

AGENT FACTORY

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User Guide (DRAFT)

# Getting Started Guide

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## Installation Instructions

*This chapter describes how to install Agent Factory.*

**A**gent Factory is available from <http://www.sourceforge.net/projects/agentfactory> where you can download either a pre-compiled Java version, known as the Agent Factory application bundle, or the Java source code, known as the Agent Factory source bundle. To install Agent Factory, you should follow the instructions presented below.

### Requirements

To use Agent Factory, you must install the following programs on your computer:

- Either **Java 2 Standard Environment (J2SE)** or the **Java 2 Mobile Environment (J2ME)** can be used. While any version can be used, application bundles are only available for J2SE 1.4.1 and later.
- **Apache Ant 1.5** or greater is required if you wish to compile the Agent Factory source code.
- We recommend that you use the **Netbeans 3.6** or **Eclipse** Integrated Development Environments to compile source code. However, these are not necessary and it is also possible to use any standard text editor together with the command line compilation tool.
- A **CVS shell** for downloading the un-compressed source code from the Sourceforge CVS repository. This is not mandatory because the source code can be downloaded as a zip, tar, or gz file. However, source code bundles are only created for releases of the system. Using CVS will provide you with a more up-to-date snapshot of Agent Factory.

## Compiling the Source Code

To compile the Agent Factory source code you must install Apache Ant and follow the instructions below:

- Start by either expanding the source bundle or checking out the latest code from the Sourceforge CVS repository.
- Go to the “**AgentFactory**” root folder, and type in “**ant release -Drelease-number=0.2.0**”. This will start the compilation process, the results of which can be found in the “**build**” subdirectory.
- Go to the “**build**” subdirectory. You will find two subfolders: the “**release**” subfolder contains the application bundles for Agent Factory, while the “**temp**” folder contains an uncompressed version of the Agent Factory application.

In the following installation instructions, you can either extract the application bundle, or copy the subdirectory contained in the “**temp**” subfolder.

## Installing Agent Factory

To install Agent Factory, please follow the appropriate instructions below.

### Windows

For windows, please complete the following steps:

- Extract the **Agent Factory application bundle** to an appropriate location on your computer. By default, we recommend that you extract it to a root folder on one of your drives (for example, c:\agentfactory-0.2.0).
- Set the **AF\_HOME** environment variable to point to the base folder of the application directory structure. For example, if Agent Factory is installed at the location specified above, then **AF\_HOME** should be set to c:\agentfactory-0.2.0. You can do this via the System Properties panel.
- Add the “**bin**” subfolder to the **PATH** environment variable. In the example installation above, this would involve adding the c:\agentfactory-0.2.0\bin path to the **PATH** environment variable. Again, you can do this from the System Properties panel.
- Set the **JAVA\_HOME** environment variable to point to the base folder of the Java virtual machine you wish to use (this should already be set if you are using Apache Ant).

You are now ready to use Agent Factory!

Linux

For Linux, please complete the following steps.

- Extract the **Agent Factory application bundle** to an appropriate location on your computer. By default, we recommend that you extract it to the `/opt/agentfactory-0.2.0` folder.
- Set the **AF\_HOME** environment variable to point to the base folder of the application directory structure. For example, if Agent Factory is installed at the location specified above, then **AF\_HOME** should be set to `/opt/agentfactory-0.2.0`.
- Add the **“bin”** subfolder to the **PATH** environment variable. In the example installation above, this would involve adding the `/opt/agentfactory-0.2.0/bin` path to the **PATH** environment variable.
- Set the **JAVA\_HOME** environment variable to point to the base folder of the Java virtual machine you wish to use (this should already be set if you are using Apache Ant).

You are now ready to use Agent Factory!

## Overview of the Directory Structure

The base folder of the Agent Factory application has been sub-divided into a number of sub-folders. Figure 1 below presents an overview of the directory structure.



Figure 1: The Agent Factory application directory structure

### “bin” folder

The “bin” folder contains a number of **batch files** (for Windows) and **scripts** (for Linux) that should be used to run the various Agent Factory components. These include:

- The **“agentfactory”** script – starts an instance of an agent platform and takes two arguments “-config” identifies a platform configuration file, and “-script” identifies an initialization script file. Details on these two files can be found in the **Platform Guide**.
- The compile scripts – currently **“afapl”**, **“afapl2c”**, and **“alphac”** which can be used to compile: AF-APL, role-based AF-APL, and ALPHA agent programs respectively. Details of each of these languages can be found in the respective language guides.

- The Remote Command Service scripts – these include a script for starting the command line version of the RCS (**afrcs**), and a script for starting the graphical version of the RCS (**afgui**).

“lib” folder

This folder contains the jar files that implement the core functionality of Agent Factory.

“examples” folder

This folder contains a number of demo applications that can be used to gain a basic understanding of how Agent Factory works. Current demo applications include the “Chatter Application, a Vickrey Auction, and an example Interface Agent.

“plugins” folder

This folder should be used to include any additional Java code that may be required by any agent-oriented application that you implement. All jar files placed in this folder are subsequently extracted and placed in the “work” folder, which is specified within the classpath of every agent platform.

“work” folder

The “work” folder is where the contents of jar files placed in the “plugins” folder are extracted. This allows developers to implement custom functionality that can be directly accessible from within the agent platform.

## Running the Chatter Application

*This chapter describes how to run one of the example applications that is provided with Agent Factory.*

**A** number of example applications come with Agent Factory. These applications are located in the “**examples**” folder. The instructions below describe how to start one of these applications. For details of how the application has been implemented, please consult the **Examples Guide**.

The Chatter application is a very simple application that contains two “Chatter” agents, who send messages to each other, responding to the receipt of a message by sending a message back in response, and also printing out “hello” to the console to indicate that they have sent the message.

### Starting the Agent Platform

To start the Chatter application, you must open a command prompt/terminal and go to the “**examples**” folder within the Agent Factory directory structure. Once in this directory, type:

```
>agentfactory -config com/agentfactory/examples/chatter/chatter.cfg -script com/agentfactory/examples/chatter/chatter.ap
```

This will start the agent platform, and will result in an output that looks something like this:

```
Agent Factory Runtime
(C)opyright 1996-2005, The Agent Factory Working Group
Adding: ams.jar 1112621178346
[SystemProperties] File skipped as already expanded - ams.jar
count = 0, total = 1373
[RemoteCommandService] started on port 5050
```

Figure 2: An example output for the agent platform

A key piece of information provided in this output is the port number on which the Remote Command Service has been started (in this case it is 5050). This is needed to connect the AF GUI tool to this platform.

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## Starting the AF GUI

Open a second command prompt/terminal and type **afgui**. This should cause the AF GUI component of the Remote Command Service to be loaded. A screenshot of this interface is presented in figure 3 below.

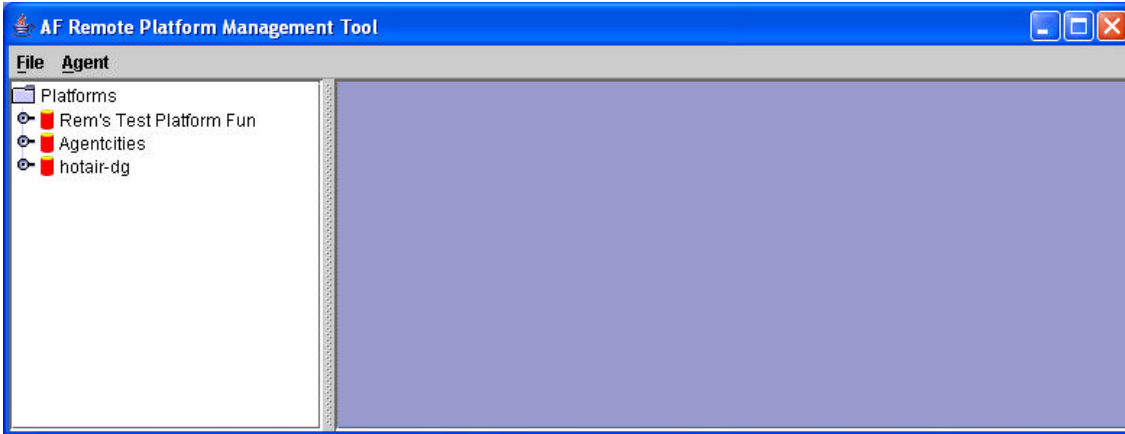


Figure 3: Screenshot of the Graphical Interface for the Remote Command Service

## Connecting the AF GUI to the Agent Platform

To connect the AF GUI to the agent platform, you must right-click over the Platforms node of the tree on the left-hand side of the interface, and select the "Add Site Profile" option. This will cause the dialog box presented in figure 4 to be opened.

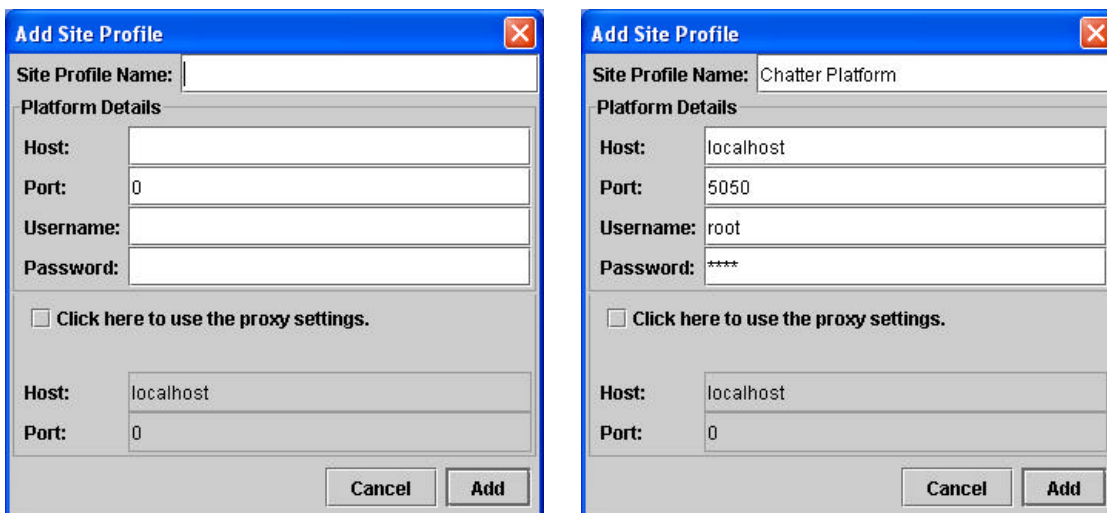


Figure 4: Two screenshots of the Add Site Profile dialog

This interface is used to input the information necessary to connect the AF GUI to the relevant agent platform. The screenshot on the right of the figure shows what the completed

form should look like. Specifically, we use the default username, **root**, together with the default password, **fish** to authenticate the connection. Once connected, you can use the AF GUI to add/remove users, and to change their passwords. Additionally, you should notice that the port number entered (5050) is the same as the port number displayed when the agent platform was started. Ultimately, this port number can be set in the configuration of the Remote Command Service as described in the **Platform Administration Guide**.

Once you have entered the site profile, you can connect to that agent platform but double-clicking on the node of the same name (e.g. Chatter Platform) in the tree on the left hand side of the interface. Figure 5 below shows a screenshot of the AF GUI once it is connected to an agent platform.

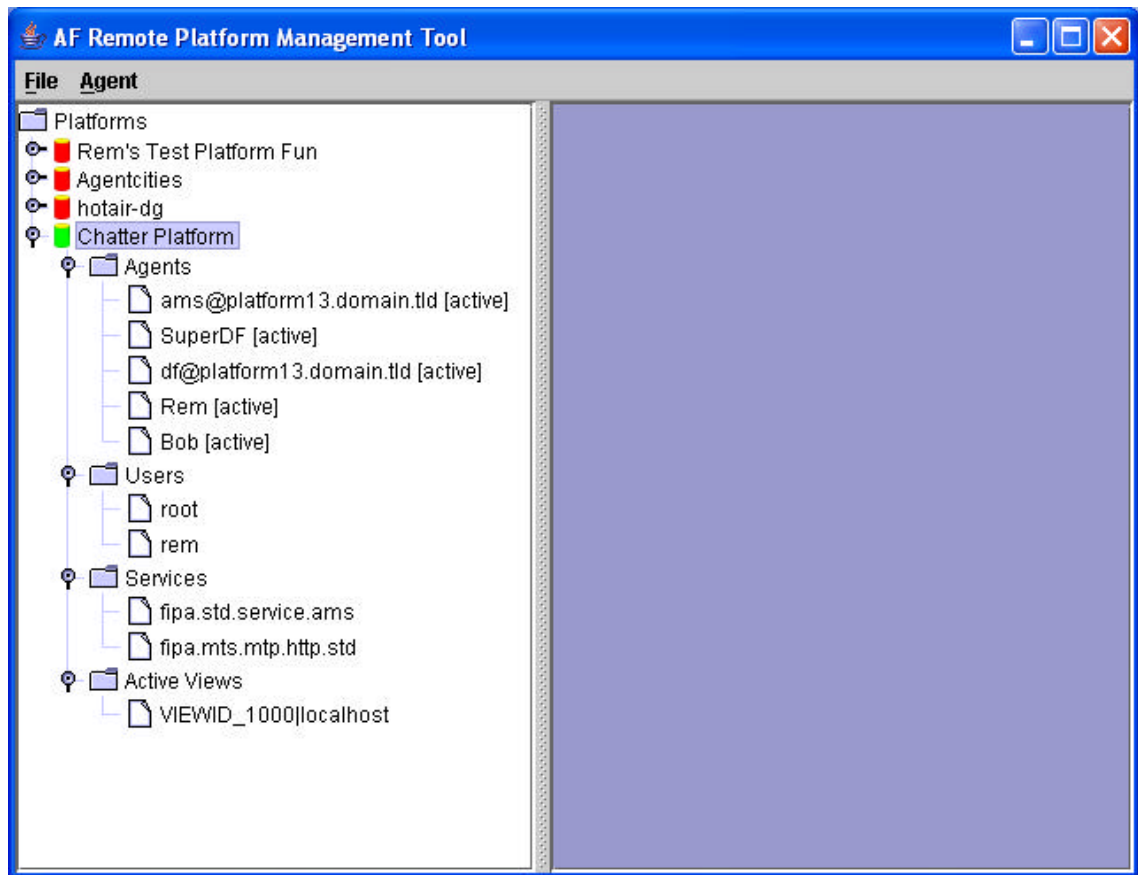


Figure 5: Screenshot of the AF GUI connected to the Chatter Platform

## Viewing and Controlling the Agents

The AF GUI provides support for both the management of agents and the visualisation of agents. Details of the support provided by the AF GUI can be found in the **Platform Administrators Guide**. In this section, we simply illustrate some of the core functionality and tools in the context of the chatter application.

Figure 6 below presents a screenshot of the AF GUI where the user has chosen to monitor the execution of the two chatter agents: Rem and Bob. To monitor an agent, simply double-click on the node that corresponds to the agent in the tree on the left-hand side of the interface. This opens up an instance of the **Agent Viewer Tool** (the internal pane on the right-hand side of the interface).

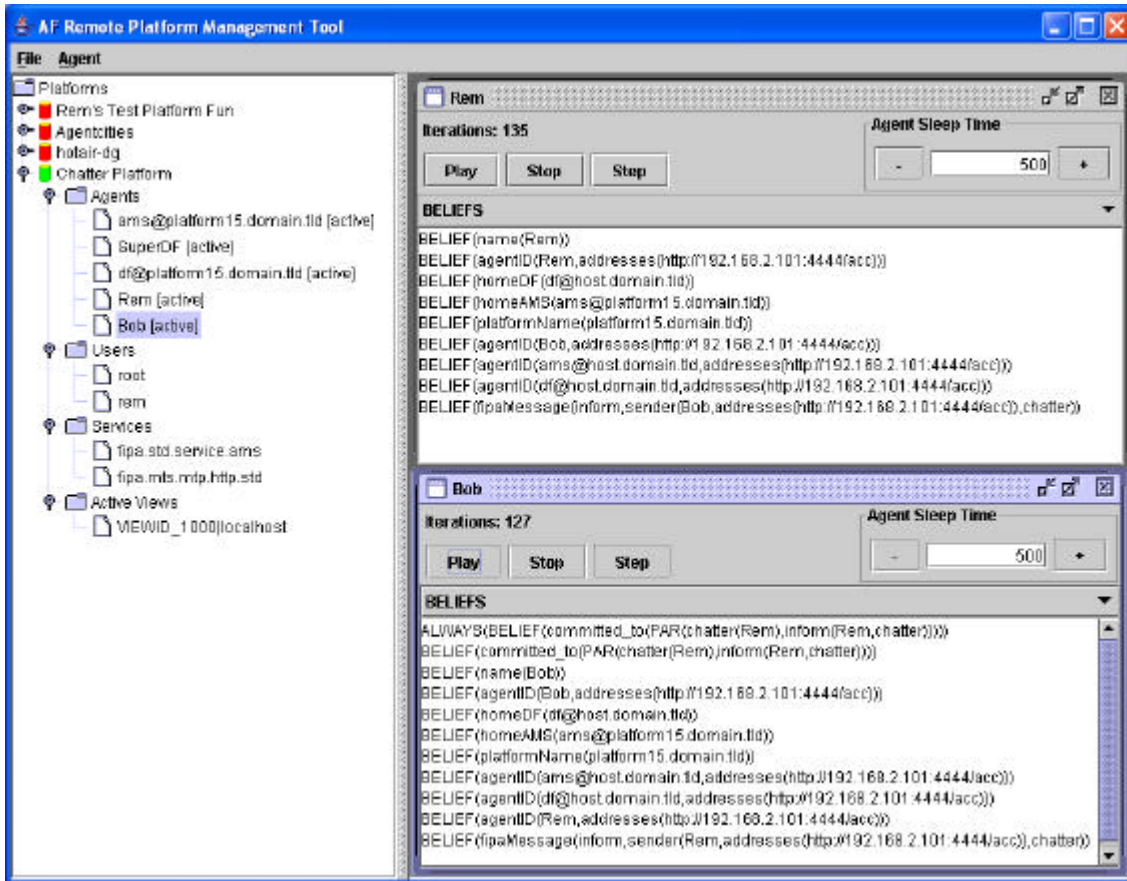


Figure 6: Monitoring Rem and Bob

The Agent Viewer Tool provides support for the monitoring and management of an individual agent. Management is supported through the control panel at the top of the tool (this provides support for starting, stopping and stepping the agent). Conversely, support for the monitoring of the agent is provided through the bottom half of the tool, which is comprised of a viewing area (at the bottom of the tool) together with a drop-down box that lists the different views that are available.

At this point in the walkthrough, we suggest that you take some time to explore how this tool operates. Specifically, we suggest that you stop both agents, and then use the step function to move through successive iterations of the interpreter cycle of the agent. After each step, have a look at the different views provided, and see how the agent's state changes!