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Energy Smart Heat Pump

Interoperable Demand Side Response Programme (NZIP)

2nd OpenADR User Conference Europe

Introduction

Passiv UK

- Providers of smart heating controls since 2008
- Recently launched the Passiv Smart Thermostat
- Manages FiT and REGOs for thousands of domestic solar assets
- Provided modelling and control for innovation projects such as FREEDOM, MADE, No Regrets and Flatline
- Part of the BUUK Infrastructure group

Samsung R&D Institute UK

- Established in 1996 as the first Samsung research institute outside of Korea
- Heads a range of different research areas, including communications, IoT, artificial intelligence, and decarbonisation
- Leading the Clean Heat Streets project, decarbonising heating in Oxford
- Provider of highly efficient ASHPs utilising both R32 and R290

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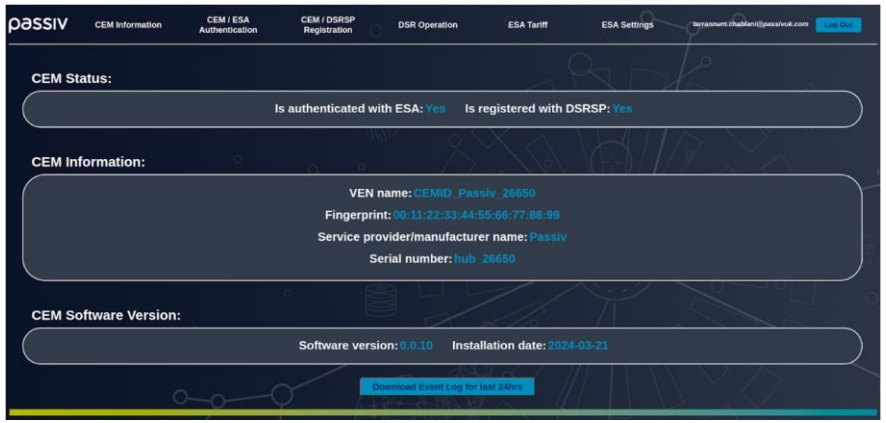
Brief

Samsung

Gen 6 ASHP

Passiv



ESA/CEM UI
OADR Service

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Controls

- Passiv sends flow temperature instructions, via the compressor speed, to the Samsung ASHP over Modbus
- Flow temperature is minimised to maximise efficiency while guaranteeing temperatures
- Optimisation algorithms take into account temperature, weather, tariff, and solar
- ‘Explicit’ DSR signals are overlaid onto the underlying ‘implicit’ optimisation to cap consumption at near-zero
- Optimised preheating prevents temperatures dropping below target

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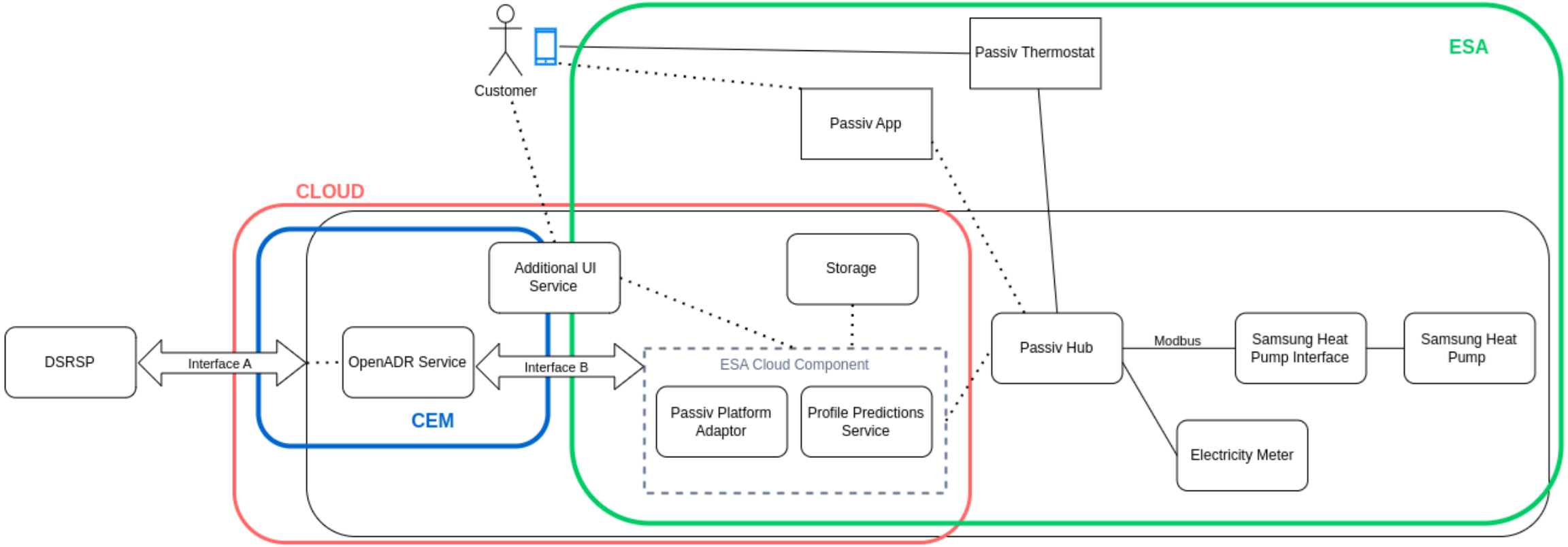
Architecture



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Takeaways

Project learnings:

- Value of the ESA/CEM/DSRSP model
- Introduction to OpenADR and standardisation of flexible communication
- Recognition of asset-specific considerations

- Majority of issues stemmed from PAS-specified values in OpenADR
- Large payloads made reports difficult to process
- Too much uncertainty in profile system for heating appliances

Going forward

Comments on the future of PAS 1878:

- Many of the comments in the PAS 1878 review are positive
- Important that DSRSP driven communications are implemented
- Consideration of the position of the CEM and HEMS
- Consideration of eiEvent and potential transition to OpenADR 3.0

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Thanks for listening