Rook Project

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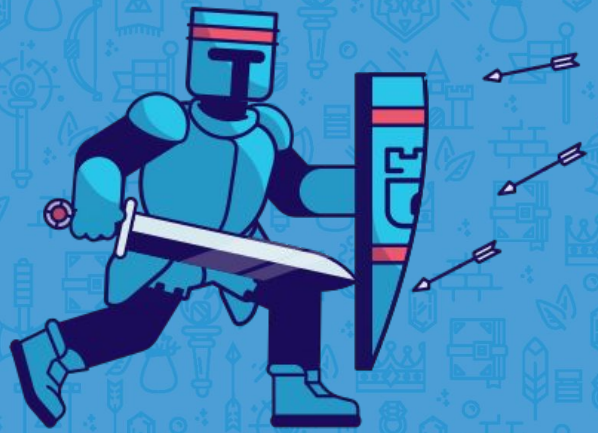
Rook Maintainers

https://rook.io/
https://github.com/rook/rook



Agenda

- Introduction to Rook
- Architectural Overview
- Roadmap
- Production Usage
- Storage Provider Deep Dives

Schedule

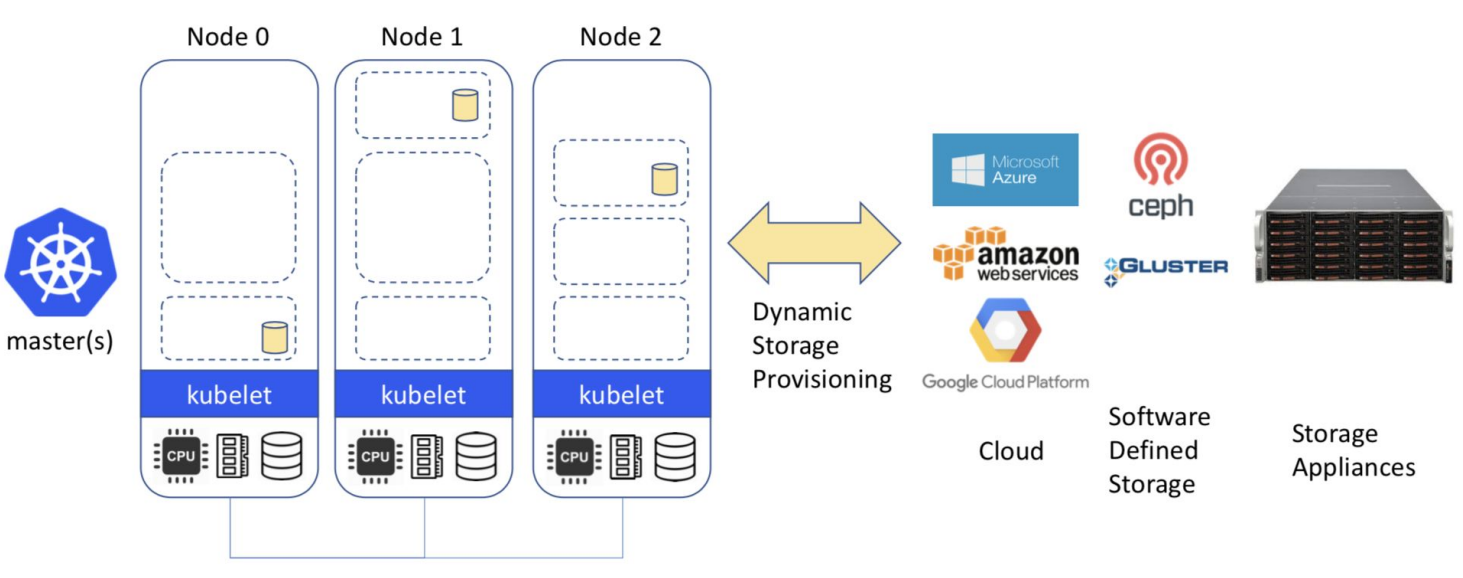
Length	Presenter(s)	Description
15	Travis/Alexander	Intro to Rook
5	Jared	Path to Graduation
20	Sebastien	Deep Dive: Ceph
20	Ilya	Deep Dive: EdgeFS
10	Sid	Deep Dive: YugabyteDB
10	Yannis	Deep Dive: Cassandra
10	Rohan	Deep Dive: NFS

Rook Stats

- v1.1.7
- 6.4K+ Github Stars
- 96M+ Downloads
- 210+ Contributors

Storage for Kubernetes

- Volume plugins allow external storage solutions to provide storage to your apps

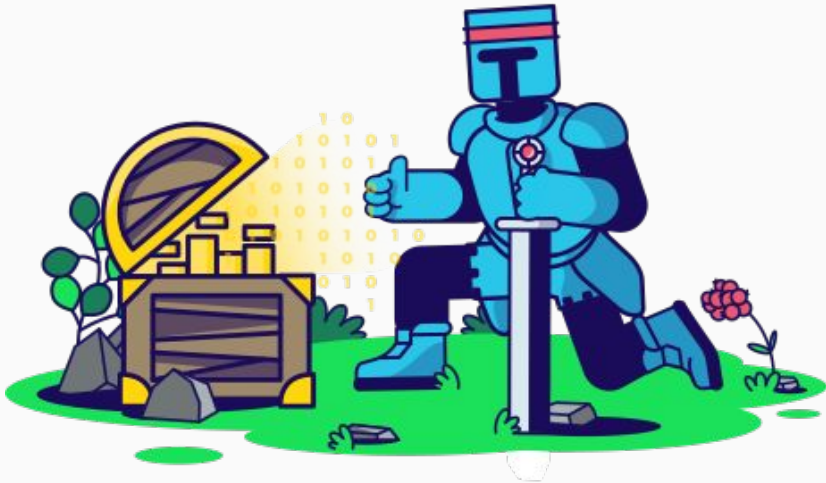


Storage Challenges

- Reliance on external storage
  - Not portable
  - Requires these services to be accessible
  - Deployment burden
- Reliance on cloud provider managed services
  - Vendor lock-in
- Day 2 operations - who is managing the storage?

What is Rook?

- Storage Operators for Kubernetes
  - Wherever K8s runs
- Automate Management
  - Deployment
  - Configuration
  - Upgrading

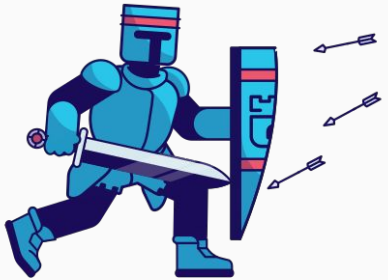


What is Rook?

- Open Source (Apache 2.0)
- Cloud-Native Computing Foundation (CNCF)
  - Incubation Project
- Extends Kubernetes with Operators and custom types
- Framework for many storage providers and solutions

Storage Providers

Storage Provider	Status	Joined Rook
Ceph	**Stable**	v0.1
CockroachDB	Alpha	v0.8
Minio	Alpha	v0.8
EdgeFS	**Stable**	v0.9
Cassandra	Alpha	v0.9
NFS	Alpha	v0.9
YugabyteDB	Alpha	v1.1
Apache Ozone	Alpha	v1.2*



Architectural Layers

- Orchestration
  - The operator owns the **management** of the storage provider
- Storage Provisioning
  - CSI driver **connects** client pods to the storage
- **Data** layer: Storage Provider
  - Block/File/Object storage
  - Databases

Rook Operators

- Deploy and manage a storage platform
  - Automates actions a human would normally do
- Defines *desired state* for the storage resource
  - Storage Cluster, Filesystem, Object Store, etc.
- The Operator runs reconciliation loops
  - Watches for changes in desired state
  - Watches for changes in the cluster
  - Applies changes to the cluster to make it match desired

Rook Operators

- The Operators leverages the full power of K8S
  - Services, ReplicaSets, DaemonSets, Secrets, …
- Manage storage systems at scale
  - Stateful upgrades
  - Health and monitoring tasks
- Not on the data path – can be offline for minutes

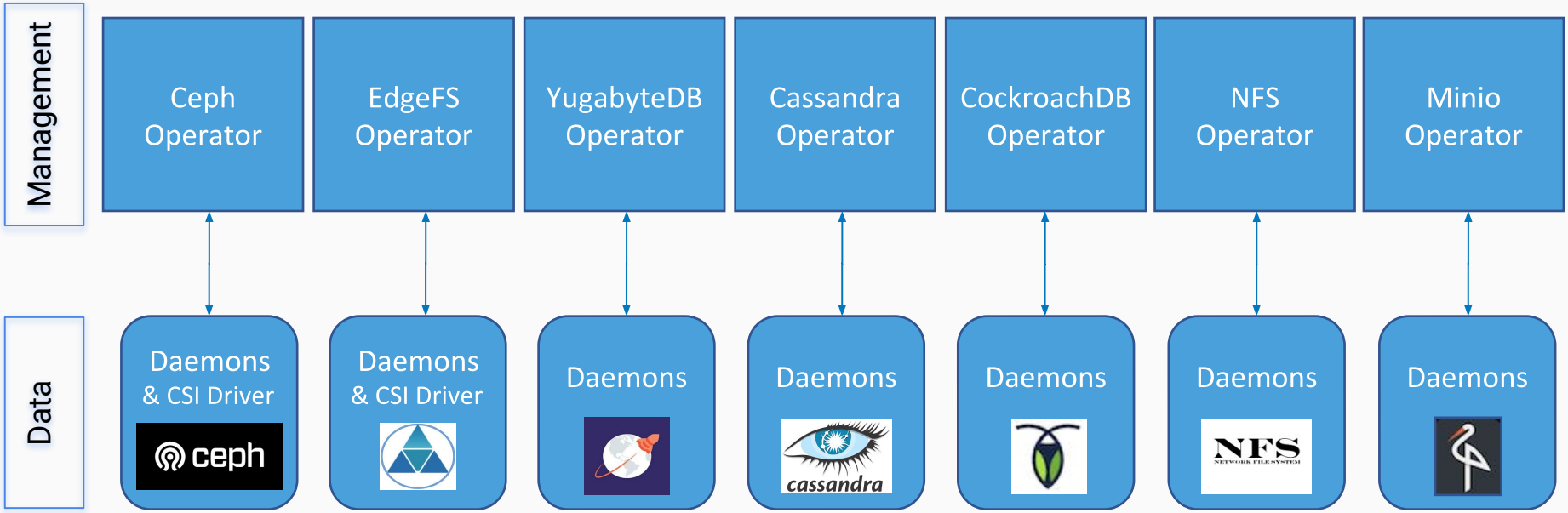
Custom Resource Definitions (CRDs)

- Teaches Kubernetes about new first-class objects
- Custom Resource Definition (CRDs) are arbitrary types that extend the Kubernetes API
  - look just like any other built-in object (e.g. Pod)
  - Enabled native `kubectl` experience
- A means for user to describe their desired state

Framework for Storage Solutions

- Rook is more than just a collection of Operators and CRDs
- **Framework** for storage providers to integrate their solutions into cloud-native environments
  - Storage resource normalization
  - Operator patterns/plumbing
  - Common policies, specs, logic
  - Build/CI/Testing tools
- Community: Slack & GitHub

Rook Architecture (Runtime)



Storage Configuration Sequence

- Admin configures storage for K8s
  - Installs the storage provider (Rook operator/CRDs)
  - Creates storage class(es)
- Application requests storage with a PVC
  - Storage is mounted into the pod

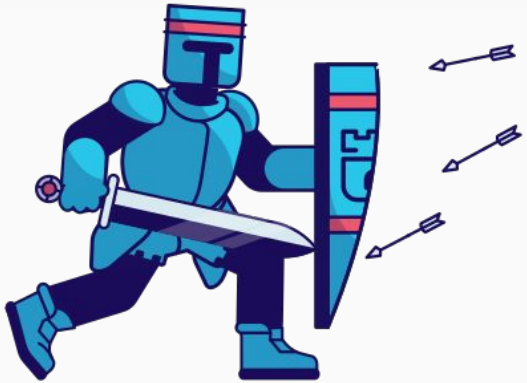
Roadmap

- Define API for storage operators
- Storage providers
  - Owner and community driven
  - Features depend on the storage provider

Getting Started with Rook

Website	https://rook.io
Documentation	https://rook.io/docs/rook/v1.1/
Blog	https://blog.rook.io/
Install v1.1	https://github.com/rook/rook/releases/

How to get involved?



- Contribute to Rook, review issues and PRs
  - https://github.com/rook/rook
- Slack - https://rook-io.slack.com/
  - #conferences
- Twitter - @rook_io
- Community Meetings
- Forums: https://groups.google.com/forum/#!forum/rook-dev

Production Usage

<Title>

- We need your input on production usage!

Storage Provider Deep Dives

Thank you!

https://github.com/rook/rook

https://rook.io/