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Abstract: It is proposed to accept the Soramitsu distributed ledger contribution into incubation status as "Iroha." Iroha is a distributed ledger project inspired by the Fabric API that aims to provide a development environment where C++ and mobile application developers to contribute to the Hyperledger Project. The project seeks to complement Fabric, Sawtooth Lake, and other potential projects, through interoperability protocols.

Context: The design and architecture of Iroha is greatly inspired by Fabric, in that membership, blockchain, and chaincode services form the overall architecture. Where possible, APIs were made to be similar to Fabric and, rather than competing with Fabric, the goals of Iroha are to: provide an environment for C++ developers to contribute to Hyperledger, provide infrastructure for mobile and web application support, and provide a framework to experiment with new APIs and consensus algorithms that could potentially be incorporated into Fabric in the future.

Motivation: Currently, the Hyperledger Project lacks an infrastructure project written in C++, thus limiting the potential developers who can contribute. Also, there is not currently a strong focus on user interaction or mobile applications, though both are necessary for the realization of the widespread use of distributed ledger technology. Iroha aims to rectify both of these points, bringing in more developers while providing libraries for mobile user interface development.

Iroha is a distributed ledger project that was designed to be simple and easy to incorporate into infrastructural projects requiring distributed ledger technology. Iroha features a:

- simple construction
- modern, domain-driven C++ design
- emphasis on mobile application development
- new, chain-based Byzantine fault tolerant consensus algorithm, called Sumeragi

Iroha was made to be simple and easy to use. Although Turing complete smart contracts are available via chaincode in Java (running a sandboxed JVM), users do not need to write chaincode in order to define digital assets in Iroha. Common use cases, such as deploying new currencies and sending text messages, are available as part of the core framework.

Iroha is composed of the following:

- Iroha core

- Iroha Native iOS Library
- Iroha JavaScript Library
- Iroha Native Android Library

Iroha core provides the distributed ledger infrastructure comprising the data membership services, consensus algorithm, peer-to-peer network transmission, data validation, and chaincode infrastructure. The iOS, Android, and JavaScript libraries provide convenience functions for performing common operations, such as digitally signing transactions. Future work should expand these common functions to interoperate with the Fabric ledger.

By creating C++, mobile, and web development environments for the Hyperledger project, new developers can join the project and help contribute not only to Iroha, but to other sub projects, such as Fabric and Sawtooth Lake. This will contribute to a diverse and sustainable open source ecosystem built on cooperation.

Proposed Status: Incubation

Solution: The following project tasks should be considered:

- Creating more detailed architectural documentation
- Creating automated network tests for the Iroha architecture
- Creating an automated test framework for the mobile and web libraries
- Creating a protocol for interchain transaction between Fabric and Iroha
- Adding Fabric support for the iOS, Android, and JavaScript libraries
- Further expanding the libraries and APIs to match real use cases

Effort and Resources: Soramitsu is committing several full time engineers to the project. Makoto Takemiya is the initial project maintainer, along with 5 other engineers at Soramitsu. A designer and UX/UI expert at Soramitsu will also be committed to the project. Besides Soramitsu, the co-sponsors of the proposal and other Hyperledger members are considering committing resources to work on Iroha. Use case partners at financial and academic institutions in Japan (see current use case partners at <http://iroha.tech>) are also providing support to Soramitsu.

How to: We propose the creation of the following repositories on github to manage Iroha resources:

- github.com/hyperledger/iroha-core
- github.com/hyperledger/iroha-docs
- github.com/hyperledger/iroha-ios
- github.com/hyperledger/iroha-android
- github.com/hyperledger/iroha-javascript

Closure: Working with community members and use case partners, we would like to continue to improve upon Iroha and have it reach and active project stage in the future.

