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Control and Management Platform

Challenge

The **amount of technical devices** in our environment **increases rapidly**.

The **complexity and dependency of the devices grows** as well.
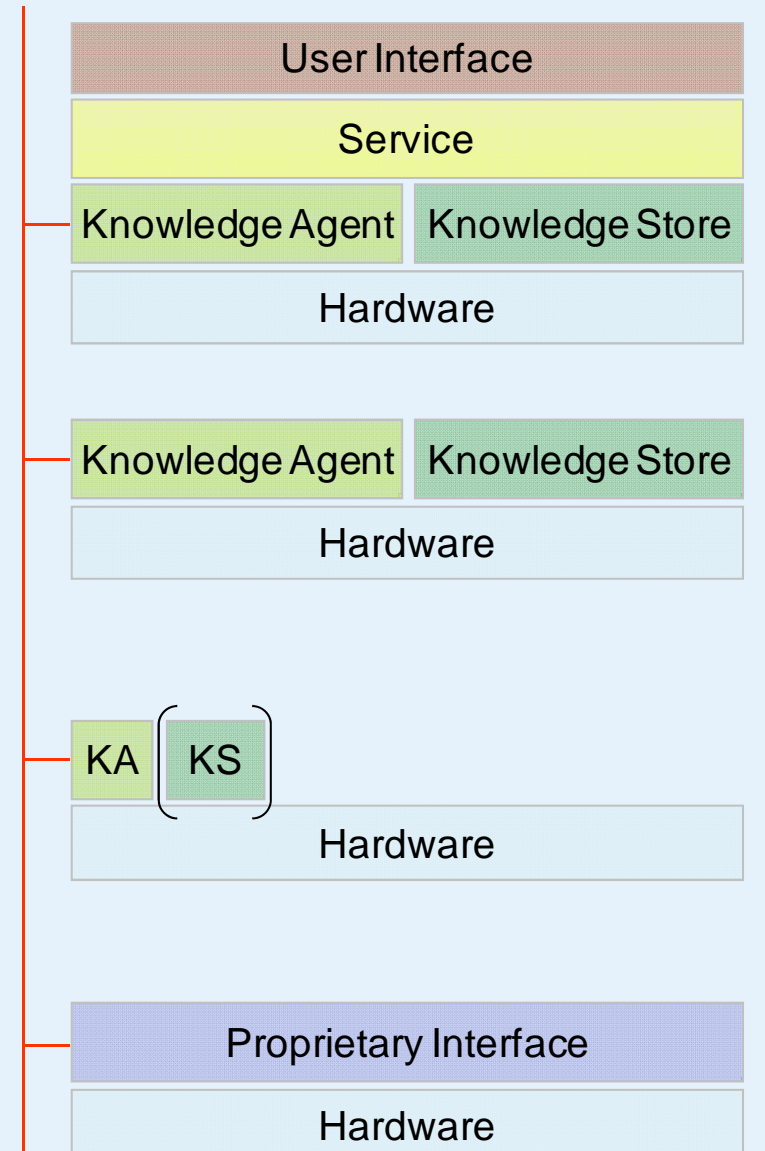
We need unified autonomous control and management functionality inside our future home networks in order to keep them manageable and making them more comfortable!

Having such functionality provides space for new applications that let the user experience his daily environment in a new way opening a market for new products using the platform as base.
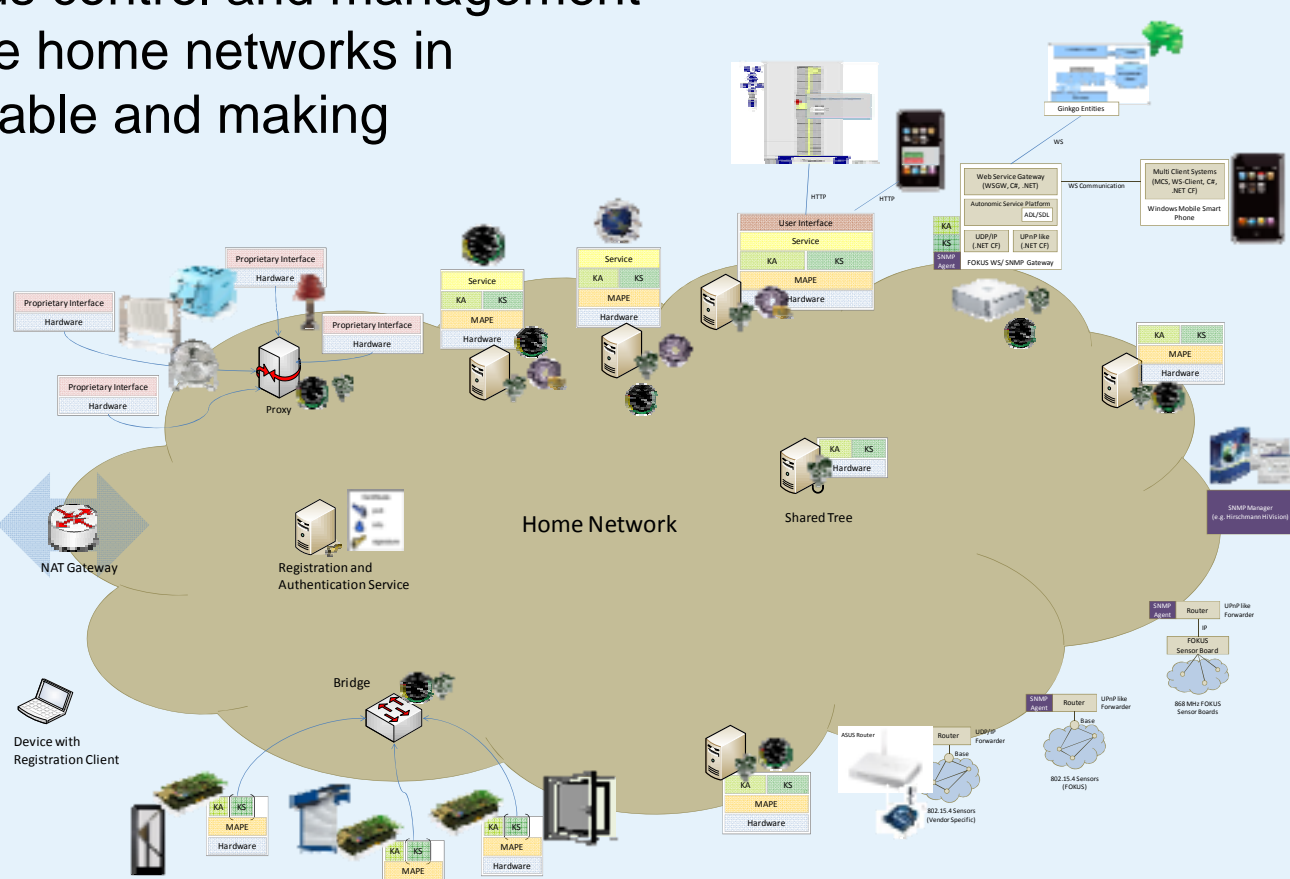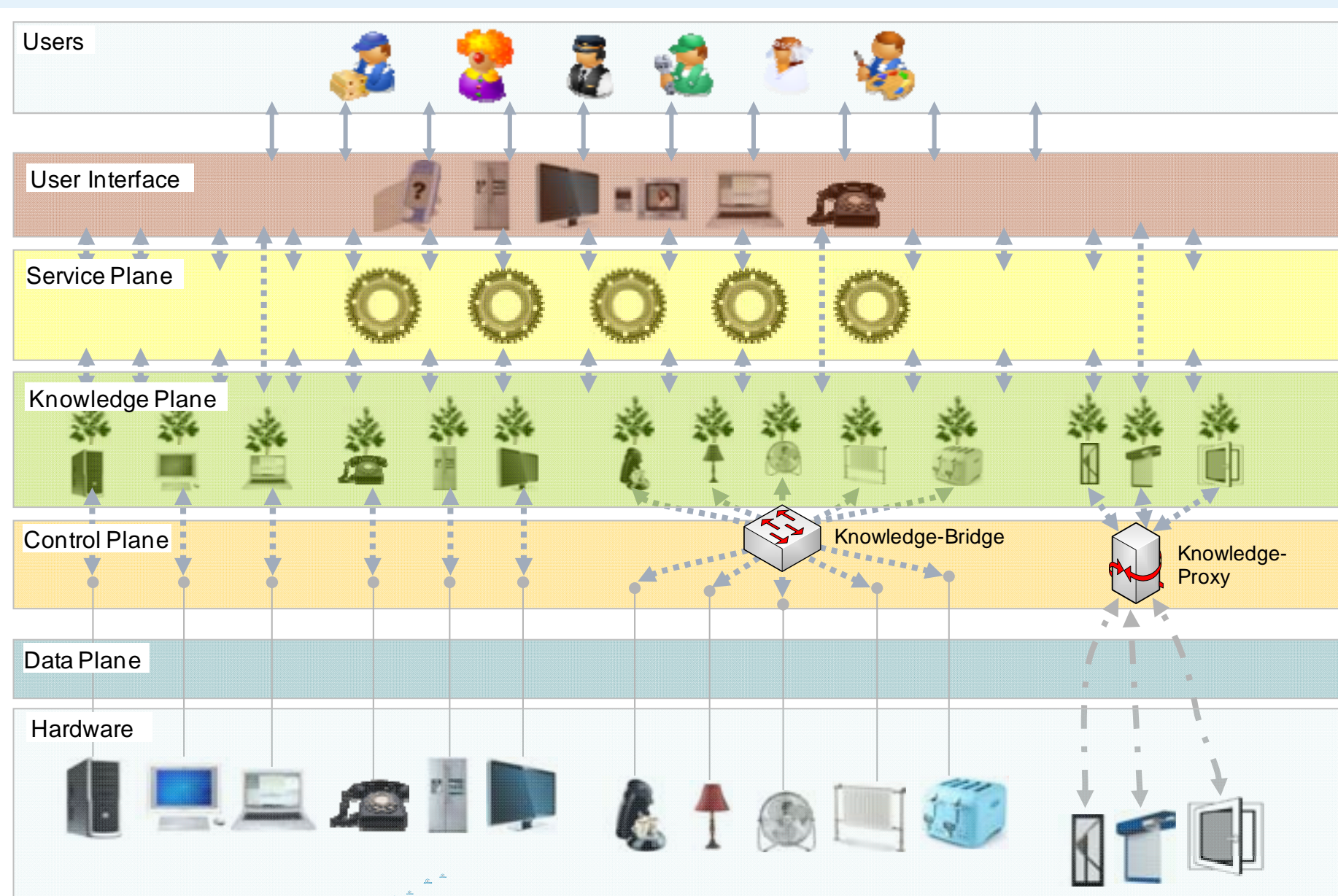

Node Classes

□ **Maximum** AutHoNe Functional Node
  - User Interface
  - Hosting services

□ **Full** AutHoNe Functional Node
  - Fully Functional Knowledge Agent
  - Fully Functional Knowledge Store

□ **Reduced** AutHoNe Functional Node
  - Reduced Functional Knowledge Agent [KA] (possibly connected to Knowledge Bridge)
  - (Reduced Functional Knowledge Store [KS])

□ **Legacy** Node
 - Proprietary Software Interface (connected to Knowledge Proxy)

Layered Design

Users — User Interface — Service Plane — Knowledge Plane — Control Plane — Data Plane — Hardware

Knowledge-Bridge — Knowledge-Proxy

Monitor Analyze Plan Execute

The MAPE loop is one way to structure the functionality needed on autonomously behaving nodes.

The monitor gets data from the managed device and passes it to the analyzer that transforms the data into knowledge by adding semantics. The data is then passed to the knowledge agent that acts as an administrator of the data. It stores it inside the knowledge store and provides it to other knowledge agents. The planner on the right side of the circle decides what to do according to the data it gets from the knowledge plane as well as its internal logic that might contain artificial intelligence, policies etc. The actions to be performed are handed to the executor that puts them into action.
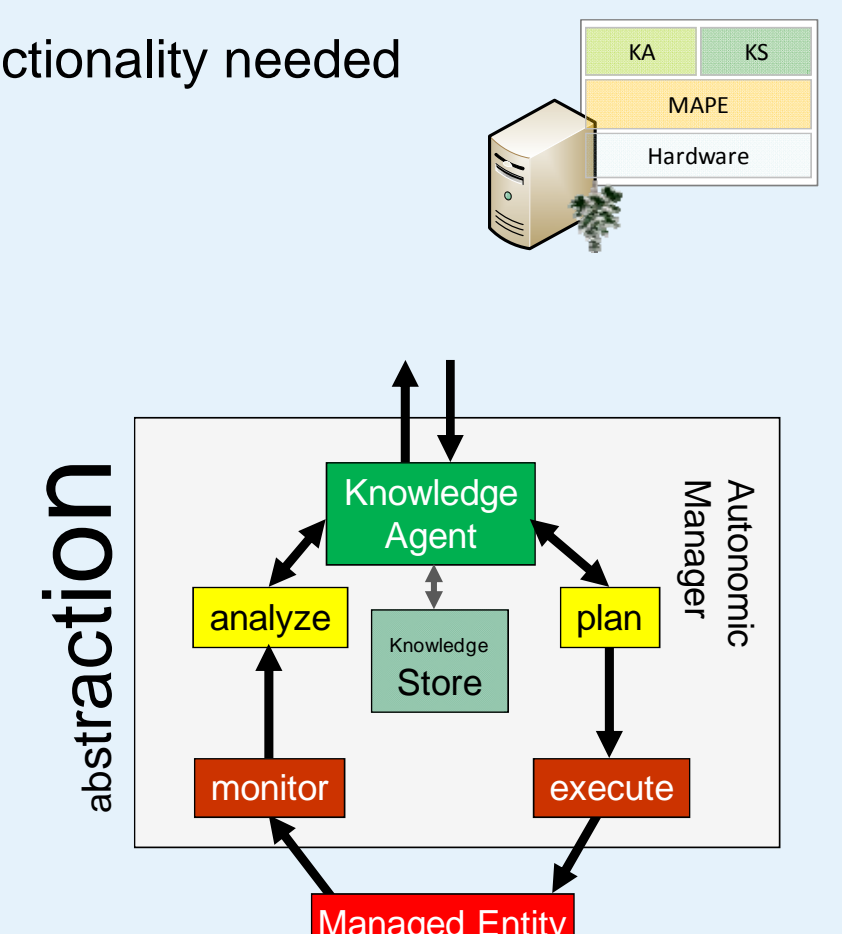
The MAPE loop runs on every node inside the platform that is controllable. It reflects the autonomic nature of the platform.

Knowledge Bridge

A knowledge bridge is used to **connect reduced AutHoNe functional nodes to the platform**.

The communication protocol on both sides of the bridge is the one of the platform. Due to bandwidth or other limitations the dialect on the right side is different from the one used in the non limited domain on the left. The representation of the data may be compressed or reduced.

The bridge extends the platform towards domains with specific need for protocol optimization.

Knowledge Bridge
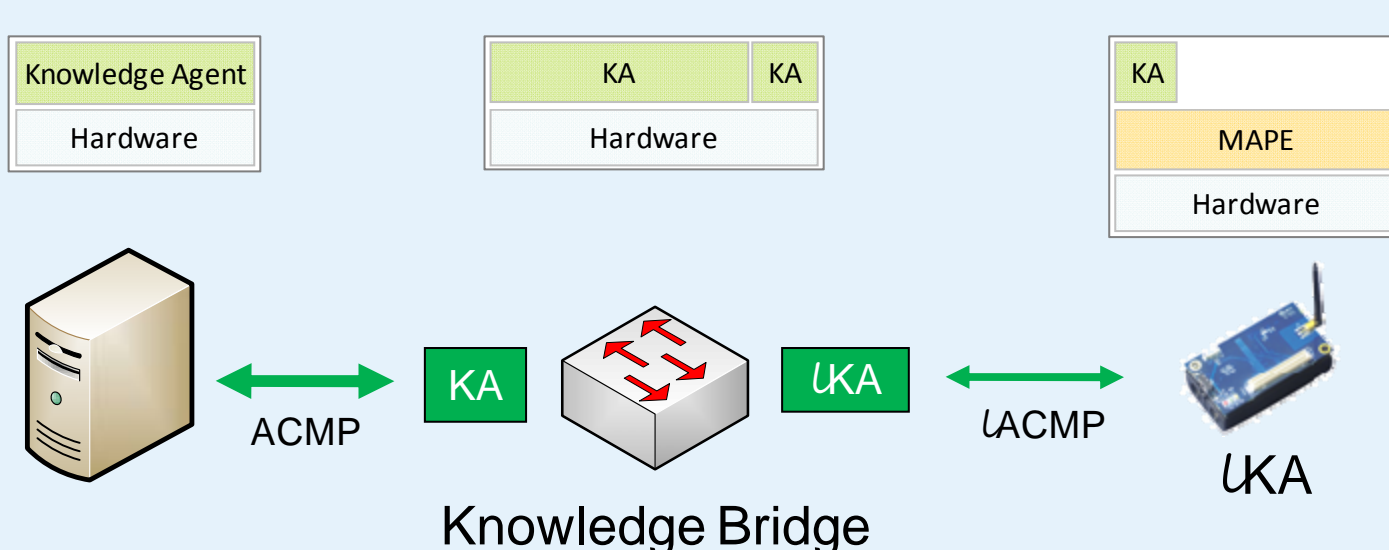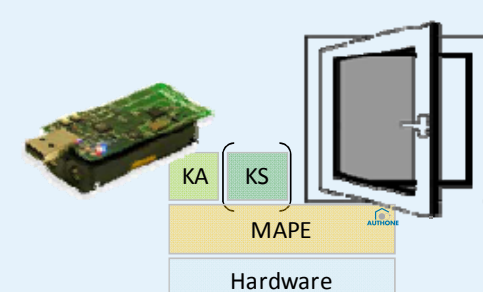
Knowledge Proxy

A knowledge proxy is used to **connect legacy nodes to the platform**.

The communication protocol on the left side of the proxy is the one of the platform. The protocol on the right is a proprietary one. The proxy provides autonomous functionality on behalf of its legacy nodes.

The Proxy extends the platform towards a huge amount of already existing legacy devices.

Knowledge Proxy — SNMP agent