

**Rakuten Cloud**

# Rakuten Cloud-Native Storage for Kubernetes

Unlocking Application Agility and Data  
Protection Across Any Kubernetes Environment



## Product Overview

Rakuten Cloud-Native Storage is a next-generation Kubernetes® block/file/object storage solution designed to address the unique challenges of stateful applications in dynamic environments. From the resource-constrained edge to the expansive cloud, Rakuten Cloud-Native Storage delivers unprecedented levels of automation, driven by intelligent, user-defined policies. By seamlessly integrating application-aware Software Defined Storage (SDS) constructs, Rakuten Cloud-Native Storage enables holistic management of data, critical metadata, application configurations, and Kubernetes deployments, accelerating time to value and minimizing errors.

Rakuten Cloud-Native Storage empowers developers and DevOps teams to manage storage with ease as a standard Kubernetes operator.

## KEY WORKLOADS

Real-time analytics  
Databases  
AI/ML frameworks  
Dynamic retail environments  
Expansive IoT deployments  
Immersive content delivery experiences  
Computer Vision  
Security applications

## Solution Benefits

- **Faster Outcomes, Fewer Errors:** Superior automation streamlines storage tasks and data protection.
- **Boost Team Productivity:** Simplifies collaboration, cloning, and data management.
- **Protect Investments, Maximizes Resources:** Scales efficiently, manages diverse workloads, and integrates with existing storage.
- **Reduce Recovery Times:** Application-awareness protects entire configuration state application, metadata, and secrets for data integrity and business continuity.
- **Unlock Edge Agility with Software-Defined Storage:** Enables flexible, cost-effective storage management, optimized resource utilization, and simplified operations across distributed edge locations.
- **Automate Capacity Management:** Optimizes storage with granular visibility and policy-driven provisioning.
- **Reduce Replication Resources:** Selective replication policies on a per-application basis.
- **Unifies Infrastructure, Reduced Silos:** Supports VMs and containers, simplifying management and reducing costs.
- **Flexible Deployment of Reliable Storage on Any K8s:** Supports all popular Kubernetes distributions.
- **Optimize Storage Utilization with Intelligent Policies:** Rules-based engine with customization to optimize application storage and avoid over-provisioning.
- **Enable Seamless Application Mobility:** Easily migrate Kubernetes applications and data across clusters and clouds.
- **Guarantee Application Performance:** Enforce and protect Quality of Service (QoS) based on Input/Output Operations Per Second (IOPs) to ensure consistent application performance and live data rebalancing

## Rakuten Cloud-Native Storage Application-Aware, Software-Defined Storage

Any Application	Any Kubernetes	Any Infrastructure
<p>Real-time analytics</p> <p>Databases</p> <p>AI/ML frameworks</p> <p>Dynamic retail environments</p> <p>Expansive IoT deployments</p> <p>Immersive content delivery experiences</p> <p>Computer Vision</p> <p>Security applications</p>	 <b>kubernetes</b>   <b>Google Cloud</b>	<p>SuperMicro</p>    <p><b>Hewlett Packard Enterprise</b></p> 

\*Requires a Cloud Native Computing Foundation (CNCF) compliant Container Storage Interface (CSI).

## Rakuten Cloud-Native Storage Use Cases

### Retail

**Real-Time Inventory Optimization with Application-Aware Storage:** Ensure accurate and consistent inventory data across all store locations for real-time optimization, minimizing stockouts and overstocking.

**Example:** A national retail chain uses Rakuten Cloud-Native Storage to provide application-aware storage for its edge-based inventory management system. The Rakuten Cloud-Native Storage solution ensures that inventory data, application configurations, and critical metadata are consistently replicated and protected at each store location. This allows for rapid recovery from any storage-related issues and guarantees the accuracy of real-time inventory data, leading to increased sales and reduced waste.

### Healthcare

**Personalized Healthcare Monitoring and Diagnostics with Persistent Data:** Enable reliable remote patient monitoring and personalized treatment plans with persistent, application-aware storage for critical patient data.

**Example:** A healthcare provider uses Rakuten Cloud-Native Storage to provide persistent, application-aware storage for its edge-based remote patient monitoring system. The Rakuten Cloud-Native Storage solution ensures that patient data collected from wearable sensors and other devices is securely stored and readily available for analysis. This allows for personalized treatment plans and timely intervention, improving patient outcomes and reducing healthcare costs. The application-aware capabilities ensure that the entire application state, including configurations and metadata, is protected for rapid recovery.

### Manufacturing

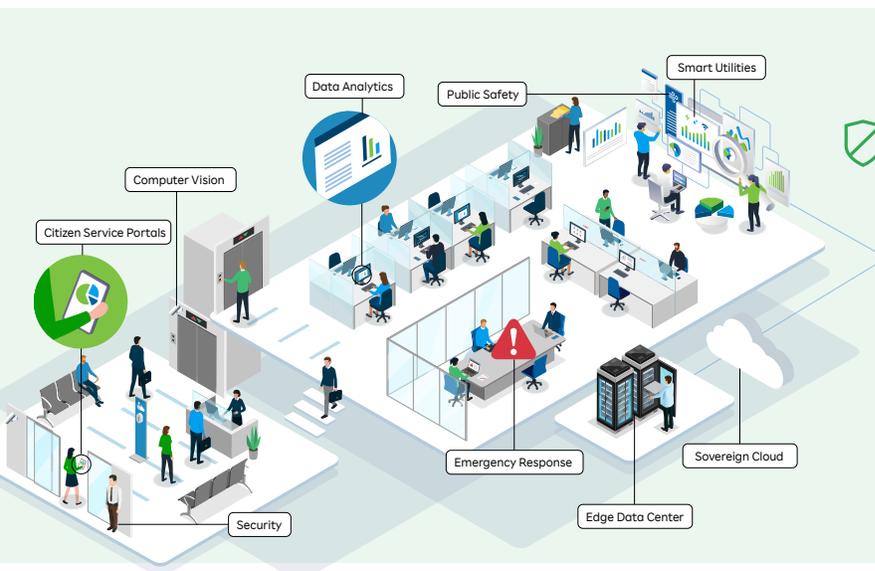
**AI-Powered Predictive Maintenance with High-Performance Storage:** Accelerate AI-powered predictive maintenance by providing high-performance storage for large datasets and rapid data analysis at the edge.

**Example:** An automotive manufacturer uses a Rakuten Cloud-Native Storage deployment to provide high-performance storage for its edge-based predictive maintenance system. The Rakuten Cloud-Native Storage solution enables rapid analysis of sensor data collected from factory equipment, allowing the system to identify potential equipment failures before they occur. The high IOPs and low latency of Rakuten Cloud-Native Storage ensure AI models can quickly process data and provide accurate predictions, reducing downtime and cost savings.

### Database-as-a-Service (DBaaS)

**DBaaS with Automated Scaling and Management at the Edge:** Provide a platform to support any database for developers with on-demand access to scalable and reliable database resources at the edge, reducing operational overhead and ensuring high availability for edge applications.

**Example:** A company deploying a distributed IoT application uses Rakuten Cloud-Native Platform to provide a DBaaS solution at the edge. The Rakuten Cloud-Native Storage solution automates the provisioning, scaling, backup, and recovery of databases, enabling developers to focus on building and deploying edge applications without worrying about managing the underlying storage infrastructure. The application-aware capabilities of Rakuten Cloud-Native Storage ensure that database backups are consistent and readily available for recovery, even in disconnected or intermittent network environments.



### Public Sector

**Secure and Compliant Data Management for Smart City Applications:** Ensure data privacy and integrity for smart city applications.

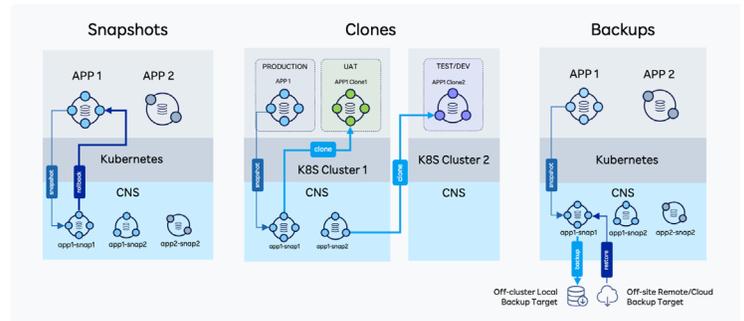
**Example:** A city uses Rakuten Cloud-Native Storage for secure storage in traffic management and public safety. Rakuten Cloud-Native Storage encrypts citizen data and provides the performance for real-time analysis. Application-aware features ensure quick recovery and service continuity.

## Advanced Capabilities

**Software-Defined Storage (SDS)** unlocks unprecedented agility and efficiency for modern IT environments. By abstracting storage management from the underlying hardware, SDS enables organizations to optimize resource utilization, reduce costs, and simplify operations across diverse infrastructure landscapes, especially at the edge. This flexibility allows businesses to rapidly adapt to changing demands, deploy new applications faster, and maximize the return on their storage investments.

**Application-aware storage** takes data management to the next level by deeply integrating with the application's entire state, including data, metadata, configurations, and secrets. This holistic approach ensures data integrity, simplifies disaster recovery, and reduces recovery times. By understanding the specific needs of each application, application-aware storage can optimize performance, automate data protection, and streamline storage tasks, leading to faster outcomes, fewer errors, and increased team productivity.

- **Unified storage support block/file/object:** Provides the flexibility to handle diverse application workloads and data types.
- **Simplified Disaster Recovery:** Automates disaster recovery processes with application-aware backups and replication, ensuring rapid recovery and minimal downtime.
- **Enhanced Security:** Provides robust security features, including encryption, access controls, and audit logging, to protect sensitive data and ensure compliance with industry regulations.
- **Automated Provisioning:** Streamlines storage provisioning with automated workflows and policy-based management, reducing manual effort and accelerating application deployment.
- **Automated node reconnect:** Ensures continuous application availability by seamlessly reintegrating nodes into the cluster after temporary outages, minimizing downtime and maintaining business continuity.
- **Cost Optimization:** Optimizes storage costs with incremental backups, snapshots, compression, data retention policies and thin provisioning, reducing storage footprint and maximizing resource utilization.



### SIMPLIFIED OPERATIONS

- 1-click via GUI
- Triggered via API
- Single CLI command
- Ease of operations

- **Real-Time Monitoring and Analytics:** Provides comprehensive monitoring and analytics dashboards to track performance, identify bottlenecks, and optimize storage utilization.
- **Integration with Kubernetes Ecosystem:** Seamlessly integrates with other Kubernetes tools and services, providing a unified and consistent management experience.
- **Policy-Based Management:** Enforces storage policies automatically, avoiding overprovisioning, ensuring compliance, and consistency across all applications and environments.
- **Data Locality:** Optimizes performance by placing data closer to the applications that need it, reducing latency and improving responsiveness.
- **Dynamically Scale Storage Resources:** Automatically resize container volumes or entire storage pools to meet application demands.
- **Maintain Consistent Performance with Live Data Rebalancing:** Avoid performance bottlenecks with live data rebalancing to eliminate hotspots.

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