

# DSoak: A Distributed Virtual Water Fight

## Overview

### 1. Introduction and Context

DSoak is a multi-player, distributed virtual water-fight game, where the players are fully automated processes. Users simply start them up and watch them buy balloons, fill them with water, and then attack each other. A player can automatically look for available games and join one that is open but not yet started. Then, once a game starts, the players compete for shared resources to stay alive and knock other players out of the game. Here are some key features of the system:

- At any time, there may be multiple games available for players to join, as well as other games in already progress.
- As soon as one game finishes, another is created and made available for players to join.
- There can be many active players at any time.
- A player not already in a game can select a game from the list of any available games and join it.
- When a player joins a game, it receives 200 pennies.
- Once enough players have joined a game, the game starts and launches resource managers: Balloon Stores, Water Sources, and Umbrella Suppliers.
- While in a game and as long as resources last, a Player can
  - buy balloons from a Balloon Store
  - fill a balloon from a Water Source
  - throw a water-filled balloon at another Player
  - buy an umbrella from a Umbrella Supplier
  - Raise an umbrella as protection against being hit with a water-filled balloon thrown by another Player
- During a game, if 10 or more water-filled balloons hit a player, then that player will be ejected from the game.
- A game ends when a) there are no more resources, b) there are no more players, and c) there is just one player left. In the latter case, the last player in the game is the winner. In the former cases, the game is draw.
- Once a player is no longer in a game, it is free to join another game.

In DSoak, the players are fully automated processes. An end user may start multiple players concurrently. Besides players, there are five other types of processes in the DSoak system: registry, game manager, balloon store, water source, and umbrella supplier. The registry will manage a list of known processes and allow processes to discover each other. The game manager will manage one or more games and start up balloon stores, water sources, and umbrella suppliers as needed. Balloon store, water sources, and umbrella supplier each hold a limited stock pile of a resource that can be acquired by players and used to play the game.

### 2. Actors and their Goals

Since this application is a fully automated game, there are only two types of actors external to the system: an administrator and an end user. The administrator's goals are as follows:

- Start up the registry

- Review statistics and logs about the system's performance
- See the status of the system at a glance

The end user's goals are as follows:

- Startup game managers – as many as desired
- Startup players – as many as desired
- Watch the players play games with each other
- See the status of the system at a glance
- See scores and other statistics about the individual player processes