STORAGE DEVELOPER CONFERENCE
SDC 21
BY Developers FOR Developers

Virtual Conference
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A SNIA Event

Data Management Going Beyond Storage Boxes

Exploring Trends in Cloud Native Data Management

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soda foundation

Connected.

Anywhere

Data Management Across

Edge

Core

Cloud

File

Block

Object

Platforms

Applications

Use cases

We want

Unified

Global

Across Edge Core and Cloud

Across File, Block and Object

Across platforms, applications and use cases

STaaS to CSTaaS

(STorage as a Service to Container STorage as a Service)

SODA Data & Storage Survey 2021[#0]

- Platform use pivoting to **container-based environments**
- Over the last 5 years there has been a seemingly **rapid transition from VMs to containers.**
- Kubernetes deployments came top (in fact **top 3 positions - K8S cloud, Hybrid K8S, K8S on prem**)
- Organizations are using **Container Storage for real use cases deployments**

Other Industry Reports / Surveys

- **Application Container** Market CAGR **26.5%** (2019-25)[#1]
- **CaaS** CAGR **35%** (2021-26)[#2]
- Installed base of **container instances** CAGR **62.1%**(2019-23)[#3]
- **84%** using Container in **Production**[#4]

Container centric storage solutions | Hybrid Cloud Data Management for DR | Momentum towards CSTaaS

Solutions Trend

- **Logical solutions to provide end to end data management**
  - With Storage Boxes + Features
  - Outside box features for Data Management, O&M, …
  - Third party storage support
  - Container Deployment Support
  - Multi-Cloud support
  - Application Aware

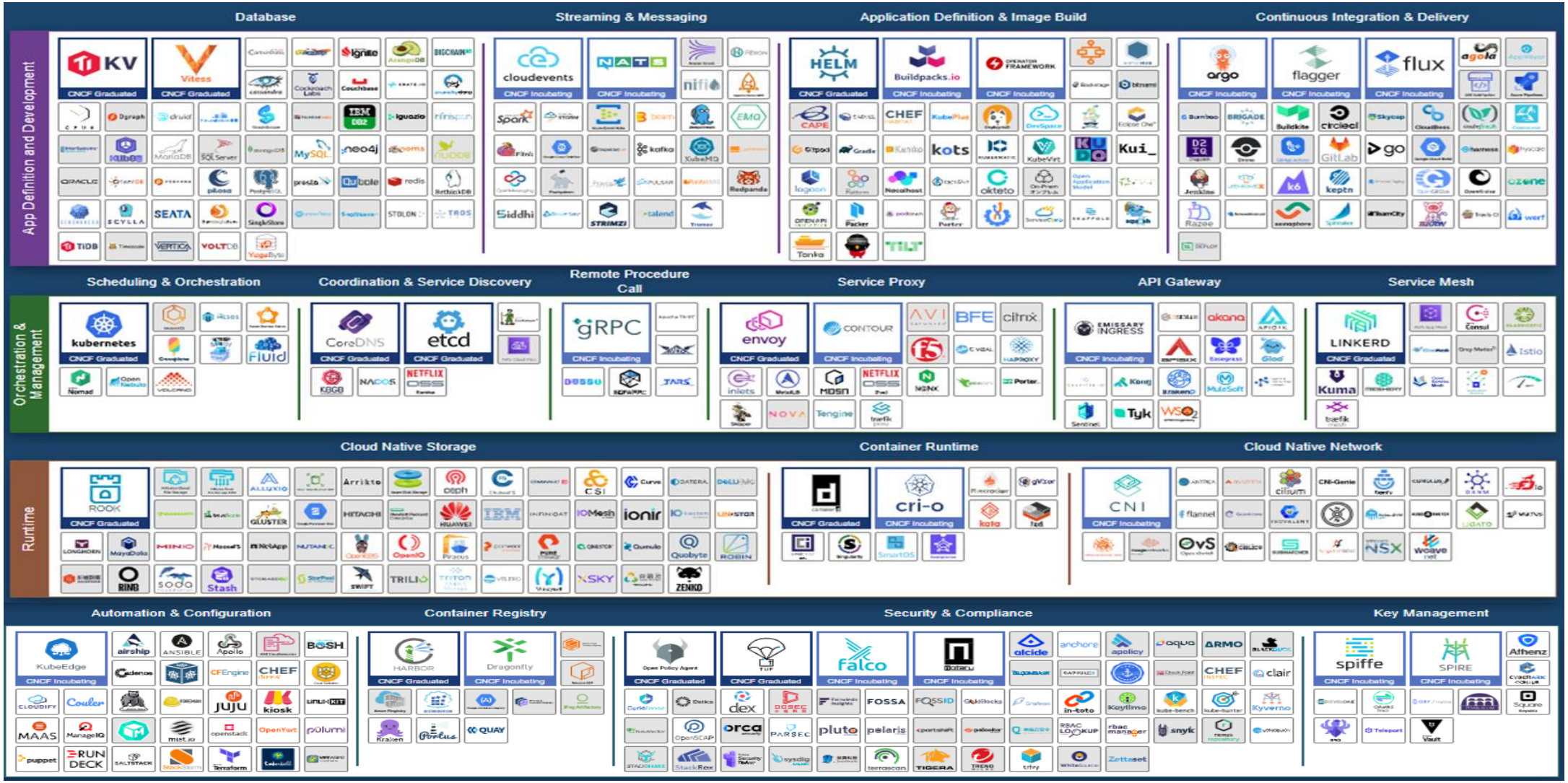
A few examples:

- NetApp Astra : Application aware data management service built for Kubernetes
- VMware Tanzu & VMware Valero : enables you to build, run and manage modern apps on any cloud, back up and restore your Kubernetes cluster resources and persistent volumes
- Pure Service Orchestrator: Storage as a service for containers; gives developers the agility of public cloud with the reliability and security of on-premises infrastructure

Note: There are similar other products from other vendors and above are just examples for reference.

Not limited to Storage Box Features
Best utilize existing open source / own products to build the solution
Application Aware data management & Container Storage push this trend

Container Landscape is growing exponentially!



Container Data Management

Cloud Native Storage, Container Storage, CSI…

Cloud Native Storage(CNS)

Software Defined Storage - that is API driven and customers can auto-provision. A storage solution that is secure, performant and scalable to application demands.

Container Storage

Container centric storage solutions are Cloud Native Storage solutions and more.

Declarative API (GitOps), Auto-healing and 1000x in terms of Volume Churn. Scale up and down.

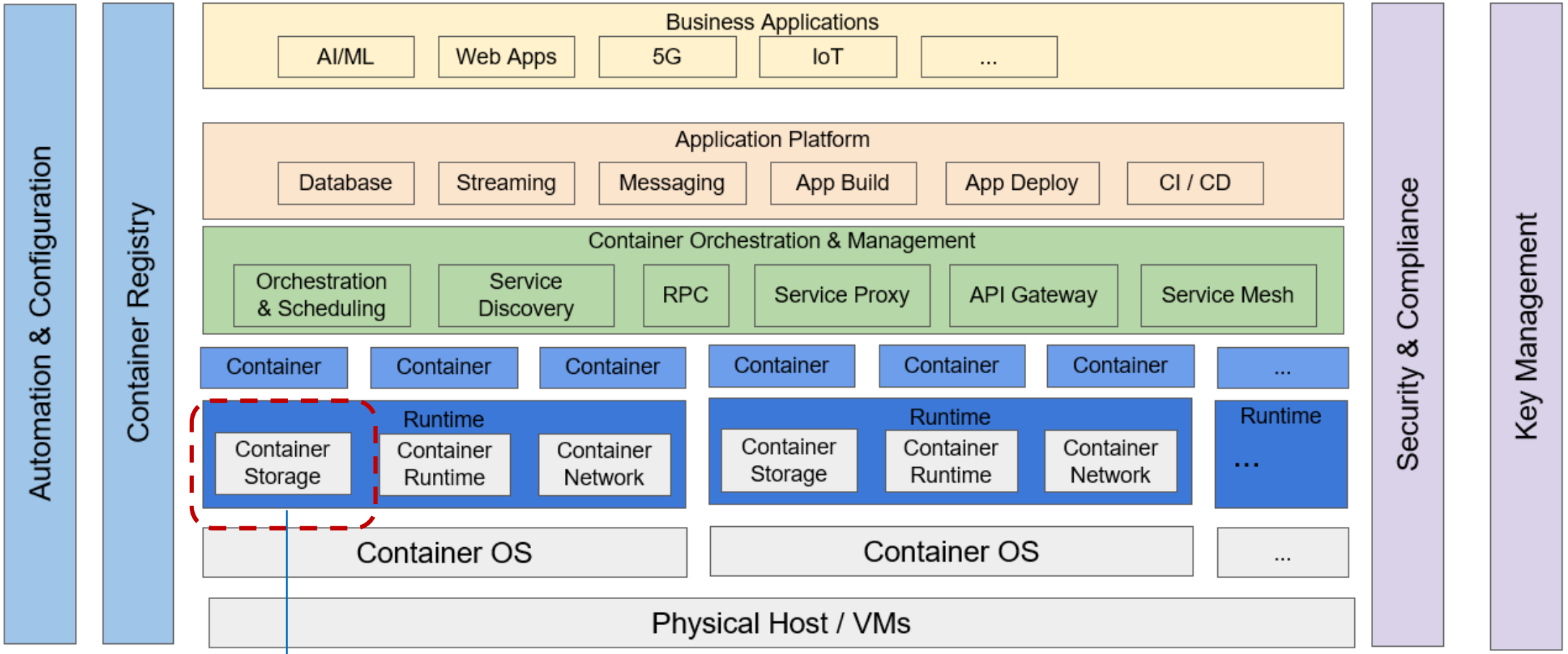
Developer productivity, cost optimization and truly hybrid.

Container Storage Interface

Container Storage Interface (CSI) is a specification on how Container Orchestrators interact with Storage Solutions to connect to Containers.

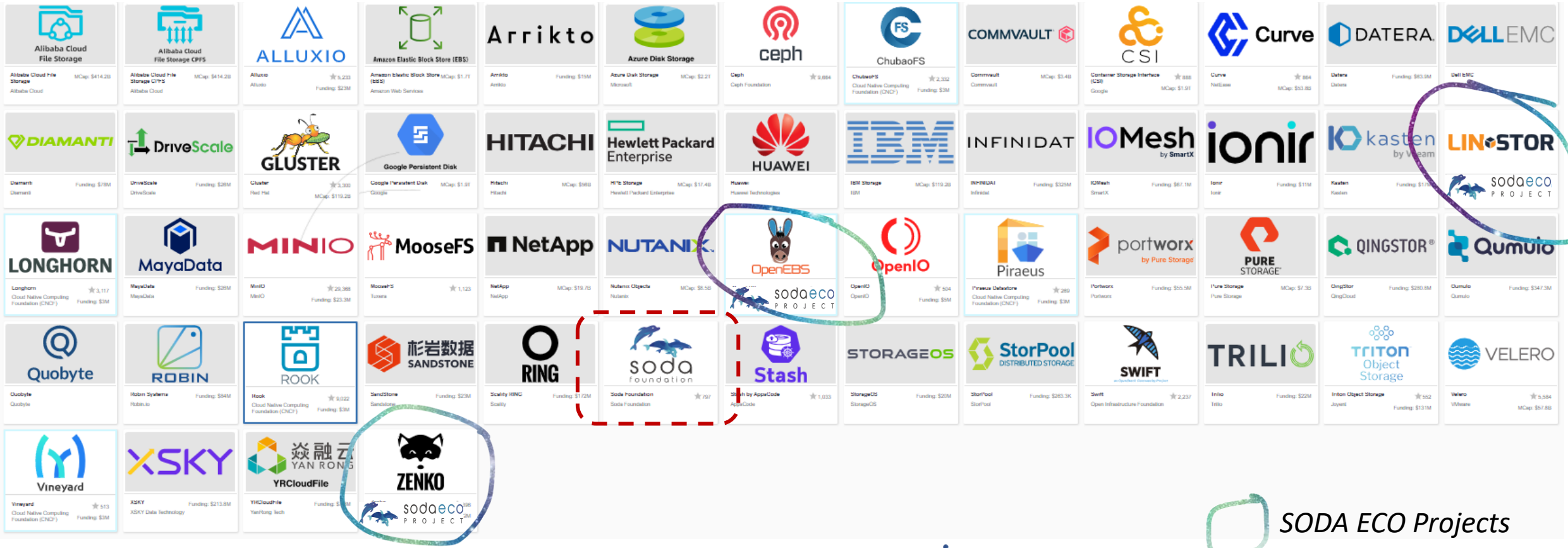
Container Storage is CNS, other way need not be true | CSI is an interface specification

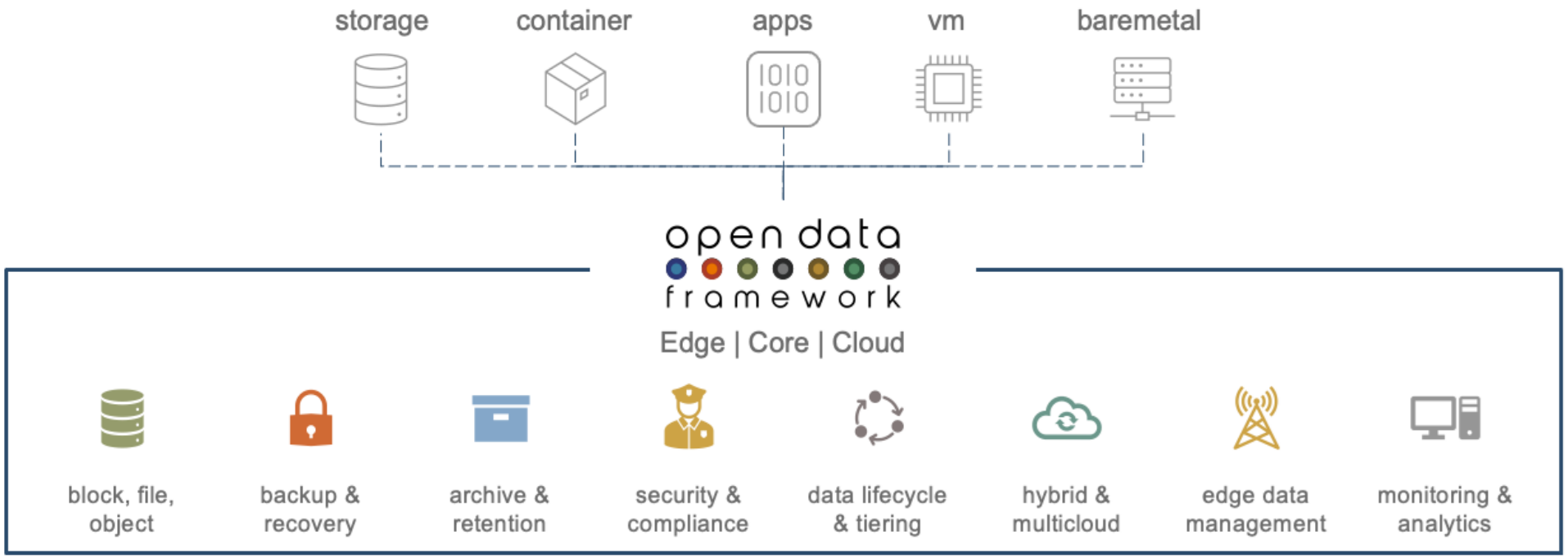
Cloud Native Stack



Storage Boxes

Cloud Native Storage Projects

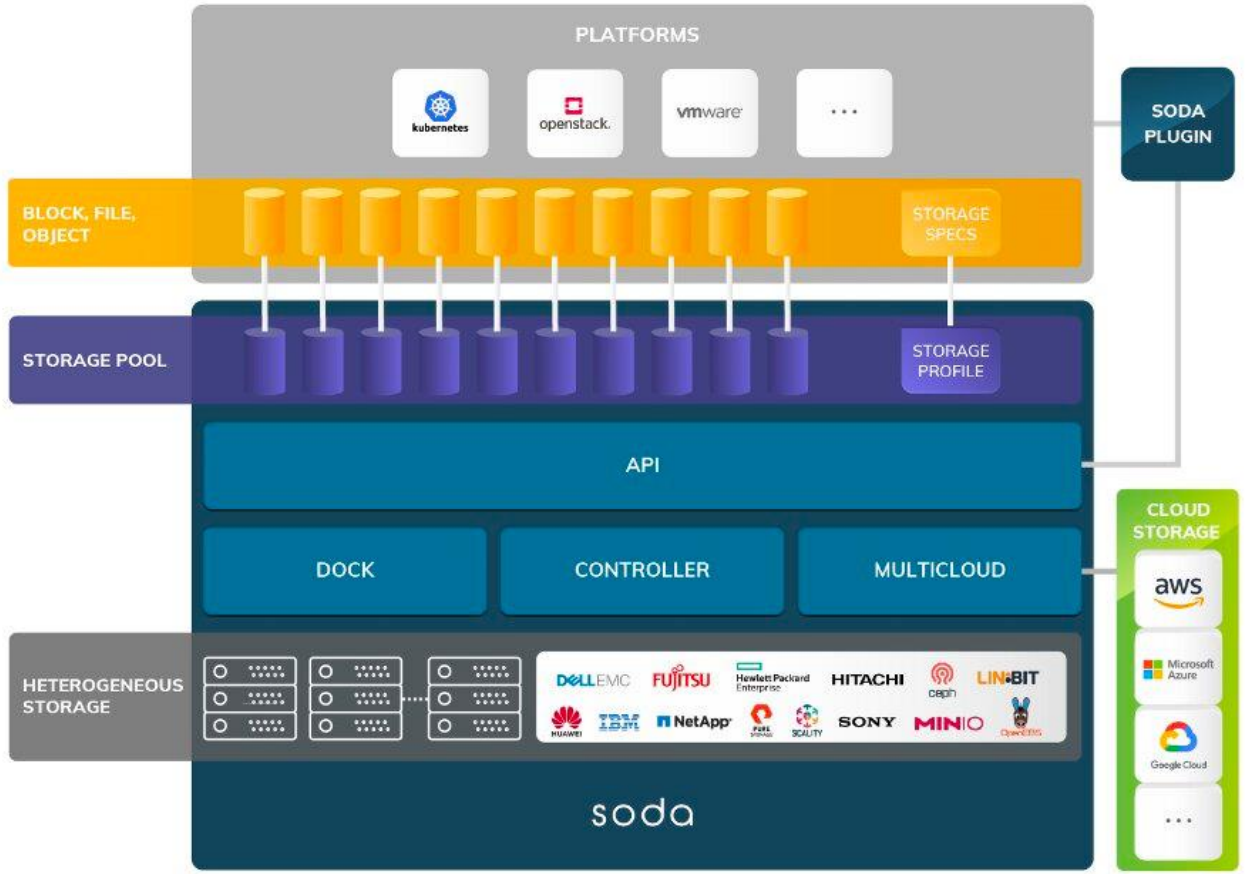




Unify Data And Storage Management With A Single Open Framework Across The Core, Cloud And Edge

SODA ODF

SODA Open Data Framework (ODF) is an open source software developed by SODA Foundation. ODF connects **data end to end**, from platform to storage, and from **edge to core to cloud**, and manages all the data in between. Goal is to let users use this data framework with **any platform and application** to build **end to end** solutions easily.



KEY PROPOSITIONS

Open Source – prevents vendor lock-in
Connects Data Silos – eliminates data fragmentation
Extensible –can integrate solutions and products easily

HIGHLIGHTS

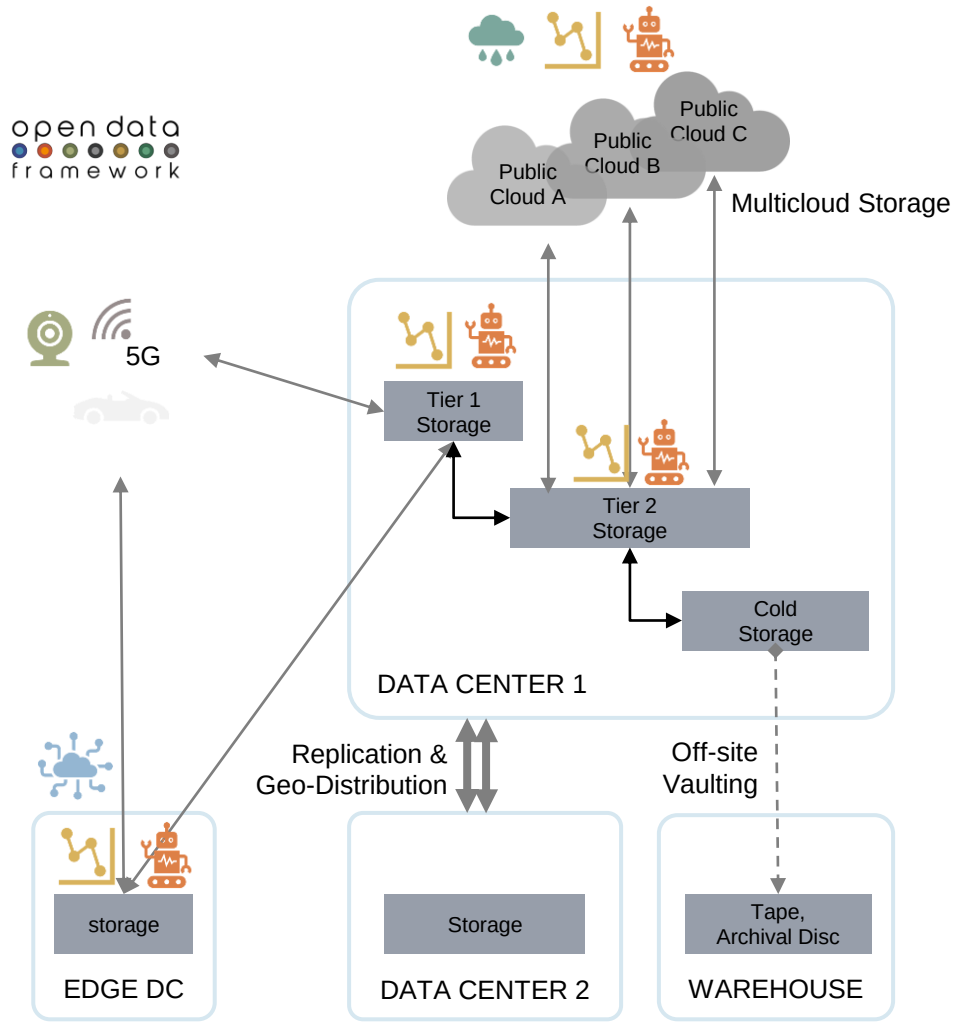
Standardization – data and storage management
Ecosystem – hardware, software, solutions, services
Certification – ecosystem components, developers, operators

SODA ODF runs in your cluster out side and agnostic to your storage boxes

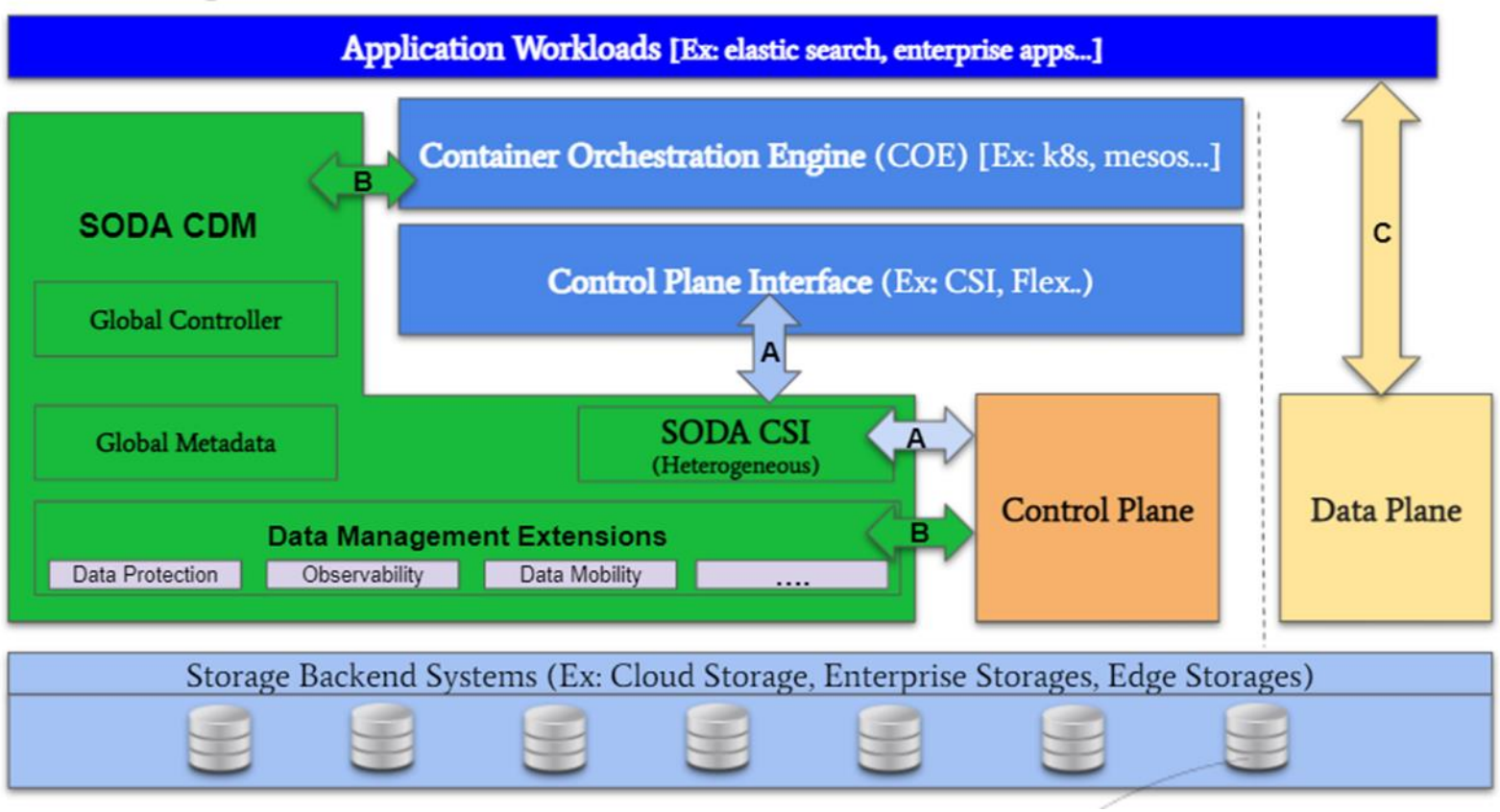
Use case covering hybrid demands

Services For Connected Car Platform

block, file, object	block, file, object storage for edge, DC multicloud storage
backup & recovery	backup to cloud or tape snapshots from tier2 to cloud
lifecycle & tiering	edge to DC tier 1 to tier 2, tier2 to cloud, tier2 to cold
security & compliance	edge, DC, & cloud security and compliance offsite tape/archive
retention & archive	tier2 to cold storage (tape/archive disc) tier2 to cloud for long term retention
analytics & intelligence	data integration for analytics and AI/ML applications



SODA CDM (Container Data Management)

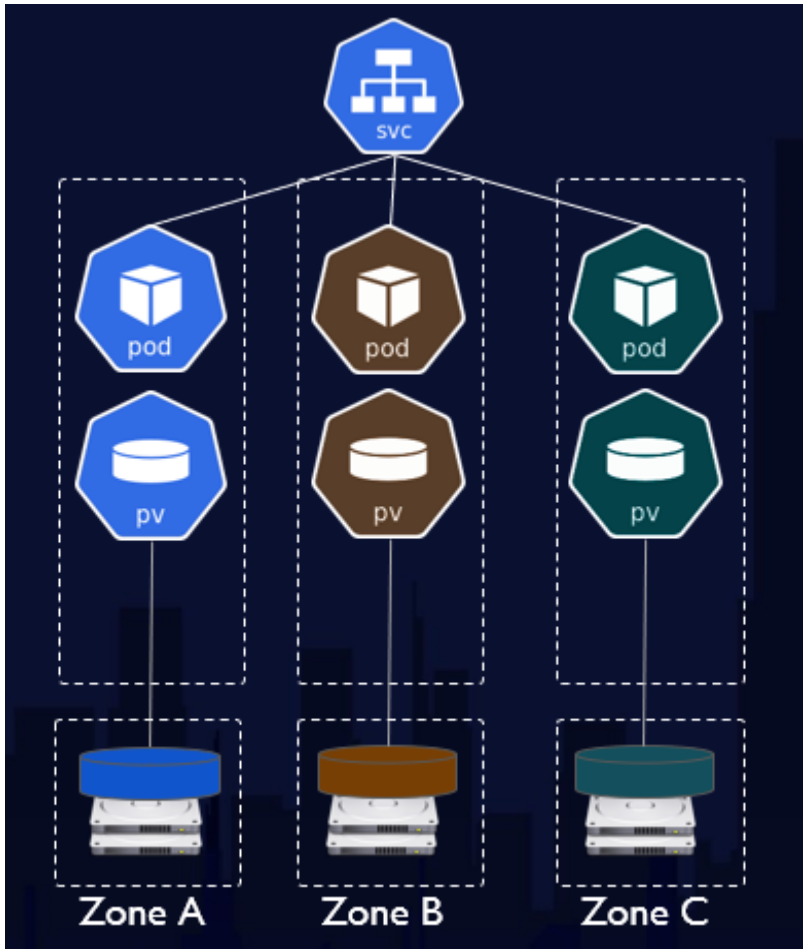


A: Support control plane interface API directly and interact with respective COE
B: Interact with Orchestrator through Data Management Framework(SODA)
C: Workloads consume storage through data access interfaces.

Augment Kubernetes (or COE) capabilities for heterogeneous and hybrid container data management.

- Unified CSI
- Heterogeneous Ready
- Designed for Container Data Management: Data Protection, Data Observability, Data Mobility and more
- Hybrid Data Management Ready

SODA CSI



VANILLA CSI	V/S	SODA CSI
• 3 Different PVC requests • There is no information on pods (other than pod name passed down to storage) • There is no zone or tenant information passed down. • Distributed applications using distributed storage. Even with single vendor - multiple storage classes.		• Unified CSI for All • Any vendor CSI plug and play • Future ready to enhance for container data management services like Data Protection, Observability and Global Metadata Management

SODA CDM Features

CURRENT

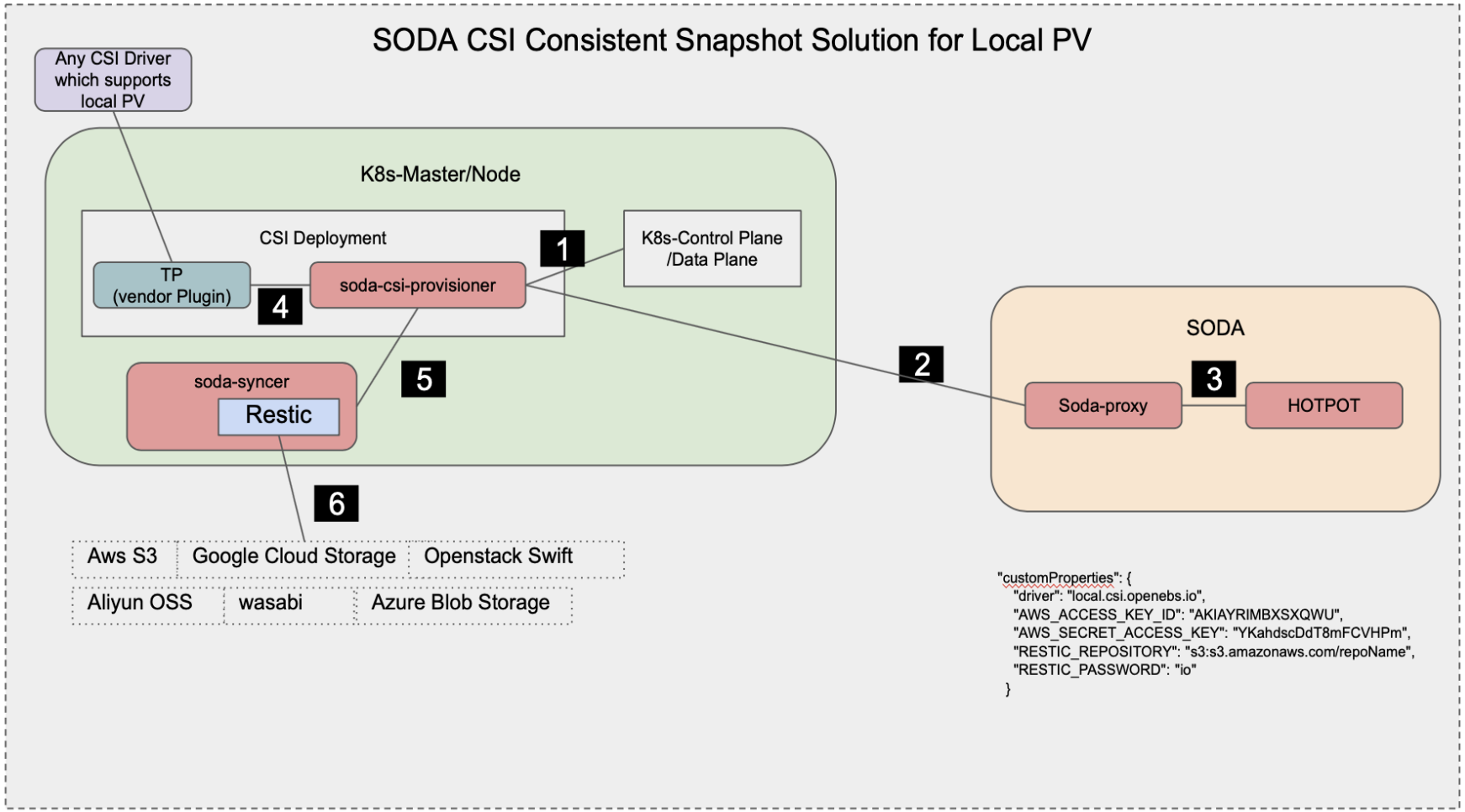
- CSI Plug and Play : Plug-in support for any CSI driver
- Support multiple concurrent CSI drivers in Kubernetes deployment
- Container data protection framework based on Restic
- Policy-based application-consistent snapshot to cloud

Jerba Release :
https://github.com/sodafoundation/soda/releases/tag/v1.4.0

NEXT

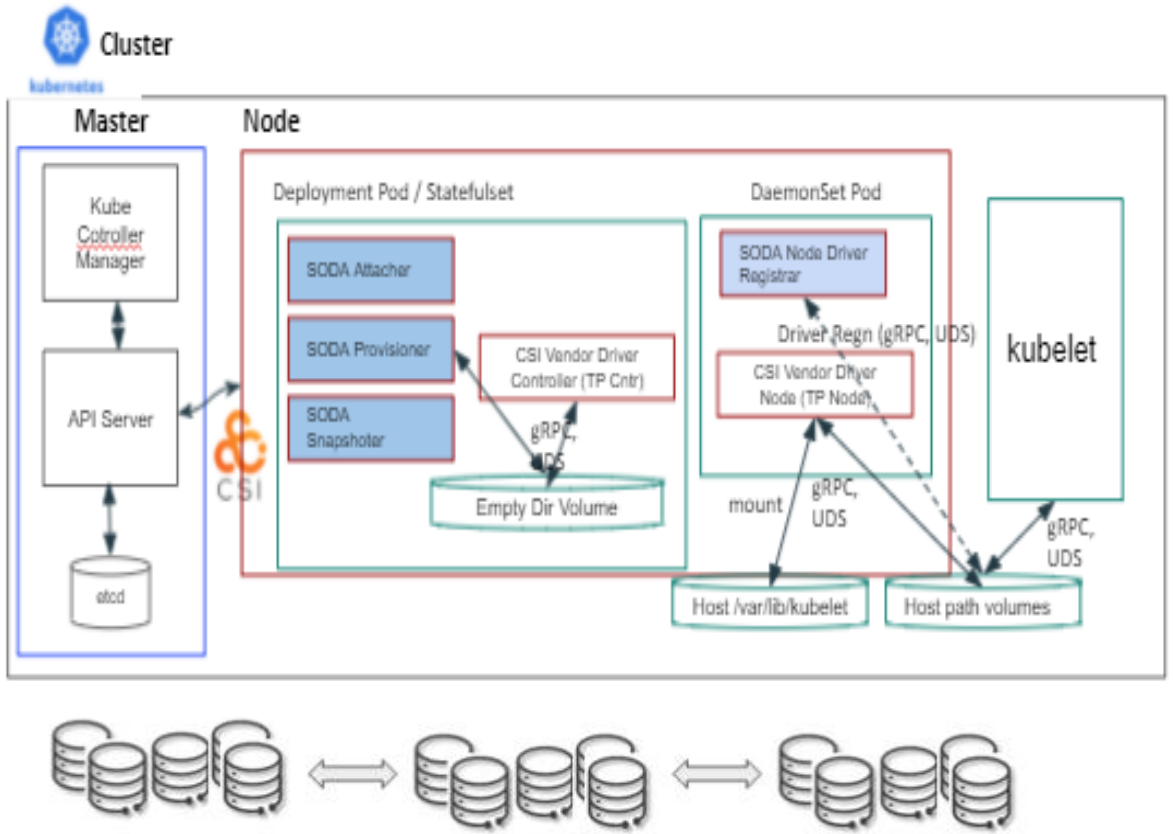
- Unified SODA CSI Enhance
- Data Protection (Snapshot, Backup, Recovery) Enhance
- Observability

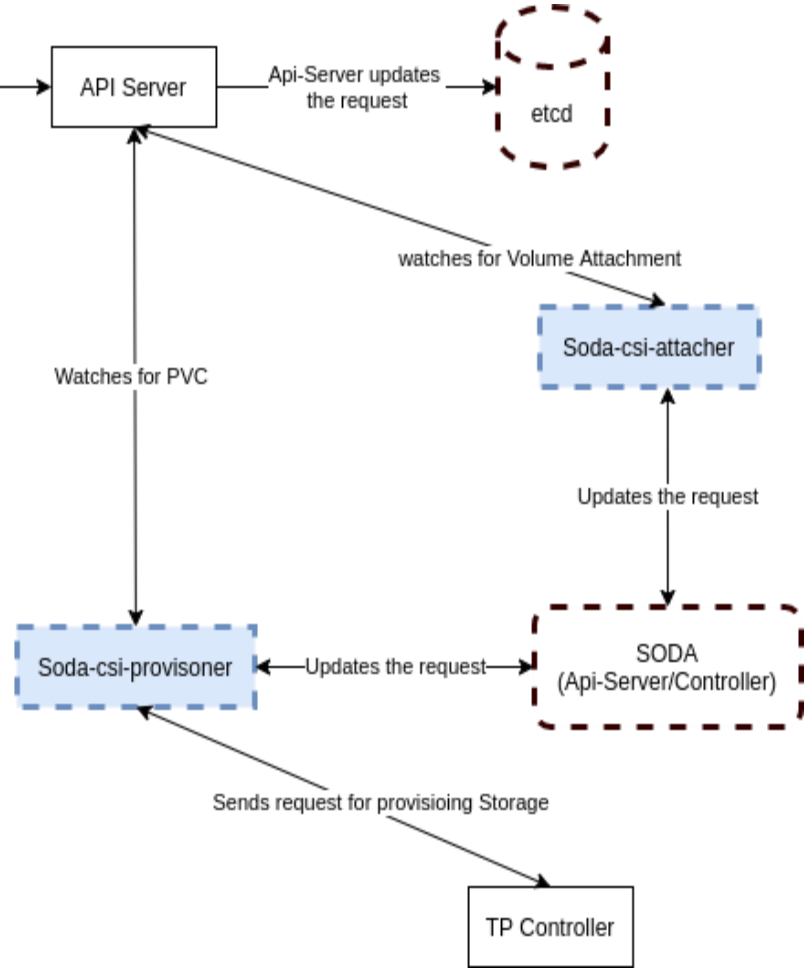
SODA CDM Data Protection PoC



SODA CDM CSI Plug N Play

Standard vendor CSI driver can plug and play with SODA ODF





TP Controller : CSI driver provided by each vendor

SODA ODF for Container Storages : Demo

https://www.youtube.com/watch?v=_hv6Sap1bxQ&t=481s

Demo presented by our team during SODACON based on Jerba Release , July 2021

Data Management Going Forward

- Mutually complementing solutions and standards between In Box features and Out of Box features for Storages
- STaaS and CSTaaS
- Cross Cluster, Cross Cloud, Cross Domain (Edge/Cloud/On Prem)
- Storage Vendors come up with out of the box solutions for Hybrid scenarios (bundle all components needed)
- Cloud vendors moving to enterprise/on prem and storage vendors to cloud!

Thank You

https://sodafoundation.io/

SODA **Source Code**: https://github.com/sodafoundation
SODA **Docs**: https://docs.sodafoundation.io/

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