



## DATA & STORAGE MATTERS

Steven Tan

SODA Foundation Chairman  
VP & CTO Cloud Solution - Storage, Futurewei



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1

# sodacon

— Global 2021 — July 13-14  
Data and Storage Matters

Virtual #sodacon2021



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soda  
TURNS  
**1 YEAR OLD!**





EUROPE - KubeCon Barcelona 2019



JAPAN - CloudNativeDays Tokyo 2019



INDIA - Open Source India, Bengaluru 2019



CHINA - KubeCon Shanghai 2019

YEAR



“We’re eager to contribute to the SODA Foundation. The technical and community momentum is impressive, and we believe our participation can have a deep impact on the future of data storage and management, both for our customers and the industry at large,”

- Mike Moritzkat, President, Seagate Federal and Ken Claffey, Seagate SVP, Cloud Systems



SEAGATE

Seagate Federal joins SODA Foundation



soda foundation



Open Infrastructure  
FOUNDATION

SODA Foundation joins Open Infrastructure Foundation to advance open data & storage infrastructure  
TOGETHER



# JONATHAN BRYCE

Executive Director  
Open Infrastructure Foundation





soda foundation

PREMIER MEMBERS



GENERAL MEMBERS



SUPPORTERS

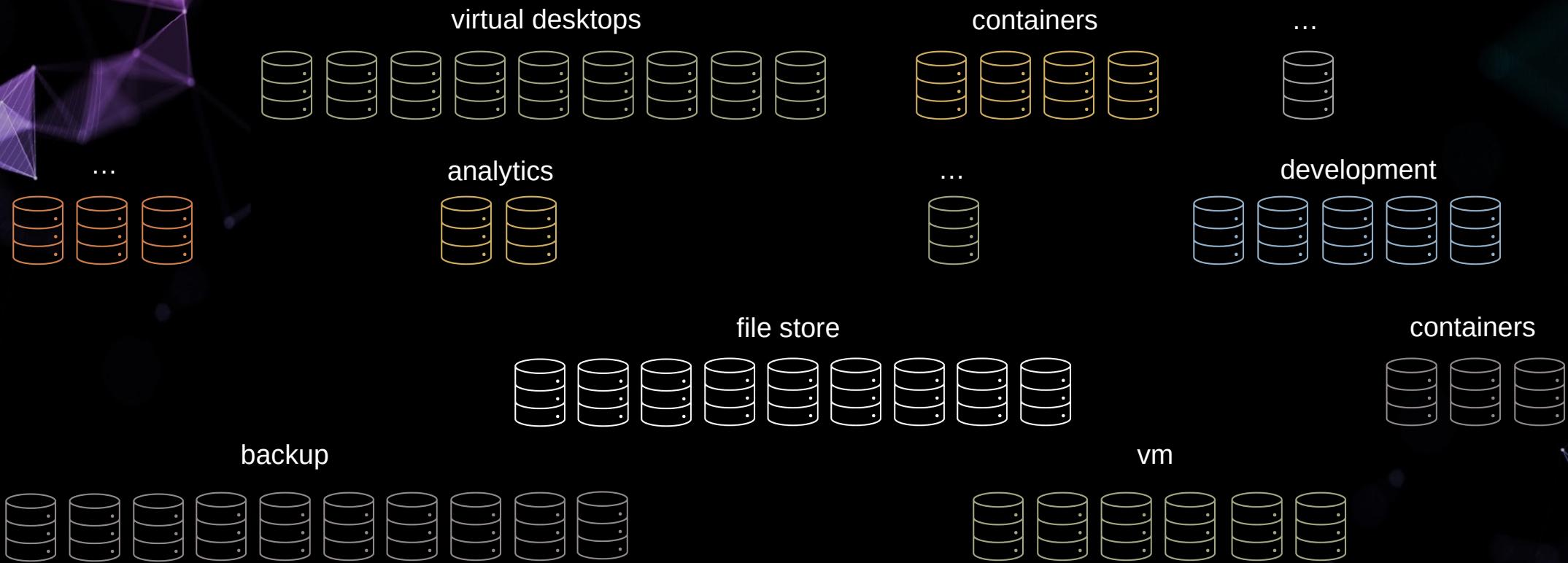


ASSOCIATE MEMBERS

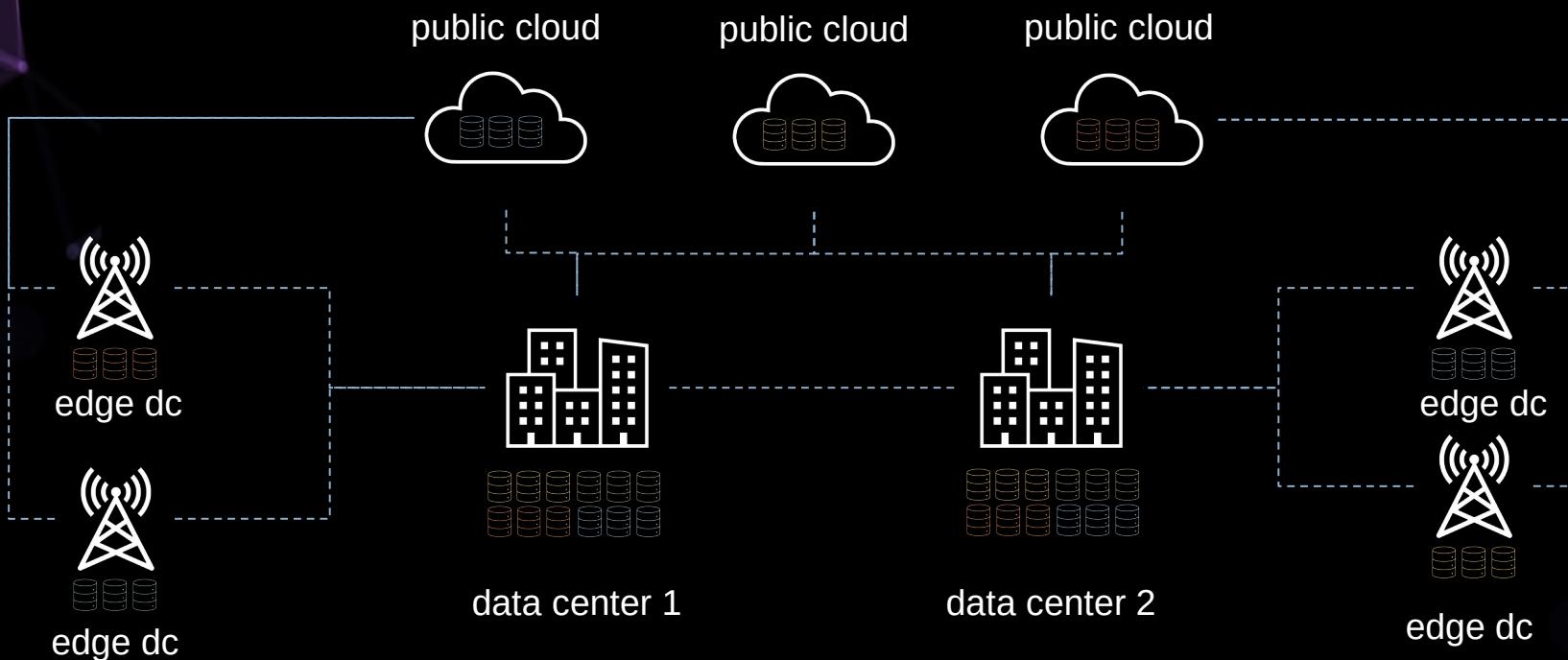


ALLIANCE PARTNER

con2021

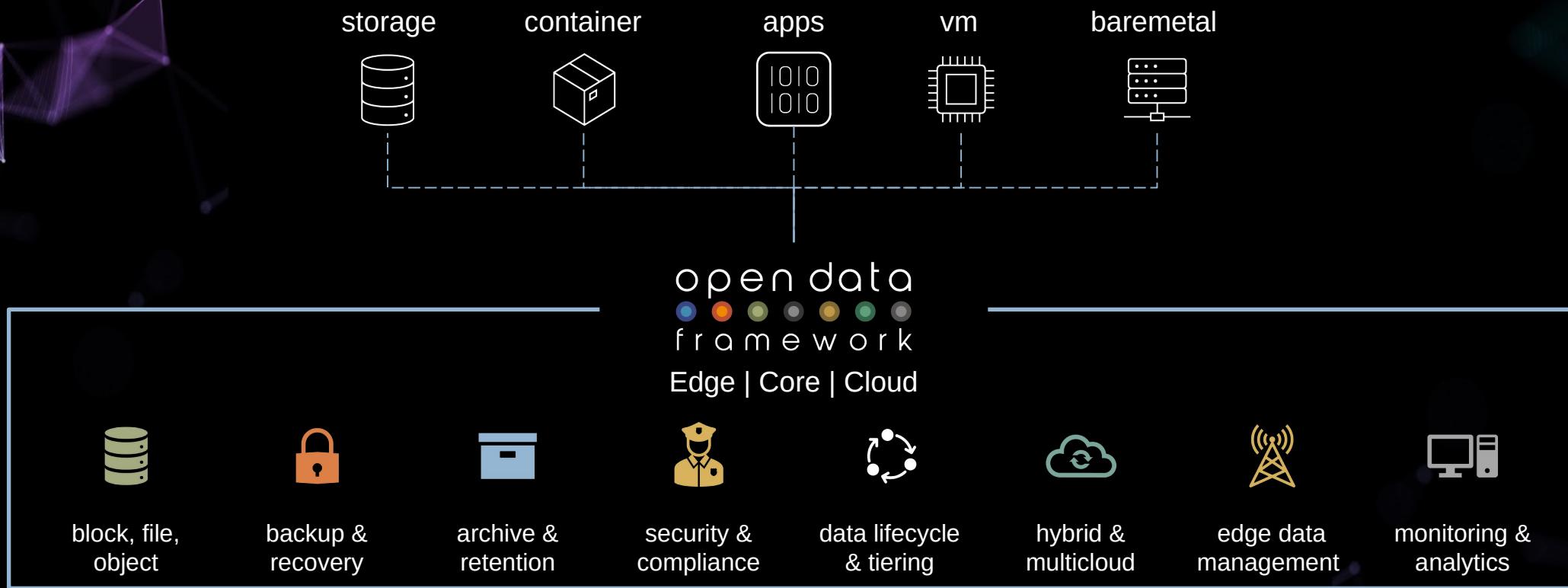


Technology Stacks Create Environments That Are Hard To Monitor and Control

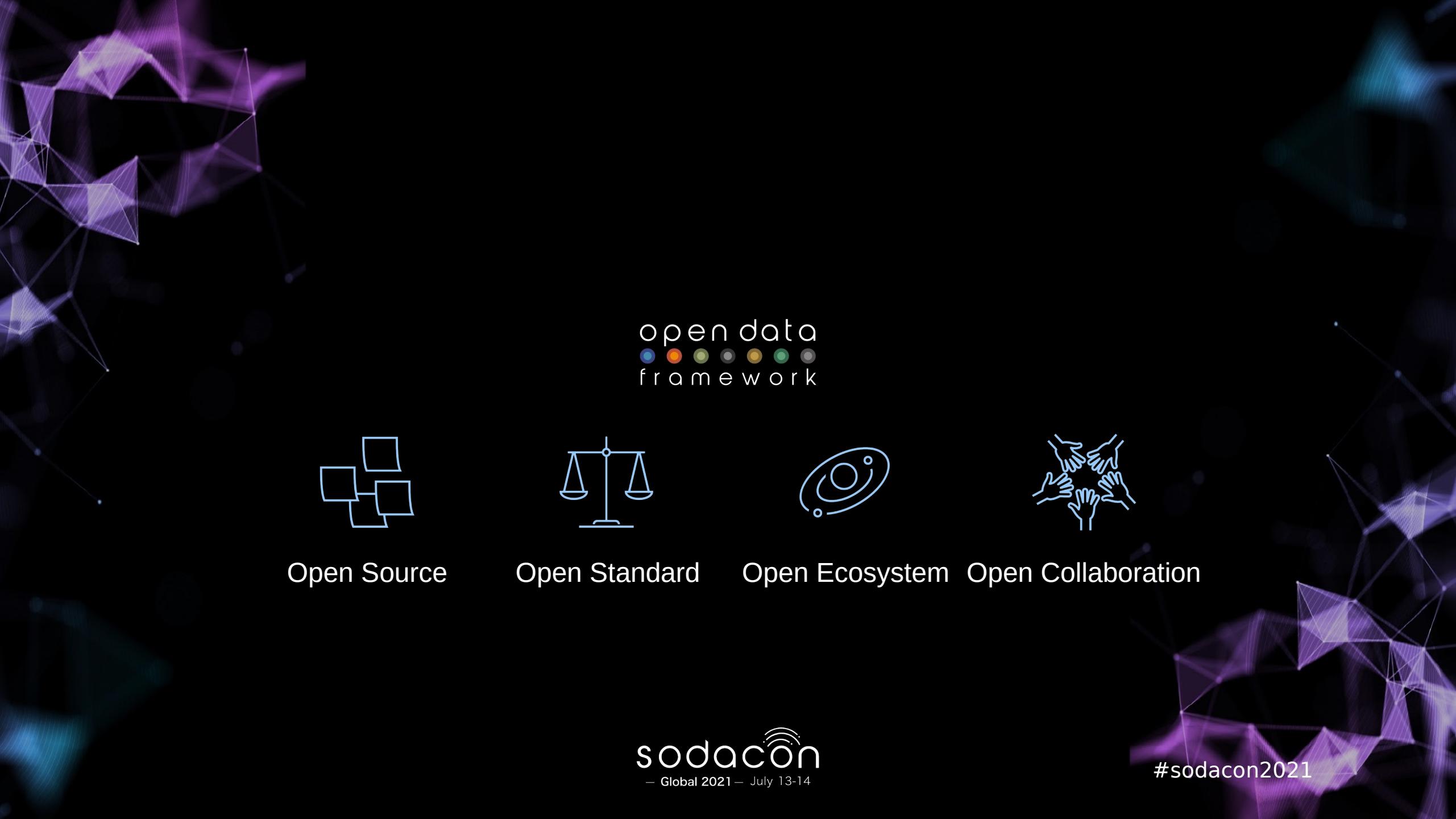


key challenges: capacity - performance - data protection - data compliance - ...

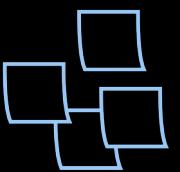
Multi-DC, Cloud, and Edge Add To Monitor and Control Challenges



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



open data  
frame work



Open Source



Open Standard



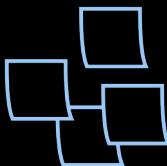
Open Ecosystem



Open Collaboration

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# OPEN SOURCE

## Towards Open Data Autonomy

2017-2019  
2017H2 Zealand  
2018H1 Aruba  
2018H2 Bali  
2019H1 Capri  
2019H2 Daito  
2020Q1 Elba

JUL 2020

Heterogeneous Storage Management  
Block/File Multi cloud  
CSI Plug & Play experiment

OCT 2020

Prometheus & Kafka integration  
Storage Performance Monitoring (SPM)  
Multicloud object and file - AWS, Azure, GCP  
CSI Plug & Play  
Edge data management  
NetApp ONTAP & more

JAN 2021

Performance anomaly detection  
Performance visualization with Grafana  
Enhanced cloud file shares for AWS, GCP, Azure, Huawei  
Enhanced block AWS  
More storage support - IBM SVC, HDS VSP, EMC

APR 2021

Improved storage monitoring  
Monitor NAS performance  
HA support with multi-cloud  
Cold storage  
CSI plug-n-play with more drivers  
More on-prem and cloud backends

JUL 2021

Plug-in any CSI driver  
Multiple CSI drivers in K8S  
Container data protection (Restic)  
Application consistent snapshot to cloud  
Multi-cloud storage tiering  
Storage performance monitoring with more metrics

OPENSDS  
(PRE-SODA)

FAROE V1.0

GREENLAND V1.1

HAWAII V1.2

ISABLELA V1.3

JERBA V1.4

open data  
framework

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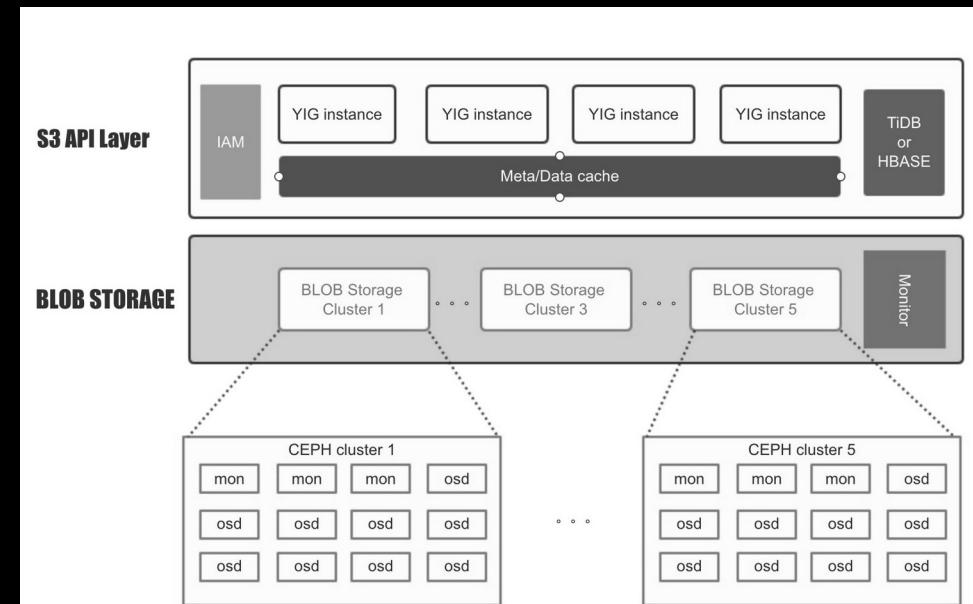


soda  
PROJECT



YIG is a massively scalable object developed to support EB level deployments using Ceph clusters on the backend.

- Uses POSIX API
- Easy to use, no SDK integration
- Support broad applications, such as Spark, etc.
- Have high availability
- Have high capacity



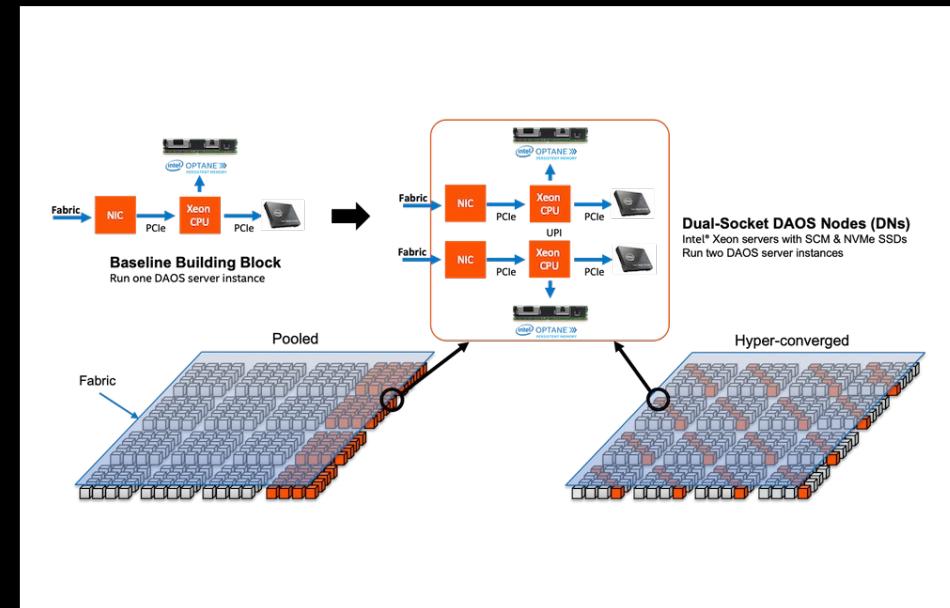


soda  
PROJECT

| daos

The Distributed Asynchronous Object Storage (DAOS) is an open-source object store designed from the ground up for massively distributed Non Volatile Memory (NVM).

- High throughput and IOPS
- Fine-grained I/O operations with true zero-copy I/O to SCM
- Support for massively distributed NVM storage
- Non-blocking data and metadata operations
- Advanced data placement considering fault domains
- Software-managed redundancy supporting both replication and erasure code with an online rebuild
- End-to-end data integrity
- Dataset snapshot
- And more...





Open Standard

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# OPEN STANDARD. API FIRST

ODF API is based on SNIA Swordfish standard, everything in the framework is accessible and extensible by API's

The screenshot shows a detailed API documentation interface for the SodaCon framework. It lists numerous endpoints categorized under various sections:

- API versions**: GET /, GET /{apiVersion}
- Dock**: GET /v1beta/{tenantId}/docks, GET /v1beta/{tenantId}/dock
- Pool**: GET /v1beta/{tenantId}/pools, GET /v1beta/{tenantId}/pool
- Availability Zone**: GET /v1beta/{tenantId}/avail
- Profiles**: GET /v1beta/{tenantId}/prof, POST /v1beta/{tenantId}/prof, PUT /v1beta/{tenantId}/prof, DELETE /v1beta/{tenantId}/prof, POST /v1beta/{tenantId}/prof
- Block volume attachments**: GET /v1beta/{tenantId}/block, POST /v1beta/{tenantId}/block, GET /v1beta/{tenantId}/block, PUT /v1beta/{tenantId}/block, DELETE /v1beta/{tenantId}/block
- Block volume snapshots**: GET /v1beta/{tenantId}/block, POST /v1beta/{tenantId}/block, GET /v1beta/{tenantId}/block, PUT /v1beta/{tenantId}/block, DELETE /v1beta/{tenantId}/block
- Block volumes**: GET /v1beta/{tenantId}/block, POST /v1beta/{tenantId}/block, GET /v1beta/{tenantId}/block, PUT /v1beta/{tenantId}/block, DELETE /v1beta/{tenantId}/block
- FileShare**: Multi-cloud cloud file shares: POST /v1/{tenantId}/file/share, GET /v1/{tenantId}/file/share, PUT /v1/{tenantId}/file/share, DELETE /v1/{tenantId}/file/share
- Storage Pools**: GET /v1/storage-pools, GET /v1/storage-pools/{id}
- Controllers**: GET /v1/controllers, GET /v1/controllers/{id}
- Ports**: GET /v1/ports, PUT /v1/ports, GET /v1/ports/{id}
- Storages**: GET /v1/storages, POST /v1/storages, GET /v1/storages/{storage\_id}, DELETE /v1/storages/{storage\_id}, POST /v1/storages/sync, GET /v1/storages/{storage\_id}/sync, PUT /v1/storages/{storage\_id}/access-info, GET /v1/storages/{storage\_id}/access-info, GET /v1/storages/access-infos, GET /v1/storages/snmp-configs

The screenshot shows a specific API endpoint detail and the SNIA Swordfish logo.

**Endpoint Detail:**

```
{
  "id": "084bf71e-al02-11e7-88a8-e31fe6d52248",
  "createdAt": "2017-07-10T14:36:58.014Z",
  "updatedAt": "2017-07-10T14:36:58.014Z",
  "name": "File_Profile",
  "storageType": "block",
  "description": "string",
  "provisioningProperties": {
    "dataStorage": {
      "recoveryTimeObjective": 10,
      "provisioningPolicy": "thick",
      "compression": false,
      "deduplication": false,
      "characterCodeSet": "ASCII",
      "maxFileNameLengthBytes": 255,
      "storageAccessCapability": "Read"
    },
    "ioConnectivity": {
      "accessProtocol": "iscsi",
      "maxIOPS": 150,
      "minIOPS": 50,
      "maxBWS": 5,
      "minBWS": 1,
      "latency": 1
    }
  },
  "replicationProperties": {
    "dataProtection": {
      "isIsolated": true,
      "minLifetime": "P3Y6M4DT12H30MS",
      "RecoveryGeographicObjective": "datacenter",
      "RecoveryPointObjectiveTime": "P3Y6M4DT12H30MS",
      "RecoveryTimeObjective": "offline",
      "ReplicaType": "snapshot"
    },
    "replicainfos": {
      "replicaUpdateMode": "Active",
      "replicationBandwidth": 5,
      "replicationPeriod": "P3Y6M4DT12H30MS",
      "consistencyEnabled": true
    }
  },
  "snapshotProperties": {
    "schedule": {
      "dateTime": "2019-09-07T07:02:35.389",
      "occurrence": "Daily"
    },
    "retention": {
      "duration": 15,
      "number": 10
    },
    "topology": {
      "bucket": "string"
    }
  },
  "dataProtectionProperties": {
    "dataProtection": {
      "isIsolated": true,
      "minLifetime": "P3Y6M4DT12H30MS",
      "RecoveryGeographicObjective": "datacenter",
      "RecoveryPointObjectiveTime": "P3Y6M4DT12H30MS",
      "RecoveryTimeObjective": "offline",
      "ReplicaType": "snapshot"
    },
    "consistencyEnabled": true
  },
  "customProperties": {
    "key1": "value1",
    "key2": false,
    "key3": {
      "key31": "value31"
    }
  }
}
```

**SNIA Swordfish Logo:**



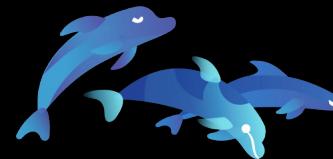
Open Ecosystem

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# OPEN ECO INITIATIVE

The SODA Eco Initiative enables ecosystem collaboration among SODA community stakeholders, leads to deeper adoption among end users



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P R O J E C T



## Collaboration

Collaborate with other open source projects



## Solution

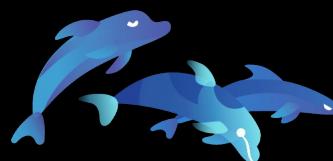
Build end-to-end solutions with ODF



## Adoption

Accelerate adoption with POC's

# WELCOME THE FIRST SODA ECO PROJECTS



soda eco  
P R O J E C T

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**LIN<sup>STOR</sup>**

 OpenEBS

 ZENKO

**CORTX™**

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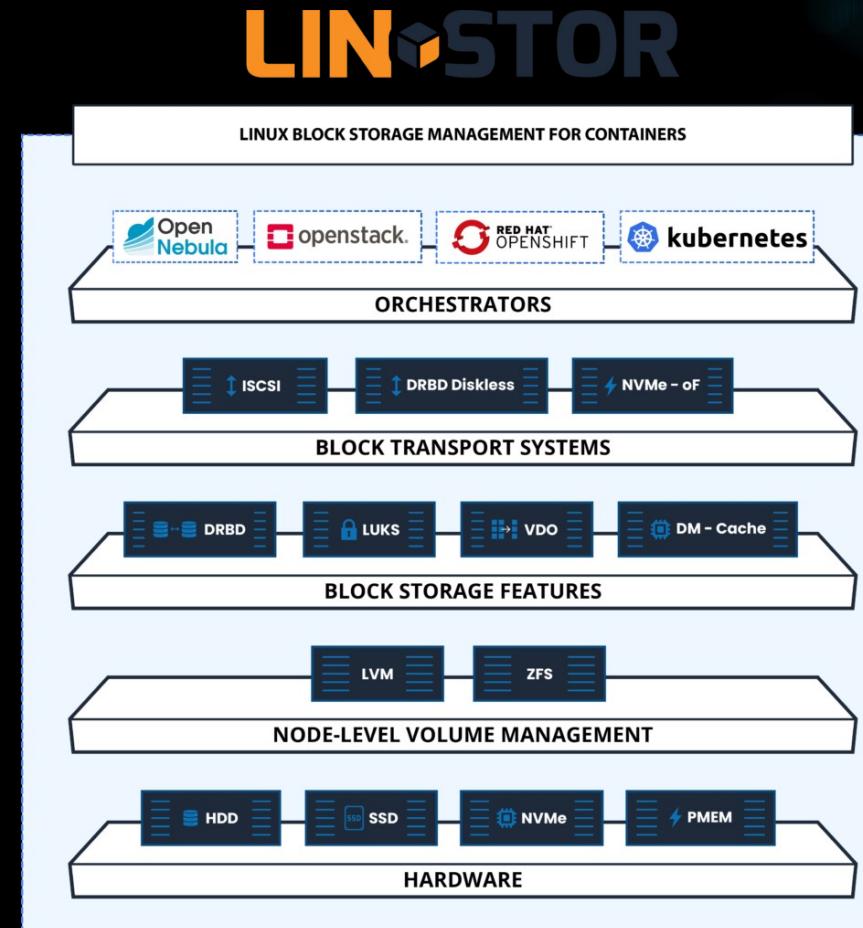


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PROJECT

| LIN<sup>3</sup>STOR

With native integration to Kubernetes, LINSTOR® makes building, running, and controlling block storage simple.

- Multi-tier storage: Data can be stored on either HDD, SSD, NVME or PMEM. Live migration is possible between each other.
- Data Dedupe: Data deduplication is one such technology that enables better utilization of both storage devices and network bandwidth.
- Geo Clustering: Possibility to have multiple clusters in different geographical locations
- Ultra Fast Performance: World IOPS record with DRBD
- Wide Platform Support: OpenShift, OpenNebula, OpenStack, Kubernetes, Docker, HyperV, Vmware, Proxmox
- And more...





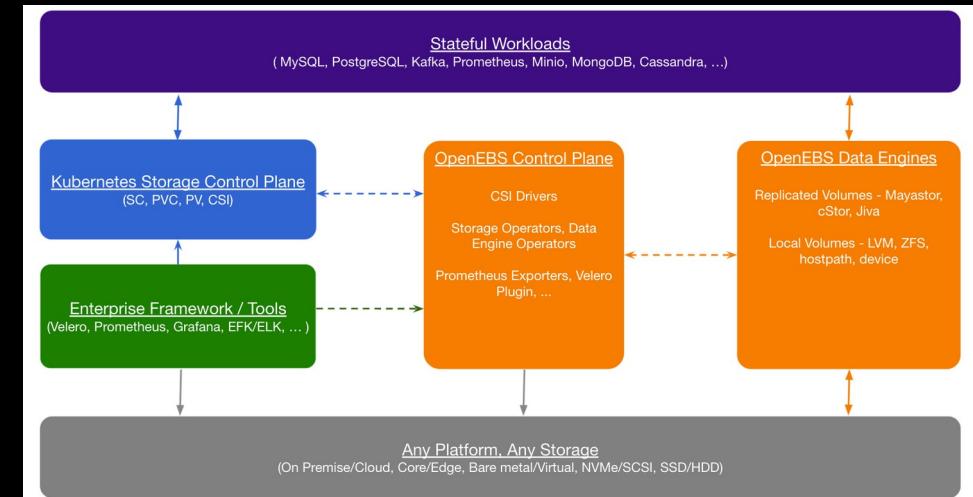
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PROJECT

| OpenEBS

CLOUD NATIVE  
SANDBOX

OpenEBS builds on Kubernetes to enable Stateful applications to easily access Dynamic Local PVs or Replicated PVs.

- Kubernetes native - ease of use and operations. integrates into the standard cloud native tooling
- Lower footprint. Flexible deployment options. Fastest NVMe Replicated Storage.
- Controlled and predictable blast radius. Easy to visualize the location of the data of an application or volume
- Horizontally scalable. Scale up and/or down
- Highly composable. Choice of data engines matching the node capabilities and storage requirements
- Open Source and Avoid vendor lock-in
- And more...





soda eco  
PROJECT

| ZENKO

Zenko is open-source infrastructure software for DevOps, storage and data managers to view and control data in multi-cloud IT environments.

- Single API (Amazon S3) data access to any storage location or cloud
- Global multi-cloud namespace
- Data remains in format of each storage system or cloud (open, readable, non-proprietary)
- Multi-cloud data management through lifecycle & replication policies
- Extensible metadata and search across clouds
- Zenko includes open-source Cloudserver (S3 endpoint service) and Backbeat workflow service (asynchronous processing engine) projects
- And more...



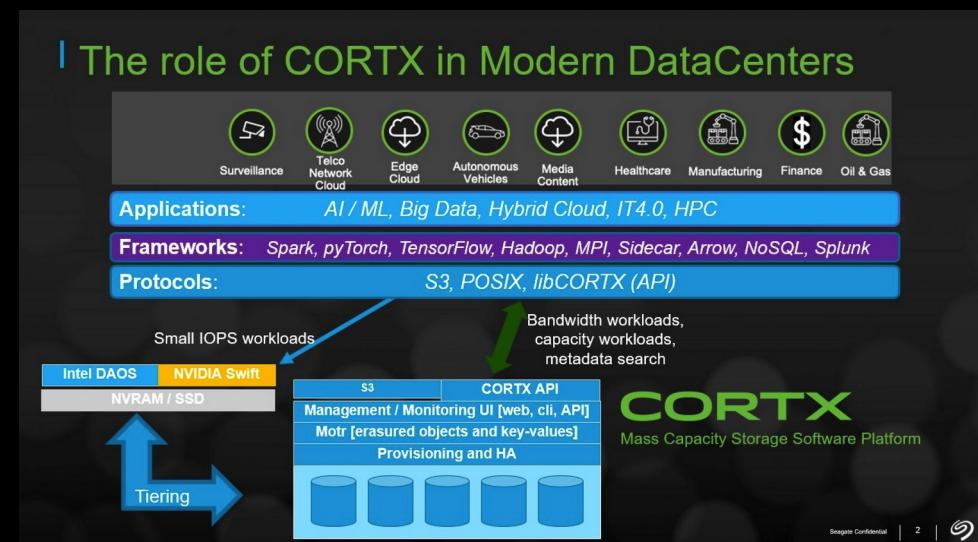


sodaeco  
PROJECT

CORTX™

CORTX is an opensource distributed object storage system designed for great efficiency, massive capacity, and high HDD-utilization.

- Object storage uniquely optimized for mass capacity storage devices
- Works with any processor.
- Highly flexible, works with HDD, SSD, and NVM
- Massively Scalable. Scales up to a billion billion billion billion billion exabytes ( $2^{206}$ ) and 1.3 billion billion billion billion objects with unlimited object sizes.
- Rapidly Responsive. Quickly retrieves data regardless of the scale using a novel Key-Value System that ensures low search latency across massive data sets.
- And more.





Open Collaboration

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soda foundation



CLOUD NATIVE  
COMPUTING FOUNDATION

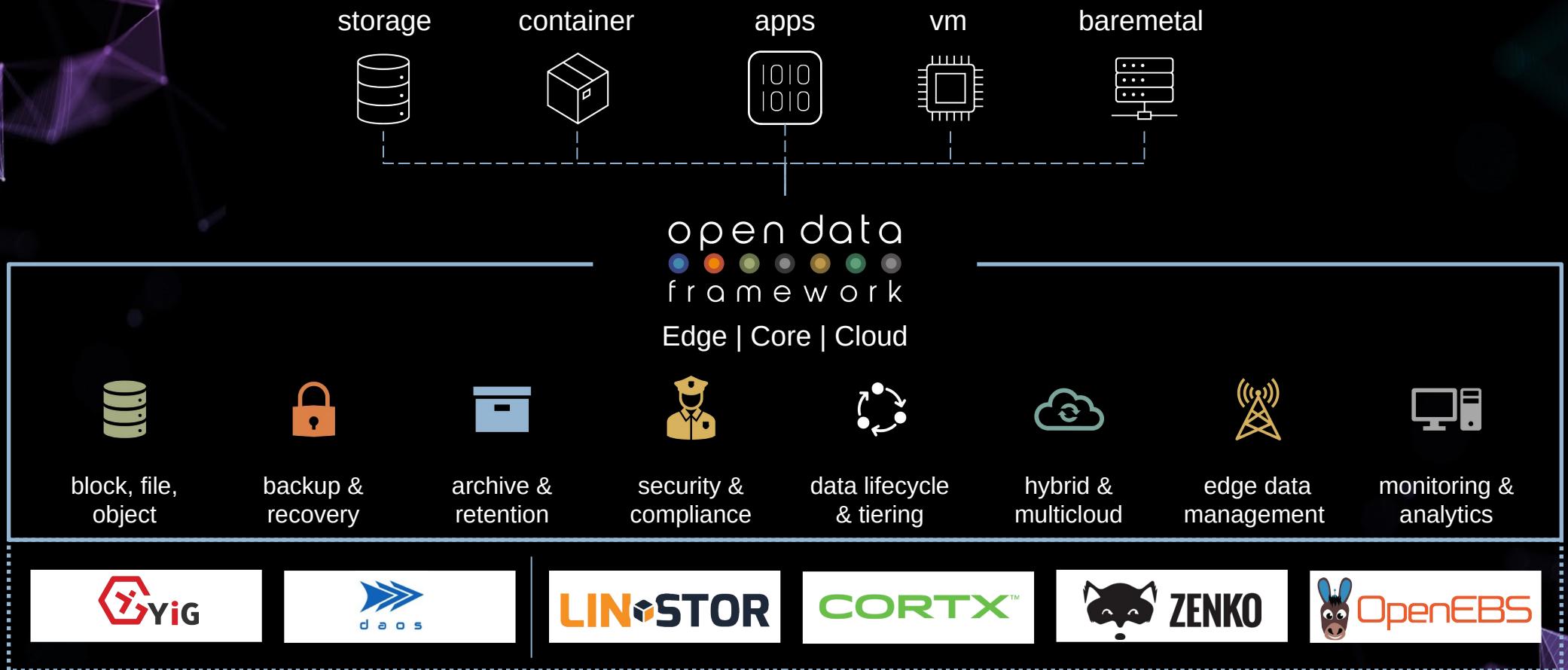
SODA Foundation joins Open Infrastructure Foundation to advance open infrastructure together.  
SODA Foundation and Cloud Native Computing Foundation working together to advance cloud native data  
management and storage



# BILL MULLIGAN

Marketing Manager  
Cloud Native Computing Foundation





Open Source • Open Standard • Open Ecosystem • Open Collaboration



Yuji Yazawa  
Toyota Motor Corp



Cosimo Rossetti  
Vodafone



Zhong Xin  
CCB FINTECH



Kei Kusunoki  
NTT Communications



Tomoko Kondo  
Softbank



Zhan Shu  
China Construction Bank Fintech



Yusuke Sato  
Yahoo! JAPAN



Wim Jacobs  
KPN



Michiharu Nakazawa  
Sakura Internet



Mitchitaka Terada  
Internet Initiative Japan



Wei Rao  
China Railway



Shinya Tsunematsu  
GMO Pepabo

## END USER ADVISORY COMMITTEE

The background of the slide features a photograph of several dolphins swimming in clear blue ocean water. They are captured in various stages of motion, some leaping and others gliding. The water has gentle waves and sunlight filtering through from above.

# SODA Data & Storage Trends 2021 Survey

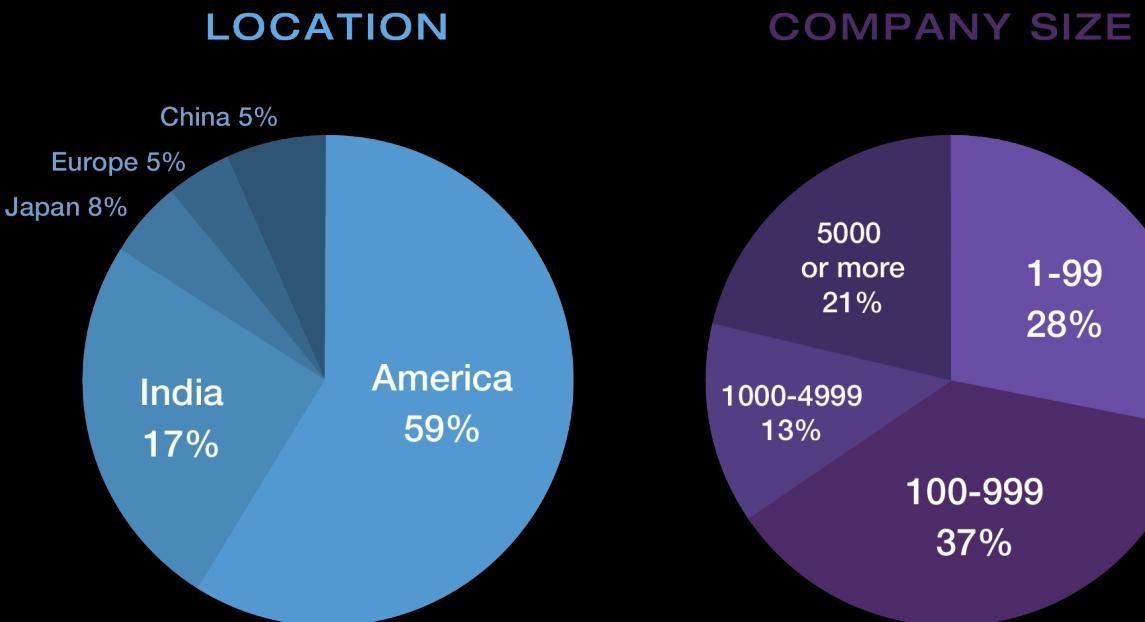
SODA Foundation &  
Linux Foundation Research

# SODA DATA & STORAGE TRENDS SURVEY

- Research Partner: Linux Foundation Research Team
- Survey Partners
  - Cloud Native Computing Foundation (CNCF)
  - Storage Networking Industry Association (SNIA)
  - Open Infrastructure Foundation (OIF)
  - Japan Data Storage Forum (JDSF)
  - China Open Source Cloud League (COSCL)
  - Mulan Open Source
  - Storage Performance Council (SPC)

# SODA DATA & STORAGE TRENDS 2021 SURVEY

197  
respondents



SODA DATA & STORAGE TRENDS 2021 SURVEY

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# 1. PLATFORM USE PIVOTING TO CONTAINER-BASED ENVIRONMENTS

 43.5%

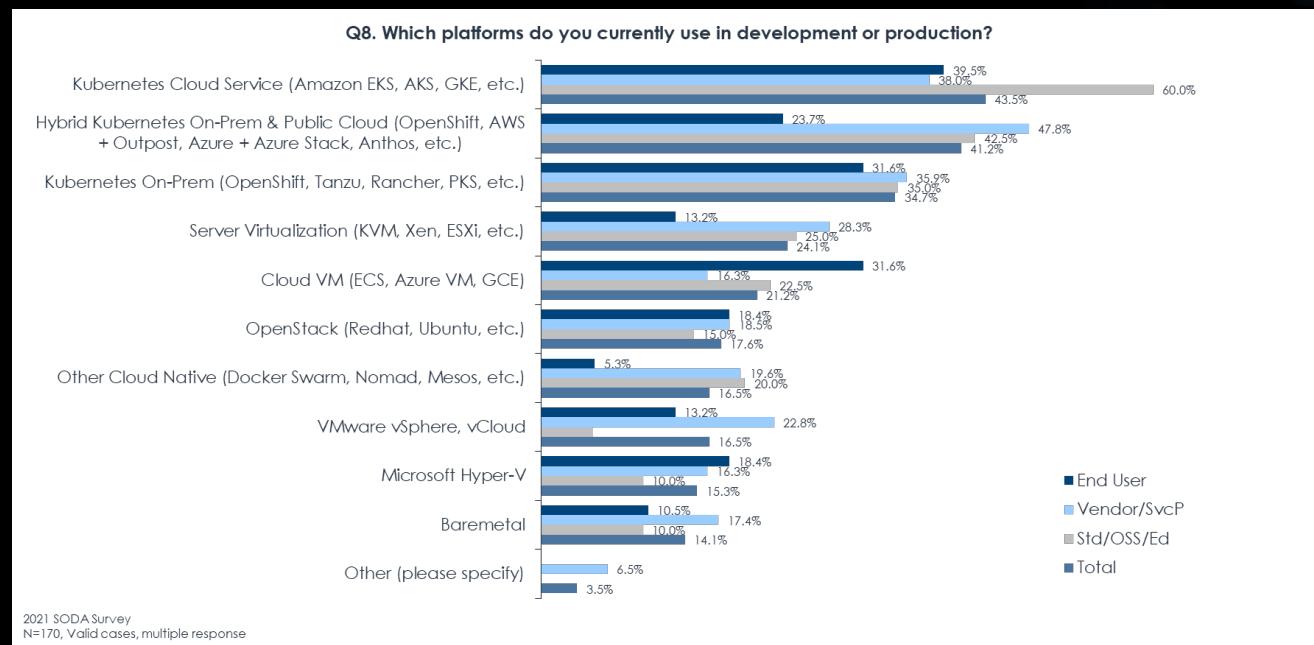
k8s cloud service

 41.2%

k8s hybrid

 34.7%

k8s on-prem

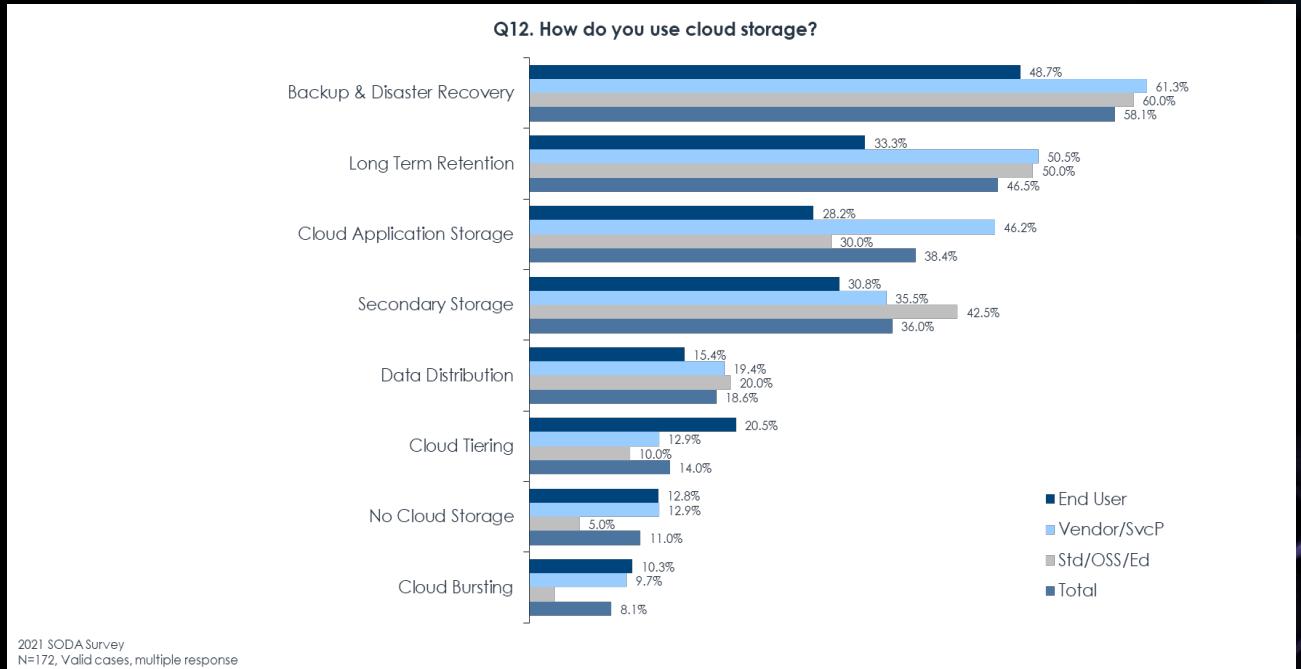


SODA DATA & STORAGE TRENDS 2021 SURVEY

## 2. CLOUD STORAGE FOCUSES ON BACKUP & DR

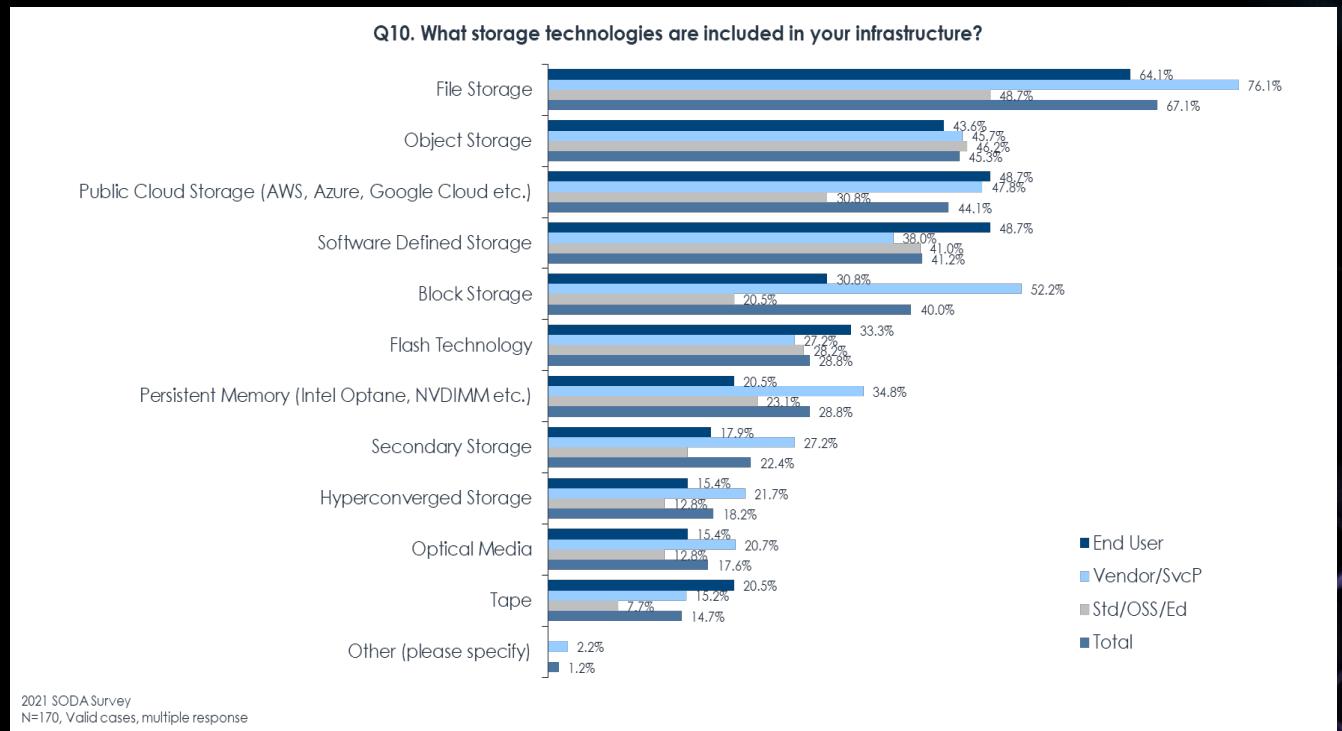
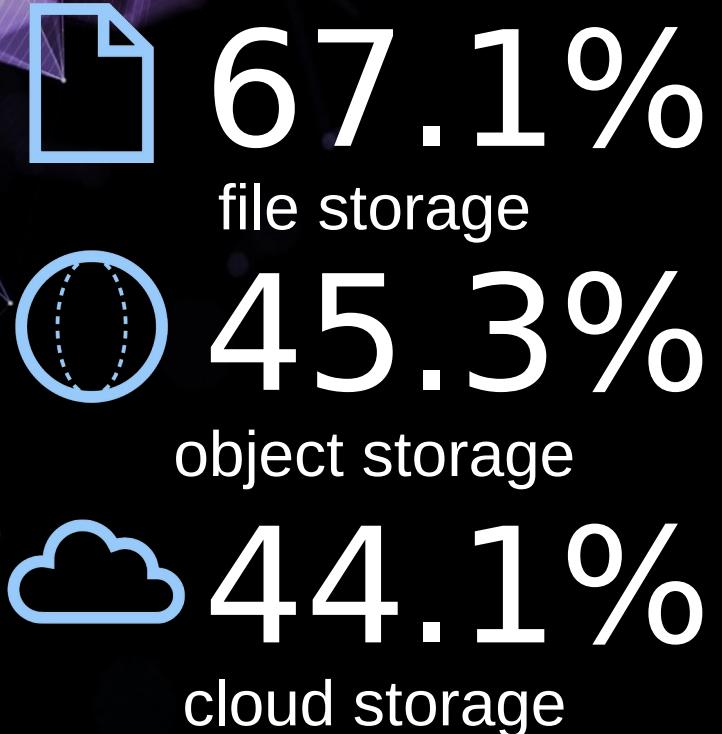
 58.1%  
backup & disaster recovery

 46.5%  
long term retention



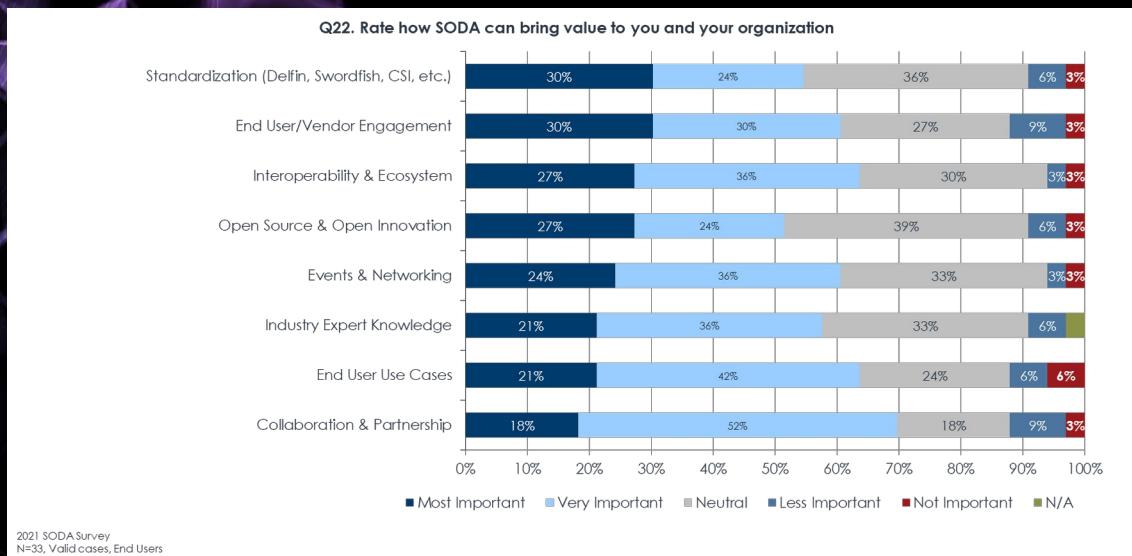
SODA DATA & STORAGE TRENDS 2021 SURVEY

### 3. STORAGE TECHNOLOGIES IN USE

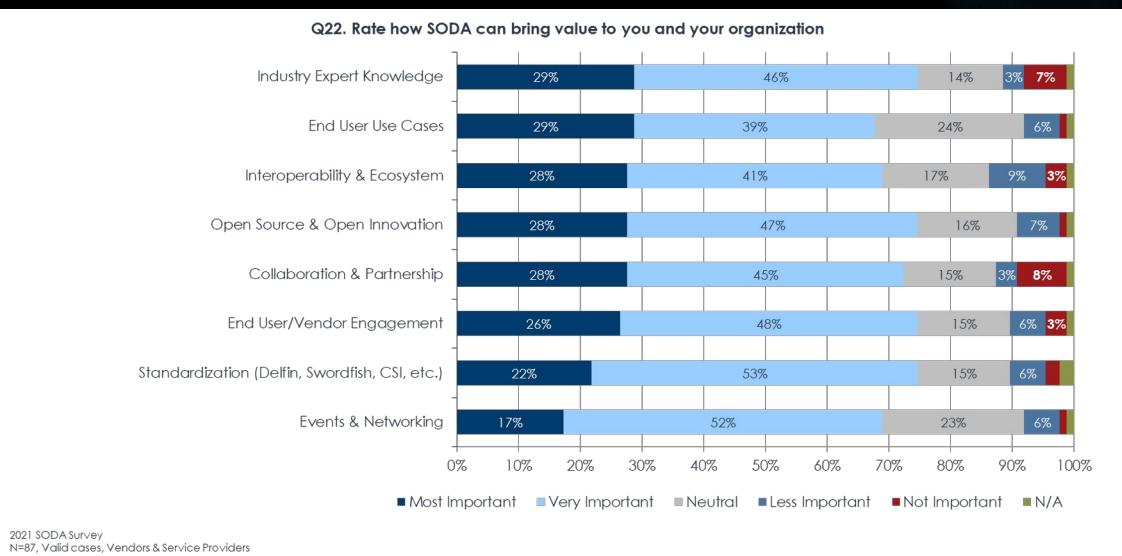


SODA DATA & STORAGE TRENDS 2021 SURVEY

## 4. HOW SODA BRINGS VALUE TO YOUR ORGANIZATION



50%-70%  
end users  
consider SODA activities are very important



~70%  
vendors  
consider SODA activities are very important

SODA DATA & STORAGE TRENDS 2021 SURVEY



# SODA Data & Storage Trends 2021 Survey

SODA Foundation &  
Linux Foundation Research





Thank You