

JAL Library

The Java Abstraction Layer (JAL) library is the Java wrapping of Abstraction Layer Bundle Protocol (ALBP). It allows users to use Bundle Protocol sockets on Java programs without caring about DTN implementation running on the machine. According to ALBP library, the supported DTN implementations are DTN2, ION and IBR-DTN.

Installation

The installation of JAL is pretty easy, it just needs 3 steps:

1. Download and compile ALBP library

The first step is to download and to compile the ALBP library. To perform this operation you should run the make command in a terminal. The make command requires some parameters to let it know which implementations you want to make the ALBP library work with. You can run the following commands to get the help message.

```
$ cd <ALBP_folder>
$ make
```

It follows an example for compiling properly the library for working only with ION implementation.

```
$ cd <ALBP_folder>
$ make ION_DIR=<ION_folder>
```

2. Download and install JAL library

Once the ALBP library is compiled you need to download, compile and install the JAL library. Once downloaded the library and unzipped you should proceed to compile and install the C module for the JNI calls, you can perform it running the following commands in a terminal.

```
$ cd <JAL_folder>
$ make ION_DIR=<ION_folder> AL_BP_DIR=<ALBP_folder>
$ sudo make install
```

Note that <ALBP_folder> must be the absolute path and should be the same as the previous command because the JAL library have to use the ALBP library to work!

Now the al_bp library is correctly installed and ready to be used from the JAL library. For building the JAL library is necessary to run the command

```
$ ant
```

That will compile and prepare the .jar file and it will be saved in /dist/lib/JAL_version.jar where *version* will be the downloaded version.

3. Import and use the library

Once created the .jar file you need to import it in your project and use it. After including the .jar file you can specify the internal folder “doc” which contains the javadoc documentation.

Requirements

To install JAL library you need:

- Java version 1.7 (at least).
- ALBP library.
- Linux system. Necessary because of compatibility of ALBP library.
- At least one of the DTN implementations supported by ALBP library (ION, DTN2 and IBR-DTN).
- Ant
- Javadoc

Examples

The following code is a simple echo program, it receives and sends data from/to a DTN socket.

```
BPSocket socket = BPSocket.register("echo", 10); // Registers using the demux token "echo" in case of DTN scheme or 10 in case of IPN scheme

Bundle bundle = null;
try {
    bundle = socket.receive(); // Receives a bundle from the BP socket
} catch (JALReceptionInterruptedException e) {
    System.err.println("Reception interrupted.");
    System.exit(1);
}
catch (JALTimeoutException e) {
    System.err.println("Timeout.");
    System.exit(1);
}

bundle.setDestination(bundle.getSource()); // Sets the destination
bundle.setExpiration(60); // Set the expiration (in seconds)

socket.send(bundle); // Sends the bundle through the BP socket

socket.unregister(); // Unregisters the socket (closing it)
JALEngine.getInstance().destroy(); // Destroys the engine (after this you shouldn't use anymore BP sockets)
```

Uninstall

To uninstall the JAL library you need to run the commands below.

```
$ cd <JAL_folder>  
$ make clean  
$ make uninstall  
$ ant clean
```

After that you can stop using the .jar file from your projects.