Submission date	20180603
Grant name	Java Enterprise Client Library
Organization	Blockchain Innovation Foundation
Previous Protocol Grant nr	(IGNORE)
Protocol Grant nr	FACTOM-INITIAL-GRANT-BIF-001

Executive Summary

BIF believes that it is essential for the success both short and long term of the Factom ecosystem to have as many good quality programming language integrations for the Factom RPC Rest API's as possible. External programmers need good clients to start integrating their products with Factom without having to rely on third parties. Java is still the number one programming language, especially in the enterprise world. BIF's external employees have extensive knowledge of using Java in enterprise settings and creating API's, as well as interacting with Factom's REST API's. We are well equipped to create a high quality Enterprise Java Client Library to help Java developers and Architects integrate Factom into their Enterprise application, whether it is plain Java or managed code like JEE CDI or Spring DI.
To create a high quality Java integration library in 4 weeks the amount of 1200 FCT is needed (little less than $20.000 at current FCT valuation of $16,45)

Type of grant

[X] Software development [ ] Legal [ ] other

Development of Software Library and accompanying Documentation

Blockchain Innovation Foundation

Project description

Create a liberal open source Java client library that is easy to integrate in plain Java products as well as JEE CDI or Spring (boot) products for the Factom RPC Rest API's.

The client library will have the following features:

- Synchronous and Asynchronous support
- Plugable injection for JEE CDI and Spring (boot)
- Proper design patterns
- Extensibility
- Good documentation
- Developer walkthrough
- Unit and integration tests
- Continuous integration

Problem statement

We are trying to make sure that Java developers and architects have a proper Java client library that has a liberal open source license like MIT or Apache2 to integrate Factom functionality into their own (Enterprise) products without having to rely on external (third) parties and without having to pay license fees. The code and documentation should be self explanatory so they can get up and running in a matter of hours. Currently there is no good Java integration possibility with Factom.

Goals & Objectives

The goal is to make Factom integration available for (enterprise) product integration. Both for external developers and companies as well as our fellow Authority Node Operators

The objective is to create a high quality liberal open source Java Library useful in enterprise applications and having good documentation as well. To have well tested code for the library functions that can be integrated in vanilla Java applications as well as JEE CDI / Spring (boot) applications.

Success criteria (measurable)

Criteria	Measurement
Having proper Factomd and Walletd support	Having unit and integration tests for all Chain, Entry and Wallet REST API functions
JEE CDI and Spring IoC	Spring (boot) and reference CDI tests
Having documentation	Published documentation
Having a walkthrough for developers	Published documentation
Code deliverance with liberal license	GitHub code repository and initial release

Timeline, activities & milestones

Activity	Milestone	Timeline
Creating library, documentation and tests	N/A	4 weeks, starting end of june

Budget(s)

We need two scrum sprints of 2 weeks to have an enterprise ready Java library completely documented and tested with roughly 1,25 FTE. Sprint 1 will be used to get the design and basic commands up and running. Sprint 2 will be completing the product, polishing and making sure the documentation is in order. Total duration is 4 weeks.

This puts the budget at 1200 FCT (little less than $20.000 at current FCT valuation of $16,45).

Competition & collaboration

https://github.com/FactomProject/javaAPI

There is an existing Java Library that is unmaintained, has no test coverage and documentation. It's design has serious flaws, meaning it is not easily extensible and definitely not ready for production usage in enterprise Java projects.
Actually it is so badly written a redesign of the complete library is needed, since no self respecting Enterprise would want to use the current library.

- It uses static functions making it impossible to extend
- A lot of duplicated code, making it impossible to maintain and waiting for bugs to happen.
- No asynchronous support
- It swallows almost all exceptions, meaning programs cannot react to it properly.
- No proper logging
- No design patterns, like for instance using a command pattern
- No good separation of concerns
- Invalid usage of Java Naming Standards
- Serialization/deserialization using strings in functions like `"{\"hash\":\"" + searchKey + "\"}";`
- No Inversion of control / Dependency Injection like JEE / Spring
- No unit tests
- No integration tests
- No continous integration

Organization or Person info

The project is conducted by the Blockchain Innovation Foundation (BIF). One of the Factom Authority Node Operators. For inquiries you can contact info@blockchain-innovation.org

BIF is a non-profit foundation that targets blockchain infrastructure, knowledge and development by creating open-source solutions using a liberal license. For questions you can reach BIF's chairman at nklomp@blockchain-innovation.org

Additional documentation

BIF will use Sphereon resources to create the Java Library. Sphereon has extensive experience in creating high quality API software being a content services API

Indemnification

By submitting a grant proposal or participating in the grant proposal process, the submitter indemnifies and holds harmless all Guides, Authority Set Members, and Standing Parties from and against any loss or expense incurred by reason of the fact that the Guides, Authority Set Members, and Standing Parties including without limitation any judgment, settlement, attorneys' fees and other costs or expenses incurred in connection with the defense of any actual or threatened action or proceeding, provided the loss or expense resulted from Good Faith Errors or from action or inaction taken in good faith for a purpose which the Guides, Authority Set Members, or Standing Parties reasonably believed to be in, or not opposed to, the best interests of the Factom Protocol.

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