



Europe 2022 -

WELCOME TO VALENCIA





Longhorn Intro, Deep Dive, and Q&A

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Speakers





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Open Source
Distributed Storage Software for Kubernetes
https://longhorn.io/

Design Principles



Reliability

- Crash consistent
- Multiple layers of protection against data loss, including built-in snapshot and backup support

Usability

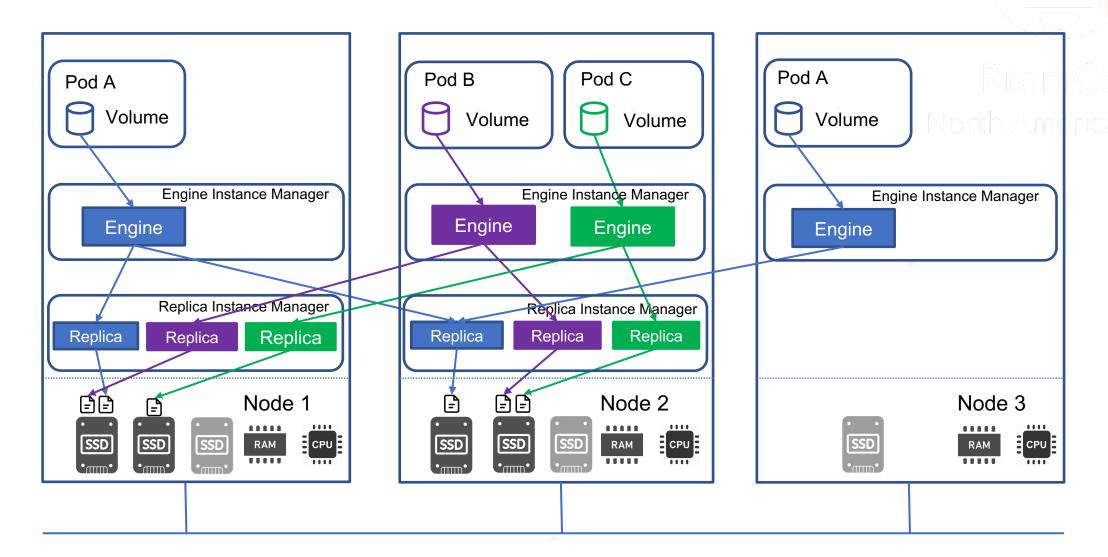
- One click installation
- Polished user experience

Maintainability

- Easy to understand
- Easy to recover even in the worst-case scenario
- Upgrade without interrupting the workload

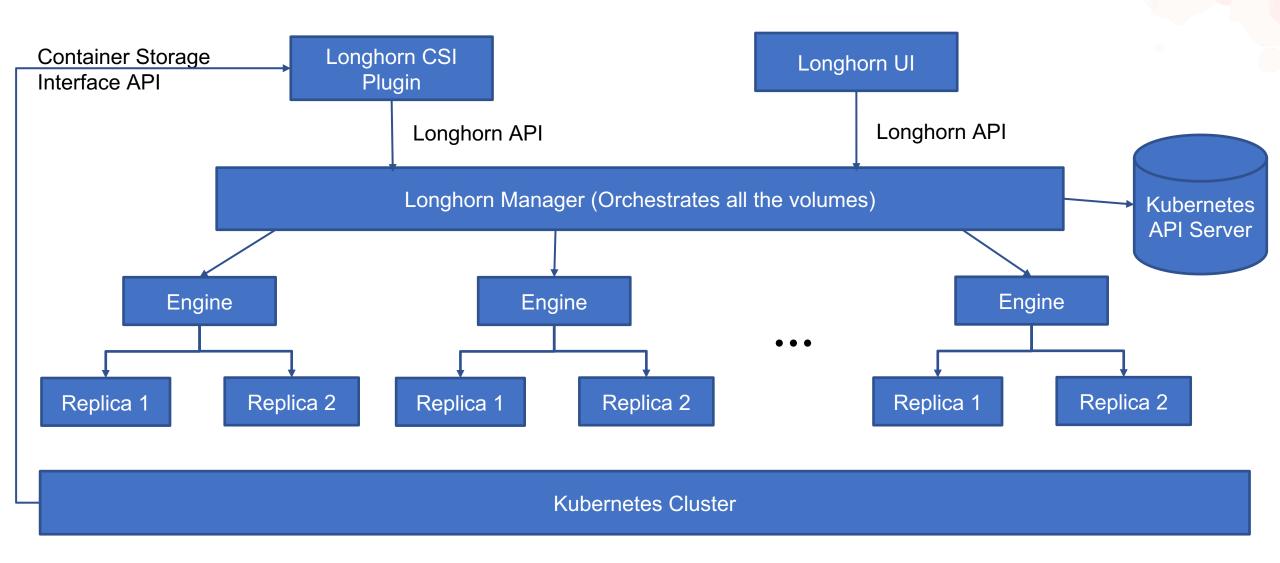
Architecture – Engine





Architecture - Manager





Open-Source Community (by May 2022)

KubeCon CloudNativeCon
Europe 2022

- CNCF Incubating project
- GitHub star: 3.8k
- Worldwide active nodes count: 53k+
 - Metrics available at https://metrics.longhorn.io/
- 2,000+ users in the Slack channels

Upcoming v1.3 release (Q2 2022)



- CSI Snapshot support for Longhorn snapshot
- API via Custom Resources
- Storage Network
- Backing image/volume download
- Secured communication (mTLS) among control/data plane components

And in the future...



- 'trim' support to reduce volume size
- Longhorn system backup & restore
- Volume Group
- HA NFS (RWX)
- HA S3 support
- High performance engine based on SPDK

See the latest roadmap at https://github.com/longhorn/longhorn/wiki/Roadmap



Demo





Questions?





Thanks!





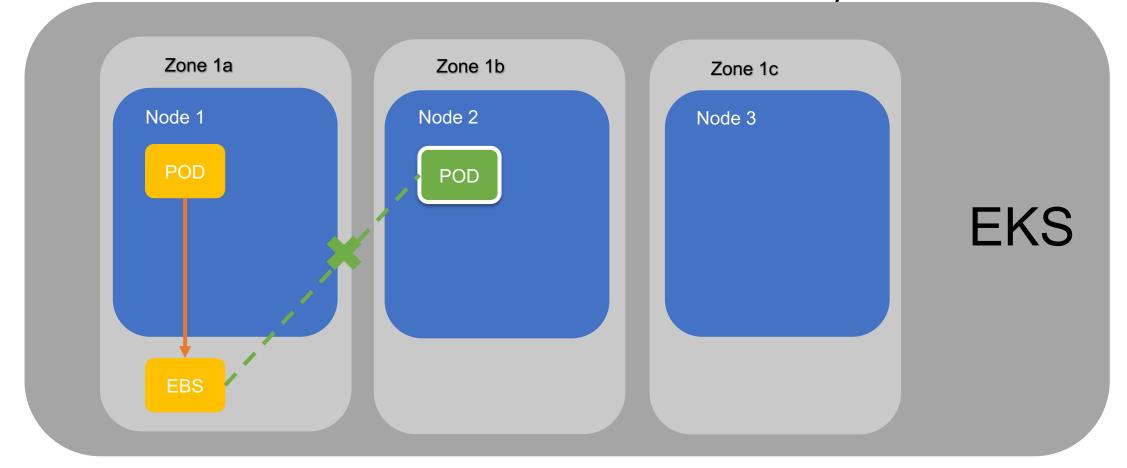
Backup: Technical Deep Dive



Use case — HA for cross AZ cluster



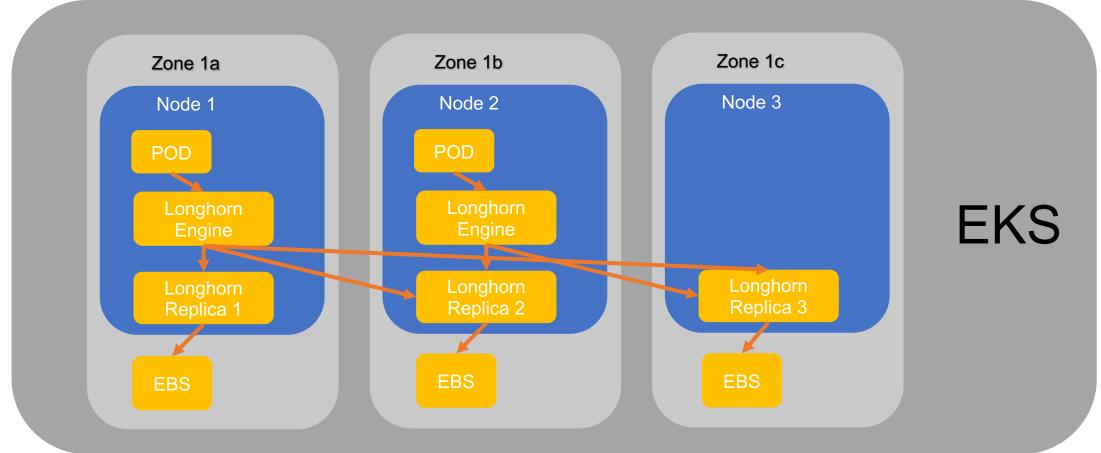
Native block devices are not available cross the availability zone



Use case – HA for cross AZ cluster (cont.)

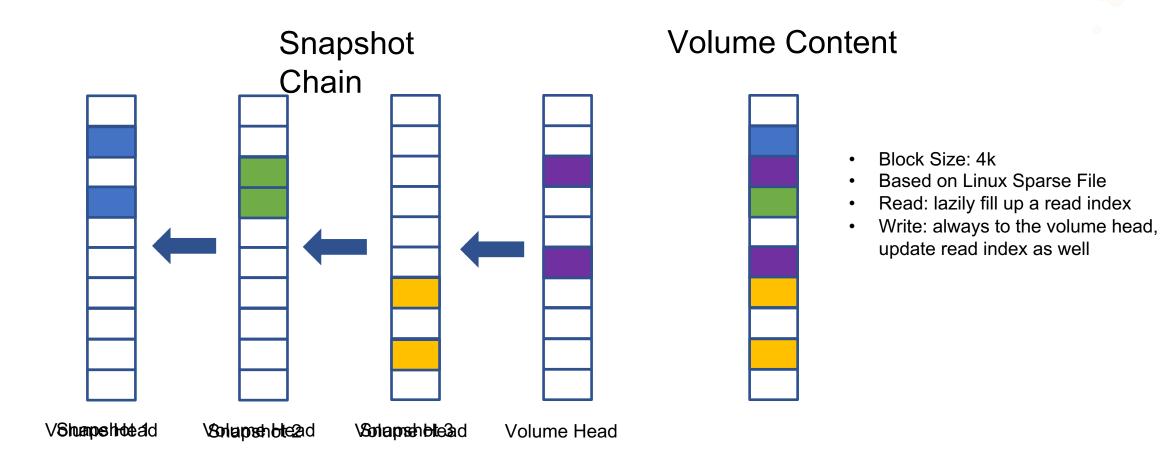


Longhorn provides high availability block device cross the availability zone



Volumes and Snapshots





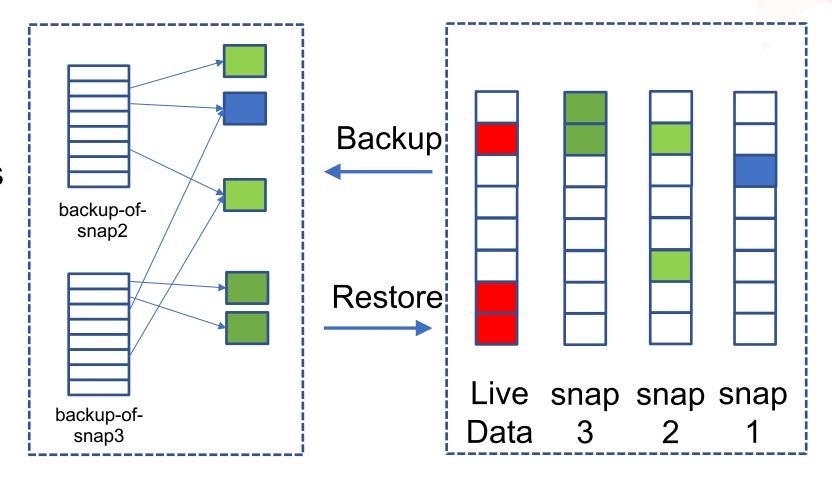
Backup



AWS EBS-style backup

Only changed blocks are copied

2M block size



Secondary Storage (S3, NFS, ...)

Primary Storage

How backups are stored



```
volume.cfg
backups/
    snap2.cfg
    snap3.cfg
blocks/
    c0facb6ba3102d29e8d847f32982a030028369020fd5ab6dfc99e63f8a1af903.blk
    f1af6a6aa6410a1eea5a1ba2a8856cc7bb01b302483e819f3ff4ca46bb17bb16.blk
    21935af9e15f5c32c843fbfb6fa01369cc7c0aa0c589f7d1e930bf351f8650c7.blk
    731859029215873fdac1c9f2f8bd25a334abf0f3a9e1b057cf2cacc2826d86b0.blk
    965b2b6871ebb1b57d1bad2c087aeebc3f7052487b38fac939d655a493b49d06.blk
```

Add a new replica (replica rebuild)



- Pause engine
- Take snapshot of existing replica
- Add new replica in WO mode
- Unpause engine
- Sync snapshots
- Set new replica to RW

