

Project Plan

Cross-Chain Trading Bridge for JPMorgan

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1. Overview

JP Morgan requires a bridge between two distinct blockchain tokens using their Quorum blockchain environment. There will be two tokens on separate blockchains: an ERC20 "cash" token, and an ERC721 loan token. In order for this conversion to take place, a "bridge" between these separate blockchain implementations will be needed to be developed using these two distinct smart contract protocols. The bridge that we create will be developed within a Java environment. The developed bridge will atomically swap tokens, as to adhere to the necessary requirements for ERC721 tokens. The bridge will prompt users to undergo the tokenswap process, and prevent any malicious intent that could be utilized to steal or create false transactions.

The team is expected to explore whether such a bridge is possible to create and implement effectively. Much of the project will include researching blockchain technology while furthering the development of the Quorum private blockchain service. Services for the project implementation will be hosted on a virtual machine created for the team. JP Morgan will be providing existing Quorum solutions for the team to become familiar with the technology. The project should keep scalability in mind, and potentially be able to utilize multiple ERC20 tokens.

2. Goals and Scope

2.1 Project Goals

The team is going to investigate the feasibility of creating a bridge to perform atomic swaps between two different blockchains. At the end of the project, the team will produce a detailed report of the findings and an implementation in Java (the bridge) and Solidity (the smart contracts) if applicable.

2.2 Project Scope

The bridge will convert assets from an ERC721 blockchain to an ERC20 blockchain, and vice versa. The ERC721 tokens represent a loan, whereas the ERC20 tokens represent cash. These private clusters of Quorum nodes will be necessary in performing the swaps later on. The bridge will be written in Java, and will need to sync multiple blockchains in order to ensure a transaction properly takes place. Additionally, each swapping participant will need to have their own wallets on each blockchain in order for a proper exchange to take place.

3. Organization

3.1 Team Roles

Name	Role
Mackenzie Bowe	Scribe
Sadaf Chowdhury	Project Leader
Nathan Connor	Webmaster
William Duong	Project Leader
Colin Fausnaught	Team Communicator

3.1.1 Project Leader

The Project Leaders are responsible for coordinating meeting times, making sure the project stays within scope, making sure deliverable deadlines are met and coordinating with external partners to make sure everything needed for the team success is available. They will help recognise, rank, and mitigate risk as well as search for possible improvements in the team's process model.

3.1.2 Team Communicator

The Team Communicator is responsible for all communication with the customer. They will be in charge of sending official emails concerning project status and roadblocks as well as relay information from the customer back to the team.

3.1.3 Scribe

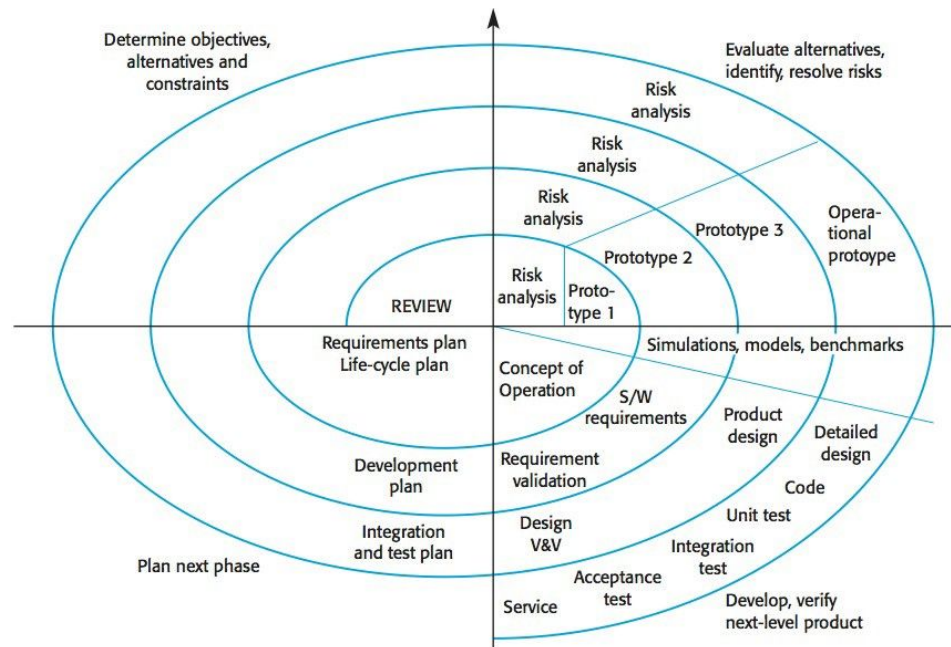
The Scribe will be in charge of documenting all relevant team meeting discussions, documenting customer clarifications to questions, and general discussion. They will also be running the weekly "4-Up" meetings.

3.1.4 Webmaster

The Webmaster is in charge of making sure the team's website is kept up to date with relevant and accurate information to reflect the teams progress. Daily updates, weekly 4-Ups and relevant documents will be posted to the site.

3.2 Methodology

We will be using the Spiral software methodology for our project. There will be four stages on the spiral model: Determine Objectives, Identity and Resolve Risk, Development and Test, Plan the Next Iteration. This methodology will encourage iteration throughout the project lifecycle, and allow the project sponsors to have full visibility on the progress.



3.2.1 Determine Objectives

During the Determine Objective phase the team will look their current progress and see what it left to be done to achieve the requirements set by the customer. During this phase objective and risks are defined. Based on what was accomplished in the previous iteration, we will then define the objectives necessary for the current iteration.

3.2.2 Identify and Resolve Risk

For each objective determined in the first phase, a risk evaluation will be conducted. The analysis will determine the risks, define the severity of each risk, and find ways to mitigate the risk. During this phase prototypes can be created to help determine risks and find ways to overcome the challenge. Risks will be tracked over the course of the project through internal documentation. Risks will also be given a priority based on how severe the risk may or may not be.

3.2.3 Development and Testing

After risks have been determined and categorized, a process model will be chosen for the development phase to best combat the risks found. This model can range from waterfall to scrum based on where the risk is and how the team feels the best way to combat the problem is. Risks ranked with the highest priority will be tackled first, second highest second, so on and so forth.

3.2.4 Plan the Next Iteration

After development and testing of new features, the team will meet with the customers to evaluate the system, determine usefulness of functionality, and identify areas for improvement and/or additional features.

4. Schedule

4.1 Proposed Cycles

Cycle Number	Objectives	Description
1	Set up VM	Set up Windows VM to use and test ERC20
2	Set up Quorum blockchain	Run the example Quorum projects on our private Quorum blockchain
3	Develop Smart Contract for ERC20 and ERC 721	Create smart contracts for ERC20 and ERC721. The contract will have to be compiled and run on the Quorum blockchain.
4	Create Webapp and create initial endpoints	Decide what technology to use as the webapp. Create initial endpoints. Where are we hosting the app?
5	Add functionality for ERC20 to interact with Webapp	Allow the webapp to interface with ERC20 tokens. Be able to get access to the token and be ready to modify it.
6	Add functionality for ERC721 to interact with Webapp	Allow the webapp to interface with ERC20 tokens. Be able to get access to the token and be ready to modify it.
7	Create atomic swap functionality	Allow the webapp to swap between the two blockchains. Delete the spent tokens
8	Handle error cases	What happens when the multiple transactions are sent from the same person? Insignificant funds? General error checking.
9	Test all functionality	Overall systems test. Get metrics on how long the swap takes to process.
10	TBD	TBD