6.033 DP Update, Spring 2022

As Centertown embarks on their microgrid project, they've noticed that some of the microgrid controllers have begun to fail. So far, they've observed a single type of failure, where the controller crashes, reboots immediately, and goes through a 20-minute boot sequence.[1] The controller cannot perform any other actions during this 20-minute sequence.

You can assume a few things about these failures:

- No data that has been stored in stable storage will be lost by the controllers when they're down.
- Although multiple controllers could fail at once, it will never be the case that *all* controllers are down at once.
- It's possible that in the future, the controllers will fail for longer periods of time, although Centertown has not yet observed this.

Previously, we had assumed that smart meters would only communicate with a single microgrid controller: the one associated with their grid. Now, you can assume that they may communicate with any microgrid controller in the system. Allowing smart meters to communicate with multiple controllers may allow you to keep certain parts of the system up and running during microgrid-controller failures. However, think carefully about how (or even whether) you use it; adding this additional type of communication is sure to add complexity. If you do choose to have smart meters communicate with multiple controllers, you'll need to describe the process (e.g., how does the smart meter get the correct IP address, etc.).

Regardless of how you handle this new situation, you will need to justify your decisions.

[1] Thanks to Mike Cafarella, this 20-minute boot sequence is rooted in the real world, as it's how long it took his solar panels to come online earlier this semester.