GemStone®

GemBuilder® for Java™ Installation Guide

Version 3.0

September 2010

GemStone™

INTELLECTUAL PROPERTY OWNERSHIP

This documentation is furnished for informational use only and is subject to change without notice. GemStone Systems, Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in this documentation.

This documentation, or any part of it, may not be reproduced, displayed, photocopied, transmitted, or otherwise copied in any form or by any means now known or later developed, such as electronic, optical, or mechanical means, without express written authorization from GemStone Systems, Inc.

Warning: This computer program and its documentation are protected by copyright law and international treaties. Any unauthorized copying or distribution of this program, its documentation, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted under the maximum extent possible under the law.

The software installed in accordance with this documentation is copyrighted and licensed by GemStone Systems, Inc. under separate license agreement. This software may only be used pursuant to the terms and conditions of such license agreement. Any other use may be a violation of law.

Use, duplication, or disclosure by the Government is subject to restrictions set forth in the Commercial Software - Restricted Rights clause at 52.227-19 of the Federal Acquisitions Regulations (48 CFR 52.227-19) except that the government agency shall not have the right to disclose this software to support service contractors or their subcontractors without the prior written consent of GemStone Systems, Inc.

This software is provided by GemStone Systems, Inc. and contributors “as is” and any expressed or implied warranties, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose are disclaimed. In no event shall GemStone Systems, Inc. or any contributors be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of the use of this software, even if advised of the possibility of such damage.

COPYRIGHTS

This software product, its documentation, and its user interface © 1986-2010 GemStone Systems, Inc. All rights reserved by GemStone Systems, Inc.

TRADEMARKS

GemStone, **GemBuilder**, **GemConnect**, and the GemStone logos are trademarks or registered trademarks of GemStone Systems, Inc. in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Sun, **Sun Microsystems**, **Solaris**, and **SunOS** are trademarks or registered trademarks of Sun Microsystems, Inc. All **SPARC** trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. **SPARCstation** is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

HP and **HP-UX** are registered trademarks of Hewlett Packard Company.

Intel and **Pentium** are registered trademarks of Intel Corporation in the United States and other countries.

Microsoft, **MS**, **Windows, Windows XP, Windows 2000**, **Windows 2003**, and **Windows Vista** are registered trademarks of Microsoft Corporation in the United States and other countries

Linux is a registered trademark of Linus Torvalds and others.

Red Hat and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries.

AIX and **POWER4, POWER5**, and **POWER6** are trademarks or registered trademarks of International Business Machines Corporation.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries.

Other company or product names mentioned herein may be trademarks or registered trademarks of their respective owners. Trademark specifications are subject to change without notice. All terms mentioned in this documentation that are known to be trademarks or service marks have been appropriately capitalized to the best of our knowledge; however, GemStone cannot attest to the accuracy of all trademark information. Use of a term in this documentation should not be regarded as affecting the validity of any trademark or service mark.

GemStone Systems, Inc.
1260 NW Waterhouse Avenue, Suite 200
Beaverton, OR 97006

Preface

About This Documentation

This document provides instructions for installing GemBuilder® for Java™, Version 3.0. GemBuilder for Java version 3.0 includes substantial internal redesign and has significant changes from previous versions. You should read through this document, as well as the *GemBuilder for Java Release Notes*, before beginning the installation or upgrade process.

This installation guide is also available on the GemStone customer support website, as described in following sections.

GemBuilder for Java tools may be used with both 32-bit GemStone/S and GemStone/S 64 Bit. The term "GemStone" may be used to refer to any GemStone server product, as well as to the company, GemStone Systems, Inc.

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 GemStone/S or GemStone/S 64 Bit describes the GemStone System 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 GemStone/S or GemStone/S 64 Bit.

Technical Support

GemStone's Technical Support website provides a variety of resources to help you use GemStone products.

GemStone Web Site: http://support.gemstone.com

Use of this site requires an account, but registration is free of charge and provides immediate access.

All GemStone product documentation is provided in PDF form on this website. Documentation is also available at

http://www.gemstone.com/documentation

In addition to documentation, the support.gemstone.com website provides:

- Bugnotes, identifying performance issues or error conditions that you may encounter when using a GemStone product.
- TechTips, providing information and instructions that are not otherwise included in the documentation.
- Compatibility matrices, listing supported platforms for GemStone server 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.

Requests for technical assistance may be submitted online, or 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: http://techsupport.gemstone.com

Email: support@gemstone.com

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

Your GemStone support agreement may identify specific designated contacts who are responsible for submitting all support requests to GemStone. If so, please submit your information through those individuals.

If you are reporting an emergency by telephone, select the option to transfer your call to the Technical Support administrator, who will take down your customer information and immediately contact an engineer. Non-emergency requests received by telephone will be placed in the normal support queue for evaluation and response.

When submitting a request, please include the following information:

- Your name, company name, and GemStone server license number.
- 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.

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

24x7 Emergency Technical Support

GemStone 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 your GemStone account manager.

Training and Consulting

Consulting and training for all GemStone products are available through GemStone's Professional Services organization. GemStone periodically offers training courses at our offices in Beaverton, Oregon, or training can be arranged at your location. Contact your GemStone account representative for more details or to obtain consulting services.

Contents

Chapter 1. Installing GemBuilder for Java

System Requirements 9
Installing GemBuilder for Java into the GemStone Server. 10
Prepare for Installation. 11
Environment Setup 11
Installing GemBuilder for Java into your Repository. 12
Client Setup 13
Preliminaries 13
Copy GBJ files to the client 13
Environment variables 15
Start up the GBJ Launcher and log into GemStone 16

Chapter 1

Installing GemBuilder for Java

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

If you are upgrading from an earlier version, note that v3.0 of GemBuilder for Java includes substantial internal redesign and significant changes. For details on the changes in this version of GBJ, see the *GemBuilder for Java Release Notes* for version 3.0.

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 3.0 is compatible with 32-bit GemStone/S versions 6.5 and above, and GemStone/S 64 Bit versions 2.4 and above.

GemBuilder for Java v3.0 has been tested with the following server versions:

- GemStone/S 6.5.7
- GemStone/S 64 Bit version 2.4.4

Supported platforms for the GemStone Object Server are provided in the Installation Guide for your Server product.

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.

Supported client operating systems are:

- GBJ v3.0 clients are supported with the **GemStone/S v6.5.7** server on:
  - Solaris 2.9 and 2.10
  - AIX version 5.3 and 6.1
  - Linux Red Hat ES 5.0
  - Windows XP, Windows 2003, and Windows Vista
- GBJ v3.0 clients are supported with the **GemStone/S 64-Bit** v2.4.4 server on:
  - Solaris 2.9 and 2.10 on SPARC
  - HP-UX version 11.11 and 11.31 on PA-RISC
  - AIX version 5.3 and 6.1
  - Linux Red Hat ES 5.0 and SuSE ES 10

Java

- A Java development environment. This release was built and tested with Java Development Kit (JDK) version 1.6.0_14. Earlier and later versions of the JDK are expected to work.

Disk Space

- Approximately 6 MB of free disk space to hold the GemBuilder for Java distribution files.

Ram

- Approximately 8 MB per logged-in Tools session.

Display System

- Support for at least 256 colors (8 bits).

Installing GemBuilder for Java into the GemStone Server

The following instructions describe installing the GemBuilder for Java Smalltalk code into your GemStone / S or 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 3.0. Version 3.0 classes have been renamed, so earlier version of GBJ will not be affected. Both version 3.0 GBJ clients and earlier GBJ clients can log into the same repository at the same time, although only from separate client java application.

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, `GemBuilderJava3.0.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 `GemBuilderJava3.0`. 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
   `gbj30.jar` - the Java class library
   `gbjopensrc30.jar` - class library containing open source libraries
   `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
   - `licenses.txt` - license agreement, if not covered by a specific license.
   - `sources.html` - Further information and GemStone Technical Support

   `server` - directory containing:
   - `GbjFileinReader.gs`
   - `GbjGciForwarder.gs`
   - `GbjGciInterface.gs`
   - `GbjToolsInterface.gs`
   - `install.gs`

Environment Setup

GemBuilder for Java version 3.0 requires several environment variables to be set prior to installation, including the path.

1. The GEMSTONE environment variable, $GEMSTONE or %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, for example for a platform running HP-UX:

   ```
   % echo $GEMSTONE
   /users/GemStone6.5.7-hppa.hpux
   ```

   or for Windows:

   ```
   c:\> echo %GEMSTONE%
   c:\gemstone\GemStone6.5.7-x86.Windows_NT
   ```

2. Your path should include the path for the Gemstone Server executables, $GEMSTONE/bin or %GEMSTONE%\bin.
3. $GBJ or %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
   ```

   On Windows, you may set this using the System control panel, or execute the following:

   ```
   c:\> set GBJ=gbj_directory
   ```

Installing GemBuilder for Java into your Repository

1. If necessary, start the GemStone repository monitor on the repository with which you want to use GemBuilder for Java. You may also want to start a NetLDI for use later in testing the GBJ installation.
2. At a command prompt, change (**cd**) to a working directory where 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 gemserver65
   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 instance, on UNIX or Linux:

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

   Or on Windows:

   ```
   topaz 1> input %GBJ%\server\install.gs
   ```

   During the file-in operation, output is directed to the file `Gbj30ServerFilein.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 `Gbj30ServerFilein.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.

   In order for GemBuilder for Java to connect to GemStone, TCP/IP must be functional. Verify that TCP/IP networking software is up and running on your workstation and on the machine where the Stone is running. Issue the **ping** command for your workstation and again for the Stone host, if different. For instance:

   Solaris:

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

   HPUX and AIX:

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

   Linux:

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

   Windows:

   `c:\>` `ping -n 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. GBJ files required for the client

   If you are running the GBJ client on the same machine as the server, use the existing location, which is $GBJ or %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 11. You may also copy these files from the server installation.

   The required files from the GBJ distribution are the jar files, `gbj30.jar` and `gbjopensrc30.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 client shared library

   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.

The GBJ shared libraries are distributed with the server, however, the ones that are distributed with the currently supported server versions are not compatible with GBJ v3.0. You will need to contact GemStone Technical Support for the correct GBJ shared libraries for GBJ 3.0. Please specify the client platform and the GemStone server product and version.

The GBJ shared library file names for the supported platforms are:

Solaris, Linux, and AIX: `libgbjgci30.so`

HP-UX: `libgbjgci30.sl`

Windows: `gbjgci30.dll`

The shared library must be in a location accessible to the client; normally the same directory as the GCI shared libraries. This directory will be referred to as *shared_library_dir*.

3. Locate and copy the client GCI shared libraries.

   The GBJ shared library uses the GCI interface to GemStone, and requires access to the GCI shared libraries distributed with the server. You must use the correct GCI client library for your client platform and for your GemStone server product and version.

   If you are using GBJ on a separate machine from the GemStone server, 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, or `%GEMSTONE%\bin` on Windows. See Table 1 on page 15 for the specific client library filenames required.

   If you have the GemStone server installed on the same machine that you will be running the GBJ client, you can use the existing location, `$GEMSTONE/lib` or `%GEMSTONE%\bin`.

   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.

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

   The following table lists the names of the required shared library files, including the GBJ shared libraries and the GCI shared libraries.

Table 1 Client Shared Libraries

	Solaris, Linux, and AIX	HP-UX	Windows

GemStone/S 64 Bit v2.4.4	`libgbjgci30.so`
	`libgcirpc.so`
	`libgcirpc244.so`
		`libgbjgci30.sl`
		`libgcirpc.sl`
		`libgcirpc244.sl`
			`libgbjgci30.dll`
			`libgcirpc.dll`
			`libgcirtl64-244.dll`
			`libgs64-244.dll`

GemStone/S 6.5.7	`libgbjgci30.so`
	`libgcirpc.so`
	`libgcirpc65.so`
			`gbjgci30.dll`
			`gcirw65.dll`
			`gcitw65.dll`
			`gsw65.dll`

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.

Environment variables

1. The CLASSPATH environment variable must include the GBJ Tools class library, `gbj30.jar`, and the open source libraries, `gbjopensrc30.jar`. These must be in a directory accessible from the client, as described above in "GBJ files required for the client" on page 13.

   To set the CLASSPATH on UNIX or Linux:

   C shell:

   ```
   % setenv CLASSPATH gbj_jar_dir/gbj30.jar:gbj_jar_dir/gbjopensrc30.jar
   ```

   Bash, Bourne or Korn shell:

   ```
   $ CLASSPATH=gbj_jar_dir/gbj30.jar:gbj_jar_dir/gbjopensrc30.jar
   $ export CLASSPATH
   ```

   On Windows, you may set this using the System control panel, or execute the following:

   ```
   c:\> set CLASSPATH=gbj_jar_dir\gbj30.jar;gbj_jar_dir\gbjopensrc30.jar
   ```

2. Set the environment variable to include the client library directory, *shared_library_dir*, as described above in "Get the correct GBJ client shared library" on page 13 and "Locate and copy the client GCI shared libraries." on page 14.

   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
   ```

On Windows, the %PATH% environment variable must include the directories containing the GCI and GBJ shared libraries. You may set this using the System control panel, or execute the following:

```
c:\> set PATH=%PATH%;shared_library_dir\bin
```

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=(/users/jdk1.6.0_14/bin $path)
   ```

   Bash, Bourne or Korn shell:

   ```
   $ PATH=/users/jdk1.6.0_14/bin:$PATH
   $ export PATH
   ```

   On Windows, you may set this using the System control panel, or execute the following:

   ```
   c:\> set PATH=%PATH%;C:/jdk1.6.0_14/bin
   ```

Start up the GBJ Launcher and log into GemStone

1. Invoke the GBJ Tools Launcher.

   32-bit platforms:

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

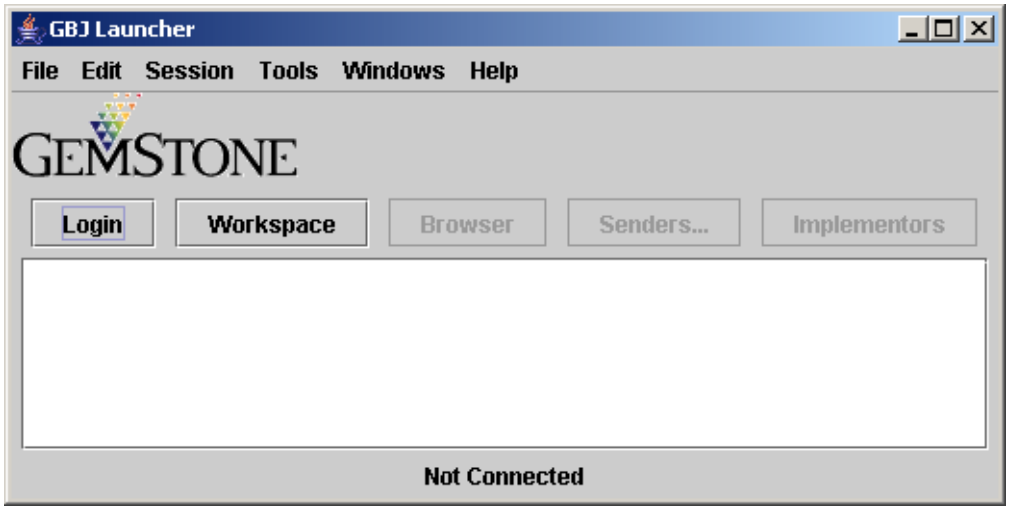
   64-bit platforms:

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

   This opens the GBJ Tools Launcher (Figure 1.1). You may specify the following command line options:

   - `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

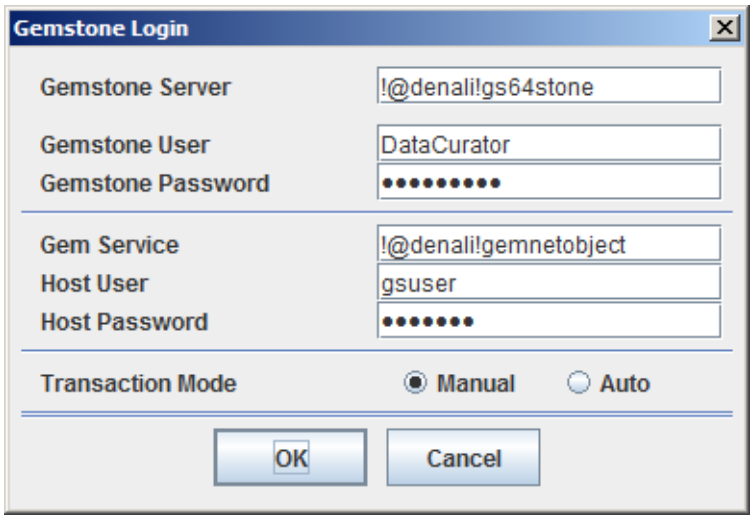
Figure 1.1 The Tools Launcher



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 (Figure 1.2), prompting you for the session parameters.

Figure 1.2 The Session Parameters Dialog



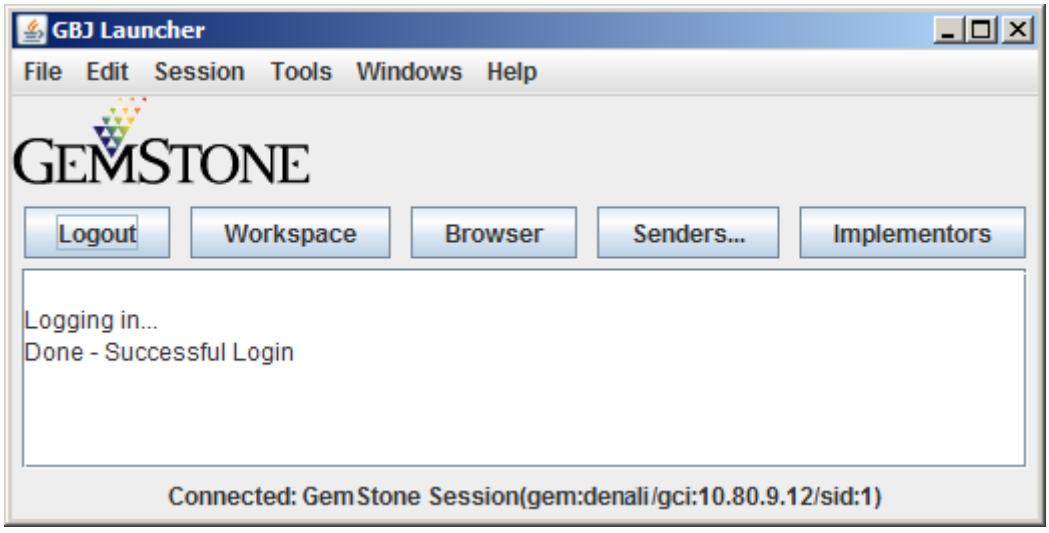
3. Fill in the session parameters, as described in Table 2. When you're done, click **Ok**.

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 'gemserver65' running on node 'handel', you would specify this NRS string: !@handel!gemserver65 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	Specify **gemnetobject** (the initial default, but not shown) or **gemnetobjcsh** (32-bit GS/S only, for C-Shell users on UNIX hosts). If you are running on a machine remote for the GemStone server, you should include the server's hostname in NRS format. For example, with the Stone example above, you would specify this NRS string for the Gem Service: !@handel!gemnetobject
Host User	The username for your account on this machine. This username and password are required unless your GemStone server installation uses another method of providing network authentication, such as a `.netrc` file or running the NetLDI in guest mode with a captive account. For details, see the *System Administration Guide* for your GemStone server.)
Host Password	The password for your 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** (Figure 1.3).

Figure 1.3 The Launcher After Login



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. Also examine the file `gbjbroker.log`. 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*.