RED HAT CEPH

TECHNICAL OVERVIEW

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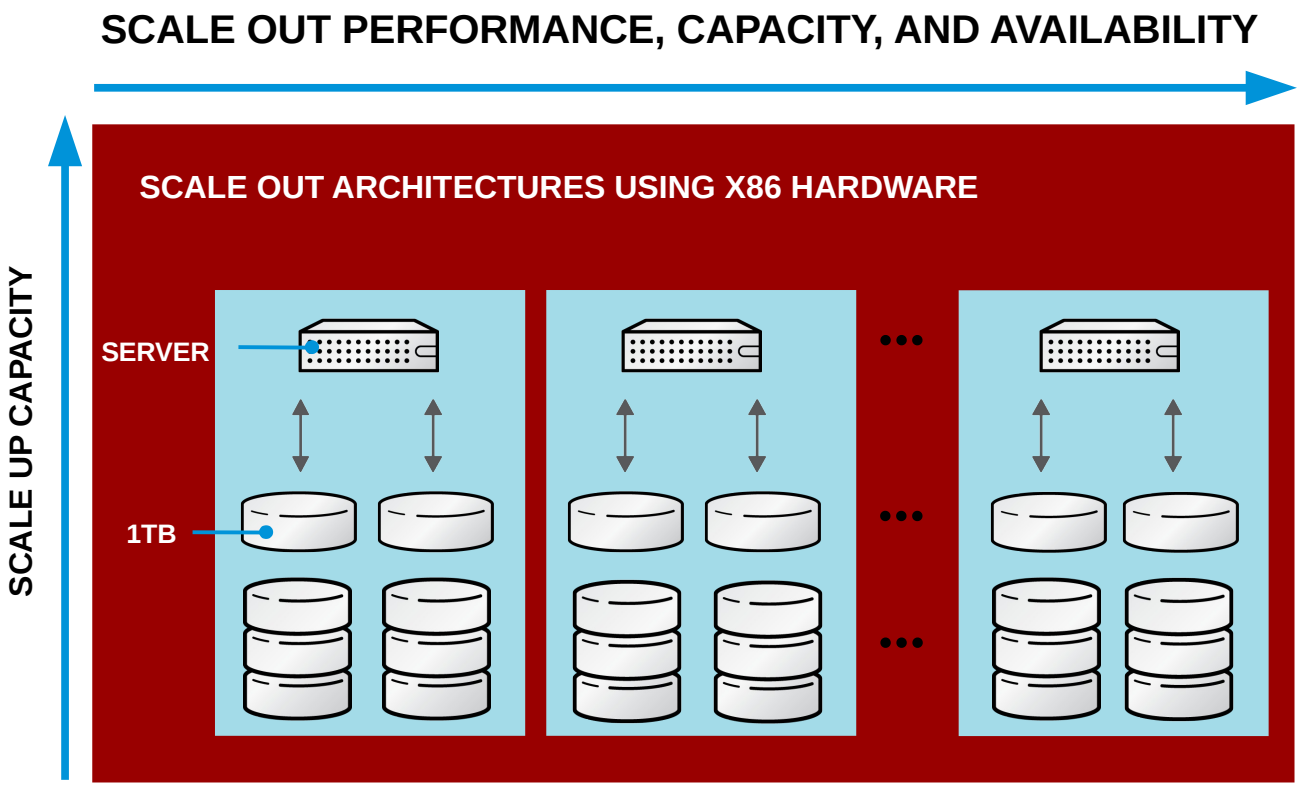
BEFORE WE BEGIN



GAME-CHANGING TECHNOLOGY

DESIGNED FOR MODERN WORKLOADS

EXPAND ON DEMAND

WORKS WITH INNOVATIVE TECHNOLOGY LIKE CISCO UCS

LOWER $/TB

THE OPEN SOFTWARE-DEFINED STORAGE PLATFORM FOR THE MODERN HYBRID DATACENTER

TRADITIONAL STORAGE

VENDOR CONTROLLED

- HARDWARE CENTRIC
- LOCKED DOWN
- EXPENSIVE
- PROPRIETARY

THE RED HAT WAY

COMMUNITY DRIVEN

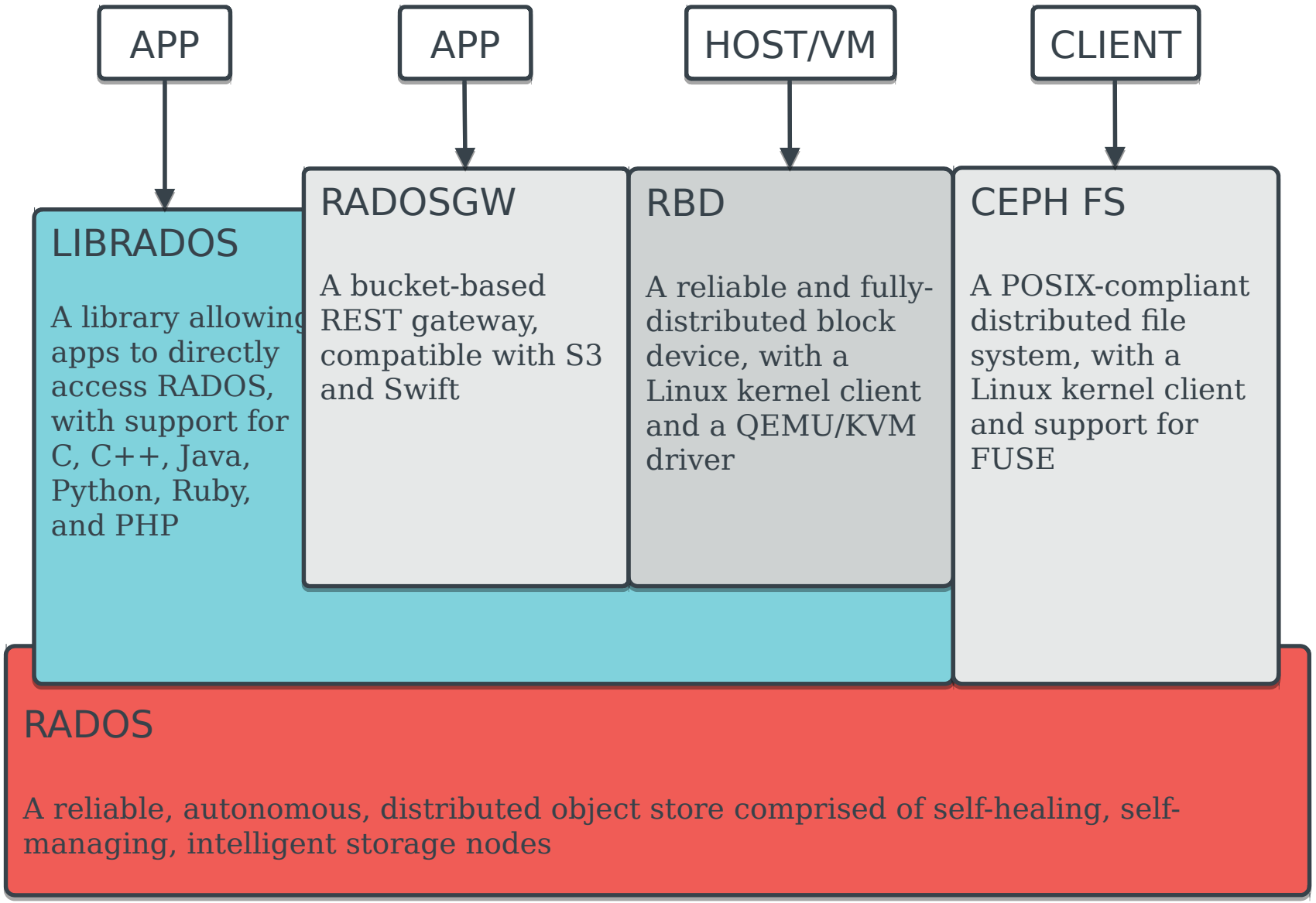
- SOFTWARE CENTRIC
- DISRUPTIVE ARCHITECTURE
- INEXPENSIVE
- OPEN SOURCE

CEPH & INKTANK

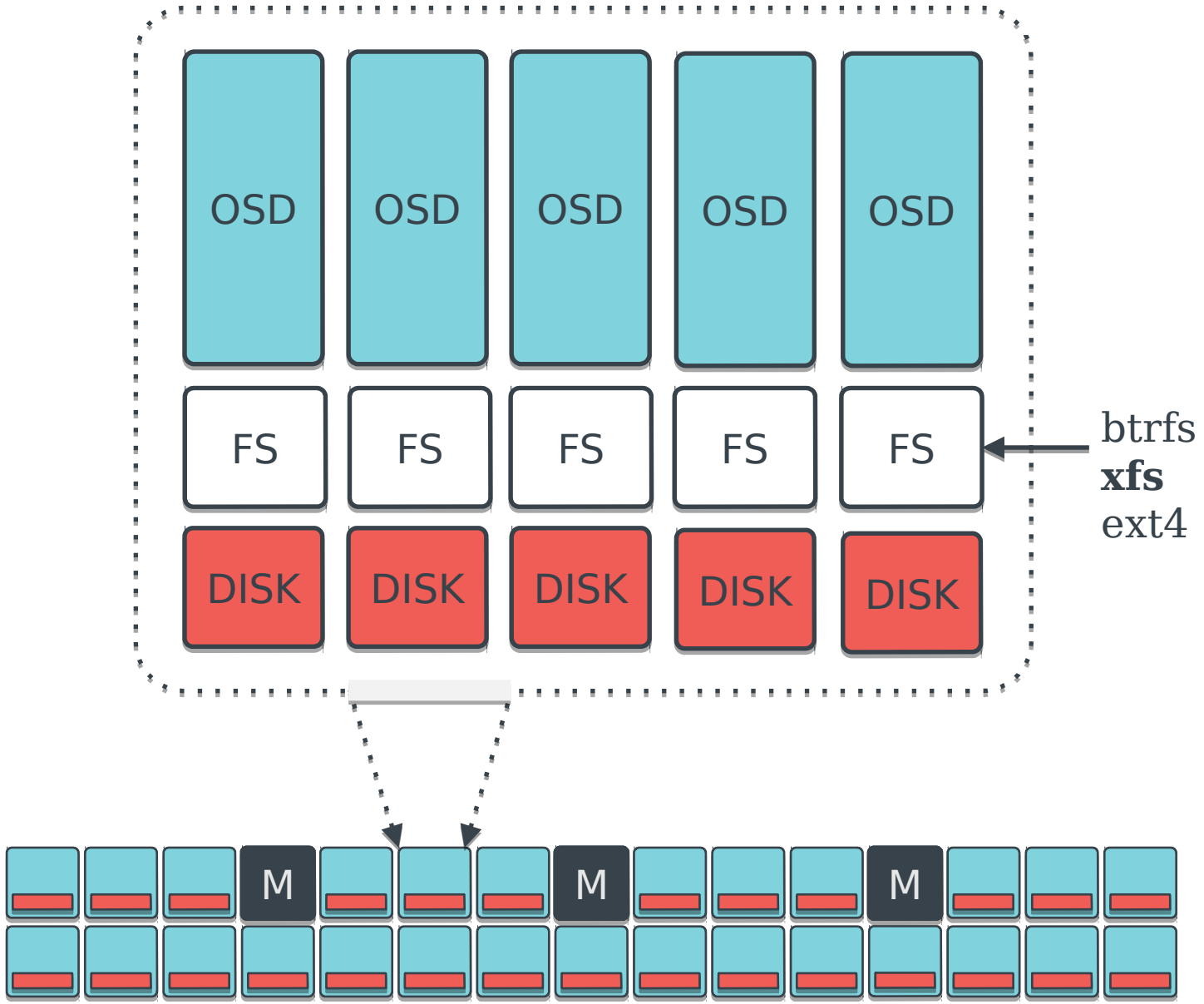
- Red Hat acquired Inktank, the company behind Ceph
- Ceph is scale out software defined storage
  - Unlike Glusterfs, Ceph's main focus is block
  - Ceph is architecturally an *object store (RADOS)*
  - Ceph can assemble block images (similar to LUNs) through chunks of objects

- **Glusterfs & Ceph are complementary technologies that address different use cases**

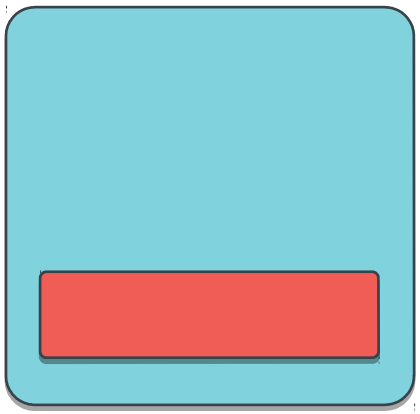
CEPH ARCHITECTURE



OSD & MONITOR NODES



OSD & MONITOR NODES



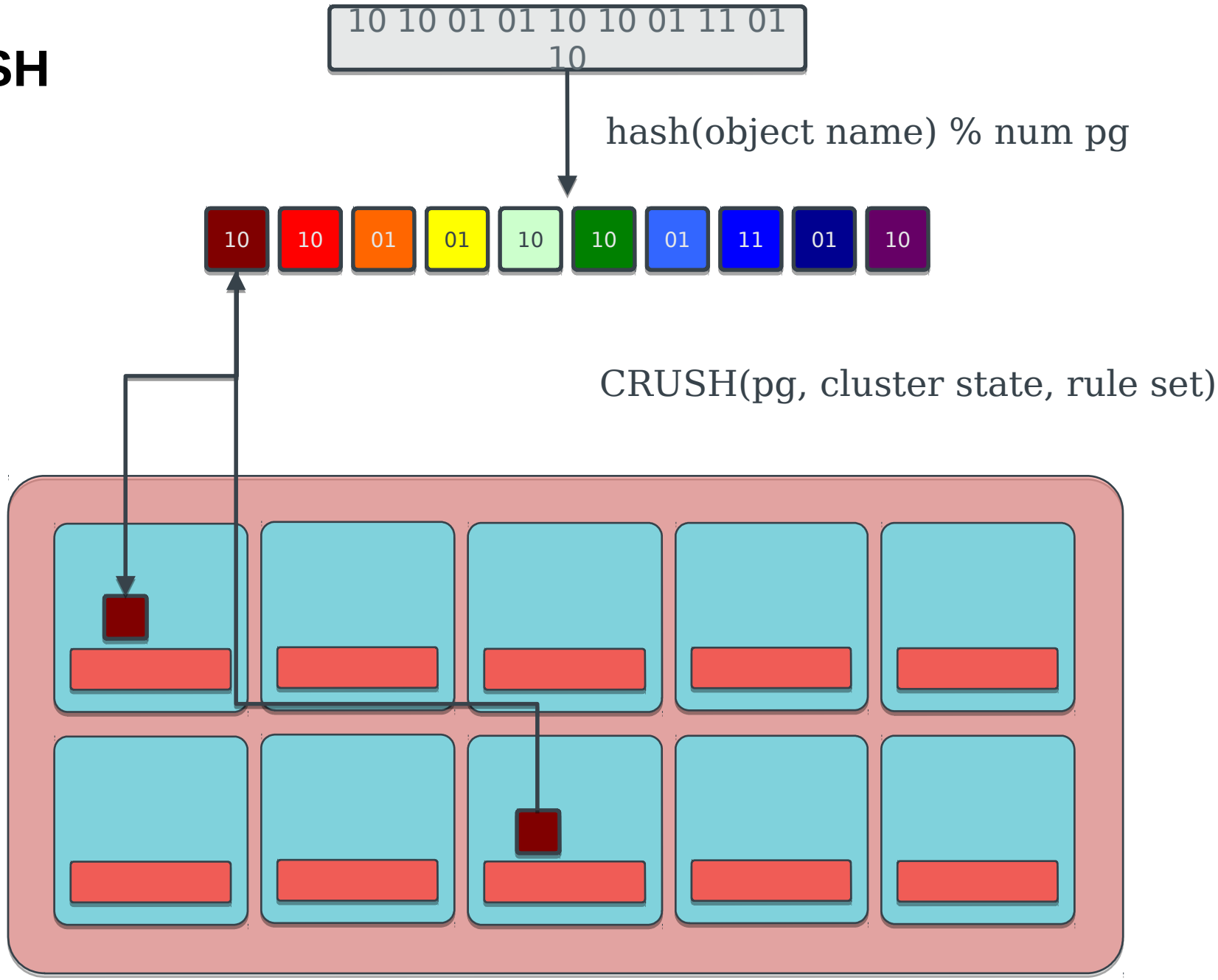
OSDs:

- 10s to 10000s in a cluster
- One per disk
  - (or one per SSD, RAID group…)
- Serve stored objects to clients
- Intelligently peer to perform replication and recovery tasks

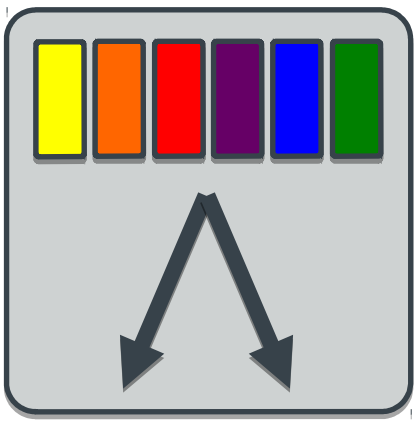
Monitors:

- Maintain cluster membership and state
- Provide consensus for distributed decision-making
- Small, odd number
- These do **not** serve stored objects to clients

CRUSH


10 10 01 01 10 10 01 11 01 10
hash(object name) % num pg
10
10
01
01
10
10
01
11
01
10
CRUSH(pg, cluster state, rule set)

CRUSH

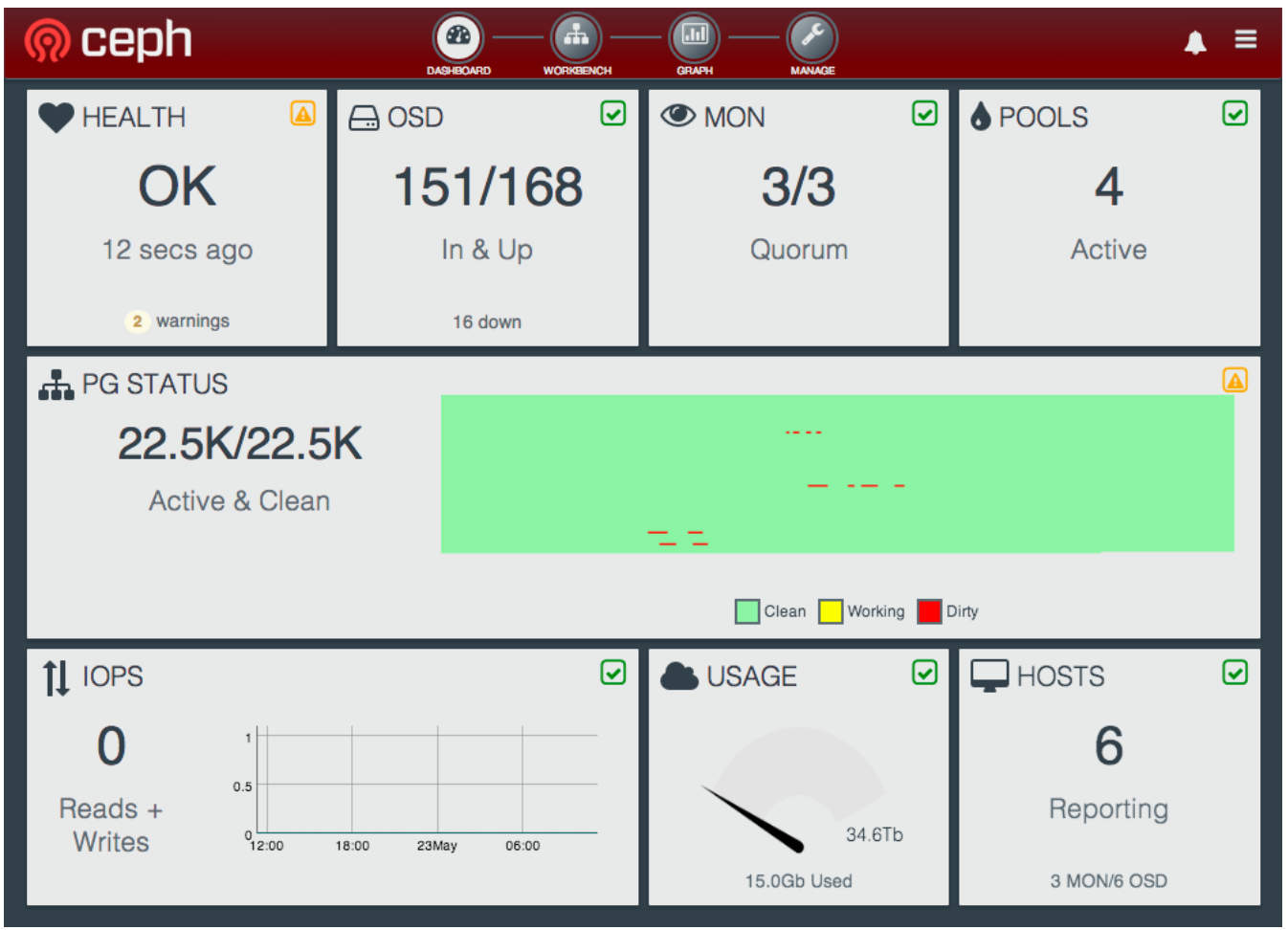


CRUSH

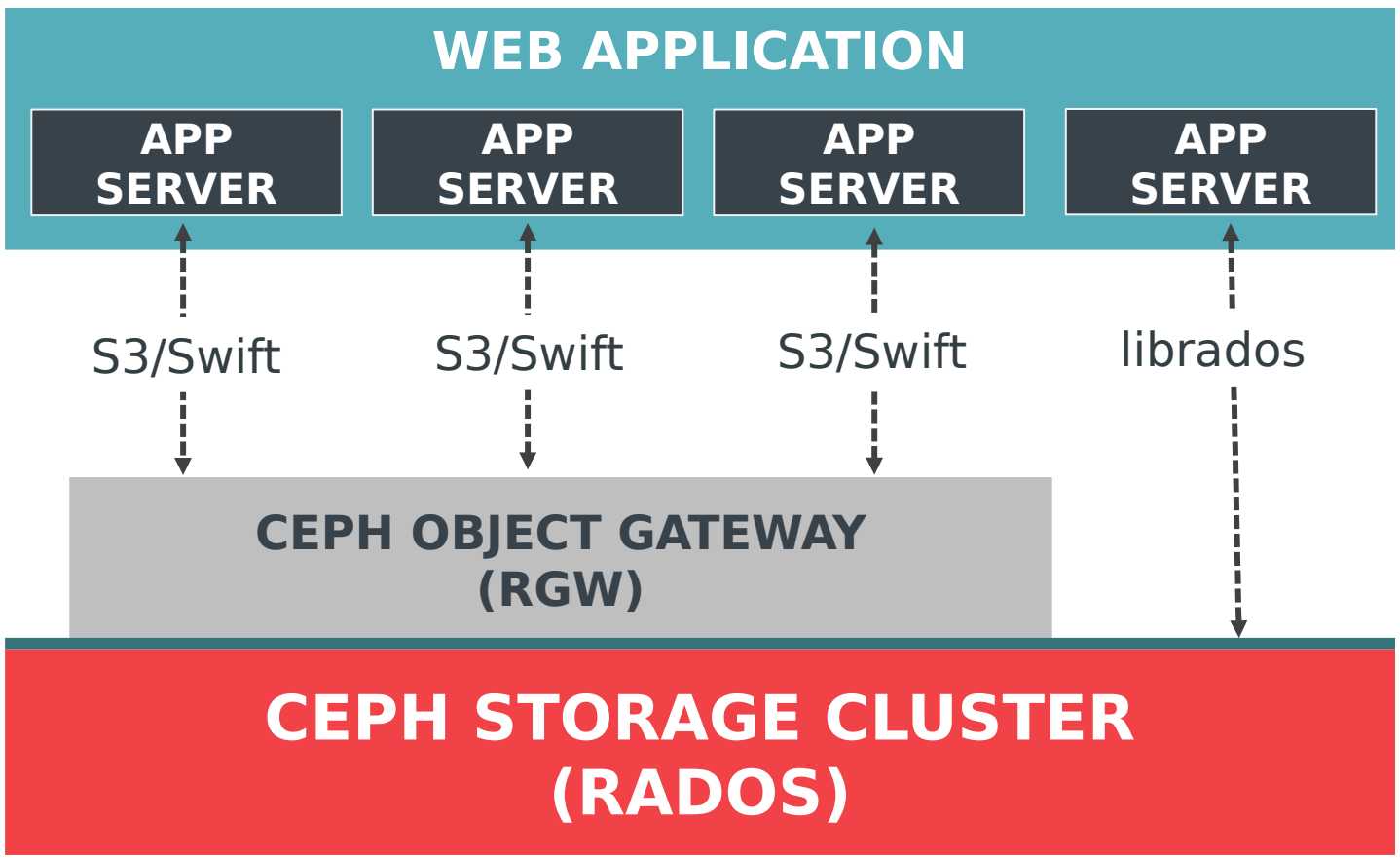
- Pseudo-random placement algorithm
  - Fast calculation, **no lookup**
  - Repeatable, deterministic
- Statistically uniform distribution
- Stable mapping
  - Limited data migration on change
- Rule-based configuration
  - Infrastructure topology aware
  - Adjustable replication
  - Weighting

CALAMARI

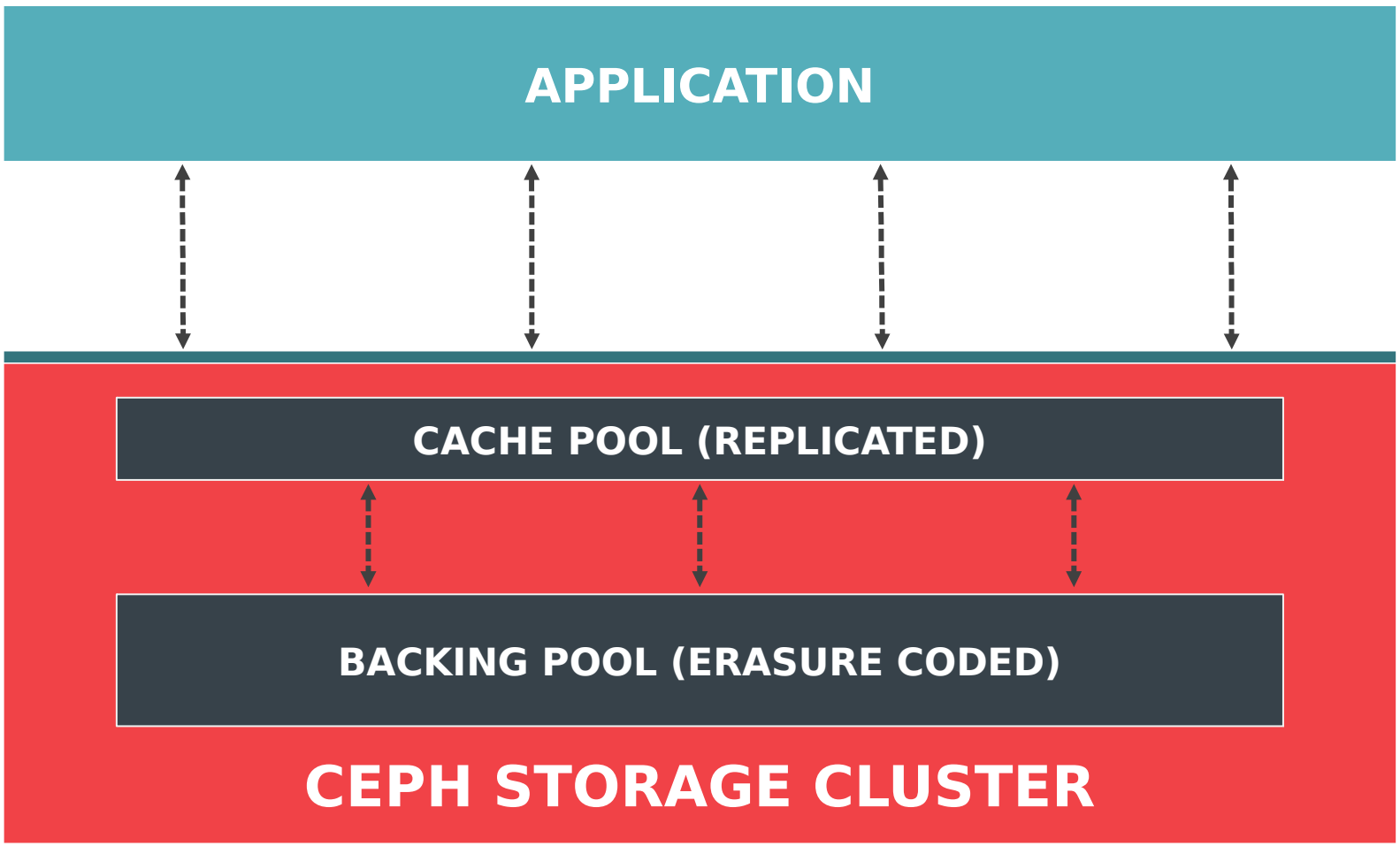
- Graphical management tool for Ceph Enterprise
- Quickly determine cluster health, utilization, etc
- Red Hat open sourced Calamari (only ~30 days after acquisition)



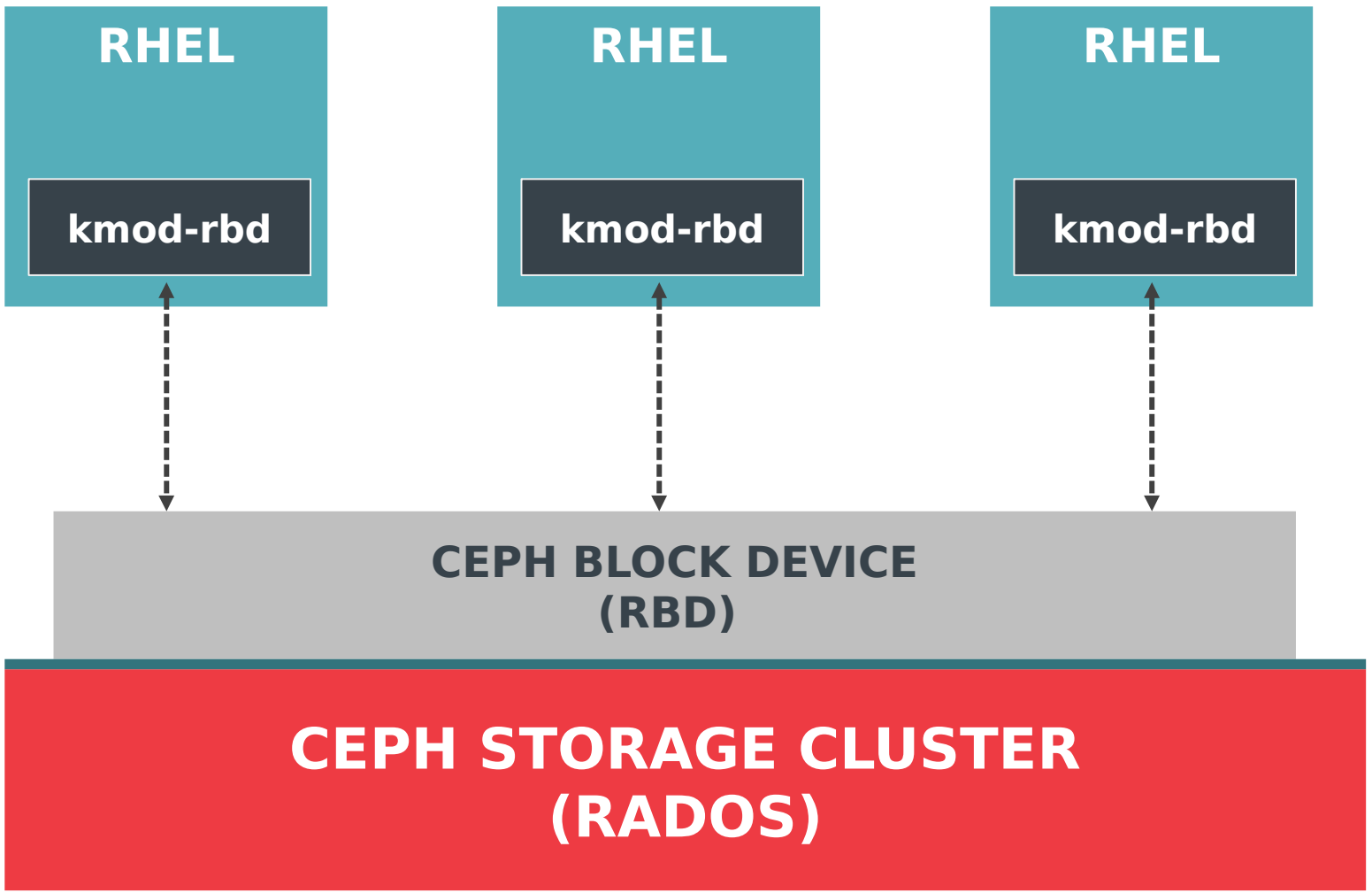
USE CASE: WEB APP STORAGE



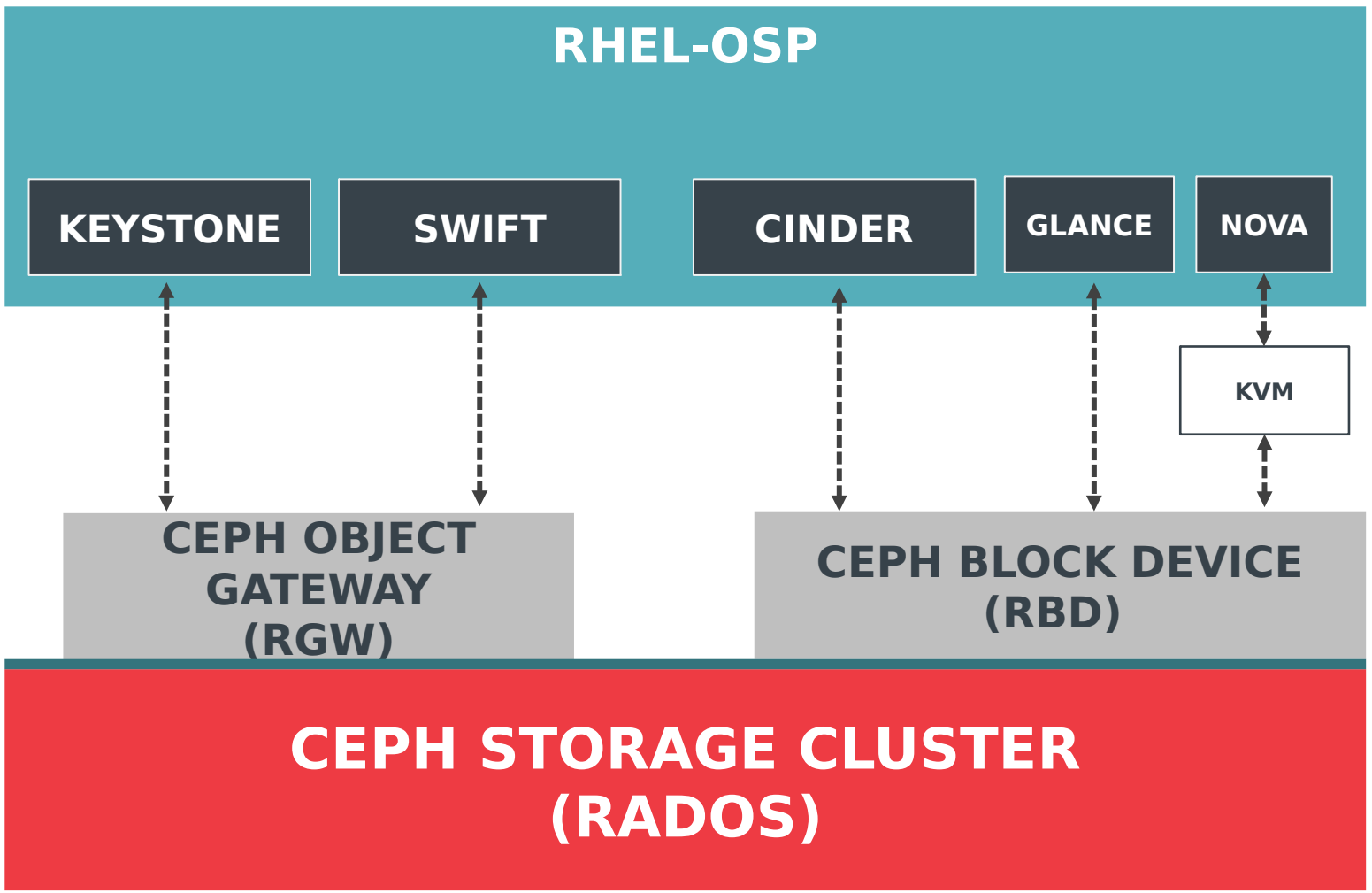
USE CASE: COLD STORAGE



USE CASE: RHEL BLOCK STORAGE



USE CASE: OPENSTACK



“...A DISRUPTIVE AND UNSTOPPABLE FORCE.”

–IDC REPORT

THANK YOU