SERVICE ORCHESTRATION IN INTERNET OF THINGS

Orchestration generally refers to the study of arranging music for a musical ensemble. In other words, it consists of deciding which instruments should play which notes in a piece of music. Internet of Things (IoTs) can be viewed as a bridge between physical world and its representation in digital world where each thing/object is uniquely identifiable through devices. In the context of Internet of things, orchestration refers to identifying, which objects/devices are required for the service requested by the user. Each device can provide various services depending upon the context and semantics. Representation of these devices and the services provided in digital world is crucial.

Understanding the semantics of the service requested and decomposing the service requests are some of the important tasks involved in developing a service orchestration for IoTs. The application developed should not only be able to understand the service request but also be able to create service request in runtime based on certain observations. For instance, temperature and pressure values exceeding a threshold can initiate a new service request, which might require other sensors to be monitored in the room to detect an emergency. Self organization of these devices for a particular request will be challenging due to fluctuation in energy resources, context and situation awareness. Developing the complete framework and implementation of the same on a wireless sensor network test-bed would be the outcome of this project.

Tasks:

1. Defining and representation of devices and their services in digital world.
2. Semantic breakdown of service request and creation of service requests at real time.
3. Self organization mechanisms for Internet of things.
4. Framework for user profiling, context and situation aware mechanisms in service orchestration.
5. A complete framework and implementation of service orchestration in IoTs has to be demonstrated.

Prerequisites:

1. Knowledge on semantic services and machine learning techniques will be required.
2. Programming skills in Java, C/C++, MATLAB is essential.
3. Course on Ad-hoc networks or Wireless Sensor networks would be handy.

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