GemStone®

GemStone/S Release Notes

November 2003

Version 6.1.1

Send your comments about this manual to docs@gemstone.com

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Patents

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

Preface

About This Documentation

These release notes describe new features and the bugs fixed in the GemStone/S Version 6.1.1 release.

We recommend that everyone using GemStone/S read these release notes before beginning installation or development. These release notes are also available on the GemStone customer website.

Technical Support

GemStone provides several sources for product information and support. The *product-specific manuals, API reference pages, 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. However, you may need to contact Technical Support 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/S 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, you should contact Technical Support by web form or E-mail. You will receive confirmation of your request, and a request assignment number for tracking. Replies will be sent by E-mail whenever possible, regardless of how they were received.

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

This is the preferred method of contact. 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.

Technotes provide answers to questions of general interest submitted by GemStone customers. They may contain coding examples, links to other sources of information, or downloadable code.

Bugnotes 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.

Patches provide code fixes and enhancements that have been developed after product release. A patch generally addresses a specific group of behavior or performance issues. Most patches listed on the GemStone Web site are available for direct downloading.

Tips and Examples 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.

Release Notes and Install Guides for your product software are provided in PDF format.

Documentation for GemStone/S is provided in PDF format. This is the same documentation that is included with your GemStone/S product, with the exception of the API reference files (HTML files).

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.

Email: support@gemstone.com

Please do not send files larger than 100K (for example, core dumps) to this address. A special address for large files will be provided as appropriate.

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

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.

Emergency requests are handled by the first available engineer. If you are reporting an emergency and you receive a recorded message, transfer your call to the next available technical support administrator, who will take a message 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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Chapter

1 GemStone/S 6.1.1 Release Notes

Overview

GemStone/S® 6.1.1 is a new version of the GemStone Smalltalk object server. This release provides new support for AIX® systems, including the ability to run on POWER4™ processors. It also contains bug fixes that further improve the robustness and performance of GemStone/S on all platforms. We recommend everyone using GemStone/S to upgrade to version 6.1.1.

Details of the changes are described in the following sections.

For details about installing GemStone/S 6.1.1 or upgrading from a previous release of GemStone/S, see the *GemStone/S Installation Guide*.

New Features

GemStone/S 6.1.1 includes the following new features.

Support for AIX POWER4 processors

Previous versions of GemStone/S did not work correctly on AIX machines that use the POWER4 processor, including the Regatta. These chips introduced changes that affected some low-level GemStone functions, including spin lock handling and native code generation. With version 6.1.1, GemStone/S has been modified to fully support the AIX POWER4 processors.

Support for more shared memory on AIX 5.2

GemStone/S 6.1.1 supports 2.75 GB of shared memory when running on AIX 5.2. Taking overhead into account, the actual configurable SHR_PAGE_CACHE_SIZE_KB limit is now 2350000. Previously, GemStone/S supported up to 1.9 GB shared memory on AIX. Note that using GemStone/S on AIX 5.2 requires Maintenance Release 5200-01 or later.

Support for Red Hat Enterprise Linux Advanced Server 2.1

GemStone/S 6.1.1 adds support for Red Hat Enterprise Linux Advanced Server 2.1, SMP kernel (2.4.9-e.25smp). Support for Red Hat Linux 7.3 (2.4.18) continues to be provided.

New runtime StnRecoveryPageReclaimLimit configuration parameter

The STN_RECOVERY_PAGE_RECLAIM_LIMIT configuration parameter specifies the maximum number of pages to reclaim for each transaction log record processed during recovery or restore from tranlogs. It also determines the number of pages reclaimed during SystemRepository >> restoreReclaimPages.

GemStone/S 6.1.1 introduces a new runtime parameter #StnRecoveryPageReclaimLimit, supporting dynamic changes in the page reclaim limit during restore from tranlogs. Previously, a change in this parameter could be applied only by stopping and restarting the stone.

See STN_RECOVERY_PAGE_RECLAIM_LIMIT in Appendix A of the *GemStone/S System Administration Guide* for more information on this parameter.

Backup raises error on Bad Data Page

In previous releases, performing a backup would complete execution and return TRUE, even under circumstances where the backup had encountered an error and the resulting backup file was corrupt. Now in GemStone 6.1.1, the fullBackupTo: method will raise a GemStone runtime error if it encounters an error condition.

Bugs Fixed

The following bugs have been fixed in GemStone/S 6.1.1.

Indexing internal resize could cause index corruption

Under some conditions, resizing the index of a large collection may have caused corruption.

When creating or adding to the index for a large collection with several multiple-term indexes, an internal hashed structure containing indexing information (a RcIndexDictionary) may not be large enough and need to be enlarged. If there is a high degree of sharing in the data structure being indexed (i.e. the same object appears multiple times within the data structures), then under some conditions the resize may have caused corruption in the RcIndexDictionary. (#29191)

This problem could be detected in two ways:

- <TheCollection> _refreshIndexCaches reported messages of the form:

  “For index bucket at NN updated cache entry at: MM to indicate [no/a] BucketValueBag”

- In GemStone/S versions 6.0 and later, <TheCollection> _auditIndexes reported messages of the form:

  “Index Dictionary has incorrect number of entries (0) for [oopNNN] of class XX (should be 1)”

As a side effect of this bug, the RcIndexBucketWithCache>>_isBucketValueBagAt: method could return an incorrect answer. (#29018)

Session running markGcCandidates may have been killed by timeout

The method Repository>>markGcCandidates is used by the offline garbage collection process to identify objects that are candidates for garbage collection. It returns the same results as a markForCollection.

This method takes some time to run, depending on the size of the repository, and it is marked internally as a "long running primitive" to prevent it from being timed out as an idle session.

At the end its execution, this method builds the array of results that will be returned. However, the time it takes to build this result array was not considered part of the long primitive, and so it was not protected from timing out. If the result array was very large, the session may have timed out during this period and may have been killed by the stone. (#29701)

Tranlog replay may have caused free oops to be assigned to live objects

Under some circumstances, the sequence of events of freeing the oop of a reclaimed object and updating the free oop list may be recorded in the wrong order in the transaction logs. This might result in corruption, where the oops of live objects also appear on the free oop list. There have been similar timing scenarios that were found and fixed in past releases. The variation that is fixed in this release is new: it is related to a commit record backlog in the original repository. (#29526)

Excessive growth during tranlog replay due to problems with page reclaim

There were some internal problems with page reclaiming during tranlog replay that caused the following problems during system restore/recovery:

1. The method SystemRepository>>restoreReclaimPages did not reclaim any pages.
2. The only pages that could be reclaimed while replaying a tranlog were those that were made reclaimable within that tranlog. This meant that pages which were made reclaimable prior to the start of a given tranlog could not be reclaimed during replay, regardless of the setting of the STN_RECOVERY_PAGE_RECLAIM_LIMIT. These pages could only be reclaimed once the recovery was completed and the GcGem was started.

The results of these problems was that a repository would grow excessively if it was in restore mode and tranlogs were being replayed. Eventually, it may have filled up all available disk space and shut down. This was primarily an issue for warm standbys, which apply tranlogs continuously over periods of time. (#29358)

Change in GC privilege broke methods such as RcIdentityBag>>cleanupBag

In GemStone/S 6.1, the call to System _gcSessions was restricted to users with the GarbageCollection privilege, assuming that only users with GC privileges should be informed about GC sessions. However, this call is used in other places, such as RcIdentityBag>>cleanupBag, which were consequently broken for users without GC privilege. With this release, use of System _gcSessions (and therefore RcIdentityBag>>cleanupBag) no longer requires GC privilege. (#29521)

Gems could hang on logout

During logout, after the gem has logged out from the stone, the gem waits for its client to disconnect. If the gem did not detect or receive the socket disconnect from the client, it could hang indefinitely. As of GemStone/S 6.1.1, the gem waits up to 30 seconds for its client to disconnect before proceeding with shutdown. (#29497)

SesNewOops: inconsistent TranState.oopNumHighWaterTemp

Under extremely rare conditions, the stone process could crash with the message:

SesNewOops: inconsistent TranState.oopNumHighWaterTemp

Attempts to restart the stone failed with the message:

TranStartup: inconsistent TranState.oopNumHighWaterTemp

The conditions that caused this error have been fixed. (#28223)

Stone core dump due to “HostAioWait returned NULL” error

Under very rare conditions, GemStone would core dump with the following message in the stone log file: “HostAioWait returned NULL!” This problem occurred when the stone was attempting to open a new transaction log file. This was done asynchronously, unlike other transaction log writes. Due to a combination of OS disk hardware and system load issues, there very rarely may have been a failure in the set of OS calls that implement this function. GemStone could not proceed without a tranlog, and shut down. (#26669)

_markNotConnectedForCollection behavior changed

The fix for bug 28182: locks on temporary objects continue after GC, caused a change in the behavior of System Class>> _markNotConnectedForCollection. In GemStone/S 6.1, the notConnectedSet garbage collection was not actually performed until after a transaction boundary. (#29646)

GcGem transactionLevel statistic was inaccurate

The GcGem's cache statistic TransactionLevel may have had inaccurate values. The number could have become a large negative number, which was not intended. (#29364)

GcEpochState statistic incorrect

The GcEpochState statistic was incremented continuously, making the value invalid for analysis. (#29359)

sigAbort/sigLostOTRoot statistics incorrect for remote gems

Neither the sigAbort count nor sigLostOTRoot count statistics were incremented by remote gems. (#29257)

Inadvertent “DEBUG: directAccept...” message in stone log

An error message stating “DEBUG: directAccept in acceptOutOfBand would have blocked!” was inadvertently left in the product. (#29256)

VSD permissions set incorrectly on install

If installgs was run as user “root”, and the option to change the owner of the GemStone tree was chosen, then execute permission would have been removed from $GEMSTONE/bin/vsd. (#29233)

Possible false alarm on CR backlog during tranlog restore

Due to rare but serious problems with corruption during tranlog replay, a strongly worded warning about a CR backlog during tranlog restore was added in 6.1. The trigger for this error warning was too sensitive, resulting in occasional false positives. (#29193)

Setting STN_SHR_TARGET_PERCENT_DIRTY at runtime

The stone configuration option STN_SHR_TARGET_PERCENT_DIRTY, as documented in the system.conf file, can be set at runtime using #StnMntShrPcTargetPercentDirty. However, attempting to set a value for this parameter programatically resulted in a key-not-found error. (#29544)

VSD on Linux failed looking for /bin/ksh

If you did not have ksh installed on your machine, VSD failed to start. (#29298)