Red Hat OpenShift Data Foundation

Persistent storage and cluster data management for Red Hat OpenShift

Highlights

▸ Simplified access to a complete and consistent data platform experience for Red Hat OpenShift

▸ A consistent user experience independent of where data resides, driving consistency across cloud environments and confidence across teams

▸ Scalability to multiple petabytes with business-critical resiliency and peak performance

▸ Sophisticated data management and business continuity features for deployments in the datacenter, public or private cloud environments, or at the edge

Red Hat® OpenShift® Data Foundation[1] is a persistent storage and cluster data management solution integrated with and optimized for Red Hat OpenShift. In addition to a distributed, scalable software-defined storage platform, OpenShift Data Foundation provides sophisticated enterprise cluster data management services, allowing applications to interact with data in a simplified, consistent, and scalable manner. Multicloud data management capabilities allow organizations to extend and federate data across multiple infrastructures.

A data foundation for modern production workloads and applications

OpenShift Data Foundation runs anywhere Red Hat OpenShift does: on-premise, in public or private cloud environments, and at the edge. It provides agile and flexible data access using common protocols—file, block, and object—to support a broad range of workloads and applications. The platform abstracts the details and inconsistencies among different underlying storage infrastructures while delivering sophisticated cluster data management services that organizations require.

OpenShift Data Foundation was created for container-based environments and also supports Red Hat OpenShift Virtualization. With a supported Red Hat OpenShift operator, the platform is simple to install and manage as a part of the container-based application life cycle, including cloud-native container management, scheduling, and orchestration. This level of integration yields benefits that include:

▸ **Storage for trusted enterprise-class Kubernetes.** OpenShift Data Foundation supports diverse workloads, multicloud object gateway functionality[2], and business continuity for workloads running in Red Hat OpenShift.

▸ **Data protection and resiliency for Red Hat OpenShift.** Support includes essential features like replication, data placement across different availability zones, and backup and restoration services for Kubernetes applications, including their namespace-related data, custom resources, and state.

▸ **A cloud-like experience everywhere.** OpenShift Data Foundation provides software-defined storage that lets organizations deploy their applications and storage as business needs dictate and adjust as situations change.

▸ **Increased developer productivity.** OpenShift Data Foundation provides consistent functionality and user experience across all hybrid cloud platforms, simplifying processes for developers and users.

▸ **Application and data modernization.** Support for Red Hat OpenShift Virtualization means organizations can continue to run their existing applications alongside their cloud-native application development—all on a single platform.

---

1 *"OpenShift Data Foundation overview."* Red Hat, 4 Nov. 2022.

2 *"Multicloud object gateway namespace bucket replication."* Red Hat, 1 July 2022.

Technical specifications

OpenShift Data Foundation is available in Essentials and Advanced editions (Table 1). OpenShift Data Foundation Essentials edition is included with Red Hat OpenShift Platform Plus, offering Red Hat OpenShift Container Platform along with the following components:

▸ Red Hat Advanced Cluster Management for Kubernetes

▸ Red Hat Advanced Cluster Security for Kubernetes

▸ Red Hat Quay (a security-focused global container private registry platform)

Table 1. OpenShift Data Foundation editions

Essentials edition provides	Advanced edition adds
• **Kubernetes RWO (block, file)** • **Kubernetes RWX (shared file, shared block)** • **Object storage (S3-compatible)** • **Internal-mode storage (on-cluster)** • **Volume snapshots** • **Cluster-wide encryption** • **Multicloud object gateway** • **Native namespace backup and recovery with OpenShift APIs for Data Protection (OADP)**	• **External-mode storage (shared storage cluster)** • **Mixed usage patterns (off-cluster workloads)** • **Granular volume-level encryption** • **Support for external key management systems (KMS) with Key Management Interoperability protocol (KMIP)** • **Metro disaster recovery (DR)** • **Regional DR**

Table 2 summarizes OpenShift Data Foundation features and functionality.

Table 2. Features and functionality

Business continuity and disaster recovery	
OpenShift APIs for Data Protection	Cluster-aware backup and data recovery interfaces include namespace backup and recovery for individual workloads, applications, and cluster services.
Regional Disaster Recovery (DR)	Asynchronous DR for datacenter failures can be extended across regions or continents via a wide area network (WAN), offering protection from regional disasters.
Metropolitan DR	Synchronous DR for cluster failures provides protection against system failures and no-loss recovery within a campus or metropolitan setting where low-latency networks are available.

Data services at the edge	
3-node compact clusters	Supports Red Hat OpenShift and OpenShift Data Foundation on three production nodes.
Single-node OpenShift support	A single-node configuration of OpenShift Data Foundation supports thin-provisioning, snapshots, and backups for edge locations within a small infrastructure footprint.
Single-node thin provisioning	Thin provisioning allows for resource growth over time to accommodate user demand.

Multicluster monitoring	
Multicluster dashboards	Multicluster dashboards Integrate with Red Hat Advanced Cluster Management to provide single-view observability for multicluster health and optimization to identify, isolate, and resolve issues affecting distributed workloads.

Multicloud gateway	
Object buckets	Object buckets deliver data storage with available mirroring, spreading, encryption, and multiple supported tiering approaches.
Namespace buckets	Namespace buckets can be used for data federation capabilities to organize, configure, and manage diverse data resources without having to copy over data sets.
Object bucket claims	Object bucket claims allow users to dynamically create object buckets for developer workflows, aligning with persistent volume claims workflows.

Enhanced data security	
End-to-end encryption	End-to-end encryption between the cluster and clients delivers enhanced data security across the entire cluster.
Persistent volume-level encryption	Encrypt data at the persistent volume level, by using a Key Management Service, allowing you to bring your own key.
Key management service (KMS) integration	Support for Key Management Interoperability Protocol (KMIP) integrates encryption with customer-provided keys.

Network File System (NFS) support	
NFS support	NFS services for internal or external applications support legacy application interaction, application modernization, and future migration to a Red Hat Openshift environment.

About Red Hat

Red Hat is the world's leading provider of enterprise open source software solutions, using a community-powered approach to deliver reliable and high-performing Linux, hybrid cloud, container, and Kubernetes technologies. Red Hat helps customers develop cloud-native applications, integrate existing and new IT applications, and automate and manage complex environments. A trusted adviser to the Fortune 500, Red Hat provides award-winning support, training, and consulting services that bring the benefits of open innovation to any industry. Red Hat is a connective hub in a global network of enterprises, partners, and communities, helping organizations grow, transform, and prepare for the digital future.

f facebook.com/redhatinc
🐦 @RedHat
in linkedin.com/company/red-hat

North America
1 888 REDHAT1
www.redhat.com

Europe, Middle East, and Africa
00800 7334 2835
europe@redhat.com

Asia Pacific
+65 6490 4200
apac@redhat.com

Latin America
+54 11 4329 7300
info-latam@redhat.com

redhat.com
#158362_1122