Università della Svizzera italiana

Faculty of Informatics

Distributed Systems **Autumn 2023/24**

Theory Assignment 0 — Warm Up

Exercise 1 -

Why is it so hard to hide the occurrence of failures, and subsequent recovery, in a distributed system?

Exercise 2 -

What does it mean for a distributed system to be scalable? What techniques can be used to achieve scalability?

Exercise 3 -

When a transaction is aborted, we said that the world is restored to its previous state, as though the transaction had never happened. This is not always true. Give an example in which resetting the world is impossible.

Exercise 4 -

In the advent of increasingly more network-connected devices and the emergence of the Internet-of-Things (IoT) (e.g. sensor networks), systems designers often have to choose between placing data processing on / close to the sensors (e.g. edge computing) or send the data to a centralized location (e.g. cloud computing). Explain possible advantages and disadvantages of each approach.