(Team 5)
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ECE411 - Homework #5
Vaccine Monitoring System - UML

Background:

In order to meet CDC and VFC recommendations for proper vaccine storage, they recommend that temperature-monitoring devices be installed in all storage facilities and regularly report and store temperature data. Unstable temperatures can negatively affect the potency and effectiveness of vaccines, so it's important to comprehensively maintain and monitor the storage temperature.

System Description and Assumptions:

This system is comprised of an internet-connected database and networkable sensors.

Each sensor is serialized, and is internet-connected and capable of performing basic HTTP actions on the web. The sensors use predefined polling intervals, contain an RTC (real-time clock) that is set automatically over the Internet.

The system will use Transport Security Layer (TLS) encryption to validate the host and protect the data from snooping during transmission.

The sensors do not require any authentication; data is simply validated based on the correct formation of the GET URL used to upload data to the server where each transmission includes both the serialized device ID from the sensor, the time, date, and a temperature value. During this process the alarm threshold temperature will be set by the response returned by the HTTP GET request (response from server).

The addition of sensors is accomplished via web page hosted by the same temperature reporting system. The service registers a new device with a serialized ID as well as metadata such as contact information, location, and alarm threshold.

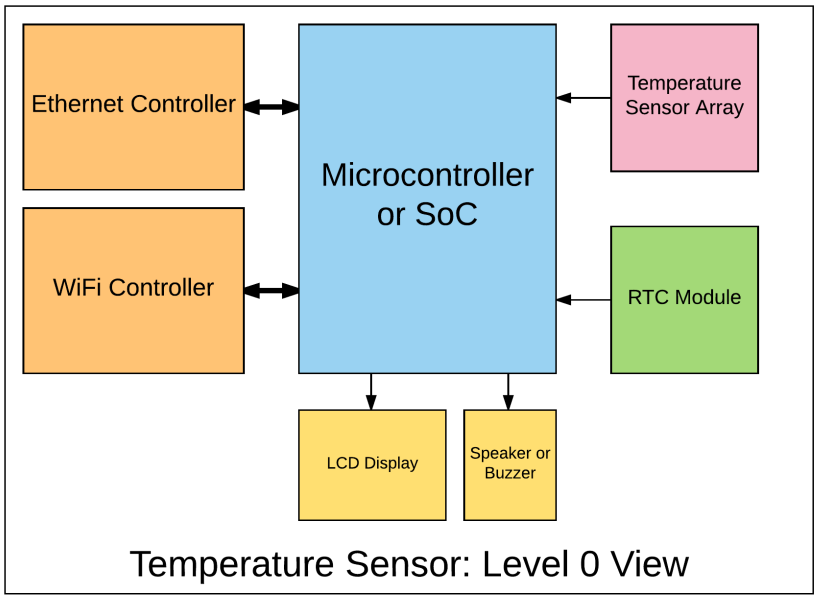


Fig. 1: Physical View of Sensor

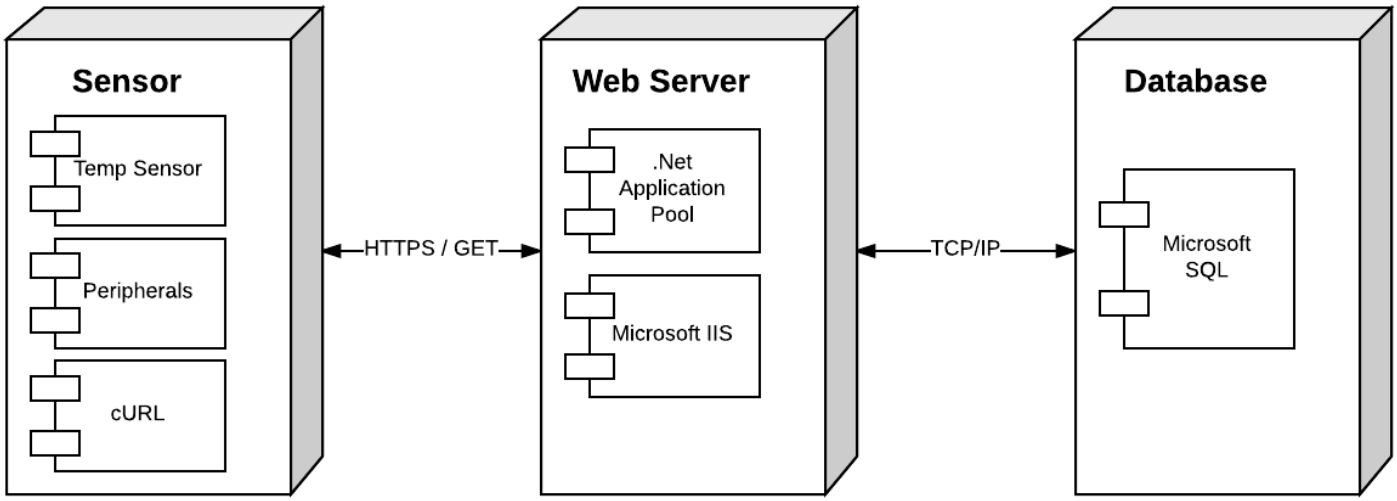


Fig. 2: Physical View of System

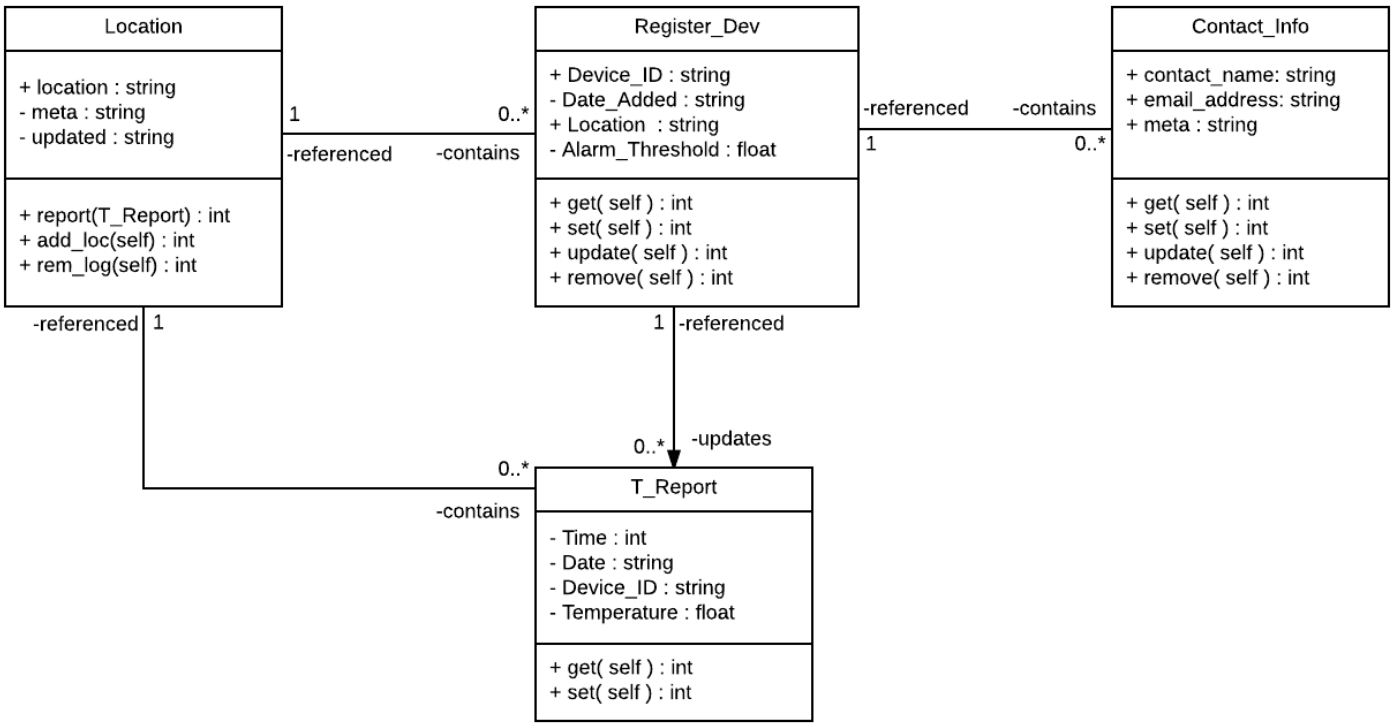


Fig. 3: UML Class View

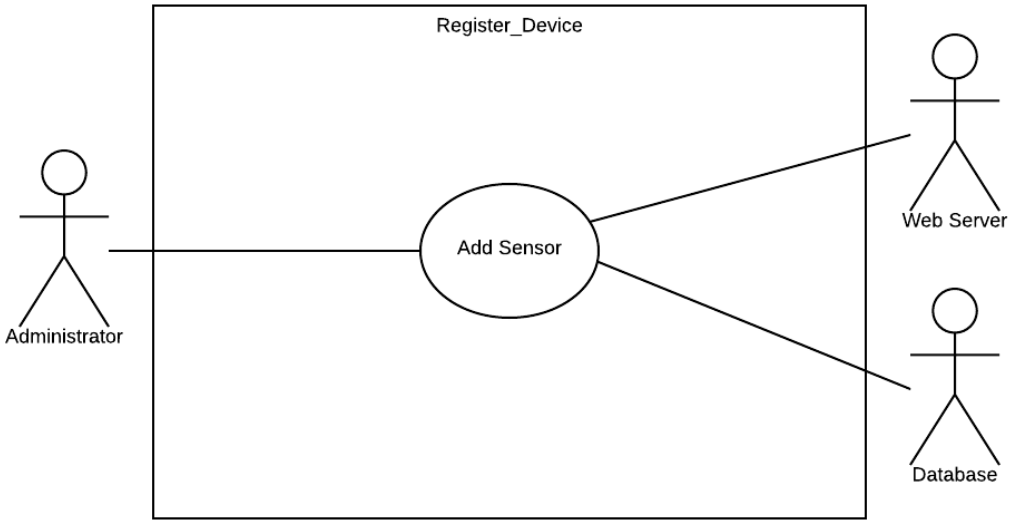
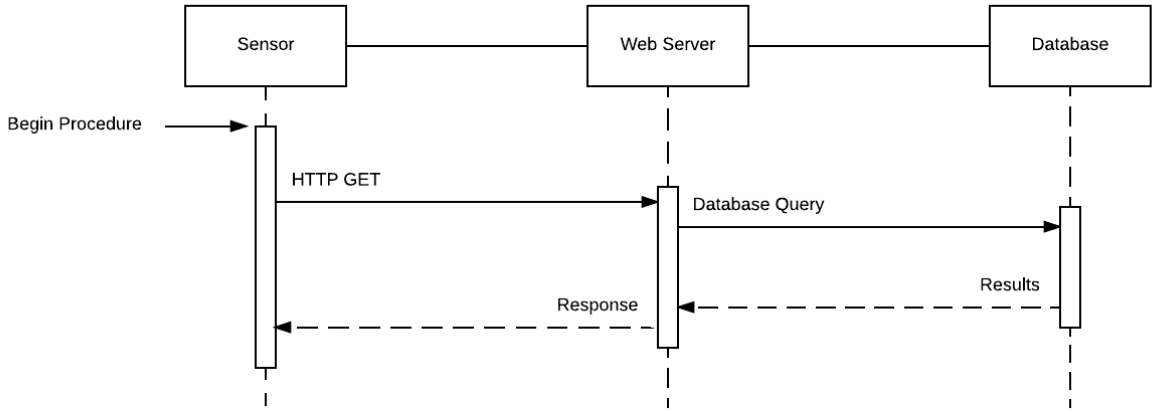


Fig. 4: Use-Case View

Use Case	Add Sensor *Ref. Class: Register_Dev*
Description	Add a new sensor device to the networked monitoring system. Register the devices Unique ID, Location, and any contact information needed for notifications.
Actors	Administrator, Web Service, Database
Assumptions	The person attempting to access the service has proper access. The device is fully functional, and connected to an internet-facing network. The device Unique_ID is known and authentic.
Steps	<1> Install device and verify network connectivity <2> Access and authenticate to web service <3> Enter pertinent information in web service <4> Submit request <5> A confirmation email will be sent by the server when the device is ready

Sensor - Server Network Interaction:



Sensor - Server Activity:

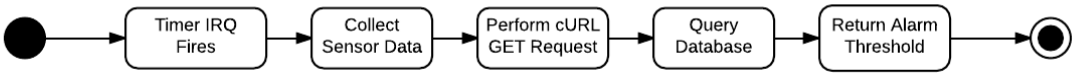


Fig. 5: UML Interaction and Activity View

HTTP GET String:

The webserver is using an ajax query for the GET process. Values are passed using a strong typed key-value formation like so: 'field1=value1&field1=value2&field2=value3'. This allows for the query parser to assemble data in any order, with any values present.

Note: Without the <UniqueID> filed, the server will deny the request.

Report Temperature:

```
https://<Server URL>/Query?T_report=ID=<UniqueID>&Time=<Report
Time>&Date=<Report Date>&Temp=<Report Temperature>
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Where <> represents the data field to be populated by the remote sensor.