


GemStone/S 64 BitTM **Release Notes**

Version 3.4.1

January 2018



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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 3.4.1 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 3.4.1, or upgrading or converting from previous products or versions, see the Installation Guide for version 3.4.

For questions or to submit feedback on this manual, join the documentation mailing list: <http://lists.gemtalksystems.com/mailman/listinfo/documentation>.

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.

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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.

We recommend checking this site on a regular basis for the latest updates.

Help Requests

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Requests for technical assistance can be submitted online or by email. Telephone support is available but should be limited to urgent requests that require immediate assistance, such as a production system down.

Website: techsupport.gemtalksystems.com

Email: techsupport@gemtalksystems.com

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

Please include the following, in addition to a description of the issue:

- ▶ The versions of GemStone/S 64 Bit and of all related GemTalk products, and of any other related products, such as client Smalltalk products, and the operating system and version you are using.
- ▶ Exact error message received, if any, including log files and statmonitor data if appropriate.

Technical Support is available from 8am to 5pm Pacific Time, Monday through Friday, excluding GemTalk holidays.

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GemStone/S 64 Bit

3.4.1 Release Notes

Overview

GemStone/S 64 Bit™ 3.4.1 is a new version of the GemStone/S 64 Bit object server. This release includes some new features and fixes a number of bugs. We recommend everyone using or planning to use GemStone/S 64 Bit upgrade to this new version.

These release notes describe changes between the previous version of GemStone/S 64 Bit, version 3.4, and version 3.4.1. If you are upgrading from a version prior to 3.4, review the release notes for each intermediate release to see the full set of changes. Particularly note that there were many changes in v3.4, including the requirement for updated keyfiles and GBS upgrade.

The Installation Guide has not been updated for this release. For installation, upgrade and conversion instructions, use the Installation Guide for version 3.4.

Supported Platforms

Platforms for Version 3.4.1

GemStone/S 64 Bit version 3.4.1 is supported on the following platforms:

- ▶ Red Hat Enterprise Linux Server 6.7 and 7.1, and Ubuntu 14.04 and 16.04, and SUSE Linux Enterprise 12, on x86. Testing has also been done on Red Hat Enterprise Linux Server 6.x and 7.x with the latest ssecurity patches.
- ▶ Solaris 10 and 11.3 on x86
- ▶ AIX 6.1 on POWER6 and POWER7 and AIX 7.1 on POWER8
- ▶ OS X 10.11.2 (El Capitan) with Darwin 15.2.0 kernel, and OS X 10.13.2 (High Sierra), with Darwin 17.3.0 kernel, on x86 (Mac is supported for development only)

For more information and detailed requirements for each supported platforms, please refer to the GemStone/S 64 Bit v3.4 Installation Guide for that platform.

Spectre and Meltdown

OS vendors have begun rolling out patches to these chip vulnerabilities as v3.4.1 has been in final QA. Testing results indicate that while there are no operational problems, there is a performance impact in line with industry reports for these patches. The specific impact varies depending on the specific GemStone operation and details of the hardware and virtualization of the test system.

v3.4.1 has been tested on Red Hat 6.x and 7.x with the latest security patches, and is fully supported with these configurations.

GemBuilder for Smalltalk (GBS) Versions

GemStone/S 64 Bit version 3.4.1 requires GBS version 8.3 or later for VisualWorks Smalltalk, or version 5.4.4 or later for VA Smalltalk.

The following versions of GBS are supported with GemStone/S 64 Bit version 3.4.1:

GBS version 8.3

VisualWorks 8.2.1 32-bit and 64-bit	VisualWorks 7.10.1 32-bit	VisualWorks 7.10.1 64-bit
<ul style="list-style-type: none"> ▶ Windows 10, Windows 8.1, Windows 2008 R2 and Windows 7 ▶ RedHat ES 6.7, 7.1, and 7.4; Ubuntu 14.04 and 16.04 	<ul style="list-style-type: none"> ▶ Windows 10, Windows 8.1, Windows 2008 R2 and Windows 7 ▶ RedHat ES 6.7, 7.1, and 7.4; Ubuntu 14.04 and 16.04 	<ul style="list-style-type: none"> ▶ Windows 10 ▶ RedHat ES 7.1

GBS version 5.4.4

VA Smalltalk 8.6.3
<ul style="list-style-type: none"> ▶ Windows 10 ▶ Windows 8.1, Professional or above ▶ Windows 2008 R2 ▶ Windows 7, Professional or above

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 v3.4 distribution includes VSD version 5.3.1; this is the same version as was distributed with the previous GemStone/S 64 Bit, v3.4.

Changes in this release

Updated library versions

The version of OpenSSL has been updated to v1.1.0g.

The version of LZ4 has been updated to v1.8.0.

The version of Kerberos has been updated to v1.16.

Change in lock files

The file `/opt/gemstone/locks/<stoneName><hostid>` is no longer created. A `shrpcmonitor` now creates only one file, `/opt/gemstone/locks/<stoneName>~<hostid>.LCK`, to represent both its listening socket and its shared memory segment.

Support for Mac/High Sierra file system

The new Apple File System, `apfs`, is now recognized and handled by GemStone, allowing support for the High Sierra Mac version.

Support for Opportunistic TLS Sockets

New methods have been added that can promote an existing `GsSocket` to a `GsSecureSocket` without losing an existing socket connection. The socket connection is transferred from the `GsSocket` to the `GsSecureSocket`, which enables `STARTTLS` behavior.

The following methods have been added to support this functionality:

```
GsSecureSocket class >> newServerFromGsSocket: aGsSocket
```

Creates a new instance and initializes it to act as an SSL server socket. Any existing (non-SSL) connection owned by `aGsSocket` is transferred to the new instance and `aGsSocket` is effectively closed. No SSL connection is made.

```
GsSecureSocket class >> newClientFromGsSocket: aGsSocket
```

Creates a new instance and initializes it to act as an SSL client socket. Any existing (non-SSL) connection owned by `aGsSocket` is transferred to the new instance and `aGsSocket` is effectively closed. No SSL connection is made.

GsFile flush performance over NFS

The performance of `GsFile` flush for a file accessed over NFS could be very slow. The method `GsFile >> sync` has been added, which invokes UNIX `fflush` and `fsync`.

Additional information on RC retry failures

When an RC retry failure occurs, it previously only provided a `#'Rc-Write-Write'` conflict object. Now, conflict resolution code has the option of including additional information, using the conflict keys:

```
#'Rc-Retry-Failure-Description'  
#'Rc-Retry-Failure-Reason'
```

Configuration Parameter Changes and Fixes

Change in configuration parameter `STN_GEM_ABORT_TIMEOUT`

The parameter `STN_GEM_ABORT_TIMEOUT` now configurable in seconds, and the runtime configuration parameter has been renamed.

Previously, this parameter was only configurable in minutes, although internal resolution was in seconds. Now, this can be configured in seconds. This is done by specifying the number of seconds followed by 'seconds', for example, 60seconds. Values without the trailing seconds are interpreted as minutes, for compatibility with previous releases, so a value of 60 is 60 minutes.

The minimum is changed from 1 (that is, 1 minute) to 5seconds.

Runtime parameter `#StnGemAbortTimeout` renamed

The runtime parameter has been renamed from `#StnGemAbortTimeout` to `#StnGemAbortTimeoutSeconds`.

`STN_SIGNAL_ABORT_AGGRESSIVE` now make `LostOt` aggressive also

This configuration parameter made `sigAbort` handling more aggressive, but did not previously affect `lostOT` and was not sufficient to manage the CR backlog in cases of very high commit rate. (#47335)

`GEM_PGSVR_USE_SSL` is unreliable

There are code paths that are broken when the configuration parameter `GEM_PGSVR_USE_SSL` is set to `TRUE`. There are thread safety issues in the socket code, making the multi-threaded `pgsvr` end of the `ssl` connection unreliable (#47275).

`GEM_PGSVR_UPDATE_CACHE_ON_READ` can cause errors for remote logins

When the remote gem configuration parameter `GEM_PGSVR_UPDATE_CACHE_ON_READ` is set to `true`, logins from remote gems may encounter the error 'Repository root page is corrupted or contains a disk media defect'. This is related to the requested root page having been flushed from the Stone's cache. (#47291)

Bug Fixes

`gslist` crashed if `GS64 2.x Stone` or `NetLDI` is running

If a `Stone` or `NetLDI` from older, 2.x version of `GemStone/S` is running on a host machine, the v3.4 `gslist` gets a segmentation fault. (#47234)

Failed mid-level cache startup caused Gem crash

When a mid-level cache could not be started, it caused a fatal error in the gem. (#47305)

Abort may not advance view if not in transaction and many CRs behind

If a session performs an `System >> abortTransaction`, when the session is outside of transaction, and many `commitRecords` behind the current, it will not advance it's view. (#47344)

GsFile contents*OfDirectory: did not correctly handle Characters with codePoints over 127

In Unicode Comparison Mode, the method `GsFile class >> contentsAndTypesOfDirectory:` and `contentsOfDirectory:`, when encountering a directory or file name that included Characters with codePoints over 127, returned instance of `Utf8`. In Traditional String Mode, the results were corrupt. (#47325)

Now, in Unicode Comparison Mode, these methods return instance of `Unicode16`, and in Traditional String Mode, the results are a `DoubleByteString` or `String` with valid contents.

Restore from backup with missing or corrupted objects

If a backup file has corruption which prevents certain objects from being restored, the restore would terminate with a non-fatal error depending on the specific problem, and the backup file could not be restored. (#47401)

Rather than allowing the backup to be completely unusable, the restore now tolerates some corrupted records and continues to complete the restore. On completion, the restore reports a new fatal error, `BKUP_ERR_RESTORE_FAILURE/4152`.

If you encounter this error, it is recommended that you find a non-corrupt backup file to restore. However, if you do not have another backup, you can continue to restore the tranlogs and perform `commitRestore`. After the `commitRestore` you should perform an object audit to determine the extent of the problems, and if possible, attempt to repair the issues.

Code path in validatePassword: could crash Gem

It was possible under certain conditions that sending `validatePassword:` to a `UserProfile` could crash the Gem. (#47327)

This was specifically exposed when using the GBS User Tool to change a User's authentication from UNIX to GemStone. However, note that changing the authentication to GemStone did not work in 3.4, due to bug #47294.

Errors on bitmap filenames that are not String or Unicode7

The code to write or read bitmap (.bm) files did not handle UTF8, and `DoubleByteStrings` or `Unicode` strings outside the `Unicode7` range reported primitive failures or argument errors. (#47395)

RcIdentityBag loses RC when remove bags are large

If the number of items in an internal per-session remove bag becomes large, that is, contains more than about 2000 items, the remove bag becomes subject to transaction conflicts. Remove bag entries are associated with the session slot that added the object; this required a particular set of circumstances to occur. (#47212)

PR_SET_PTRACER misplaced error message

In some cases unrelated to pstack, the printout "PR_SET_PTRACER returned -1, pstack may fail" appeared. This is now only printed when appropriate, when forking to run pstack. (#47333)

Security error when browsing implementors

If session methods have been enabled for a user that does not have CodeModification privilege, attempting to browse implementors of any method will trigger a SecurityError. (#47364)

openssl executable not working on Windows

openssl executables are provided with the GemStone distribution on each platform. On Windows, libraries were missing and the executable would not run. (#47393)

The windows client distribution in v3.4.1 includes additional files:

```
bin\libcrypto-1_1.x64.dll, .pdb
bin\libssl-1_1-x64.dll, .pdb
bin\openssl.pdb
bin32\libcrypto-1_1.dll, .pdb
bin32\libssl-1_1.dll, .pdb
bin32\openssl.exe, .pdb
```

Subclass creation using byteSubclass:... did not tolerate nil SymbolDictionary

Classes may be created and not put into a specific SymbolDictionary by passing in a nil for the inDictionary: argument. The subclass creation methods subclass:... and indexableSubclass:... allowed this, but byteSubclass:... generated an error. (#47403)

GsSecureSocket did not correctly apply client certificates

There was a bug in the internal code such that when configuring mutual authentication, the method to set CA certificates did not work correctly for client contexts. This did not cause any observed problems, although openssl documentation indicated this was required. (#47256).

Restore from secure but not encrypted backup accepted decryption key

The methods that perform secure restore, are used to restore both encrypted and signed but not encrypted backups. When restoring a signed unencrypted backup, the private key arguments and passphrase are not needed and should be nil. It was previously not an error if these arguments were provided. (#47138)

GsFile >> isTerminal incorrect

The code for isTerminal checked against an incorrect constant and did not return correct results. (#47283)