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GemStone®

# *GemStone/S 64 Bit Release Notes*

Version 2.3.1.6

June 2009

GEMSTONE<sup>™</sup> S 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 2.3.1.6 release. We recommend that everyone migrating to this version read these release notes before beginning installation, testing or development.

No separate Installation Guides are provided with this release. For instructions on installing GemStone/S 64 Bit version 2.3.1.6, or upgrading or converting from previous products or versions, see the Installation Guides for version 2.3.

### **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.

This Help Request system is in the process of being replaced by a new system:

<http://techsupport.gemstone.com/>

**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](mailto: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.

## 24x7 Emergency Technical Support

GemStone 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, if they encounter problems that cause their production application to go down, or that have the potential to bring their production application down. For more details, contact your GemStone account manager.

## Training and Consulting

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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## Overview

GemStone/S 64 Bit 2.3.1.6 is a new version of the GemStone/S 64 Bit object server. This release provides new features 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 2.3.1, and version 2.3.1.6. Versions 2.3.1.1 through 2.3.1.5 were private releases; all changes in these releases are included in this release, and are documented in these release notes. If you are upgrading from a version prior to 2.3.1, please also review the release notes for each intermediate release to see the full set of changes.

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

This version is available for Solaris on Sparc, Solaris on x86, AIX, HP on Itanium, and Linux.

### Technical Support new site

GemStone Technical Support has a new Help Request system. Customers with support agreements are invited to submit Help Requests to:

<http://techsupport.gemstone.com>

## Changes and New Features

### Ability to count instances

A method has been added to return the number of instances of specific classes within the repository.

Repository >> countInstances: *anArray*

This method returns a count of instances on the receiver that belong to one of the classes listed in the argument *anArray*. *anArray* must be an array of kinds of Behavior containing 2024 or fewer elements. The result of this method is an Array of Associations, where each key is an element of the input array and the value is the count of all instances whose class is equal the key.

## Cached Page Cache Entries

As processes use page frames in the cache, they also use page cache entries (PCEs). On busy systems, waiting for the PCE spin lock may be a bottleneck. Now, PCEs are cached by all processes, reducing contention for the PCE lock and improving performance. The PCE cache is sized based on the free frame cache size for that process.

### New cache statistics

#### **FreePceCacheEntries** (All)

The number of entries in the free PCE cache for this process.

#### **PcesRemovedFromFreeList** (All)

The number of PCEs removed from the free list by this process.

#### **PcesAddedToFreeList** (All)

The number of PCEs added to the free list by this process.

#### **FreePceCount** (SPC Monitor)

The current number of PCEs on the free list.

#### **TotalKPcesRemovedFromFreeList** (SPC Monitor)

The total PCEs removed from free list by all processes, in thousands.

#### **TotalKPcesAddedToFreeList** (SPC Monitor)

The total PCEs added to the free list by all processes, in thousands.

#### **TotalFramesInFreeFrameCaches** (SPC Monitor)

The aggregate of all cache processes' free frame cache size.

#### **TotalPcesInFreePceCaches** (SPC Monitor)

The aggregate of all cache processes' free PCE cache size.

## Date format in log headers now localized and configurable

The format of the timestamps in GemStone log files now conforms to local date display conventions, and can be configured more specifically, if desired.

If the locale is set (using the LC\_ALL or LC\_TIME environment variables), in the environment from which the process is started, the timestamp is now printed according to the this locale's date and time printing.

To override the locale information to set a specific time stamp display format, you may use the environment variable GS\_CFTIME. For example,

```
% setenv GS_CFTIME '%Y-%m-%d %H:%M:%S'
```

results in a log header line of the form:

```
| PROCESS ID: 21586      DATE: 2008-03-21 12:33:00 PDT
```

If the timestamp display is non-US default, either due to localization or specification using GS\_CFTIME, an extra line is printed in the log header with the format. This avoids risk of ambiguous timestamp formatting.

```
| DATEFORMAT: %Y-%m-%d %H:%M:%S
```

The new format is also used for some Repository timestamps, such as the results of restoreFromBackup.

## Bugs Fixed

The following bugs in GemStone/S 64 Bit 2.3.1 have been fixed in version 2.3.1.6.

### Out of memory error in code\_gen

The area of temporary object memory used to store code could become full before garbage collection on this area was triggered, resulting in out of memory errors. (#40042)

### Corrupt object error during GBS flush

Under rare conditions, GBS object flush to the gem may have triggered corrupt object errors. (#40035)

### Indexes incorrect with LargePositiveIntegers in SmallInteger range

The indexed comparison for SmallIntegers and LargeIntegers that are within a portion of the new range of SmallIntegers was incorrect, resulting in incorrect indexed query results. (#40025)

### Fatal Error while replying transaction logs

The code that handles the replay of transaction logs did not correctly handle a specific set of operations that could appear in a transaction log. Encountering this sequence of operations in a tranlog resulted in a fatal error, preventing that transaction log from being restored. (#40003)

### System >> \_getAndClearGciDirtySet: could encounter ObjDoesNotExist error

If objects were removed from the PureExportSet, subsequent fetch of the ExportedDirtySet could have resulted in an object does not exist error. (#39880)

### Core file may still be created

When GemStone processes encounter fatal internal errors and terminate, they should only create core files if GS\_WRITE\_CORE\_FILE is set. However, under some conditions involving multiple fatal errors, a core file could still have been generated, potentially causing disk space problems. (#39743)

### Concatenating with InvariantString resulted in InvariantString

If a Invariant String was concatenated with another String, either as receiver or argument, the result was incorrectly an Invariant String. (#39809)

## Error in index creation on ScaledDecimals or Fractions with LargeIntegers

When an index was created with the final path term on instance of ScaledDecimal or Fraction, where a component of the ScaledDecimal or Fraction was an Integer outside the SmallInteger range, it resulted in an invalid corrupt object error which disallowed further commits in that session. (#39914)

This problem occurs for ScaledDecimal or Fraction components that are Integers less than  $-1,152,921,504,606,846,976$  ( $-2^{60}$ ), or greater than  $1,152,921,504,606,846,975$  ( $2^{60} - 1$ ).

## Cache statistics impact reduced

To reduce the impact on the shared page cache monitor of collecting cache statistics in very large systems, several enhancements have been made. Statistics are now computed in a separate thread, and not more than once per second. Additional checks are made to sleep when idle. Also, file handles are cleaned up regularly to avoid running out of file handles. (#39708)

## Incorrect free frame cache size

For the configuration parameter `GEM_FREE_FRAME_CACHE_SIZE`, the threshold at which the gem free frame cache is disabled was incorrectly 200MB, rather than 100MB as documented. (#39750)

## SPCMonitor impacted by remote page server disconnects

When a remote session logged out, the associated page server process did an unclean disconnect from the cache, requiring cleanup by the SPC monitor. On busy systems, this could overload the SPC monitor. Now, the page server will cleanly detach if possible. Page server log files are now retained if any issue is encountered, including this type of exit. (#39706)

## Passivating SmallFloats resulted in message not understood error

SmallFloats are deprecated in GemStone/S 64 Bit version 2.0 and above, but may still exist as a result of conversion from an earlier version or product. Attempting to passivate an instance of SmallFloat resulted in a message not understood error on `asStringLocaleC`. (#39913)

Note that this fix passivates the SmallFloat as SmallDouble, the replacement class for SmallFloat. Due to limitations in the creation of SmallFloats, it is not possible to activate a SmallFloat from a passivated file. You should convert all SmallFloats to SmallDoubles prior to using `passivate/activate`.

## Segment conversion from 6.2+ on sequentially upgraded repositories

Repositories that originated in very old versions of GemStone/S have unusual Segment layouts. If a repository with this unusual Segment layouts had been progressively upgraded to GemStone/S 6.2 or later, the conversion to GemStone/S 64 Bit did not correctly rearrange the Segments according to the expected GemStone/S 64 Bit Segment ordering. (#39849)