GemStone®

GemStone/S 64 Bit™ Release Notes

Version 3.2.16

April 2017

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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 3.2.16 release. Read these release notes carefully before you begin installation, conversion testing, or development with this release.

No separate Installation Guide is provided with this release. For instructions on installing GemStone/S 64 Bit version 3.2.16, or upgrading or converting from previous products or versions, see the Installation Guide for version 3.2.6.

These documents are available on the GemTalk website, as described below.

Terminology Conventions

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

Technical Support

Support Website

gemtalksystems.com

GemTalk's website provides a variety of resources to help you use GemTalk products:

- **Documentation** for the current and for previous released versions of all GemTalk products, in PDF form.
- **Product download** for the current and selected recent versions of GemTalk software.
- **Bugnotes**, identifying performance issues or error conditions that you may encounter when using a GemTalk product.

- **TechTips**, providing information and instructions that are not in the documentation.
- **Compatibility matrices**, listing supported platforms for GemTalk 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, 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 down. The support website is the preferred way to contact Technical Support.

Website: support.gemtalksystems.com

Email: techsupport@gemtalksystems.com

Telephone: (800) 243-4772 or (503) 766-4702

When submitting a request, please include the following information:

- Your name and company name.
- The versions of GemStone/S 64 Bit and of all related GemTalk 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 GemTalk holidays.

24x7 Emergency Technical Support

GemTalk 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 GemTalk Support Renewals.

Training and Consulting

GemTalk Professional Services provide consulting to help you succeed with GemStone products. Training for GemStone/S is available at your location, and training courses are offered periodically at our offices in Beaverton, Oregon. Contact GemTalk Professional Services for more details or to obtain consulting services.

Table of Contents

Chapter 1. GemStone/S 64 Bit 3.2.16 Release Notes

Chapter

1 GemStone/S 64 Bit 3.2.16 Release Notes

Overview

GemStone/S 64 Bit 3.2.16 is a new version of the GemStone/S 64 Bit object server. This release include fixes for a number of serious bugs, as well as some new features and improvements.

These release notes provide changes between the previous version of GemStone/S 64 Bit, version 3.2.15, and version 3.2.16. If you are upgrading from a version prior to 3.2.15, review the release notes for each intermediate release to see the full set of changes.

No specific Installation Guide is provided with this release. For details on installing GemStone/S 64 Bit 3.2.16 or upgrading from earlier versions of GemStone/S 64 Bit, see the *GemStone/S 64 Bit Installation Guide* for v3.2.6 for your platform.

Supported Platforms

Platforms for Version 3.2.16

GemStone/S 64 Bit version 3.2.16 is supported on the following platforms:

- Solaris 10 and 11 on SPARC
- Solaris 10 on x86
- AIX 6.1 and AIX 7.1
- Red Hat Linux ES 6.4 and 6.5, Ubuntu 12.04 and 14.04, and SUSE Linux Enterprise 12, on x86
- Mac OSX 10.9.5 (Mavericks), with Darwin 13.4.0 kernel, on x86 (Mac supported for development only)

Note that Ubuntu 12.04 end-of-life is imminent, and that Solaris on SPARC support is being deprecated and will be available for development only. Solaris on x86 will continue to be fully supported.

GBS Versions

The following versions of GBS are supported with GemStone/S 64 Bit version 3.2.16.

GBS version 8.2

VisualWorks 8.1.1 32-bit	VisualWorks 8.1.1 64-bit	VisualWorks 7.10.1 32-bit	VisualWorks 7.10.1 64-bit
▸ Windows 10, Windows 8, Windows 2008 R2 and Windows 7 ▸ Solaris 10 on SPARC ▸ Ubuntu 12.04 and 14.04, RedHat Linux ES 6.4 and 6.5, and SUSE Linux ES 12	▸ Windows 7 ▸ RedHat Linux ES 6.4 and 6.5	▸ Windows 8, Windows 2008 R2 and Windows 7 ▸ Solaris 10 on SPARC ▸ Ubuntu 12.04 and 14.04, RedHat Linux ES 6.4 and 6.5, and SUSE Linux ES 12	▸ Windows 8, Windows 2008 R2 and Windows 7 ▸ Solaris 10 on SPARC ▸ Ubuntu 12.04 and 14.04, RedHat Linux ES 6.4 and 6.5, and SUSE Linux ES 12

GBS version 5.4.2

VA Smalltalk 8.6	VA Smalltalk 8.5.2
▸ Windows 8, Professional or above ▸ Windows 2008 R2 ▸ Windows 7, Professional or above	▸ Windows 2008 R2 ▸ Windows 7

For more details on supported GBS and client Smalltalk platforms and requirements, see the *GemBuilder for Smalltalk Installation Guide* for that version of GBS.

VSD Version

The GemStone/S 64 Bit v3.2.16 distribution includes VSD version 5.3, while the previous version, v3.2.15, included version 5.1.3. There have a been significant changes in versions 5.2 and 5.3. In particular, 5.2 improves support for working with multiple files, and v5.3 contains important changes in managing the VSD configuration and in monitoring.

For details on the changes, see the release notes for versions 5.2 and 5.3, accessible at gemtalksystems.com/products/vsd/versions/.

Changes and New Features

Community Edition Keyfile for Linux and Darwin

For some time, GemStone distributions on certain platforms have included a limited starter keyfile, intended primarily for use with Seaside/GLASS/GsDevKit applications and therefore located under the $GEMSTONE/seaside directory. These keyfiles are suitable for evaluation.

In v3.2.16, on Linux and Darwin, the GemStone distribution includes a starter keyfile under `$GEMSTONE/sys`, with the name `community.starter.key`. If there is no keyfile at the location `$GEMSTONE/sys/gemstone.key`, then the stone will look for a keyfile `$GEMSTONE/sys/community.starter.key` and use that for startup.

If the configuration parameter KEYFILE refers to an invalid file, or a file other than `$GEMSTONE/sys/gemstone.key` that does not exist, then the stone will not use the starter keyfile and will fail to start.

Note that the starter keyfile does not have permissions for GBS, GemConnect, or GBJ; if you set up a new installation and do not set your license keyfile, the stone will now start rather than failing with an error. Operations such as attempting to login from GBS, for example, will fail.

The keyfile that is distributed under the seaside directory continues to be included in the distribution in the old location on Linux and Macintosh, in addition to the new keyfile.

Improved handling of CR backlog on stone startup.

When the stone recovers after an unexpected shutdown, and there is a large number of commit records to process, it can delay making the stone available for users for a significant period of time.

In this release, the way recovery from a commit record backlog is handled on startup has been modified to reduce this delay. Now, while some critical work is done during the initial recovery and startup, the final commit record processing and disposal is now done in the background, after the stone is available to users.

The startup messages in the stone log under these circumstances have been updated to log the new behavior.

Additional printing for GCI errors

When a GCI protocol error occurs, GemStone will now print the recent GCI calls and associated packets to allow diagnosis.

Change in errors

Error number 2230 was previously LGC_ERR_PACKET_KIND_BAD; this is now LGC_ERR_SERVER_PACKET_KIND.

Error number 2231 was previously LGC_ERR_EXPECTED_CONTINUE; this is now LGC_ERR_CLIENT_PACKET_KIND.

gslist "exe deleted" status

When a GemStone distribution is replaced while netldi, stone, or cache are running, gslist described these as killed; now it reports a new status "exe deleted".

Increased limit for GsSocket read:into:startingAt:

The read limit for the method `GsSocket >> read:into:startingAt:` was previously 10000000 (10MB), now it is 500000000 (500MB)

Bugs Fixed

Idle Gems not terminated by STN_GEM_TIMEOUT

The configuration parameter STN_GEM_TIMEOUT is designed to terminate gems that have had no interaction with the stone for some period of time. There was a logic error that prevented the check from running, with the result that idle gems were not terminated. (#46723)

Gem hot hangs when repository oop high water mark exceeded 4 billion

When the repository's oop number high water mark exceeded 4 billion, a number of operations that scan the entire repository, including backup, restore, MFC and write set union sweep as well as multithreaded scan operations, could hang. (#46252).

Gem crash due to excessive recursion in MFC

There was an optimization in the multithreaded MFC that performed a recursion; it was possible for excessive recursion to occur which resulted in running out of C stack space. This optimization was determined to provide very little value and has been removed. (#46194)

Infinite loop if gemstone.hostid exists but not readable

Each host with a GemStone server node finds or creates a file /opt/gemstone/locks/gemstone.hostid to identify the host. If this file existed, but was not readable by a process such as linked topaz, the process hung. (#46219)

listReferences failed to find object in large IdentityBags/Sets

If an object is in an IdentityBag or IdentitySet with more than about 1015 or 2030 elements, respectively, a listReferences: or fastListReferences: operation did not detect the reference. (#46645)

Incorrect tranlog entries for insert into a large byte object

When a large object is modified, changes to leaf objects composing it must be tranlogged. In the case of byte objects (such as Strings), insert operations did not correctly log the changes, so after restore the state could be inconsistent. (#46474)

changeClassTo: disallowed for NSCs with fewer named instance variables

When `changeClassTo:` is requested, and the number of named instance variables is fewer than that of the original class, the values in the removed named instance variable slots may be moved to unnamed instance variables. This caused object corruption for instances of IdentityBag, and data corruption for instances of IdentitySet. (#46475)

AES encryption with wrong argument size handled incorrectly

Encryption methods such as `aesEncryptWith256BitKey:` require specific sizes for the key and salt. If an incorrect salt size was provided, it crashed. (#46358)

gslist -m did not report information on non-netldi process

gslist -m reports information on remote servers; however, it incorrectly only reported information on NetLDI processes, omitting information on Stone and other processes. (#46262).

GsNMethod instance variables not protected

Some instance variables are unsafe to access directly due to the way they are stored in memory. These accesses are protected; however, `instVarAt:` was not reimplemented to provide safe access. This method has been added to GsNMethod. (#46405)

Resuming after AlmostOutOfMemory

When the Gem is almost out of memory it signals an Admonition, #6013, AlmostOutOfMemory/ #rtErrSignalAlmostOutOfMemory. This can be handled, the cause of the out of memory corrected, and processing resumed. To avoid getting stuck when no memory can be freed, after two unsuccessful attempts it will now signal an Error, #2517, #errAlmostOomPending. (#44514)

Indexing bugs

GsQuery reject: incorrect results

The code for GsQuery reject: included a bug and returned the wrong results. (#46184)

GsQuery detect:ifNone: returned query instead of ifNone: result

Rather than returning the results of the `ifNone:` block, on a negative result it returned the query. (#46184)

ReversedRangeIndexReadStream size incorrect

Sending #size to an indexing reverse read stream returned 0, rather than the number of elements in the results to be streamed over. (#46184)

Index Audit could miss invalid encryption keys

Index audit did not catch all cases of invalid encryption keys in interior nodes. (#46069)

upgradeSeasideImage failed as a result of recently added class

After additions of GLASS/Seaside/GsDevKit class NumberParserGsDevKitIssue75Test, the upgradeSeasideImage step failed. (#46217)

Object >> storeOn: failed for large strings

The method `Object >> storeOn:` had a typo that was exposed for large strings. (#46381)

_tempObjSpaceMax can return negative values on large TOC

When GEM_TEMPOBJ_CACHE_SIZE was configured to larger than about 2800000, the method `System >> _tempObjSpaceMax` returned a negative value. (#46384)