
GemStone®

GemStone/S 64 Bit™
Release Notes

Version 3.1.0.3

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GEMTALK™
SYSTEMS

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 3.1.0.3 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 3.1.0.3, or upgrading or converting from previous products or versions, see the Installation Guide for version 3.1.

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, previously GemStone Systems, Inc. and a division of VMware, Inc.

Technical Support

GemStone Website

<http://gemtalksystems.com/techsupport>

GemTalk’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, 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.

Refer to the support website for the website address.

Email: support@gemtalksystems.com

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

When submitting a request, please include the following information:

- ▶ Your name and company name.
- ▶ 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.

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GemTalk offers, at an additional charge, 24x7 emergency technical support. This support entitles customers to get immediate response 24 hours a day, 7 days a week, 365 days a year, for issues impacting a production system. For more details, contact GemTalk sales.

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Overview

GemStone/S 64 Bit 3.1.0.3 is a new version of the GemStone/S 64 Bit object server. This includes new features and fixes a number of serious bugs. We recommend everyone using GemStone/S 64 Bit upgrade to this new version.

These release notes provide changes between the previous version of GemStone/S 64 Bit, version 3.1.0.2, and version 3.1.0.3. If you are upgrading from a version prior to 3.1.0.2, review the release notes for each intermediate release to see the full set of changes. In particular, if you are upgrading from version 2.4.x, note that there were substantial changes in v3.0 that impact your application.

Version 3.1.0.3 requires GBS version 7.5 or later.

No separate Installation Guide is provided with this release. For installation instructions, use the Installation Guide for version 3.1.

Supported Platforms and GBS Versions

Platforms

GemStone/S 64 Bit version 3.1.0.3 is supported on the following platforms:

- ▶ Solaris 10 and 11 on SPARC
- ▶ Solaris 10 on x86
- ▶ AIX 6.1, TL1, SP1, and AIX 7.1
- ▶ SuSE Linux ES 10 SP1 and ES11 on x86;
Red Hat Linux ES 5.5 and 6.1 on x86
- ▶ Mac OSX 10.6.4 (Snow Leopard), with Darwin 10.4.0 kernel, on x86

For more information and detailed requirements for each supported platforms, please refer to the GemStone/S 64 Bit v3.1 Installation Guide for that platform.

GBS version summary

The following versions of GBS are supported with GemStone/S 64 Bit version 3.1.0.3. Note that versions of GBS earlier than 7.5 and 5.4.1 cannot log in to GemStone/S 64 Bit v3.1.0.3.

GBS version 7.6

VW 7.9.1 32-bit	VW 7.9.1 64-bit	VW 7.9 32-bit	VW 7.9 64-bit
<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1 	<ul style="list-style-type: none"> ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1 	<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1 	<ul style="list-style-type: none"> ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1

GBS version 7.5

VW 7.9.1 32-bit	VW 7.9.1 64-bit	VW 7.9 32-bit	VW 7.9 64-bit
<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1 	<ul style="list-style-type: none"> ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1 	<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1 	<ul style="list-style-type: none"> ▶ Solaris 10 on SPARC ▶ SuSE Linux ES 10 and 11, and RedHat Linux ES 5.5 and 6.1

GBS version 5.4.1

VA Smalltalk 8.5.2	VA Smalltalk 8.5	VA Smalltalk 8.0.3
<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP 	<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP 	<ul style="list-style-type: none"> ▶ Windows 2008 R2, Windows 7, and Windows XP

For more details on supported GBS and client Smalltalk platforms and requirements, see the *GemBuilder for Smalltalk Release Notes* for the appropriate GBS version.

Changes in this Release

The following bugs and feature enhancements are included in this release.

Socket and IPv4 Support

In addition to better handling IPv4 and the specific bugs mentioned, sockets have had extensive review and a number of other minor issues have been fixed.

Support for IPv4-only machines

With version 3.0, GemStone/S 64 bit added support for IPv6 connections, and would fall back to an IPv4 connection if IPv6 was not available. The code used IPv4-mapped IPv6 addresses for all connections, and therefore required IPv6 support in the kernel. This has been changed, so now, it will first try to make an IPv4 connection. Older kernels and kernels compiled without IPv6 support are now fully usable. (#42717)

connectTo:on: and getHostAddressesByName: handling of IPv4 addresses

The GsSocket method getHostAddressesByName: previously only returned the first address, generally a IPv6 address. Now, all valid addresses are returned, with the IPv4 address returned before the IPv6 addresses.

The connectTo:on: had a similar issue determining the IP address of a host name argument. (#42717)

getHostAddressByName: when host not found

The comment for the method GsSocket getHostAddressByName: has been updated to reflect the behavior. While in 3.0.x and earlier versions, this method returned nil when no address was found for the argument, now an error is returned. (#42670)

SEGV in GsSocket

The primitive code that waited for an event on a GsSocket could encounter SEGV or other problems. This code has been fixed and the testing expanded.

Multi-threaded/Restore issues

In addition to the specific bugs listed, the multi-threaded code that supports the multi-threaded restore added in 3.1, as well as other multi-threaded operations added in 3.0, has had improvements in some areas including thread management.

Further improvement in restore performance

The last phase of the new multi-threaded restore performs a scan of the Object Table to build the sets of pages. This code has been optimized to improve performance of this phase, which results in about 10% overall performance, depending on the specific configuration. (#42648)

Crash immediately after commitRestore fails to recover from tranlogs

This occurs when restoring into empty extents. The commitRestore did not write a checkpoint, and since no transaction logs are created during the restore process, if a crash

occurs after the commitRestore but prior to any work done that would create tranlogs, the recovery would fail to find tranlogs and report an error. (#42709)

After startstone -R, restoreToPointInTime: failed

Startstone -R starts up in restore mode, with the restore status time restored to value not set. The method Repository >> restoreStatusTimeRestoredTo incorrectly returned an empty string rather than nil in this case, and the method Repository >> restoreToPointInTime:, which invoked that method, failed with an error. (#43026)

Recovery resulted in incorrect values for stats trackedSetSize, exportedSetSizePinnedInMemory

Stone recovery after an unclean shutdown caused the pointers for the Stone's statistics timeInPgsvrNetReadsStat and timeInPgsvrNetWritesStat to point to the incorrect process slot, one that is used by Gem sessions for trackedSetSize and exportedSetSizePinnedInMemory. After this, for the life of the stone, the Stone's values for timeInPgsvrNetReadsStat and timeInPgsvrNetWritesStat will overwrite the gem statistics trackedSetSize and exportedSetSizePinnedInMemory for whatever gem is currently using that process slot. (#42658).

Cache warming not done in restore mode

Specifying cache warming STN_CACHE_WARMER did not cause the cache to be warmed, if the stone was started in restore mode; either using the -R option, or if the previous stone shutdown had been in restore mode. (#42884)

This was further masked by the absence of logs. Now, the cache warmer logs are not automatically deleted, and the stone log now references the cache warmer log.

markForCollection could have hung

There was a rare timing condition that caused the markForCollection operation to hang when the commit record backlog approached the STN_SIGNAL_ABORT_CR_BACKLOG. (#43108)

Kill -TERM of stone did not shutdown cleanly

Sending kill -TERM to a stone should result in the stone shutting down cleanly, and not requiring recovery on restart. In v3.1.0.2 only, the final checkpoint was not being written, so the shutdown was not clean. (#42676)

Hot Standby fixes and improvements

Much further work has been done on the hot standby code in this release.

Among other changes, the logsender now handles gaps in the tranlog sequence (#42675), and the logreceiver wait now avoids running hot (#42679).

New feature to get brief gem pstacks

The pstack utility that is provided with the GemStone distribution now accepts a -b option:

```
pstack -b <pid>
```

This allows you to request gem stacks that only include one line per frame, and do not include details on variables and their values.

CommitRecordBacklog created by terminated session

It was possible for a session that is no longer logged in to hold the oldest commit record, causing a commit record backlog that could not be recovered normally (by terminating the session). The specific scenario involved a session killed by idle session timeout and exiting with a fatal error in such a way that the OOB socket was not properly terminated. (#42690)

Improved statmonitor tracking

In addition to ensuring terminated sessions are always entirely terminated, further information is recorded in cache statistics. Statmonitor will now continue to record session data until the internal sessionId, as well as the processId, is released.

The following cache statistics have been added:

ForcedDisconnects (Stone)

The number of session logouts for which the stone forced the disconnect of the OOB socket.

AfterLogoutState (Gem)

Bits from the after-logout state machine in stone.

Conversion Issues

Added no-op method GsNMethod>>recompile

When upgrading from v2.x, which requires all methods to be recompiled, it is documented to file in all application code to ensure everything is recompiled. An alternative is to send the method recompileAllMethods to each application class. However, if some or all methods in the class had already been recompiled, this resulted in an error, GsNMethod does not understand #recompile. With the addition of this no-op method, sending recompileAllMethods to a class that has had some or all methods already recompiled does not error. (#42488, #42763)

postconv failure with few SortedCollections and many gems

During the postconv step of conversion from 2.x to 3.x, the blocks of SortedCollection instances are converted. This step failed for repositories with fewer SortedCollections than the number of gems specified for the postconv step. (#42592)

ProcessScheduler issues

ProcessorScheduler >> allProcesses not thread safe

It was possible to get errors from ProcessorScheduler >> allProcesses since the code supporting it was not thread safe (#43068)

Sending terminate to a GsProcess from an ensure block may have caused crash

If terminate is sent to a GsProcess from within an ensure block on the stack of that GsProcess, when the running process was also on the readyQueue, it may cause a SEGV. (#43068)

ProcessorScheduler lost track of a Delay when a shorter Delay expired

When a short Delay at lower priority expired, the scheduler may fail to resume waiting for a higher priority longer Delay. (#42998)

Remote logins may have failed if stone's netldi running as root

When running the netldi as root and requiring authentication (that is, not in guest mode), remote logins failed. The stone's netldi should have, but did not, use trusted mode to fork the pgsvr for the remote gem on the stone's host. (#42863)

NotTranloggedGlobals problems in restore/recovery

The NotTranloggedGlobals is a feature added in v3.0, intended for future use by the Seaside product. This feature avoids tranlog overhead for objects that do not need to be recoverable.

The tranlog records were not always correctly written to allow for these objects when garbage collection occurred. In some cases, replaying transaction logs with non-empty NotTranloggedGlobals could result in corrupted objects. (#42702, #43113)

NotTranloggedGlobals has been disabled in this release to avoid these problems.

Statmonitor and VSD changes

Statmonitor did not collect disk stats for Linux SAN

Statmonitor did not recognize the disk type commonly used by SAN devices, and did not collect disk stats. (#42928)

Statmonitor started with -f could overwrite existing active file with same name

Starting statmonitor with the -f option allows you to specify a filename; this overwrite any existing file with that name. If two statmonitor processes were started specifying the same file name, both wrote to this same filename, which corrupts the file. (#42913)

Now, it is an error to specify an existing file with the -f option.

VSD limited to 2GB on AIX

vsd on AIX used the "Large Address Space Model", which limited data loading to loading 2GB. Now, it uses the "Very Large Address Space Model", and up to 3.25GB of data can be loaded. (#43097)

GemStone handling of stone names containing special characters

In v3.1.0.2, stone names with a dash (-) were disallowed to avoid certain problems with System gems. In this release, the underlying problem has been fixed. Stone names with dashes are now again permitted. (#42603)

GsFile >> createServerDirectory:mode: ignored mode argument

The mode argument was not applied to directories created using the method GsFile >> createServerDirectory:mode:. Directories were always created with the default mode 8r770. (#43100)

Risk of crash during stopstone

There is a code path during stopstone in which the shutdown process could have resulted in a SIGSEGV, as a result of an earlier problem. (#43114)

Wrong error for removing a collection of objects that are not there

IdentityBag >> removeAll: returns an error if one of the elements in the collection to be removed is not in the receiver. This incorrectly returned an InternalError, object does not exist error rather than a LookupError. (#42641)

printStringRadix: incorrect for 0

The result of printing zero (0) with printStringRadix: and printStringRadix:showRadix: was incorrect, omitting the 0. (#42803)

String >> withAll: incorrect for some QuadByteString arguments

Previously, String withAll: would return a result with trailing garbage characters for QuadByteString arguments that contained only characters in the String or DoubleByteString character range. (#42917).

Also note the comment for this method was previously incorrect.

dynamicInstVarAt: on special object caused gem crash

Sending dynamicInstVarAt: to an object that is special (such as Character, SmallInteger, nil, etc.) caused the gem to crash with SIGSEGV. (#43105)

Loading multiple user actions failed on AIX

On AIX, attempting to load a second user action library would fail. (#42931)

Infinite recursion in error handling on Solaris x86

if an error such as sigAbort occurs during execution of a user action, the error handling may result in an infinite recursion. This has been observed on Solaris x86 only. (#42975)