# Backup and Disaster Recovery

**We start at 1:30 PM CEST**

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# BACKUP an OPENSHIFT Cluster

# Backup Solutions for Red Hat OpenShift

## Business Continuity

OpenShift OADP 1.1 – Native backup utility with 4.12

OpenShift native backup utility

–or–



OCP Cluster

OADP

NAMESPACE

RESOURCES

PVs

S3
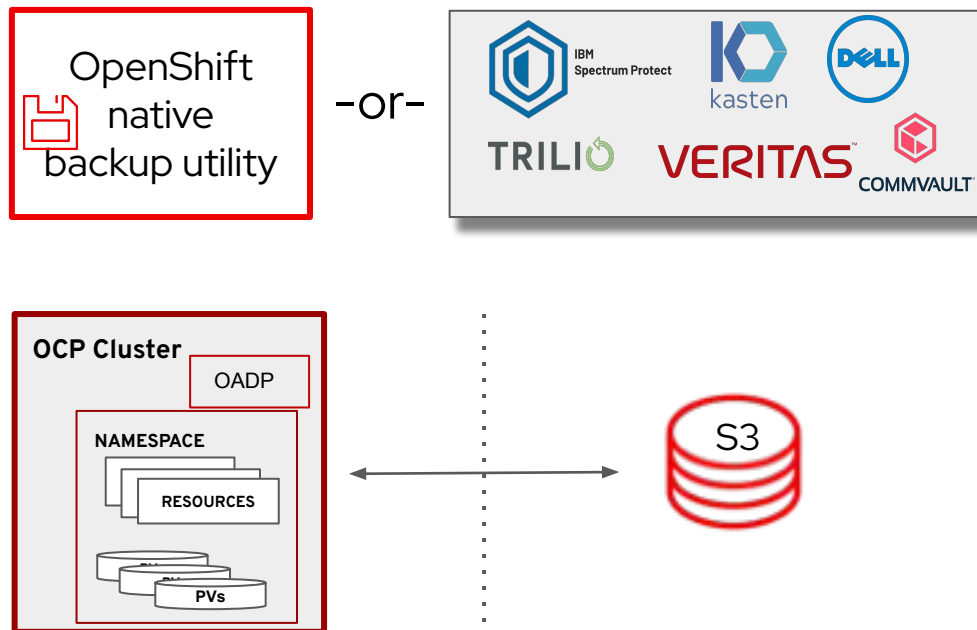
- **Application level (Namespace), consistent backups with OADP**
- CLI based **scheduling and management** of backups
- **Built-in data mover** enables CSI-based storage snapshots to be backed up to a remote S3 compatible object store.
  - **Plugable DataMover** support is Tech Preview (ie. VolSync)
- **Supports** all **OpenShift storage provisioners** that also support **CSI Snapshots**

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# OADP Operator
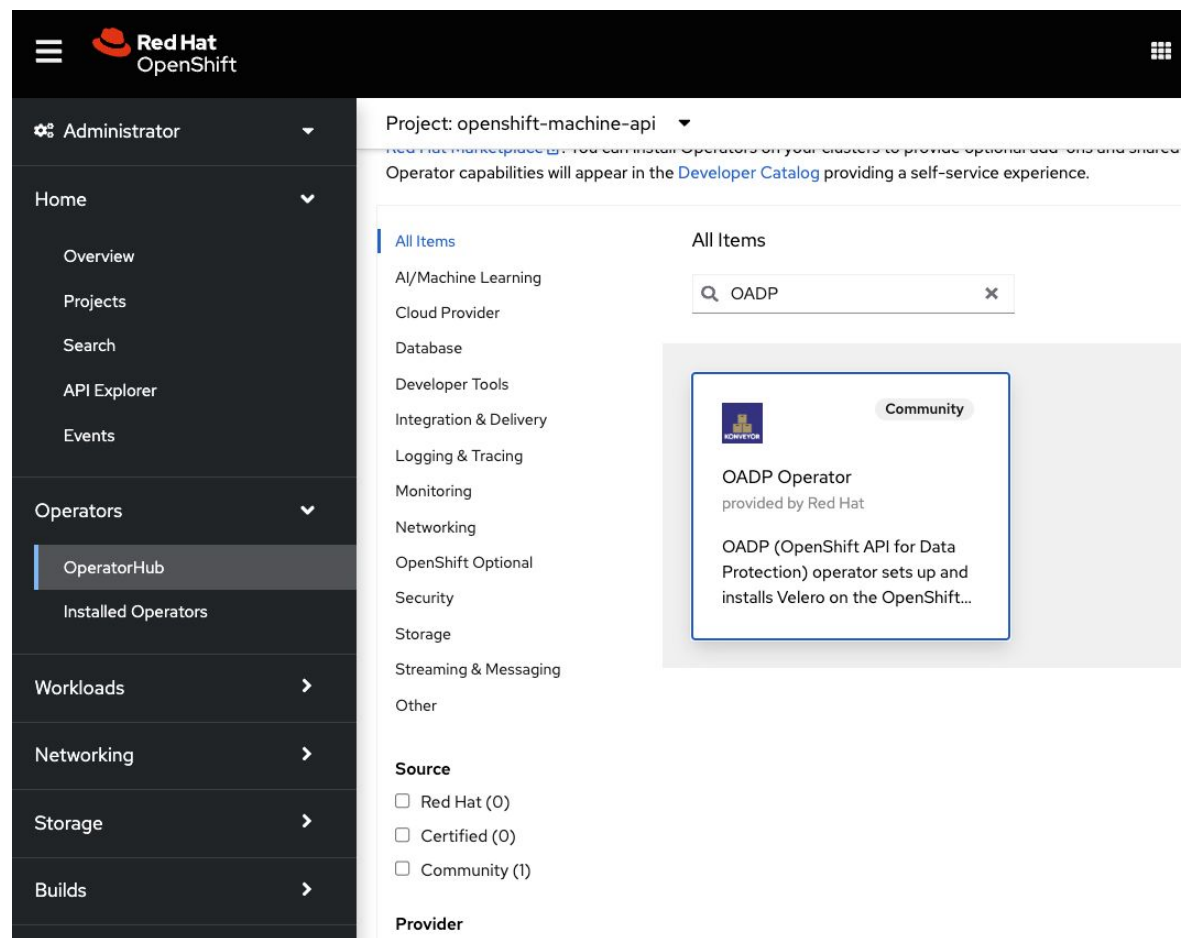


OpenShift API for Data Protection (OADP) supports the following features:

**Backup**

You can back up all resources in your cluster or you can filter the resources by type, namespace, or label.

OADP backs up Kubernetes objects and internal images by saving them as an archive file on object storage. Restore

You can restore resources and PVs from a backup. You can restore all objects in a backup or filter the restored objects by namespace, PV, or label.

**Schedule**

You can schedule backups at specified intervals.

**Hooks**

You can use hooks to run commands in a container on a pod

# Business Continuity and Disaster recovery

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# OCP Application Backup – Key Components

3rd party backup Applications

Backup CLI

**Red Hat**
OpenShift

OADP
operator

**Red Hat**
OpenShift
Data Foundation

CSI Snapshots

CONTAINER
STORAGE
INTERFACE

Bare metal

Virtual

Private Cloud

Public Cloud

Edge
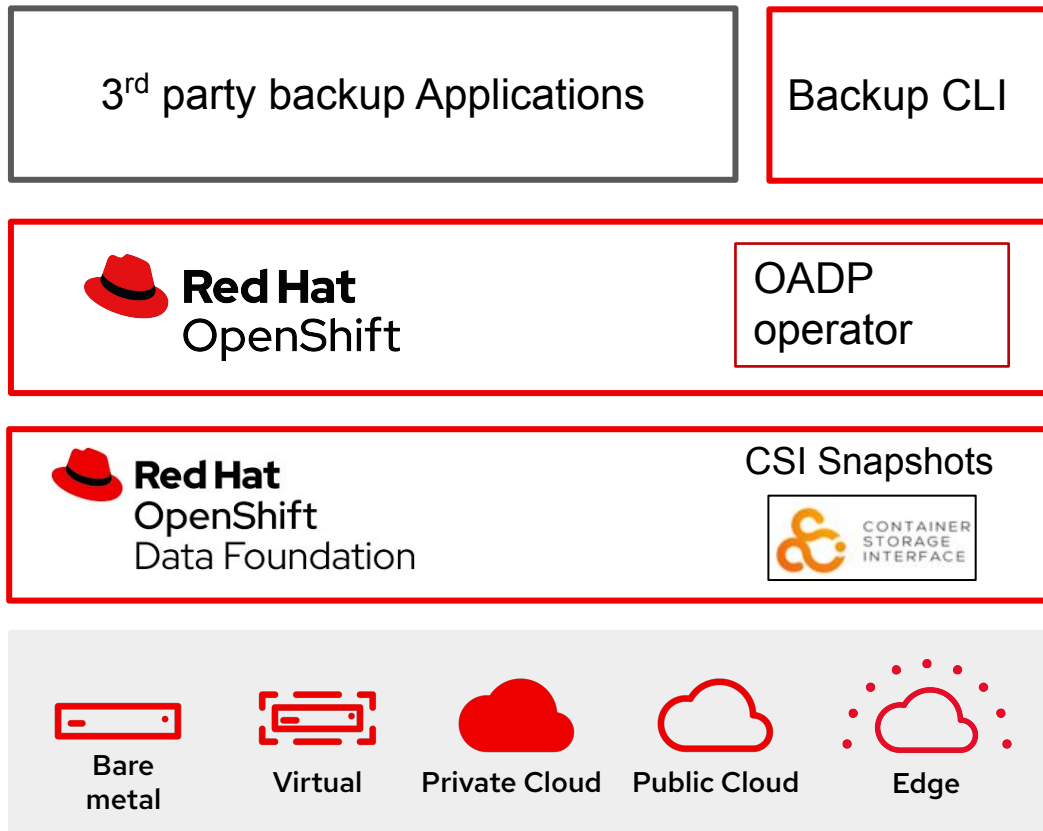
- Third party backup Applications /native CLI
  - Handles Backup policy management, backup scheduling, retention and restore management and data movement

- OADP – OpenShift App Data Protection API
  - Enables namespace or label scoped backups with all ensuing cluster resources and application data (PVs)
  - Ensures OCP version independence and works across storage providers (via plug-ins)

- ODF PV Snapshots via CSI
  - PV/PVC backups of ODF volumes through standard CSI interfaces
  - Can be used with or without OADP

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# Resiliency Solutions for different service level objectives



**Backup**

Logical failures

Snapshot based

**Regional DR**

Site Disasters

Asynchronous Replication

**Metro DR**

HW System failures

Synchronous Mirroring

Tolerance for App downtime

RTO ------------- >

Day · Hour · Minutes

Minutes.    Hours    Days

Tolerance for Data loss

RPO ---------------------------- >
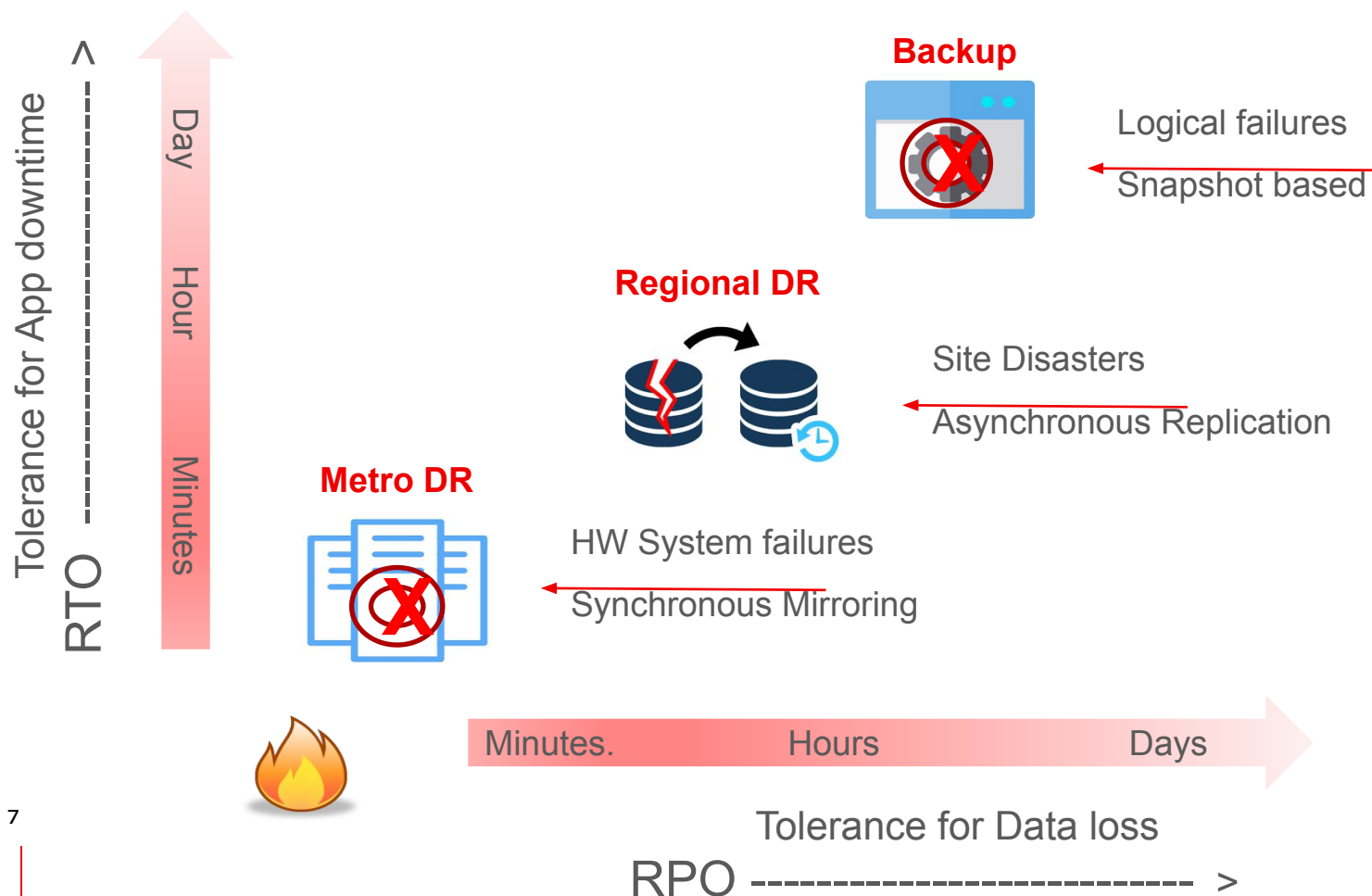
- ▸ Comprehensive protection solutions against wide spectrum of failures

- ▸ Beyond Data Protection --> Full Application protection

- ▸ Resiliency built into the platform – Available to all stateful and stateless applications on OpenShift

- ▸ OCP + ODF + ACM integrated stack lends towards Automated and Simplified Application granular protection

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# OCP Integrated, Full Stack DR Protection

**Multi-Site Multi Cluster Manager**

**RHACM**
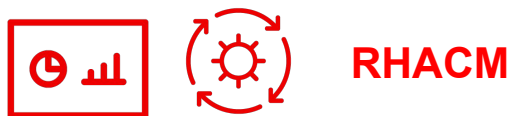
- ODR Hub Operator – Orchestrates & Automates DR operations across clusters

**Platform**

Red Hat OpenShift

- ODR Cluster Operator - Manages and synchronizes cluster meta data and application data

**Persistence Layer**

Red Hat OpenShift Data Foundation

- Asynchronous replication of Application volumes – or-
- Synchronous Mirroring of Application volumes

- Easy configuration DR across cluster and sites as part of application deployment
- Automated DR Failover and Failback operations reduces RTO
- Manage and Monitor DR across clusters and Apps
- Same consistent DR operations for both Metro-DR and Regional-DR
- Both Application Data and State is protected and used for Application granular protection
- Consistent Data replication or mirroring or both based on infrastructure and desired protection.

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# OCP Cluster HA + DR for stateful Applications
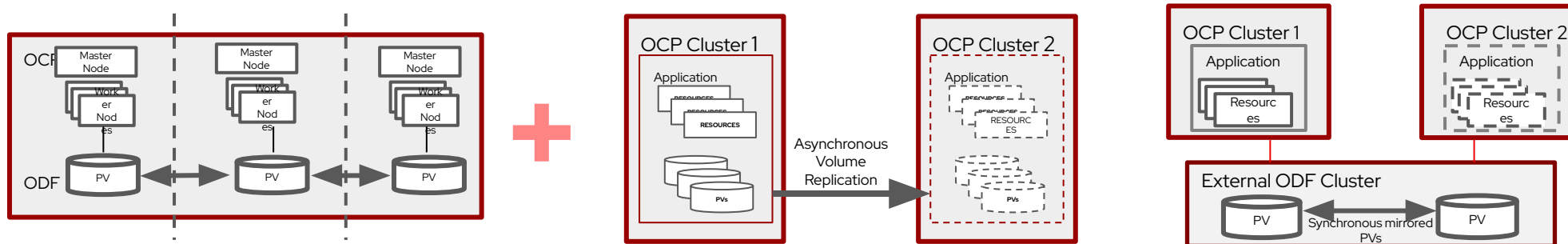


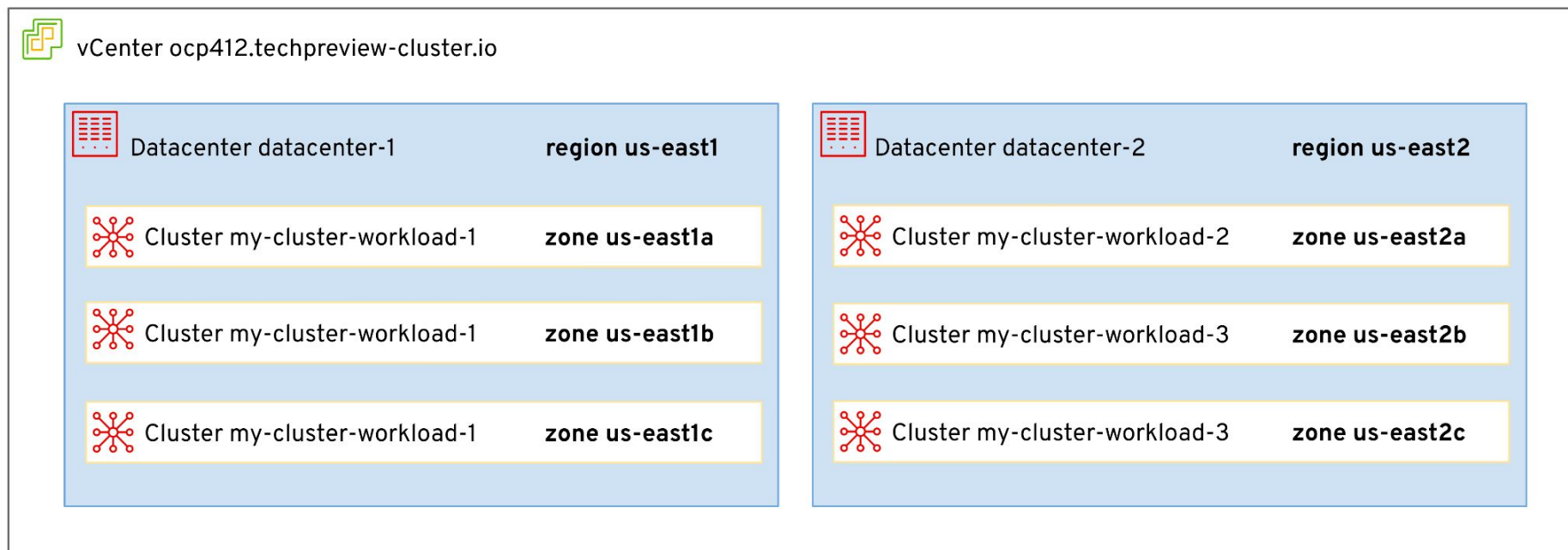| | **Cluster HA** | **Regional-DR** | **Metro-DR** |
|---|---|---|---|
| **Topology** | Single OCP+ODF clusters deployed over multiple AZs in a single region | Multi OCP + ODF clusters spread over multiple regions | Multi OCP clusters + single external ODF stretched cluster deployed over low latency networks |
| **RTO (Downtime)** | RTO=0 (Continuous)* | RTO = minutes<br>DR Automation from ACM+ODF reduces RTO | RTO = minutes<br>DR Automation from ACM+ODF reduces RTO |
| **RPO (Data loss exposure)** | RPO=0<br>No Data loss due due to Synchronous mirroring of ODF data | RPO > 0; Usually 5 min or higher<br>Depends upon network bandwidth & change rate | RPO=0<br>No Data loss due due to Synchronous mirroring of ODF data |
| **Infra Requirements** | Multi-AZ supported public clouds (vSphere support in OCP 4.10) | All ODF supported platforms<br>No network latency limits | On-prem only (vSphere, bare metal)<br><10ms network latency between sites |

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* Subject to RWO PV limitations

# OpenShift in vSphere is Zone Aware

▶ Create highly-available OpenShift clusters in vSphere with installer provisioned infrastructure (IPI)

▶ Applies zonal tags (regions and zones) to multiple vCenter datacenters and clusters in a single vCenter

▶ Excludes User Provisioned infrastructure (UPI) deployments

vCenter ocp412.techpreview-cluster.io

| Datacenter datacenter-1 | region us-east1 |
|---|---|
| Cluster my-cluster-workload-1 | zone us-east1a |
| Cluster my-cluster-workload-1 | zone us-east1b |
| Cluster my-cluster-workload-1 | zone us-east1c |

| Datacenter datacenter-2 | region us-east2 |
|---|---|
| Cluster my-cluster-workload-2 | zone us-east2a |
| Cluster my-cluster-workload-3 | zone us-east2b |
| Cluster my-cluster-workload-3 | zone us-east2c |

**Technology Preview**

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# Thank you

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