

Team Decided – Raft Consensus

Inception Iteration Plan 6 - Starting 21/05/2018

1. Key Milestones

Milestone	Date
Iteration Start	21/05/2018
Complete TDD for Raft Consensus + API	04/06/2018
Complete Raft Consensus Implementation	04/06/2018
Complete a functional demonstration prototype	04/06/2018
Iteration End	04/06/2018

2. High-level Objectives

ID	Objective	Date
1	Complete TDD for Raft Consensus + API	04/06/2018
2	Complete Raft Consensus Implementation	04/06/2018
3	Complete a functional demonstration prototype	04/06/2018

3. Evaluation Criteria

Obj. ID	Evaluation Criteria
1	Have complete TDD for Raft Consensus + API
2	Have completed Raft Consensus Implementation
3	Have completed a functional demonstration prototype

4. Work Item Assignments

State:

C – Complete

P – In Progress

W – Waiting to start

Work ID	Name or keywords	Outcome	State	Assigned to	Est (hrs)	Act (hrs)	Left (hrs)
1.1	Complete TDD for Raft Consensus + API	Wrote tests for usage of the API	C	Sean	8:00	10:00	0:00
2.1	Complete Raft Consensus Implementation	Wrote the consensus algorithm, a few bugs may still exist	P	Joshua	40:00	45:00	15:00
3.1	Complete a functional demonstration prototype	Wrote the prototype, a few bugs may still exist	P	Joshua	6:00	40:00	10:00
Totals					54:00	95:00	25:00

5. Issues

Issue	Status	Notes
Scope creep on prototype	Closed	We kept adding functionality to the prototype to fill it out, it was much more time than we originally intended. This took up more time than anticipated
Had a lot of timing and GUI issues with the prototype	Closed	Huge amount of time was sunk into trying to debug issues with the prototype. Issues in updating GUI across threads, issues with leader election, heaps of deadlocking/multithreaded issues
Prototype found bugs in consensus	Closed	While we were getting the prototype working, it kept finding obscure edge case bugs in the consensus algorithm.
Had to rewrite a lot of functionality of algorithm due to start up mechanism	Closed	We wrote our implementation with a join cluster feature to allow for dynamic cluster membership, that feature got dropped due to time limitations, however we were still starting by "joining" the cluster. This caused issues with the prototype with the leader not being up yet, weird timing issues.
Had huge multithreaded issues, had to rewrite to simplify consensus	Closed	Debugging the multithreading in Raft was so difficult, had to rewrite background threads into a single background thread. Had issues with figuring out what algorithm was doing, so implemented a big logging library so we got insight. Then had to solve deadlocking issues by implementing ordered locking in algorithm. Then had issues with the speed we write to log, so had to write a buffer.

6. Assessment

Assessment target	Inception Iteration 6	
Assessment date	04/06/2018	
Participants	All - Joshua and Sean	
Project status	<p>Green</p> <p>Although the consensus algorithm still has some small bugs to be removed, and the prototype still has some small bugs to be removed also, we see looking forward that plenty of time is available for us to complete these in the next iterations as well as compiling the LCAM document. We're confident we'll be able to complete everything on time according to schedule in the next iteration. Our confidence in being able to complete the final touches on the algorithm/prototype come from educated guesses from already being deep into working on it, rather than estimating something we haven't attempted yet.</p>	
Assessment against objectives	Objective	Result
	Complete TDD for Raft Consensus + API	Wrote tests for usage of the API
	Complete Raft Consensus Implementation	Wrote the consensus algorithm, a few bugs may still exist
	Complete a functional demonstration prototype	Wrote the prototype, a few bugs may still exist