Greenhouse System

SySD
The SoS is built up of seven different main components. Authorization, orchestrator, service registry, soil sensor provider, light sensor provider, controller consumer, and hardware systems provider. Authorization handles access to the different systems and services so that no unauthorized system accesses secure ones. Service registry handles the registration of new services and is a way of keeping track of all the systems, services and endpoints. The orchestrator is responsible for connecting the services with each other and works in unison with the service registry. These three are considered core systems and can be further read about here: Authorization, Orchestrator and Service Registry. The system contains three providers: SoilSensor, LightSensor and HardwareSystems. SoilSensor create and register an endpoint for access to the soil moisture measurements. The Light Sensor create and register an endpoint for light measurements. The Hardware Systems is responsible for the endpoints controlling watering and light adjustments. Last is the Controller consumer, this consumes both of the sensors and the hardware systems reading the measured data and handling logic for deciding if the hardware systems should be turned on. If a system is to be turned on it then sends a request to that endpoint through the orchestrator.

SoSD
System Overview:

The Greenhouse System is a microservice-based application that monitors soil moisture as well as lighting and controls a watering and lighting system to maintain the desired moisture and light levels for optimal plant growth. It consists of seven main components: authorization, orchestrator, service registry, soil sensor provider, light sensor provider, controller consumer, and hardware systems provider. Authorization, orchestration and service registry are core systems and can be read more about in the SySD. The soil sensor provider, light sensor provider, controller consumer, and hardware systems provider all provide services listed below.

Service Definitions:

- **get-soilsensor:** Provides an endpoint (`GET soilsensor/`) to retrieve the current soil moisture level measured by the soil sensor provider. This is at the moment mocked data by just randomizing between 1 to 100 which acts as a moisture percentage.
- **get-lightsensor:** provides an endpoint (`GET lightsensor/`) to retrieve the current light levels measured by the light sensor provider. This is at the moment mocked data by just randomizing between 1 to 100 which acts as reading of the light levels in the greenhouse.
- **get-lighting:** Provides an endpoint(`POST hardwaresystems/adjustLight`) to trigger the light system to adjust the lighting. This endpoint is at the moment just returning a string but it would be where you would connect to a physical device.

- **watering-on:** Provides an endpoint (`POST hardwaresystems/on`) to trigger the watering system to turn on the watering system. This endpoint is at the moment just returning a string but it would be where you would connect to a physical device.
- **watering-off:** Provides an endpoint (`POST hardwaresystems/off`) to trigger the watering system to turn off the watering system. This endpoint is at the moment just returning a string but it would be where you would connect to a physical device.

Diagram of the cloud

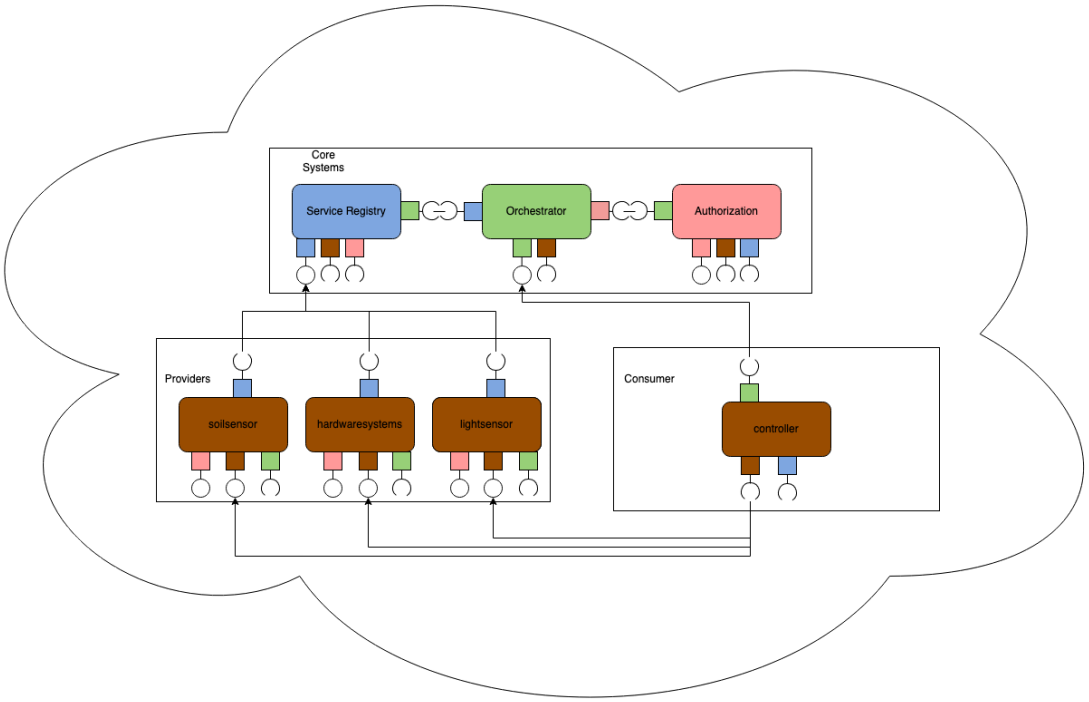

Diagram of a Workflow (both water and light updated)