
GemStone®

GemStone/S 64 Bit™

Release Notes

Version 3.2.1

June 2014



GEMTALK™
SYSTEMS

GEMSTONE S™ 64
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PATENTS

GemStone software is covered by U.S. Patent Number 6,256,637 "Transactional virtual machine architecture", Patent Number 6,360,219 "Object queues with concurrent updating", Patent Number 6,567,905 "Generational garbage collector with persistent object cache", and Patent Number 6,681,226 "Selective pessimistic locking for a concurrently updateable database". GemStone software may also be covered by one or more pending United States patent applications.

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About This Documentation

These release notes describe changes in the GemStone/S 64 Bit™ version 3.2.1 release. Read these release notes carefully before you begin installation, conversion testing, or development with this release.

No separate Installation Guide is provided with this release. For instructions on installing GemStone/S 64 Bit version 3.2.1, or upgrading or converting from previous products or versions, see the Installation Guide for version 3.2.

These documents are available on the GemTalk support website, as described below.

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, previously GemStone Systems, Inc. and a division of VMware, Inc.

Technical Support

Support Website

<http://gemtalksystems.com/techsupport>

GemTalk’s Technical Support website provides a variety of resources to help you use GemTalk products:

- ▶ **Documentation** for released versions of all GemTalk products, in PDF form.
- ▶ **Downloads**, including current and recent versions of GemTalk products.

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

This material is updated regularly; we recommend checking this site on a regular basis.

Help Requests

You may need to contact Technical Support directly, if your questions are not answered in the documentation or by other material on the Technical Support site. Technical Support is available to customers with current support contracts.

Requests for technical assistance may be submitted online, by email, or by telephone. We recommend you use telephone contact only for more serious requests that require immediate evaluation, such as a production system down. The support website is the preferred way to contact Technical Support.

Website: <http://techsupport.gemtalksystems.com>

Email: techsupport@gemtalksystems.com

Telephone: (800) 243-4772 or (503) 766-4702

When submitting a request, please include the following information:

- ▶ Your name and company name.
- ▶ The versions of GemStone/S 64 Bit and of all related GemTalk products, and of any other related products, such as client Smalltalk products.
- ▶ The operating system and version you are using.
- ▶ A description of the problem or request.
- ▶ Exact error message(s) received, if any, including log files if appropriate.

Technical Support is available from 8am to 5pm Pacific Time, Monday through Friday, excluding GemTalk holidays.

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GemTalk offers, at an additional charge, 24x7 emergency technical support. This support entitles customers to contact us 24 hours a day, 7 days a week, 365 days a year, for issues impacting a production system. For more details, contact GemTalk Support Renewals.

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GemStone/S 64 Bit 3.2.1 Release Notes

Overview

GemStone/S 64 Bit 3.2.1 is a new version of the GemStone/S 64 Bit object server. This release fixes several critical bugs in v3.2. We recommend everyone using or planning to use GemStone/S 64 Bit v3.2 upgrade to this new version.

These release notes provide changes between the previous version of GemStone/S 64 Bit, version 3.2, and version 3.2.1. If you are upgrading from a version prior to 3.2, review the release notes for each intermediate release to see the full set of changes. In particular, if you are upgrading from version 2.4.x, note that there were substantial changes in v3.0 that impact your application.

No separate Installation Guide is provided with this release. For installation instructions, use the Installation Guide for version 3.2.

Note that the Linux Installation Guide does not mention SUSE. SUSE 11, service pack 3, is now supported for both v3.2 and v3.2.1. Configuration information is the same as for the other Linux platforms.

Supported Platforms

Platforms for Version 3.2.1

GemStone/S 64 Bit version 3.2.1 is supported on the following platforms:

- ▶ Solaris 10 and 11 on SPARC
- ▶ Solaris 10 on x86
- ▶ AIX 6.1, TL1, SP1, and AIX 7.1
- ▶ Red Hat Linux ES 6.1, Ubuntu 10.04, and SuSE 11 SP3, on x86
- ▶ Mac OSX 10.6.4 (Snow Leopard), with Darwin 10.4.0 kernel, on x86

For more information and detailed requirements for each supported platforms, please refer to the GemStone/S 64 Bit v3.2 Installation Guide for that platform.

GBS Versions

The following version of GBS is supported with GemStone/S 64 Bit version 3.2.1. You must use GBS version 7.6.1 or later for VisualWorks, or 5.4.2 or later for VA Smalltalk, with GemStone/S 64 Bit v3.2.1.

GBS version 7.6.1

VisualWorks 7.10 32-bit	VisualWorks 7.10 64-bit	VisualWorks 7.9.1 32-bit
<ul style="list-style-type: none"> ▶ Windows 8, Windows 2008 R2 and Windows 7 ▶ Solaris 10 on SPARC ▶ Ubuntu 10.04, RedHat Linux ES 6.1, and SUSE Linux ES 11 SP3 	<ul style="list-style-type: none"> ▶ Windows 8, Windows 2008 R2 and Windows 7 ▶ Solaris 10 on SPARC ▶ Ubuntu 10.04, RedHat Linux ES 6.1, and SUSE Linux ES 11 SP3 	<ul style="list-style-type: none"> ▶ Windows 2008 R2 and Windows 7 ▶ Solaris 10 on SPARC ▶ Ubuntu 10.04, RedHat Linux ES 6.1, and SUSE Linux ES 11 SP3

GBS version 5.4.2

VA Smalltalk 8.6	VA Smalltalk 8.5.2
<ul style="list-style-type: none"> ▶ Windows 8, Professional or above ▶ Windows 2008 R2 ▶ Windows 7, Professional or above 	<ul style="list-style-type: none"> ▶ Windows 2008 R2 ▶ Windows 7

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

Changes and Bugs Fixed in this Release

SymbolKeyValueDictionary >> at:ifAbsent:, includesKey: have lookup failures

In versions before 3.2, SymbolKeyValueDictionary inherited the implementation of a number of methods from its superclass. When these methods were added to SymbolKeyValueDictionary in 3.2 for optimization, there was a coding error in the implementation of the at:ifAbsent: method. (#44204)

CodeModification privilege required for GBS operations

GBS users who did not have CodeModification privilege encountered errors when attempting to flush instances of Bag, Set, or Dictionary. This was related to changes in the way System class >> _processDeferredGciUpdates was executed, when performing a store traversal. (#44251)

Updated SSL libraries

OpenSSL released a security advisory, and the version of OpenSSL used by GemStone/S 64 Bit v3.2.1 has accordingly been updated to 1.0.1h. (#44330)

Reclaim issues

Performance issues with very high commit rate

Systems with very high commit rates could not achieve the highest performance in version 3.2. The problems were the result of the Reclaim Gem not being able to keep up, and the cache becoming filled with pages. The causes of the problem relate to the way threads within the ReclaimGem aborted to get updated views of the pages that need reclaim. (#44167)

Reclaim may stay in transaction for 30 seconds

When reclaim is busy, it may stay in transaction for 30 seconds. This has the potential to cause a commit record backlog on a busy system. (#44174)

Reclaim pause with low free space is not functional

The feature that allows reclaim to pause when free space is low, using `#reclaimMinFreeSpaceMb`, has an internal error that causes the pause to not occur. This feature has also had other improvements to the algorithm in this version. (#44203)

ReclaimGem did not initialize from configuration when Stone in restore/recovery

When the stone is in restore mode, or during recovery, the Reclaim GcGem did not initialize its configuration from the settings of the GcUser configuration parameters, and used the default values. (#44221)

Reclaim Gem commit stats recorded in microseconds

The commit statistics for the Reclaim Gem cache statistics `TimeWaitingForCommit`, etc, were incorrectly recorded in microseconds rather than milliseconds. (#44171)

Reclaim Gem log recorded no-op reclaims

The Reclaim Gem wrote log records regularly, including when no reclaim had been done. (#44295)

Hot standby issues

stoplogsender and stoplogreceiver incorrectly documented to use SSL options

When SSL options were added to the hotstandby utilities, these were inadvertently added to the stoplogsender and stoplogreceiver utility documentation. Since the stop utilities no longer need to connect to the process in v3.2 (they rely on `kill -TERM`), these options are not needed and errored. (#44288)

Logreceiver process could run hot

An idle logreceiver process could run hot, due to an incorrect argument in a sleep call. (#44297)

SymbolGem out of memory may have caused crash during upgrade

If the SymbolGem ran out of memory during the upgrade, it triggered in-memory GC, but this was disallowed during certain stages. This resulted in the SymbolGem crashing with UTL_GUARANTEE. (#44214)

Multithreaded scan code may not respond properly to low memory conditions

If one of the threads that implements the multithreaded scan code ran out of memory, this was not always handled correctly, causing the scan operation to hang. This includes operations such as listInstances. (#44219)

SmallFloat changes and bug fixes

asSmallFloat now returns SmallFloat, not SmallDouble

SmallFloats have been deprecated in GemStone versions 2.0 and later, replaced by SmallDouble. The method asSmallFloat previously returning a SmallDouble or Float, depending on the range of the receiver.

For the convenience of customers who find SmallFloats valuable, these deprecated methods have been changed in v3.2.1 to return instances of SmallFloat rather than instance of SmallDouble. If the receiver is outside of the range of SmallFloat, it will return a NaN. (#44275)

Added method SmallFloat>>signBit

The method SmallFloat >> signBit has been added. (#44280)

SmallFloat exceptional floats may be incorrect

SmallFloat expressions may result in quiet NaN when they should be a signalling NaN. (#44281, #44276)

sha1Sum execution resulted in SEGV

The methods ByteArray >> sha1Sum and CharacterCollection >> sha1Sum invoke a primitive that had an internal code error, which caused a gem crash with SEGV. (#44215)

OldestCRSession statistics may be incorrect

In some cases, the session holding the oldest commit record was not recorded correctly in statmonitor data, and showed 0 when a session was holding the oldest commit record, or the session Id of a session that had logged out. (#44301)

System Gem may hold oldest commit record

It was possible for a system gem, such as the Symbol Gem, Reclaim Gem, or Admin Gem, to hold the oldest commit record, and not be notified by the Stone to abort. (#44123)

SessionId-based cache stats incorrect for first session on remote cache

The first session on a remote host performs the startup of the remote shared page cache on that node. This session was not initialized properly for tracking cache statistics. As a result, the methods:

```
System class >> gemCacheStatisticsForSessionId:  
System class >> cacheStatisticsForSessionId:  
System class >> cacheSlotForSessionId:
```

Returned nil for this session, both from the same session and from sessions that logged in later. (#44243)

cacheStatisticsForAllSlotsShort did not convert negative sessionIds correctly

The System class >> cacheStatisticsForAllSlotsShort returns basic information for all sessions, including the sessionId for each session. For sessions with negative sessionIds (the shared page cache monitor and page servers), this was incorrectly not converted, resulting in values of 42949672954 or 4294967295. (#44247)

Stone recovery after crash causes errors under specific rare conditions

If the Stone dies in such a way as to require recovery from tranlogs, and the tranlog records since the last checkpoint do not include any normal commits, but do include special simple commits (from reclaimAll or shrinkExtents), the commit sequence number may be corrupted. This may cause the symptoms of a fork-in-time error, or errors in a hotstandby system. (#44283).

Log file related issues

GcGems deleted logs on kill -TERM

Reclaim and Admin gems by default currently delete their log files on a clean exit, but leave the log files in place when the process exits due to an error. The handling of kill -TERM of these processes incorrectly deleted the log files. (#44218)

Log file names for remote cache and page server logs

When a remote cache is started up, the remote cache and associated free frame and cache page server processes create log files that previously had names of the form startchildNNNN.log. Now, these files have appropriate names. (#44266)

Topaz exit with non-zero error status treated as error in Gem log

When an RPC topaz session exited with a non-zero errorcount or exit argument, this was reported as an Abnormal Shutdown in the Gem log, and the Gem log is not deleted.

Sessions terminated using System logout, which is reported as an error, are now considered non-error exists for the Gem log. (#44224)

Remote Gem's page server log did not include client host name

The page server for a remote gem was not able to print the client host name to its log file. (#44284)

Login failure errors simplified to avoid security leak

When logins fail, security best practices requires that as little information as possible be provided. With version 3.2, a different error was reported for SSL failures than `userId` and `password` errors. Now, when logins fail due to issues with SSL, `invalid user`, or `invalid password` for an existing user, the same error is reported. (#44250)

Upgrade Issues

Image upgrade required C compilation environment

The upgrade process required the C preprocessor to be available, to parse the C header files to handle `GciLibrary`. On many systems, the required header files were present, but environments in which the path did not include the correct directories, or have the appropriate components installed, encountered upgrade errors. (#44253)

Seaside upgrade fails when path length exceeds 100

If the length of the path and filename of a file is longer than 100 chars, it triggers an error, causing seaside upgrade to fail. (#44262)

Seaside upgrade created package-cache directory in working directory

The seaside upgrade script process attempted to create the package-cache directory in the current working directory. This errored if the current directory was not writable. (#44286)

`gciStructs.txt` and `gcitsStructs.txt` packing in distribution

`gciStructs.txt` and `gcitsStructs.txt`, introduced in v3.2, have had a change in distribution process related to the `GciLibrary` upgrade changes.

These files are now packed in the `$GEMSTONE/upgrade` directory for use by the upgrade process. They are no longer packed in `$GEMSTONE/doc`, and no longer generated by the upgrade process in `$upgradeLogDir`.

Exception `stackReport` gets message not understood

The method `AbstractException >> stackReport` can be used to get a stack report, if the system is configured to do so. This method had an incorrect index offset start, which resulted in a message not understood error. (#44259)

Soft break not trappable

A `Break` exception was not trappable, which is incorrect for soft break. (#44191)

Remote cache `pgsvr` buffer size not set correctly

When a remote cache tried to reset the buffer size to a larger value, this call failed and printed a `EBADF` warning in its log. The page server worked, but may have performance impact. This error was related to design changes in v3.2. (#44285)

Mid-level cache connect failed on first try, then succeeded

On the first connection for a mid-level cache, the connection would fail, although the cache was created. A second connection attempt succeeded. (#44299)

startcachewarmer script now supports remote caches

Previously, the startcachewarmer scripts could not be used to warm a remote cache. Now, startcachewarmer accepts the -H argument. (#44298)

AIO page server hung on SIGTERM

Sending SIGTERM to an AIO page server caused it to hang, and prevented the stone from shutting down cleanly. Now, AIO page servers will ignore this signal and write a message to their log file. (#44294)

GBS failed to highlight on step in some DoubleByteString methods

When debugging a method with DoubleByteString source in GBS, the step method may have failed to highlight the correct step point in the code. This is a server bug, but primarily visible when using GBS. (#44273, #44245)

Topaz prompt flush issue

The topaz prompt was not always flushed to stdout until a command was received. (#44293)