OPENSDS JAPAN MEETUP VOL2

Hosted by YAHOO! JAPAN

STEVEN TAN
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OpenSDS TSC Chairman

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@stevenphtan

State of The Project

OPENSDS JAPAN MEETUP VOL1

Dec 2018 Hosted by RedHat


2018 1st Meetup Shanghai

2018 Year End Meetup Hosted by Toyota


2017 Mini Summit, Prague

2019 Kubernetes Day India

2018 Mini Summit, Copenhagen

2018 Interop Japan


2018 Open Source Forum, Yokohama

Driving China Community

Intel is leading community establishment and development in China.

Community

OpenSDS

HUAWEI

intel

中国移动 China Mobile

UnionPay 银联

openstack CLOUD SOFTWARE

China unicom 中国联通

ceph

lenovo

中国电信 CHINA TELECOM

...

Activity

Meetup

OpenSDS Meetup
Shanghai, Nov 15 2018

Open Source Hackathon
Shenzhen, April 18-20 2019

...

Intel co-hosted the 1st OpenSDS Meetup at Shanghai, is leading OpenSDS session in the 9th Open Source Hackathon, and planning more activities in China.

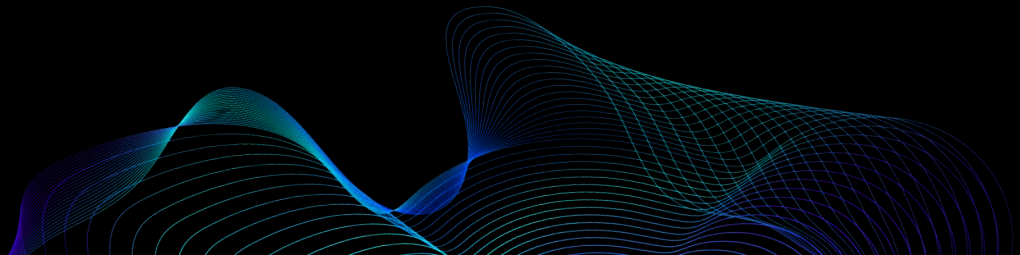

BARCELONA
KubeCon
CloudNativeCon
Europe 2019
OPEN DATA AUTONOMY MINI SUMMIT
2019年5月20日 月曜日 09:00 - 17:00
FIRA GRAN VIA, BARCELONA, SPAIN
Write to us for a FREE PASS
Featuring Speakers From:
IBM, Intel, Huawei, Google,, Linbit, NTT Communications, SUSE, Yahoo Japan,
Vodafone, SNIA, SPC, Quobyte
OpenSDS

8:00 – 9:00 am	**Registration, Breakfast and Networking**
9:00 – 9:20 am	**Welcome** **Open Data Autonomy : Introduction and Background** Steven Tan, OpenSDS TSC Chair, VP & CTO Cloud Solutions, Huawei
9:20 – 9:40 am	**State of Cloud Native : Going through CNCF Landscape** Dan Kohn, Executive Director, CNCF
9:40 – 10:00 am	**OpenSDS Capri Release Overview** Anjaneya "Reddy", Chief SDS Architect, Intel
10:00 – 10:20 am	**Data Service Automation and Orchestration** Sanil Kumar, Chief Architect, Huawei and Xulin, OpenSDS Maintainer, Huawei
10:20 – 10:40 am	**Telemetry and Anomaly across Platforms and Storage** Xing Yang, Lead Architect of OpenSDS, Huawei
10:40 – 11:10 am	**Coffee Break & Networking**
11:10 – 11:30 am	**CSI Updates** Michelle Au, Software Engineer, Google, Kubernetes SIG Storage Maintainer
11:30 – 11:50 am	**Multiple platforms with heterogeneous storage – How OpenSDS solves the challenges** Yahoo! JAPAN
11:50 – 12:10 pm	**Open Data Autonomy for Edge – A Usecase View** Vivian Zhu, Engineering Manager, Intel
12:10 – 12:30 pm	**Meeting Multi-Cloud Challenges for Data Services** NTT Communication
12:30 – 12:50 pm	**Data Management Challenges across heterogeneous storage : End users perspective** Cosimo Rossetti, Lead Infrastructure Architect, Vodafone

12:50 – 01:50 pm	**Lunch & Networking**
01:50 – 2:00 pm	**Quiz and Goodies! Welcome Back from Lunch!**
02:00 – 02:45 pm	**Demo & Hands-on (BYOD) : Capri Preview, Integration and More**
02:45 – 03:05 pm	**Standardizing Data and Storage Management** SNIA
03:05 – 03:25 pm	**A Proposal for Evaluating Storage Platforms** Stephen Daniel, HPE, Chair of Storage Performance Council
03:25 – 03:40 pm	**Containers and Filesystems** Dr. Felix Hupfeld, CTO, Quobyte GmbH
03:40 – 04:00 pm	**Coffee Break & Networking**
04:00 – 04:15 pm	**Manage big data in multi-cloud environment using software defined storage technology** Prashant Mishra, CEO, Click2Cloud and Rupal Shirpurkar, Business Head, Click2Cloud
04:15 – 04:30 pm	**LINSTOR: A Linux centric software defined storage** Philipp Reisner, CEO, LINBIT and author of DRBD
04:30 – 05:00 pm	**OpenSDS Planning and Wrap up**
05:00 pm onwards	**Evening Reception : Networking Dinner & Drinks** **Surprises Awaited!**

The Open Autonomous Data Platform

An Overview



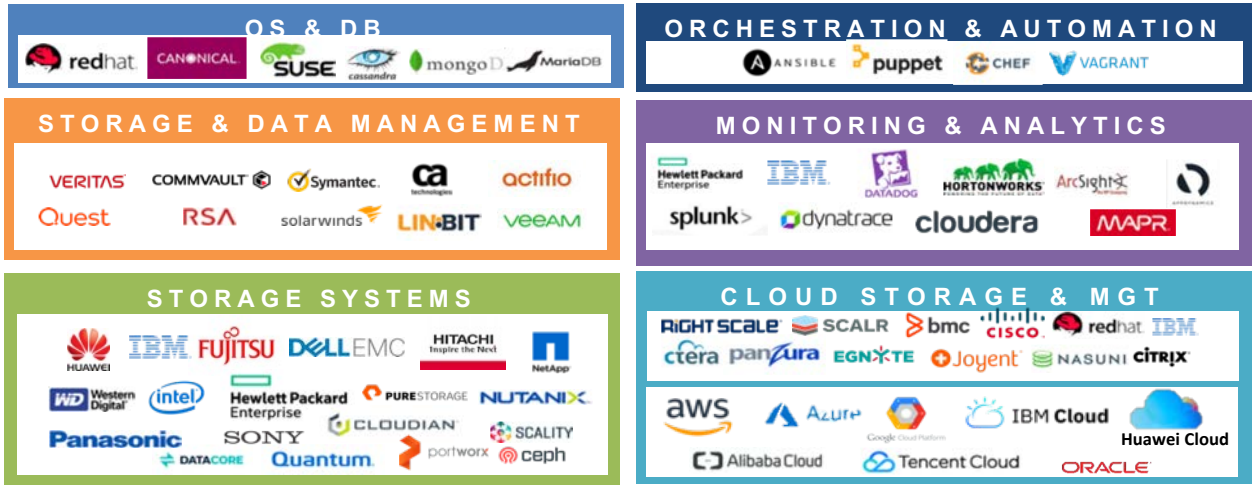
OpenSDS

IT Trends トレンド

- **Cloud Native コンテナ、マイクロサービス** – データの可用性、保護、複製
- **Multi-Cloud ハイブリッド/マルチクラウド** – データの移動性、ガバナンス、移植性
- **Edge Computing エッジコンピューティング** – データ移行、配信
- **Automation 自動化** – データ回復、削減、最適化
- **Big Data ビッグデータ** – データ取得、変換、洞察、可視化
- **ML/AI** – データ収集、分類
- **IoT** – データライフサイクル、階層化、移行、バックアップ、アーカイブ
- **Data Governance データガバナンス** – データセキュリティ、追跡、保存、廃棄

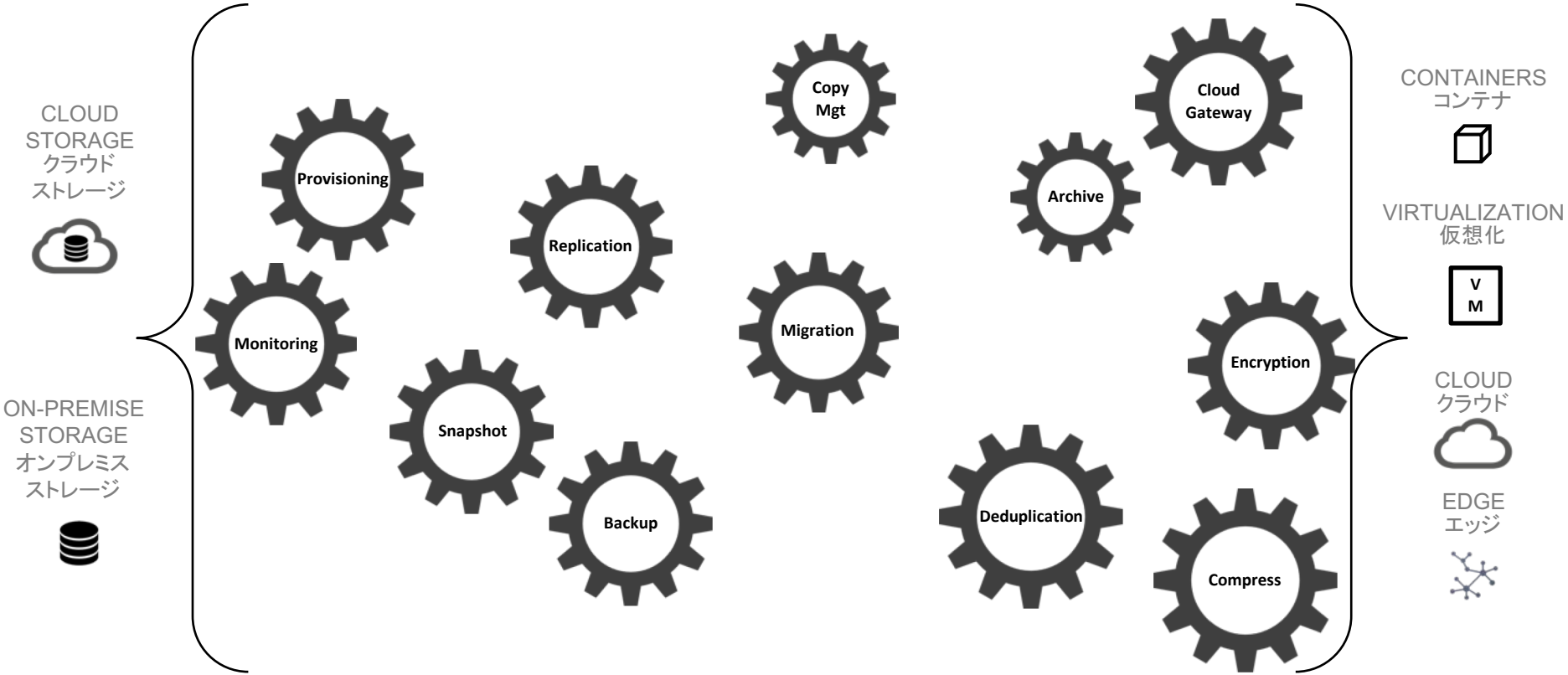
データを中心に

Industry Solutions 業界データ & ストレージソリューション



OPEN SOURCE

Today 今まで



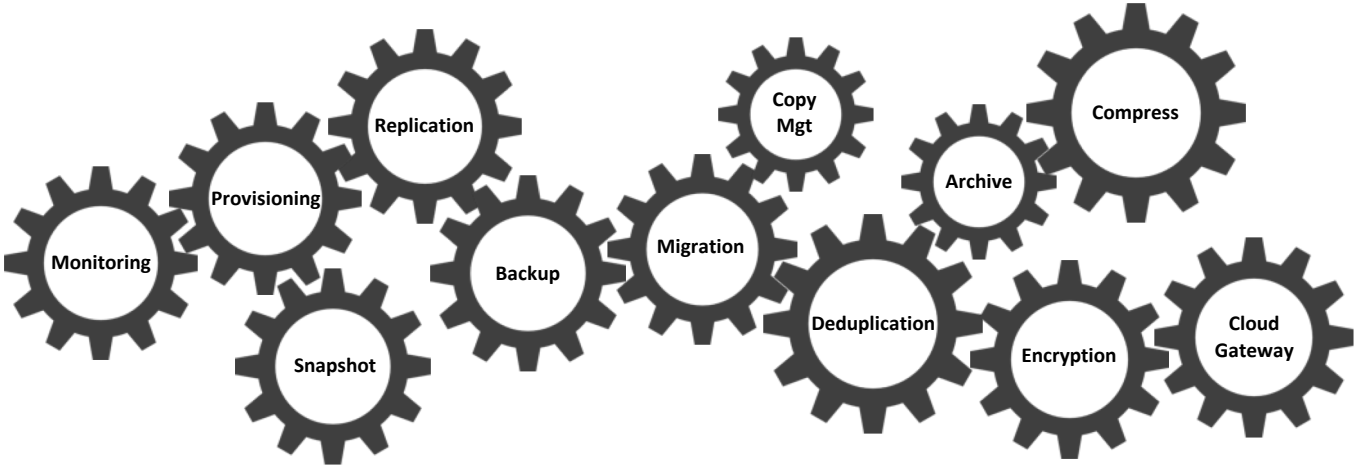
SILOED SOLUTIONS
それぞれ孤立しているソリューション

Future Needs これからのニーズ

Data Services + Intelligence + Automation & Orchestration
データサービス+インテリジェンス+自動化&オーケストレーション

CLOUD STORAGE
クラウド
ストレージ

ON-PREMISE STORAGE
オンプレミス
ストレージ



CONTAINERS
コンテナ

VIRTUALIZATION
仮想化

V M

CLOUD
クラウド

EDGE
エッジ

AN OPEN AUTONOMOUS DATA PLATFORM
オープンインテリジェント自律型データプラットフォーム
Self-driving: BC/DR, Lifecycle, LB, Governance, Optimization …

The Open Autonomous Data Platform
オープンな自律データプラットフォーム

CONTAINERS

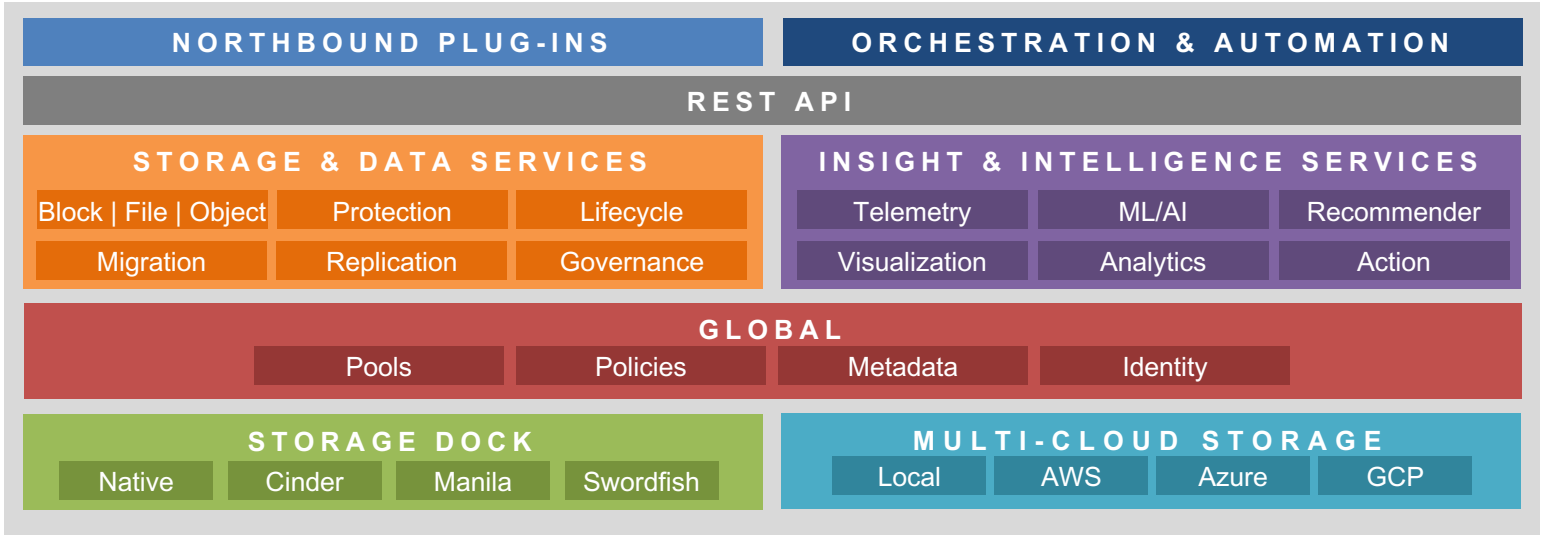
kubernetes docker MESOS OPENSHIFT

VIRTUALIZATION

openstack. vmware Microsoft Hyper-V

OTHERS

CLOUD FOUNDRY now ORACLE SAP



ON-PREMISE STORAGE

Direct Attached | Software-Defined | Enterprise

CLOUD STORAGE

HUAWEI aws Azure Google Cloud Platform

OPEN. INTELLIGENT. AGILE

Roadmap and Capri Overview

OpenSDS Roadmap v0.24

2017H2
ZEALAND

- Kubernetes FlexVolume
- Vol CRUD
- Standalone Cinder Integration
- CSI Support
- Ceph, LVM

2018H1
ARUBA

- OpenStack
- Replication
  Array-Based, Host-Based
- Dashboard
- Storage Profiles
- Enumeration
- Block Storage
  - Cinder Drivers
  - Ceph
  - LVM
  - Huawei: Dorado

2018H2
BALI

- S3 Object
- Multi-Cloud
  AWS, Azure, Ceph, Huawei
- Multi-OpenStack
- CSI v1.0

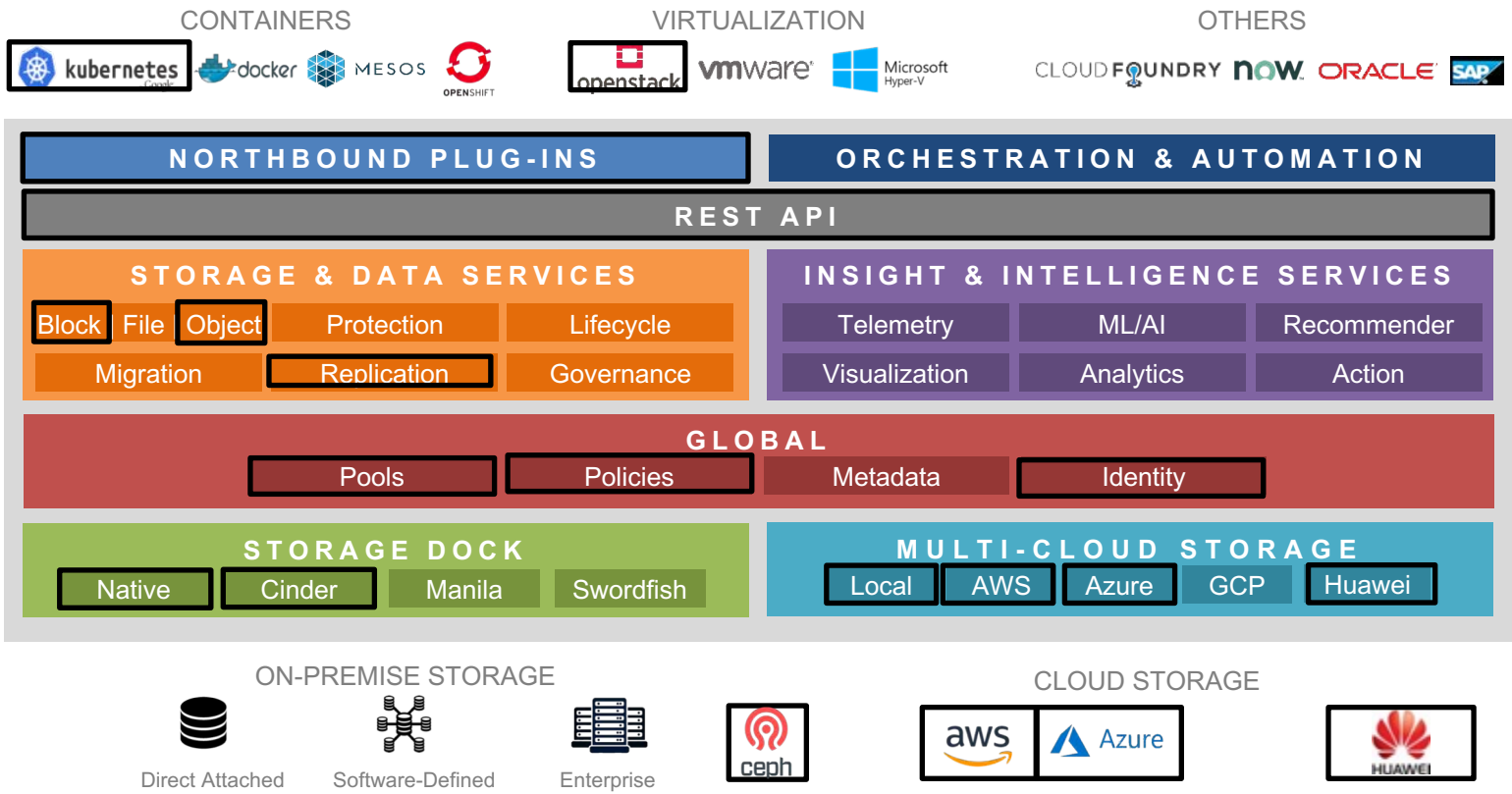
2019H1
CAPRI*

- **Data Lifecycle**
- **Telemetry**
- **Anomaly Detection**
- **Orchestration & Automation**
- **File Share**
- **NVMeoF**
- **Swordfish**
- **Multi-Cloud: GCP, IBM**
- **Storage**
  - **Fujitsu**
  - **HPE**

2019H2
DAITO*

- Data Protection

Bali – Dec 2018



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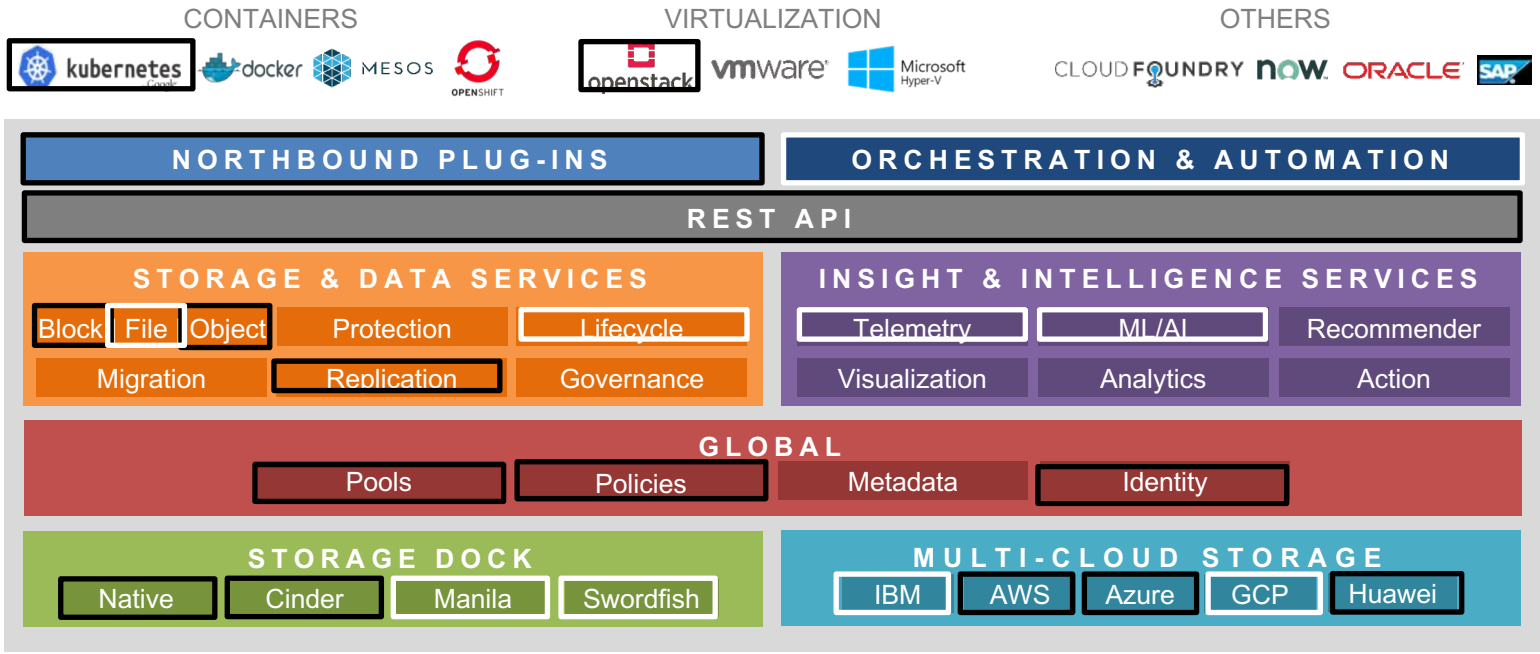
Capri – June 2019



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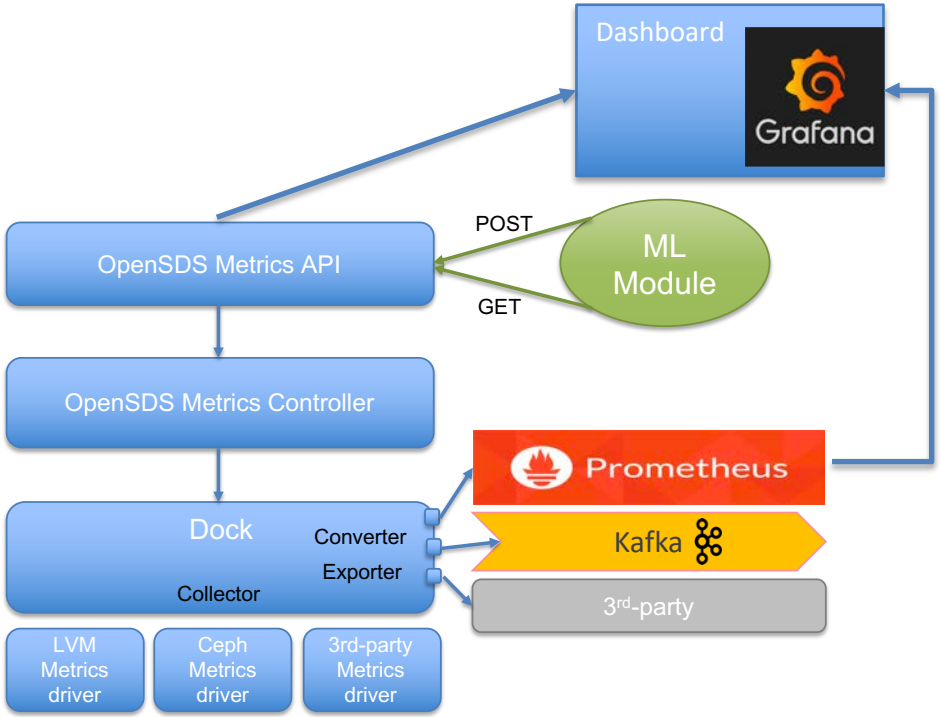
Capri Features

- Telemetry
  - Integrate with Prometheus and Grafana, and collecting metrics from storage backends.
- Anomaly detection
  - Detect anomalous data points based on metrics collected from Telemetry.
- Automation and orchestration
  - Design orchestration workflow using StackStorm
  - Use case includes provisioning storage with hooks to add custom actions.
- Multi-cloud
  - GCP object store backend
  - IBM Cloud object store backend
  - Signature identification with AK/SK
- Object lifecycle management
  - Provide object lifecycle management mechanism that allows tenants to manage lifecycle configuration policies through APIs.
- File share support
  - Profiles design based on Swordfish
  - NFS/CIFS driver, Manila driver
- Drivers
  - NVMeoF driver, HPE Nimble driver, Fujitsu driver
  - Add replication support to Ceph driver
- Thin OpenSDS
  - A light-weight OpenSDS to serve Cloud Native environment
- CSI 1.1.0 support
  - Raw block support
  - Resize volume
  - CSI plugin support for shared file systems (through file share APIs)
- Installer
  - Enable multi-dock/multi-node and multi-backend installation with Ansible
  - Helm installation with Ceph
  - Salt installer

Telemetry – integration with Prometheus & Grafana

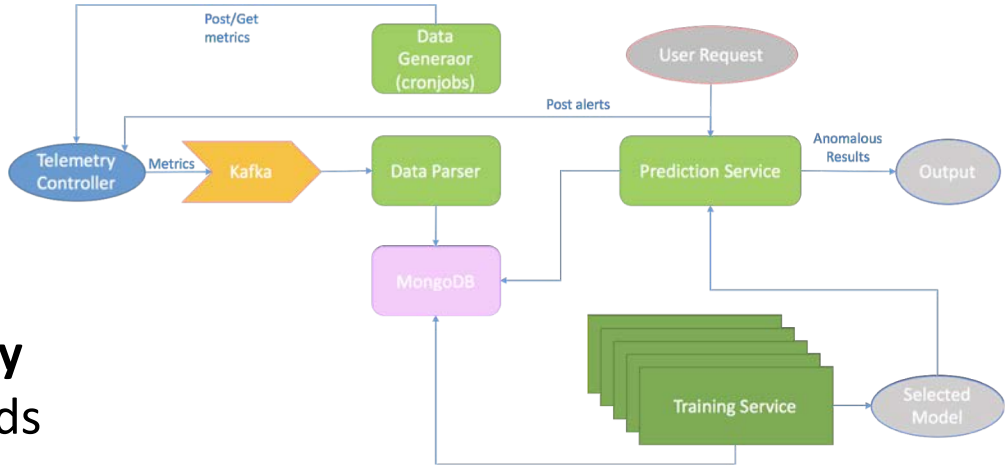


- ML module sends requests using Metrics API that generates data.
- Collector collects metrics from metrics drivers.
- Adapter includes a Converter that converts data to a proper format that can be understood by the receiving end, e.g., Prometheus, and an Exporter that sends(emits) the data to the intended destination.
  - An adapter will be developed to send data through Kafka as well.
- ML module receives data through Kafka. ML module also retrieves additional data using Metrics API which gets data from Prometheus.
- For Ceph, an existing Prometheus Ceph exporter will be used. Prometheus Node exporter will also be used to collect node metrics.
- OpenSDS dashboard is integrated with Grafana to display metrics and Prometheus Alert Manager to show alerts
- Link to spec: https://github.com/opensds/design-specs/pull/28

Collected metrics include **IOPs, bandwidth, latency, average CPU** usage, etc. for various resources such as **storage controller, pools, volumes, disks**, etc.

Anomaly Detection

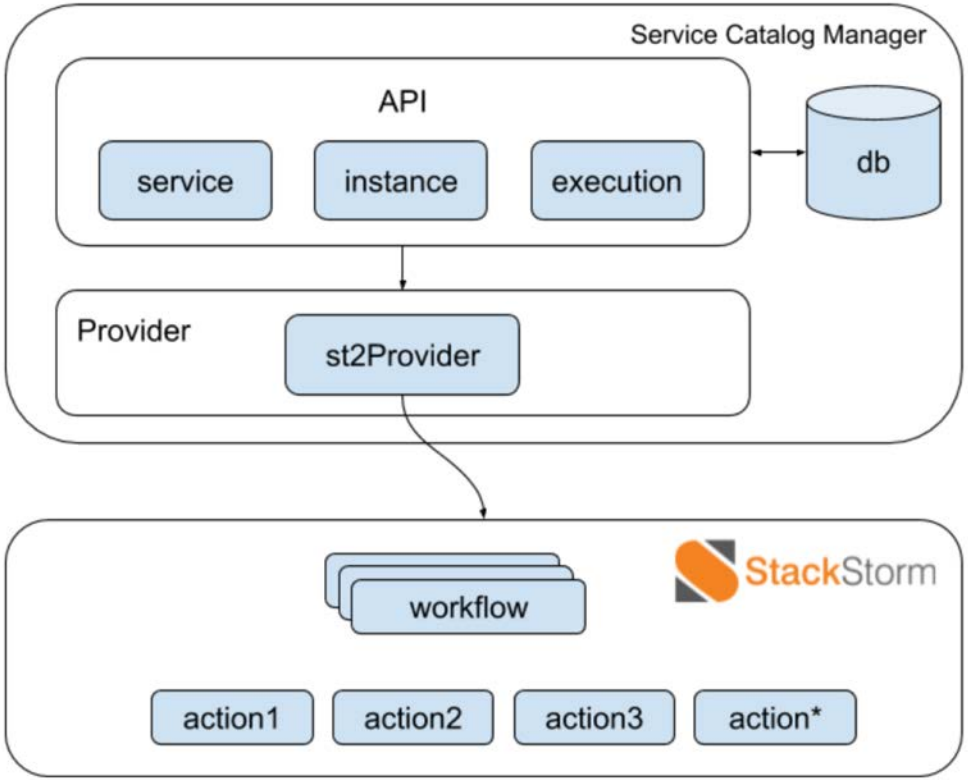
Focus in Capri:
Analyze performance data such as **IOPs, bandwidth, and latency** generated from storage backends serving workloads running on **Kubernetes**, and detect performance anomalies in cloud native storage.



- Data Generator runs a cronjob that calls Telemetry POST API to generate metrics periodically.
- Data Parser receives data from Kafka (from Telemetry) and saves it in database.
- Training Service trains models using data from database and selects an optimal model.
- Prediction Service uses selected model to predict anomalous data points, generate alerts and send to Telemetry.

- Link to spec: https://docs.google.com/document/d/1rF9Dh16YQNhudfP3pQODuYTQvrL2AkpEyIbPUo7aud8/edit?usp=sharing

Automation & Orchestration

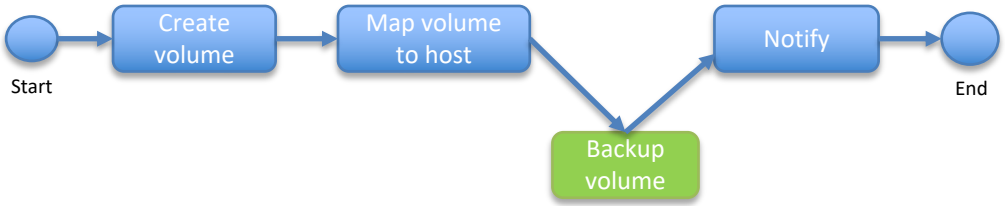


- Define actions as part of a workflow.
- Integrate with workflow manager such as StackStorm.
- Define generic services based on specific use cases.
- Allow users to customize services and insert multiple custom actions in the beginning, middle, and end of a workflow.
- Link to spec: https://docs.google.com/document/d/1BO775XNoUBTY4ka0kMyUHL1WBKK7MO4mcvvn4UJ13Xc/edit?usp=sharing

Use cases include automation of **volume provisioning, data migration, big data analysis, autoscaling,** etc.

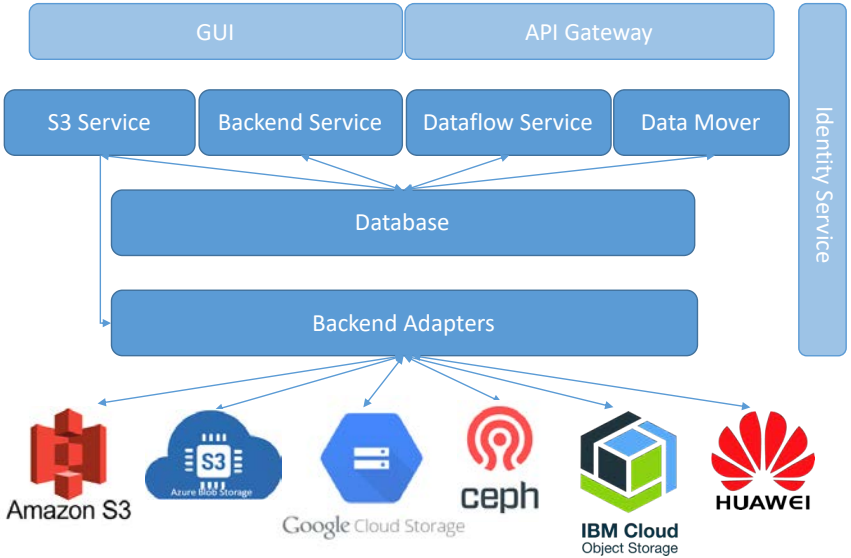
Automating Volume Provisioning

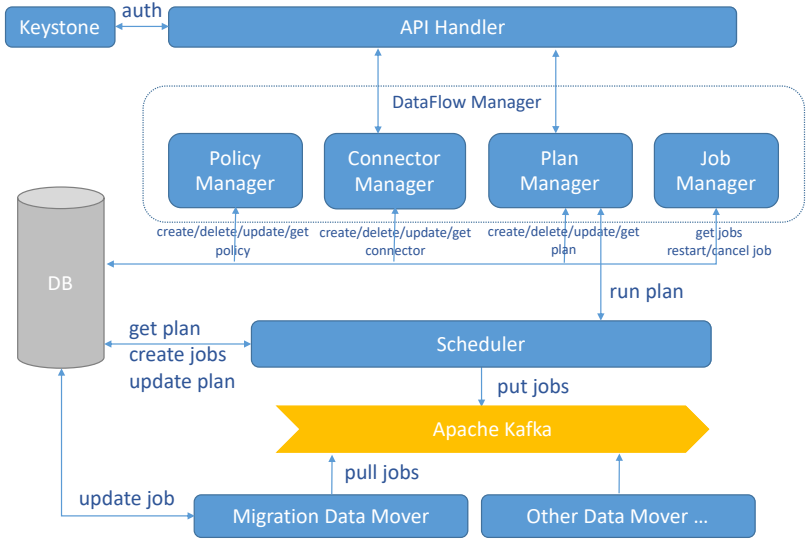
- User registers a service, e.g. volume provisioning service, by defining a template in YAML or JSON.
  - Workflow can be customized, e.g., a “backup-volume” task can be added after “map-volume-to-host” in “provisioning-workflow” to backup the volume periodically to some 3rd-party backup device. New workflows can be created by users.
- Once the service is registered, user can consume the service by creating a service instance which can be executed immediately or delayed. Service catalog manager will read parameters from the instance, and initiate and execute a specific workflow.




```yaml
---
version: 1.0
name: “Provisioning service”
description: “Provisioning a volume for a host”
parameters:
  “volume_name”:
    type: “string”
    description: “Name of the volume to be provisioned”
    constraints":
      allowed_pattern: "[A-Z]+[a-zA-Z0-9]*"
  “profile”:
    type: “string”
    default: “default”
    description: “Profile ID or name”
  “volume_size”:
    type: “integer”
    “default”: 1
  “host”:
    type: “string”
    description: “Name or IP address of the host”
workflows:
  “provisioning-workflow”:
    description: “This is the workflow for provisioning a volume”
    input: [“volume_name”, “profile”, “volume_size”, “host”]
    output: <json>
    tasks:
      “create-volume”:
        action: “opensds.create-volume”
          on-success:
            - “mapping-volume-to-host”
      "mapping-volume-to-host":
        action: "opensds.attach-volume"
          on-success:
            - ”notify”
      “notify”:
        action: “opensds.notify”
        "input":
              "cmd: "printf 'volume <% $.volume_id %> was attached to
host successfully'"
```

Multi-Cloud Data Control

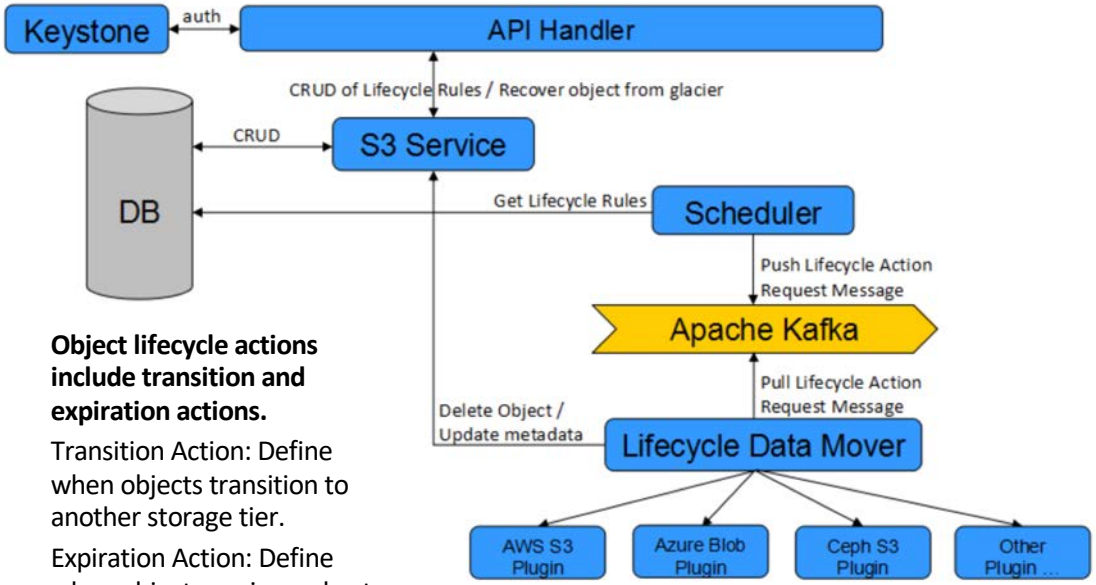




- **Multi-Cloud Data Control allows data to migrate across multiple clouds.**
- Support object store backends including AWS, Azure, **GCP**, Ceph, **IBM Cloud**, Huawei Cloud, and Fusion Storage. Supports S3 APIs.
- Link to spec: https://github.com/opensds/design-specs/blob/master/specs/bali/MultiCloud_Design.md

Object Lifecycle Management

- Provide object lifecycle management mechanism that allows tenants to manage lifecycle configuration policies through APIs.
- **Support object lifecycle management across different cloud service providers and support of choosing the storage tier while setting the lifecycle rules.**
- **Support object lifecycle management within the cloud storage.**
- Note: support non-versioned bucket only in Capri.
- Link to spec: https://github.com/opensds/design-specs/pull/24

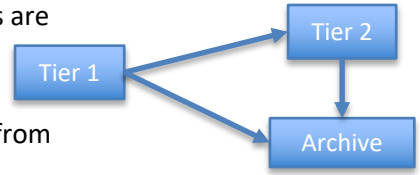


- **Object lifecycle actions include transition and expiration actions.**
- Transition Action: Define when objects transition to another storage tier.
- Expiration Action: Define when objects expire and get removed.
- Set lifecycle management rules on bucket and all rules will be scheduled by OpenSDS.

Storage Tiers and Rules

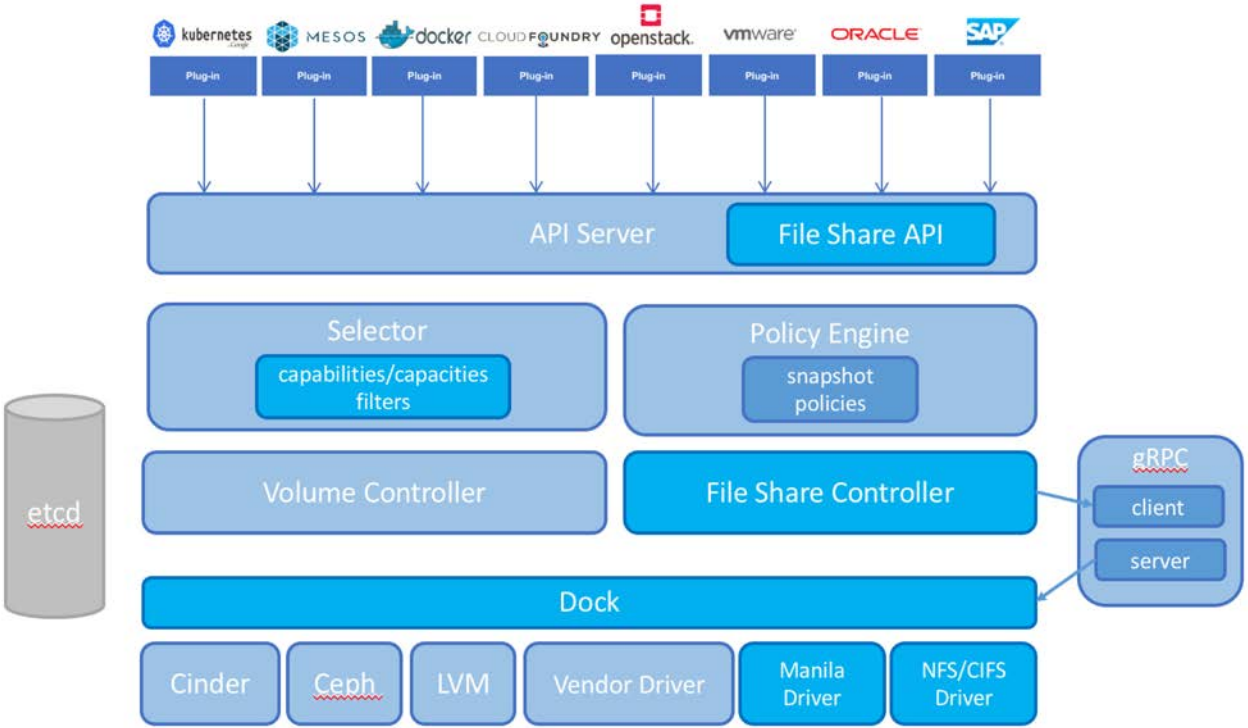
OpenSDS S3	AWS S3	Azure (blob)	Google Cloud Storage	Huawei OBS	IBM Cloud Object Storage	Ceph / Fusion Storage
Tier 1	Standard	Hot	Multi-Regional	Standard	Standard	Stardard
Tier 2	Standard_IA	Cool	NearLine	Warm	Vault	
Archive	Glacier	Archive	ColdLine	Cold	Cold Vault	

- Default OpenSDS storage tiers, Tier 1 (frequently accessed data), Tier 2 (infrequently accessed data), and Archive, are mapped to AWS S3 storage classes and classes in other clouds. AWS S3 storage classes are supported at API level for S3 compatibility.
- **Default rules: Migration is allowed in one direction within the same cloud and across clouds.**
- User can define their own storage tiers and set rules on the direction of migration, e.g., migration from Hot to Cold is allowed, but migration from Cold to Hot is not, etc.
- Only object storage migration is supported in Capri. This will be extended to support block and file storage migration in the future (For example, migration from tier 1 on-premise block storage to archive in the cloud.



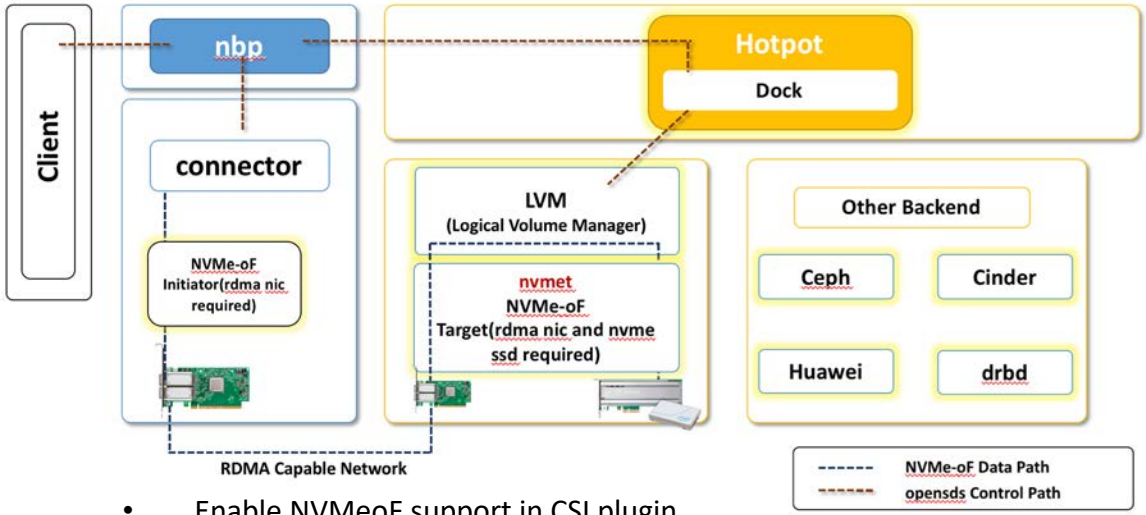
Support migration between on-premise object storage (Ceph or Fusion Storage) and cloud storage (AWS S3, Azure Blob, GCS, Huawei OBS, IBM Cloud Object Storage)

File Share



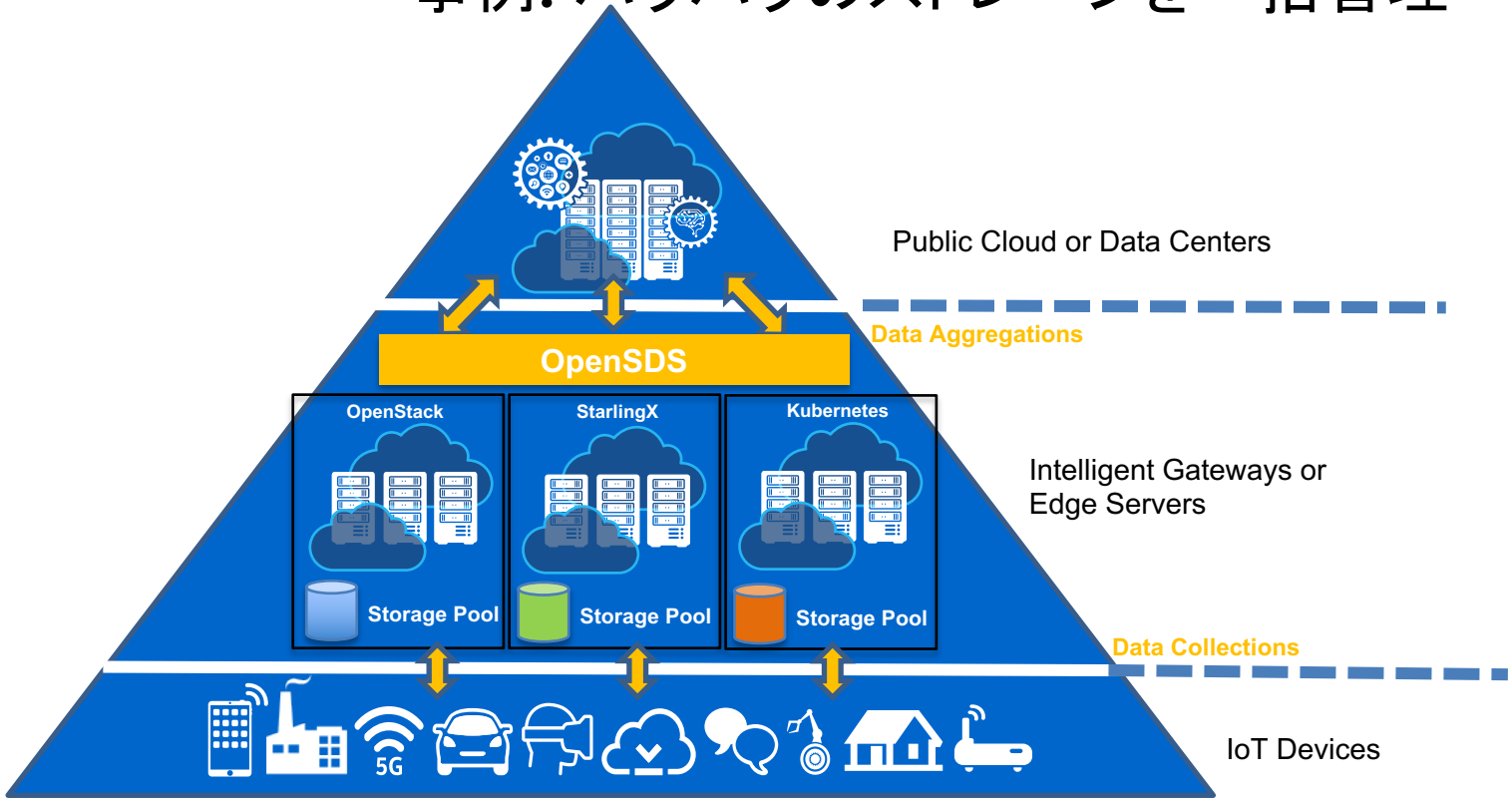
- Add File Share Service by providing APIs and a controller that supports file share provisioning and access control.
- Profiles design is based on Swordfish.
- **File share drivers include NFS/CIFS driver (LVM as backend), Manila driver, etc.**
- **CSI plugin support for shared file systems will be added.**
- Link to spec: https://github.com/opensds/design-specs/pull/27

NVMeoF Driver



- Enable NVMeoF support in CSI plugin.
  - NVMeoF connector is added.
- NVMeoF support for native OpenSDS southbound LVM driver is added.
- NVMeoF depends on RDMA technologies
  - **Only Intel iWARP RDMA technology is tested so far**
  - **Other RDMA technologies such as InfiniBand and RoCE will be tested later.**
- RDMA ethernet card is required for NVMeoF Initiator/Target environment. OpenSDS Ansible installer is updated to load the following modules to enable the RDMA feature in user space: nvmet, nvmet-rdma, nvme-rdma
- Link to spec: https://github.com/opensds/design-specs/blob/master/specs/capri/nvmeof_support.md

Use Case: Management Across Heterogeneous Edge Storage
事例: バラバラのストレージを一括管理



Solutions ソリューションズ

CLOUD NATIVE
クラウドネイティブ

HYBRID & MUTLI-CLOUD
ハイブリッド＆マルチ - クラウド

VIRTUALIZATION & CLOUD
仮想化とクラウド

AUTOMATION & ORCHESTRATION
自動化とオーケストレーション

DATA PROTECTION
データ保護

DATA MIGRATION & LIFECYCLE
データ移行とライフサイクル

MONITORING & ANALYTICS
モニタリングと分析

EDGE COMPUTING
エッジストレージ

Plans

The Plan 2019 以降の計画

新技術の開発

Towards Autonomous Data Management

エコシステムの建設

An Open Data Ecosystem

OpenSDS Ready

Standards & Certification

グローバルイベント開催

Mini Summits, Hack Fests, Sponsor

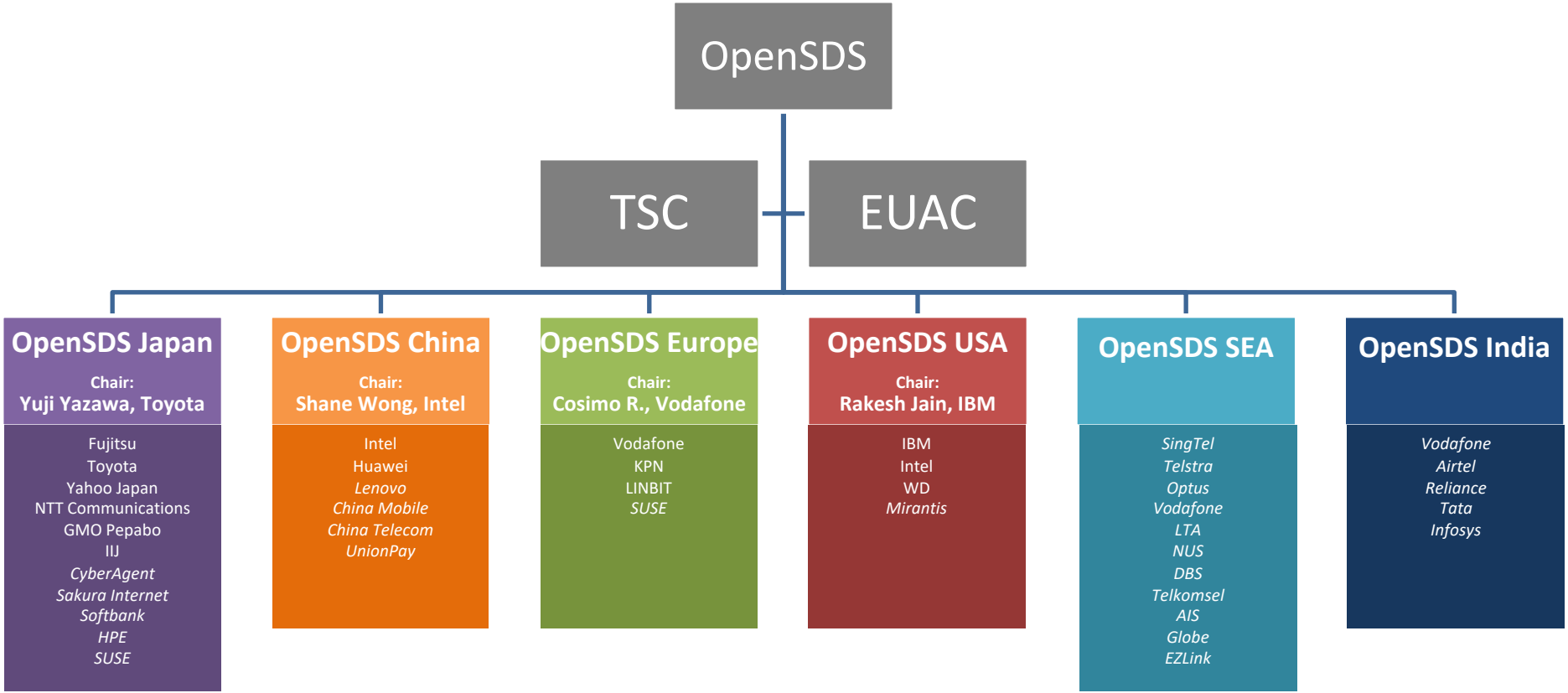
コミュニティの成長

Community Meetings, Meetups

OpenSDS Ready

- **Conformance and Benchmarks**
  - Products & Solutions: Storage hardware & software, data management
  - Environments: Kubernetes, OpenStack, Vmware, OpenShift. AWS, Azure etc.
  - Topologies: On-premise, Hybrid Cloud, Multi-Cloud, Edge
  - Applications: Data protection, replication, migration, tiering, archiving, security, etc.
- **Training**
- **Certified Administrators**
- **Certified Developers**
- **Certified Service Providers**

Organization 組織/コミュニティ図



Governance ガバナンス

TSC 技術運営委員会

Steven Tan, Chairman
Huawei, VP & CTO Cloud Storage Solution

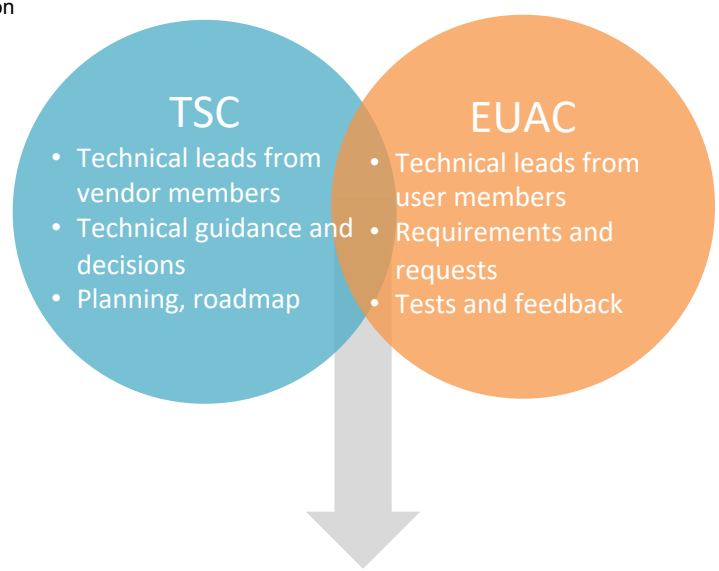
Rakesh Jain, Vice-Chair
IBM, Research Engineer and Architect

Allen Samuels
Western Digital, R&D Engineering Fellow

Anjaneya "Reddy" Chagam
Intel, Chief SDS Architect

Jay Bryant
Lenovo, Cloud Storage Lead

Shinya Hamano
Fujitsu, Lead Software Engineer



EUAC エンドユーザー諮問委員会

Cosimo Rossetti
Vodafone, Lead Storage Architect

Yusuke Sato
Yahoo Japan, Infrastructure Lead

Kei Kusunoki
NTT Communications, Storage Architect

Yuji Yazawa
Toyota ITC, Principal Architect

Wim Jacobs
KPN, Senior Architect

Shinya Tsunematsu
GMO Pepabo, Chief Technical Lead

Terada Mitchitaka
IIJ, Software Manager

Membership and Events	Project and Architecture	Community and Release	Ecosystem

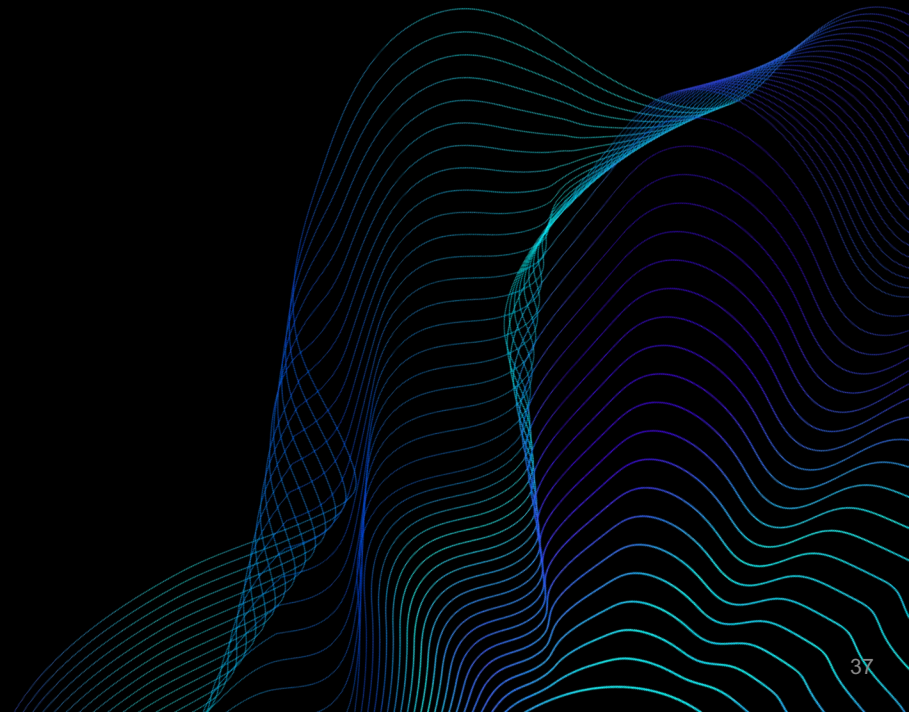
Upcoming Events

- Apr 18-20: China Hackathon, Shenzhen
- Apr 30: OpenSDS & SNIA Swordfish BOF @ Open Infrastructure Summit, Denver
- May 20: Open Data Autonomy Mini Summit @ CloudNativeCon, Barcelona
- Jun 24: Open Data Autonomy Mini Summit @ CloudNativeCon, Shanghai
- Jul or Aug: Open Data Autonomy Mini Summit @ Open Source Summit, Tokyo
- Sep : Kubernetes Day, Singapore
- Sep : Kubernetes Day, Sydney
- Sep 23-26: SNIA SDC, Santa Clara

PROJECT REBRANDING

The SODA Project

Smart Open Data Autonomy



JOIN THE PROJECT
プロジェクトの参加にあたって

ENGAGE
メンバーと密にコミュニケーションを取ります。

INNOVATE
オープン自律型データエコシステムでソリューションの開発を革新し加速させましょう。

COLLABORATE
新規パートナーを開拓し、共に開発や催事の協力をします。

PARTICIPATE
ローカル会議でもグローバルイベントでも貴社の宣伝および登壇の機会がございます。

info@opensds.io

OpenSDS

LEARN MORE AT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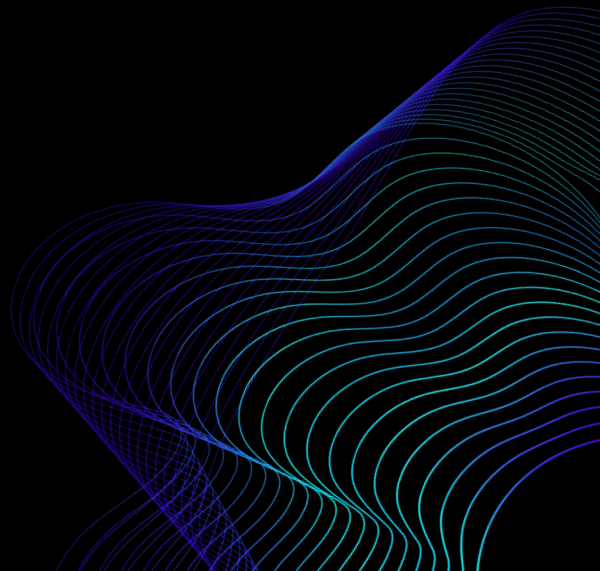
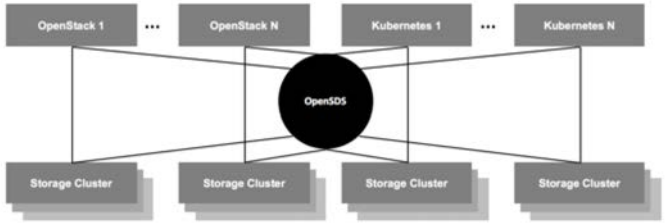


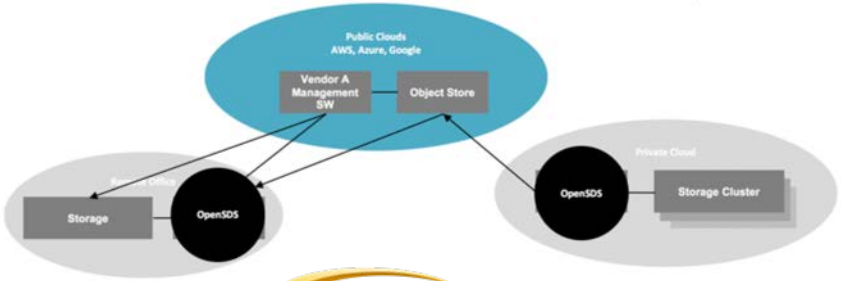
Use Cases 各社考えている

OpenStack + Kubernetes



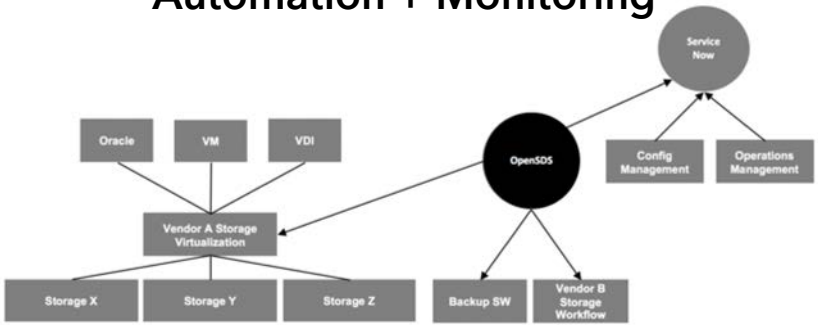
YAHOO! JAPAN

Multi-Cloud



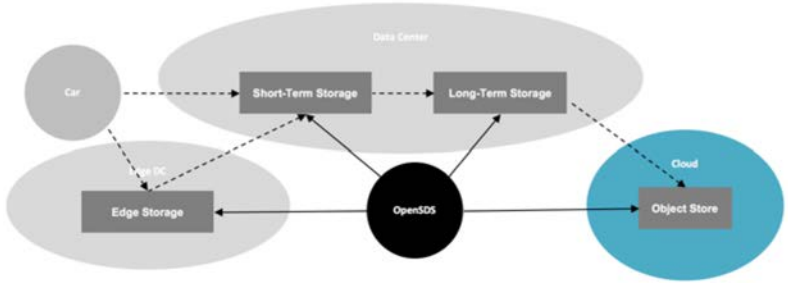
NTT Communications

Automation + Monitoring



kpn

IOT + Edge



TOYOTA

Kubernetes Day Bangalore 2019