

Simplifying Access to Energy Data

Matter-Based Integration of Distributed
Energy Resources into an Energy Data Agent

Manuel Seifriedsberger, Shievam Kashyap, Christoph Schaffer



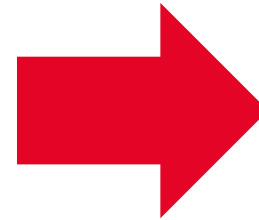
Access to near-real time energy data of DERs

Energy Community Operator

- Producing and consuming members
- Maximize community self-consumption

Virtual Power Plants

- Orchestrating thousands of DERs
- Know capabilities and effect of actions



Near-real time data

Communicating Data: Existing Data Paths



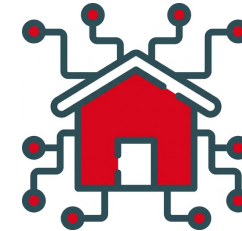
Vendor Integrations

- Proprietary
- Vendor lock-in
- Often Cloud dependent



Protocols

- E.g. Modbus, KNX, EEBus
- Difficult to use for average user



Smart Home Platforms

- E.g. HomeAssistant, OpenHAB, ...
- Built for data access, not for data sharing

DER communication via Matter



Vendor independent, local-connectivity & open-source

Communicate with DERs via:



- Smart Home Standard
- First published: 2022
- Developed by the Connectivity Standards Alliance

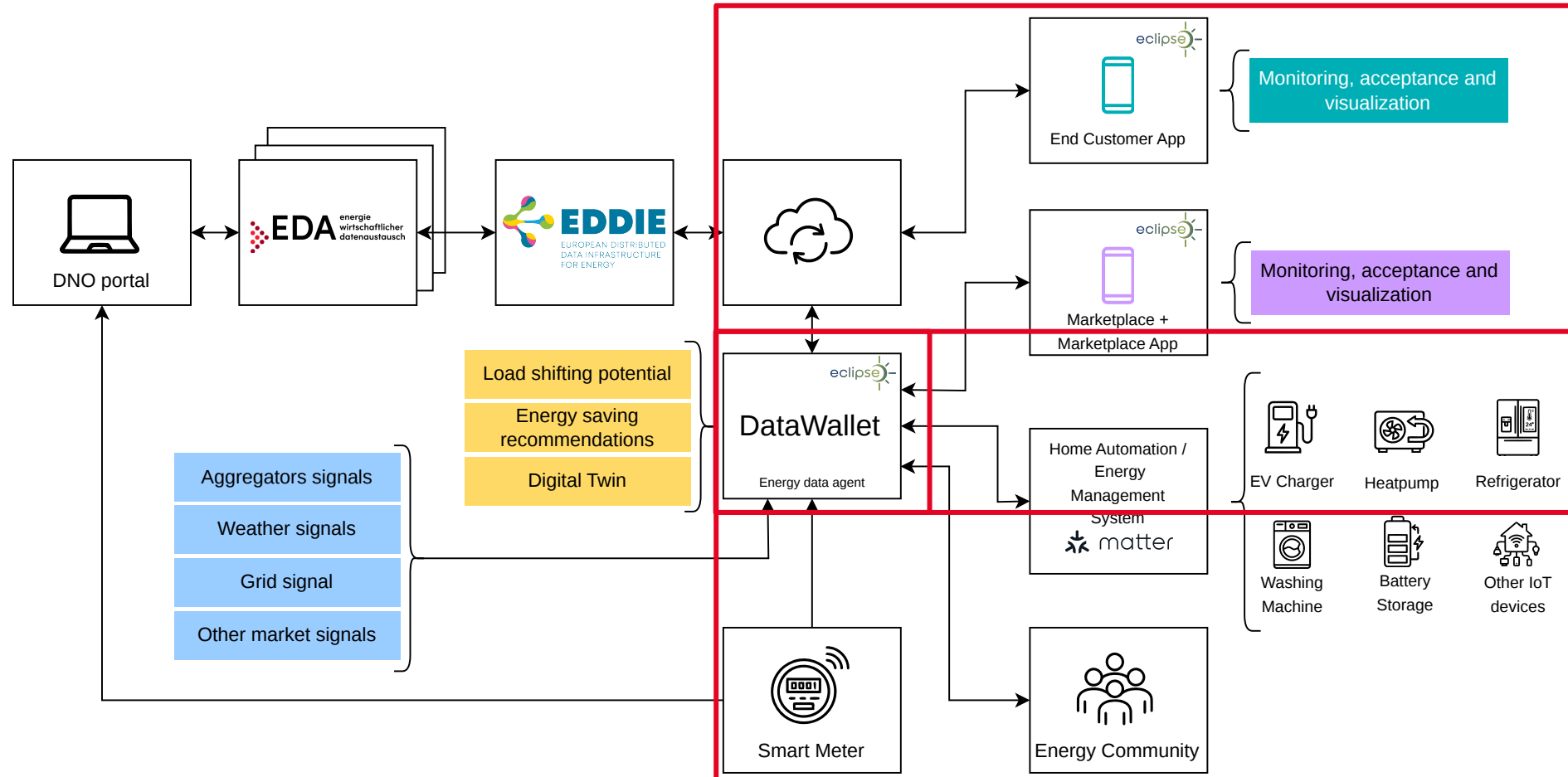


Simplicity of use



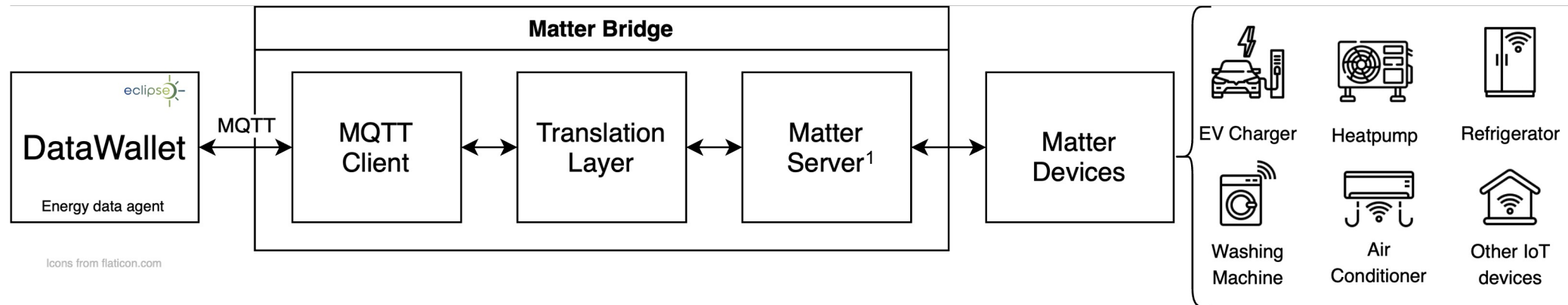
Support for Energy-relevant aspects

Reference Architecture



Reference Architecture of Eclipse Project – Austrian Pilot

Matter Integration – Architecture



¹<https://github.com/matter-js/python-matter-server>

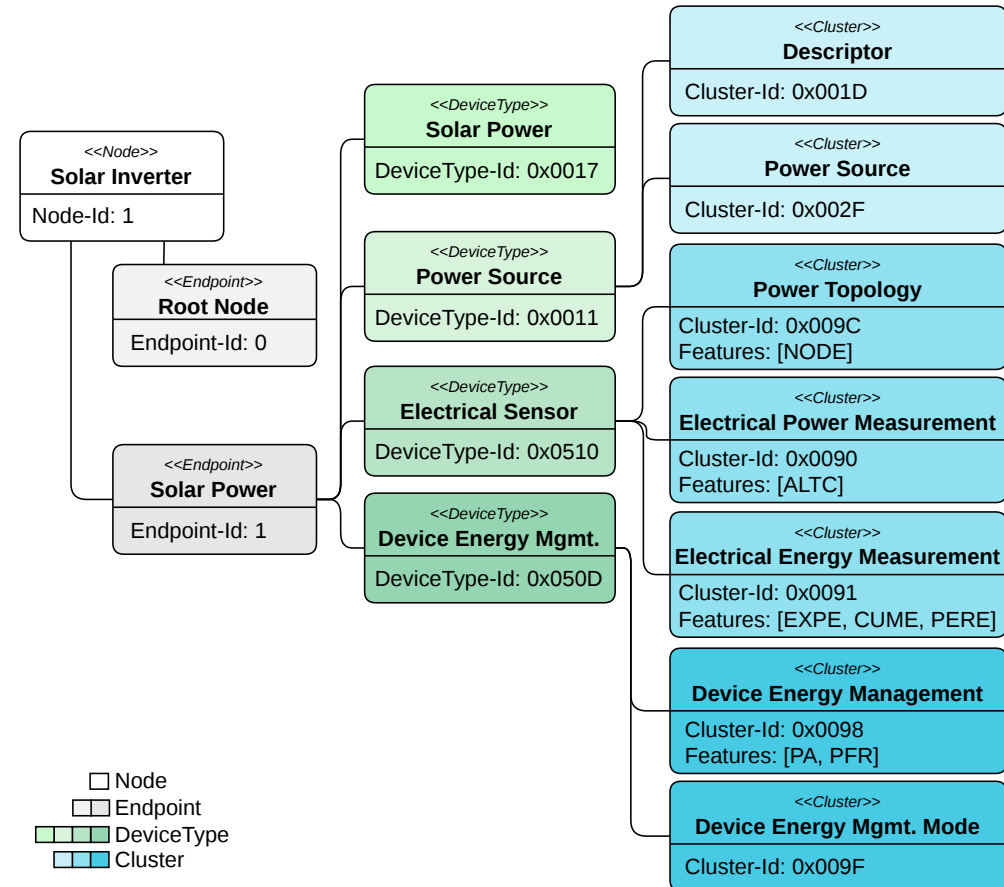
Evaluating the Integration

- **Solar Invert Simulator**

- No commercial DER supporting Matter available
- Based on ESP32 with prerecorded data

- **Supported Functionality**

- Power and Energy readings
- Forecasting the next 2h
- Adjustment of production



Implemented Matter Data-Model

Five Setup Steps to add a device

1

Connect
Device

2

Choose
Matter

3

Choose „Add
configured device“

4

Enter Pairing
Code

5

Confirm



Excluding general platform access and setup steps & external device sharing



Generic inverter

Connect

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Back

Step 1 of 4

Close

Connect Matter Device

How do you want to setup the Matter Device?



Add configured device

Share a device with the Data Wallet that is already configured in another home platform.



QR-Code

Setup the device by scanning the QR-Code on the device. This directly adds the device to the Data Wallet.

Coming soon



Manual Setup Code

Setup the device by manually entering the setup code printed on the device. This directly adds the device to the Data Wallet.

Coming soon

Five Setup Steps to add a device

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Enter Pairing
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Confirm

Back Add configured device ×

Enter commissioning code

Before sharing a configured Matter device with the Data Wallet, it must already be set up in another Matter-compatible platform, such as Apple Home, Home Assistant, etc. Share the device from the origin platform and use the setup code generated by the origin platform to connect the device with the Data Wallet. Enter the code below:

[How do I get a commissioning code?](#)

Commission Code

11/11

Connect

Five Setup Steps to add a device

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[How do I get a commissioning code?](#)

Commission Code

11/11

Connect

Add configured device



Two setup scenarios

Initial Setup of factory reset device

- QR-Code or Manual Setup Code
- Requires out of band channel (e.g. Bluetooth)

Add configured device

- Share device already connected to another Matter Controller
- Prevailing real-world deployment scenario

A screenshot of a web interface for connecting a Matter device. At the top right is the Eclipse logo. Below it is a navigation bar with a 'Back' button, 'Step 1 of 4', and a 'Close' button. The main heading is 'Connect Matter Device'. Below this is the question 'How do you want to setup the Matter Device?'. There are three options, each in a box with a red border: 1. 'Add configured device' with a share icon, text 'Share a device with the Data Wallet that is already configured in another home platform.', and 'Coming soon'. 2. 'QR-Code' with a QR icon, text 'Setup the device by scanning the QR-Code on the device. This directly adds the device to the Data Wallet.', and 'Coming soon'. 3. 'Manual Setup Code' with a keypad icon, text 'Setup the device by manually entering the setup code printed on the device. This directly adds the device to the Data Wallet.', and 'Coming soon'.

Questions



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Questions

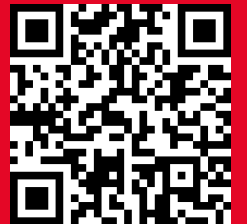
Comments

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Evaluation

	Commissioning Flow	Near-Real-Time Aspect		
	Commissioning Time	MatterBridge: Poll to publish	DataWallet internal processing	Total processing time (incl. Communication)
Average	12,79s	3,27ms	7,57ms	13,9ms
Standard Deviation	1,75s	0,83ms	1,92ms	2,54ms