

---

GemStone®

# *GemConnect Installation Guide*

For use with GemStone/S or  
GemStone/S 64 Bit  
on UNIX and Linux platforms

January 2007

Version 2.0

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 © 1986-2007 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.

**Oracle** is a registered trademarks of Oracle Corporation. **Oracle9i** is a trademark of Oracle Corporation.

**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.

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 the Documentation

This document provides instructions for installing GemConnect version 2.0. 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.

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

For information about changes in this release, refer to the *GemConnect Release Notes*.

### Typographical Conventions

This document uses the following typographical conventions:

- ▶ Commands issued at a command prompt are shown in **bold** typeface. For example:

**copydbf**

- ▶ Smalltalk methods, GemStone environment variables, file names and paths, listings, and prompts are shown in monospace typeface. For example:

markForCollection

- ▶ Place holders that are meant to be replaced with real values are shown in *italic* typeface. For example:

*StoneName.conf*

### 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 Web Site:** <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 web site:

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

**Documentation** for GemConnect is provided in PDF format. This is the same documentation that is included with your GemConnect product.

**Release Notes** and **Install Guides** for your product software are provided in PDF format in the Documentation section.

**Downloads** and **Patches** provide code fixes and enhancements that have been developed after product release. Most code fixes and enhancements listed on the GemStone Web site are available for direct downloading.

**Bugnotes**, in the Learning Center section, 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.

**TechTips**, also in the Learning Center section, 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.

**Community** provides customer forums for discussion of GemStone product issues.

Technical information on the GemStone Web site 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/S server 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](mailto: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. Installation***

System Requirements . . . . .	1
GemStone server . . . . .	1
Platform . . . . .	2
Disk Space. . . . .	2
Ram . . . . .	2
Relational Database Server . . . . .	2
C compiler. . . . .	2
Install GemConnect . . . . .	3
Add GemConnect to your GemStone Repository . . . . .	6
Log In To GemStone . . . . .	6
File In the New Classes . . . . .	7
Set Up New Users . . . . .	8
Installed Files and Directories . . . . .	8





# Installation

This document describes how to install GemConnect 2.0 on workstations running the UNIX or Linux operating system. It also explains how to upgrade a GemStone repository for use with GemConnect and how to set up new GemConnect users.

This version of GemConnect supports GemStone/S and GemStone/S 64 Bit, and includes a number of new features. Please review the *GemConnect Release Notes* for details of the changes before upgrading to this version.

We recommend that this installation be done by an experienced system administrator. If you need more information, the *Installation Guide* for your GemStone/S or GemStone/S 64 Bit server tells how to install the GemStone system, and lists any additional requirements for network communications between your workstation and GemStone.

For GemConnect to work properly with the rest of the GemStone system and your relational server, you must follow every step of this installation procedure.

## System Requirements

Before installing GemConnect, ensure that the following system requirements are satisfied.

### **GemStone server**

A GemStone/S or GemStone/S 64 Bit object server, installed and started according to instructions in the appropriate *Installation Guide*.

GemConnect version 2.0 is compatible with all GemStone/S versions later than 6.1, and GemStone/S 64 Bit 1.1.x and 2.1.x. GemConnect v2.0 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

## Platform

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

- ▶ **GemStone/S v6.1.5** is supported for GemConnect on:
  - Solaris 2.8, 2.9, or 2.10
  - 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 for GemConnect on:
  - Solaris 2.9 or 2.10
  - 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 for GemConnect on:
  - Solaris 2.9 or 2.10
  - AIX version 5.2 or 5.3
  - Linux Red Hat ES 4.0 or SuSE ES 9.3

## Disk Space

- ▶ Approximately 1 megabyte for GemConnect system files

## Ram

- ▶ 3 megabytes per GemStone session (See the *System Administration Guide* for other configuration recommendations.)

## Relational Database Server

- ▶ Relational database server: Oracle 9i Database version 9.2.0.1.0 running and available via the `$ORACLE_HOME` environment variable.
- ▶ If GemStone and your relational database server run on different machines, you will also need Oracle Net9 (supersedes SQL\*Net). Be sure that it is installed and running on the machine where GemStone will be running, so that GemStone will be able to communicate with the relational database.

## C compiler

See the *Installation Guide* for your GemStone server product and version for specific C compiler details.

A C compiler is required only for customizing GemConnect. It is used to relink with any changes you make in the C language source module provided with GemConnect. You do not need a C compiler if you do not expect to customize GemConnect.

## Install GemConnect

**Step 1.** Log in to a machine that has the GemStone repository server installed on it.

We recommend that you log in using a local UNIX user name (such as the name of your GemStone system administrator) to perform this installation procedure, so that the GemConnect files will be owned by this user. Later in the installation you need to log in as `root`. However, if you copy the files as `root` (as in Step 3) the original ownerships are maintained, which may result in file protection errors for users at your site. If you plan to limit GemConnect access to a certain UNIX group, the owner of the GemConnect files must be a member of that group.

**Step 2.** Select an installation directory.

You can install the GemConnect files into almost any directory. Administration is easier, however, if you install GemConnect in the same top-level directory you installed the GemStone server software. For example, if the GemStone server directory is:

```
/usr2/GemStone
```

then install GemConnect under `/usr2`.

From now on, we'll refer to your site's installation directory as *InstallDir*. When you see *InstallDir* in a command or pathname, substitute the name of this directory.

Move to the disk drive and directory where you will install GemConnect software:

```
% cd InstallDir
```

**Step 3.** Copy the GemConnect distribution file to this directory. GemConnect is provided as a zipped archive file with a name similar to `GemConnect-2.0+oracle9i-platform.OS.zip`. See Table 1 "Distribution file names" for specific file names on each platform.

**Table 1. Distribution file names**

Solaris	<code>GemConnect-2.0+oracle9i-sparc.Solaris.zip</code>
AIX	<code>GemConnect-2.0+oracle9i-RISC6000.AIX.zip</code>
Linux	<code>GemConnect-2.0+oracle9i-i686.Linux.zip</code>
HP-UX	<code>GemConnect-2.0+oracle9i-hppa.hpux.zip</code>

**Step 4.** Unzip the distribution file using `unzip`. For example:

```
% unzip GemConnect-2.0+oracle9i-platform.OS.zip
```

*InstallDir* now contains a directory with a name similar to `GemConnect-2.0+oracle9i-platform.OS`. This directory contains the following subdirectories (denoted with a `/` character) and files:

```
PACKING  verora.txt  doc/  install/  make/  ualib/
```

See Table 3 for tables describing the contents of each file and each directory.

**Step 5.** Log in as `root`.

You must perform the rest of the installation as `root`, because a number of these procedures require `root` privileges.

**Step 6.** Set the GemStone environment.

Set the `$GEMSTONE` environment variable to the full pathname (starting with a slash) of your GemStone installation directory.

C shell:

```
% setenv GEMSTONE InstallDir/GemStone64Bit-1.0.9-platform.OS
```

Bourne shell or Korn shell:

```
$ GEMSTONE=InstallDir/GemStone64Bit-1.0.9-platform.OS
$ export GEMSTONE
```

For example, for C shell on Solaris you may do the following:

```
% setenv GEMSTONE InstallDir/GemStone64Bit-1.0.9-sparc.Solaris
```

**Step 7.** Complete setup of the GemStone environment by invoking `gemsetup`.

Depending on your login shell, type:

C shell:

```
% source $GEMSTONE/bin/gemsetup.csh
```

Bourne shell or Korn shell:

```
$ . $GEMSTONE/bin/gemsetup.sh
```

**Step 8.** Define an environment variable to the GemConnect installation directory to reduce the need to type the long pathname. For example:

C shell:

```
% setenv GEMCONNECT InstallDir/GemConnect2.0+oracle9i-platform.OS
```

Bourne shell or Korn shell:

```
$ GEMCONNECT=InstallDir/GemConnect2.0+oracle9i-platform.OS
$ export GEMCONNECT
```

**Step 9.** Check to make sure that the new GemConnect directory tree includes all of the files listed in the `PACKING` file. Use the following step to automate the checking, by running the GemStone `checksum` utility.

```
% cd $GEMSTONE/install
% ./checksum $GEMCONNECT $GEMCONNECT/PACKING \
$GEMCONNECT/install/checksums.good install/checksums.good
```

This script checks the files that have been copied from the distribution CD against the file `checksums.good` to make sure that all the files listed in the `PACKING` file are present. If there are any discrepancies, they are displayed on your screen in standard **diff** format. If a discrepancy occurs, contact GemStone Technical Support.

**Step 10.** Check the file protection settings for the GemConnect files.

Check that GemConnect users have read and execute access to GemConnect directories and all the directories above them in the directory tree. GemConnect users who need to rebuild the GemConnect shared library will also need write access to the `make` directory.

```
% cd $GEMCONNECT
% ls -al
```

If the permissions are set correctly, they look similar to this:

```
dr-xr-xr-x  6 gsadm    4096 Jan  8 16:34 .
dr-xr-xr-x  4 gsadm    4096 Jan  8 16:34 ..
-r--r--r--  1 gsadm    1289 Jan  8 16:34 PACKING
dr-xr-xr-x  1 gsadm    4096 Jan  8 16:34 doc
dr-xr-xr-x  2 gsadm    4096 Jan  8 16:34 install
drwxr-xr-x  2 gsadm    4096 Jan  8 16:34 make
dr-xr-xr-x  2 gsadm    4096 Jan  8 16:34 ualib
-r--r--r--  1 gsadm         55 Jan  8 16:34 verora.txt
```

Make sure that the files have the appropriate permissions for your site.

If necessary, use the `chmod` command to reset permissions or the `chown` command to change the owner.

**Step 11.** Copy the appropriate GemConnect shared library into the GemStone object server shared library directory.

The GemConnect installation includes shared libraries for each GemStone server product and version. Table 2 shows the shared library to use with specific server product and versions.

**Table 2. Shared Library Names**

Server product and version	Shared library name
GemStone/S	liboraapi20-32.so
GemStone/S 64 Bit v1.1.x	liboraapi20-641.so
GemStone/S 64 Bit v2.1.x	liboraapi20-642.so

As `root`, you have the necessary write permission on the subdirectories of `$GEMSTONE`. Issue this command:

```
% cp $GEMCONNECT/ualib/liboraapi20-32.so $GEMSTONE/ualib
```

**Step 12.** Check the shared library file protection settings.

The permissions on the shared library file should look like this:

```
-r-xr-xr-x-  1 gsadm    76144 Jan  8 16:34 liboraapi20-32.so
```

If the GemStone files are on a disk owned by a different workstation, you may have permission problems. If so, log in directly on that machine and set your environment variables again for that session.

## Add GemConnect to your GemStone Repository

You add GemConnect to your existing GemStone repository with the following steps.

**Step 1.** Back up your GemStone repository.

Before you begin the upgrade, make sure a current backup of your GemStone repository exists. If you need to make one, use the GemStone backup method described in the *System Administration Guide*.

**Step 2.** Ask users to log off GemStone.

**Step 3.** Check to be sure a GemStone network server (NetLDI) process is running.

To start a NetLDI process on your workstation, type the following command:

```
% startnetldi
```

This starts a network server process with the default name of `netldi61` or `gs64ldi`, depending on the server product you are running.

For information about additional options for the `netldi` commands, see the *System Administration Guide*.

**Step 4.** Log in with some UNIX user name other than `root`.

Do not try this upgrade as `root`, unless the Stone (GemStone repository monitor process) is running on your local machine. Log in as the UNIX user who owns the GemConnect directories and files (`gsadm` in the example listing above). Make sure the account you use is set up with a `.netrc` file that lists the host where the Stone is running.

**Step 5.** Set the GemStone environment for this user.

Define the `GEMSTONE` and `GEMCONNECT` environment variables and execute the `gem-setup` script for this user, as you did for `root` on page 1-4.

### Log In To GemStone

**Step 6.** Change to the GemConnect `make` directory.

```
% cd $GEMCONNECT/make
```

**Step 7.** Log in to the GemStone server as SystemUser, using linked Topaz. For instance:

```
% topaz -l
topaz> set gemstone gs64stone
topaz> set user SystemUser password swordfish
topaz> login
[Info]: LNK client/gem GCI levels = 801/801
[Info]: User ID: SystemUser
[Info]: Repository: gs64stone
[Info]: Session ID: 6
[Info]: GCI Client Host: <Linked>
[Info]: Page server PID: -1
[Info]: Login Time: 01/09/07 18:03:51 PST
gci login: currSession 1 rpc gem processId -1
successful login
topaz 1>
```

**WARNING:**

*Logging in to GemStone as SystemUser is like logging in to your workstation as root—an accidental modification to a kernel object can cause a great deal of harm. Use the DataCurator account for all system administration functions except those that **require** SystemUser privileges, such as upgrades and full restores.*

## File In the New Classes

**Step 8.** File in the GemConnect for Oracle classes and methods, using the following Topaz command line:

```
topaz 1> input gsoraapi.gs
```

**Step 9.** Check for errors in the upgrade.

The number of errors will appear at the end of the file-in process. The error line should look similar to the following:

```
topaz 1> obj ErrorCount
0
```

If the number is greater than zero, please contact GemStone Technical Support.

**Step 10.** Log out of GemStone.

```
topaz 1> logout
```

**Step 11.** Leave Topaz and return to the operating system prompt.

If you want to do something else in Topaz, reset the user name, unless you want to be SystemUser, and type the **login** command again. Otherwise, type **quit** to return to an operating system prompt.

```
topaz> quit
```

This completes the GemStone repository upgrade procedure. GemConnect is now installed and ready for use with your GemStone system.

## Set Up New Users

**Step 1.** If anyone who is going to use GemConnect does not have a GemStone user account, set it up according to the instructions in the *Installation Guide* for your server product and version.

**Step 2.** Help GemConnect users edit their login shells' initialization files (`.cshrc` or `.profile`). Have them add:

- ▶ The GemStone `gemsetup` command line
- ▶ The definition of the `ORACLE_HOME` environment variable, which is the same command line they use to define `$ORACLE_HOME` interactively.
- ▶ The definition of an environment variable `LD_LIBRARY_PATH` to `$ORACLE_HOME/lib` in their path. `$ORACLE_HOME/lib` must be the first entry for the `LD_LIBRARY_PATH` environment variable.

For information on automatic `gemsetup`, see the *Installation Guide*. For information on defining the `ORACLE_HOME` environment variable, see "Environment Variables" in Appendix A of the *GemConnect Programming Guide*.

**Step 3.** Have the users invoke their edited initialization files immediately. This allows the new path to take effect, and also tests for errors in the files.

Depending on their login shell, users should type:

C shell:

```
% source $HOME/.cshrc
```

Bourne shell or Korn shell:

```
$ . $HOME/.profile
```

From now on, the environment needed for running GemConnect will be set up automatically each time they log in.

**Step 4.** Once users log in to GemStone, they can also test the `ORACLE_HOME` environment variable setting by invoking this method:

```
System performOnServer: 'echo $ORACLE_HOME'
```

If the variable is set correctly, this method returns a GemStone string that is the path-name to the Oracle installation directory.

## Installed Files and Directories

This section contains a table that shows the directories and files installed by the GemConnect installation process.

Table 3 shows the directories and files installed under the GemConnect installation directory.



**Table 3. Files in GemConnect installation**

Directory	File Name	Function
	PACKING	Packing file for GemConnect
	verora.txt	GemConnect version information
install	checksums.good	Installation verification file
make	Makefile32	Makefile to rebuild shared library for GemStone/S
make	Makefile641	Makefile to rebuild shared library for GemStone/S 64 Bit v.1.1.x
make	Makefile642	Makefile to rebuild shared library for GemStone/S 64 Bit v.2.1.x
make	gsrdbapi.hf	Exported functions and variables for the GemConnect interface (header file)
make	gsrdbapi.ht	Exported types and definitions for the GemConnect interface (header file)
make	gsoraapi.gs	GemStone Smalltalk source code for GemConnect for Oracle
make	gsoraapi.ht	Exported Oracle types and definitions for rebuilding the user-action library (header file)
make	gsorapublic.c	Public source module for adding functionality
make	liboraapi20-32.a	Used to relink shared library (archive library) for GemStone/S
make	liboraapi20-641.a	Used to relink shared library (archive library) for GemStone/S 64 Bit v.1.1.x
make	liboraapi20-642.a	Used to relink shared library (archive library) for GemStone/S 64 Bit v.2.1.x
make	patchlevel.h	Patch level and version information for GemConnect
ualib	liboraapi20-32.so	User action shared library for GemStone/S
ualib	liboraapi20-641.so	User action shared library for GemStone/S 64 Bit v.1.1.x
ualib	liboraapi20-642.so	User action shared library for GemStone/S 64 Bit v.2.1.x

