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**HIP identifier:** Proposal to include [chaintool](https://github.com/ghaskins/chaintool) project repository in hyperledger/fabric

**Sponsor(s):**

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**Abstract:** Accept chaintool source into incubation status within the fabric repository.

***Context:*** *Chaintool* is tooling to assist in various phases of hyperledger fabric chaincode development, such as compilation, test, packaging, and deployment. A chaincode application developer may express the programmatic interface to their application in a high-level protobuf-like structure, and *chaintool* will generate:

1. the chaincode methods stub, and
2. a chaincode archive package so the application may be deployed.

Basic chaintool support is already [included in the fabric](https://github.com/hyperledger/fabric/blob/4e0961b49364eb1b3e6eb2527797a3e580f3d0ab/protos/chaincode.proto#L63). For instance, mainline fabric will accept chaintool-based “.car” (chaincode archive) inputs for application deployment. The mainline repository also hosts a [jvm-binary snapshot](https://github.com/hyperledger/fabric/tree/4e0961b49364eb1b3e6eb2527797a3e580f3d0ab/devenv/tools) of the tool to facilitate said support as well as provide a working environment for chaintool-based chaincode development.

The summary proposal presented in this document is to move the [current repository](https://github.com/ghaskins/chaintool) of the chaintool source used to build the chaintool binary into fabric.git (proposed as ./tools/chaintool) and incubate it to maturity along with the rest of the fabric.

**Motivation:** Please see <https://github.com/ghaskins/chaintool#why>

**Proposed Status:** Incubation

**Solution:** Chaintool could be best described as a compiler and build-tool. For instance, in one mode of operation it takes a chaincode application as input, including chaintool specific metadata, and compiles various outputs such as an executable for running on a fabric. It may also be used to generate a chaincode archive (CAR) for deployment, stub functions for marshalling the interfaces of an application, as well as providing client-utilities such as SHA computation, metadata inspection, etc.

This proposal raises the following considerations:

* Effects on User facing Clients: Chaincode applications developed with chaintool will use [protobuf encodings](https://github.com/ghaskins/chaintool#interacting-with-chaintool-managed-applications) tunneled through the standard chaincode strings-based ABI. Clients that wish to interface with chaintool managed applications will need to adhere to this encoding. Examples, documentation, and tooling to assist with said encodings are provided and will continue to evolve. Existing clients that interact with existing, non-chaintool-managed applications will not be impacted.
* Backward compatibility: chaintool applications tunnel through existing fabric protocols and may coexist alongside non-chaintool managed applications with zero impact. Further, chaintool helps to improve backwards/forwards compatibility in the future by managing client/chaincode ABI compatibility in a relatively transparent manner for applications that chose to use chaintool
* License of codebase: Chaintool was designed from day one as an extension of hyperledger fabric and has therefore followed suit with its licensing (currently Apache 2.0). It is expected that the codebase will simply be considered a standard contribution to fabric and follow whatever licensing fabric chooses to utilize now or in the future.
* Any trademarks used in the project name or codebase? None that we are aware of. It consists completely of code developed from scratch by the authors or std/community libraries that are FOSS.

**Effort and resources committed:** The chaintool project was started several months back and has matured to a stable and feature rich/complete facility and could be considered a “1.0” release. As with any software, it is expected to evolve over time with the ebb and flow of community demands. However, the vast majority of the goals set forth for the project are now complete and ready for broader adoption/contribution.

Currently, two people (Greg Haskins and Eric Baur, LSEG) are committed part-time to developing and maintaining the project. This is not the main thrust of their responsibilities however, and it is hoped that the community will rally around the concept and further develop features/tests/doc/etc.

**Actions:**

The proposed actions would be as follows:

* Migrate code from <https://github.com/ghaskins/chaintool> to fabric.git/tools/chaintool
* Deprecate <https://github.com/ghaskins/chaintool>
* Delete ./devenv/tools/chaintool binary
* Hook compilation of chaintool binary to fabric.git/Makefile, as appropriate
* Hook unit-tests for tools/chaintool to “make unit-test” target, as appropriate
* Integrate existing chaintool documentation with fabric docs, as appropriate

**Closure:** Success of the project is tied to success of the fabric project as a whole. Within the fabric ecosystem, success for chaintool itself could be measured via two distinct vectors:

1. User adoption: The primary measure of success will be the breadth of users willing to adopt chaintool as part of their application workflow, particularly because they value the utility/functionality it brings.
2. Developer/community contribution: A secondary measure of success would be the emergence of a development community contributing updates/enhancements to the code/documentation/tests of chaintool.