Leader Selection

Foundations of Distributed Systems
Lab Guide 3

2019/2020

Consider a set of n processes with a fully connected network (i.e., all know all addresses) that aims at selecting a leader. Use an interactive mechanism for starting the protocol (i.e., waiting for keyboard input).

Steps

1. Implement a leader election protocol assuming a synchronous system model.
2. Implement an eventual leader election protocol assuming an asynchronous system model.
3. Encapsulate protocols in simple interfaces.

Questions

1. What protocol terminates first?
2. What happens if the set of candidates changes?
3. How do interfaces for synchronous and asynchronous protocols differ?

Learning Outcomes Recognize the impact of system assumptions, in particular regarding synchrony, in the correctness of distributed programs. Implement abstract distributed protocols using an event-driven programming framework.

Dependencies

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<dependency>
    <groupId>io.atomix</groupId>
    <artifactId>atomix-cluster</artifactId>
    <version>3.0.11</version>
</dependency>
<dependency>
    <groupId>io.atomix</groupId>
    <artifactId>atomix-utils</artifactId>
    <version>3.0.11</version>
</dependency>
<dependency>
    <groupId>org.slf4j</groupId>
    <artifactId>slf4j-simple</artifactId>
    <version>1.7.7</version>
</dependency>
```