ENCOURAGEing Results on ICT for Energy Efficient Buildings

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Introduction

- ENCOURAGE Project
- Middleware
- Supervisory Control
- Pilot results

Introduction
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Project Overview
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Middleware
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Supervisory Control
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Pilot Results
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Conclusion
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Project Overview

- Embedded intelligent controls for buildings with renewable generation and storage
- 11 partners from 5 countries: Spain, Portugal, Italy, Ireland, and Denmark
- Optimize energy usage and integrate into Smart Grid
- Middleware

- Reduce energy consumption by 20%
- Smart grid
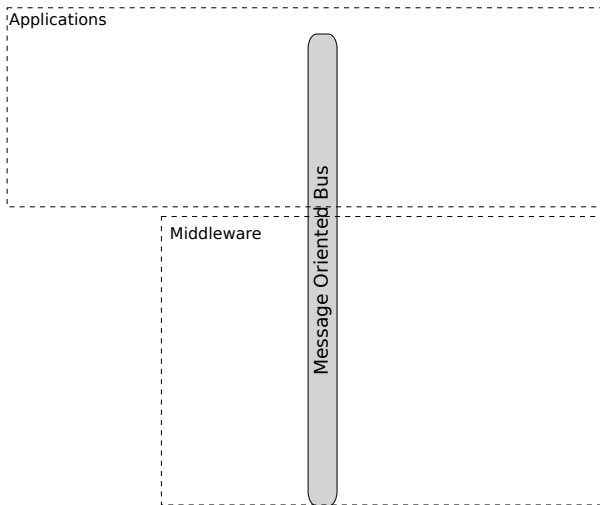- ICT

Project Overview
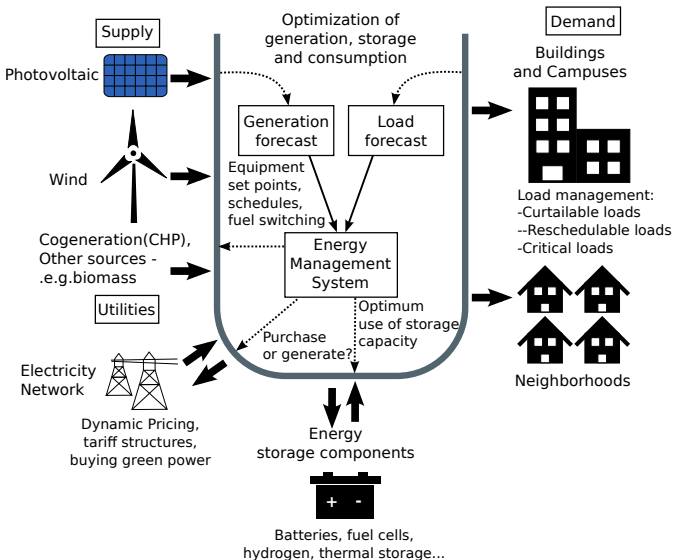
Architecture

- Message Oriented Middleware - RabbitMQ
- Publish-subscribe
- CIM encoding format
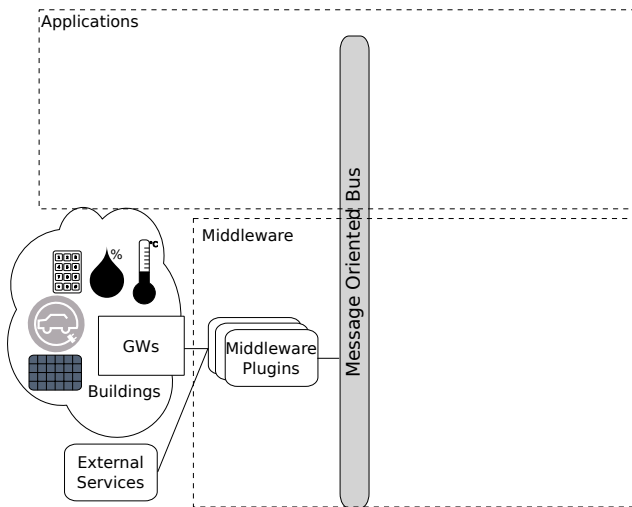- Middleware module
- Application modules
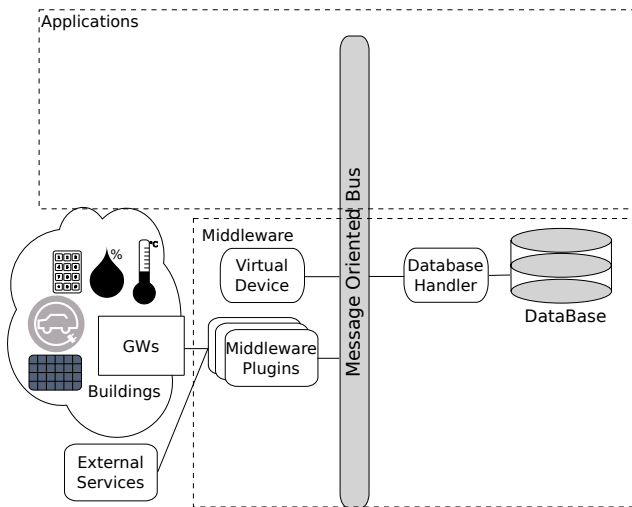
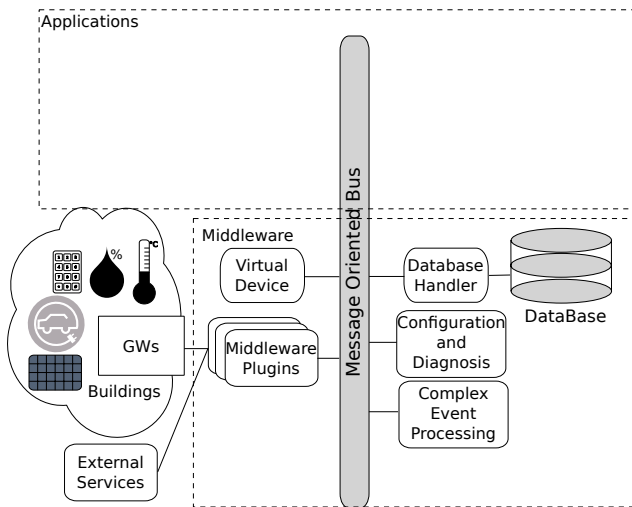## Architecture

Message Oriented Bus
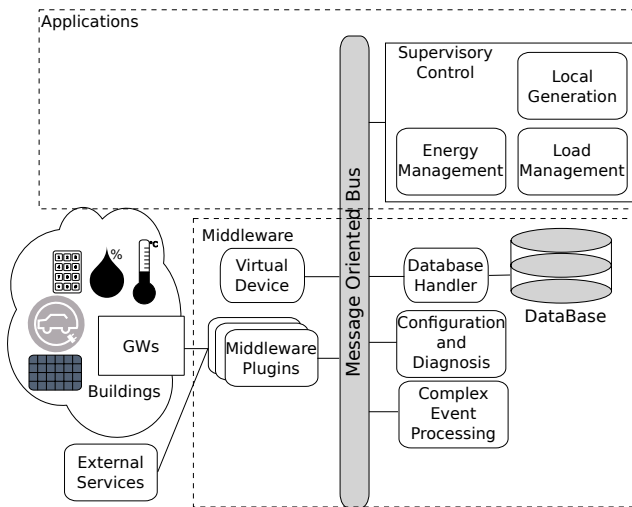
Architecture
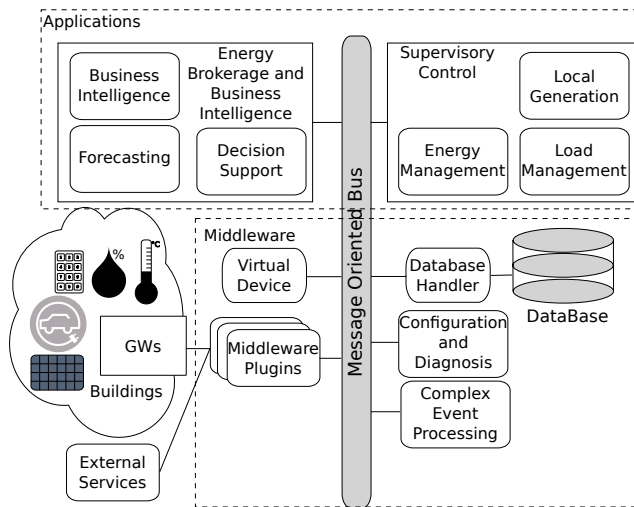
Architecture

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Performance test

- Performed on distributed computers
- Involved VD, DBH, SC, and MPG
- Several test of differing sizes
- Expected cost € 0.60 per month per HAN

Supervisory Control

- Optimize energy usage
- Local consumption
- Single control for all houses
- Enabled by middleware and virtual devices

Supervisory Control

- Model Predictive Controller
- Loads, productions, and building dynamics
- Predicted and current values

Pilot Results

- Vestervej, Denmark
- Jadevej, Denmark
- Terrassa, Spain

Vestervej

- Single house
- Solar cells and floor heating
- Temperature and presence sensors
- Energy meters
- Control floor heating
- Subcontractor left project
- Unable to measure effectiveness

Jadevej

- Residential area, 8 houses
- Solar cells and floor heating
- Simulated 33% to 50% reduced cost

Terrassa

- Campus building
- Energy meters and presence sensors
- Social media as controller
- Raise awareness
- Twitter messages when light is left on
- 32.51% savings

Conclusion

- Middleware enabling control and collaboration
- Supervisory control
- Social media
- Energy savings

Questions?