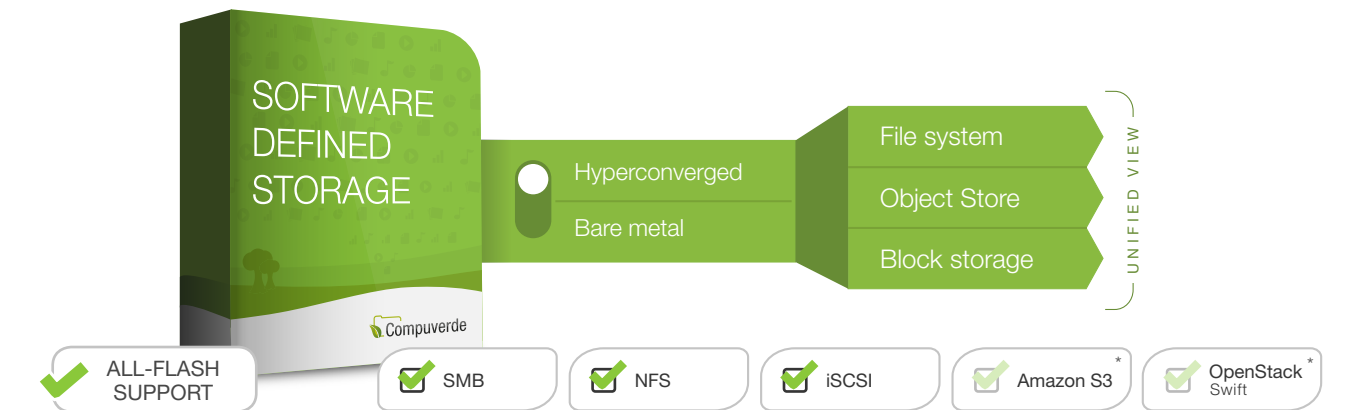


Compuverde Scale-out Storage

Combines file system, block storage & object storage. Future proof, hardware-agnostic & massively scalable, using standardized storage servers as building blocks. Scale out from four nodes.



<h3>Scale-out NAS</h3> <p>Install on physical servers. Start small and scale-out to hundreds of nodes.</p>	<h3>Hyperconverged</h3> <p>Computing and storage in one, using hypervisors such as ESXi, Hyper-V, KVM, and Xen.</p>	<h3>Metro Cluster</h3> <p>Improved redundancy by stretching your cluster to two locations in the same LAN.</p>	<h3>Async Replication**</h3> <p>Replication between multiple locations for fast Disaster Recovery.</p>
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Compuverde Scale-out storage delivers a cost efficient storage with fully featured unified file system on top. Each node in the cluster is a self-sustained server installed with Compuverde vNAS software. The file system spans all nodes in the cluster,

consistently available through any node and through any of the major protocols. This makes for a storage system that is self healing, flexible and fully automated – packed with essential features for flexibility, safety and security.

<h3>Protocol Support</h3> <ul style="list-style-type: none"> SMB 1 / 2.1 / 3.1.1 NFS 3 / 4.0 / 4.1 <p>cross protocol access</p>	<h3>DR</h3>	<h3>Authentication</h3> <ul style="list-style-type: none"> Active Directory LDAP Kerberos KDC NIS Local database
<h3>File Policies</h3> <ul style="list-style-type: none"> Tier Snapshots Quota Encryption WORM Retention 	<h3>Multitenancy</h3>	<h3>Authorization</h3> <ul style="list-style-type: none"> ACL mode_t SID UID/GID <h3>Antivirus</h3> <p>Integration</p>

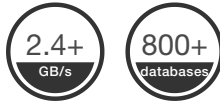
*) S3 and Swift protocols currently in beta
 **) Async Replication is available 2019



PERFORMANCE



Databases
Database mixture



Multiple Small Files
Software build workloads



Video Surveillance
36 Mb/s video streams



Virtual Desktop Infrastructure
High intensity workers



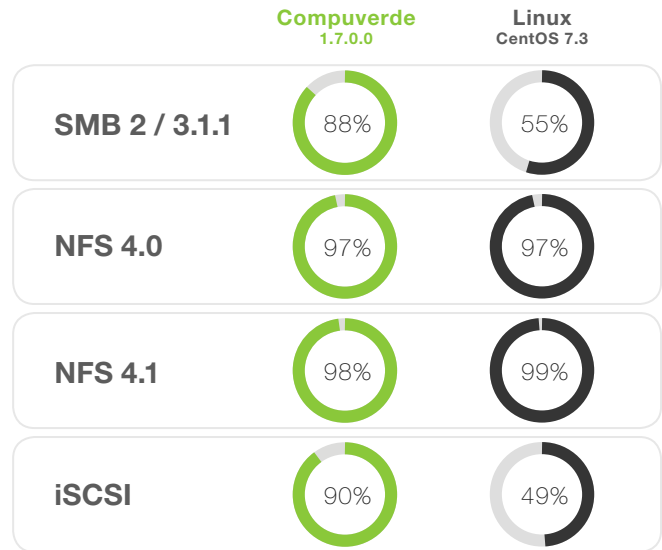
Performance Test Hardware Specifications

8x SuperMicro SuperChassis 24 slot

- 2x 2.0 GHz Intel® Xeon™ E5-2620
- 1x 256 GB DDR3
- 2x Intel® P3700 400 GB NVMe
- 24x 900 GB SAS 10K (HBA)
- 2+1 Erasure Coding
- 2x Intel® X520 10 GbE dual NIC

PROTOCOL COMPATIBILITY

Tight integration between protocols and the virtual file system, as no third party software or open source is used in the solution.



- SMB 2&3 Protocol Family Test Suite Version 2.0.66.0 developed by Microsoft
- pyNFS version October 20, 2015, developed by CITI
- LibiSCSI version 1.18.0 update November 8, 2017

TECHNICAL SPECIFICATIONS

Key Features

Access Protocols	<ul style="list-style-type: none"> SMB (1 / 2.0 / 2.1 / 3) NFS (3 / 4.0 / 4.1) iSCSI (with MPIO and ALUA) OpenStack Swift + Cinder (beta) Amazon S3 (beta) NNTP back end storage
All-Flash	Yes
Tiering	Yes
Multi-tenancy	Yes (multiple file systems)
Network	Multiple NICs, Virtual IP, VLAN
Bonding / Link Aggregation	<ul style="list-style-type: none"> Round Robin Active/Backup XOR Broadcast LACP Adaptive Transmit Load Balancing Adaptive Load Balancing
Rolling upgrade	Yes
Cache support	NVMe SSD / RAM
Cache mode	<ul style="list-style-type: none"> Read/Write Write Only
Mirrored write cache	1-4 copies
RAM write cache	On / Off
Authentication	<ul style="list-style-type: none"> Active Directory LDAP Kerberos KDC NIS Local database

Management Features

Management tool	<ul style="list-style-type: none"> Configuration Performance Health Alerts Logging
API	<ul style="list-style-type: none"> REST API Usage statistics
Logging	<ul style="list-style-type: none"> Remote syslog (rsyslog) SNMP v2c
Alarms	<ul style="list-style-type: none"> SNMP v2c E-mail
Backup	NDMP (full, incremental and differential)

Files and Folders

File Policy	At Folder level:												
Filters	<ul style="list-style-type: none"> Pattern (ex: *.jpg) Age (days/weeks/months/years) 												
Actions	<ul style="list-style-type: none"> Change file coding Change tier Data encryption Retention (remove files after set time) WORM (write once read many) 												
Snapshot Policy	At folder level:												
Schedule	<ul style="list-style-type: none"> Automated: Every hour/day/week Manual 												
Snapshots retained	Up to 253 (circular overwriting)												
Quota Policy	Folder or domain size limit												
Antivirus Support	Yes												
File coding													
Copies	3 or 5 copies												
Erasure coding	<table border="1"> <tbody> <tr> <td>2+1</td> <td>2+2</td> <td>3+1</td> <td>3+2</td> <td>4+1</td> <td>4+2</td> </tr> <tr> <td>5+1</td> <td>5+2</td> <td>6+1</td> <td>6+2</td> <td>8+1</td> <td>8+2</td> </tr> </tbody> </table>	2+1	2+2	3+1	3+2	4+1	4+2	5+1	5+2	6+1	6+2	8+1	8+2
2+1	2+2	3+1	3+2	4+1	4+2								
5+1	5+2	6+1	6+2	8+1	8+2								

Cluster features

Scalability	<ul style="list-style-type: none"> Linear, by adding new nodes Petabytes of data, billions of files
Elasticity	Runtime change of cluster size
Self-healing	Yes (Automatic)
Automatic detection	<ul style="list-style-type: none"> Node failure Disk failure Data inconsistency
Healing mode	Prioritized automatic repair
Availability	> 99.999 %
Data addressing	<ul style="list-style-type: none"> File system Block Objects
Encryption	Data at rest: AES 256 bit XTS - one key for each file system