GemStone®

GemStone/S 64 Bit™ Release Notes

Version 2.4.4.7

August 2011

vmware®

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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Preface

About This Documentation

These release notes describe changes in the GemStone/S 64 Bit™ version 2.4.4.7 release. Read these release notes carefully before you begin installation, conversion testing, or development with this release.August 2011

No separate Installation Guide is provided with this release. For instructions on installing GemStone/S 64 Bit version 2.4.4.7, or upgrading or converting from previous products or versions, see the Installation Guide for version 2.4.

Terminology Conventions

The term "GemStone" is used to refer to the server products GemStone/S 64 Bit and GemStone/S; the GemStone Smalltalk programming language; and may also be used to refer to the company, previously GemStone Systems, Inc., now a division of VMware, Inc.

No separate Installation Guide is provided with this release. For instructions on installing GemStone/S 64 Bit version 2.4.4.7, or upgrading or converting from previous products or versions, see the Installation Guide for version 2.4. These documents are also available on the GemStone customer website, as described below.

Technical Support

GemStone Website

http://support.gemstone.com

GemStone's Technical Support website provides a variety of resources to help you use GemStone products:

- **Documentation** for released versions of all GemStone products, in PDF form.

- **Downloads** and **Patches**, including past and current versions of GemBuilder for Smalltalk.
- **Bugnotes**, identifying performance issues or error conditions that you may encounter when using a GemStone product.
- **TechTips**, providing information and instructions that are not in the documentation.
- **Compatibility matrices**, listing supported platforms for GemStone 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 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.gemstone.com

Email: techsupport@gemstone.com

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

When submitting a request, please include the following information:

- Your name, company name, and GemStone server license number.
- The versions of all related GemStone 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 GemStone holidays.

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, for issues impacting a production system. For more details, contact your GemStone account manager.

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Consulting is available to help you succeed with GemStone products. Training for GemStone software is available at your location, and training courses are offered periodically at our offices in Beaverton, Oregon. Contact your GemStone account representative for more details or to obtain consulting services.

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Chapter 1

GemStone/S 64 Bit 2.4.4.7 Release Notes

Overview

GemStone/S 64 Bit 2.4.4.7 is a new version of the GemStone/S 64 Bit object server. This release fixes several serious bugs potentially causing repository corruption; we recommend all GemStone/S 64 Bit 2.x applications upgrade to this version.

These release notes provide changes between the previous version of GemStone/S 64 Bit, version 2.4.4.6, and version 2.4.4.7. If you are upgrading from a version prior to 2.4.4.6, 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 2.4.

Supported Platforms and GBS Versions

Platforms

GemStone/S 64 Bit version 2.4.4.7 is supported on the following platforms:

- Solaris 9 and 10 on SPARC
- Solaris 10 on x86
- HP-UX 11.11 and 11.31 on PA-RISC
- HP-UX 11.23 and 11.31 on Itanium
- AIX 5.3, TL5, SP3 and AIX 6.1, TL1, SP1
- SuSE Linux ES 10 SP1, and Red Hat Linux ES 5.0 and 5.5

For more information and detailed requirements for each supported platforms, please refer to the GemStone/S 64 Bit v2.4 Installation Guide for that platform.

GBS versions

The following versions of GBS are supported with GemStone/S 64 Bit version 2.4.4.7.

GBS version 7.4

VW 7.8 32-bit	VW 7.8 64-bit	VW 7.7.1 32-bit	VW 7.7.1 64-bit
▸ Windows XP, Windows 2003, Windows Vista, and Windows 7 ▸ Solaris 9 and 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5	▸ Solaris 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5	▸ Windows XP, Windows 2003, Windows Vista, and Windows 7 ▸ Solaris 9 and 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5	▸ Solaris 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5

GBS version 7.3.3

VW 7.7.1 32-bit	VW 7.7.1 64-bit	VW 7.7 32-bit	VW 7.7 64-bit
▸ Windows XP, Windows 2003, Windows Vista, and Windows 7 ▸ Solaris 9 and 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5	▸ Solaris 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5	▸ Windows XP, Windows 2003, Windows Vista, and Windows 7 ▸ Solaris 9 and 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5	▸ Solaris 10 on SPARC ▸ SuSE Linux ES 10, Red Hat Linux ES 5.0 and 5.5

GBS version 7.1.2patch2

VW 7.5 with 7.5 OE	VW 7.4.1 with 7.4d OE
▸ Windows XP and Windows 2003 ▸ Solaris 9 and 10 on SPARC ▸ HP-UX 11.11 on PA-RISC ▸ SuSE Linux ES 10	▸ Windows XP ▸ Solaris 9 and 10 on SPARC ▸ HP-UX 11.11 on PA-RISC ▸ SuSE Linux ES 10

GBS version 5.3.2

VA Smalltalk 8.0.2	VA Smalltalk 8.0.1	VA Smalltalk 7.5.2
▸ Windows 7, Windows Vista, Windows 2003 Server, Windows XP	▸ Windows 7, Windows Vista, Windows 2003 Server, Windows XP	▸ Windows 2003 Server, Windows XP

For more details on supported platforms and requirements, see the release notes for that version of GBS.

Changes and new features

Added method to get the session id of the session holding the GC lock

A method has been added:

`System class >> sessionIdHoldingGcLock`
Returns an SmallInteger session ID of the session currently holding the garbage collection lock, or 0 if the GC lock is free.

PercentCpuUsed statistic now available on Linux

This Gem OS statistic is now also available on Linux; previously it was Solaris only. This is reported as the percentage of the total number of CPUs that this gem is using. While this is information originating from the OS, PercentCpuUsed is reported in a way that is consistent with Solaris' reporting of this statistic. On Linux, top reports the percentage of one CPU that the Gem is using, rather than the percentage of all CPUs. The statistic value will not match what top reports on Linux.

Updating lastLoginTime

The UserProfile's lastLoginTime is not updated automatically by the system unless password aging or stale account aging is enabled. This avoids the overhead of an extra commit at each login. However, initially enabling password or stale account aging can mean that existing accounts are disabled. To avoid that, you can manually execute the following method for each account that is subject to password or stale account aging, using the current DateTime (DateTime now), or nil. Accounts with a nil lastLoginTime do not fail aging tests.

`UserProfile >> lastLoginTime:` *aVal*
Updates the lastLoginTime for the receiver to be *aVal*, which must be an instance of DateTime or nil.

Performance improvements

The code has been updated in several places to use `at:otherwise:` instead of `at:ifAbsent:`, and `to:do:` instead of `do:`. (#41573, #41574)

checksum, woman, and snefru removed from distribution

The checksum, woman, and snefru executables are no longer included in the distribution.

Bugs fixed

Epoch-related corruption

System crash between Epoch completion and checkpoint may corrupt repository

If Epoch GC was enabled, and the system shut down uncleanly after the end of the Epoch but before a checkpoint, the recovery on startup may have corrupted the repository. An important step, clearing the internal bitmap containing the Epoch GC OOPs, did not have a record written to the tranlog, so on recovery after a shutdown, this step was not performed, and objects could be reclaimed a second time. (#41775)

This internal bitmap is cleared by a commitRestore, so repositories with tranlogs replayed during restore, including warm standbys, are not affected by this bug.

Turning Epoch on an off may corrupt repository

If Epoch GC was enabled in a repository, a disable and re-enable of Epoch via the configuration file may result in repository corruption. The internal bitmap that records Epoch GC OOPs was not cleared correctly when Epoch GC state was updated during stone startup, and as a result objects could be reclaimed a second time. (#41784)

This bug does not apply for Epoch disable/enable via runtime parameter.

Hole in voting may result in corruption

After a mark/sweep has completed, the voting step handles references to objects from sessions that were logged in during the mark/sweep. If a session creates a temporary reference to a persistent object X, removes all references to X from other persistent objects, and commits, the analysis of references to X during voting will incorrectly determine that X is not referenced. This allows X to be garbage collected. If the session then commits a persistent reference to X, it creates repository corruption. (#41584)

The fix in version 2.4.4.7 is not complete; in-memory object references are checked for two levels of reference. If object X references object Y which references object Z, object Z will still be subject to this bug.

Restore from tranlogs may timeout due to reclaim

If there is a large amount of reclaim to do in restoring a tranlog, the restore operation may be timed out by the stone after 30-minute limit. Since the restore operations has failed, the repository is not usable, and further restore from log operations may result in fork-in-time issues. Now, this timeout is reset for each reclaim operations rather than for the total reclaim within a transaction log. (#41778)

Possible stone crash due to race condition in tranlog restore

Internal ordering of operations during tranlog restore created a race condition, which could result in a stone crash with SEGV. (#41671)

SIGBUS on internal operation

It was possible for operations on the internal commit record list to conflict, resulting in a SIGBUS. (#41627)

Conversion from 32-bit GemStone/S does not properly upgrade DoubleByteString class

The conversion from 32-bit GemStone/S to GemStone/S 64 Bit version 2.3 and later requires modification of the hierarchy of DoubleByteString. This is done correctly for the class, but was not done for the metaclass (DoubleByteString class), resulting in message-not-understood errors, or execution of incorrect methods. (#41637).

LoadAverageStat not handled by VSD

The cache statistics LoadAverageStat was not handled correctly by VSD, resulting in a very large, useless number. (#41420)

Signals re-enabled timeout disabled via disableStoneGemTimeout

The method disableStoneGemTimeout allows a gem to perform a long running operation and not be subject to STN_GEM_TIMEOUT. However, receiving signals such as #rtErrSignalAlmostOutOfMemory, #rtErrSignalAbort, #rtErrSignalGemStoneSession, and other signals re-enabled the timeout, leaving the gem subject to termination due to the STN_GEM_TIMEOUT. (#41530)

System forceEpochGc does not increment EpochGcCount

Invoking System class >> forceEpochGc forces an Epoch to start, but did not increment the statistics EpochGcCount. (#41534)

Improved error reporting for performOnServer: problems

When the performOnServer: primitive fails, no information was provided on the specific OS-level error, which would be helpful in diagnosing underlying problems. Now, this error information is reported. (#41600)

Improved error checking in sessionCacheStatAt:put:

The error checking following primitive failure in the method System class >> sessionCacheStatAt:put: has been improved, so more specific errors are reported for invalid arguments. (#41569)

Log is unclear when stone crashed due to STN_HALT_ON_FATAL_ERR

When a gem encounters a fatal error and terminates, and the stone configuration setting for STN_HALT_ON_FATAL_ERR is true, then the stone will also shut down. This can avoid corrupting the repository in the rare case that a gem crashes due to corruption that is not already in the repository but would be made persistent in time. However, it risks shutting down the system for cases such as GEM_HALT_ON_ERROR and may not be acceptable in production systems.

Previously, the stone log included the Gem's fatal error report, and reported the coredump including the C level stack. Now, a message specifically mentioning STN_HALT_ON_FATAL_ERR is included, and the stack trace is omitted. (#41562).

If your scripts detect specific phrases in the log file, you should verify that these are still correct.

Versioning class may have left reference to original class

Creating a version of a class copies the contents of the description to the new class. If the description contained an instance of GsClassDocumentation, this GsClassDocumentation then had references from both class versions, but would continue to reference the original class instance. If the original class was dereferenced, this reference would prevent garbage collection. (#41763)

Disable #sleepTimeBetweenReclaimMs when not in normal database operation

The GcUser parameter #sleepTimeBetweenReclaimMs is used to slow down reclaim, to ensure reclaim does not overload a repository that is in regular use. This control was previous disabled during tranlog restore, but may have been applied during other offline repository operations. Now, this parameter is only used when the repository is in normal use. (#41701)