GemStone®

GemStone/S Release Notes

Version 6.3.1.2

November 2008

GemStone S™

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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 version 6.3.1.2 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 version 6.3.1.2, or upgrading or converting from previous products or versions, see the Installation Guide for version 6.3.1. These documents are also available on the GemStone customer website, as described below.

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 is provided in PDF format. This is the same documentation that is included with your GemStone/S 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 Links provide 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.

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

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- 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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Chapter 1

GemStone/S 6.3.1.2 Release Notes

Overview

GemStone/S 6.3.1.2 is a new version of the GemStone Smalltalk object server. This special build release provides several critical bug fixes and performance improvements.

These release notes provide changes between GemStone/S version 6.3.1 and version 6.3.1.2. (GemStone/S version 6.3.1.1 was a special limited release version; version 6.3.1.2 contains all fixes in that release) If you are upgrading from a version prior to 6.3.1, 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 6.3.1.

Changes and New Features

Performance improvements

Mark/sweep performance

This release provides significant performance improvements in the mark/sweep operation, including Epoch, `markForCollection`, `findDisconnectedObjects` and `findObjsConnectedTo:`.

Note that with these changes, running with a very large setting for `#mfcGcPageBufSize`, along with large cache sizes, increases the risk of reaching the 4 GB address space limit of 32-bit processes. If you experience malloc issues, reduce the `#mfcGcPageBufSize`.

Bitmap optimizations

Bitmaps are structures that are used to communicate lists of OOPs. These structures have been optimized to take advantage of 64 bit registers on platforms that support them

(Solaris and AIX). This improves performance for operations such as garbage collection that make heavy use of bitmaps.

Improved handling of low free space conditions

In low free space conditions, the stone will now service the page manager while waiting for free space, to allow pages to be returned to make space available.

In addition, checkpoints during low free space conditions are now done every minute, rather than every three minutes.

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.

Improved timestamps in log files

Timestamps in system log files now include the date as well as time, for all timestamps. Previously, only the first timestamp within each hour included the date; timestamps for subsequent events within the same hour omitted the date.

Bugs Fixed

The following bugs in GemStone/S 6.3.1 have been fixed in GemStone/S 6.3.1.2:

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. This is a new design in GemStone/S 6.2 (cf. #30900); previously, both processes performed the read, with the second process' read subsequently discarded.

The new design exposed a bug, where 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. (#39576)

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, #39633)

Additional logging

In addition to fixing these bugs, version 6.3.1.2 includes additional printing to the SPC monitor for the slot recovery process, including stuck spin locks.

- 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.
- The contents of the frame lock fields and the contents of the cache frame.

After lostOT, gem could have crashed in lomClearCaches

In the processing following a lostOTRoot, a gem could encounter a recursive call within the internal function lomClearCaches, and terminate. (#39408)

Commit during login could have failed, causing later errors

During the login process, a new session updates the account's last login time, write-locks the security data information. and commits. In scenarios with many logins occurring simultaneously, the write lock may fail or be dirty, or the commit may fail. The code did not handle these scenarios and several subsequent problems could occur:

- The first user commit after login by the new session may fail, since no abort was done following the failed commit.
- The write lock may remain on the security data information.
- User information, such as login count, may not get updated. This affects results such as number of logins permitted before a password change is required.

(#39478, #39525)

Slow session logins

Code changes in 6.3.1 inadvertently introduced a one-second sleep in the login process. (#39428)

Potential for late or missing OOB events

A code path existed where pending OOB events could have been missed during iteration of the set of sockets. This could result in OOB signals, such as sigAbort, being received late, or potentially being missed entirely. (#39523)

Stone crash due to invalid access to remote session information

Code that used session information returned by Page Manager for remote sessions did not have appropriate bounds checking. In some cases this could have resulted in invalid pointer references leading to Stone SEGV due to memory corruption. (#39176, #39244)

With password features enabled, logins failed while PDR gems running

When running with password aging features enabled, such as `loginsAllowedBeforeExpiration:`, which permits a limited number of logins for a userId before the password must be changed, each login commits to the repository. However, commits are disallowed while Parallel Dead Reclaim (PDR) GcGems are running. As result, all logins failed until the PDR gems completed reclaim and shut down. (#39630)

PageReads, PageWrites cache statistics were zero

The gem cache statistics PageReads and PageWrites were not updated, and were always zero. (#39600)

Object already exists errors

During certain store traversal operations, such as flush from GBS, there was a risk of OBJ_ERR_ALREADY_EXISTS errors (error 2105). (#39626)

Stack traces on Linux

To avoid problems with the installed location of gstack on Linux distributions, GemStone now includes gstack in the bin directory. This provides more reliable stack traces on Linux. (#39407)

Empty descriptionOfSession: IP address in linked

In sessions that are running in linked mode, the results of System class >> descriptionOfSession: includes an empty string in the array element designated to return the client / gem IP address. (#39402)