

IBM Cloud Object Storage System
Version 3.12.4 June Maintenance Release

Release Notes



This edition applies to IBM Cloud Object Storage System™ and is valid until replaced by new editions.

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Contents

Support information	v	System Behavior.	12
Chapter 1. New Features and Improvements in ClevOS 3.12.4	1	Storage Pools.	12
Chapter 2. Interface Modifications	3	Data Evacuation.	13
Chapter 3. Resolved Issues	5	System Configuration	13
Resolved issues in 3.12.4 June Maintenance Release	5	Deleting objects	13
Resolved issues in 3.12.4 May Maintenance Release	5	Manager Web Interface	13
Resolved issues in 3.12.4 April Maintenance Release	5	Vaults	14
Resolved issues in 3.12.4 March Maintenance Release	6	Vault Mirrors.	14
Resolved issues in 3.12.4	7	Vault migration	14
Resolved issues in 3.12.3	7	Native File	14
Resolved issues in 3.12.2 January Maintenance Release	7		
Resolved issues in 3.12.2	7	Chapter 5. Supported Hardware	
Chapter 4. Known issues	9	Platforms	17
Upgrading and Installation	11	IBM Cloud Object Storage Appliances	17
Container	11	Hewlett Packard.	17
Alerting and Reporting	12	Seagate.	18
		Cisco	18
		Dell	18
		Lenovo.	18
		Notices	19
		Trademarks	21

Support information

For more information on the product or help with troubleshooting, contact IBM Support at IBMCloudStorageSupport@us.ibm.com or visit the Directory of worldwide contacts.

Chapter 1. New Features and Improvements in ClevOS 3.12.4

This release has various defect fixes.

Chapter 2. Interface Modifications

API updates for the 3.12 release have been referenced in the following documentation:

- CSO API Developer Guide
 - NEW section added for Compliance Enabled Vaults
- REST API Developer Guide
 - Updated section on Access Pool Management>Create an access pool
Request parameters
 - Updated section on Storage Pool Management>Edit a storage pool
Request parameters
 - Updated section on Administration>Configure Accesser API
Request parameters
 - Added new section to Vault Management
View a concentrated dispersal vault IDAs

API Changes 3.12

Only S3 is supported for operations on Protected Vaults/Objects and includes the following changes:

- Create Vault - 4 new parameters are added to the existing API: status and retention durations
- Edit Vault - 4 new parameters are added to the existing API: status, and retention durations
- Create Vault template - 4 new parameters are added to the existing API: status and retention durations
- Edit Vault Template - 4 new parameters are added to the existing API: status and retention durations
- Configure Vault Protection - new api to enable the feature.

COS-26638: In prior releases, the Storage Pool Capacity and Disk Report Manager REST API provided duplicate entries for any disk within a storage pool that is not in a “good” (pre-3.10.1) or “online” (3.10.1 or later) state. This issue has now been resolved.

COS-26512: The Compliance Report has been renamed to System Usage and Configuration Summary Report. The corresponding REST API endpoints have been updated to reflect this, as have any REST API fields that specify the Compliance Report.

Support retrieval of region code and billing class separately [1141]. APIs modified for this feature:

- Create Vault - Two parameters, region and storageClass are added to the request.
- Edit Vault - Two parameters, region and storageClass are added to the request.
- Create Vault From Template - Two parameters, region and storageClass are added to the request.

Chapter 3. Resolved Issues

Resolved issues in 3.12.4 June Maintenance Release

Table 1. Resolved issues

Issue	Description
14450	Indexes that cannot be read will return zero for size in DMS metrics collection.
COS-39150	<p>For storage pools that have a high number of vaults (>100), there is degradation in the performance of the scanning process used to determine what needs to be scanned to find data that may need to be rebuilt. As a result, this may slow the rate of scanning and rebuilding across the drives within a storage pool.</p> <p>Exposure to this issue is limited to ClevOS™ 3.12.4.72 and 3.13.3.59 releases. This issue is addressed in this release. If the system configuration meets the above conditions, the IBM COS support team should be contacted to assess any potential impact.</p>

Resolved issues in 3.12.4 May Maintenance Release

Table 2. Resolved issues

Issue	Description
COS-37407	Vault deletion is not picking up increased reserved scheduler permit configuration changes.
COS-37563	A slow memory leak was introduced in 3.12.2 which affects very stable systems that don't drop connections to external devices very often. The leak is only present under certain race conditions and when heavily impacted by the leak, the core process will perform garbage collection more often than it otherwise would. Race conditions in the code were fixed so as to not leak old regions.
COS-38383	Fixed an issue where heavy rebuild delete activity may cause rebuilder to report that it is not making progress.
COS-37557	Clients observed a bunch of client disconnects due to request timeouts, for some of the stores. The root cause was that the scanning rate did not remain stable during the entire scanning cycle, and we observed huge spikes in it, especially at the beginning of the cycle. This resulted in a large number of listing requests, and affected the IO.
COS-39105	Fixed an issue where the Slicestore device may enter a potentially inconsistent state upon upgrading from a pre-3.12.x release to a post-3.12.x release.
COS-38405	Fixed an issue where conditional request headers (such as If-Modified-Since), were not properly returning a 304 - Not Modified response where the provided timestamp matches the existing object timestamp.

Resolved issues in 3.12.4 April Maintenance Release

Table 3. Resolved issues

Issue	Description
COS-32649	Fixed an issue with the manager application not starting up properly when certain fields of a multi-node device are not set properly.
COS-32492	Fixed an issue where a core process restart may be triggered due to a race condition that may exist while performing reallocation.

Table 3. Resolved issues (continued)

Issue	Description
COS-28665	Resolved an issue where the dlm process was erroneously reported as not running when a device was under extreme workload and stress.
COS-36653	Fixed an issue where certain errors encountered during listing may be ignored, resulting in successful listing responses that omit ranges of results that should have been included in the output.
COS-31475	Resolved an issue that was preventing hard drive Advanced Power Management functionality from being disabled on Slicestor device data drives.
COS-27605	Resolved an issue where upon upgrade of certain Slicestor appliances, data drives could erroneously transition to a diagnostic or offline state, preventing them from being used by the device.
COS-34886	Fixed an issue where requests being sent via the SOH API that also included CORS headers ('Origin' and 'Host') were encountering an exception and causing the core process on the Accesser device to restart.
COS-25365	Resolved an issue where upon removal of a Slicestor device data drive, the drive was still being reported as present with an invalid drive bay number.
COS-31864	Fixed a race condition where slices maybe erroneously removed during an overwrite operation. This has been observed to impact the name index, which by nature is updated frequently. In this situation, write, delete, or listing requests to the impacted location of the index will fail and return HTTP status code 500.

Resolved issues in 3.12.4 March Maintenance Release

Table 4. Resolved issues

Issue	Description
COS-34232	Resolved an issue that might result in inconsistent revisions of slices for an index node being persisted under heavy load. Affects any environment that uses the distributed index, including the name index, data migration services, globally prioritized rebuilder, and multi part uploads. Inconsistent slices are more likely to produce availability or reliability issues in configurations where the difference between width, and write threshold, is larger than the difference between write threshold and threshold.
COS-34143	Resolved an issue that was causing increased memory pressure on Slicestor devices when heavy slice listing operations were being performed. This was particularly prominent when utilizing Vault Mirrors or Data Migration Services, but could also be seen in heavy rebuild scenarios on storage pool sets with a large number of Slicestor devices.
COS-35277	Resolved an issue with Slicestors going into inconsistent state after upgrade.
COS-15399	Following an Accesser OS drive replacement, a new device certificate must be generated for this device, and a whitelist containing this certificate information must be distributed to the other devices in the system which this device will attempt to communicate with.
COS-33227	In a multi-stripe system, the namespace boundaries between stripes are calculated in such a way that the boundaries between stripes is not the same for each pillar. This means that there are ranges of the namespace that may be entirely within the stripe for one index in a pillar, but spans stripes for another index. When doing reverse rebuild listing where a range crosses a stripe boundary, the client will select the wrong device to send the request to, resulting in a empty listing result.
COS-32383	Fixed an issue where a timing issue or race condition where, upon first establishing a connection between Accesser and Slicestore devices following a new device registration, OS drive replacement, or device certificate update, the Accesser device may not be able to authenticate to the Slicestore device.
COS-34886	Requests sent through the SOH API that also include CORS headers ("Origin" and "Host") encounter an exception and cause the core process on the Accesser device to restart.

Resolved issues in 3.12.4

Table 5. Resolved issues

Issue	Description
COS-32649	Fixed an issue with manager startup handling of chassis ID in multi node chassis.

Resolved issues in 3.12.3

Table 6. Resolved issues

Issue	Description
COS-31605	In previous releases, when using Concentrated Dispersal with an older version of Firefox (before version 47), any creation of mirrored vaults can fail. This issue is resolved; however, users should upgrade to the latest version of Firefox.
COS-30962	In the Device Statistic API, service state and uptime metrics were unnecessarily included in the output, and have been removed.
COS-31470	In previous releases, if a set replacement or set removal was performed before initiating a device replacement activity, the set numbering displayed on pages that are associated with the device replacement flow is incorrect. This issue has been resolved.
COS-31449	Addressed an issue that is related to deletion of vault alias during migration.
COS-30097	500 Errors for GET.SERVICE request while PUT.VAULT is in process.

Resolved issues in 3.12.2 January Maintenance Release

Table 7. Resolved issues

Issue	Description
COS-27973	Addressed an issue where Slicestors are exhibiting high cpu and causing dlm process to be restarted.
COS-30612	Addressed an issue where the server returns a 403 when a bucket is created through S3 and using the HMAC account/keys.
COS-30999	Fixed an issue with Manager returning internal error when the devices are approved in bulk.
COS-31227	Fixed an issue when adding a device on a storage pool with missing Slicestors.
COS-31482	Robust handling of Accesser stability in an error scenario.

Resolved issues in 3.12.2

Table 8. Resolved issues

Issue	Description
COS-28338	Updated access control permissions enforcement for Compliance Enabled Vault API extensions. PUT/GET legal holds require WRITE_ACL/READ_ACL permission and PUT/GET Bucket Protection operations now bucket owner permission after this fix.
COS-28629	In certain conditions, Execution of the storagetl commands (list, list all, info, and history) through the manager troubleshooting console will timeout, particularly when a significant amount of information is present, resulting in the following message to be displayed on the user interface: "The command is taking too long to execute ." This issue is fixed in this release.
COS-27795	Logging updates for token refresh failures.

Table 8. Resolved issues (continued)

Issue	Description
COS-28787	In earlier releases, when operating in container mode with a service vault, the Create Vault link for each vault template on the "Template Management" page of the Manager user interface did not initiate the "Create Vault" process. This issue has now been resolved.
COS-28790	In release 3.10.2 and after, the CSV content associated with the Vault Summary Report on the Manager user interface did not contain the SSE-C column. The issue has been resolved in this release.
COS-28572	Fixed an issue where Manager complains about 2 drives missing for Lenovo System x3650.
COS-29667	Fixed an issue with COS access logs reporting storage_account_id .
COS-22881	When performing a form-based upload using a POST request, if the client disconnects from the Accesser device before completing the request, the error is incorrectly logged as an HTTP 500 error and generates an event in the Manager UI event console.
COS-28179	Who to contact in the event of a scenario causing a large number of destroyed data-slices, such as multiple Slicestore reimage, site destruction, site reimage, or large scale long time scale outage.

Chapter 4. Known issues

Table 9. Known issues

Issue	Failing Condition	Disposition
COS-6803	For Slicestor® devices with multiple OS drives, degradation of OS drives does not affect the device's health on the Monitor device page.	Repair the OS drive or contact IBM® Customer Support for more information.
COS-12691	Instability has been observed when running two 40 Gbit links in LACP mode.	Do not use LACP aggregated links with 40 Gbit Intel Network cards.
COS-11201	In the Event Console of the Manager User Interface, the event details section for failing disk migration events contains a parameter called Migration Progress. However, it is not clear what this value represents.	This value corresponds to the percentage of failing disk migration that is complete.
COS-11355	Replacing a failed drive with another failed drive results in an inconsistent view on the Manager User Interface. On the Monitor Device page, in the "Summary of device health" section, both the replaced failed drive and the new failed drive are shown. The "Drive Information and Actions" view of the drive layout shows the replaced failed drive. On the Maintenance page, the FRU report contains the replaced failed drive.	Perform another replacement of the failed drive with a good drive.
COS-13575	The "stop migration" operation for failing disk migration on the Manager User Interface (UI) may take ~20 seconds to complete after being initiated by the user. The button continues to be enabled during this time. This issue exists for dispose and reset disk operations as well.	Do not hit the button again until the operation completes. If the drive stays in the same state for more than 20 seconds, perform a refresh of the page. If the drive continues to stay in this state, follow the recommended action provided in the Manager Administration Guide under disk lifecycle management.
COS-10031	When resuming a drive in the DIAGNOSTIC state from the Manager User Interface, it may take ~20 seconds to complete. The resume button is not disabled during this time.	Do not hit the resume button until the operation completes. If the drive stays in the DIAGNOSTIC state for more than 20 seconds, perform a refresh of the page. If the drive continues to stay in this state, follow the recommended action provided in the Manager Administration Guide under disk lifecycle management.
COS-12983	Virtual devices running ClevOS within VMware may experience a kernel panic when migrating the virtual machine to a new server using VMware (R) vMotion (tm).	Should this occur when migrating a VMware virtual device using vMotion, a cold migration should be used instead such that the virtual machine is offline during the migration.
COS-10445	When using the storage command from the localadmin shell on a Slicestor device, it is possible to resume all drives that are currently in the DIAGNOSTIC state. In some cases however, this process may take too long, which will cause the command to return an error code -15 due to a timeout.	Despite the error, the resume process is continuing in the background. The storage list command can be used to monitor the progress of resume process.
COS-16114	On systems with RAM roughly equal to or greater than the size of the OS drive, a kernel panic may result in the system being in an unusable state.	Contact IBM customer support to help correct the situation.

Table 9. Known issues (continued)

Issue	Failing Condition	Disposition
COS-7488	When performing a storage pool set removal, it is possible that once the reallocation has finished for an source Slicestor device, it may show some small amount of data still present.	No action is required. Once the set removal has completed, all slices will have been reallocated to the new storage pool. Any discrepancy in a Slicestor device's used space is generally a result of small inaccuracies that may occur during normal usage of the system.
COS-13504	When failing a quarantined drive, it is possible that after data has been migrated off the failing drive, the Manager event console will report that no data migration was attempted.	No action is required. Despite the event description, data migration will always be attempted unless the user specifically chooses to skip migration via the localadmin shell storage command.
COS-22921	When someone attempts to delete a bucket they first need to determine the assessor that can be used to issue the command. The S3 GET Bucket Location is one means to determine this. However this command may not work at every access pool.	Enhancing the S3 GET Bucket Location as a corner case command that can work at any access pool will be addressed in a future release.
COS-22990	The S3 remote proxy implementation of vault proxy has a few limitations related to communicating with an Amazon S3 endpoint. The version of the AWS SDK used to communicate to Amazon will default to using V2 instead of V4 authentication, causing authentication issues when communicating with certain AWS endpoints.	For further assistance in configuring a remote proxy for use with Amazon S3, contact IBM customer support.
COS-23025	SL 4U slicestor devices, LEDs are incorrectly set.	Recovery Action: The user can use MegaCLI/storcli commands to issue LED actions before performing disk replacements. This will be fixed in a future release.
COS-23962	Vault quotas are static and do not update when storage pool capacities change. If a system expansion, set replacement, or set removal is performed on the storage pool, vault quotas for any vaults on that pool will not update to consider the new capacity.	The user defined vault quotas will work as expected. However, they may not be consistent with the current storage pool capacity. For example, a vault quota may be higher than total storage pool capacity after a set removal.
COS-22924	When you upgrade the Manager to ClevOS 3.10.1 or newer for the first time, you might not be able to log in immediately. The Manager application might need an extra 20 - 30 minutes to become available due to database schema changes introduced in ClevOS 3.10.1. On systems with large databases, particularly systems with considerable historical event content, the time can be longer.	Contact Customer Support if it takes longer than 30 minutes to successfully log in to the Manager. Do not attempt to restart the Manager while it is upgrading.
COS-26214	Lack of documentation highlighting dependencies of Hadoop-connector package with GA releases.	For legacy customers who are still using Hadoop connector for ClevOS software, please contact IBM customer support to install a new package compatible with latest build.
COS-27469	When performing a PUT-COPY operation, a request header is used to specify the source of the copy operation. If this header is specified, but with an empty value, the request is expected to fail with a HTTP 400 - Bad Request. Instead, the object is being successfully created but with empty content.	This will be fixed in a future release.

Table 9. Known issues (continued)

Issue	Failing Condition	Disposition
COS-29681	When using the Microsoft IE9 web browser, certain Manager user interface elements like the left navigation tree and the vault capacity bar charts on the Monitor Vault page may not appear.	Microsoft has ended support of IE9 and IE10. Users should upgrade to Microsoft IE11 or higher, or use an alternative browser, such as Firefox, Safari, or Chrome.

Upgrading and Installation

Table 10. Upgrading and Installation

Issue	Failing Condition	Disposition
COS-7126	When extracting of upgrade file fails when a device is upgrading the failure message "The Selected File cannot be extracted while upgrades are in progress" continue to show if upload is restarted.	Only one upgrade file can be uploaded to the manager at a time. If another file is uploaded during an upgrade, an error message appears until the page is reloaded.
COS-15372	When upgrading from ClevOS 3.8.x, 3.9.x, or 3.10.0 to 3.10.1 or later, all drives not used for Slicestor data (e.g. OS drives) will be reported as newly discovered in the Manager event console.	No action is required.
COS-15642	When upgrading devices that contain logical RAID drives, the Manager event console will show a drive offline event immediately followed by a drive online event for each physical drive that is part of a logical RAID drive.	No action is necessary. These events are simply representative of a transition phase of the RAID drives during the startup sequence and will be removed in a future release.

Container

Table 11. Container

Issue	Failing Condition	Disposition
COS-1852	When attempting to write an object to a container that does not exist, the Accesser [®] appliance returns an HTTP 404 response with an error message of NoSuchKey instead of the appropriate NoSuchBucket. This includes cases where the container name includes a "/".	Ensure that your vault or container is successfully created before attempting to write objects to it. If you receive an error message of NoSuchKey for an upload request, verify that the container you are addressing does exist.
COS-15401	If a user attempts to create a management vault using "manual configuration" (accessed through the Configure Management Vault page) based on an existing vault template, management vault creation will fail with the following message: "Cannot create a management vault from this template. It is deployed to access pools with standard vaults"	Use the "automatic configuration" available on the Configure Management Vault page.
COS-15218	Container creation or deletion can sometimes result in 500 error responses when the requests are sent concurrently with other configuration requests to the same storage account.	Retrying the request that received a 500 is a suggested recovery action. It's best to retry the request when not doing other operations on the same storage account.

Alerting and Reporting

Table 12. Alerting and reporting

Issue	Failing Condition	Disposition
COS-1749	After recovering from an unresponsive IPMI controller, the open incident in the Manager event console sometimes fails to clear. The open incident is misleading, but has no impact on the system operation.	Contact IBM Customer Support to confirm and correct the false incident.
COS-6490	If a manager appliance is imaged with a degraded RAID array, no event is presented to the user in the event console. In some cases this can cause no warnings to be shown about a potential problem.	Repair the RAID array by replacing the failing drive.

System Behavior

Table 13. System behavior

Issue	Failing Condition	Disposition
COS-2498	The usage of a disk is counted while the disk is offline. However, its capacity is not counted.	No action. Awareness of limitation. If necessary a restart of core would fix the usage values. Limit DLM events
COS-2753	Under certain circumstances involving a combination of high concurrency (100 s to 1000 s of threads) and large object uploads (GB and larger), it is possible that multiple Slicestor appliances might experience disks being quarantined due to IO timeouts simultaneously.	This is a direct consequence of the workload being too high for the system and is likely to occur under certain test conditions but is much less likely to occur in a production environment. If this occurs, resume the disks and resume IO but reduce the workload on the system.
COS-2128	In a GDG configuration with high request latency to the remote stores and low latency to local stores, an Accesser Appliance will open multiple connections to the remote stores and a single connection to local stores. Large bursts of IO can overwhelm the single local connection, resulting in elevated response times and operation latencies.	Using the System Advanced Configuration framework, the Accesser Appliance can be configured to open multiple connections to local stores, allowing it to better handle burst of IO activity. The parameter to configure appropriately is <code>network.connection-profile</code> . Please refer to section 3 of the Advanced System Configuration guide for more details.
COS-1920	Support for "encoding-type" header when performing xml-based listing requests is not currently provided.	This feature is not currently supported

Storage Pools

Table 14. Storage pools

Issue	Failing Condition	Disposition
COS-2642	On the *Monitor Storage Pool Page, the Reallocation Progress graph, which displays historical data, is inaccurate when a device is down or statistics are not collected for a window of time.	The Data Reallocation progress bar, available at the top of the *Monitor Storage Pool Page, is always accurate. This view reflects the status and should be used to monitor progress of the data reallocation activity.

Data Evacuation

Table 15. Data evacuation

Issue	Failing Condition	Disposition
	Nothing to report.	

System Configuration

Table 16. System configuration

Issue	Failing Condition	Disposition
	Nothing to report.	

Deleting objects

Table 17. Deleting objects

Issue	Failing Condition	Disposition
9444	If a system is 100% full, customers might encounter an HTTP 500 error if they attempt to delete objects larger than the embedded content threshold (<1MB S3, >4MB SOH for default segments size). This issue has existed since release 3.0. It occurs because deleting large objects causes an intermediate write that appears larger to a Slicestor [®] Node, causing that node to fail the request due to an insufficient space error.	Contact IBM Support. They must use a development-provided procedure to free up disk space.

Manager Web Interface

Table 18. Manager Web Interface

Issue	Failing Condition	Disposition
COS-13189	For drives that do not have a SCSI name, some Disk Lifecycle Management (DLM) actions, such as resume and fail, performed through the Manager User Interface (UI) will fail.	Use drive serial number to perform the action from the command line. Obtain drive serial number information by executing (see SERIAL column): # storage list Perform the operation based on the drive serial number (Z29010L5), for example: # storage fail Z29010L5
COS-10031	When resuming a drive in the DIAGNOSTIC state from the Manager User Interface, it may take ~20 seconds to complete. The resume button is not disabled during this time.	Do not hit the resume button until the operation completes. If the drive stays in the DIAGNOSTIC state for more than 20 seconds, perform a refresh of the page. If the drive continues to stay in this state, follow the recommended action provided in the Manager Administration Guide under disk lifecycle management.
COS-23764	Upon network failure while going through the one time setup process in the manager, a network error page will appear. When the network comes back, re-load the page, at which point an internal server error page will appear in some scenarios.	Log out from the internal server error page and log back into the manager, which will take you through one time setup again.

Vaults

Table 19. Vaults

Issue	Failing Condition	Disposition
	Nothing to report	

Vault Mirrors

Table 20. Vault mirrors

Issue	Failing Condition	Disposition
COS-7019	When performing IO against a vault mirror with synchronous writes disable, HEAD requests performed against a successfully written object may return an HTTP 404 response.	If an HTTP 404 is returned for a HEAD request for a recently written object, please retry your request.
COS-13370	Through the Manager User Interface (UI), after creating a mirror from a mirror template that has Authorized IP Addresses populated, the mirror does not contain the specified IPs.	Perform the following workaround. After the mirror is created, add the IPs using the Edit Mirror Access Control page.

Vault migration

Table 21. Vault migration

Issue	Failing Condition	Disposition
COS-12442	When a vault migration finishes the work contained in its TODO queue, it kicks off a process to calculate the exact count of the number of objects migrated as part of the migration. This process of calculating the exact size is performed by each device in the target pool, and can take a long time to complete for large migrations.	

Native File

Table 22. Native File

Issue	Failing Condition	Disposition
COS-5896	File Accesser devices only support hardware Accesser devices. Docker Accesser installations are not supported.	Deploy F5100 devices for use only with physical Accesser devices.
COS-6851	Using Filesystem or Share names with capital letters might prevent some S3 clients from accessing content properly by using the File Accesser device REST API.	Create Filesystems and Shares by using only lower case letters or avoid use of S3 clients that force lowercase referencing of bucket names.
COS-7497	When performing large file writes in excess of 1TB through the NFS gateway appliance, the write operation will fail to complete and return an error.	Avoid writing files in excess of 1TB, and break up large files into multiple smaller files.
COS-7898	An abrupt shutdown of a File Accesser device can cause issues with the storage database (Cassandra) upon restart.	Contact IBM Customer Support and run "nodetool repair" on the effected device. Use a graceful shutdown of a File Accesser device whenever possible.

Table 22. Native File (continued)

Issue	Failing Condition	Disposition
COS-10195	Extended Characters in filename do not convert properly between windows and linux clients.	Do not set character encoding from default (UTF-8). Transformations may not work properly.
COS-7783	In process I/O may fail in the event of any File Accesser device going off line if that File Accesser is receiving a metadata update at the time of the outage.	Resend of failed data write.

Chapter 5. Supported Hardware Platforms

IBM Cloud Object Storage Appliances

Table 23. Minimum Version of ClevOS Compatible with Cleversafe Hardware Platforms

Appliance	Product	Minimum ClevOS
System Manager Appliance	M2100	≤2.7.0
System Manager Appliance	M2105	3.2.2
System Manager Appliance	M3100	2.7.0
IBM COS Accesser [®] Device	A2100	≤2.7.0
IBM COS Accesser [®] Device	A3100	≤2.7.0
IBM COS Slicestor [®] Device	S1440	≤2.7.0
IBM COS Slicestor [®] Device	S2104	3.2.1
IBM COS Slicestor [®] Device	S2212	3.2.1
IBM COS Slicestor [®] Device	S2440	3.0.1
IBM COS Slicestor [®] Device	S4100	3.1.0

Table 24. Minimum Version of ClevOS Compatible with IBM Hardware Platforms

Product Name	Machine Type (1Yr/3Yr Warranty)	Model	Minimum ClevOS
IBM COS Accesser [®] 3105	3401/3403	A00	3.8.1
IBM COS Accesser [®] 4105	3401/3403	A01	3.8.1
IBM COS Accesser [®] F5100	3401/3403	A02	3.8.3
IBM COS Accesser [®] T5100	3401/3403	A02	3.10.1△
IBM COS Manager [™] 2105	3401/3403	M00	3.8.1
IBM COS Manager [™] 3105	3401/3403	M01	3.8.1
IBM COS Slicestor [®] 2212	3401/3403	S00	3.8.1
IBM COS Slicestor [®] 2448	3401/3403	S01	3.8.1
IBM COS Slicestor [®] 3448	3401/3403	S02	3.8.3
IBM COS Slicestor [®] 2584	3401/3403	S03	3.8.1
IBM COS Slicestor [®] 2212A	3401/3403	S10	3.10.0

Note: △ Requires RPQ

Hewlett Packard

Table 25. Minimum Version of ClevOS Compatible with Hewlett Packard Hardware

Appliance	Model	Minimum ClevOS
Manager Appliance	DL360P Gen8	3.2.1
Manager Appliance	DL360 Gen9	3.5.0
Manager Appliance	DL380 Gen9	3.5.0
Accesser [®] Device	DL360P Gen8	3.2.1

Table 25. Minimum Version of ClevOS Compatible with Hewlett Packard Hardware (continued)

Appliance	Model	Minimum ClevOS
Accesser® Device	DL360 Gen9	3.5.0
Accesser® Device	DL380 Gen9	3.5.0
Slicestor® Device	SL4540 Gen8	2.9.0
Slicestor® Device	DL380 Gen9	3.5.0
Slicestor® Device	Apollo 4200	3.6.0
Slicestor® Device	Apollo 4510	3.6.0
Slicestor® Device	Apollo 4530	3.6.0

Seagate

Table 26. Minimum Version of ClevOS Compatible with Seagate Hardware

Appliance	Model	Minimum ClevOS
Seagate OneStor®	AP-2584 1 AP-TL-1	3.4.2

Cisco

Table 27. Minimum Version of ClevOS Compatible with Cisco Hardware

Appliance	Model	Minimum ClevOS
Cisco Slicestor® Device	UCS C3260	3.7.4
Cisco Slicestor® Device	UCS S3260 (Single Node)	3.12.0
Cisco Slicestor® Device	UCS S3260 (Dual Node)	3.12.0
Cisco Manager Appliance	UCS C220 M4	3.12.0
Cisco Accesser® Device	UCS C220 M4	3.12.0

Dell

Table 28. Minimum Version of ClevOS Compatible with Dell Hardware

Appliance	Model	Minimum ClevOS
Dell Slicestor® Device	DSS 7000	3.10.1

Lenovo

Table 29. Minimum Version of ClevOS Compatible with Lenovo Hardware

Appliance	Model	Minimum ClevOS
Lenovo Manager Appliance	X3550 M5	3.10.1
Lenovo Accesser® Device	X3550 M5	3.10.1
Lenovo Manager Appliance	X3650 M5	3.10.1

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