
GemStone[®]

GemBuilder[®] for Java Installation Guide

for UNIX and Linux platforms

October 2006

Version 2.2



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 © 1986-2006 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 2000** and **Windows XP** 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** 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 2.2. You should read through this document before beginning the installation process, to ensure that you understand the installation process and that all system requirements are satisfied before beginning the installation.

For information on the changes in this release, see the *GemBuilder for Java Release Notes*.

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

GemBuilder for Java tools may be used against any GemStone/S server product, including GemStone/S, the 32-bit server product, or GemStone/S 64 Bit versions 1.x or 2.x. 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

- ▶ *GemBuilder for Java Tools* 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 provides several sources for product information and support. The product-specific manuals and online help provide extensive documentation, and should always be your first source of information. GemStone Technical Support engineers will refer you to these documents when applicable.

GemStone Support Website: <http://support.gemstone.com>

GemStone's Technical Support website provides a variety of resources to help you use GemStone products. Use of this site requires an account, but registration is free of charge. To get an account, just complete the Registration Form, found in the same location. You'll be able to access the site as soon as you submit the web form.

The following types of information are provided at this website:

Help Request allows designated support contacts to submit new requests for technical assistance and to review or update previous requests.

Bugnotes identify performance issues or error conditions that you may encounter when using a GemStone product. A bugnote describes the cause of the condition, and, when possible, provides an alternative means of accomplishing the task. In addition, bugnotes identify whether or not a fix is available, either by upgrading to another version of the product, or by applying a patch. Bugnotes are updated regularly.

Patches provide code fixes and enhancements that have been developed after product release. A patch generally addresses a specific group of behavior or performance issues.

TechTips provide information and instructions for topics that usually relate to more effective or efficient use of GemStone products. Some Tips may contain code that can be downloaded for use at your site.

Release Notes and Install Guides for all products are provided in PDF format.

Documentation for GemBuilder for Java products are provided in PDF format. This is the same documentation that is included with your GemBuilder for Java product.

Community Links provide customer forums for discussion of GemStone product issues.

Technical information on the GemStone support website is reviewed and updated regularly. We recommend that you check this site on a regular basis to obtain the latest technical information for GemStone products. We also welcome suggestions and ideas for improving and expanding our site to better serve you.

You may need to contact Technical Support directly for the following reasons:

- ▶ Your technical question is not answered in the documentation.
- ▶ You receive an error message that directs you to contact GemStone Technical Support.
- ▶ You want to report a bug.
- ▶ You want to submit a feature request.

Questions concerning product availability, pricing, keyfiles, or future features should be directed to your GemStone account manager.

When contacting GemStone Technical Support, please be prepared to provide the following information:

- ▶ Your name, company name, and GemStone license number
- ▶ The GemStone product and version you are using
- ▶ The hardware platform and operating system you are using
- ▶ A description of the problem or request
- ▶ Exact error message(s) received, if any

Your GemStone support agreement may identify specific individuals who are responsible for submitting all support requests to GemStone. If so, please submit your information through those individuals. All responses will be sent to authorized contacts only.

For non-emergency requests, the support website is the preferred way to contact Technical Support. Only designated support contacts may submit help requests via the support website. If you are a designated support contact for your company, or the designated contacts have changed, please contact us to update the appropriate user accounts.

Email: support@gemstone.com

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

Requests for technical assistance may also be submitted 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 that is non-operational. In these cases, please also submit your request via the web or email, including pertinent details such error messages and relevant log files.

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.

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, if they encounter problems that cause their production application to go down, or that have the potential to bring their production application down. 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.

- ▶ Training courses are offered periodically at GemStone's offices in Beaverton, Oregon, or you can arrange for onsite training at your desired location.
- ▶ Customized consulting services can help you make the best use of GemStone products in your business environment.

Contact your GemStone account representative for more details or to obtain consulting services.

Contents

Chapter 1. Installing GemBuilder for Java

System Requirements	1
Preliminaries	2
Prepare for Installation	3
Checking the Environment Variables	4
Installing GemBuilder for Java into your Repository	5
Set up CLASSPATH	5
Starting the Session Broker	6
Start up the GBJ Launcher and log into GemStone.	7

Installing GemBuilder for Java

This Installation Guide describes how to install GemBuilder for Java on workstations running the UNIX or Linux operating system.

System Requirements

To install GemBuilder for Java, ensure that the following system requirements are satisfied. Systems meeting these requirements are suitable for installing GemBuilder for Java and beginning development, but additional system resources may be necessary to support large applications.

GemStone server

GemBuilder for Java version 2.2 is compatible with all GemStone/S versions later than 6.1, GemStone/S 64 Bit 1.1.x and 2.1, and all versions of GemStone/S 2G. GemBuilder for Java v2.2 has been tested with the following server versions:

- ▶ GemStone/S 6.1.5
- ▶ GemStone/S 64 Bit version 1.1.5
- ▶ GemStone/S 64 Bit version 2.1

Install a GemStone server and start the Stone repository monitor before installing GemBuilder for Java. The GemStone server can run on a different machine than GBJ.

Platform

- ▶ A supported platform for the server product and version you will be using. See your GemStone server product Installation Guide for more information.

Operating System

A supported platform for the server product and version you will be using

- ▶ **GemStone/S v6.1.5** is supported on:
 - Solaris 2.8, 2.9, or 2.10
 - HP-UX version 11.11
 - AIX version 5.1, 5.2, or 5.3
 - Linux Red Hat Advanced Server 2.1 or 3.0
- ▶ **GemStone/S 64-Bit v1.1.5** is supported on:
 - Solaris 2.9 or 2.10
 - HP-UX version 11.11
 - AIX version 5.2 or 5.3
 - Linux Red Hat ES 4.0 or SuSE ES 9.3
- ▶ **GemStone/S 64-Bit v2.1** is supported on:
 - Solaris 2.9 or 2.10
 - HP-UX version 11.11
 - AIX version 5.2 or 5.3
 - Linux Red Hat ES 4.0 or SuSE ES 9.3

Disk Space

- ▶ Approximately 6.5 MB of free disk space to hold the GemBuilder for Java distribution files

Ram

- ▶ Approximately 4 MB for the Session Broker, plus 8 MB per logged-in Tools session

Display System

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

Java

- ▶ A Java development environment, 1.4 or later. This release is based on Java Developer's Kit (JDK) version 1.4.2_06.

Preliminaries

For best results, prepare your system as described in this section before copying the GemBuilder for Java software from the distribution media.

In these instructions, we use "GemStone" to refer to any GemStone/S server product.

1. Check disk space.

You can install GemBuilder for Java in any directory. Check disk space and determine the disk drive on which you will install GBJ. You will need 6.5 MB of free disk space.

2. Verify that TCP/IP networking software is up and running.

In order for GemBuilder for Java to connect to GemStone, TCP/IP must be functional, even if your workstation is not connected to a network. 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
```

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.

If you don’t know the host names of the machines, you can find a list of all the network nodes in the */etc/hosts* file. If you are running **NIS**, check the */etc/hosts* file on your **NIS** master node. Otherwise, check the file on your current machine.

Prepare for Installation

1. Select an installation directory, *installdir*, and make this directory the current working directory.
2. GemBuilder for Java is provided as a zipped archive file with a name similar to *all_unix.zip*. Move this distribution file to the directory location in which GemStone will be installed.
3. Unzip the distribution file using *unzip*. For example:

```
% unzip installdir/all_unix.zip
```

InstallDir now contains a GemStone directory with a name similar to *GemBuilderJV2.2-all.unix*. In the instructions that follow, we refer to this directory as *gemBuilder_directory*.

gemBuilder_directory includes the following:

version.txt

README.txt

gbj22.jar - the Java class library

doc - directory containing GemBuilder for Java documentation:

index.html - the entry point for the online documentation

api - directory containing support files for the online documentation.

examples - directory containing containing examples referred to in the *GemBuilder for Java Programming Guide*:

```
EFlattener.gs
EFlattener.java
EFlattenerTest.java
EVector.gs
EVector.java
EVectorTest.java
```

server - directory containing:

gbj.ini - initial copy of the configuration file.

The following files required for installation:

```
install32.gs
install641.gs
install642.gs
install2G.gs
installMain.gs
GbjForwarder32.gs
SmallDouble.gs
GbjForwarder64.gs
startup.gs
```

bin - directory containing containing scripts to start and stop the Session Broker:

```
startgbj
stopgbj
```

Checking the Environment Variables

1. Verify that your GEMSTONE environment variable is set. For example (for a platform running HP-UX):

```
% echo $GEMSTONE
/users/GemStone6.1.5-hppa.hpux
```

2. Verify that the GemStone executables are in your path. For example:

```
% which topaz
/users/GemStone6.1.5-hppa.hpux/bin/topaz
```

3. Set the GBJ environment variable required for installation.

C shell:

```
% setenv GBJ gemBuilder_directory
```

Bash, Bourne or Korn shell:

```
$ GBJ=gemBuilder_directory
$ export GBJ
```

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. If necessary, also start a NetLDI for use later in testing the GBJ installation.
2. 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:

```
% topaz -i -l
topaz> set gemstone gemserver61
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 (the path must be complete, beginning with a slash).

The server component to file in will depend on the server product you are running.

- ▶ For GemStone/S, file in `install32.gs`
- ▶ For GemStone/S 2G or GemStone/S 64 Bit version 1.x, file in `install641.gs`
- ▶ For GemStone/S 64 Bit version 2.x, file in `install642.gs`

For instance, for use with GemStone/S 6.1.5:

```
topaz 1> input gemBuilder_directory/server/install32.gs
```

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

The file-in operation should end with a message that the errorcount is 0. If you encounter errors, notify GemStone Technical Support, as described on page iv.

5. Exit Topaz:

```
topaz 1> quit
```

Set up CLASSPATH

1. Set your CLASSPATH environment variable to point to the Tools class library, `gbj22.jar`. You may need to append this file to your existing CLASSPATH, separated with a colon (:).

To set the operating system environment:

C shell:

```
% setenv CLASSPATH gemBuilder_directory/gbj22.jar
```

Bourne or Korn shell:

```
$ CLASSPATH=gemBuilder_directory/gbj22.jar
$ export CLASSPATH
```

Starting the Session Broker

1. To use the session broker, you must have the *gemBuilder_directory/bin* directory in your executable search path.
2. Go to the *server* directory.

```
% cd gemBuilder_directory/server
```

3. Make the configuration file *gbj.ini* writable. For example:

```
chmod u+w gbj.ini
```

4. Edit the configuration file *gbj.ini* in the *gemBuilder_directory/server* directory to set the name of the stone, and optionally change the various GBJ configuration parameters. This file contains comments describing each parameter and its valid values.

Two important parameters are the port number of the broker and the port numbers of the spawned gems. In the default assignment, port 9090 serves as the “well-known” port at which Java clients contact this Session Broker to open a session. Users may need to provide this number as input to an application.

By default, ports 9091 through 9099 are used internally during the login process, then recycled. These port numbers do not need to be contiguous with the well-known port (9090). Their quantity is arbitrary but limits the number of logins that can be processed concurrently.

You may omit passwords from this file for security. You may later specify them on the command line or type them at the prompt when starting the Session Broker.

5. Write-protect the file *gbj.ini*. For example:

```
chmod u-w gbj.ini
```

6. Unless you set the log file directory when you changed the configuration parameters, move to the directory where you want the Session Broker logs to be created.
7. Invoke the *startgbj* script. The *startgbj* script is located in the **bin** directory of your GBJ installation. This script has the following syntax:

```
startgbj [<iniFile>][-h][-a <gbjAdministratorPassword>]  
          [-d <brokerLogDirectory>][-p <password>]  
          [-P <hostPassword>][-T <gbjBrokerConnectToken>]
```

<iniFile> the path to a valid GBJ initialization file. Defaults to "gbj.ini" in the current working directory.

-h display this message and exit.

-a *<gbjAdministratorPassword>* the GemStone password for the GbjAdministrator account.

-d *<brokerLogDirectory>* the directory for holding the broker log.

-p *<password>* the GemStone password for spawning gems.

-P *<hostPassword>* the host password for launching gems.

-T *<gbjBrokerConnectToken>* the GemStone userId for connecting to a running broker.

If you have omitted passwords from the gbj.ini configuration file, you may specify them during script invocation.

% **startgbj**

If you have omitted passwords from the gbj.ini file, and not included them on the command line, you will be prompted to enter the required information.

You may also start the Session Broker from Topaz. For more information, including troubleshooting Session Broker problems, see the *GemBuilder for Java Programming Guide*.

Start up the GBJ Launcher and log into GemStone

1. Invoke the GBJ Tools Launcher:

% **java com.gemstone.tools.GbjLauncher** [*options*]

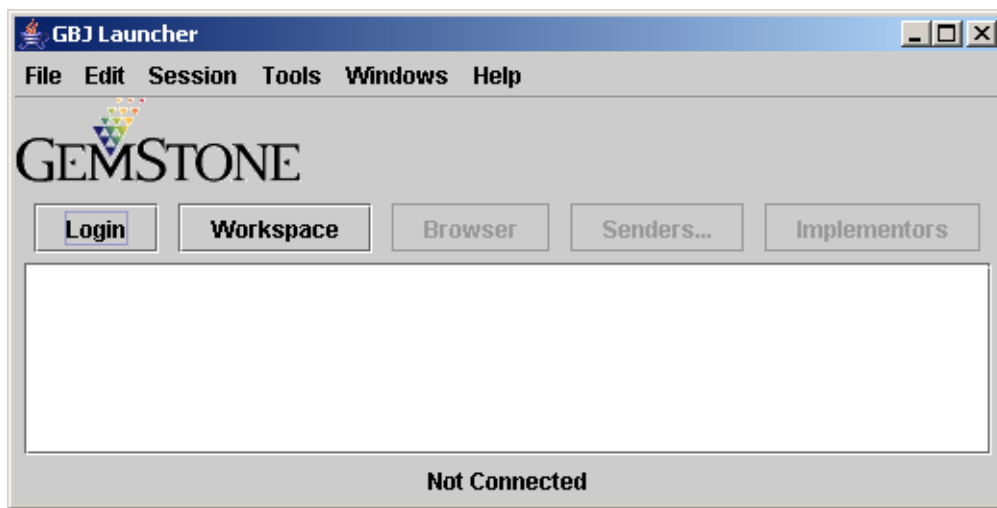
or

% **java -jar gbj22.jar** [*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

If you receive the message “Can’t find class com.gemstone.tools.GbjLauncher”, it’s likely that CLASSPATH is not defined appropriately for the Java system you are using. Consult the documentation for your Java tools and operating system.

Figure 1.1 The Tools Launcher

To log in to GemStone, the following requirements must be met:

- ▶ A GemStone server and a NetLDI are running.
 - ▶ A Session Broker has been started, as described in “Starting the Session Broker” on page 6.
 - ▶ The Java executables (such as the JDK bin directory) are in your path.
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

Gemstone Login

GemBroker Machine: localhost

GemBroker Port: 9090

Gemstone Server:

Gemstone User:

Gemstone Password:

Gem Service:

Host User:

Host Password:

Transaction Mode: ☒ Manual ☐ Auto

TimeOut: 900

Connect Timeout: 150

GS Format: ☒ 32 ☐ 64.1 ☐ 64.2

Ok Cancel

- Fill in the session parameters, as described in Table 1. When you're done, click **Ok**.

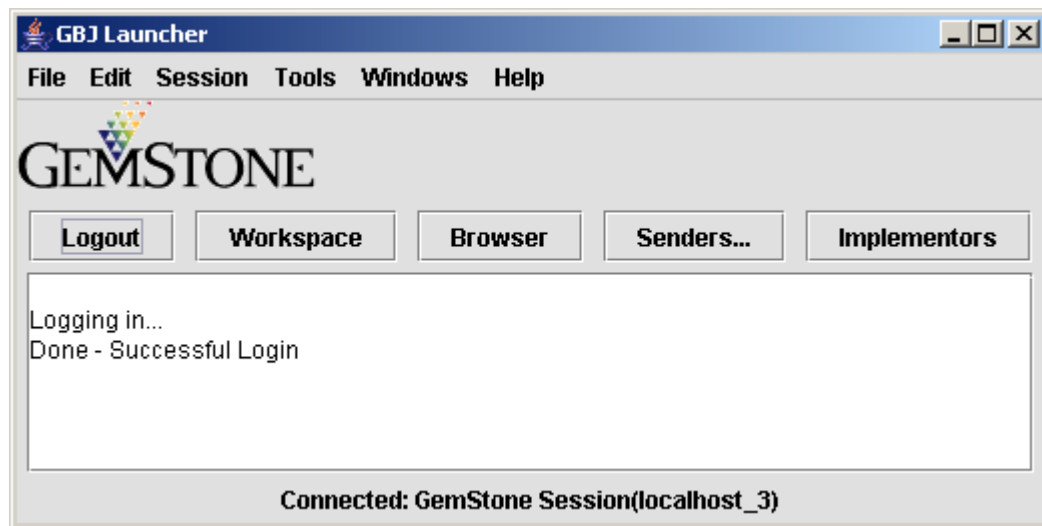
Table 1 Session Parameters

Parameter	Description
GemBroker Machine	(Required) The name of the machine where the Session Broker is running. (May be "localhost" if the broker is on your machine.)
GemBroker Port	(Required.) The number of the well-known port, either 9090 or the number you specified explicitly in <code>gbj.ini</code> .
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 'gemserver61' running on node 'handel', you would specify this NRS string: !@handel!gemserver61 For more information on Network Resource Strings, see the <i>System Administration Guide</i> for your GemStone server.
GemStone User	(Required.) Your GemStone username, such as DataCurator.

Table 1 Session Parameters (continued)

Parameter	Description
GemStone Password	(Required.) Your GemStone password.
Gem Service	Specify gemnetobject (the initial default, but not shown) or gemnetobjcsh (for C-Shell users on UNIX hosts). Because the Gem process must run on the same machine as the Session Broker, a server name should not be provided in this field as part of an NRS.
Host User	The username for your account on this machine. (This username and password are required for an RPC session unless your GemStone/S installation uses another method of providing network authentication, such as a <code>.netrc</code> file or running NetLDIs in guest mode with a captive account. For details, see the <i>System Administration Guide</i> 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.
TimeOut	The length of time (in seconds) that the Gem will wait before it drops an idle session. The Tools default of 0 means that the session will not timeout.
Connect Timeout	The length of time (in seconds) that the Java client will wait for a response from the Broker.
GS Format	The OOP format to use. This depends on the GemStone server product and version. The default of 32 is for use with GemStone/S, 64.1 applies to GemStone/S 2G and GemStone/S 64 Bit version 1.x, and 64.2 applies to GemStone/S 64 Bit version 2 and above.

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 and the Session Broker, see the *GemBuilder for Java Programming Guide* and the *GemBuilder for Java Tools Manual*.

