GemStone®

GemStone/S 64 Bit™
Release Notes

Version 3.2.3

November 2014

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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 3.2.3 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 3.2.3, or upgrading or converting from previous products or versions, see the Installation Guide for version 3.2.

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

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http://gemtalksystems.com/techsupport

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- **Documentation** for released versions of all GemTalk products, in PDF form.
- **Downloads**, including current and recent versions of GemTalk products.
- **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.

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Website: http://techsupport.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.

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Chapter 1

GemStone/S 64 Bit 3.2.3 Release Notes

Overview

GemStone/S 64 Bit 3.2.3 is a new version of the GemStone/S 64 Bit object server. This release fixes a number of bugs in v3.2.2, and adds some new features. We recommend everyone using or planning to use GemStone/S 64 Bit v3.2.x upgrade to this new version.

These release notes provide changes between the previous version of GemStone/S 64 Bit, version 3.2.2, and version 3.2.3. If you are upgrading from a version prior to 3.2.2, 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.

The Installation Guide has not been updated for this release. For installation, upgrade and conversion instructions, use the Installation Guide for version 3.2.

Supported Platforms

Platforms for Version 3.2.3

GemStone/S 64 Bit version 3.2.3 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
- Red Hat Linux ES 6.1, 6.4, and 6.5; Ubuntu 10.04 and 12.04; and SUSE Linux Enterprise 11 Service Pack 3, on x86
- Mac OSX 10.6.8 (Snow Leopard), with Darwin 10.8.0 kernel, on x86

For more information and detailed requirements for each supported platforms, please refer to the GemStone/S 64 Bit v3.2 Installation Guide for that platform. Note that the Linux Installation Guide does not mention SUSE or recently added versions of Red Hat and Ubuntu. Configuration information is the same as for the other Linux platforms.

GBS Versions

The following version of GBS is supported with GemStone/S 64 Bit version 3.2.3. You must use GBS version 7.6.1 or later for VisualWorks, or 5.4.2 or later for VA Smalltalk, with GemStone/S 64 Bit v3.2.3.

GBS version 7.6.1

VisualWorks 7.10.1 32-bit	VisualWorks 7.10.1 64-bit	VisualWorks 7.9.1 32-bit
▸ Windows 8, Windows 2008 R2 and Windows 7 ▸ Solaris 10 on SPARC ▸ Ubuntu 10.04 and 12.04, RedHat Linux ES 6.1, 6.4, and 6.5, and SUSE Linux ES 11 SP3	▸ Windows 8, Windows 2008 R2 and Windows 7 ▸ Solaris 10 on SPARC ▸ Ubuntu 10.04 and 12.04, RedHat Linux ES 6.1, 6.4, and 6.5, and SUSE Linux ES 11 SP3	▸ Windows 2008 R2 and Windows 7 ▸ Solaris 10 on SPARC ▸ Ubuntu 10.04, RedHat Linux ES 6.1, and SUSE Linux ES 11 SP3

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.

Changes in this Release

Updated SSL libraries

OpenSSL has released a security advisory, and the version of OpenSSL used by GemStone/S 64 Bit v3.2.3 has accordingly been updated to 1.0.1j.

Changes in use of #netldi specification in GEMSTONE_NRS_ALL

The Network Resource Syntax (NRS) defined by the GEMSTONE_NRS_ALL environment variable may include a specifications for #netldi, which defines a netldi name or port. If this is defined, this is the default name for the NetLDI, rather than gs64ldi. New functionality allows this to be further overridden.

Changes include the following:

startnetldi/stopnetldi default name may be taken from GEMSTONE_NRS_ALL setting

startnetldi and stopnetldi historically use a default name of gs64ldi. Now, if there is a GEMSTONE_NRS_ALL setting that defines #netldi in the environment in which startnetldi or stopnetldi is executed, this name is used for the default. If #netldi is not defined in GEMSTONE_NRS_ALL, the default gs64ldi is used.

gslist new argument and new default NetLDI for remote connections

When gslist uses the -m option to list processes on a remote host, it connects to a netldi running on that remote host. Previously, this was the default named gs64ldi; now, it will take the default from GEMSTONE_NRS_ALL.

gslist now includes the additional -N argument, specifying the netldi name to use when contacting a remote netldi.

The following is the precedence for how gslist determines the name of a remote netldi to contact:

1. a netldi with the name specified by the new -N argument to gslist.
2. a netldi with the name specified by a #netldi: setting in GEMSTONE_NRS_ALL
3. a netldi with the default name gs64ldi

Added GCI functions

The following GCI functions have been added:

`GciGetNetldiFromNrsAll`

```
If the environment variable GEMSTONE_NRS_ALL is defined,
conforms to NRS syntax, and defines a netldi name, return that
value in *result and function result will be TRUE. Ootherwise
store *result = '\0'; and function result is FALSE.
```

```
(BoolType) GciGetNetldiFromNrsAll(
   char* result,
   size_t resSize);
```

```
GciSetNetEx__
```

Similar to GciSetNetEx_, but includes an argument for netldiName.

```
(BoolType) GciSetNetEx__(
   const char *StoneName, const char *HostUserId,
   const char *HostPassword, const char *GemService,
   BoolType passwordIsEncrypted,
   char *errString, size_t maxErrSize,
   const char* netldiName);
```

New method in GsNetworkResourceString

A new method has been added to determine the netldi name from within the image:

`GsNetworkResourceString class >> systemNetLDIName`
Return the name of a #netldi defined in GEMSTONE_NRS_ALL in the environment of the Gem. If none is defined, return the defaultNetLDI name, gs64ldi.

Legal characters in NetLDI name

In past releases, the Stone name was restricted to POSIX compliant characters; A-Z, a-z, 0-9, and the characters period, underscore, and dash (. _ -). In this release, NetLDI names must also confirm to POSIX.

Note that while the Stone name may not be entirely numeric, a numeric NetLDI name is allowed, and interpreted as specifying the port.

Changes in Login logging

Changes in log file naming

The file created for login log records now includes a timestamp representing the time that this login log file was created.

Previously, the login log file was named
`<stoneName>_login.log`
now, it is
`<stoneName>_login_yyyy-MM-dd-HH:mm:ss.ffff.log`

for example:
`gs64stone_login_2014-09-07-18:03:33.834.log`

Action on log file write issues

If the stone cannot write to the login log file, due to path or permissions problems or other errors, the action taken depends on the setting for the new configuration parameter STN_LOGIN_LOG_HALT_ON_ERROR.

If this is true, the stone will perform a shutdown cleanly if the login log file record cannot be written. If it is false, the login log records will be discarded and the writes will be retried. A message will be printed to the stone log every 60 seconds in this case.

Creation of new log files

Previously, the login log file grew unbounded, and the user was responsible to archive and create new log files.

Now, a new log file is generated in the following cases:

- At each Stone startup
- When the file size exceeds the configured value for the new configuration parameter STN_LOGIN_LOG_MAX_SIZE, if this is not set to 0 (unlimited)
- When the user explicitly calls the new method System class >> startNewLoginLog

The following methods have been added:

`System class >> startNewLoginLog`
Tells the stone to close the current login log file and open a new one.

`System class >> loginLogFileName`
Returns a String containing the name of the current login log file, or nil if the login log file is not enabled.

Added configuration parameters

STN_LOGIN_LOG_HALT_ON_ERROR

Specifies the behavior of the stone if a write to the login log file fails. If this option is set to TRUE, the stone will shutdown if the login log file cannot be written due to lack of disk space or any other error. If this option is set to FALSE, the stone does not halt but a warning message is printed to the stone log.

Default: FALSE

STN_LOGIN_LOG_MAX_SIZE

Specifies the maximum size of the login log file in megabytes. Once the login log file reaches this size, it will be closed and a new login log file will be created. 0 means no file size limitation and the file size is not monitored by GemStone.

Default units: M Bytes (1 Megabyte = 1048576 bytes), suffixes KB, MB, GB may be used to specify units.
Default: 0 (no size limit)
Minimum: 0
Maximum: 1024

Added environment variable to control socket buffer sizes

New environment variables have been added to allow increasing the socket send and receive buffer sizes on the gem and GCI client. These settings do not affect other sockets and have no effect on linked gems. Socket tracing (using GEMSTONE_SOCKET_DEBUG) will display the buffer sizes in use.

GS_SOCK_SEND_BUF_SIZE
GS_SOCK_RECV_BUF_SIZE

To enable larger buffers, for a GCI client, set the environment variables in the environment of the GCI client; GCI main, RPC topaz, GBS, etc.

For a Gem, $GEMSTONE/sys/gemnetobject to a new file and enable the buffers in this custom gemnetobject file. You will also need to add the new file to $GEMSTONE/sys/services.dat.

Added methods for Socket buffer sizes

The following methods have been added to allow you to fetch/increase the size of the send and receive buffers. These methods apply to RPC sessions only.

On Linux only, the implementation of setsockopt() doubles the requested buffer size to account for overhead. So that the GsSocket methods to fetch buffer sizes return values that are consistent with the methods that set them, the fetch methods divide by two before returning. See the man page (socket(7)) for details. It is not recommended to modify the socket buffer socket on Linux, as that disables autotune.

`GsSocket class >> sendBufferSizeForClient`
: Returns the current size of the socket send buffer in bytes used by the RPC GCI client of the current session. This is the size of the socket buffer used by the client to send data to its gem. On Linux, this method accounts for the OS overhead and divides by 2 the result returned by getsockopt().

`GsSocket class >> sendBufferSizeForServer`
: Returns the current size of the socket send buffer in bytes used by the current session to send data to its client. This is the size of the socket buffer used by this process to send data to its client. On Linux, this method accounts for the OS overhead and divides by 2 the result returned by getsockopt().

`GsSocket class >> receiveBufferSizeForClient`
: Returns the current size of the socket receive buffer in bytes used by the RPC GCI client of the current session. This is the size of the socket buffer used by the client to receive data from its gem. On Linux, this method accounts for the OS overhead and divides by 2 the result returned by getsockopt().

`GsSocket class >> receiveBufferSizeForServer`
: Returns the current size of the socket receive buffer in bytes used by the current session to receive data from its client. This is the size of the socket buffer used by this process to receive data from its client. On Linux, this method accounts for the OS overhead and divides by 2 the result returned by getsockopt().

`GsSocket class >> sendBufferSizeForClient: newSize`
: Set the size of the socket send buffer used by the RPC GCI client of the current session to a new size. This is the size of the socket buffer used by the client to send data to its gem. newSize must be an even, positive SmallInteger that is larger than the current size.

`GsSocket class >> receiveBufferSizeForClient: newSize`
: Set the size of the socket receive buffer used by the RPC GCI client of the current session to a new size. This is the size of the socket buffer used by the client to receive data from its gem. newSize must be an even, positive SmallInteger that is larger than the current size.

`GsSocket class >> sendBufferSizeForServer: newSize`
: Set the size of the socket send buffer used by the current session to send data to its client. newSize must be an even, positive SmallInteger that is larger than the current size.

`GsSocket class >> receiveBufferSizeForServer: newSize`
Set the size of the socket receive buffer used by the current session to receive data from its client. newSize must be an even, positive SmallInteger that is larger than the current size.

Added methods to determine if the current session is linked or RPC

The following methods have been added:

`System class >> sessionIsRpc`
Answer true if the session and its client run in different operating system processes. Otherwise answer false.

`System class >> sessionIsLinked`
Answer true if the session and its client run in the same operating system process. Otherwise answer false.

Limit on threads for write set union sweep and epoch increased

Previously, the maximum threads that could be used for write set union sweep and epoch was 8. This has been increased to 32.

PrintStream >> print: added

The method PrintStream >> print: was added; this is for completeness, since the method was not inherited from WriteStream.

DateTime, DecimalFloat, and LargeInteger basicNew now allowed

These classes formerly disallowed instance creation using basicNew from server Smalltalk. For convenience of applications perform low-level operations, this is now permitted.

Added method _vmInstanceCountsReport: to report instance counts asString

The existing method System class >> _vmPrintInstanceCounts: writes instance counts to stdout for the process. A variant of this method has been added that writes the results to a string report. The arguments are the same as _vmPrintInstanceCounts:; see image for details.

```
System _vmInstanceCountsReport:
```

DateTime and Date methods undeprecated

The following methods were deprecated in a previous version, but have been undeprecated in this release:

DateTime>>dayOfMonth
DateTime>>dayOfMonthGmt
Date >> dayOfMonth
Date >> monthOfYear

copydbf target may now include NFS-mounted drives

Previously, copydbf to a remote NFS-mounted drive requires netldi to be running and appropriate authentication. Now, the target of copydbf may be an NFS-mounted drive.

Adding configuration parameter to control timeout on remote cache startup

The following configuration parameter has been added in this release:

STN_REMOTE_CACHE_STARTUP_TIMEOUT
Time in seconds allowed for startup of a remote shared cache. This is time from when first gem on the remote machine connects to the stone process until the remote cache completes its connection to the pagemanager thread in stone. Within this interval the first gem forks the remote cache and that cache has to create its shared memory.

A scaledTimeout is also computed based on size of a shared cache:

```
scaledTimeout := cacheSize <= 32GB
    ifTrue:[ (cacheSize / 32GB)  * 120]
    ifFalse:[ 120 + ((cacheSize - 32GB / 268GB) * 300) ]
```

If this scaledTimeout exceeds the configured value of STN_REMOTE_CACHE_STARTUP_TIMEOUT , the scaledTimeout is used for that cache.

Runtime equivalent: #StnRemoteCacheStartupTimeout
Minimum: 10
Maximum: 1800
Default: 60

Change in GEM_HALT_ON_ERROR configuration parameter

It was possible for an error to be triggered that incorrectly reported its number as 0 (See bug 44766 on page 15). This case could not be caught by GEM_HALT_ON_ERROR, since a 0 indicated not to halt.

To avoid this situation and allow debugging of similar cases, the default for GEM_HALT_ON_ERROR, which configures it not to halt on any errors, is now -1.

AUTH_ERR_SEG_READ_RECURSION now fatal error

The error AUTH_ERR_SEG_READ_RECURSION is now a fatal error, and has been renumbered from 2174 to 4015. This is related to bug #44630; see “SymbolGem startup failure during conversion” on page 15s.

Bugs Fixed

The following bugs have been fixed in this release.

Risk of page cache fault during backup

Some repository scan operations may leave stale data buffered in the Gem. If a fullBackup is then done in the same session, this may result in the backup encountering a page cache fault error. For example, an object audit, markForCollection, or listInstances, followed by a full backup in the same session, may encounter this error. (#44559)

Commit record backlog during write-set union sweep not clearable

The commit record in place at the start of the write-set union sweep cannot be disposed until the sweep is completed; this commit record is therefore "pinned" in place, which can create a commit record backlog.

f the Admin Gem is shut down during the sweep, the commit record was left pinned, and the commit record backlog continued to grow. Restarting the Stone clears the pinned commit record; however, the same problem reoccurred when the Admin Gem was restarted and retried the uncompleted write set union sweep. (#44574)

Nested transactions did not handle abort correctly

Nested transactions, which are logical units of work that are handled locally within an actual GemStone transaction, include abort and commit behavior to manage local state within the nested transaction. The abort operation does not correctly handle a transaction that had modified a large number of objects, so in some cases the restore of the previous state would be incorrect. (#44639)

Intermittent error from GCI transport layer

Version 3.2 included changes in the GCI transport layer. There was a bug in the buffer management which could occur intermittently without compression, or always with a large compressed traversal buffer, which triggered an error. (#44766)

GCI transport error could return 0

When bug #44766 was encountered, it could return error 0; the error information was lost during the unwind from the transport layer. Error #0 was not helpful, and could not be debugged using GEM_HALT_ON_ERROR. (#44755)

The default for GEM_HALT_ON_ERROR has been changed to -1; see page 14.

Conversion issues

SymbolGem startup failure during conversion

The restart during conversion may attempt to start the SymbolGem before the Stone is ready for login. (#44632).

It also may have failed with some invalid Segment (ObjectSecurityPolicy) configurations (#44630).

postConv performance improvement

After upgrade from 2.x, the postConv step converts SortedCollection sortBlocks to the new block format. The multi-threaded scan that detects the SortedCollection instances was throttled by page ordering of the results, which was especially noticeable on systems in which the repository fit into the cache. Now, the results are not ordered, which results in much faster performance. (#44610)

The postConv output in the $upgradeLogDir has changed. Now, multiple files per SortedCollection subclass are created, in a new subdirectory $upgradeLogDir/scbm/.

Bugs specific to new indexing API/features

GsQueryFormula class variable Dictionaries broken after a 2.X upgrade

After upgrade from 2.x, the class variable dictionaries in GsQueryFormula named ComparisonSelectorMap, InverseOperatorMap, and NegatedOperatorMap are corrupted. Attempts to lookup entries in them will failed with a #rtErrKeyNotFound error. (#44662)

Index update lookup errors with many nil values in Unicode indexes

When the indexed instance variable is nil in a Unicode String index, and there are a large number of sequential nils (sufficient to fill a leaf node in the btree), the nil values are not sorted correctly, and may not be found. This results in lookup errors when making updates to the index, such as when making changes to elements. (#44667)

Note that you must rebuild all indexes on any collection that is subject to this bug.

Optimization error on queries of the form (boolean expression) not

When an index is on a Boolean variable, query optimization reported an error for the legal grammatical construction '(each.booleanVar) not'. (#44516)

Indexes only used for first predicate of multiple-predicate query

With multiple predicate indexed queries, the first predicate is always evaluated first, and for performance should be the most restrictive. Later ones should be evaluated using indexes until the result set size is 1000 or less, at which point it switched to iteration. GsQuery evaluation inadvertently omitted the threshold, and as a result, all predicates after the first one were evaluated iteratively. (#44493)

auditIndexes errors on non-homogenous indexes

Using optionalPathTerms, you may specify an index using a path when not all elements include that instance variable. Such indexes would report errors in auditIndexes. (#44024)

Handling of GsIndexSpec indexes when an index already exists

When an index exists on a collection, and you attempted to create a new index using GsIndexSpec with the same path and type but with different options, the code in some cases did not detect the difference, and neither errored nor created a new index. (#44038)

Incorrect query results from queries in new API with multiple predicates on the same path using |

When multiple predicates use the same path and are joined using |, the optimization incorrectly treats then as if using AND rather than OR, and optimizes to false. This results in incorrect query results. (#44529)

GsQuery with multiple predicates and first range predicate results in #rtErrSubclassResponsibility error

Range queries may be specified in queries using GsQuery, of the form (var1 < each.path < var2). Legally, these may be combined with other predicates using & or |. However, combining a range predicate with another predicate, when the range predicate was first, resulted an rtErrSubclassResponsibility error due to an unimplemented method. (#44519)

Migrate or become of objects that participate in an index may error

Due to changes in indexing infrastructure in v3.2, Objects that participate in an index may encounter errors on migration or a become: operation. The error reported was a corrupt object error. (#44740)

Sessions may encounter unexpected errors in Unicode comparison mode

In Unicode comparison mode, comparison methods are installed into each session using transient method dictionaries. These were subject to in-memory GC. If this occurred, the legacy comparison code was used, with unexpected results. (#44727)

Remote Cache startup issues

Cache startup failures caused in-progress logins to pause rather than fail

When a gem login required a remote cache to be started up, but there were problems starting up the remote cache on that node, the in-progress login/s waited, rather than failing with an error. If sometime later, another gem logged in and cache startup succeeded, the paused logins would continue, although generally fail due to a socket error as a result of the delay. (#44711)

Network error during login treated as bad password, may disable user accounts

In an RPC login, after the SSL connection, any connection failures were being treated as bad password errors. So if there was a network error (for example, due to bug #44711 above), the Stone treated this as if it was a login failure due to a incorrect password. This could result in the account being disabled, as configured after a certain number of incorrect password login attempts. (#44714)

Remote cache startup hang on tranlog full

When a gem login required a remote cache to be started up, and due to repository security configuration a commit is needed during gem login, and the repository's transaction logs are full, the remote cache startup hung. This hang did not recover once transaction log space became available again. (#44699)

Login with gem on remote node failed under certain configurations

When starting a remote shared page cache and specifying the netldi by port rather than by name in the NRS, and the NetLDI did not have the default name gs64ldi, the netldi identifier was not propagated correctly to the remote host. During the remote login process, when the remote host contacted the stone's host to create the page server for the remote cache, it used the default NetLDI name, gs64ldi. If the NetLDI on the stone's host was running with a name other than gs64ldi, it was not able to connect, and the remote login failed. (#44591)

Log file locations for remote session spawned processes

When a remote session logs in, the spawned processes (gem process spawned by gemnetobject, pgsvr process, remote cache process, etc.) create a number of log files. The rules governing these log file locations have been change and are better defined. (#44686)

The rules governing the precedence of log file locations are:

1. #log in NRS of gemnetobject parameter, if it includes both $/ and %P, and the %P comes after the last $/. This pattern is used to create specific log file names.
2. #dir in NRS of gemnetobject parameter
3. #dir in GEMSTONE_NRS_ALL in environment of GCI client,
4. #dir in GEMSTONE_NRS_ALL in environment of the NetLDI which forks the process.
5. home directory of the UNIX user as which the process is running.

Some system log files in wrong location

A #dir specification in the GEMSTONE_NRS_ALL in the stone’s environment would cause system log files other than the Stone and PageManager logs to be written in the directory specified by #dir. (#44538)

Hot standby issues

Hot standby slave lagged behind primary

A hot standby system receives transaction records from a primary and replays them as they occur, although records that do not contain application data may not be immediately replayed (e.g., "bookkeeping" records). The primary stone did not correctly flush the tranlog for each tranlog record, so the standby system was behind by at least one tranlog record from the primary system. (#44687)

Tracking progress of tranlog records in hot standby using

In a hot standby slave system, previously the statistics RecoverTranlogFileId and RecoverTranlogBlockId were not usable to track the restore progress, since they were reset after each block. Now, the statistics are not reset and can be used to track progress. (#44683)

Stepping iteratively through block drops into iteration support code

When stepping though a iteration block, execution would step back into the iteration code rather than staying within the block. (#44588)

SignalException during ensure block causes ensure block to be restarted

If an exception is signaled while the code in an ensure block is being executed, and if the exception is not resumable or the exception handler does not end with a #resume, the ensure block will be restarted. (#44675)

Exception handler frame locate error

When an exception is resumed with no handler on the stack, and there are at least two handlers on the stack with non-standard handler classes, then the handling code may fail to find the handler frame. This resulted in an ImproperOperation, error #2717. (#44745)

Distribution .so files missing execute permissions

Some of the .so files included in the product distribution did not have correct permissions; they were missing execute permission. (#44597)

_classDefiningClassVar: returned nil for class var defined on superclass

The method Class >> _classDefiningClassVar: correctly returned the receiver when the argument was a class variable defined on the receiver. But if the class variable was defined on one of the receiver's superclasses, this method incorrectly returned nil. (#44684)

Removing nil from collections not always handled correctly

Nil is not a valid value for several types of collection, such as KeyValueDictionaries and Sets. Attempting to remove nil from such a collection would sometimes get the correct error #rtErrNilKey (2090), but sometimes it would behave as if the object was not present in the collection. (#44625)

topaz errorcount not incremented if input command fails

topaz errorcount should be incremented when any error occurs, both Smalltalk and topaz errors. Errors in the input command such as file not found where not causing the errorcount to be incremented. (#44647)

Duration printString does not handle all kinds of fractional seconds

Duration seconds that were expressed as a Fraction. ScaledDecimal, or FixedPoint, rather than a floating point, encountered a message not understood exception from printString. (#44513)