


GemStone/S 64 BitTM Raspberry Pi Client Installation Guide

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PATENTS

GemStone software is or has been covered by U.S. Patent Number 6,256,637 "Transactional virtual machine architecture" (1998-2018), Patent Number 6,360,219 "Object queues with concurrent updating" (1998-2018), Patent Number 6,567,905 "Generational garbage collector with persistent object cache" (2001-2021), and Patent Number 6,681,226 "Selective pessimistic locking for a concurrently updateable database" (2001-2021).

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Installing GemStone Raspberry Pi Client

This chapter describes the procedure for installing the Raspberry Pi client components for GemStone/S 64 Bit™ version 3.5.1.

Raspberry Pi is **not** a fully certified client platform for GemStone/S 64 Bit. GemStone/S 64 Bit Client for Raspberry Pi is provided as a convenience for users and should not be used on production systems, nor for critical development tasks.

This client installation provides:

- ▶ 32-bit shared libraries that can be used to log in from a client running on Raspberry Pi to a GemStone/S 64 Bit server on a server machine; these are the shared libraries used by GemBuilder for Smalltalk, client topaz, and client GCI applications.
- ▶ Utilities such as **topaz** that can be run on the Raspberry Pi client to connect to a GemStone server on another machine
- ▶ The C/C++ include files used to link client GCI applications that will run on the Raspberry Pi client.

The GemStone/S 64 Bit server does not run directly on the Raspberry Pi platform.

Platform and O/S

The GemStone/S 64 Bit Client for Raspberry Pi is known to work in the following environment. Other Raspberry Pi configurations may work, but have not been tested.

Platform

- ▶ Raspberry Pi model 3 B+
- ▶ Armv71 processor
- ▶ 1 GB of RAM

Operating System

- ▶ Raspbarian v4.14.79-v7+

Disk space

- ▶ The complete GemStone/S 64 Bit Raspberry Pi client distribution requires about 35 MB of disk space.
- ▶ The minimum set of shared libraries requires about 20 MB.
- ▶ You will need additional space if you are installing a Smalltalk client or other software.

Configuring for named NetLDIs

GemStone NetLDI processes on the server may be accessed by the port number that the NetLDI is listening on, or by name. If the NetLDI on the GemStone server is normally accessed by port number, no further configuration is needed on the Raspberry Pi client. If the GemStone server is using named NetLDIs, you must ensure that the services on the Raspberry Pi maps these names to the appropriate port number.

The service mappings may be in `/etc/services/`, or configured via `ldap` or another mechanism.

To update `/etc/services`, add an entry similar to the following:

```
gs64ldi 50377/tcp #GemStone/S 64 Bit 3.5.1
```

This port number must be the same as the NetLDI service you will connect to on the GemStone/S 64 Bit server machine.

Installing the GemStone/S 64 Bit Raspberry Pi Client

The GemStone/S 64 Bit Client for Raspberry Pi distribution includes all the components that are needed for a variety of usages on the client. You may install the complete set of GemStone's Raspberry Pi client components, although most client applications will not need the entire set. For the initial installation, we recommend installing the complete distribution.

When using GemBuilder for Smalltalk, you may wish to copy only the specific shared libraries that are needed to connect to the GemStone server from the Raspberry Pi. That is described in the next chapter.

GemStone/S 64 Bit Client for Raspberry Pi is provided as a zipped archive. To install the complete distribution, copy the distributions to an install directory, *InstallDir*, and unzip.

InstallDir will contain a directory with a name similar to `GemStone64Bit3.5.1-arm32.Linux/`, including the following directories and files:

<code>bin32/</code>	topaz and openssl executables. The command-line topaz client is useful to verify login to the GemStone server.
<code>include/</code>	C and C++ header files needed to link GCI applications.
<code>lib32/</code>	32-bit GemStone shared libraries.
<code>licenses/</code>	GemStone licence file and licenses for open-source code included with GemStone.
<code>PACKING.txt</code>	A file containing a listing of all files in the distribution.
<code>sys/</code>	contains the topaz help file.
<code>uilib/</code>	Empty directory for user action libraries.
<code>version.txt</code>	A file containing information on the particular product and release of this GemStone client.

Set the environment

GEMSTONE

While not required, generally you should set the environment variable GEMSTONE to the *full pathname* (starting with a slash) of your new GemStone installation directory. For example:

```
unix> export GEMSTONE=InstallDir/GemStone64Bit3.5.1-arm32.Linux
```

If GemStone will be used regularly, it is recommended to set this up in the login shell initialization file.

PATH

To access the client executables (such as topaz) you should update the system path to include `$GEMSTONE/bin`.

For example:

```
unix> export PATH=InstallDir/bin32:$PATH
```

Logging in from the topaz command line

Logging in from the Raspberry Pi command line is no different than logging in from any UNIX platform.

Note that linked logins are not supported (32-bit clients cannot login linked to 64-bit GemStone/S 64 Bit).

The following example assumes that \$GEMSTONE is set, and the system path updated.

```
unix> topaz
headers
topaz> set gemstone !@stonehost!stonename
topaz> set username DataCurator password swordfish
topaz> set gemnetid !@stonehost#netldi:netldiNameOrPort!gemnetobject
topaz> login
[12/06/2019 15:37:58.612 PST]
  gci login: currSession 1  rpc gem processId 25979 socket 6
successful login
topaz 1>
```


Configuring GBS for GemStone/S 64 Bit

This chapter provides further information on setting up a client Smalltalk application using GBS on a Raspberry Pi, to run with a GemStone/S 64 Bit version 3.5.1 server on a supported server platform.

Both GemBuilder for Smalltalk/VA with Instantiation's VA Smalltalk, and GemBuilder for Smalltalk/VW for Cincom's VisualWorks Smalltalk, have been verified to connect and login. Full testing has not been done and these third-party client Smalltalk environment are not currently supported by their organizations.

GemBuilder for Smalltalk/VA

Executables for VA Smalltalk on Raspberry Pi are available in the pre-release VA Smalltalk 9.2 Early Customer Access Program (ECAP) distribution.

These have been run with the GemBuilder for Smalltalk v5.4.5 release.

GemBuilder for Smalltalk/VW

The VW 8.3.2 release includes an unsupported Raspberry Pi object engine.

These have been run with the GemBuilder for Smalltalk/VW v8.4 release.

Configuration for the Client

Shared Libraries for Client Node

The GBS client requires a set of shared libraries (.so files) that are provided as part of the GemStone server or client product distribution.

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.

It is recommended to install the full GemStone/S 64 Bit Raspberry Pi Client on your GBS client node, as is described in Chapter 1 of this *Installation Guide*.

However, you may instead just copy the specific shared libraries that are needed.

Libraries only

If you do not require tools such as **topaz** on the client, you do not need to install the full GemStone/S 64 Bit Raspberry Pi Client on the client node. You may just copy the set of library files that GBS requires:

```
$GEMSTONE/lib32/libgcirpc-3.5.1-32.so
$GEMSTONE/lib32/libssl-3.5.1-32.so
```

You may put these libraries in the client Smalltalk working directory, a directory on the machine search path, or in another location. The choice of locations will determine the options for locating and loading the shared library, as described in the next section.

Update GBS to reference v3.5.1 libraries

Once you have installed the GemStone client on the GBS client machine, or copied the appropriate shared libraries, you need to ensure that the client Smalltalk executable (the VisualWorks or VA Smalltalk application), will load the v3.5.1 libraries.

Library name to specify

For GemStone clients on the Raspberry Pi, the library name that will be loaded is always:

```
libgcirpc-3.5.1-32.dll
```

Setup GBS to load the new libraries

The client library is generally specified by executing code in the client image, prior to logging in.

There are a number of ways to specify the client library:

- **Execute code to set full path**

Set `libraryName` to the full path and file name of the client library file. This is the recommended option.

For example:

```
GbsConfiguration current libraryName:
  'InstallDir/GemStone64Bit3.5.1-arm32.Linux/lib32/libgcirpc-
  3.5.1-32.so'
```

With this option, the shared libraries may be anywhere on the client; the libraries do not need to be on the `$LD_LIBRARY_PATH`.

- **Execute code to set filename, allow system to determine path**

Set `libraryName` to the file name of the client library file.

For example:

```
GbsConfiguration current libraryName:
  'libgcirpc-3.5.1-32.so'
```

This option requires that the library be in a directory in the standard library directories.

- **Allow system to determine path and filename (VisualWorks only)**

Leave `libraryName` set to the empty string. This is the default, equivalent to:

```
GbsConfiguration current libraryName: ''
```

This requires that the client libraries be in the current working directory, or in the `bin` directory or subdirectory of your VisualWorks image's `VISUALWORKS` directory.

- **Use file dialog to set path and filename**

Use the file dialog to select the library name and path.

If the library name specified by `libraryName` in the previous options cannot be loaded, the resulting notification provides the option of selecting a file using a file dialog.

The load error may be due to an incorrect `libraryName`, copying the wrong library, or an additional required library failing to load.

Navigate to the location of the shared library and select the file. The dialog provides filename filtering, so only valid library names will appear.

Selecting a file using the file dialog will set `libraryName` to the full path selected.

Verify installation by logging into the GemStone/S Server

To preserve your `libraryName` setting, save your image. You may wish to make a backup of this image.

The `libraryName` setting controls the shared library that is loaded the first time GemStone server code is accessed after image startup. If you have a client library already loaded in your image, changing the `libraryName` has no effect. To change the shared library that is loaded, update the `libraryName`, and save and restart the image.

Once the shared libraries are loaded, you should test your installation by logging into the GemStone server. You will need to ensure that the Stone repository monitor and NetLDI are accessible.

