

Project Proposal: Simon Multicasts

Introduction

We propose the design and implementation of a massive multiplayer online game using core and advanced principles of distributed system development. The game will be based on the idea of a game known as “Simon says” with the slight difference that what “Simon says” is not to be executed in motions by the participating players; in our case “Simon” distributes a string of characters per round to the players. These have to reproduce this string through their input device and then send a message containing said input back for evaluation. The first player to return the correct response string gets 10 points, 2nd player gets 5 points and so on. After each round a new “Simon” is elected among players that returned a faulty response or at random if not applicable.

Requirement Analysis

- **Dynamic discovery:**
 - New host broadcasts a message asking to join, gets a GUID and joins
- **Crash-Fault-Tolerance:**
 - Adjacent hosts keep track of their respective neighbor’s state through heartbeats
 - Every host keeps a copy of the game’s score board
- **Voting:**
 - e.g. when Simon crashes during a game: voting for new Simon among all peers
- **Ordered reliable multicast:**
 - Vector clock to ensure the causal order of response messages
 - Total ordering with sequencer or ISIS algorithm to ensure everyone delivers crucial messages in the same order
- **Byzantine Fault Tolerance:**
 - Detection and handling of such errors is to be defined.

Architecture design

