STORAGE DEVELOPER CONFERENCE
SDC 21
BY Developers FOR Developers
Virtual Conference
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A SNIA Event

Data Protection for Stateful applications

About Me

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Committer and PMC (SODA Foundation)

Background

Veritas Technologies (Server & Storage Management, DRaaS, VRP)

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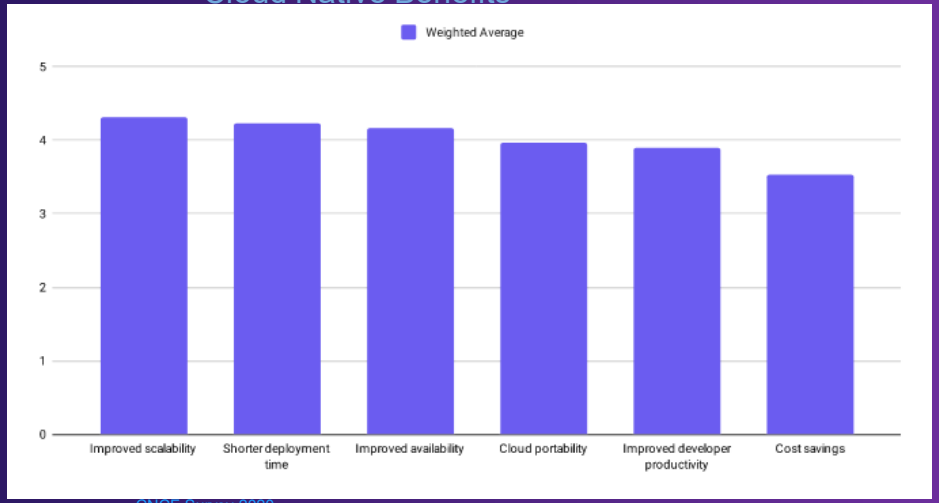
Cloud Native

Cloud native is an approach to building and running applications that exploits the advantages of the cloud computing delivery model…..

- Distributed computing
- Scalability
- Flexibility (multi-cloud)
- Resiliency
- Zero Downtime (ex. K8S..)

Cloud Native Benefits

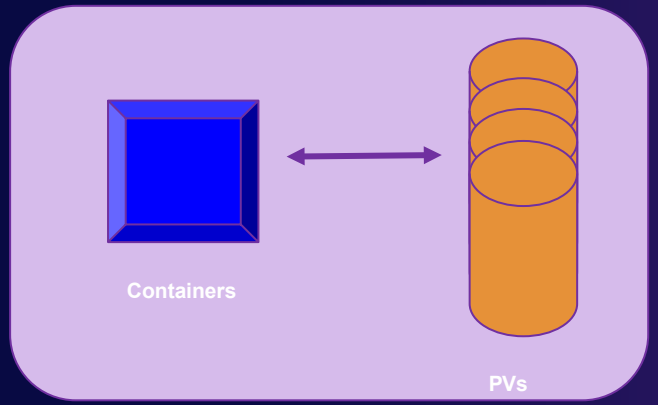


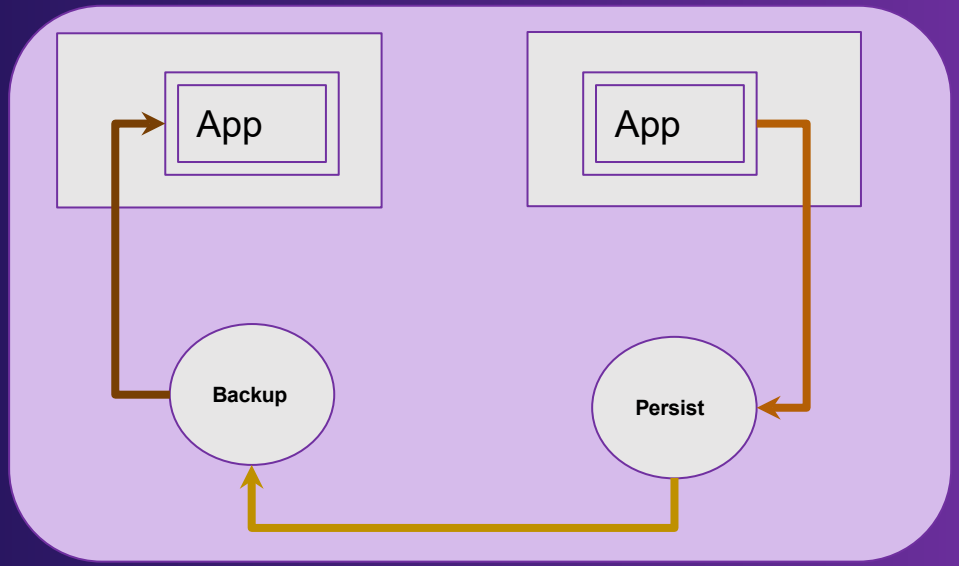
CNCF Survey 2020

Stateful Applications

- Stateful workload save Data to Persistent Disk Storage
- Data Persistence (save <-> Retrieve)

Ex: Databases, KV store





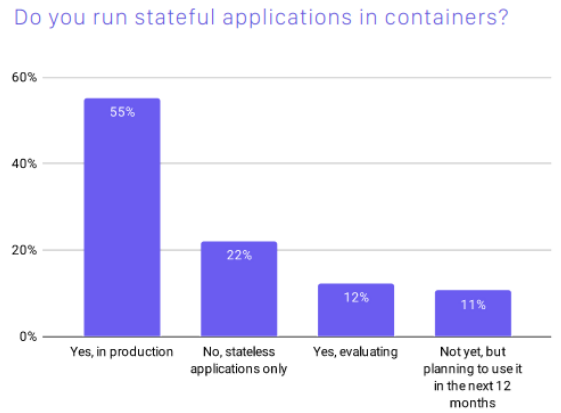
Stateful Applications

Growing use of Stateful Applications in Production..

Storage

Cloud native storage has exploded in recent years, expanding to include different storage offerings, including centralized, distributed, sharded, and hyper-converged. A special interest group (SIG) focused on storage was launched by the CNCF community to clarify these different options and identify the top attributes to consider when choosing a storage solution. This summer, the SIG released an updated CNCF Storage Landscape Whitepaper for the community to use as a guide.

Containers were originally built to be stateless in order to keep them flexible and portable. However, only 22% use only stateless applications. Demonstrating the popularity of cloud native storage, 55% use stateful applications in production, 12% are evaluating them, and 11% plan to use them in the next 12 months.



CNCF Survey 2020

Data Protection in Cloud Native

- Data Protection is not a consideration
- It’s the necessity!!!
- Required for uninterrupted application availability
- Recover from failures
- Stateful applications and Data Protection go together
- Persistent state
  - Storage (PVs)
  - Operational metadata

Data Protection

- Revolves around Backup
- Application backup end-to-end (application and its state)
  - Images
  - Metadata
  - PVs
  - ….
- Minimize RTO
- Minimize RPO
- In case of failure, Don’t run around, Just resume without delay!!!

Ideal Scenario..

- Backup -> Restore with all the pieces tied together
- Orchestrate

Need two set of interfaces

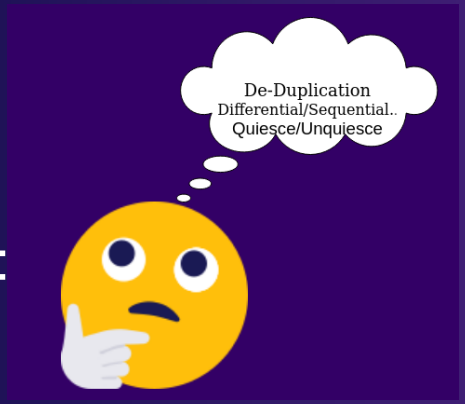
- Discover components / Lifecycle Management
- Infrastructure Interface
  - Snapshots, Object/File Storage

Backup & Restore

Backup helps in

- Application Migration
- Application rollback (to the last consistent state)
- Application cloning
- Application retrieval

Few things to keep in mind:



Restore depends upon:

- Efficiency of the Backup
- Accessibility of backup
- Cloud Native backups strategy defines near Zero RPO and RTO

Data Protection in Alternate Environment

- Applications should be protected and available
- Requires storage availability in heterogeneous environment
  - Ex: Snapshot based backup of on-prem app and restore it in cloud
- Requires storage vendor support, if using external storage
- Can I backup my Cloud A Application and restore in Cloud B?
  - Using Cloud Volumes
  - Using FS backup

All fine all good, Why I am here?

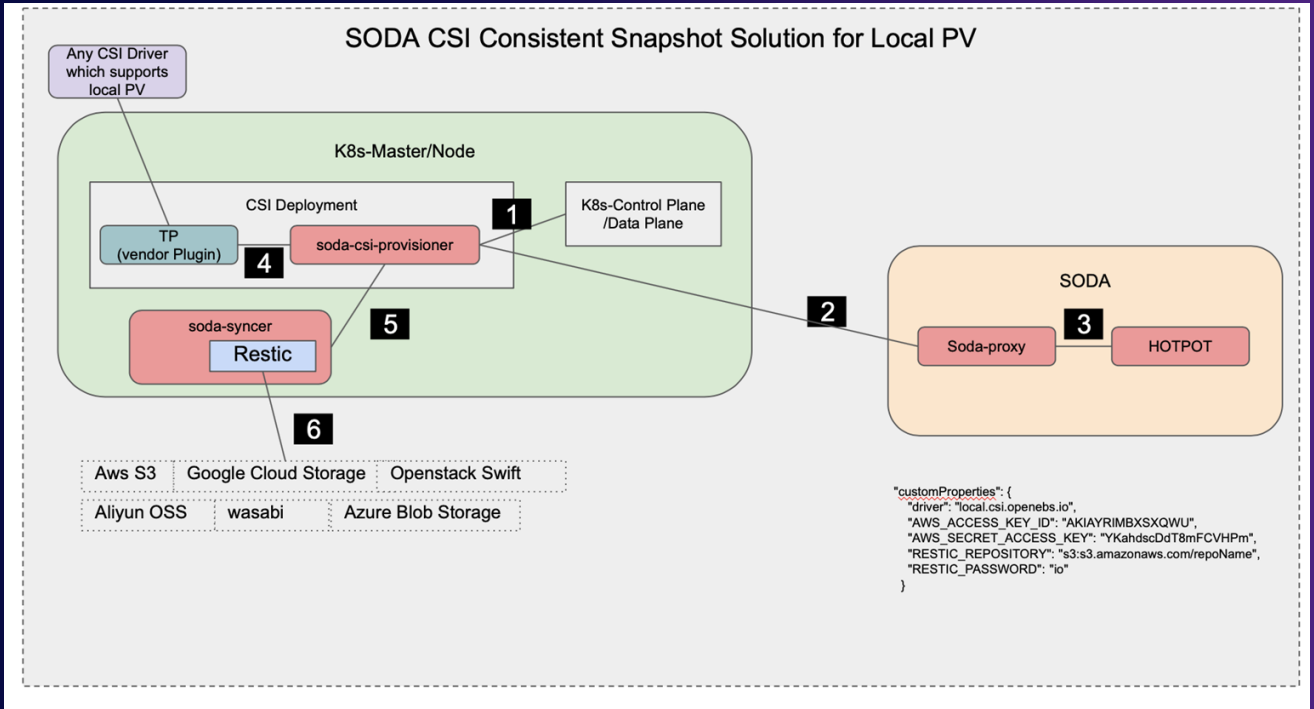
Open Source way!!!!

VELERO RESTIC LONGHORN
SODA
……..

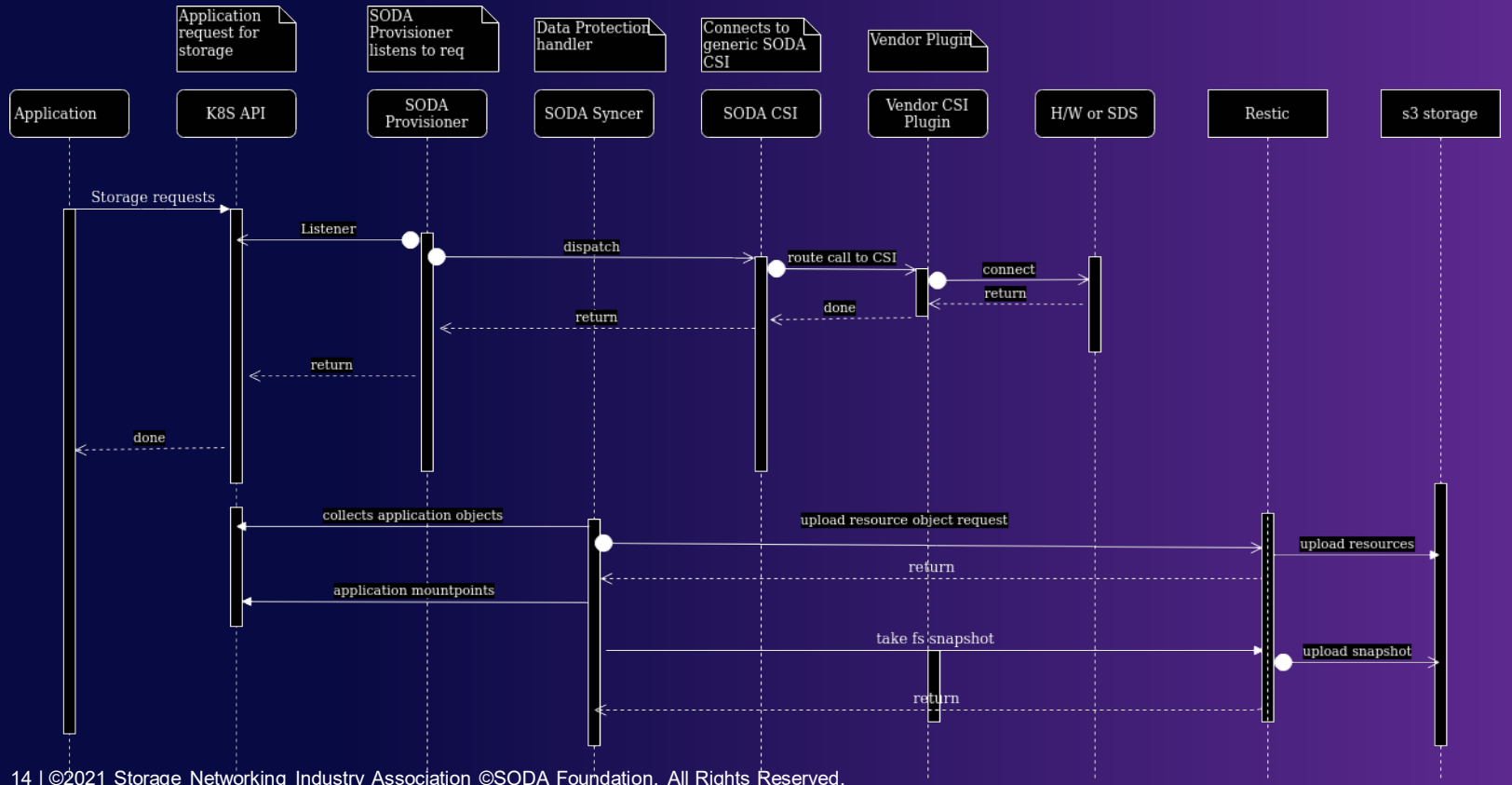
Intro SODA

SODA Foundation is an open source project under Linux Foundation that aims to foster an ecosystem of open source data management and storage software for data autonomy.
SODA Foundation offers a neutral forum for cross-projects collaboration and integration and provides end users quality end-to-end solutions.

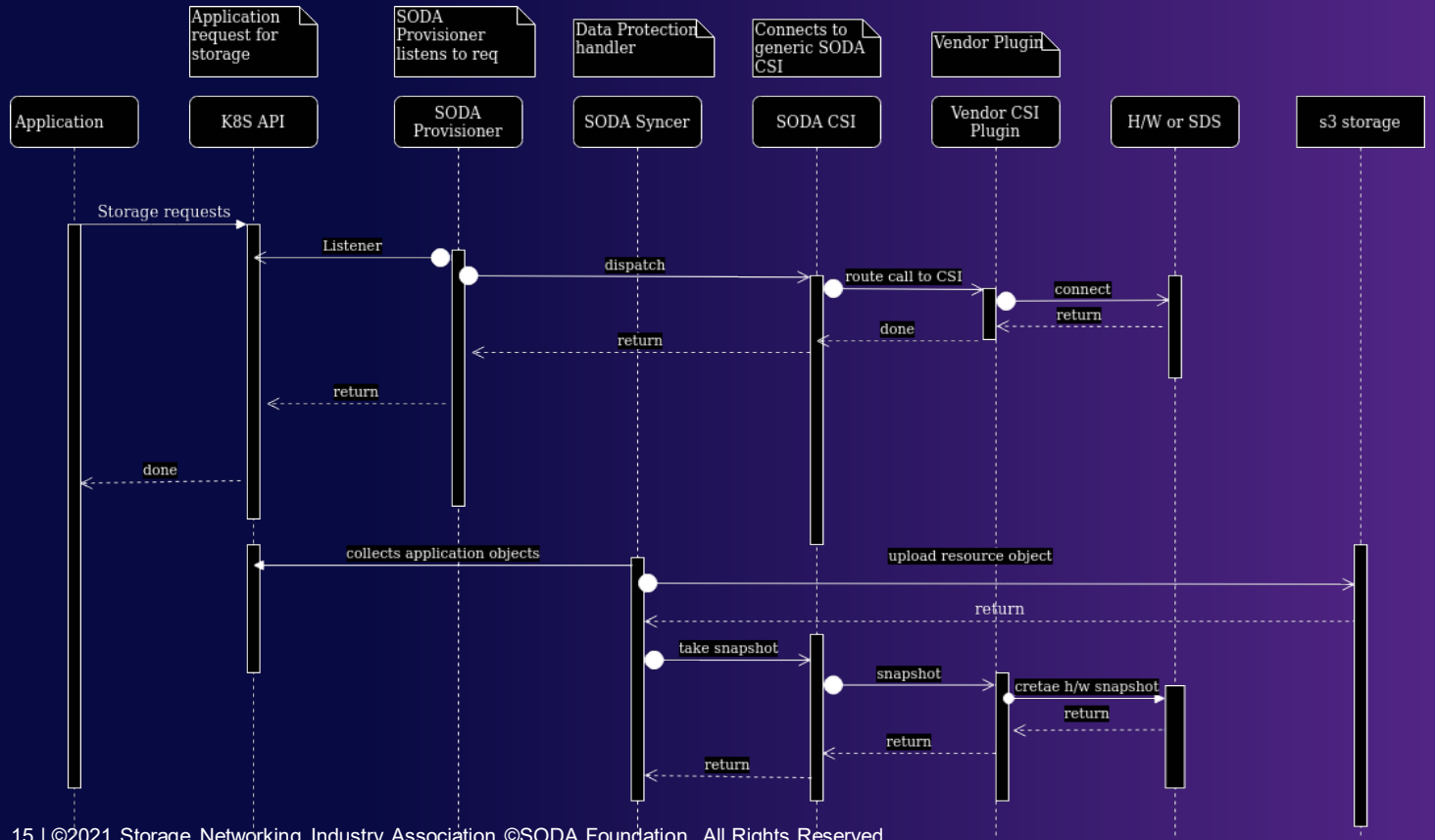
SODA and Data Protection for Stateful Applications



Flow (Protection using Restic)



Flow



References

https://github.com/sodafoundation

https://restic.net/

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Thank you!

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