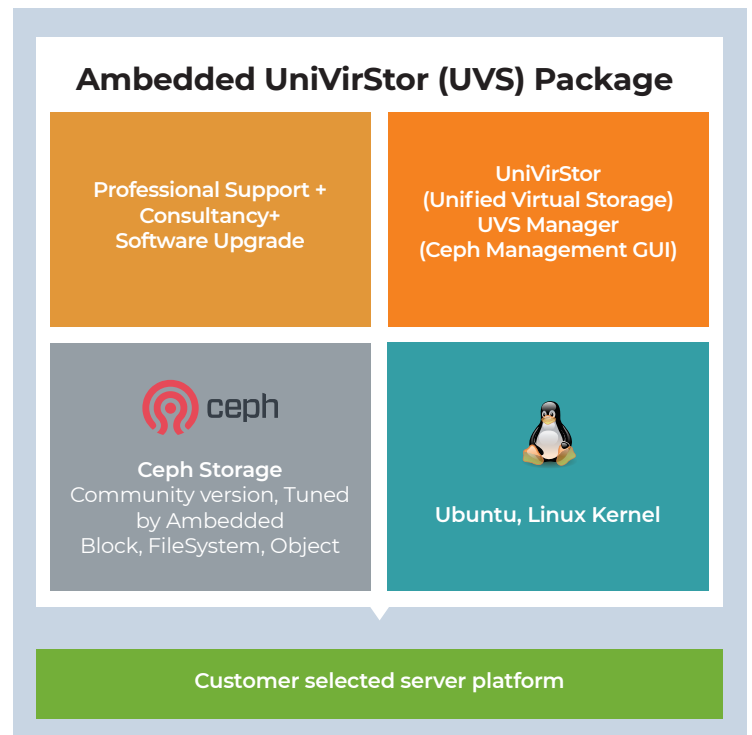


Unified Virtual Storage UniVirStor (UVS)

UVS Manager, a Unified Virtual Storage Manager to support

- Quick Ceph cluster deployment and configuration, enable a Ceph cluster for production service in one day
- Streamline daily cluster operations, making management and maintenance effortless.
- Comprehensive monitoring with Ceph dashboard, UVS dashboard, and Grafana.
- A complete solution for software upgrades, covering kernel, OS, Ceph version, and GUI management.



Features

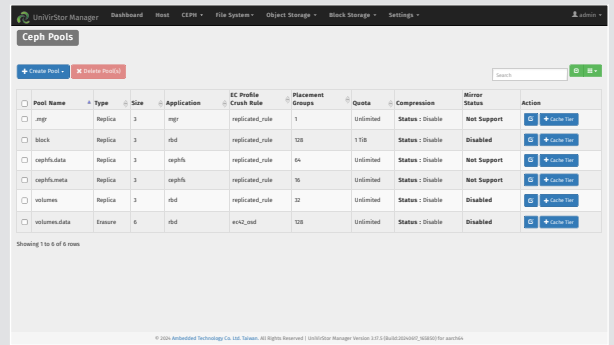
- | | |
|----------------------------|---|
| Full stack software | Includes Linux OS, Ceph storage software, and UniVirStor Manager interface. Only an ISO image installation is needed. Deployment and technical support services are available. |
| Distributed Storage | Utilizes multiple hosts to form a cluster, providing cross-host data protection to ensure no data loss or service interruption if one or two hosts or hard drives fail. |

Hardware Requirements

- Can be installed on any x86 (Intel, AMD) and Arm64 architecture servers. No need for RAID controllers or proprietary hardware, no vendor lock-in.
- Clusters multiple servers through TCP/IP network.
- Requires only standard Ethernet switches, reducing network equipment costs.

Data Protection Algorithms

Uses replication and erasure coding algorithms. Different storage pools with various protection modes can be created in the same cluster system based on usage scenarios.



Scalability

Easily add or reduce hosts and disks on demand, increasing overall system performance as capacity expands.

Support for Large Capacities

Supports storage from tens of Terabytes to hundreds of Petabytes.

Versatile Device Usage

Supports deploying mixed **all-flash NVMe, SATA/SAS hard drives, and Hybrid Cache Tier**. The system automatically distinguishes device classes, facilitating the creation of storage pools with different performance characteristics.

Disk Mixing

Can mix disks of different sizes and distribute workloads based on disk capacity to balance usage percentages.

Virtualization Platform

Seamlessly integrate with leading virtualization platforms such as Kubernetes, OpenStack, CloudStack, Proxmox, VMWare, and HyperV through various interfaces. These interfaces include libraries, CSI, API, iSCSI, NVMe-oF, NFS, and SMB.

Client OS

Linux, Windows, and VMWare.

Self-Healing

Maintains storage system service during disk or host failures by utilizing healthy hosts and disks in the cluster to reheat degrade data and restore it to a healthy state.

Encryption Support

Supports hard drive encryption, encryption of data packets between hosts, and server-side encryption, preventing data breaches during transmission or in the event of disk theft.

Automated Data Scrub

Regular background data scrubs ensure data integrity. The frequency, period, and maximum parallel check threads are adjustable.

Data Compression

Supports snappy, zlib, and zstd compression algorithms. A minimum compression ratio can be set, only compressing files that exceed this ratio.

Provisioning

Supports both Thin and Thick Provisioning.

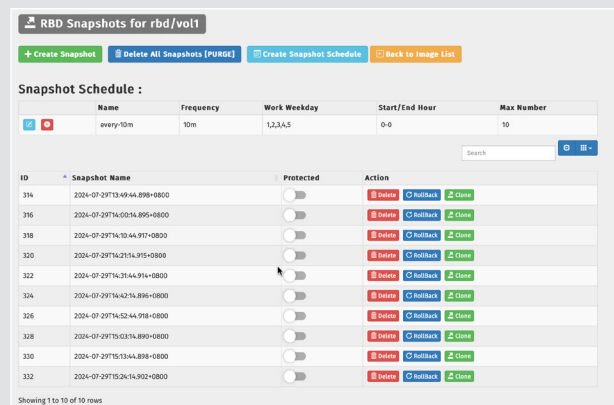
Diverse Storage Applications

- **Block Storage:** iSCSI, NVMeoF, Linux Block
- **Shared File Systems:** NFS, SMB, Linux POSIX
- **Object Storage:** Amazon S3, MiniIO, and OpenStack Swift

Block (Virtual Disk RBD) Storage

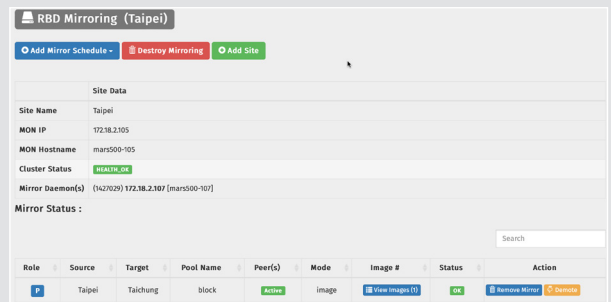
Auto Snapshot

You can set periodic automatic snapshots block images and the maximum number of snapshots retained. If a file is mistakenly deleted or maliciously encrypted, the snapshot rollback function can restore the image content.



QoS Sets read/write IOPS and throughput for each virtual disk to prevent any client application from occupying excessive performance and affecting other clients.

Asynchronous Mirroring Deploys clusters at two or more locations, periodically backing up each other using scheduled snapshots, serving as disaster recovery. If one data center experiences an outage or disaster, simply promote the secondary site via the Web UI with one click to immediately restore service without needing a backup data restore.



Block Device Encryption Users can format virtual disks with encryption formats like LUKS-1 and LUKS-2. Once encrypted, all upper-layer file system or iSCSI written data is encrypted.

Persistent Cache Uses NVMe or SATA SSDs on client servers as cache for the virtual disk, providing secure and reliable cache acceleration. Supports read-only and write-back modes.

NAS File System

Multiple NAS Creation Can create multiple independent NAS.

Asynchronous Mirroring Deploy clusters at multiple locations, mirroring directory changes to the remote cluster for backup. Each directory can independently set periodic automatic snapshots and the maximum number of snapshots retained. The snapshot restore function can recover any directory content if a file is mistakenly deleted or maliciously encrypted.

Object Storage

Amazon S3 and Swift Compatible API

Supports HTTPS and Object Encryption

Machine Learning Supports S3 select, accelerating machine learning data analysis.

Object Locking (Write Once Read Many) Prevents malicious data encryption and tampering.

Object Versioning Retains multiple versions of each object in an enabled versioning bucket. Users can store, retrieve, and restore each version of objects stored in the bucket. This helps recover from accidental deletions or overwrites.

Backup Software Compatible

Compatible with Veeam, Commvault, Nakivo, Bareos, and other backup software for backup storage.

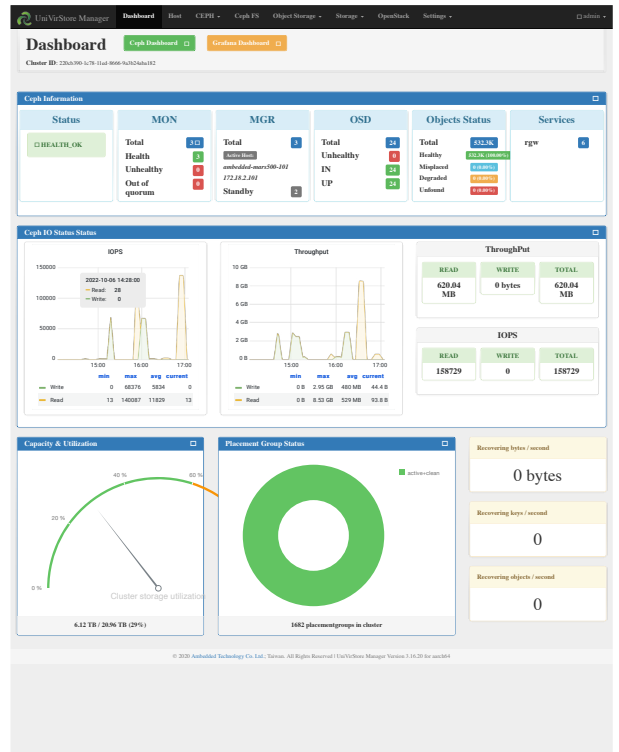
Management Interface

- Web UI and CLI Management:
- Provides quick deployment, automated processes, monitoring, and email alerts.
- Built-in Grafana Dashboard

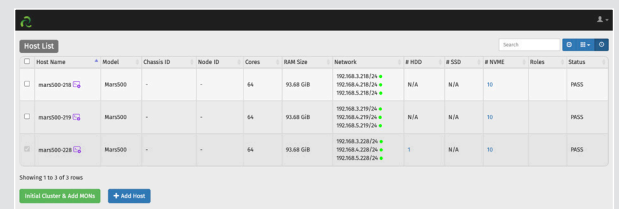
Web UI Function List

Category	Feature List
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Dashboard	Cluster health status, error messages, traffic, IOPS, disk status, service status, used capacity, object count, data repair status
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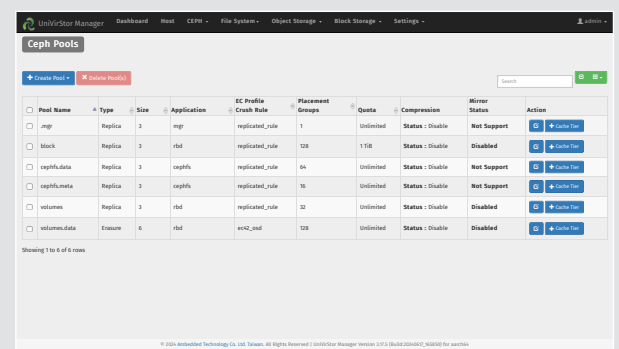


Cluster & Host Management	Cluster creation, host management, disk panel editor, disk status, adding/removing hosts, adding/removing working disks (OSD), cluster storage pool and disk usage
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Service Management	Adding Monitor, OSD status, adding/removing
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Storage Pool Management	Creating storage pools, storage list, editing storage pools, deleting storage pools, creating Cache Tier
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Erasure Code Profile	Creating and managing erasure code rules
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Cluster Map Management	Creating cluster architecture diagrams, creating data distribution rules, editing architecture hierarchy names, moving host locations
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File System	Creating file systems, metadata server management
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Object Storage

Creating object storage gateways (Fig.1), creating multi-site synchronization (Fig.2), storage pool management, user and key management

Fig.1 : Create RGW (Rados gateway) for object storage

Node Name	IP Address	API Port	Type	Action
mars500-gw1	172.18.2.6	7097/4450(119)	Secondary Gateway	Promote to Master

Showing 1 to 1 of 1 rows

Sync Status

```

Pool: 6577941-8736-4021-8617-36303988071 (asia)
zonegroup: 327c2146-8b4d-4854-4945-1d1-742226396 (Taiwan)
zone: 8958120a-9022-66ac-8495-58104862260 (taichung)
metadata: sync:ing
  type: sync
  pool: 8184 shares
  incremental: sync: 64164 shares
  metadata: sync: 640-4216-4216-master
data: sync: 3488779-071-4438-8419-368872942878 (Taiwan)
  type: sync
  pool: 8178 shares
  incremental: sync: 2387238 shares
data: sync: 4249781-4278 shares
  
```

Fig.2 : Create RGW multi-sites sync

Block Storage

Creating/deleting/editing virtual disks, creating snapshots, snapshot scheduling, creating and managing virtual disk mirroring, managing mirroring intervals, iSCSI gateway management, LUN management

System Settings

Software updates (Fig.3), time server creation and synchronization, log viewing, user account management, Prometheus deployment (Fig.4), abnormal event notification settings (Fig.5)

Node Name	IP Address	Role	UVS Version	Version
mars500-105	172.18.2.105	osd x 8 mon x 1 rgw x 1 mgr x 1 mds x 1	3.17.5	CEPH: 17.2.6 KERNEL: 5.4.0-166-generic
mars500-106	172.18.2.106	osd x 8 mgr x 1 mds x 1 mon x 1	3.17.5	CEPH: 17.2.6 KERNEL: 5.4.0-166-generic
mars500-107	172.18.2.107	osd x 8 mgr x 1 mon x 1	3.17.5	CEPH: 17.2.6 KERNEL: 5.4.0-166-generic

Showing 1 to 3 of 3 rows

Fig.3 : Software upgrade with UVS manager

Node Exporter: ON | Ceph Exporter: ON

Prometheus:

Retention Size: Auto | GB: 60 | Days: 60 | Create Prometheus

Deploy On Nodes	Service	URL	Size(GB)	Time(Day)	Action
mars500-105	ON	http://172.18.1.105:9090/	82	60	Days Clearing
mars500-107	ON	http://172.18.1.107:9090/	80	60	Days Clearing

Apply Changes

Fig.4 : Prometheus deployment on UVS manager

SMTP Host: 192.168.1.102 | SMTP Port: 25

Recipients: notify@gmail.com

Username: manager | Password: manager

Notify Frequency: 1 Minutes | Notify Times: 1

Submit

Fig.5 : Notification setting