

The Siemens logo, consisting of the word "SIEMENS" in a bold, teal, sans-serif font, is positioned in the top left corner of the slide. It is set against a white rectangular background that has a thin black horizontal line below it. The background of the entire slide is a high-resolution image of Earth from space, showing the curvature of the planet, blue oceans, and white clouds, with a bright sun on the right side creating a lens flare effect.

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Web Technologies in EV and Smart Grid Applications

Johannes Hund, Jörg Heuer, Daniel Peinter, Sebastian Käbisch, Darko Ancic

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Why WoT? Why now?



What drives WoT?

- Simple optimization of automation processes
- Across industry domains
- Across the automation layers
- Involving multiple stakeholders



Enablers

- Well, IoT ;-)
- Processing power in uC
- ComSoCs

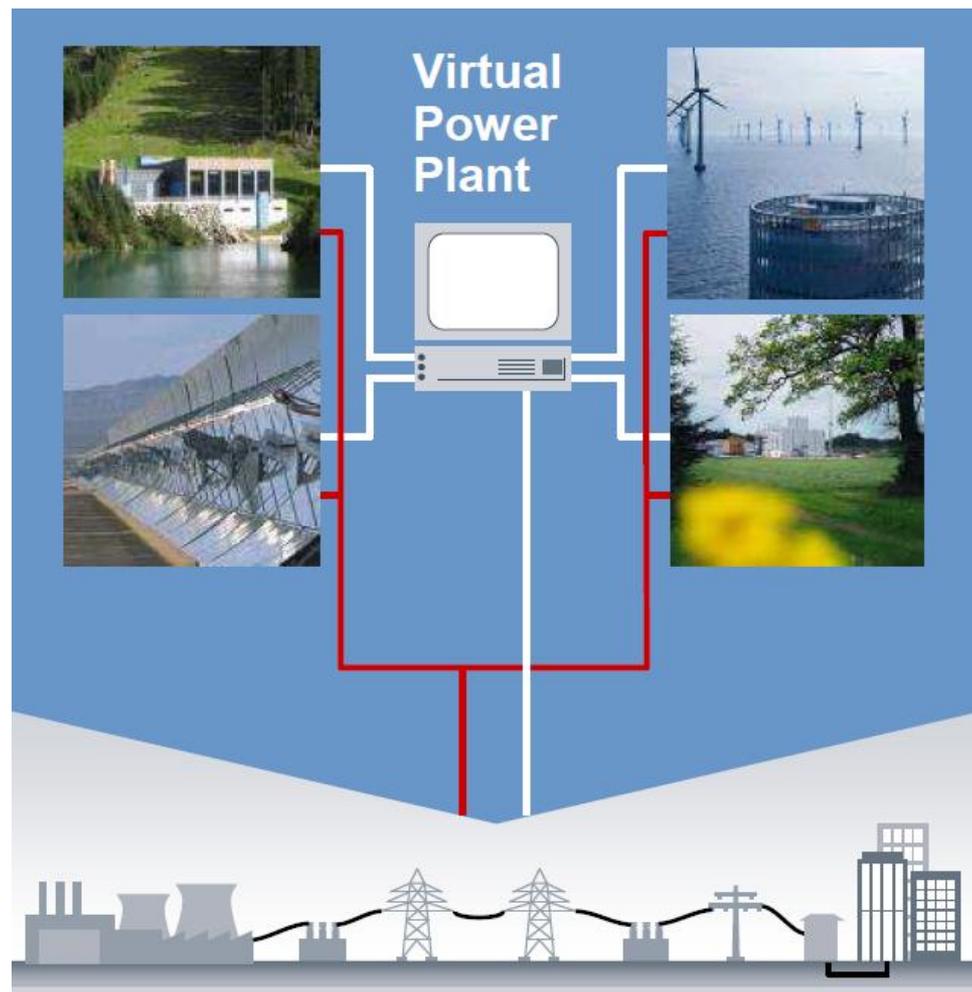


Let's have a concrete look at examples

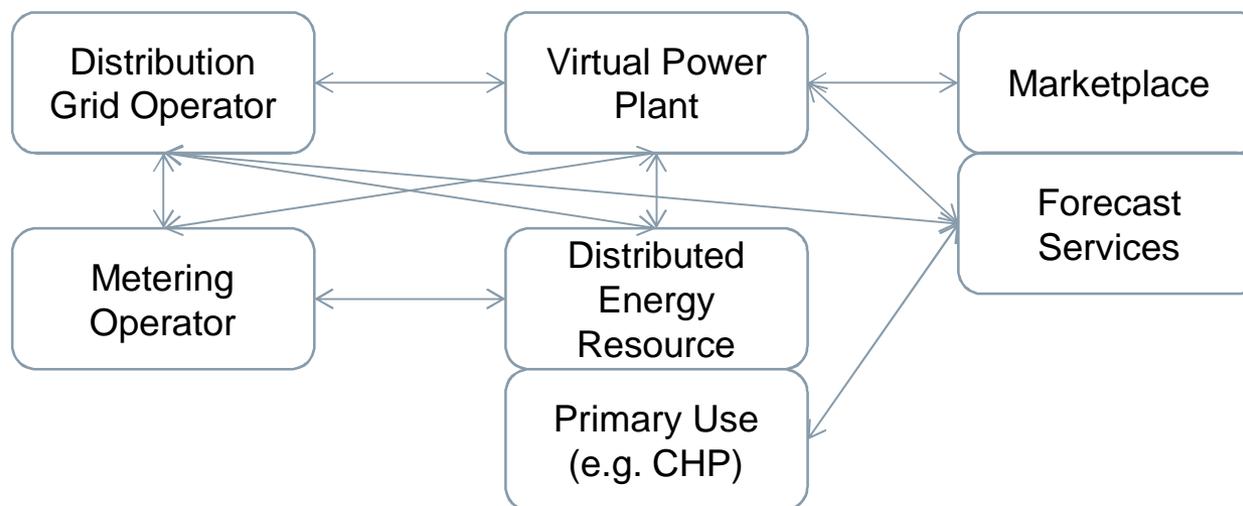
- Smart grid
- EVs

A Smart Grid Application – Virtual Power Plants (VPP)

- Key technology for Smart Grid
- Orchestration of Distributed Energy Resources (DER)
- Loosely coupled control
- Unreliable communication over public networks
- Aggregation of data vs. distribution of automation function

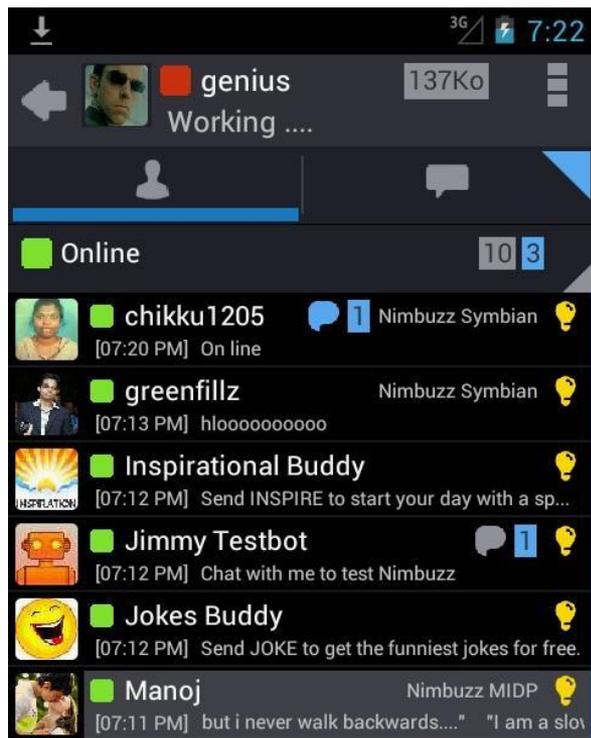


VPP automation among multiple Stakeholders



- Observations:
 - Multiple domains (e.g. building mngmt. vs. energy trading)
 - Multiple stakeholders
 - Divergent Priorities (e.g. voltage control vs. energy trading)

What interaction paradigms have persons and these distributed things in common?



participation in a chat room



Local storage participating in a
Virtual power plant (VPP)

Can web technology for chats be used to organize the collaboration of distributed energy resources?

E-Mobility: Relevant stakeholders

Demand clearing house

Original Equipment Manufacturer

Fleet Operator

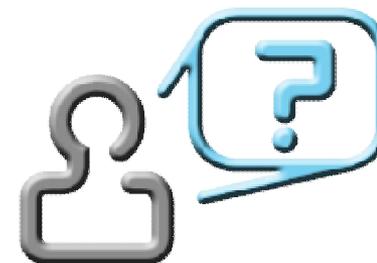
E-Mobility Operator



EV



Chargespot



User

Energy Provider

Meter Operator

Distribution System Operator

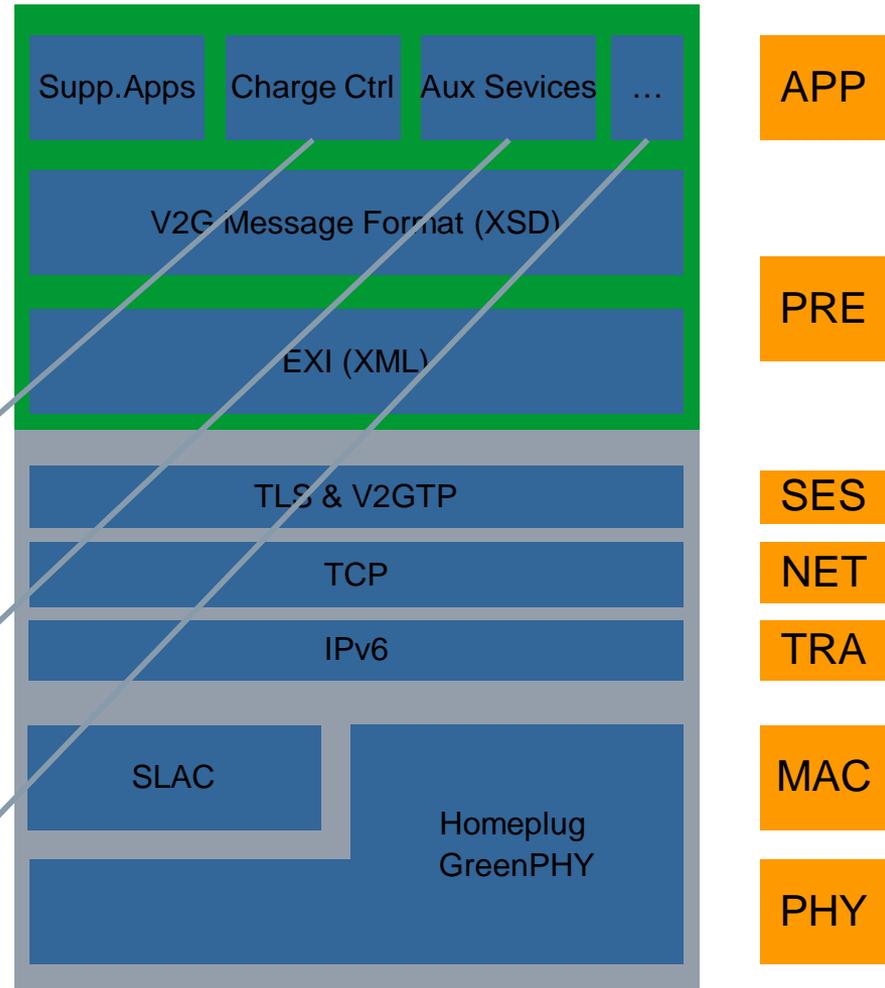
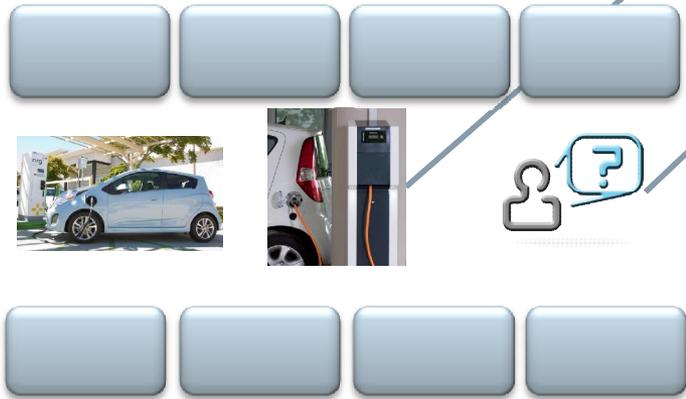
Financial clearing house

ISO/IEC 15118

Charge Control and Aux Services with Web Technology



Visit Demo for details



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Let's have a concrete look at examples

- Multiple stakeholders: from automation to collaboration
- Multiple domains: use of web technologies by means of extensibility
- Challenge: resource efficiency, security, ...

Requirements and Approaches



Support of Stakeholder Use Cases

- Do not limit to concrete application use cases
- Support Add-On Services



Provide an extensible framework

- Extensible & generic technology
- Not domain specific
- Widely accepted specs and standards for the interfaces

Support E2E security aspects



Simple Implementation

- Standard SW development tools
- Integration in IT infrastructure
- Limit to basic tool box (20:80 principle)



Define a platform for heterogeneous, loosely coupled applications

- lessons learned from www
- define platform for identification- and interaction mechanisms
 - breakout session on activity streams