


GemStone/S 64 BitTM **Release Notes**

Version 3.5.2

June 2020



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PATENTS

GemStone software is or has been covered by U.S. Patent Number 6,256,637 "Transactional virtual machine architecture" (1998-2018), Patent Number 6,360,219 "Object queues with concurrent updating" (1998-2018), Patent Number 6,567,905 "Generational garbage collector with persistent object cache" (2001-2021), and Patent Number 6,681,226 "Selective pessimistic locking for a concurrently updateable database" (2001-2021).

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Preface

About This Documentation

These release notes describe changes in the GemStone/S 64 Bit™ version 3.5.2 release. Read these release notes carefully before you begin installation, upgrade, or development with this release.

No separate Installation Guide is provided with this release. For instructions on installing GemStone/S 64 Bit version 3.5.2, or upgrading or converting from previous products or versions, see the Installation Guide for version 3.5.1.

Terminology Conventions

The term “GemStone” is used to refer to the server products GemStone/S 64 Bit and GemStone/S, and the GemStone family of products; the GemStone Smalltalk programming language; and may also be used to refer to the company, now GemTalk Systems LLC, previously GemStone Systems, Inc. and a division of VMware, Inc.

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gemtalksystems.com

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- ▶ **Documentation** for the current and for previous released versions of all GemTalk products, in PDF form.
- ▶ **Product download** for the current and selected recent versions of GemTalk software.

- ▶ **Bugnotes**, identifying performance issues or error conditions that you may encounter when using a GemTalk product.
- ▶ **Supplemental Documentation** and **TechTips**, providing information and instructions that are not in the regular documentation.
- ▶ **Compatibility matrices**, listing supported platforms for GemTalk product versions.

We recommend checking this site on a regular basis for the latest updates.

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Website: techsupport.gemtalksystems.com

Email: techsupport@gemtalksystems.com

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Please include the following, in addition to a description of the issue:

- ▶ The versions of GemStone/S 64 Bit and of all related GemTalk products, and of any other related products, such as client Smalltalk products, and the operating system and version you are using.
- ▶ Exact error message received, if any, including log files and statmonitor data if appropriate.

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GemStone/S 64 Bit

3.5.2 Release Notes

Overview

GemStone/S 64 Bit™ 3.5.2 is a new version of the GemStone/S 64 Bit object server. This release includes a number of new features and bug fixes. We recommend everyone using or planning to use GemStone/S 64 Bit upgrade to this new version.

These release notes describe changes between the previous version of GemStone/S 64 Bit, version 3.5.1, and version 3.5.2. If you are upgrading from a version prior to 3.5.1, review the release notes for each intermediate release to see the full set of changes.

The Installation Guide has not been updated for this release. For installation, upgrade and conversion instructions, use the Installation Guide for version 3.5.1.

Supported Platforms

Platforms for Version 3.5.2

GemStone/S 64 Bit version 3.5.2 is supported on the following platforms:

- ▶ Red Hat Enterprise Linux Server 6.9, 7.4, and 7.6, Ubuntu 16.04 and 18.04, and SUSE Linux Enterprise 12, on x86. Testing has been done on some earlier Red Hat Enterprise Linux Server 6.x and 7.x versions with the latest security patches.
- ▶ Solaris 10 and 11.4 on x86
- ▶ AIX 6.1, 7.1, and 7.2
- ▶ OS X 10.14.3 (Mojave) with Darwin 18.2.0 kernel, and OSX 10.15.1 (Catalina) with Darwin 19.0.0 kernel, on x86 (Mac is supported for development only)

For more information and detailed requirements for each supported platforms, please refer to the GemStone/S 64 Bit v3.5.1 Installation Guide for that platform.

GemBuilder for Smalltalk (GBS) Versions

GemStone/S 64 Bit version 3.5.2 requires GBS version 8.4 or later for VisualWorks Smalltalk, or version 5.4.5 or later for VA Smalltalk.

The following versions of GBS are supported with GemStone/S 64 Bit version 3.5.2:

GBS version 8.4

| VisualWorks 8.3.2 32-bit and 64-bit | VisualWorks 7.10.1 32-bit | VisualWorks 7.10.1 64-bit |
|---|---|---|
| <ul style="list-style-type: none"> ▶ Windows 10 and Windows 7 ▶ RedHat ES 7.4 and 6.9; Ubuntu 18.04 and 16.04 | <ul style="list-style-type: none"> ▶ Windows 10 and Windows 7 ▶ RedHat ES 7.4 and 6.9; Ubuntu 16.04 | <ul style="list-style-type: none"> ▶ Windows 10 ▶ RedHat ES 7.4 and 6.9 |

GBS version 5.4.5

| VA Smalltalk 9.2 | VA Smalltalk 9.1 | VA Smalltalk 8.6.3 |
|--|--|--|
| <ul style="list-style-type: none"> ▶ Windows 10 ▶ Windows 7, Professional or above | <ul style="list-style-type: none"> ▶ Windows 10 ▶ Windows 7, Professional or above | <ul style="list-style-type: none"> ▶ Windows 10 ▶ Windows 8.1, Professional or above ▶ Windows 7, Professional or above |

Note that Windows 7 reached end of life in January of 2020. While GemTalk will continue to test on and support GemStone clients on Windows 7, it will no longer be considered certified.

For more details on supported GBS and client Smalltalk platforms and requirements, see the *GemBuilder for Smalltalk Installation Guide* for that version of GBS.

VSD Version

The GemStone/S 64 Bit v3.5.2 distribution includes VSD v5.5. The previous version of GemStone/S, v3.5.1, included VSD v5.4.

VSD version 5.5 is a new release including a number of new features and bug fixes. For details on the changes, see the [Release Notes for VSD v5.5](#).

VSD versions are not tied to GemStone server versions: both older and newer versions of VSD can be used to read statmonitor files generated by both older and newer versions of GemStone/S and GemStone/S 64 Bit.

Changes in this release

GemStone revision numbering

GemStone internal development has moved from SVN to Git. Build numbers within the GemStone product (such as log file headers) that previously showed the 5-digit revision, now include the Git SHA; for completeness the entire 40 characters are included.

For example:

```
VERSION: 3.5.2, Thu Mar  5 11:59:57 2020  
COMMIT: 2020-03-03T14:50:13-08:00 77c22dd6aba1790789b6ce1096f881f20d5553d5
```

Updated library versions

- ▶ The version of openssl has been updated to 1.1.1g
- ▶ The version of Kerberos has been updated to 1.18.2
- ▶ The version of openldap has updated to 2.4.50

With the new version of VSD, the TCL library versions have also been updated.

Support for UUIDs

Universally Unique Identifiers are 128-bit numbers that, while not relying on a registry, provide practically unique numbers.

UUIDs are provided by the new class `GsUuidV4`. `GsUuidV4` is an implementation of a version 4 UUID as specified in RFC 4122, A Universally Unique Identifier (UUID) URN Namespace. UUIDs are generated randomly using the secure OpenSSL random number generator.

Instances of `GsUuidV4` are invariant and therefore cannot be modified.

To create an instance of UUID:

```
GsUuidV4 class >> new  
  
GsUuidV4 class >> fromString: aUuidString  
aUuidString must be a valid UUID version 4 string in the following format:  
xxxxxxxx-xxxx-4xxx-Vxxx-xxxxxxxxxxxx  
where x is any valid lower-case hex digit and V is one of 8, 9, a or b.
```

See the image for additional protocol.

Replacing Hidden sets with GsBitmap

The `GsBitmap` class was introduced in v3.4, as an improved API for accessing Hidden Set functionality. This replaces the public API for hidden sets which was added in v3.1, since the older private hidden set API was increasing in use.

In this release, while these three APIs remain unchanged (other than improvements in `GsBitmap` listed below), the functionality is now implemented with `GsBitmap`. The public and private hidden set API ultimately invoke the `GsBitmap` API.

A number of references within GemStone code to the System hidden set API have been updated in this release.

If you are using the System hidden set API methods it is recommended that you update your code to use GsBitmap.

Changes to make conversion to GsBitmap easier

The following added method allows you to translate a Hidden set ID into a GsBitmap name symbol.

```
GsBitmap class >> hiddenSetIdAsSymbol: oldHiddenSetId
  Returns the symbol corresponding to the old hiddenSet specifier
```

The following identifiers have been added to GsBitmap class >> *hiddenSetSpecifiers*, to allow creating a GsBitmap directly from a hidden set.

```
#Indexing
#Conversion
#WeakReferences
#ObjInventory
#Customer1
#Customer2
#Customer3
#Customer4
#Customer5
```

Added GsBitmap Methods

The following methods have been added to GsBitmap.

```
GsBitmap >> enumerateAsOopsWithLimit: maxResultSize startingAfter:
  anOop
  Returns an Array containing the first maxResultSize bits as oops starting with the
  first one after the specified oop. To start the enumeration use the SmallInteger zero
  as anOop. To get the next batch use the last element of the array returned. This
  enumeration is non destructive, so no values are cleared. If the GsBitmap contains
  fewer than maxResultSize elements after the specified object or the maxResultSize
  has the value 0, then it returns all of the elements after the specified object.
```

```
GsBitmap >> enumerateWithLimit: maxResultSize startingAfter: anObject
  Returns an Array containing the first maxResultSize bits as objects starting with the
  first one after the specified object. To start the enumeration use the SmallInteger
  zero as anObject. To get the next batch use the last element of the array returned.
  This enumeration is non destructive, so no values are cleared. If the GsBitmap
  contains fewer than maxResultSize elements or the maxResultSize has the value 0,
  then it returns all of the elements after the specified object.
```

The equivalent private methods (with a leading underscore) have been removed.

GsSecureSockets support for SNI

Server Name Indication (SNI) provides a way for a client to provide a hostname along with the other connection parameters. This allows the server to present multiple certificates in response to connections on the same IP address/port.

`getServerNameIndication`

Answer a string indicating the SNI name assigned to the receiver, or nil if no SNI name has been assigned.

`setServerNameIndication: aString`

Sets the SNI name for the receiver to be *aString*. This method is only valid for client sockets which have not yet securely connected to a peer.

Conveniences for using X509 keys with passphrases

The GemStone distribution examples provide private keys that have passphrases, which are also provided as files. For convenience, creating instances of `GsTlsPrivateKey`, and making and restoring secure backups, now have methods that allow you to provide the passphrase as a filename.

Additional methods to create `GsTlsPrivateKey` instances

Creating a `GsTlsPrivateKey` previously included protocol to specify the key as a `String` or as a filename, but only accepted `String` for the passphrase. Now, the passphrase can also be specified by filename, using the following added methods.

`newFromPemFile: fileNameString withPassPhraseFile: aPassphraseFile`

`newFromPemString: aPemString withPassPhraseFile: aPassphraseFile`

Secure backup with passphrase provided from a file

The following methods have been added, which are similar to existing methods, but the passphrase is provided as a filename rather than a `String`.

`restoreFromSecureBackup: aFileName privateKey: aKey
passphraseFile: pfFileName`

`restoreFromSecureBackup: aFileName scavengePagesWithPercentFree:
aPercent privateKey: aKey passphraseFile: pfFileName`

`restoreFromSecureBackups: arrayOfFileNames
scavengePagesWithPercentFree: aPercent privateKey:
aKey passphraseFile: pfFileName`

`secureFullBackupTo: aFileName MBytes: mByteLimit compressKind: compKind
bufSize: count encryptKind: encKind publicKeyCerts: anArrayOfString
signatureHashKind: hashKind signingKey: signingKeyFn
signingKeyPassphraseFile: pfFileName`

GsFile added methods

The following method has been added, allowing to read a file and return the contents in a single operation.

```
GsFile class >> getContentsOfServerFile: filePathAndName
    Return the contents of the named file in a single operation. Use caution when
    reading a large file as doing so may cause an out of memory error.
```

A convenience method to get access to stdin for the server has also been added:

```
GsFile class >> stdinServer
    Return an instance of the receiver that is set up to read the standard input of the
    server process.
```

Improvements to thread specification for repository scans

Repository scan functions, such as backup, restore, and finding instances, calculate the number of threads to use based on the number of cores and extents. These calculations may not be optional if, for example, there is one very large extent.

For any backup and restore method, the default number of threads can be explicitly specified by executing, before the backup and restore, the following:

```
SessionTemps current at: #GsOverrideNumThreads put: numThreads
```

For convenience, the following methods have been added to control the number of threads:

```
Repository >> getDefaultNumThreads
    Returns the default number of threads to use for multi threaded operations

Repository >> setDefaultNumThreads: numThreads
    Sets default number of threads to use for multi threaded operations

Repository >> setDefaultNumThreads: numThreads during: aBlock
    Sets default number of threads to use for the execution of aBlock containing a multi
    threaded operation and then resets it after the operation completes.
```

The following convenience methods have been added, which are similar to existing methods, but include an additional *numThreads* argument with the number of threads to use for the operation:

```
Repository >> allInstances: inputArg threads: numThreads
Repository >> allObjectsInObjectSecurityPolicies: inputArg
    threads: numThreads
Repository >> allObjectsLargerThan: aSize threads: numThreads
Repository >> allReferences: inputArg threads: numThreads
Repository >> fullBackupGzCompressedTo: fileNameOrArrayOfNames
    threads: numThreads
Repository >> fullBackupLz4CompressedTo: fileNameOrArrayOfNames
    threads: numThreads
Repository >> fullBackupTo: fileNameOrArrayOfNames threads: numThreads
Repository >> markForCollectionWithMaxThreads: numThreads
Repository >> objectAuditWithMaxThreads: numThreads
Repository >> restoreFromBackups: fileNameOrArrayOfNames threads:
    numThreads
```

Programmatic access to shared cache configuration

Methods have been added to allow you to collection information on the shared page cache configuration. These methods return values for the shared cache to which the Gem is attached, which may be the Stone's cache, a remote cache, or a mid-level cache. This is similar to information that can be found in the shared page cache monitor log.

The following information is provided by these methods:

| Key | Value Type | Description |
|-----------------------|---------------|---|
| cacheName | String | Name of the cache, which includes the stone name and GemStone host ID. |
| numFrames | Small-Integer | Total number of 16Kb frames in the cache (the maximum number of pages that can be contained in the cache) |
| physicalSizeInBytes | Integer | Physical size of the shared memory segment in bytes. Includes both space for frames and space for other cache requirements. |
| numSharedCounters | Small-Integer | Number of shared counters in the cache (SHR_PAGE_CACHE_NUM_SHARED_COUNTERS). |
| numProcesses | Small-Integer | Maximum number of processes that can attach the cache, both user sessions and system sessions. (SHR_PAGE_CACHE_NUM_PROCS). |
| spinLockCount | Small-Integer | Spin lock count (SHR_SPIN_LOCK_COUNT). |
| largeMemoryPagePolicy | Small-Integer | the large memory page policy (SHR_PAGE_CACHE_LARGE_MEMORY_PAGE_POLICY). |
| largeMemoryPageSizeMb | Small-Integer | the large memory page size in MB (SHR_PAGE_CACHE_LARGE_MEMORY_PAGE_SIZE_MB). |
| largeMemoryPagesUsed | Small-Integer | the number of large memory pages used to create the cache. |
| targetFreeFrameCount | Small-Integer | the target free frame count (SHR_TARGET_FREE_FRAME_COUNT). |
| cacheLocked | Boolean | true if the cache is locked in memory (SHR_PAGE_CACHE_LOCKED). |
| isRemoteCache | Boolean | true if the cache is remote from the stone. |
| isRemoteMidCache | Boolean | true if the cache is a mid-level remote cache. |

The following methods provided access:

`System class >> getSharedCacheAttributes`

Returns a `SymbolDictionary` which contains attributes of the shared page cache. Returns nil if the current session is a solo session, which does not connect to a Stone.

`System class >> sharedCacheAttributesReport`

Returns a string describing attributes of the shared page cache. Returns nil if the current session is a solo session.

For example,

```
topaz 1> exec System sharedCacheAttributesReport %
Attributes Report For Shared Cache 'devstone~64623bb08b19f712':
  cacheLocked -> false
  cacheName -> devstone~64623bb08b19f712
  isRemoteCache -> false
  isRemoteMidCache -> false
  largeMemoryPagePolicy -> 0
  largeMemoryPageSizeMb -> 0
  largeMemoryPagesUsed -> 0
  numFrames -> 4736
  numProcesses -> 52
  numSharedCounters -> 1900
  physicalSizeInBytes -> 127926272
  spinLockCount -> 5000
  targetFreeFrameCount -> 585
```

Improvements to results for `fileSizeReport` in GB

Starting in 3.5.1, the method `System >> fileSizeReport` reported in units of GB rather than MB, for repositories with a size over 2 GB. Units of GB were too coarse for repositories that were only somewhat over this size limit. Now, all GB sizes are reported rounded to tenths of a GB.

Added String compare method

The method `String/MultibyteString >> codePointCompareTo:` has been added. This provides a character-by-character codePoint-based comparison, returning -1, 0, or 1.

Fix for bug 48343 (reference to `JISCharacter`) backed out

In v3.5.1, a reference to the class `JISCharacter`, which is now in `Obsolete Classes`, was removed. However, this reference is required to avoid potential issues with legacy indexes using `JISCharacter` (#48530). The fix for bug 48343 has been backed out, and the reference to `JISCharacter` has been restored.

If you need to recompile kernel code, you should include `ObsoleteClasses` in the `SymbolList` of `SystemUser` during recompile.

Handling of objects that do not exist by objectAudit

When the objectAudit scan reports objects that do not exist – that is, a valid object contains a reference to an OOP that is on the list of free OOPs, rather than pointing to an actual object – this is now handled immediately, to avoid logical corruption of the repository.

The objectAudit removes these OOPs from the free list immediately, to avoid them being reused for another new object by another session, and immediately checkpoints. If the checkpoint fails, or if any of the invalid referenced OOPs has already been reused, the stone will shutdown to avoid any commits for new values for these OOPs.

Script to verify secure backup renamed

The script that is used to verify a secure backup, `verify_backup_with_openssl.sh`, has been renamed to omit the trailing `.sh`; it is now `verify_backup_with_openssl`.

This script also now supports the `-h` argument to print usage information.

Functionally, the script is unchanged.

Configuration Parameter-Related Change

Default calculation for STN_MAX_GC_RECLAIM_SESSIONS and STN_NUM_GC_RECLAIM_SESSIONS

The configuration parameters `STN_MAX_GC_RECLAIM_SESSIONS` and `STN_NUM_GC_RECLAIM_SESSIONS` set the maximum allocated sessions for the Reclaim GcGem, and the normally running number of reclaim session, respectively. When left at the default values, the system will calculate session counts based on the number of extents. This was not optimal for large, single-extent-file repositories.

Now, if the repository size at stone startup is larger than 100GB and the host has 20 or more cores, the default for `STN_MAX_GC_RECLAIM_SESSIONS` is 10 or the number of extents, whichever is greater.

If the repository size is > 10GB and the host has at least 8 cores, the default for `STN_MAX_GC_RECLAIM_SESSIONS` is 4 or the number of extents, whichever is greater.

If the system calculates the default `STN_MAX_GC_RECLAIM_SESSIONS`, then the default for `STN_NUM_GC_RECLAIM_SESSIONS` is set to half of the value of `STN_MAX_GC_RECLAIM_SESSIONS`.

Explicitly setting `STN_MAX_GC_RECLAIM_SESSIONS` and/or `STN_NUM_GC_RECLAIM_SESSIONS` will bypass the automatic calculations.

Statmonitor and Cache Statistics Changes

Added statmonitor option

The `-a` option has been added; this is similar to `-A` except that it does not collect per-core CPU statistics. This avoids clutter for systems with very large numbers of cores.

- `-a` Collect all available system statistics except per-core CPU statistics.

Now allowed to use %%S and %%C with -X, when statmonitor started by Stone

Previously it was disallowed to use the file pattern %%S and %%C with statmonitor run in host-only mode with the -X argument. Now, if the Stone starts statmonitor using the configuration parameter STN_STATMONITOR_ARGS, these file patterns may be used.

Cache Statistics Changes

OmBytesFlushed replaced by OmKBytesFlushed

This statistic has been renamed and is now reported in units of Kbytes.

Added statistics:

AllSymbolsSize (Stone)

The size of the dictionary AllSymbols.

ObjectForOopCount (Gem)

Number of invocations of the primitive Object class >> _objectForOop:

VoteClosureObjects (Gem)

Number of objects scanned when voting on possibly dead objects during commit.

Statistic TimeStoneCommit reported in wrong units

The values reported for the Gem statistic TimeStoneCommit were reported as if they were scaled by 1000000. (#48516)

Further details for failures in network handshake

To diagnose errors during login, the NetSAccept/NetSConnect handshake now prints additional diagnostic information. Details of failure in NetSAccept/NetSConnect handshake are automatically included in the error message of the GciErrSType coming back to the GCI on login failure (and thus printed by topaz or delivered to GBS).

Removed private/example methods

The Ruby-support classes Regexp and RegexpError have been removed, and are now in ObsoleteClasses. A number of methods that reference this class have been updated.

The following methods have been removed:

```
GsBitmap >> _enumerateAsOopsWithLimit:startingAfter:
GsBitmap >> _enumerateWithLimit:startingAfter:
GsSecureSocket class >> httpsClientExampleForHost:certificateDirectory:
Object >> _isRegexp
Object >> _isRubyHash
```


Bug Fixes

Performance issue in AIO Pgsvr

The AIO pgsvr made several calls to HostGetNanoTime() within its loop. These calls put load on the CPU and impacted performance. (#48503)

objectAudit did not run to completion for some cases of corruption

When SystemRepository objectAudit encountered a corrupted data page that could not be read, it stopped, rather than completing the audit and reporting that as an error. (#48518)

Collection Issues

Removing dynamic instance variable from large SequenceableCollection

Removing a dynamic instance variable from an instance of a subclass of SequenceableCollection (such as Array, OrderedCollection, or String), that is a Large object (that is, a pointer size larger than 2K or a byte size larger than 16K), causes the size to become incorrectly very large. (#48506)

Sending printString to an invalid instance of RcQueue caused coredump

While RcQueue is not intended to be accessed using at:put:, these selectors are not disallowed. Sending printString to the resulting invalid RcQueue caused the Gem to coredump. (#48504)

CByteArray >> autoRelease returns self, not a boolean

The method CByteArray >> autoRelease is intended to return a boolean, but incorrectly returned self. (#48558)

XFS file system errors for 32-bit processes

Some GemStone operations could error when run within 32-bit processes (such as 32-bit topaz RPC, or a 32-bit GCI application), on 64-bit XFS file system. Specifically, GsFile client file directory operations from 32-bit client processes for 32-bit client processes resulted in EOVERFLOW. (#48462, #48601)

Error on upgrading from version 3.3.x

When upgrading from v3.3.x to v3.5.x, a Message Not Understood error occurred on #_selectedPrimeGreaterThan:. (#48477)

Periodic 30-second hangs with small STN_MAX_SESSIONS

When STN_MAX_SESSIONS was explicitly set to a small value (such as 10), there was likely to be a periodic hang for as long as 30 seconds, after each 10 to 20 commits, while tranlog AIO buffers are recycled. (#48520)

Garbage Collection Issues

Symbol Garbage Collection not scalable

Garbage collecting unreferenced Symbols from AllSymbols is a multi-step process to avoid any risk of collecting a Symbol that is in use. The way that the existing design handled the symbols did not respect the Collision Buckets within the AllSymbols collection, and processed Symbols in OOP order, which became unusable with a very large AllSymbols and many dead symbols. The process has been significantly updated to avoid these issues. (#48535).

The AllSymbolsSize cache statistic has been added, providing the size of AllSymbols.

listInstances and similar repository scans are now disallowed while Gems are voting on possible dead.

Risk of object does not exist errors with commits during Write Set Union Sweep

During the WriteSet Union Sweep step of garbage collection, the handling of objects after Gems that vote during commit failed to perform certain checks; this could lead to object audit failures with does not exist errors. (#48678)

System >> reclaimGemSessionCount did not return values over 1

The value returned by System >> reclaimGemSessionCount represented the number of GemStone processes running, not the number of threads. (#48120)

Backup and restore issues

Backup made during reclaim may have object audit failures after restore

When making a programmatic backup while the deal object reclaim is running, following a markForCollection, there have been cases where the resulting backup, when restored, has object audit errors (with object does not exist errors). This is related to a non-thread-safe access to the gcHighWater page, that is used to avoid backing up any unreclaimed dead objects. (#48583)

Poor handling in recovery if the oldest tranlog not found

On recovery, if the oldest transaction log was not found, the Stone crashes rather than providing an error message. (#48591)

Page cache fault in remote cache

It is possible for a remote cache to become corrupted with bad lifetimes of pages, such that Gems could not login. This resulted in messages in the stone log of the form "STOP_ZOMBIE stoppedSessionTimeLimit", and "Warning: PageSetLostOt didn't find session" in the page manager log. (#48631)

Issues related to Repository low space

Stone out of extent space may result in ReclaimGem not running

When the stone is restarted following a shutdown due to lack of free space, it is possible for the restarted Stone to not have a Reclaim GcGem running. System gems may have login failures as the Stone recovers; the code paths to ensure the correct number of ReclaimGem sessions were running was not handling this situation correctly. (#48675)

Excessive RepositoryErrors to session when repository is almost full

When a repository is close to full, the Stone sends messages to sessions, to ensure that action is taken. The number of errors is excessive, making the session unusable. (#48571)

GsExternalSession executeString: crash on nil argument

Passing nil to GsExternalSession>>executeString: or GsExternalSession>>forkString: caused the Gem to SEGV. (#48644)

Negative bitShift: for negative LargeInteger is off by one

If a negative LargeInteger is sent bitShift: with a negative argument, the result is computed based on the LargeInteger internal representation, which is sign-magnitude. This is off by one (one larger than the expected result), compared to other Smalltalk dialects and what would be inferred from the behavior of SmallIntegers. (#48602)

The ANSI specification says that #bitShift with a negative receiver has undefined results, however, the Smalltalk convention is that bitShift: should behave as if the representation was twos-complement, regardless of the internal representation, to be consistent with SmallInteger. SmallIntegers are generally represented as twos-complement.

Adjustments to hot standby debug logging output

The hotstandby processes, logreceiver and logsender, print some information to their log files. Starting in v3.4.2, to reduce clutter in the logs, some of these output statements are only printed when debugging is enabled. Debugging is enabled using the startlogreceiver/startlogsender utility argument -d. Some log messages now printed only in debug mode were still prefixed with [Info]. In addition, flush records are printed to the log in regular as well as debug mode. (#48484)]

gslist -x does not include exe entry for -n process on -m host

When the gslist options -x, -m, and -n are all specified, the resulting report does not include the line providing the exe=<executable> information. (#48489)

gslist -p returned invalid PID when process is not running/status killed

gslist -p returns the processId only of one or more GemStone processes. This information is from GemStone locks files, and thus the former PID returned for processes with status killed. In the case of that PID being reused, this is incorrect. Using this information, such as to kill process, may cause unexpected errors outside of GemStone. (#48734)

GsFile remove file did not handle filenames with * or ?

GsFile removeServerFile: and removeClientFile: did and do not support wild card removes; however, they did not remove files that contained the literal character * or ?. Now, files with names containing these characters can be removed by the removeServerFile: and removeClientFile: methods. (#48533)

Repeated DEBUGGEM/logout sequences can hang process

The DEBUGGEM command allows you to connect a second process to a running Gem for debugging. If multiple repeated DEBUGGEM/logout commands are sent from the debugging process to the running target gem, the target may have stopped accepting connections and may have hung. (#48515)

Statmonitor could fail to add correct file extension

When specifying a file name for a statistics file using the -f or -F command, if the file pattern included .lz4 or .out in a non-terminal location, the correct extension was not appended, resulting in a misleading file name. (#48531)

Risk of SEGV on Stone shutdown after local network disruption

If the local network connections are disrupted by changes in the OS configuration, on shutdown the Stone may SEGV. (#48564)

Attempt to cluster in ClusterBucket over 31 crashed gem

Attempting to cluster into a ClusterBucket with ID greater than 31 caused the Gem process to SEGV. (#48507)

copydbf with compression to directory did not compress

When the destination for a copydbf is a directory rather than a file name, a compression argument (-Z, -z, -C) also included was not applied. (#48540)

GEM_KEYRING_DIRS did not accept a list

The configuration parameter GEM_KEYRING_DIRS only accepted a single directory, not a list of directories as documented. (#48537)

Irrelevant socket listen errors in stone log on startup

When the Stone starts up with listening on the wild address (::), it attempted to listen on loopback 127.0.0.1 as well, which failed as a duplicate. This resulted in listen failure errors in the Stone log, although everything was working correctly. (#48544)