ATAM evaluation of ”An Integrated System to support Internet of Things (IoT) in a Smart Home” Architecture

as proposed by Group 6 in the course Software Architecture at the IT-University of Copenhagen

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ATAM evaluation

To begin with, I will define my understanding of what the ATAM actually is about:

The purpose of the ATAM is to assess the consequences of architectural decisions in light of quality attribute requirements[1].

To be more precise the ATAM is meant to be a risk identification method, in order to detect potential risks within the architecture of a software system. So the purpose is not to predict quality attribute behavior, but rather whether attributes of interest is affected by some design decision.

The evaluation at hand will focus on exactly that – finding risks in the proposed architecture. Furthermore an attempt on identifying sensitivity and tradeoff points will be made. Sensitivity points in this context are a property of one or more components that is critical for achieving a particular quality attribute. Tradeoff points is key architectural decisions which impacts multiple components and sensitivity points, and as the name implies, is a consequence of some kind of tradeoff design decision.

The following analysis takes base in the Design decision section in the architecture for evaluation.

Risks/Sensitivity/Tradeoff points

In the current architecture, it is stated that the system should be running 24/7. This is obviously a reliability criterion. The design decision states that in case of any (flooding, fire, power failure) emergency, the system is able to function, due to the architecture using a cloud solution. This decision, though, does not contain any information whether how the system is able to function if for instance a power failure occurs. A solution with 4G SIM cards (and some battery) in each sensor could for instance be a solution. In the physical overview, all communication goes through the router in the Smart Home, so if this Router is without power, it could be a potential risk for the reliability of the system.

The next design decision stated in the architecture is about the use of a *broker design pattern*. In the current architecture description, there seem to be no mention of how the different messages/information is being handled by the system (other than by the use of a broker pattern). A minor, but important tradeoff point could be the use of some kind of prioritizing of these messages. For instance it could be beneficial for the system to process emergency messages before/faster than normal “house routine” information. The tradeoff being the solution might be getting a bit more complex to implement.

Conclusion

The given architectural description seems to be inadequate of basic service descriptions, which, as an evaluator, makes it difficult to actually understand how the system is thought out to be realized. Furthermore a description of how the actual IoT reference architecture (given in the course literature) is being used would also benefit the entire architectural description.

[1] ATAM: Method for Architecture Evaluation, by Rick Kazman et. Al (http://lore.ua.ac.be/Teaching/CapitaMaster/Assignment/ATAM-TR.pdf)