
GemStone®

GemStone/S Installation Guide

for Windows
on Intel-compatible Systems

Version 6.7

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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 explains how to install GemStone/S™ version 6.7, and how to upgrade from previous GemStone/S versions.

For information regarding new and modified features in GemStone/S v6.7, please refer to the *GemStone/S Release Notes* for version 6.7.

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

Terminology Conventions

The term “GemStone” is used to refer to the server products GemStone/S 64 Bit and GemStone/S, and the GemStone family of products; the GemStone Smalltalk programming language; and may also be used to refer to the company, now GemTalk Systems, previously GemStone Systems, Inc. and a division of VMware, Inc.

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gemtalksystems.com

GemTalk’s website provides a variety of resources to help you use GemTalk products:

- ▶ **Documentation** for the current and for previous released versions of all GemTalk products, in PDF form.
- ▶ **Product download** for the current and selected recent versions of GemTalk software.
- ▶ **Bugnotes**, identifying performance issues or error conditions that you may encounter when using a GemTalk product.

- ▶ **TechTips**, providing information and instructions that are not in the documentation.
- ▶ **Compatibility matrices**, listing supported platforms for GemTalk product versions.

This material is updated regularly; we recommend checking this site on a regular basis.

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Website: techsupport.gemtalksystems.com

Email: techsupport@gemtalksystems.com

Telephone: (800) 243-4772 or (503) 766-4702

When submitting a request, please include the following information:

- ▶ Your name and company name.
- ▶ The versions of GemStone/S and of all related GemTalk products, and of any other related products, such as client Smalltalk products.
- ▶ The operating system and version you are using.
- ▶ A description of the problem or request.
- ▶ Exact error message(s) received, if any, including log files if appropriate.

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

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Installing GemStone/S Version 6.7

This chapter describes the procedure for installing GemStone/S version 6.7 on a single machine. If you have enough disk space on a single machine, we recommend that you set up GemStone this way initially to ensure that all the pieces work together. At the end of this chapter, we suggest refinements you might want to make, such running GemStone in a network configuration.

NOTE

If you are upgrading to GemStone/S 6.7 from an earlier release, follow the instructions in Chapter 2 of this installation guide.

Adjust the installation to meet your specific needs. The topic “What Next?” on page 14 provides references to procedures and related information in the *System Administration Guide for GemStone/S*.

Review the Installation Procedure

The following list summarizes the steps to install GemStone.

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Check the System Requirements

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

Platform

- ▶ An Intel-compatible Pentium-class system, clock speed 200Mhz or faster

RAM

- ▶ At least 128 MB, but most configurations will want more RAM in order to take advantage of a larger shared page cache.
- ▶ 2 MB for each Gem session process beyond the first two

Virtual memory

- ▶ In addition to other system needs, virtual memory should be configured to be larger than the intended shared page cache size. In general, the virtual memory should be at least equal to the RAM installed; it is recommended to have twice as much virtual memory as RAM.

Disk space

- ▶ About 50 MB on an NTFS or FAT file system for the typical (default) installation of the GemStone software. Installation on HPFS is not supported.
- ▶ Additional disk space as required for your repository.
- ▶ The repository files should be located on a disk drive that does not contain virtual memory. Use of multiple disk drives is advisable for servers.

Operating system

- ▶ Windows server 2008 R2 or Windows 7
- ▶ The configuration option SHR_PAGE_CACHE_SIZE_KB defines the size (in KBytes) of extent page space in the shared page cache. The maximum acceptable value for this configuration option is limited by system memory, kernel configurations, and cache space allocated by SHR_PAGE_CACHE_NUM_PROCS. As a general guideline, the maximum limit for SHR_PAGE_CACHE_SIZE_KB is approximately 1.3 GB.

For more general information about these and other configuration options, see Appendix A of the *System Administration Guide for GemStone/S*.

System clock

- ▶ The system clock must be set to the correct time. When GemStone opens the repository at startup, it compares the current system time with the recorded

checkpoint times as part of a consistency check. A system time earlier than the time at which the last checkpoint was written may be taken as an indication of corrupted data and prevent GemStone from starting. The time comparisons use GMT.

TCP keepalive option

- ▶ GemStone processes ordinarily use the TCP *keepalive* option to determine how long they will wait after communications activity ceases unexpectedly. This setting can be useful for reaping stale RPC Gems, but the operating system default may not be appropriate for this purpose. For further information, refer to your operating system documentation.

C/C++ Compiler

- ▶ Microsoft Visual Studio 2010 Version 10.0.30319.1 RTMRel

GemStone requires a C/C++ compiler only if you are developing C or C++ code for user actions or for a C or C++ application. This compiler is required only for development work, not for execution.

Debugger

- ▶ Microsoft Visual Studio 2010 Version 10.0.30319.1 RTMRel

A C debugger can be useful to allow problem analysis by GemStone consulting or Technical Support. It also may allow you to debug your C user actions. It is not required for GemStone execution.

Prepare for Installation

Perform the following steps to prepare the machine to receive the GemStone software. You must perform these steps as Administrator or while logged in as a member of the Administrators group.

NOTE

For the rest of this document, the installation directory is referred to as `InstallDir`, which is the same directory as `%GEMSTONE%`.

1. As the Windows Administrator account or as an account that belongs to the Administrators group, log in to a machine with adequate resources to run GemStone and that owns the disk on which you are going to install the GemStone files.
2. Determine that adequate virtual memory is available:
 - a. Right click on the My Computer icon and select Properties. Select the Advanced tab.
 - b. Click on the Performance settings tab or button. On Windows XP, select the Advanced tab.
3. Check the free disk space and determine the disk drive and partition on which you will install the GemStone software.
4. Select an installation directory, *InstallDir*, and make this directory the current working directory.

5. GemStone/S is provided as a zipped archive file with a name similar to GemStone6.7.0-x86.Windows_NT.zip. Move this distribution file to the directory location in which GemStone will be installed, *InstallDir*, then unzip the distribution file using unzip. For example:


```
% unzip GemStone6.7.0-x86.Windows_NT.zip
```

 If you are installing from CD-ROM, insert the CD-ROM into the drive, then unzip the files.
6. The *InstallDir* now contains a GemStone directory with a name similar to GemStone6.7.0-x86.Windows_NT.

In addition to several subdirectories, this directory also contains two text files: *PACKING*, which lists all of the GemStone files, and *version.txt*, which identifies this particular product and release of GemStone.

Set the Environment

Perform the following steps to properly configure the operating environment.

1. Add or update GemStone environment variables from previous installations:
 - a. Open the Control Panel.
 - b. From the Control Panel, double-click the System icon.
 - c. Click on the Advanced tab, then on the Environment Variables button.
 - d. Set the environment variable GEMSTONE to the *full pathname* (starting with a slash) of your new GemStone installation directory.

If this is a new installation, in the System Environment Variables list, click on the **New** button, and enter the full path, starting with the drive, of your new Gemstone Installation directory.

If you are updating an existing installation, select GEMSTONE in the System Environment Variables list. Click on the **Edit** button, and update the value with your new GemStone new installation directory
 - e. In the System Environment Variables list, select the *path* variable, and click on the **Edit** button. Add the full path, starting with the drive, to the bin directory of your new Gemstone installation to the front of the path string. If you are updating an existing installation, remove the previous GemStone directory from the path.

Create the GemStone Key File

To run GemStone, you must have a key file. The keyfile contents are provided by your GemStone sales representative, or contact keyfiles@gemstone.com.

2. Using a text editor, create the key file


```
%GEMSTONE%\sys\gemstone.key.
```
3. GemStone keys are provided in text email. Paste the contents of this email into the keyfile and save.

Verify TCP/IP

To run GemStone, TCP/IP networking software must be functioning, even if your machine is not connected to a network.

1. Verify that TCP/IP networking software is functioning by executing the following command at a Windows command prompt (1 is the number one):

```
C:\> ping -n 1 hostname
```

where *hostname* is the name of your machine. If ping responds with statistics, TCP/IP is functioning. If you see a message that indicates that the name is not recognized as an internal or external command, no TCP/IP network adapter is installed on the machine. Perform the following procedure.

Install the Minimum TCP/IP Functionality

Perform this procedure only if the machine is not connected to a network. This procedure installs the minimum TCP/IP functionality required for GemStone interprocess communication.

1. From the Control Panel, double-click the Network icon.
2. In the Network Settings dialog box, click Add Adapter.

In the Add Network Adapter dialog box, select the MS Loopback Adapter from the Network Adapter Card selection list, and click OK.

Define the NetLDI Service

The appropriate NetLDI service must be defined in your TCP/IP network database. By default, GemStone/S 6.7 will use `netldi67`. You may use another name, although this may require further configuration to allow remote caches to connect.

1. The TCP/IP network database is:

```
C:\WINDOWS\system32\drivers\etc\services
```

2. Add an entry similar to the following to the network database:

```
netldi67 50383/tcp #GemStone 6.7
```

Choose a port number that is not being used by another service. The port number should be in the range $49152 \leq \text{port} \leq 65535$, to conform to IANA standards (<http://www.iana.org/assignments/port-numbers>).

NOTE

If you are upgrading from a previous version, you might need to keep the NetLDI for that version running. You may need to define a new netldi service name with a different port number, or assign a different port number to netldi67.

3. If several machines will be running GemStone, have the system administrator update the network database for each machine. The port number must be the same on every machine.

Run the Configuration Script

The executable `gsconfig.exe` adds the GemStone keys to the Windows registry (the path is `HKEY_LOCAL_MACHINE\SOFTWARE\GemStone\GemStone`)

1. Open a command prompt window.
2. Verify that the `GEMSTONE` environment variable is set correctly:

```
C:\>echo %GEMSTONE%
```

this should report your new GemStone installation directory.

3. Run the `gsconfig` executable:

```
C:\>gsconfig
```

Set the GemStone File Permissions or Attributes

To protect certain GemStone files, you must change the files' permissions. Because the files in a directory on an NTFS file system inherit their permissions from the parent directory, you need only set the permissions for the directories.

To set these permissions:

1. In Explorer, select the directories `InstallDir\log` and `InstallDir\data`.
2. Right-click, select **Properties**, click the Security tab, and click Permissions
3. In the Directory Permissions dialog box, check the box Replace Permissions on Existing Files.
4. Select the group named Everyone, and set the Type of Access to **Change**.
5. Click OK.

NOTE

Your site may prefer to restrict access to these directories to a special group. Chapter 1 of the System Administration Guide for GemStone/S contains suggestions for doing this.

6. Protect the other GemStone directories (that is, all but `data` and `log`) by changing the permissions for group Everyone to **Read**.

Ordinary users do not need to create or modify any files in the other directories.

Create a working copy of the repository

If this is a new installation, you will need to set up a fresh repository and configuration file. If you are upgrading an existing installation, you do not need to do this – you will copy the extent/s and configuration file from your existing repository.

1. To set up a fresh repository, copy the file *InstallDir\bin\extent0.dbf* to the directory *InstallDir\data*. You can do this using File Explorer or a command prompt.

```
C:\> copy InstallDir\bin\extent0.dbf InstallDir\data\
```

Caution

Ensure that you copy the extent file, and do not move it to the working directory. You may need the clean, empty extent later to restore from backup

2. A default configuration file is provided in the *InstallDir\bin*. Create a copy of this file for your repository, modifying this as required for your application.

```
C:\> copy InstallDir\bin\initial.config InstallDir\data\system.conf
```

Define the Windows Services

The GemStone repository monitor (the Stone) and the NetLDI network server ordinarily run as Windows services independent of a particular login. As services, they can be started automatically when the system boots, and they can continue to run after the user who started them logs out.

Creating the services merely adds them to the Windows services database so that they can be started later as described in the *System Administration Guide for GemStone/S*.

To create services on Windows 2008 Server or Windows 7, you must execute these statements at a command prompt started using the right click menu item **Run as administrator**.

1. Create the Stone service. For example:

```
C:\> stone create /b
```

This command creates a Stone service with the default name of *gemserver67* and configures it to start automatically at system boot (/b).

2. Create the NetLDI service. For example:

```
C:\> netldi create /b /g /a
```

This command creates a NetLDI service with the default name *netldi67* and configures it to start automatically at system boot (/b) using guest mode (/g) with a captive account (/a).

For information about the **stone** and **netldi** commands, see the online help or Appendix B of the *System Administration Guide for GemStone/S*.

Start the GemStone Services

Before you log out as Administrator, start the Stone and NetLDI services. To start or stop services on Windows 2008 Server or Windows 7, you must execute these statements at a command prompt started using the right click menu item **Run as administrator**.

1. Start the Stone and NetLDI services. To start services with the default name and options, you can do the following:

```
C:\> stone start
C:\> netldi start
```

2. Log out as Administrator.

Install the default TimeZone

GemStone/S 64 Bit is shipped with a default time zone of US Pacific. If you are in another Time Zone, edit the file `installtimezone.txt` in the GemStone upgrade directory, then file it in as SystemUser.

Change System Passwords and Add Users

After installing GemStone 6.7, you must change the passwords for the three administrative users: DataCurator, SystemUser, and GcUser. The initial password for each is `swordfish`. The DataCurator account is used to perform system administration tasks. The SystemUser account ordinarily is used only for performing GemStone system upgrades. The GcUser account is used by the garbage collection task, which runs automatically as a separate login. Access to each of these accounts should be restricted.

The chapter entitled User Accounts and Security in the *System Administration Guide for GemStone/S* tells you how to change the passwords, and how to create new GemStone users accounts for other users on your system. These functions can also be done using GemBuilder for Smalltalk tools; see the GemBuilder for Smalltalk Users's Guide for more information.

What Next?

This chapter has guided you through installation of GemStone 6.7 in an initial configuration that is sufficient to create a basic repository and begin setting up user accounts. The objective was to get a simple, default configuration up and running.

You might consider performing the following tasks:

- ▶ If you will be using a related GemStone product, such as GemConnect, install it by referring to the product's installation guide.
- ▶ To modify the initial object server configuration to one that is more efficient for your particular needs, refer to Chapter 1 of the *System Administration Guide for GemStone/S*.

- ▶ To modify the configuration of Gem session processes and to ensure that users have the necessary permissions to access the shared page cache and the extents, refer to Chapter 2 of the *System Administration Guide for GemStone/S*.
- ▶ If you are going to operate in a network environment, Chapter 3 of the *System Administration Guide for GemStone/S* has additional information about the GemStone network object server (NetLDI), how to handle user authentication, how to share software over the network, and how to set up some common configurations.
- ▶ To start and stop the GemStone object server, refer to instructions in Chapter 4 of the *System Administration Guide for GemStone/S*.

Upgrading from Previous GemStone/S Versions

This chapter describes how to upgrade an existing GemStone/S installation to GemStone/S version 6.7.

GemStone/S version 6.7 supports upgrade from GemStone/S version 6.1.5 and later. If you are upgrading from a version prior to 6.1.5, you must first convert and upgrade to 6.1.5, then proceed to upgrade to 6.7. For instructions, see the Installation Guide for GemStone/S 6.1.5.

If you are using GemBuilder for Smalltalk (GBS), you should also upgrade the client libraries that are used by GBS. See Chapter 3 for supported versions of GBS for use with GemStone/S 6.7, and instructions on installing updated client libraries.

For applications using add-on products such as GemConnect or Gembuilder for Java, these products will need to be reinstalled following the upgrade process. For details, see the Installation Guide for that product.

NOTE

The following instructions use the version number 6.6.5 to represent any of the versions from 6.1.5 through 6.6.5. The procedure is the same regardless which of these versions you have; exceptions are noted in the instructions.

Overview of the Upgrade Strategy

We recommend that you perform the upgrade twice: first a pilot upgrade and then the production upgrade. With this strategy, you can keep your version 6.6.5 production system running while you familiarize yourself with the upgrade process.

Pilot Upgrade

The purpose of the Pilot upgrade is to familiarize yourself with the upgrade process and to help ease the upgrade of your production system. To help you gain the most information and experience from the Pilot upgrade, you must create a small repository that contains objects that are representative of your production system.

Using the representative repository, complete the upgrade and file out all changes so you can minimize down time when you upgrade your production system. During the Pilot upgrade, you:

- ▶ Modify classes and methods that run in GemStone so they work properly with the version 6.7 classes and methods.
- ▶ Modify your application's client code as necessary. This code may be in C, C++, or client Smalltalk.
- ▶ File out the changes so they can be loaded quickly when you perform the Production upgrade.
- ▶ Recompile and relink any C or C++ programs.
- ▶ Reload client Smalltalk images.

Once you complete the Pilot upgrade, you will be able to schedule down time of your production system based on what you learned during the Pilot upgrade.

Production Upgrade

The purpose of the Production upgrade is to upgrade your production system using the information you gathered during the Pilot upgrade.

Perform the Upgrade

Prepare for the Upgrade

Perform the following steps to prepare for the upgrade.

1. Install GemStone/S 6.7 to a new installation directory, separate from the installation directory for version 6.6.5, using the instructions in Chapter 1.
2. Create the version 6.7 Stone as a Windows service:

```
C:\> stone create StoneName
```

3. Configure version 6.7 the way you expect to use it – that is, with the appropriate extent locations and sizes.

Ensure that adequate space is available for extents, transaction logs, and a backup during the upgrade:

Use Windows Explorer to determine available disk space.

Space is needed for the following:

- ▶ Your version 6.6.5 extents and transaction logs.
- ▶ Your version 6.7 extents and transaction logs. You should allow for some growth of the extents during the upgrade (you can reclaim much of the physical space later by performing a full backup and restoration of the converted repository).

4. Log in to the 6.6.5 GemStone system and reset the SystemUser password to 'swordfish':

```
topaz 1> printit
(AllUsers userWithId: #SystemUser) password: 'swordfish' .
System commitTransaction .
%
```

The upgrade scripts log in to GemStone with the SystemUser account and the default password.

5. Halt all user activity on the repository you are going to upgrade:
 - a. Log in to Topaz as DataCurator.
 - b. Force all other users off the system:

```
topaz 1> printit
System stopOtherSessions.
%
```

CAUTION

You MUST file out any changes you have made to the GemStone kernel classes in order to preserve these changes in version 6.7. Also, consider saving important modified files, such as configuration files, that will be overwritten during the upgrade.

6. If this is the Pilot upgrade, file out any modifications or additions you made to GemStone kernel class methods by using Topaz command **fileout**.
7. Shut down the Stone:

```
C:>\ stone stop stone665
```

where *stone665* is the name of version 6.6.5 Stone on this machine.

8. Set up the 6.7 environment.

Set the environment variables required for the upgrade.

```
C:\> set GEMSTONE=InstallDir67
C:\> set PATH=%GEMSTONE%\bin;%PATH%
C:\> set upgradeLogDir=tempDir
```

where *tempDir* is a temporary directory for which you have write permission.

9. Copy your version 6.6.5 extent files into the location specified by the GemStone configuration option `DBF_EXTENT_NAMES`:
 - a. Using a text editor, open the file `%GEMSTONE%\data\system.conf`, or whichever configuration file your system uses.
 - b. Locate the last occurrence of the option `DBF_EXTENT_NAMES`, and note its value.

- c. Copy each .dbf file to the noted location. For example:

```
C:>\ cp InstallDir665\data\extent0.dbf 67location
```

```
C:>\ cp InstallDir665\data\extent1.dbf 67location
```

```
C:>\ cp InstallDir665\data\extent2.dbf 67location
```

where *67location* is the location specified by `DBF_EXTENT_NAMES` in the configuration file that will be used in version 6.7. If you are changing platforms, as well as upgrading, use `copydbf` instead of `cp`.

Perform the Upgrade

1. Start the 6.7 Stone. For upgrading from version 6.1.x, you must start the stone using the `/C` flag, which performs the conversion. If you are upgrading from version 6.2 or later, this flag should not be used. For example:

For upgrade from 6.1.x:

```
C:\> stone start /C stone67
```

For upgrade from 6.2 or later:

```
C:\> stone start stone67
```

You may omit the stone name, in which case `gemserver67` will be used. When this step completes, the results will be:

```
startstone[Info]: GemStone server stone67 has been started.
```

2. To upgrade the image, run the upgrade script:

```
C:\> upgradeImage stone67
```

where *stone67* is the name of the version 6.7 Stone started in the previous step. You will be prompted to continue the `upgradeImage` step.

This script invokes several subordinate scripts to complete the upgrade. This will take some time to complete; output is sent only to a log file in the `%upgradeLogDir%` directory. This process should end with this display:

```
Upgrade is now complete.
```

If errors were reported during the upgrade, please preserve the contents of `%upgradeLogDir%`. Contact your internal GemStone support person or GemStone Technical Support.

Restore Your Site-Specific Settings and Back Up the Repository

1. Reinstall any other GemStone products that modify kernel classes.

If you use GemConnect, GemBuilder for Java, or GemEnterprise, you must install them again at this time. Use the procedure in the installation guide for each product. If you have an upgraded product version you may install it at this time. Otherwise, install the same version that was previously installed.

2. Log in to GemStone version 6.7 as DataCurator.

3. Change the password for SystemUser, which you changed to `swordfish` prior to the conversion, back to its version 6.6.5 value. Also, change the password for GcUser, which was reset by the conversion process, back to its version 6.6.5 value:

```
topaz 1> printit
(AllUsers userWithId: 'SystemUser') password: '665Password'.
(AllUsers userWithId: 'GcUser') password: '665Password'.
System commitTransaction
%
```

where *665Password* is the account password used in your initial repository version.

4. If you have modified any kernel class methods in the previous version, compare these changes with version 6.7 kernel methods to see whether your changes are still necessary or appropriate. This should be done before or during the Pilot upgrade, so a filein can be created containing only the required changes.

File in the application-specific kernel modifications and commit. You may need to log in as SystemUser to do this.

5. If you are upgrading from a version earlier than 6.2, and your application includes indexes on values that may contain Characters greater than 128, you need to rebuild these indexes. This is due to changes in Character collation in version 6.2.
6. If this is the Production upgrade, create a full backup of the upgraded repository now. The upgraded repository is now usable.
7. If you are using GBS clients, configure these to use the version 6.7 client libraries. See Chapter 3, 'Configuring GBS for GemStone/S' for details.

Configuring GBS for GemStone/S

This chapter describes how to configure or update your client Smalltalk application using GemBuilder for Smalltalk (GBS) on Windows to run with GemStone/S version 6.7.

This chapter describes Windows clients only; for instructions for updating GBS clients on other platforms, see the relevant *Installation Guide* for that platform.

In addition to using the appropriate version of GBS, you must use GemStone/S 6.7 client libraries with your GBS client application, to be able to log in to the v6.7 server. These libraries are specific to the GemStone/S server version and to the client platform.

For instructions on installing and configuring GBS, see the GemBuilder for Smalltalk Installation Guide for the appropriate version of GBS.

For a table of all supported GBS and client Smalltalk platforms, see the *GemStone/S Release Notes* for v6.7.

GBS Setup or Upgrade Procedure

Shared Libraries for GBS Client Node

The GBS client requires a set of shared libraries (.so.dll files) that are provided as part of the GemStone server product distribution. When these are loaded into the client Smalltalk image in which GBS code is installed, the GBS client can log into the GemStone server.

The shared libraries must be the same version as the GemStone server. Since they are loaded into the client smalltalk VM, they must be appropriate for the client platform.

If your GBS client is on a different platform than your GemStone/server, you will need to download the version-specific libraries for the platform that the GBS client is running on.

You can either install the full GemStone/S Server on your GBS client node, or copy just the specific shared libraries you need.

Install GemStone/S on client node

If your clients run on the same machine as the server, you have no need to do anything further – you can use the libraries in their locations in the existing server installation.

Otherwise, you may find it useful to install the full GemStone/S Server on the client.

If you will run linked sessions on the GBS client, or other configurations in which the gem is on the same node as the GBS client, you will need much of the GemStone/S server installation. The GemStone/S installation also includes tools such as topaz, gslis, and VSD.

Install GemStone/S on the client machine following the instructions in the Installation Guide for the client platform. You do not need to configure an extent or perform similar server tasks.

Copy only specific client libraries

If you will only be running RPC sessions, and do not require tools such as gslis, vsd, or topaz on the client, you do not need to install the full GemStone/S Server on the client node. You may copy only the small set of library files that GBS requires. If you want to run linked sessions as well as RPC, you will need a full server installation on the client.

The following files need to be copied to the client node:

```
%GEMSTONE%\bin\gcirw67.dll.dll
%GEMSTONE%\bin\gsw67.dll.dll
%GEMSTONE%\bin\englis67.err
```

GBS provides a number of options as to where on the client machine to place the shared libraries. Refer to the *GemBuilder for Smalltalk Installation Guide* for details on these options

Update GBS to reference v6.7 libraries

Once you have installed the GemStone server on the GBS client machine, or copied the appropriate shared libraries, you need to ensure that the client Smalltalk executable will load the v3.2 libraries.

Determining library name to specify

Whether or not you have a full server installation on the client or have copied a few libraries, you need to specify the name of the library you wish GBS to load.

RPC logins only:
gcirw67.dll

Linked and RPC logins:
gcilw67.dll

Setup GBS to load the new libraries

- If you have set the GBS configuration parameter `libraryName:`, update this to the new library name, and save your image.
- If you have set the GBS configuration parameter `libraryName:` to an empty string, ensure that no other client libraries of the same name are in the current working directory or the directories that your client Smalltalk product searches.
- For a new GBS application, refer to the *GemBuilder for Smalltalk Installation Guide* for details on the library loading setup options.

Stop and restart the client VM

GBS loads the client libraries into the client Smalltalk VM the first time a GemStone server call is made after each startup of the VM. GBS is now ready to use.