GemStone®

GemBuilder® for Java™ Installation Guide

Version 3.1.1

April 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

This document provides instructions for installing GemBuilder® for Java™ version 3.1.1. You should read through this document before beginning installation or upgrade.

Please also read through the changes in this release, which are described in the *GemBuilder for Java Release Notes* for version 3.1.1.

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

Other Useful Documents

- The *Javadocs* that are provided with the GemBuilder for Java product distribution are a key source of up-to-date information on GemBuilder for Java functionality.
- *GemBuilder for Java Tools Guide* describes the independent set of tools that let you explore and modify Smalltalk code in the server.
- *GemBuilder for Java Programming Guide* describes how to develop java based applications that interface with a GemStone server.
- The *Programming Guide* for the GemStone server describes GemStone and the GemStone Smalltalk language.
- If you will be acting as a system administrator, or developing software for someone else who must play this role, you should read the *System Administration Guide* for the GemStone server.

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

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

- **Documentation** for released versions of GemTalk products, in PDF form.
- **Downloads**, including current and recent versions of GemTalk products.
- **Bugnotes**, identifying performance issues or error conditions.
- **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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Requests for technical assistance may be submitted online, by email, or by telephone.

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 GemBuilder for Java, JDK, and of all related GemTalk products, and of any other related products, and 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.

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Chapter 1

Installing GemBuilder for Java

This Installation Guide describes how to install GemBuilder for Java (GBJ) into a GemStone/S 64 Bit Repository, and how to configure Java clients to log in to the GemStone Repository using GBJ.

This version of GemBuilder for Java supports GemStone/S 64 Bit v3.2 and later only.

For details on the changes in this version of GBJ, see the *GemBuilder for Java Release Notes* for version 3.1.1.

The GemBuilder for Java installation process includes installing the GBJ interface files into the GemStone repository, and configuring your system to allow a GBJ Java application to log into GemStone. You need only install the GBJ interface files into the server once for each release of GBJ, but each Java client must be configured for login.

System Requirements

GemStone Server Product and Platform

A supported GemStone object server version, installed on a network-accessible host. GemBuilder for Java version 3.1.1 is supported with GemStone/S 64 Bit version 3.2 and later only.

Supported platforms for the GemStone/S 64 Bit version 3.2 are provided in the *GemStone/S 64 Bit version 3.2 Installation Guide.*

Server keyfile

With GemStone/S 64 Bit v3.2 and GemBuilder for Java 3.1.1, authorization for using GBJ is now provided by the GS/64 keyfile. Your GemStone server must be started using a keyfile that provides authorization for GBJ in order to use GBJ. New keyfiles are required for v3.2. If you are licensed to use GBJ, you should receive a keyfile with the appropriate authorization. Contact GemStone Technical Support, or write to keyfiles@gemtalksystem.com, if you have issues or questions.

Operating System

You may run GBJ clients on a platform other than the GemStone server platform, provided you use the appropriate client libraries for your GemStone server version and the client platform.

GemBuilder for Java version 3.1.1 is tested and supported on the following platforms, for the specified GemStone/S 64 Bit server version:

GemStone/S 64 Bit 3.2
▸ Solaris 10 and 11 on SPARC ▸ Solaris 10 on x86 ▸ AIX 6.1 and AIX 7.1 ▸ Red Hat Linux ES 6.1 on x86 ▸ Ubuntu 10.04 on x86 ▸ Mac OSX 10.6.4 with Darwin 10.4.0 on x86

Java JDK

- A Java development environment. This release was built and tested with Java Development Kit (JDK) version 1.7.0_51. Later versions of the JDK are expected to work.

Installing GemBuilder for Java into the GemStone Server

The following instructions describe installing the GemBuilder for Java Smalltalk code into your GemStone/S 64 Bit repository. Once the GemBuilder for Java code is installed, you will configure your client machines to log in to this repository.

If you are upgrading from an older version of GemBuilder for Java, follow this process to install version 3.1.1.

Prepare for Installation

1. Select an installation directory, *installdir*, and make this directory the current working directory.

   You can install GemBuilder for Java in any directory. We recommend installing GBJ at the same level as the GemStone server installation directory. You will need about 6 MB of free disk space.

2. GemBuilder for Java is provided as a zipped archive file, `GemBuilderJava3.1.1.zip`. Move this distribution file to the directory location in which GemBuilder for Java will be installed.

3. Unzip the distribution file using unzip.

   InstallDir now contains a GemStone directory with a name similar to `GemBuilderJava3.1.1`. In the instructions that follow, we refer to this directory as *gbj_directory*.

   gbj_directory includes the following:

version.txt
README.txt
PACKING.txt - list of file contents
gbj311.jar - the Java class library
gbjopensrc311.jar - class library containing open source libraries
GbjTest.zip - example Android application
README.android.txt - readme for Andriod application
doc - directory containing GemBuilder for Java javadocs documentation:
    index.html - the entry point for the online javadocs documentation
    api - directory containing support files for the online javadocs documentation.
    copyinfo.html - intellectual property ownership information
    GemStone-License.pdf - license agreement, if not covered by a specific license.
    open_source_licenses.txt - licenses for open-source components.
    sources.html - Further information and GemStone Technical Support
server - directory containing:
    GbjFileinReader.gs
    GbjGciForwarder.gs
    GbjGciInterface.gs
    GbjHypericServerTemplate.xml
    GbjHypericServiceTemplate.xml
    GbjJmxCommandsTemplate.dat
    GbjJmxSystemStatsTemplate.dat
    GbjToolsInterface.gs
    install.gs

Environment Setup

GemBuilder for Java version 3.1.1 requires several environment variables to be set prior to installation, including the path.

1. The GEMSTONE environment variable, $GEMSTONE, should be set to the GemStone server installation directory. This is described in the GemStone server documentation. To verify that this is set correctly, use the echo command.

   For example, on a platform running Linux:

   ```
   % echo $GEMSTONE
   /users/GemStone64Bit3.2.0-x86_64.Linux
   ```

2. Your path should include the path for the Gemstone Server executables, $GEMSTONE/bin.

3. $GBJ should be set to the GemBuilder for Java installation directory.

   C shell:

   ```
   % setenv GBJ gbj_directory
   ```

   Bash, Bourne or Korn shell:

   ```
   $ GBJ=gbj_directory
   $ export GBJ
   ```

Installing GemBuilder for Java into your Repository

1. If necessary, start up the GemStone repository monitor (Stone). You may also want to start a NetLDI for use later in testing the GBJ installation.
2. At a command prompt, **cd** to a working directory, in which you want the installation log to be created. You must have write permission for this directory.
3. Log in to the GemStone server as SystemUser, using linked Topaz. Use the **-i** switch, which keeps Topaz from reading any initialization file you might have. For instance:

```
prompt> topaz -i -l
topaz> set gemstone gs64stone
topaz> set user SystemUser password swordfish
topaz> login
successful login
```

4. File in the server component, which is located in the `server` directory of the GemBuilder for Java installation tree.

   For example:

   ```
   topaz 1> input $GBJ/server/install.gs
   ```

   During the file-in operation, output is directed to the file `Gbj311ServerFilein.log` in the current directory.

   The file-in operation should end with a message that the errorcount is 0. If errorcount is not 0, errors have occurred; contact GemStone Technical Support, providing the file `Gbj311ServerFilein.log` as well as details about the installation process.

5. Exit Topaz:

   ```
   topaz 1> quit
   ```

Your GemStone server is now ready for use by GemBuilder for Java clients.

Client Setup

Preliminaries

1. Verify that TCP/IP networking software is up and running on your client machine, and that there is a network path to the Stone's host.

   For example:

   Solaris:

   `% /usr/sbin/ping` *hostname* **`1 1`**

   AIX:

   `% /etc/ping` *hostname* **`8 1`**

   Linux:

   `% /bin/ping -c 1` *hostname*

Darwin/Mac:

```
% /sbin/ping -c 1 hostname
```

where *hostname* is the name of your node or the Stone host. If ping responds with statistics or "*hostname* is alive," you have verified that TCP/IP is functional.

Copy GBJ files to the client

If you are running the GBJ client on the same machine as the GemStone server, you can set your CLASSPATH and PATH or LD_LIBRARY_PATH to existing GBJ and server installation directories. However, if you are running the GBJ client on a separate machine, you will need to set up the client machine with the correct files.

1. Get the required GBJ jar files

   If you are running the GBJ client on the same machine as the server, use the existing location configured in $GBJ.

   If the GBJ client is on a different machine, install the GBJ distribution on the client. You may install these from the distribution archive as was done on the server, as described on page 8. You may also copy these files from the server installation.

   The required files from the GBJ distribution are the jar files, `gbj311.jar` and `gbjopensrc311.jar`. However, the javadocs provide key documentation for GBJ functions and should also be copied to the client.

   The directory containing the GBJ jar files accessible to the client will be referred to as *gbj_jar_dir*.

2. Get the correct GBJ and GCI client shared libraries

   The GBJ clients require access to both the GCI shared libraries and the GBJ shared library. All these shared libraries are specific to the server product and version and to the client platform.

   The GBJ shared libraries are also specific to the version of GBJ. They have a name of the form:

   `libgbjgci`*GbjVersion*`-`*ServerVersion*`-64.`*extension*

   To indicate the GBJ and GemStone/S 64 Bit version numbers.

   If you are running the GBJ client from a machine other than the GemStone server machine, copy the GCI client libraries to a location accessible from the client machine. If this is a different platform than the one the GemStone server is running on, you may need to use the GemStone server distribution for a platform other than your server platform to locate the correct libraries. Contact GemStone Technical Support if you cannot locate the correct client libraries.

   The client libraries are located in the directory `$GEMSTONE/lib` on UNIX or Linux. The following files are required:

   ```
   libgbjgci311-3.2.0-64.so
   libgcirpc3.2.0-64.so
   libssl-3.2.0-64.so
   ```

   There are also linked versions of the GCI client libraries, which you may use in custom GBJ applications. The GBJ tools support only RPC logins.

Note that only 64-bit applications are supported with GBJ.

The directory containing the server GBJ and GCI shared library files will be referred to as *shared_library_dir*.

Environment variables

1. The CLASSPATH environment variable must include the GBJ Tools class library, `gbj311.jar`, and the open source library `gbjopensrc30.jar`. These must be in a directory accessible from the client, as described above in "Get the required GBJ jar files" on page 11.

   To set the CLASSPATH on UNIX or Linux:

   C shell:

   ```
   % setenv CLASSPATH
   $JDK/lib:gbj_jar_dir/gbj311.jar:gbj_jar_dir/gbjopensrc311.jar
   ```

   Bash, Bourne or Korn shell:

   ```
   $ CLASSPATH=
   $JDK/lib:gbj_jar_dir/gbj311.jar:gbj_jar_dir/gbjopensrc311.jar
   $ export CLASSPATH
   ```

2. Set the shared library path environment variable to include the client library directory, *shared_library_dir,* as described above in "Get the correct GBJ and GCI client shared libraries" on page 11.

   On UNIX and Linux, the `LD_LIBRARY_PATH` environment variable must include the directories containing the GCI and GBJ shared libraries. For example:

   C shell:

   ```
   % setenv LD_LIBRARY_PATH shared_library_dir/lib
   ```

   Bash, Bourne or Korn shell:

   ```
   $ LD_LIBRARY_PATH=shared_library_dir/lib
   $ export LD_LIBRARY_PATH
   ```

3. If you have not already done so, add the Java executable directory to the path. To use the GBJ tools, you must have the Java executable directory, such as the JDK bin directory, on your path.

   To set this on UNIX or Linux, for example

   C shell:

   ```
   % set path=($JDK/bin $path)
   ```

   Bash, Bourne or Korn shell:

   ```
   $ PATH=$JDK/bin:$PATH
   $ export PATH
   ```

Start up the GBJ Launcher and log into GemStone

1. Invoke the GBJ Tools Launcher, **`com.gemstone.tools.GbjLauncher.`**

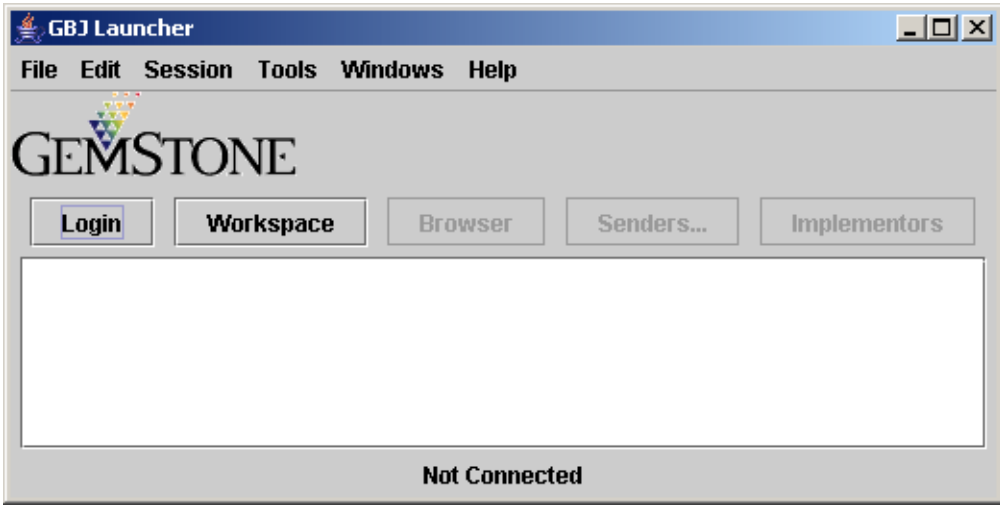
   This tool supports the following options on the command line:

   - `help` — print a help message (to standard output)
   - `version` — print GBJ version information
   - `UseLogFile` *filename* — write log output to the specified file
   - `NoFileLogger` — send log output to standard output rather than to a file
   - `UsePrefFile` *filename* — use the specified file for the preferences file
   - `NoPrefFile` — do not load or save a preferences file

   To invoke the GBJ Tools Launcher:

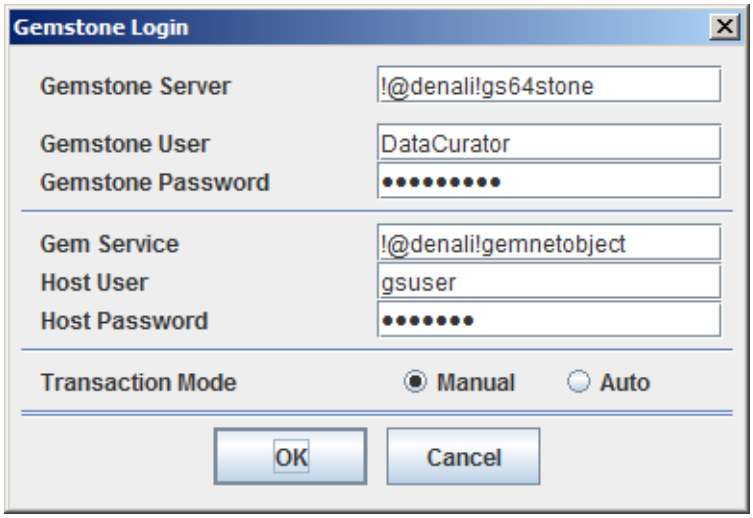
   ```
   prompt> java -d64 com.gemstone.tools.GbjLauncher [options]
   ```

   This opens the GBJ Tools Launcher



To log in to GemStone, you must have a GemStone server and NetLDI running on the GemStone server machines.

2. In the Tools Launcher, click **Login** to begin a session. A Session Parameters Dialog appears, prompting you for the session parameters.



3. Fill in the session parameters, as described in Table 2. When you're done, click **Ok**.

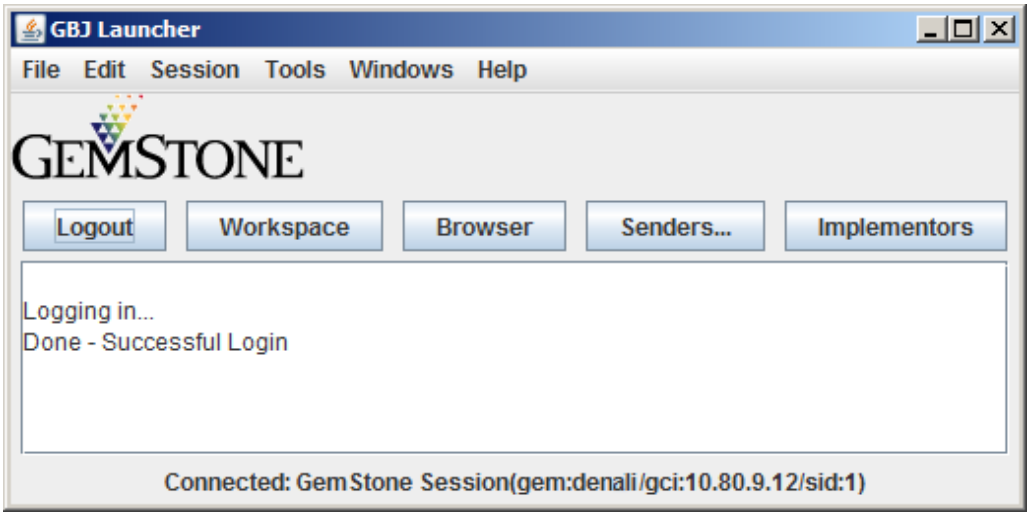
Table 2 Session Parameters

Parameter	Description
GemStone Server	(Required.) The name of the Stone process. For a Stone running on a remote server, be sure to include the server's hostname in Network Resource String (NRS) format. For example, for a Stone process called 'gs64stone' running on node 'handel', you would specify this NRS string: !@handel!gs64stone For more information on Network Resource Strings, see the *System Administration Guide* for your GemStone server.
GemStone User	(Required.) Your GemStone username, such as DataCurator.
GemStone Password	(Required.) Your GemStone password.
Gem Service	The default is **gemnetobject**, which is not shown; if you are running with the default NetLDI on the same machine as the Stone, you may leave this unchanged. Otherwise, include the appropriate information in NRS format. For example, with the Stone example above, you would specify this NRS string for the Gem Service: `!@handel!gemnetobject`

Table 2 Session Parameters (continued)

Parameter	Description
Host User	The username for your account on this machine. Host authentication may be omitted if you are using another method of network authentication. See the *System Administration Guide* for your GemStone server for more information on the options.
Host Password	The password for your unix account.
Transaction Mode	One of the following: **Auto** — Places your session in a GemStone transaction and starts a new one each time you commit or abort. **Manual** — You must explicitly begin transactions before making changes that you want to commit.

4. A successful login results in the event being recorded in the Launcher's Text Pane, which serves as a transcript. Additional buttons are activated, and the **Login** button becomes **Logout**.



After you have successfully logged in to the GemStone server, you have verified that your GemBuilder installation is correct. To end the session, click **Logout**. To close the launcher, choose **File > Exit**.

If the login attempt did not succeed, examine the error message to determine the reason. To change your session parameter settings and try again, click **Login**.

For more information on login parameters, see the *GemBuilder for Java Programming Guide* and the *GemBuilder for Java Tools Guide*.

The *GemBuilder for Java Tools Guide* provides more information on using the GBJ tools available from the GBJ Launcher.