SMART HOME:
ROBOT SECURITY

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Main idea:

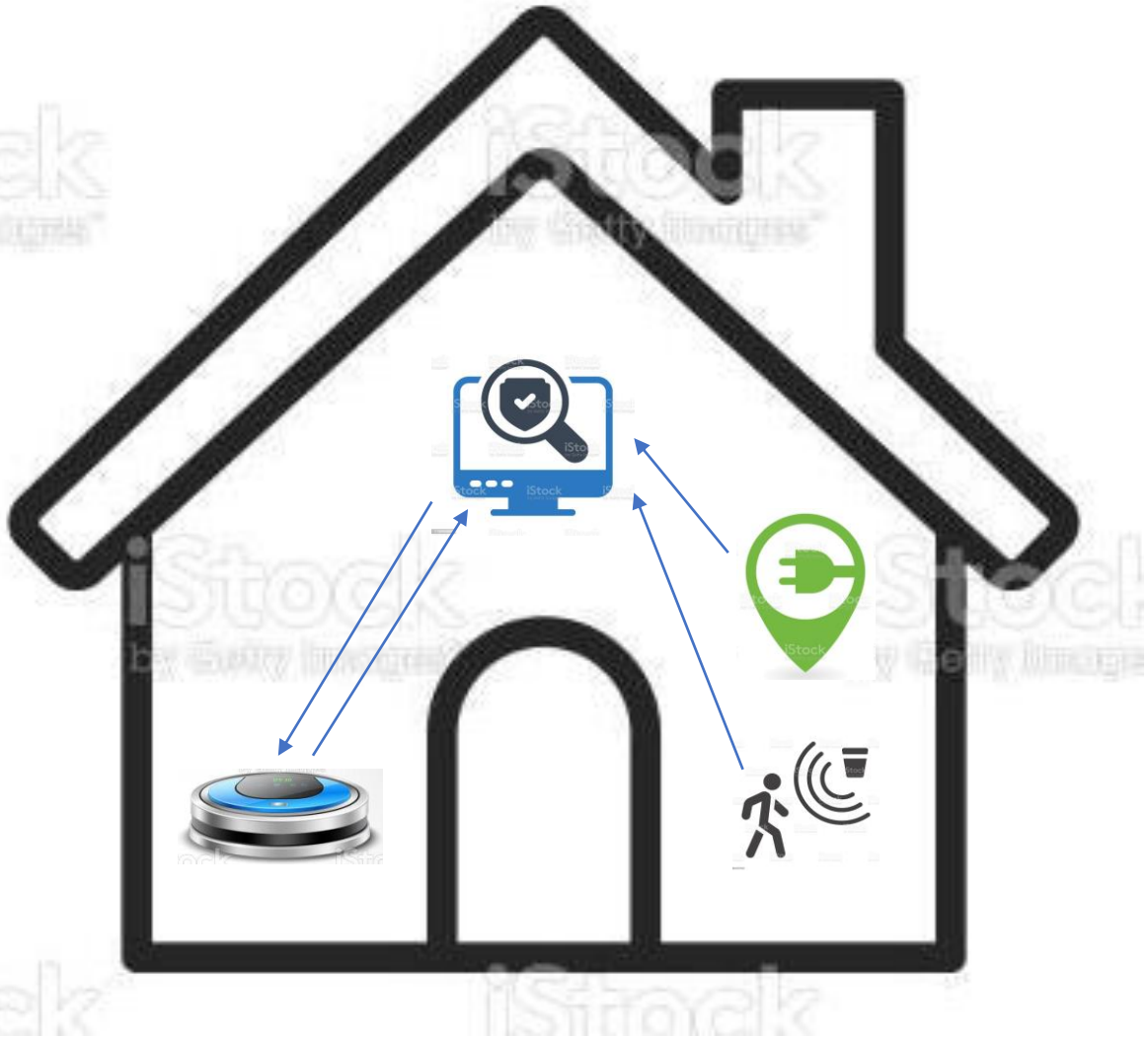
Home security system based on the following smart object types:

- Smart Home Robots;
- Presence Monitoring Smart Objects;
- Charging Stations.

All the data are sent to be managed by a Data Collector & Manager.

This scenario **can support n devices** for each type (dedicating some devices for each room) or at least three (for the entire house) one of each type.

It has been implemented with CoAP.



Smart Home Robot:

This object hosts the following resources:

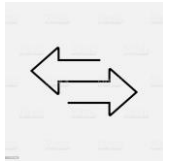
- Battery Level Sensor Resource
- Camera Switch Actuator Resource
- Indoor Position Sensor Resource
- Mode Actuator Resource
- Presence In Camera Stream Sensor Resource
- Return Home Actuator Resource
- Robot Resource

rt = it.unimore.robot.sensor.battery
if = core.s
ct = text/plain & senml+json

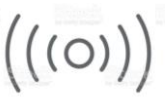
rt = it.unimore.robot. actuator.camera
if = core.a
ct = text/plain & senml+json

rt = it.unimore.robot.sensor.position
if = core.s
ct = text/plain & senml+json

rt = it.unimore.robot.actuator.mode
if = core.a
ct = text/plain & senml+json

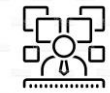


rt = it.unimore.robot.sensor.presence
if = core.s
ct = text/plain & senml+json



rt = it.unimore.robot.actuator.home
if = core.a
ct = text/plain & senml+json

rt = it.unimore.robot.descriptor
if = core.rp
ct = text/plain & senml+json

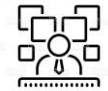


Presence Monitoring Smart Object:

This object hosts the following resources:

- Passive InfraRed Sensor Resource → rt = it.unimore.presence_monitor.sensor.pir
  if = core.s
  ct = text/plain & senml+json

- Presence Monitoring Object Resource → rt = it.unimore. presence_monitor.descriptor
  if = core.rp
  ct = text/plain & senml+json



SenML example:

```
13:39:45.841 [:CoapEndpoint-UDP-0.0.0.0:0#1] INFO  i.unimore.fum.iot.client.DataManager - NOTIFICATION Body: [{"bn":"presence-0001","bver":0.1,"n":"pir","vb":false,"t":1649763585841}]
```

```
read-0] INFO  i.unimore.fum.iot.client.DataManager - NOTIFICATION Body: [{"bn":"descriptor","n":"presenceId","vs":"presence-0001"},{"n":"room","vs":"home"},{"n":"softwareVersion","v":5.0},{"n":"manufacturer","vs":"Phillips"}]
```

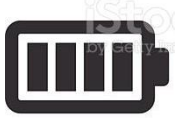
Charging Stations:

This object hosts the following resources:

- Robot Presence Sensor Resource
- Robot Battery Level Sensor Resource
- Energy Consumption Sensor Resource
- Charging Station Resource

rt = it.unimore.charger.sensor.robot_presence
if = core.s
ct = text/plain & senml+json

rt = it.unimore.charger.sensor.recharging_battery
if = core.s
ct = text/plain & senml+json



rt = it.unimore.charger.sensor.energy_consumption
if = core.s
ct = text/plain & senml+json

rt = it.unimore. charger.sensor.descriptor
if = core.rp
ct = text/plain & senml+json

Recommended Communication Technology :

- Wi-fi

Demo behaviour:

The Data Collector & Manager comunicates with three object, each one of a different type:

- Smart Home Robots;
- Presence Monitoring Smart Objects;
- Charging Stations.

It starts controlling the IP of each object stored in files, one for each type.

Then starts the alarm, inside a cycle of communication with three phases which simulate the behaviour of a real group.

The alarm can be stopped letting an ipotetical user setting a file in real time.