones

❑ Clusters
- Not implemented

❑ Routes
- Not implemented, Calico provides routing

IKS: Kubernetes Cloud Controller Manager (CCM)

Kubernetes cluster architecture **with** cloud controller manager
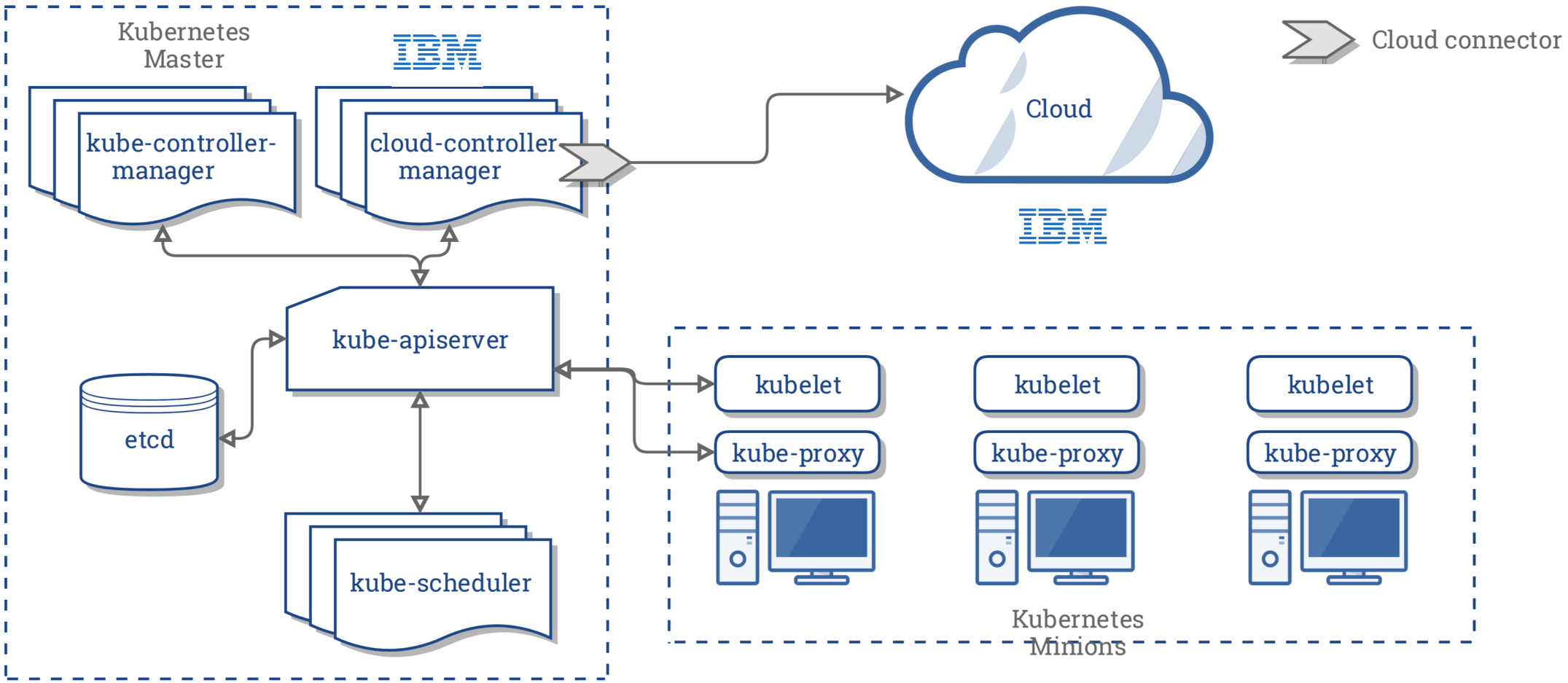
IKS: Cloud Provider Interfaces with CCM (TBD)

- ❏ Load Balancer
  - No changes
- ❏ Instances (i.e. Nodes)
  - Obtain node information from IBM Cloud rather than relying on IKS node bootstrapping
- ❏ Zones
  - Obtain zone information from IBM Cloud rather than relying on IKS node bootstrapping
- ❏ Clusters
  - No changes
- ❏ Routes
  - No changes

IBM Cloud Private

Why Multicloud

As our businesses become ecosystems for delivering greater value in a digital world , a multi-cloud strategy is not only the new reality, but the fastest path to new value - connecting multiple cloud environments or connecting cloud and on-premises environments.
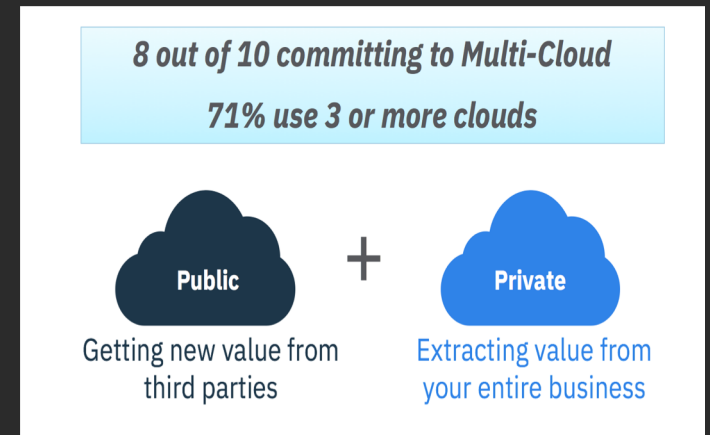
☐ **Unique Needs**
   You can run each workload where it performs best, for the lowest cost.

☐ **Legacy Apps**
   You can avoid the pain of migrating legacy apps to a new platform.
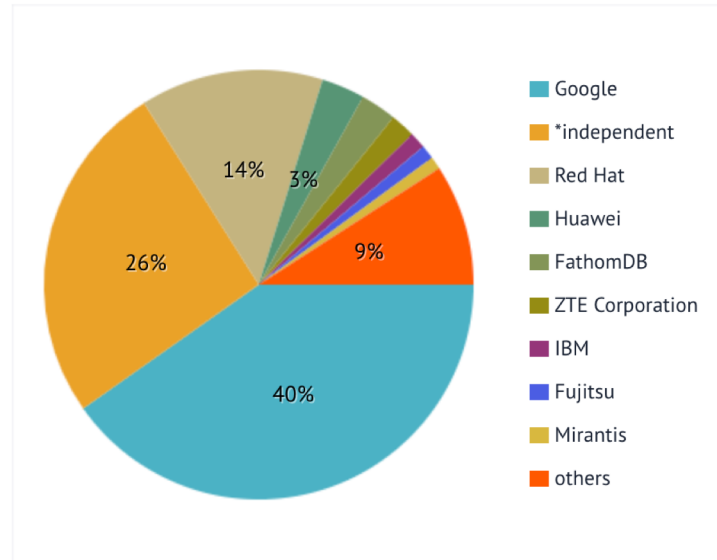
☐ **Desire to Diversify**
   You can avoid vendor lock-in and latency while creating redundancy.

8 out of 10 committing to Multi-Cloud

71% use 3 or more clouds

Public
Getting new value from third parties

+

Private
Extracting value from your entire business

Contribution to Open Source

Kubernetes

Istio
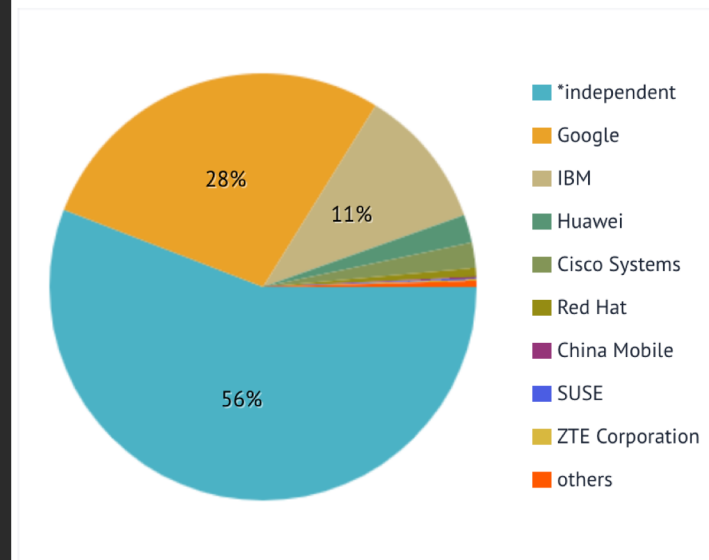
Kubernetes Federation V2

Attendees:
- Huawei
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1. Redhat
2. Huawei
3. IBM

Contribution to Open Source

❏ Cluster-Registry
- ✓ Keep track of and perform operations on your clusters.
- ✓ Cluster Registry API (code, design) as a Kubernetes CRD
- ✓ Used by IBM Multicloud Manager

❏ Application
- ✓ Simplify application deployment.
- ✓ [Difference with Helm Chart](#)
- ✓ Used by IBM Multicloud Manager

❏ Ingress Controller
- ✓ Access Kubernetes service via Ingress
- ✓ Used by IBM Cloud Private and IBM Multicloud Manager

Summary

- ❑ A SIG for building, deploying, maintaining, supporting, and using Kubernetes on IBM Public and Private Clouds
- ❑ Join the SIG Discussions
  - ❑ Follow the evolution of the IKS, ICP and Multicloud Manager platforms with respect to Kubernetes and related CNCF projects
- ❑ The IBM Cloud team significantly contributes to the community
- ❑ The near term goal of the SIG is to investigate open source of the IBM cloud provider code used by IKS

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Thank you

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