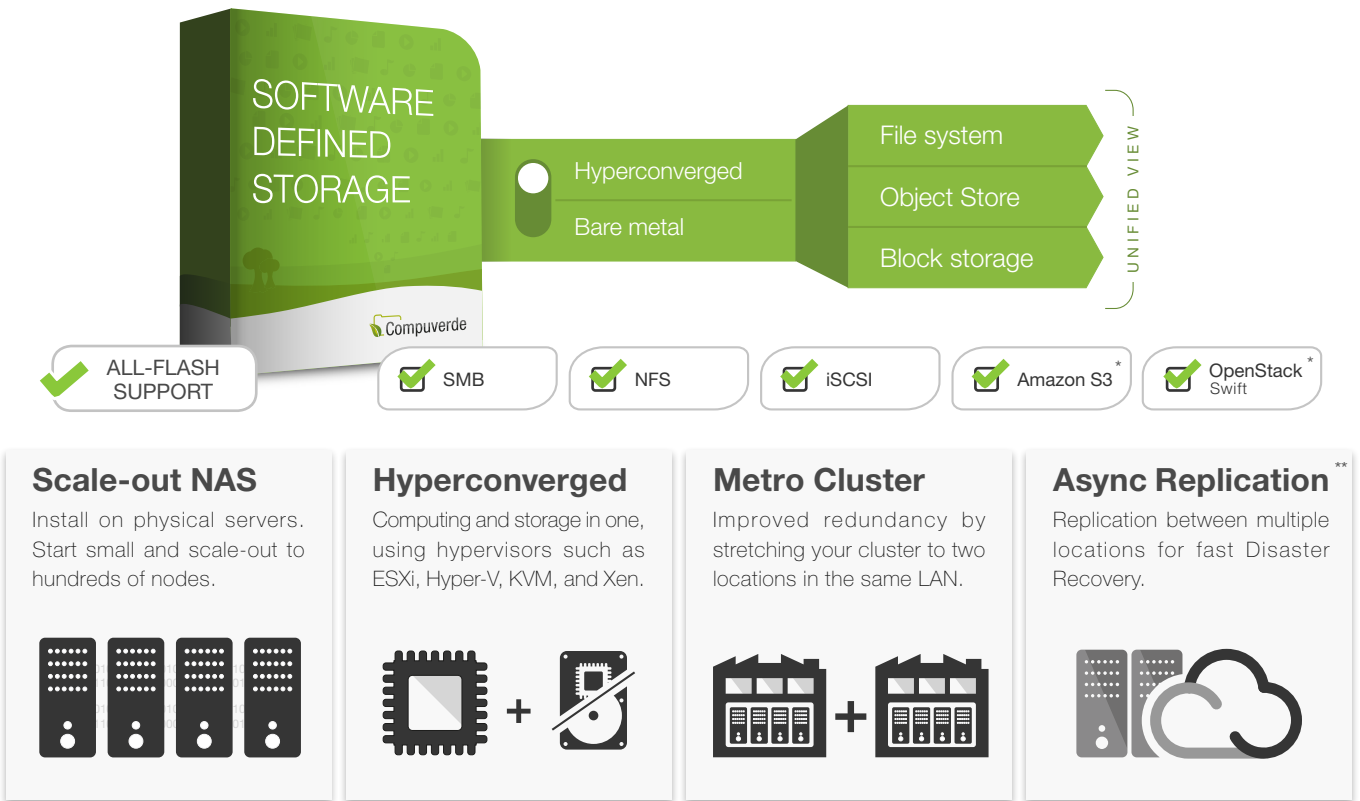




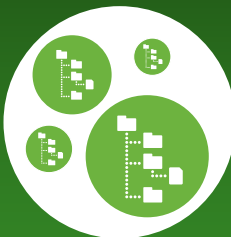


# Compuverde Scale-out Storage

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



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>  <table border="1"> <tr> <td><b>SMB</b></td> <td>1 / 2.1 / 3.1.1</td> <td rowspan="2">cross protocol access</td> </tr> <tr> <td><b>NFS</b></td> <td>3 / 4.0 / 4.1</td> </tr> </table>	<b>SMB</b>	1 / 2.1 / 3.1.1	cross protocol access	<b>NFS</b>	3 / 4.0 / 4.1	<h3>Async Replication</h3> 	<h3>Authentication</h3> <ul style="list-style-type: none"> <li>Active Directory</li> <li>LDAP</li> <li>Kerberos KDC</li> <li>NIS</li> <li>Local database</li> </ul>
<b>SMB</b>	1 / 2.1 / 3.1.1	cross protocol access					
<b>NFS</b>	3 / 4.0 / 4.1						
<h3>File Policies</h3> <ul style="list-style-type: none"> <li>Tier</li> <li>Snapshots</li> <li>Quota</li> <li>Encryption</li> <li>WORM</li> <li>Retention</li> </ul>	<h3>Multitenancy</h3> 	<h3>Antivirus Integration</h3>  <p>ICAP support</p>	<h3>Authorization</h3> <ul style="list-style-type: none"> <li>ACL</li> <li>mode_t</li> <li>SID</li> <li>UID/GID</li> </ul> <h3>Backup</h3>  <p>NDMP support</p>				

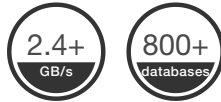
\*) S3 and Swift protocols: Limited functionality  
 \*\*) Async Replication is available 2019



## PERFORMANCE



**Databases**  
Database mixture



**Multiple Small Files**  
Software build workloads



**Video Surveillance**  
36 Mb/s video streams



**Virtual Desktop Infrastructure**  
High intensity workers



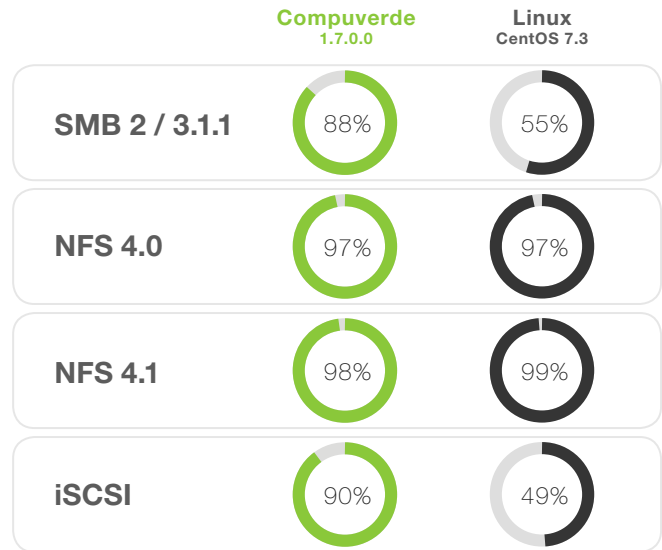
## Performance Test Hardware Specifications

**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

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

### Management Features

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

### Files and Folders

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

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

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