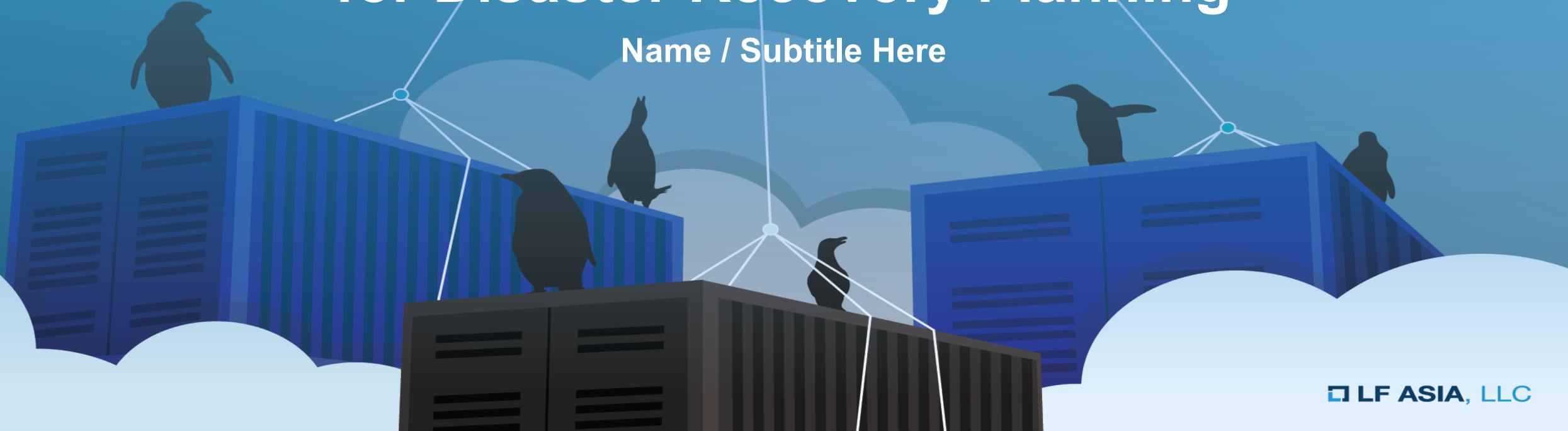


THINK OPEN

开放性思维

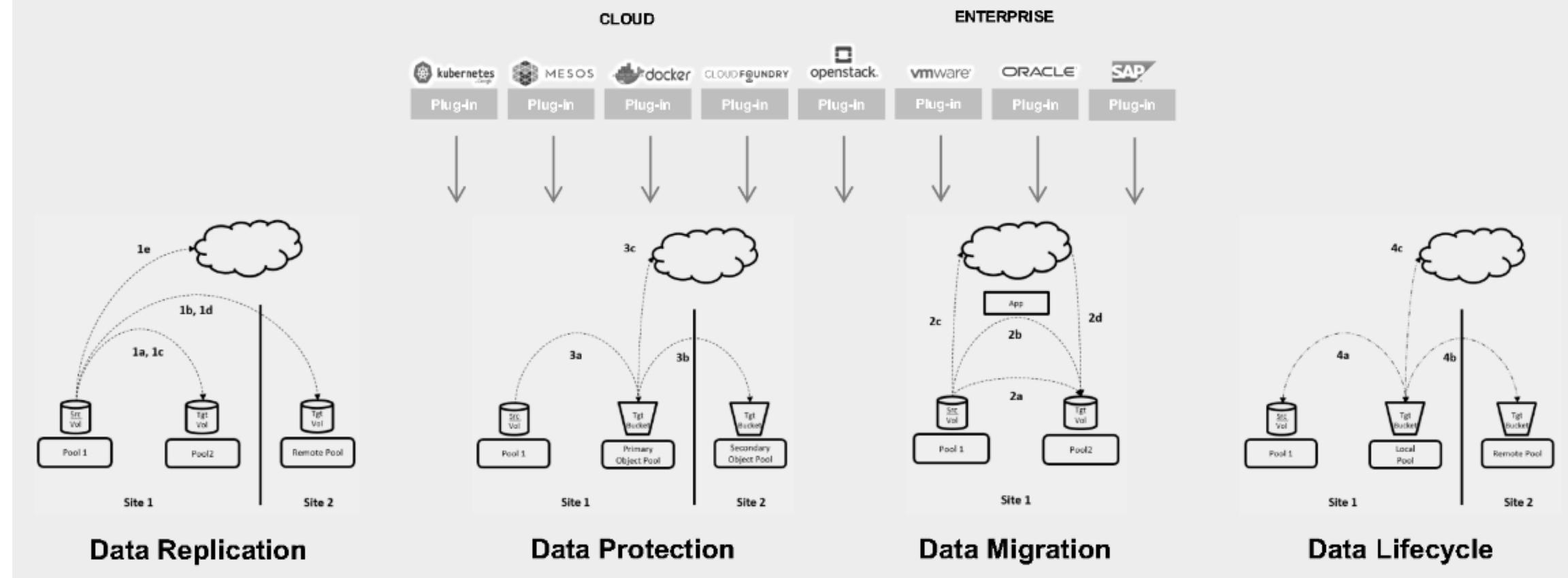
Using OpenSDS Scale-Out Data Replication for Disaster Recovery Planning

Name / Subtitle Here



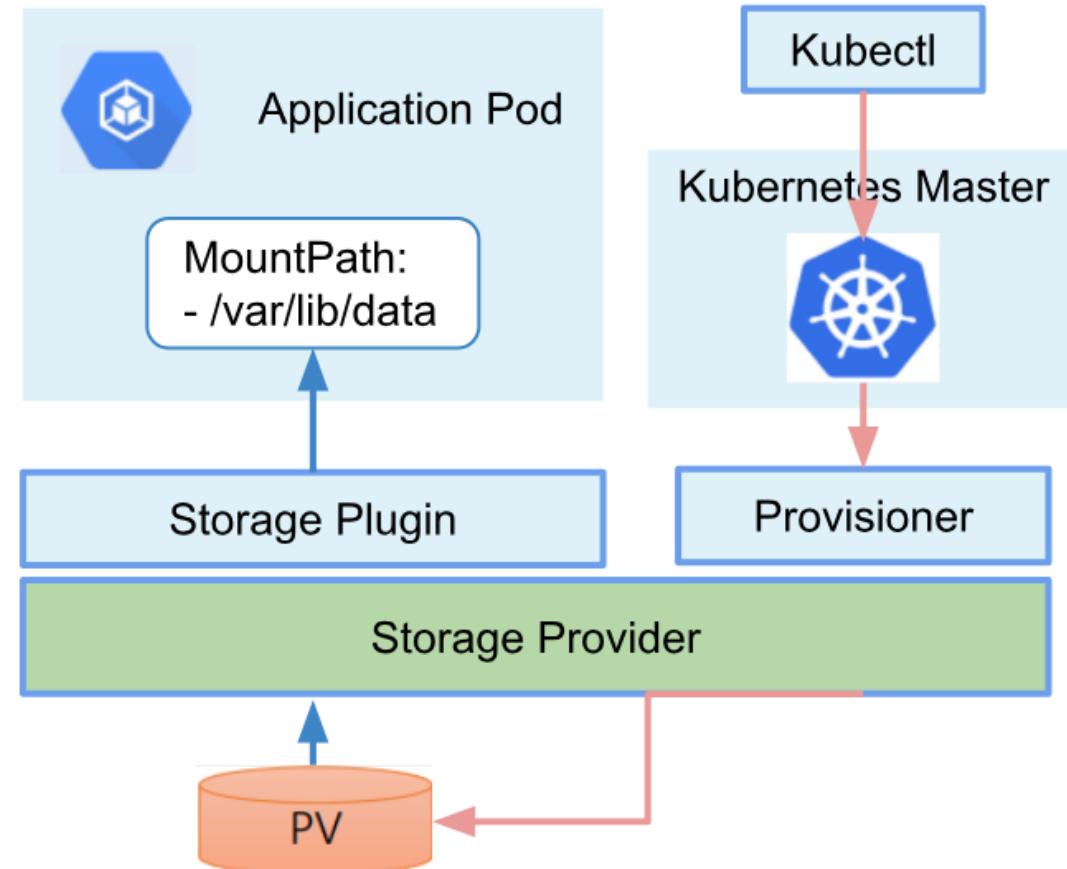
Background: storage orchestration requirement

Built-in advanced **automated storage and data services** that respond to any compute frameworks in a common way across traditional data centers, private and public clouds



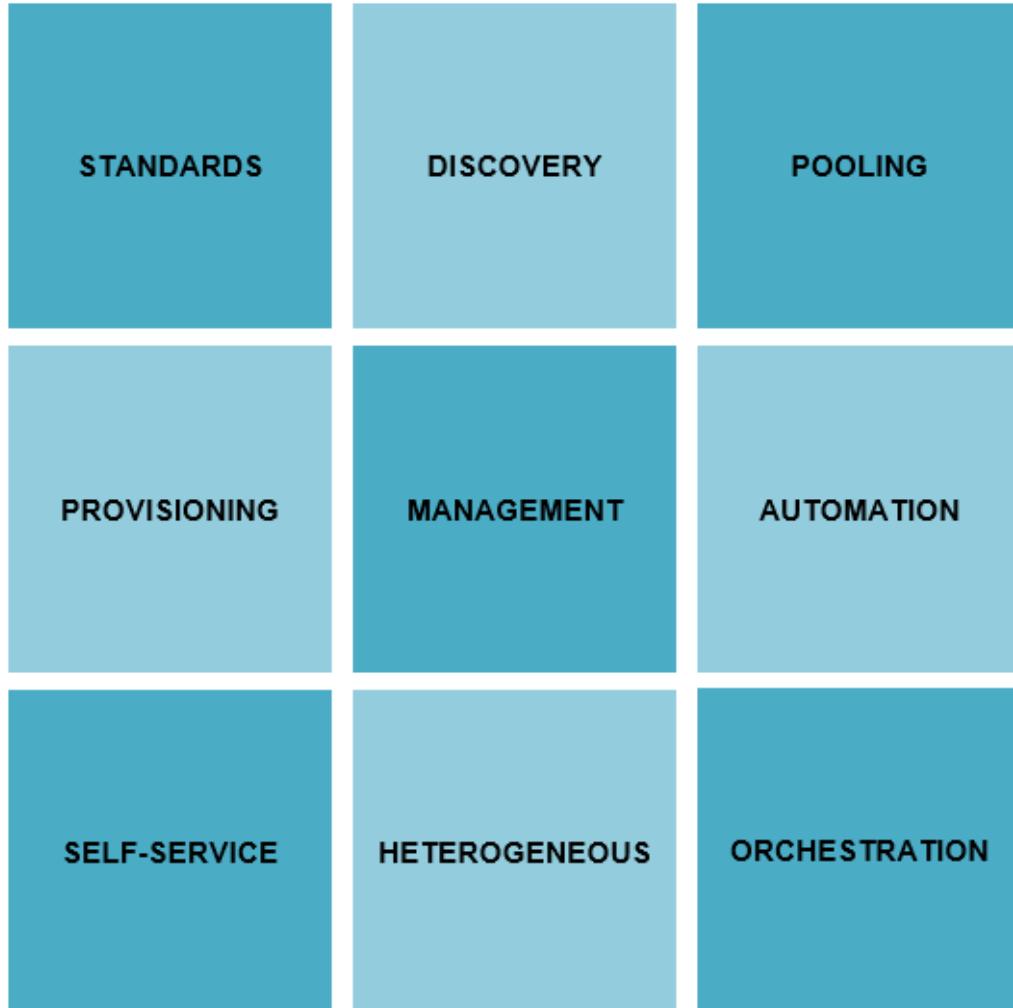
Background: storage in Kubernetes

- By leveraging storage orchestration feature provided by Kubernetes, user can create/delete/attach/detach persistent volume to/from their pod
- CSI (container-storage-interface) is well known for standardizing the storage management interface for COs (container orchestrator). Kubernetes has supported it as alpha feature since v1.9, and it has grown up as beta feature in v1.10
- CSI feature is still at early stage, for only supporting basic volume management operations, and it would be a long-term goal to support more advanced storage features (snapshot, resize, replication, etc)
- Can we provide a way to **perform storage orchestration operation in Kubernetes?**



OpenSDS

OpenSDS provides advance SDS management with [discovery](#), [pooling](#), [standards](#), [automation](#) and [orchestration](#) for [scale-out](#) cloud-native environments



OpenSDS: community



Technical Steering Committee



Steven Tan, Chairman
Huawei, VP & CTO Cloud Storage Solution



Rakesh Jain, Vice-Chair
IBM, Research Engineer and Architect



Allen Samuels
Western Digital, R&D Engineering Fellow



Anjaneya "Reddy" Chagam
Intel, Chief SDS Architect



Jay Bryant
Lenovo, Cloud Storage Lead

End-User Advisory Committee



Cosimo Rossetti
Vodafone, Lead Storage Architect



Yusuke Sato
Yahoo Japan, Infrastructure Lead

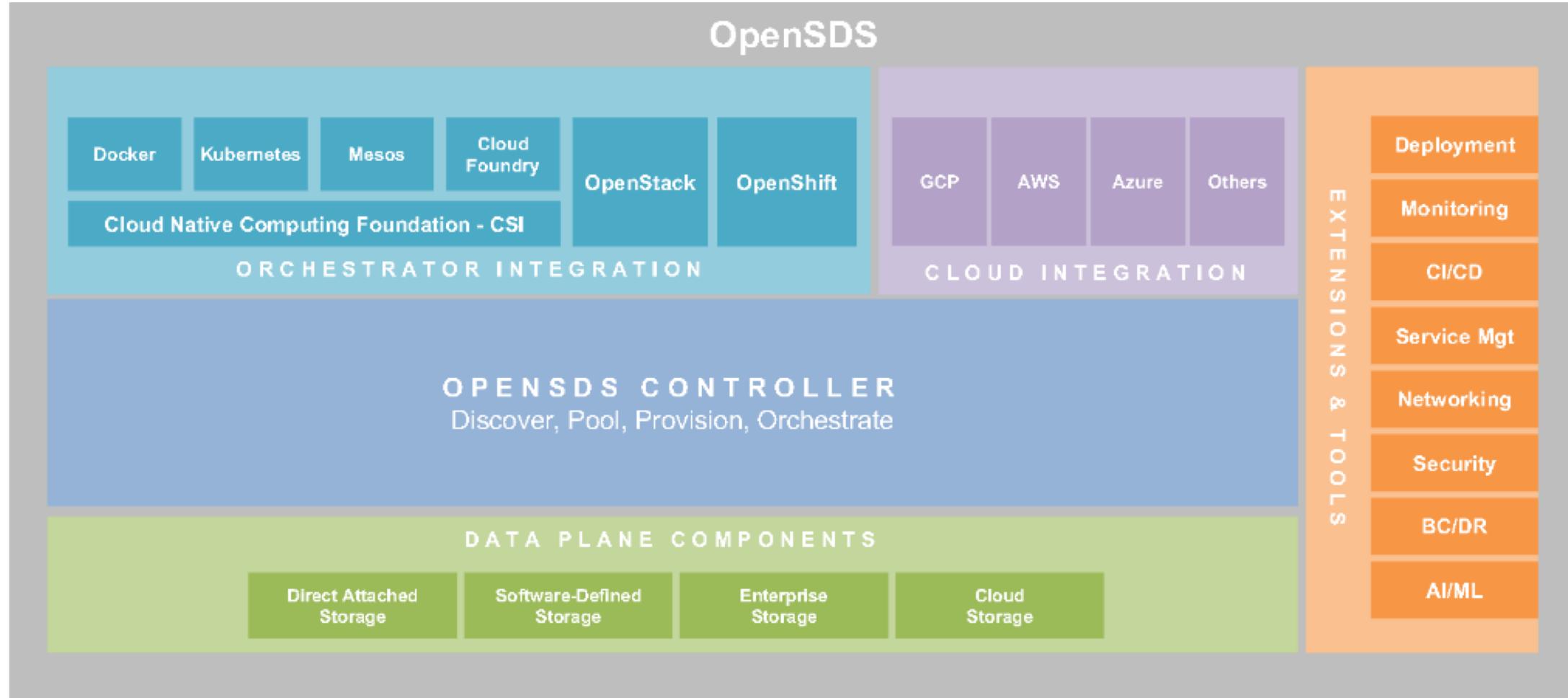


Kei Kusunoki
NTT Communications, Storage Architect

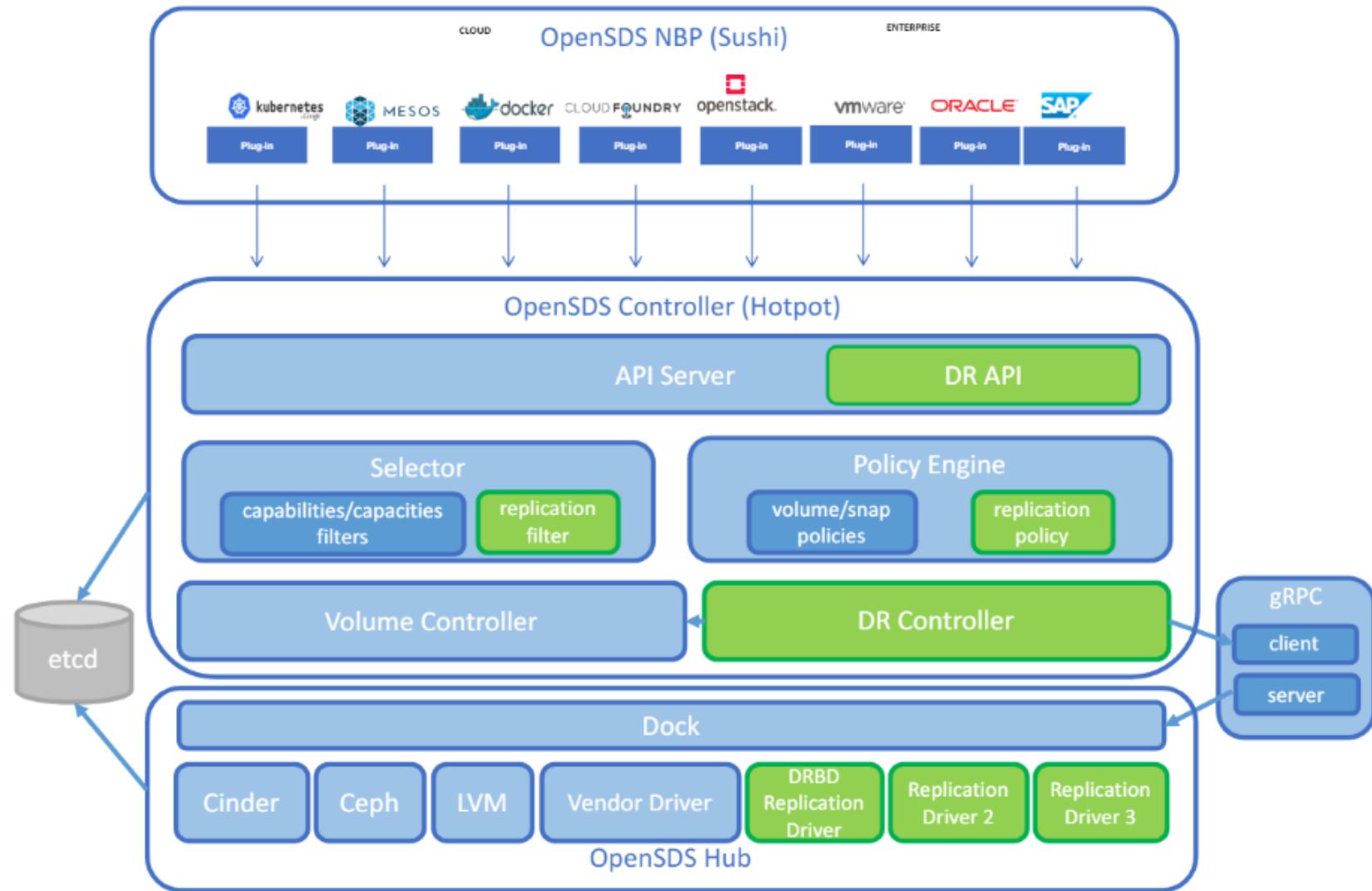


Yuji Yazawa
Toyota ITC, Group Lead

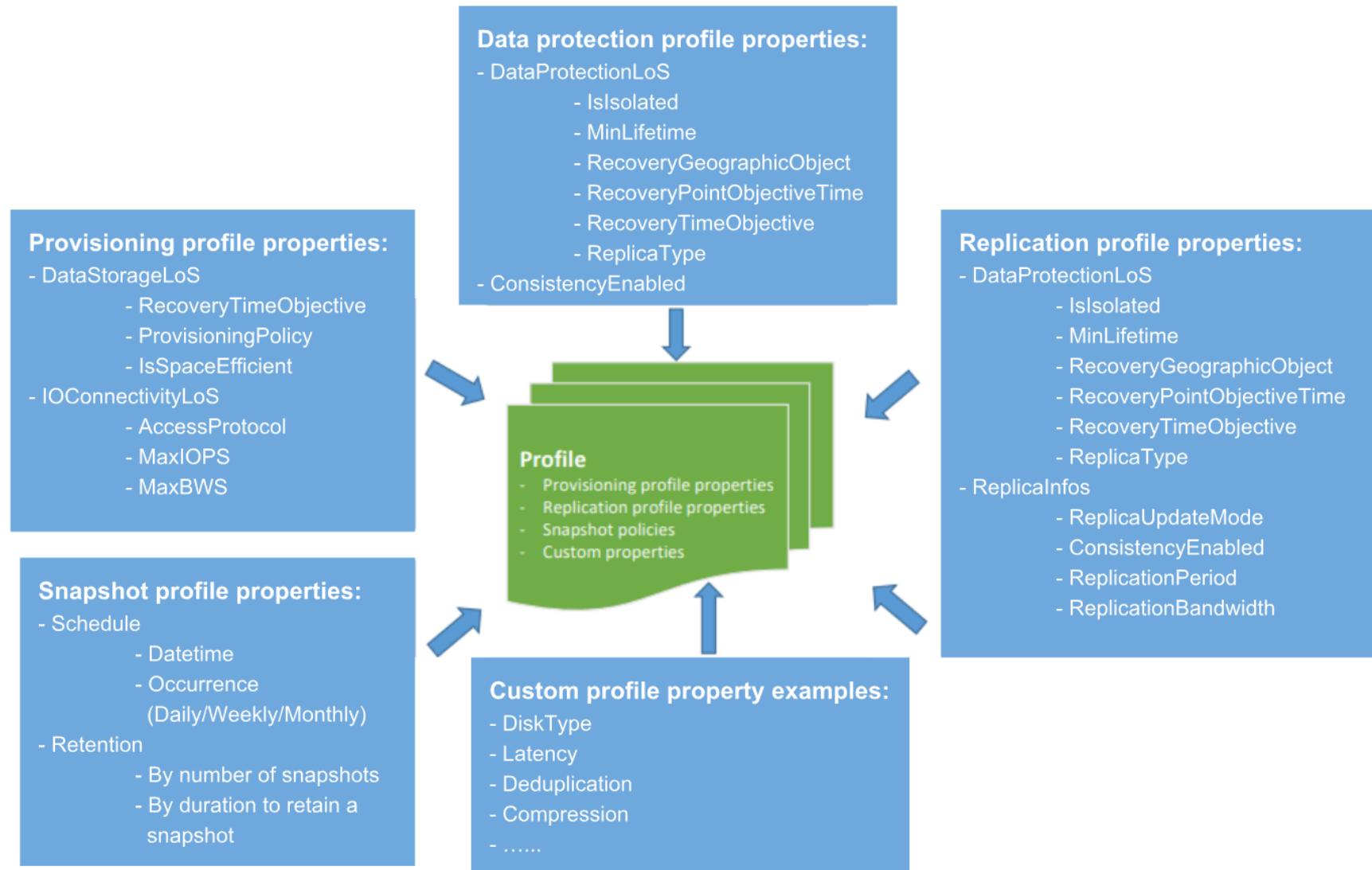
OpenSDS: framework



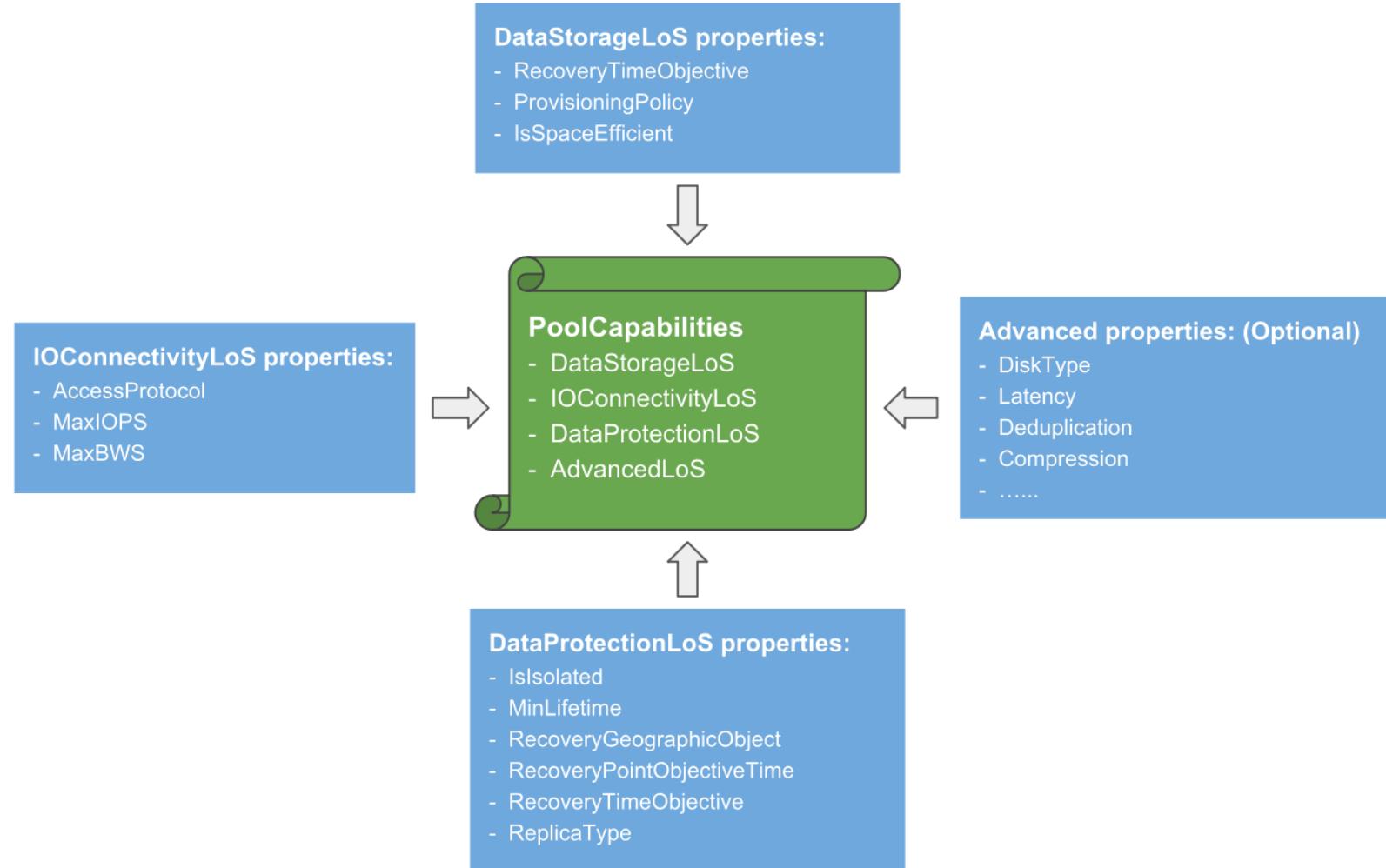
OpenSDS: architecture



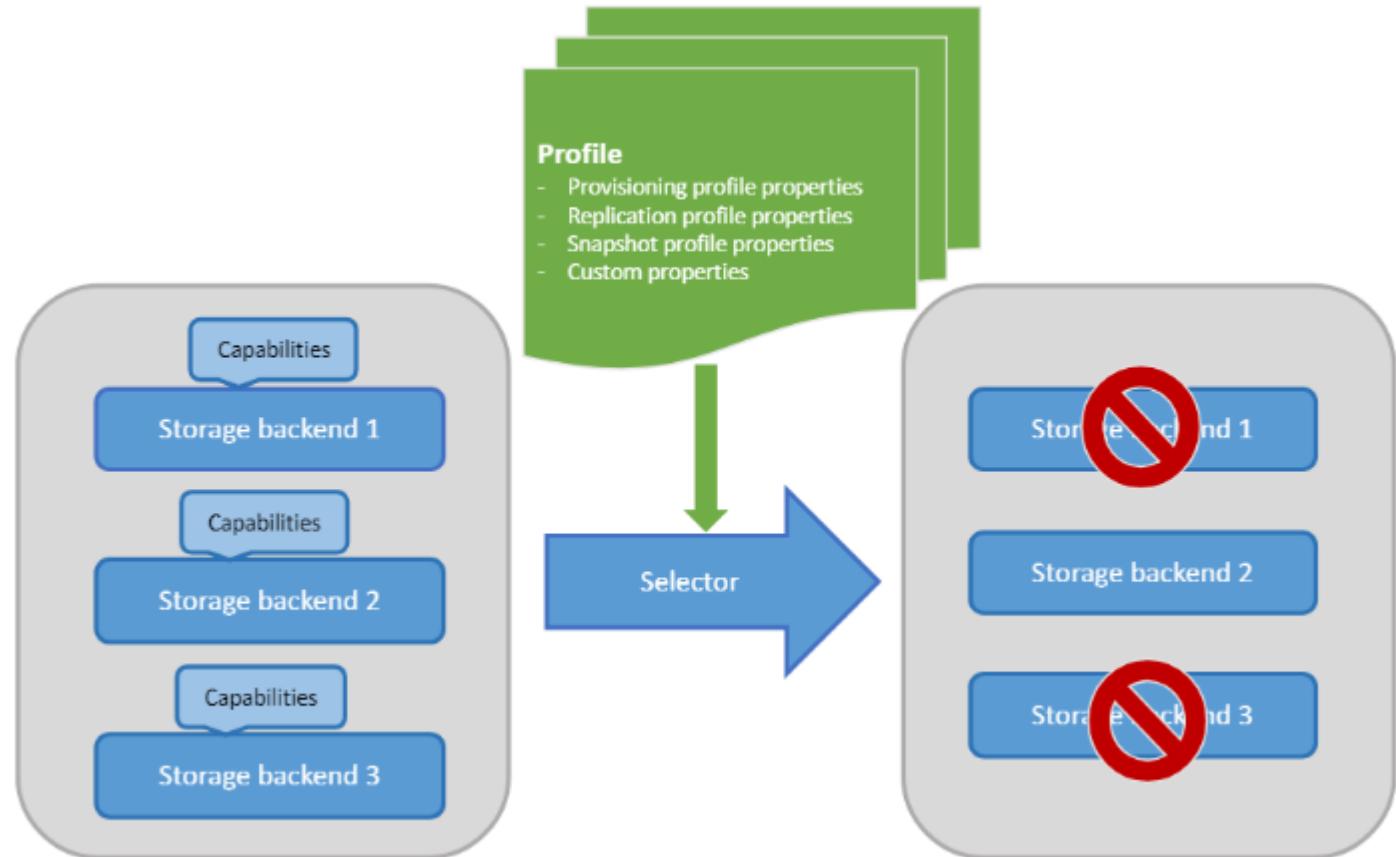
OpenSDS: Profile definition



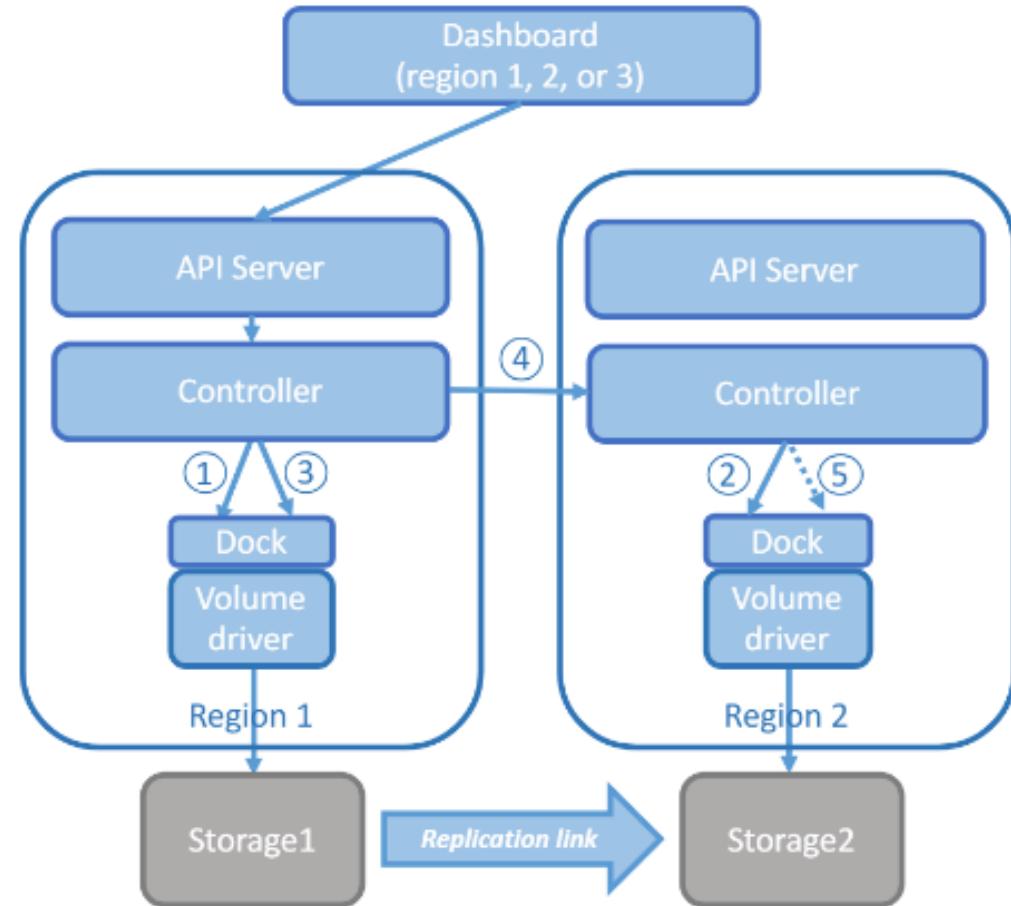
OpenSDS: PoolCapabilities definition



OpenSDS: policy-based filter

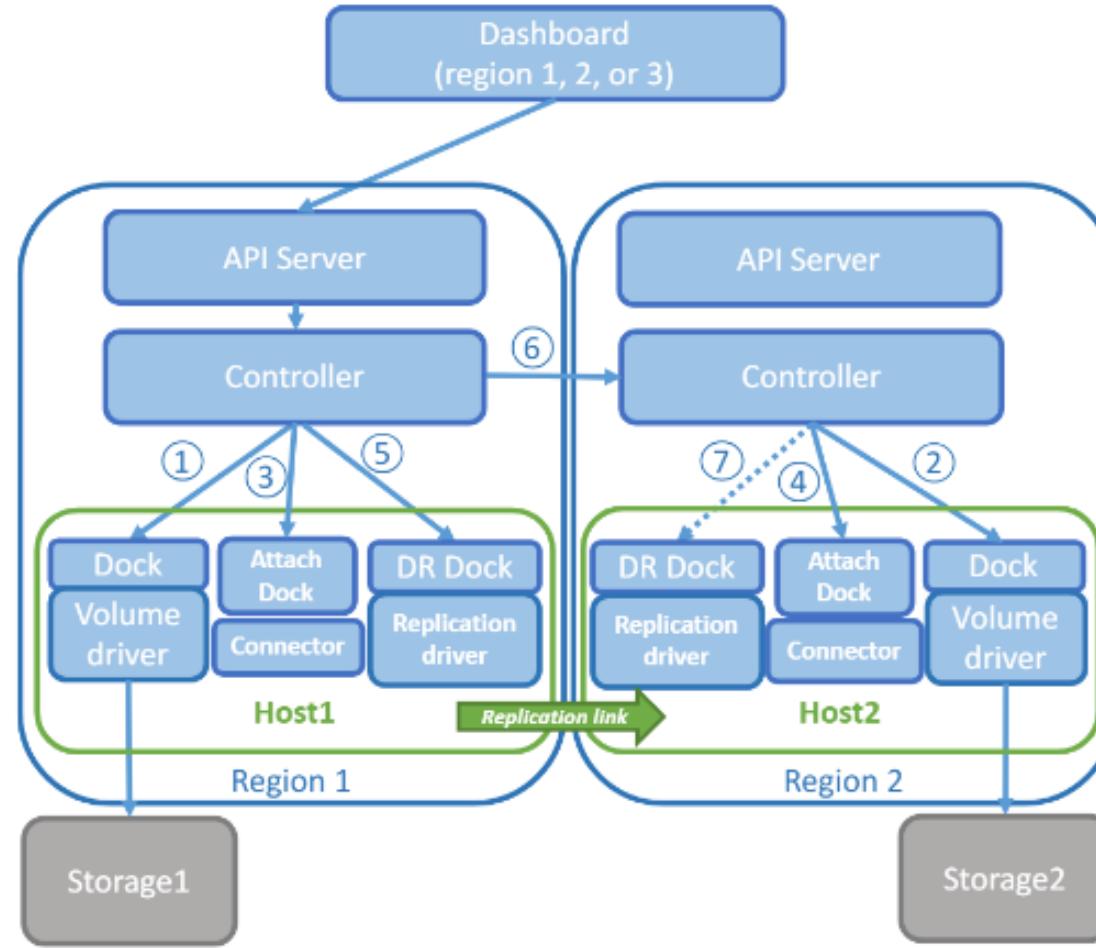


OpenSDS: array-based replication



1. Creates source volume
 - Creates entry in db
 - Creates volume on Storage1.
2. Creates target volume
 - Creates entry in db
 - Creates volume on Storage2
3. Creates source replication
 - Creates entry in db
 - Creates replication relationship on Storage1 and Storage2
4. Controller 1 communicates with controller 2 to create target replication
5. Controller 2 creates entry in db

OpenSDS: host-based replication

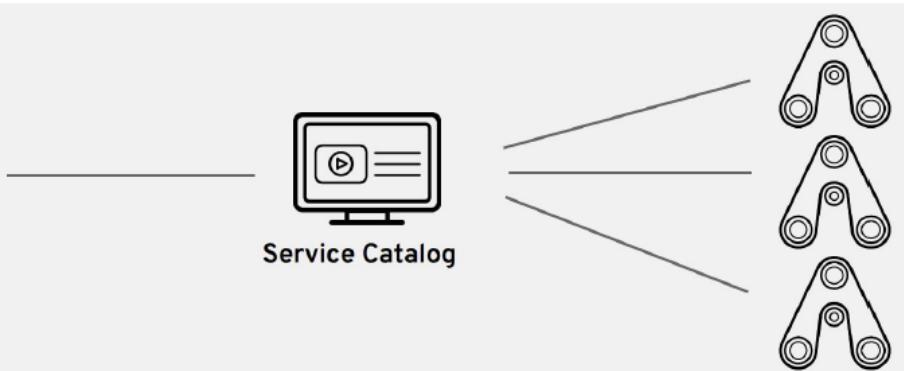
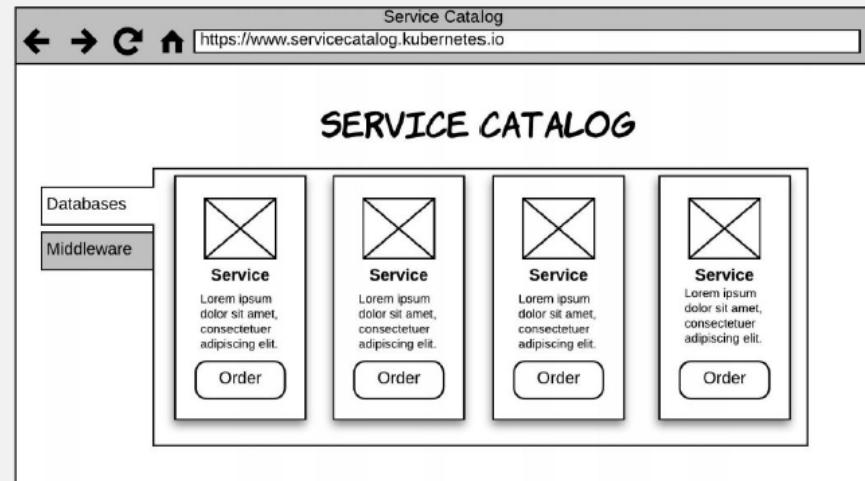


1. Creates source volume
 - Creates entry in db
 - Creates volume on Storage1
2. Creates target volume
 - Creates entry in db
 - Creates volume on Storage2
3. Attach source volume to Host1
 - Update volume entry in db with host info
4. Attach target volume to Host2
 - Update volume entry in db with host info
5. Controller 1 Creates source replication
 - Creates entry in db
 - Creates replication relationship on Host1 and Host2 (Host1 is primary)
6. Controller 1 communicates with controller 2 to create target replication
7. Controller 2 creates entry for target replication in db

Service Catalog

A Centralized Location for Services

- The service catalog provides a central place for consuming services



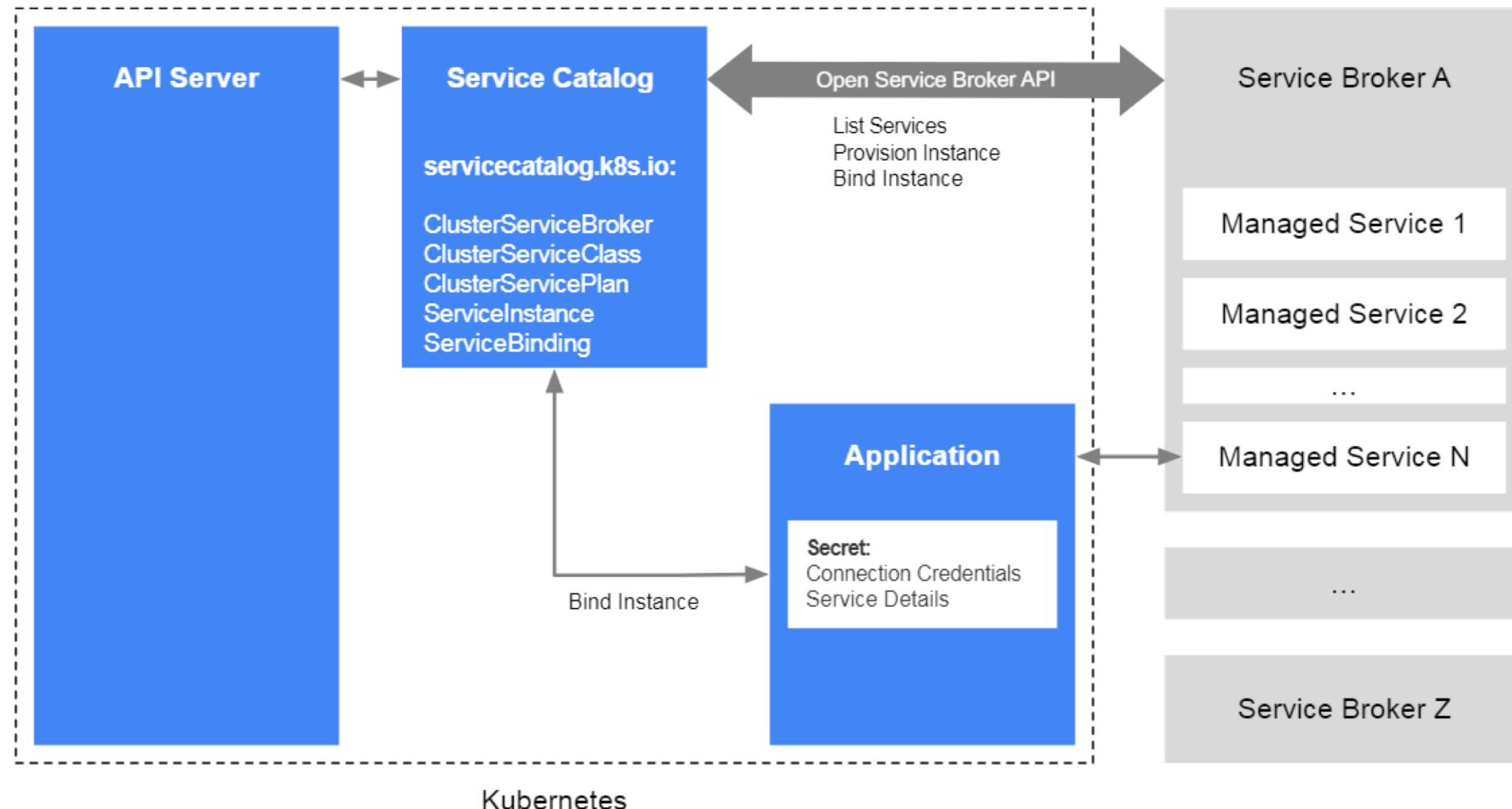
Service Catalog: community

- Integration between Kubernetes and brokers implementing the OSB API
- Timeline
 - September 2016 - Special Interest Group (SIG) formed
 - October 2016 - Incubator Repository Created
 - <https://github.com/kubernetes-incubator/service-catalog>
 - March 2017 - Alpha released

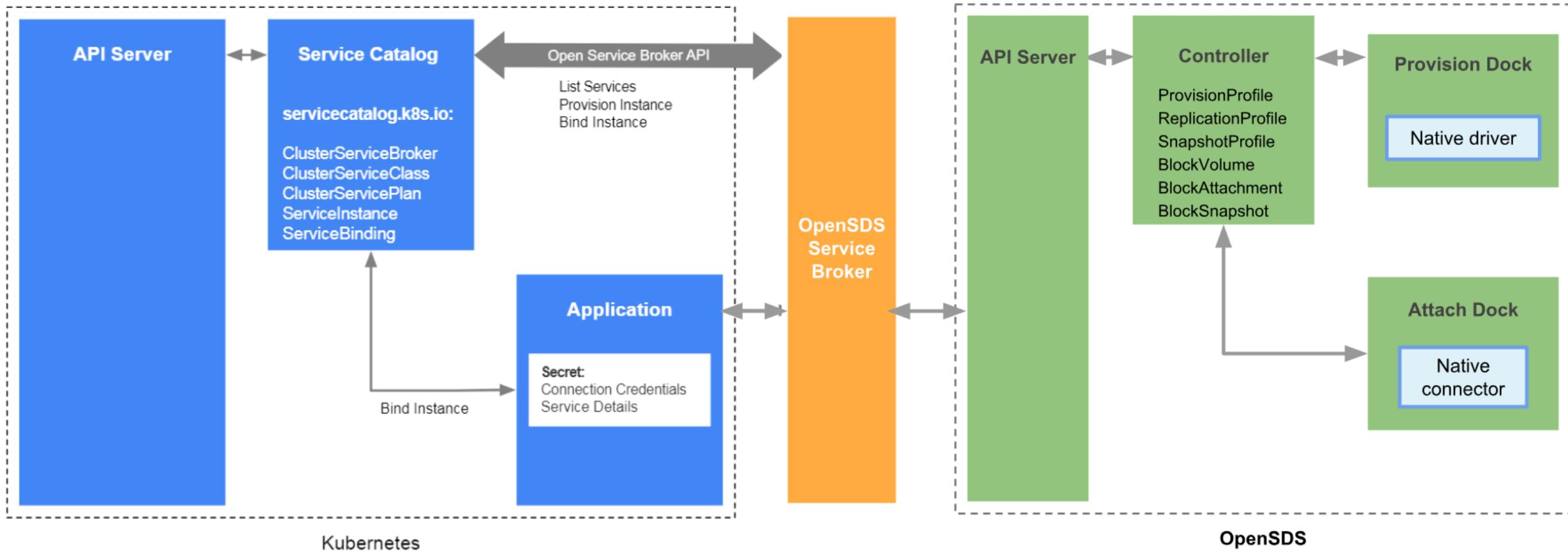


- Successor to the Cloud Foundry Service Broker API
- Existing ecosystem provided along with the API
- History
 - September 2016 - Working group formed
 - December 2016 - Publically announced

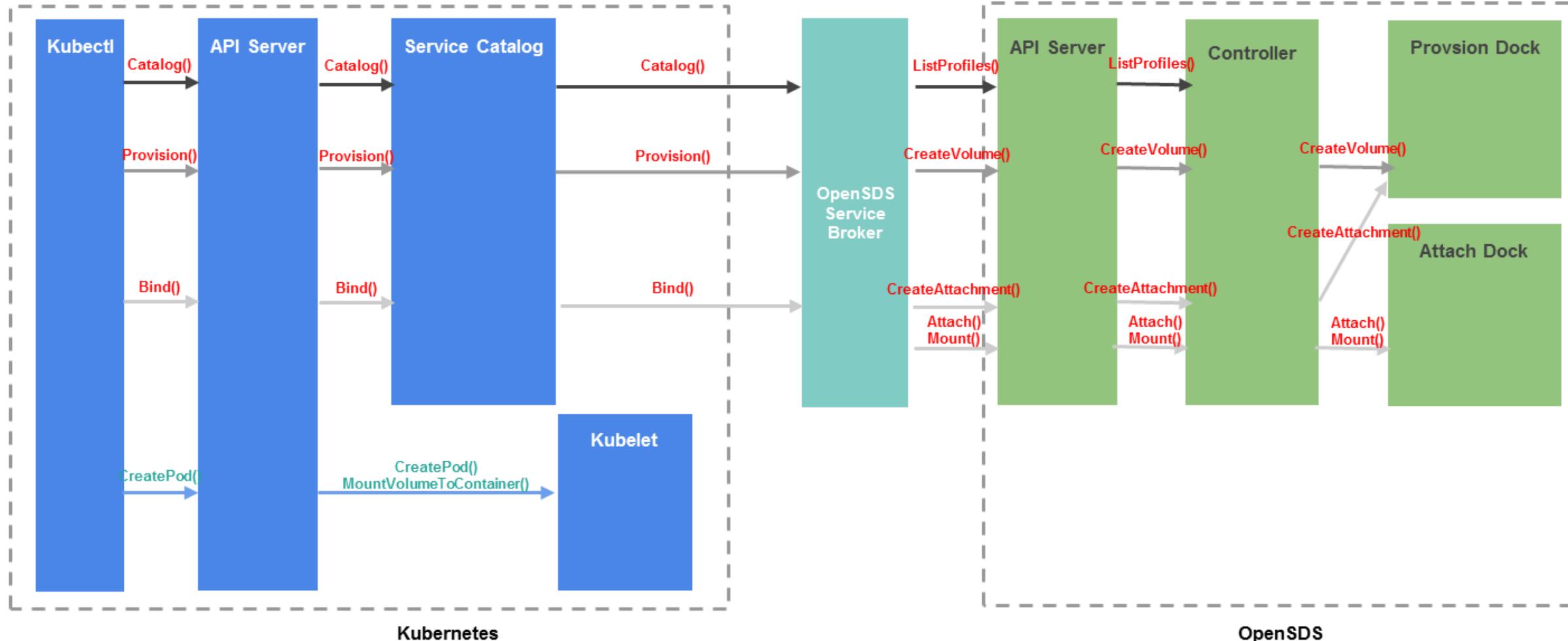
Service Catalog: architecture



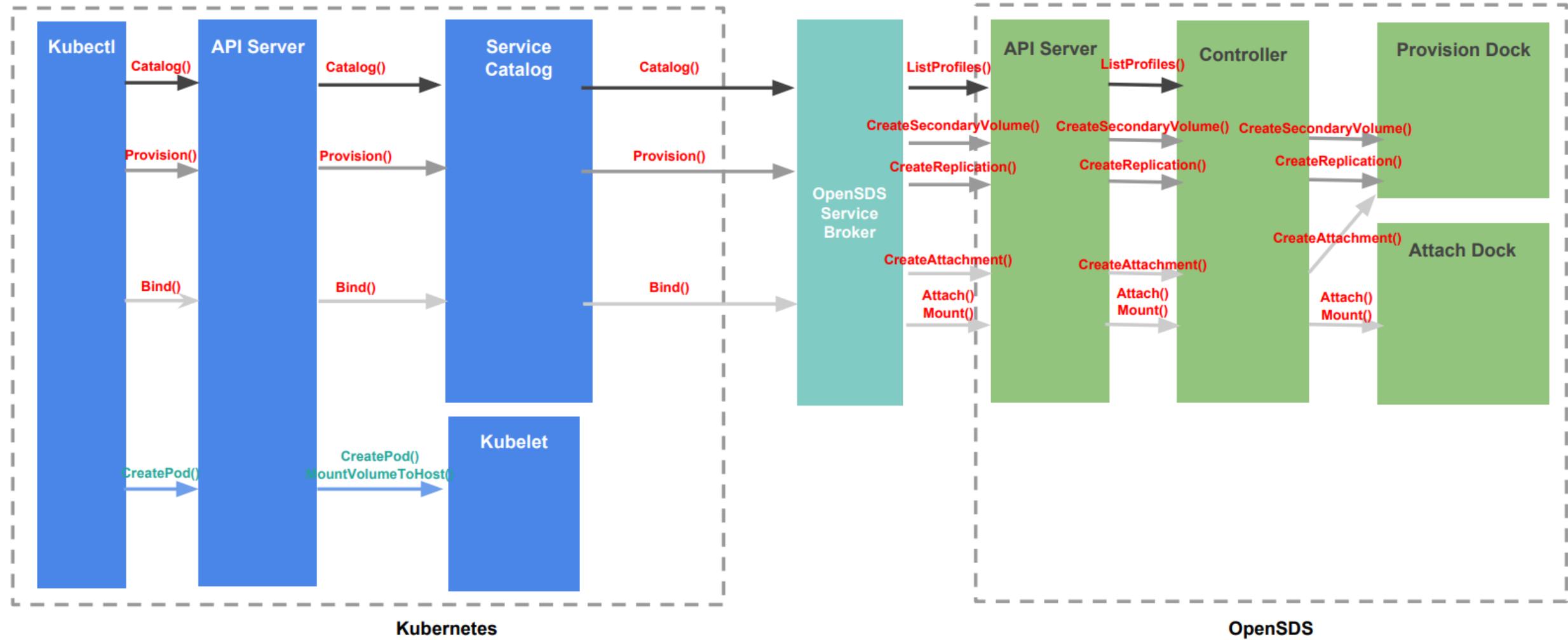
Proposed solution: architecture



Proposed solution: volume workflow



Proposed solution: replication workflow



Future work

- Short term
 - Currently we have only tested ‘hostPath’ storage plugin in raw block volume scenario, but we will target ‘local’ storage plugin support
 - Support host-based replication in OpenSDS service broker
 - Support more storage drivers in OpenSDS
- Long term
 - Assumption: What if we create a new resource (like ‘PodPreSet’) that can dynamically bind the service instance at the same time of starting application pod?



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“Quote Placeholder”



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