Mars 400 Ceph Storage Appliance

Specification

Server Platform	
ARM MicroServer Node	▪ 8x ARM microserver nodes, each microserver node has following specs - CPU: ARM Quad-Core 64-bit Cortex-A72 processor, - Memory: 4GB DDR4 SDRAM, - System Storage: 16GB flash disk - Network: Dual 2.5Gbps Ethernet - Storage Interface: 2x SATA 6Gbps ports 1x 3.5”/2.5” SATA disk bay for OSD data storage 1x 120GB M.2 SATA bluestore WAL/DB - 5 Watts power consumption ▪ Operation System: - Mars 400: Ubuntu LTS
In-Chassis Switch	▪ Dual in-chassis switches (Hot-Swappable) - Each switch has 2x 10Gbps SFP+/10G Base-T RJ-45 interface - Each switch has 8x 2.5Gbps port connect to 8x microserver nodes
Ceph Daemon Configuration	Each microserver node can be configured as independent Ceph monitor, OSD & MDS, RADOS, and iSCSI gateways
Baseboard Management Controller (BMC)	▪ Command-line user interface through SSH ▪ 10/100 Mbps out of band ethernet management interface ▪ Microserver Node Management: - Independently control microserver node power and reset - Server node console over ethernet - Network configuration - Restore microserver nodes ▪ Chassis power, fan speed, Panel LED control ▪ Monitoring: PSU, fan, temperature
Power Supply	Dual redundant 300 Watts power supply unit

Ceph Deploy and Management	
Version	Ambedded tunned Ceph community version
Management Interface	▪ Web-based user interface: - Unified Virtual Storage(UVS) Manager - Collocated on all monitor nodes ▪ Ceph Command Line Interface
OSD Node	▪ Every ARM microserver node host single OSD ▪ Data Storage Device: SATA 6Gb 3.5” HDD or 2.5” SSD ▪ Every OSD has a 120 GB M.2 SSD for bluestore DB & WAL use ▪ Support OSD encryption
Monitor	▪ Every monitor run on a independent ARM microserver node ▪ Collocates MON with UVS manager and Ceph manager ▪ Optional: Collocates MDS, RADOS and iSCSI gateways as standby service
Metadata Server (MDS) Node for CephFS	Active MDS: run on independent ARM microserver nodes Standby MDS: collocated on MON nodes Horizontal scalable active MDS
Cluster Node Management	▪ Node & disk location LED control, easy to locate the node in chassis ▪ Monitor: - Create, service re-start & node re-boot - SSD SMART information ▪ Object Storage Daemon (OSD) - Create, trash, delete, service restart & node re-boot - Data and Metadata storage SMART information ▪ Metadata Server (MDS) - Create, remove, failback
User Cryptographic Authentication	UVS allows the administrator to create/delete users' keyrings and edit their access capabilities.
Data Protection	
Replication	▪ Configurable Replica 2 to 10 ▪ Selectable failure domain with pre-defined CRUSH rule
Erasure Code	▪ Erasure Coding K+M profile configuration ▪ CLAY (Coupled-Layer) erasure code to reduce recovery time ▪ Selectable failure domain with pre-defined CRUSH rule
CRUSH MAP	▪ Bucket type: root, region, zone, data center, room, PDU, row, rack, chassis ▪ Rename bucket type ▪ Create CRUSH buckets ▪ User can move bucket to the other bucket in cluster ▪ CRUSH ruleset create, list and delete
Ceph RADOS Pools	
Pool Management	▪ Pool create & delete ▪ Pool type: Replica or Erasure code ▪ Configurable: Placement Group number, replica size, quota, CRUSH rule
Pool Configuration	Configurable items: Replica Size, Quota, Compress, CRUSH Rule Set, Placement Groups, compression & ratio
Cache Tiering	Add or remove cache tiering pool

RADOS Block Device (RBD) Images	
Basic Management	Image create & delete
Image Create	Select pool, image name, image size, object size
Image Management	Delete, re-size, snapshot, image watcher
Thin Provisioning	RBD images are thin provisioned. They don't actually use any physical storage until you begin saving data to them.RBD.
Disaster Recovery	RBD images can be automatically asynchronously mirrored between two Ceph clusters.
Image snapshot, clone and flatten	▪ Create snapshots of the images to retain a history of an image's state. ▪ Snapshot layering: Clone images quickly and easily.
Cloud-Native Storage	Ceph supports block device snapshots and the higher-level interfaces, including QEMU, libvirt, Kubernetes Container Storage Interface, OpenStack and CloudStack.
System Management	
NTP Server	▪ Create the NTP server on the monitor node or use an external NTP server ▪ Push NTP settings to all server nodes
Notifications	Configurable notifications by emails.
UVS user management	▪ Create or delete UVS users ▪ Manage user access right

Storage Protocols

Block Storage	
Linux Client	RBD
OpenStack	Cinder, Glance & Nova
Docker Container	Persistent Volume, Container Storage Interface
iSCSI Gateway	▪ Create and manage iSCSI gateways on internal ARM microserver nodes or external x86 servers ▪ LUN management: Create/Delete LUN ▪ IQN, CHAP authentication & MPIO support
Disaster Recovery	Asynchronous Mirroring
File System	
Linux Client	POSIX compatible file system
OpenStack	Manila
Kubernetes / Docker Container	Persistent Volume
Library	libcephfs
Object Storage	
API	Amazon S3, SWIFT
RADOS Gateway (RGW)	▪ RADOS Gateway. Create Standalone or multi-site RGW on internal ARM microserver nodes or external x86 servers ▪ RGW pool and user management
Disaster Recovery	Active-Active Multi-Site
Object Pool & user Management	▪ Automatic create pools for RGW ▪ Change pool replication or erasure code, Placement Groups & Crush Rules ▪ Create S3 and SWIFT users and related secret keys
Library	librgw

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