Sparkle Pharo IDE for GemStone/S 64 Bit™

DRAFT ReadMe and Install Guide

Version 1.0 Alpha

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This document is a DRAFT version for a project under active development, and subject to extensive change.
Refer to https://github.com/GemTalk/Sparkle,
and consult the Sparkle project team for recent updates.

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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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Chapter

1

DRAFT ReadMe and Install Guide for 1.0 Alpha

Overview

Sparkle 1.0 Alpha is a development version of the Pharo IDE for GemStone project, which provides GemStone development tools in the Pharo client Smalltalk environment.

This initial version of Sparkle provides a very limited set of debugging tools:

- a login window, allowing you to create login configuration parameters and login; you may also edit, persist, and restore the login configurations.
- object inspectors, allowing you to examine the contents of GemStone server objects.
- a debugger, allowing you to view the debugger call stack, examine objects, and step through code.

Sparkle is under active development and information in this document is likely to become out of date without notice.

See the project on github: https://github.com/GemTalk/Sparkle

Requirements

With Sparkle, you must use GemStone/S 64™ Bit v3.7, which has some additional features that are required for Sparkle support. v3.7 is not released as of April 16, 2021 (the date of this document), but alpha builds are available.

You should have GemStone v3.7 installed on a supported Linux server, with a Stone running and available for use.

Sparkle is supported with recent builds of Pharo 9. For the Pharo client, you should have a Windows or Linux environment in which you will install Pharo.

Pharo 9 is under active development and not all updates are stable. The current build in use is documented here: https://github.com/GemTalk/Sparkle/wiki#current-pharo-build. These instructions use build number 1310.

GemStone Server Installation on Linux

Install GemStone

1. Install GemStone/S 64 Bit v3.7. Note that v3.7 is under active development; versions other than the most recent may not work correctly.
2. Start a v3.7 Stone.

Clone Sparkle from GitHub

1. Create or choose a directory for git clones; this will be referred to as *gitRepositoryDir*.
2. Clone https://github.com/GemTalk/Sparkle.git to *gitRepositoryDir*/Sparkle

Install into GemStone on Linux

1. Go to a command shell that:
   - has defined $GEMSTONE to the GemStone/S 64 Bit v3.7 installation directory, and
   - has $GEMSTONE/bin on the $PATH
2. Change to the Sparkle GemStone directory:

   ```
   cd gitRepositoryDir/Sparkle/src-gs
   ```

3. Edit `loginSystemUser.topaz` to have the correct Stone name, and the password for SystemUser is set for your Stone.
4. execute the installation script:

   ```
   ./bootstrapSparkle.sh
   ```

   The result of the "errorcount" at the end of the output should be 0.

Sparkle is now installed in the GemStone server.

Client Installation on Windows or Linux

The following instructions are for the Sparkle client, which can be run on Windows or Linux.

Pharo Installation

1. Download the launcher or launcher installer for the given platform from https://pharo.org/download, and install.
2. Run PharoLauncher to open the Launcher.
3. Click on ✲ **New**.
4. In the Template Category list, select **Pharo 9.0 (development version)**. Note that the desired download is not under Official Distributions.
5. Select the specific build (currently 1310); this may require scrolling through more recent build numbers. Be sure you select the 64-bit image.

6. Select ✻ **Create image**. This will create a new Pharo image based on the selected template.
7. Use the right-click menu item ▶ **Launch** to launch the image.

Clone Sparkle from GitHub

1. On the client, create or choose a directory for git clones; this will be referred to as *gitRepositoryDir*.
2. Clone https://github.com/GemTalk/Sparkle.git to *gitRepositoryDir*\Sparkle

Install Sparkle in Pharo

1. Launch the Pharo 9.0 build 1310 image.
2. Open the Settings Browser using **Pharo > Settings**, select **Appearance**, and expand the list. Change the **UserInterfaceTheme** to "Pharo Dark." Sparkle is not yet themed and some color combinations are difficult to read in the light theme.
3. Open Iceberg using **Browse > Iceberg**.
4. In the Iceberg repository list window, click **+ Add** in the upper right.
5. Select **Import from existing clone**.
6. Click the folder icon to open a file selection dialog, and navigate to *gitRepositoryDir*\`Sparkle`. Click OK to select the Sparkle directory.
7. Click on the OK button. Sparkle should appear in the Iceberg repository list.
8. Right click on Sparkle, and select **Metacello > Install Baseline (default)**. Sparkle will clone the other required repositories, and load what it requires.
9. Save the image.

Login

There are two ways to login to the GemStone server from Sparkle.

- a Direct login creates a direct connection between a listening Gem on the server and the sparkle client. This does not require client libraries on the client.
- a GCI login performs a login using the GCI client libraries, as with logins using topaz or GBS.

Logging in using Direct

Direct login is a two-step process; you will launch a listening Gem on the GemStone server on Linux, and connect to this Gem from the Pharo client image on Windows.

In the Linux server environment, launch a gem that will listen for a connection from Pharo

Warning

This step will launch a gem that will listen for a connection on port 29299. At present, there is no security on that port.

1. Edit *gitRepositoryDir*`/Sparkle/src-gs/login.topaz` to have the correct stone name, user name, and password. You can use an unprivileged user for this, such as DataCurator. SystemUser is only required for installation.
2. Execute the listening gem launch script:

   ```
   ./server.sh
   ```

   You should see a "Starting to listen" message.

On the Pharo client, connect to the listening Gem

1. Open the Sparkle Connection Launcher window using the **Library > Sparkle Connections Launcher** menu item.
2. Select the **Direct** tab on the right pane. Enter the following fields:

   Connection Name — a unique identifier for this connection.

   Host — the name or IP of the host that the Stone is on.

   Port — the port that the listening Gem on the server is listening on. If you are using the server script described above, this will be 29299.
3. Click the **+ Add** button to add the new profile to your list of profiles.
4. Click the **Connect** button. A Sparkle Object Explorer window will open, containing an inspector on nil.

Logging out

Click the **Disconnect** button in the **Sparkle Connect** window to terminate your connection to the GemStone server. This closes the Sparkle Object Explorer and any other open server windows.

While the client is disconnected, the listening Gem remains logged in, and will continue to listen for connections from the client. To fully logout, you must stop the listening Gem on the server (e.g., using Control-C).

Logging in using GCI

Login using the GCI interface does not require a listening Gem on the server. However, you must have the GCI libraries available in the `clientlibs` directory.

Install clientlibs on the client host

In addition to the GemStone product distribution itself, GemTalk distributes clientlibs for v3.7. This directory tree packages the essential shared libraries, which are a subset of the libraries files that are included in the GemStone distribution for Linux or the GemStone Client distribution for Windows, in a way that can easily handle multiple versions of GemStone without complicated management in the client host environment.

With Sparkle, you must use this `clientlibs` structure, rather than the libraries in a regular product or client distribution.

1. Copy the clientlibs directory tree from the distribution area, to a location on the client host file system.

On the Pharo client, enter connection parameters and connect

1. Open the Sparkle Connection Launcher window using the **Library > Sparkle Connections Launcher** menu item.
2. Select the **GCI** tab on the right pane. Enter the following fields:

   Connection Name — a unique identifier for this connection.

   Host — the name or IP of the host that the Stone is on, and on which the Gem will be run.

   Version — 3.7.0 (do not omit the trailing .0).

   Stone — the name of the running Stone.

   NetldI — the name or port number of the NetLDI on the Stone's host.

   User — the GemStone user name, such as DataCurator.

   Password — the password for the GemStone user.

   Client Libraries Path — the path to `clientlibs` root directory. The connection will look within this directory structure for the correct version and the 64-bit (or 32-bit) libraries. You may type this in, or use the **Set Path** button to navigate to the directory.

   Set Path — a button that opens a dialog, allowing you to navigate to the `clientlibs` directory and select the value for the **Client Libraries Path**.
3. Click the **+ Add** button, to add the new profile to your list of profiles.
4. Click the **Connect** button. A Sparkle Object Explorer window will open, containing an inspector on nil.

Logging out

To logout, click the **Disconnect** button in the **Sparkle Connect** window. Unlike with a Direct login, this logs out the Gem, as well as disconnecting the client. The Sparkle Object Explorer and any other open server windows are closed.

Operations in your Session

Inspecting objects

To execute code and inspect the results, enter a GemStone Smalltalk expression in the lower Evaluator pane, and accept (Ctrl-S). The window will split, with the inspector pane appearing on the right, with a green header.

Selecting fields within this objects will add panes to the right, containing inspectors on each objects that is selected. Deselecting a field will remove the inspector pane.

You may open a new Sparkle Object Explorer using the Sparkle Connections Launcher toolbar item **Explorer**.

Debugging

If an error occurs in the executed code, a stack pane, with a red header, will appear, instead of an inspector. Selecting frames within this stack adds panes with frame details, including method source and variables, to the right; this is similar to how object inspection is handled.

Inspecting stack variables

Variable values are hidden by default. To see the details of frame variables, expand the drop town immediately under the header. Selecting individual variables will add inspector panes to the right.

Continue, Terminate, and step

The Stack Pane has two buttons under the header; a green arrow (continue execution) and a red X (terminate execution).

Individual frame method panes include three icons on the left side: Step into, Step through blocks, and Step over. These allow control over stepping through code.