
GemStone®

GemStone/S 64 Bit Release Notes

Version 2.3.1

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GEMSTONE  64

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PATENTS

GemStone is covered by U.S. Patent Number 6,256,637 "Transactional virtual machine architecture", Patent Number 6,360,219 "Object queues with concurrent updating", and Patent Number 6,567,905 "Generational Garbage Collector". GemStone may also be covered by one or more pending United States patent applications.

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Preface

About This Documentation

These release notes describe changes in the GemStone/S 64 Bit version 2.3.1 release. We recommend that everyone migrating to this version read these release notes before beginning installation, testing or development.

No separate Installation Guide is provided with this release. For instructions on installing GemStone/S 64 Bit version 2.3.1, or upgrading or converting from previous products or versions, see the Installation Guide for version 2.3.

These documents are also available on the GemStone customer website, as described below.

Terminology Conventions

This document uses the following terminology:

The term “GemStone” is used to refer both to the product, GemStone/S 64 Bit, or previous GemStone/S server products; and to the company, GemStone Systems, Inc.

Technical Support

GemStone provides several sources for product information and support. The product-specific manuals and online help provide extensive documentation, and should always be your first source of information. GemStone Technical Support engineers will refer you to these documents when applicable.

GemStone Web Site: <http://support.gemstone.com>

GemStone’s Technical Support website provides a variety of resources to help you use GemStone products. Use of this site requires an account, but registration is free of charge. To get an account, just complete the Registration Form, found in the same location. You’ll be able to access the site as soon as you submit the web form.

The following types of information are provided at this web site:

Help Request allows designated support contacts to submit new requests for technical assistance and to review or update previous requests.

Documentation for GemStone/S 64 Bit is provided in PDF format. This is the same documentation that is included with your GemStone/S 64 Bit product.

Release Notes and **Install Guides** for your product software are provided in PDF format in the Documentation section.

Downloads and **Patches** provide code fixes and enhancements that have been developed after product release. Most code fixes and enhancements listed on the GemStone Web site are available for direct downloading.

Bugnotes, in the Learning Center section, identify performance issues or error conditions that you may encounter when using a GemStone product. A bugnote describes the cause of the condition, and, when possible, provides an alternative means of accomplishing the task. In addition, bugnotes identify whether or not a fix is available, either by upgrading to another version of the product, or by applying a patch. Bugnotes are updated regularly.

TechTips, also in the Learning Center section, provide information and instructions for topics that usually relate to more effective or efficient use of GemStone products. Some Tips may contain code that can be downloaded for use at your site.

Community provides customer forums for discussion of GemStone product issues.

Technical information on the GemStone Web site is reviewed and updated regularly. We recommend that you check this site on a regular basis to obtain the latest technical information for GemStone products. We also welcome suggestions and ideas for improving and expanding our site to better serve you.

You may need to contact Technical Support directly for the following reasons:

- ▶ Your technical question is not answered in the documentation.
- ▶ You receive an error message that directs you to contact GemStone Technical Support.
- ▶ You want to report a bug.
- ▶ You want to submit a feature request.

Questions concerning product availability, pricing, keyfiles, or future features should be directed to your GemStone account manager.

When contacting GemStone Technical Support, please be prepared to provide the following information:

- ▶ Your name, company name, and GemStone/S license number
- ▶ The GemStone product and version you are using
- ▶ The hardware platform and operating system you are using
- ▶ A description of the problem or request
- ▶ Exact error message(s) received, if any

Your GemStone support agreement may identify specific individuals who are responsible for submitting all support requests to GemStone. If so, please submit your information through those individuals. All responses will be sent to authorized contacts only.

For non-emergency requests, the support website is the preferred way to contact Technical Support. Only designated support contacts may submit help requests via the support website. If you are a designated support contact for your company, or the designated contacts have changed, please contact us to update the appropriate user accounts.

Email: support@gemstone.com

Telephone: (800) 243-4772 or (503) 533-3503

Requests for technical assistance may also be submitted 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 that is non-operational. In these cases, please also submit your request via the web or email, including pertinent details such error messages and relevant log files.

If you are reporting an emergency by telephone, select the option to transfer your call to the technical support administrator, who will take down your customer information and immediately contact an engineer.

Non-emergency requests received by telephone will be placed in the normal support queue for evaluation and response.

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Consulting and training for all GemStone products are available through GemStone's Professional Services organization.

- ▶ Training courses are offered periodically at GemStone's offices in Beaverton, Oregon, or you can arrange for onsite training at your desired location.
- ▶ Customized consulting services can help you make the best use of GemStone products in your business environment.

Contact your GemStone account representative for more details or to obtain consulting services.

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GemStone/S 64 Bit 2.3.1 Release Notes

Overview

GemStone/S 64 Bit 2.3.1 is a new version of the GemStone/S 64 Bit object server. This release provides many new features and performance improvements, and fixes a number of bugs; we recommend everyone using GemStone/S 64 Bit upgrade to this new version. The details of these changes are provided in this document.

These release notes provide changes between the previous version of GemStone/S 64 Bit, version 2.3, and version 2.3.1. If you are upgrading from a version prior to 2.3, please also review the release notes for each intermediate release to see the full set of changes.

No separate Installation Guide is provided with this release. For installation instructions, use the Installation Guide for version 2.3.

Changes and New Features

Page audit now can output to file

The pageaudit utility now accepts the additional `-1 <logfile>` argument, which redirects the pageaudit output to a file. Without this argument, pageaudit output goes to stdout, as it did previously.

Reclaim more efficient in presence of sigAborts

Previously, when the Reclaim GcGem received a sigAbort, it would discard the results of all the dead object lookups, which was unnecessary since dead objects in that Reclaim GcGem's extent range cannot move. This will allow faster reclaim progress on system with a high sigAbort rate.

Ability to purge zombie sessions

Sessions may get into a state where they are partially logged out, and unresponsive; in this state, the normal mechanisms that dispose of sessions were not adequate to clean up. A new method has been added to clean up sessions in this inaccessible state:

```
System >> _cleanupZombieSession: sessionId
  This method requests that the Stone forcibly remove a stuck session with the id sessionId that is in a partially logged out state. It may only be executed by SystemUser.
```

Additional information in checkForIdleSessions log message

When idle sessions are killed by the stone as a result of timeout, additional information is now printed in the stone log message. Now, the PID and IP address of the terminated session, the PID of the terminated session's pgsvr, and the client host IP address are also printed.

Added methods

The following method lists objects in Segments:

```
Repository >> listObjectsInSegments: anArray
  Returns a list of committed objects that belong to one of the segments listed in anArray. The result of this method is an Array of IdentitySets, where the contents of each set consists of all instances whose Segment is the corresponding element in anArray. Dead objects (those in the stone's deadNotReclaimed set) are not included in the scan results.
```

The following method provides the current GcGem configuration settings:

```
System class >> gcConfigurationReport
  Returns a string describing the current garbage collection settings. Sender must have permission to read GcUsers UserGlobals.
```

Default SHR_SPIN_LOCK_COUNT increased

the default setting for SHR_SPIN_LOCK_COUNT has been increased from 4000 to 5000.

Added cache statistics

The following cache statistics have been added in this release:

GciRpcLastCommandServiced (Gem)

The numeric identifier of the last command executed by this gem on behalf of its RPC client. Not used by linked gems.

GciRpcTimeInClientRequests (Gem)

Approximate total number of real milliseconds spent executing requests from the GCI client. Not used by linked gems.

GciRpcTimeInLastCommand (Gem)

Approximate number of real milliseconds spent executing the last command from this gem's RPC client. Not used by linked gems.

PermGenObjsChanged (Gem)

Number of objects in perm gen that were changed by another process at the last transaction boundary.

PermGenObjsChangedTotal (Gem)

Total number of objects in perm gen that were changed by another process during the life of the session.

TimeInUserActions (Gem)

Approximate total number of real milliseconds spent executing user action code.

TotalBitmapPages (shrpcmon)

Total number of bitmap pages present in the shared page cache.

TotalCrPages (shrpcmon)

Total number of commit record pages present in the shared page cache.

TotalDataPages (shrpcmon)

Total number of data pages present in the shared page cache.

TotalOtherPages (shrpcmon)

Total number of pages present in the shared page cache which are of a page kind other than object table, data, bitmap

TotalOtPages (shrpcmon)

Total number of object table pages present in the shared page cache.

WorkingSetClearedCount (Gem)

Number of times the working set was cleared at a transaction boundary because a large number of objects in the working set were changed by another session.

WorkingSetObjsChanged (Gem)

Number of objects in the working set that were changed by another process at the last transaction boundary.

WorkingSetObjsChangedTotal (Gem)

Total number of objects in the working set that were changed by another process during the life of the session.

Bugs Fixed

The following bugs in GemStone/S 64 Bit 2.3 have been fixed in GemStone/S 64 Bit 2.3.1.

Gem may not be terminated by SIGTERM

Under some circumstances, gems that are sent a SIGTERM (kill -TERM) may not terminate. (#39515)

Restore from tranlogs caused repository bloat

When restoring tranlogs that include a large amount of page reclaim, pages were not disposed of quickly enough, resulting in repository growth, potentially shutting down the stone when space is exhausted. During tranlog restore, the stone was not servicing the page manager frequently enough, limiting the page disposal to 1792 pages per tranlog record. (#39564)

Shrpcmon locks issues

Core dump if process dies waiting on spin lock

When two processes need the same page at the same time, and the page is not in the cache, the first process reads the page into the cache, while the second process sleeps on a spin lock until the read is complete. If the process that was waiting on the spin lock for the read to complete died, the lock was left in a corrupted state. This caused the other process, which was performing the read to core dump. (#39577)

Stuck frame locks

When recovering following a session death, the shrpcmon process could find frame locks that were held by processes other than the one that died. These stuck locks were left with a log warning, but not cleared, and later attempts by the shrpcmon to test the spin lock could hang. (#39572)

Additional logging

The SPC monitor now writes additional log messages during the slot recovery process, including the PID of the process holding the stuck frame lock, its executable name (on Solaris only), and its cache name if it is attached to the cache, as well as the contents of the frame lock fields and the contents of the cache frame.

Commit record backlog due to zombie session

When the stone stopped a session, the session's commit record was not removed until the stone received the disconnect, on the out of band socket, from the session that was stopped. Due to bug #39215, there was a small chance that this disconnect would not be received. If this occurred and the disconnect was missed, the commit record remained in the stone, and caused a commit record backlog. (#39643)

Unkillable zombie sessions cause high CPU use

If a gem session became unresponsive, and did not terminate when sent a SIGTERM, the timer thread would constantly send work to the main stone thread to kill the zombie, which was not possible in the current state. This resulted in high stone CPU. (#39648)

Gem termination with error and warning messages

When a gem lost its client during the login process, in some cases the gem would terminate with an error and print warnings in its log file. There was no actual GemStone problem, so the gem will now terminate normally under these circumstances. (#39545)

Error during SortedCollection>>resort can corrupt collection

If an error occurred while a SortedCollection was being resorted, it could result in the collection becoming corrupt. (#39227).

Now, if an error occurs, commit is disallowed to avoid inadvertently committing the corrupted collection.

Zombie pageservers linger after network disconnect

When remote pageservers are disconnected due for example to network glitches, they did not immediately shut down. This caused resources issues and could prevent further logins until they were terminated by other means. (#39551)

String>>findString:startingAt: wrong results for empty String argument

The methods `String>>findString:startingAt:` and `includesString:` returned 1 for an argument consisting of "" (an empty String). This now returns 0 for this case. (#39473)

`SequenceableCollection >> indexOfSubCollection:` correctly returned 0 for an empty argument, including String receivers, and is unchanged.

Proceeding from Halt with handler could skip steps

Under some circumstances, following a halt that was caught by a signal handler, steps may not have been executed. For example, this code would return #(0 0) rather than the correct answer, #(1 0). (#38253)

```
| x e |
[ e := x := 0.
  nil halt.
  x:= 1.]
  on: Notification
  do: [:ex |
    e := 1.].
{e. x.}
```

