

## Chapter 2 - Context: Previous work on BFT

### ALGORITHM OVERVIEW

Today all the leader-based state machine replications algorithms are based on the PBFT, which is the first practical algorithm that is used in real world scenarios. That is why it has also been chosen for comparison with Prime. But before we describe the main building blocks of PBFT algorithm we will learn some things about the previous work on byzantine fault tolerance and state machine replication. And how Liskov managed to create this beautiful algorithm that now serves as the base building block for all other algorithms that tolerate byzantine faults. Let us start by presenting the main mechanisms used in PBFT and then for each one of them we will shortly describe the role of it, the source or the person who invented it and the pros and cons that using it has on the overall architecture of the algorithm.

PBFT has incorporated the following mechanisms:

- a. Events ordering
- b. Three phase protocol (Pre-prepare, Prepare, Commit)
- c. View change protocol
- d. Checkpoints
- e. Garbage collection
- f. State transfer
- g. Proactive recovery

Now let's dive into each one of the above parts of the algorithm and summarize their functionalities. Doing so we will create a better idea of how PBFT is built up.

## **EVENTS ORDERING**

The event ordering was first introduced by Lamport on the paper 'Time, Clocks, and the Ordering of Events in a Distributed System-Lamport'.