Introduction to ECHONET Lite Web API

ECHONET Consortium

12th September, 2022

Agenda

- Overview of ECHONET Lite, international standard
  Basis for ECHONET Lite Web API
- ECHONET Lite Web API
- Liaison activities with W3C WoT WG
- Expectations for W3C WoT

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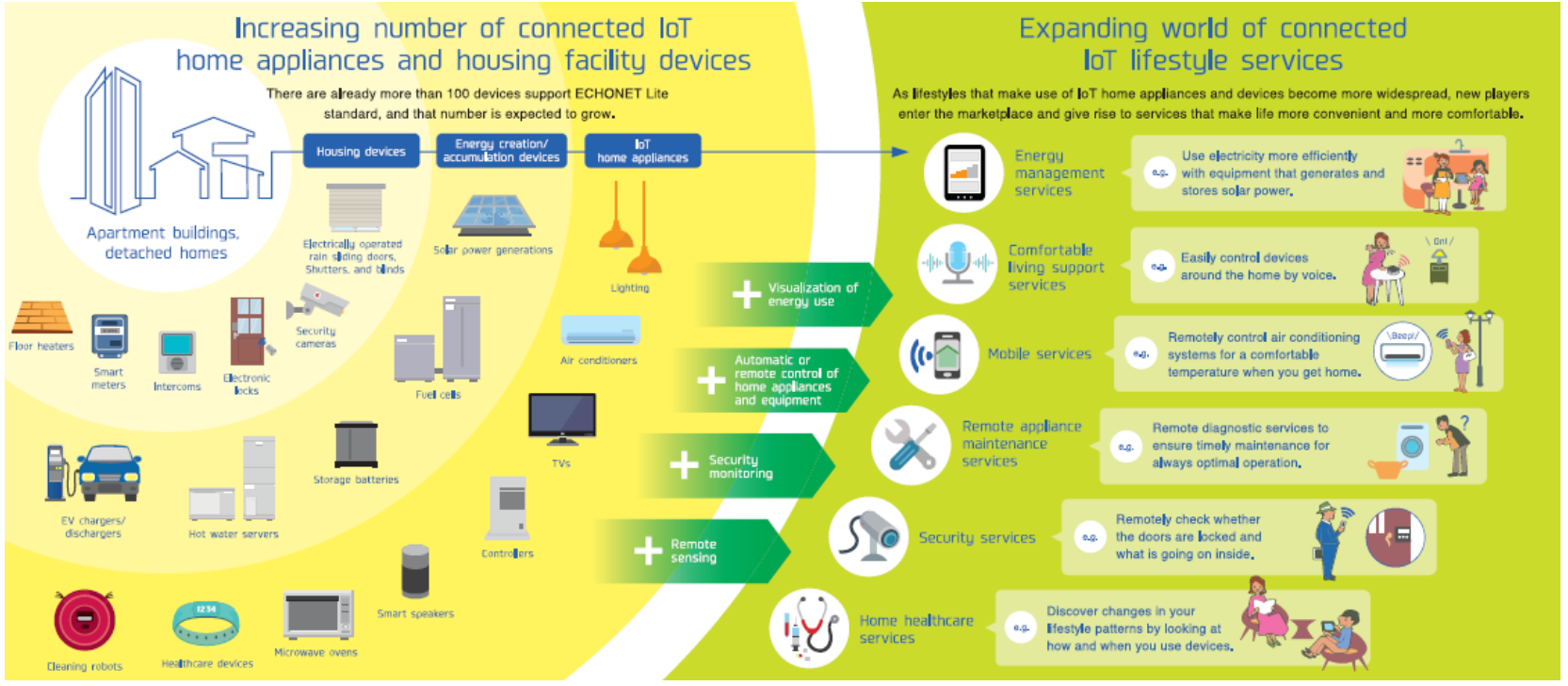
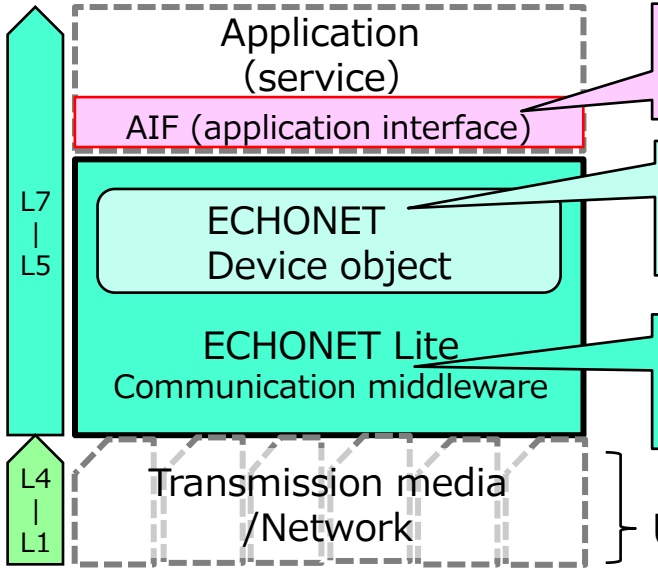
ECHONET Lite: International standard specifications

- ECHONET Lite is communication specifications for sensors, appliances and equipment.
- Target applications are "energy management", "health care" etc. ➡ Smart City



Standards comprising ECHONET Lite

- ECHONET Lite is IEC and ISO/IEC standard
- ECHONET Lite is comprised of three kinds of standards



ECHONET Lite protocol stack

Published in June, 2020 | **Under development**

ISO/IEC14543-4-301 | **ISO/IEC14543-4-302**

(3) Application communication interface specification
(Device specific behavior specification)

(2) ECHONET device object detailed standard
(command)

IEC62394 Ed4.0

Published in July, 2022 **-> Under revision**

(1) ECHONET Lite specification
(protocol, communication procedure)

ISO/IEC14543-4-3

Published in Sep., 2015

Uses various communication standards
Ex: Ethernet, Wi-Fi, Bluetooth
Wi-SUN, G3-PLC

Many kinds of devices are specified

- Seven class groups of device are defined.
- Cumulative number of ECHONET Lite compliant devices on the market exceeded 100 million in 2020.

Sensor Related	Security Sensor, Human Detect Sensor, Temperature Sensor, CO2 Sensor, Electricity Sensor, etc.
HVAC Related	Air Conditioner, Fan, Ventilator, Air Cleaner, Carpet, Fan Heater, etc.
Facility Related	Storage battery, Fuel cell, Photovoltaic system, Electric water heater, Electric vehicle charger / discharger, Smart meter, Lighting, etc.
Cooking Related	Refrigerator, Microwave, Washing Machine, Rice Cooker, etc.
Health Related	Weighing scales, Clinical thermometer, Blood Pressure Meter, etc.
Controller Related	Controller, Switch, etc.
Audiovisual Related	Television, Display, etc.

HVAC: Heating, Ventilation, and Air Conditioning

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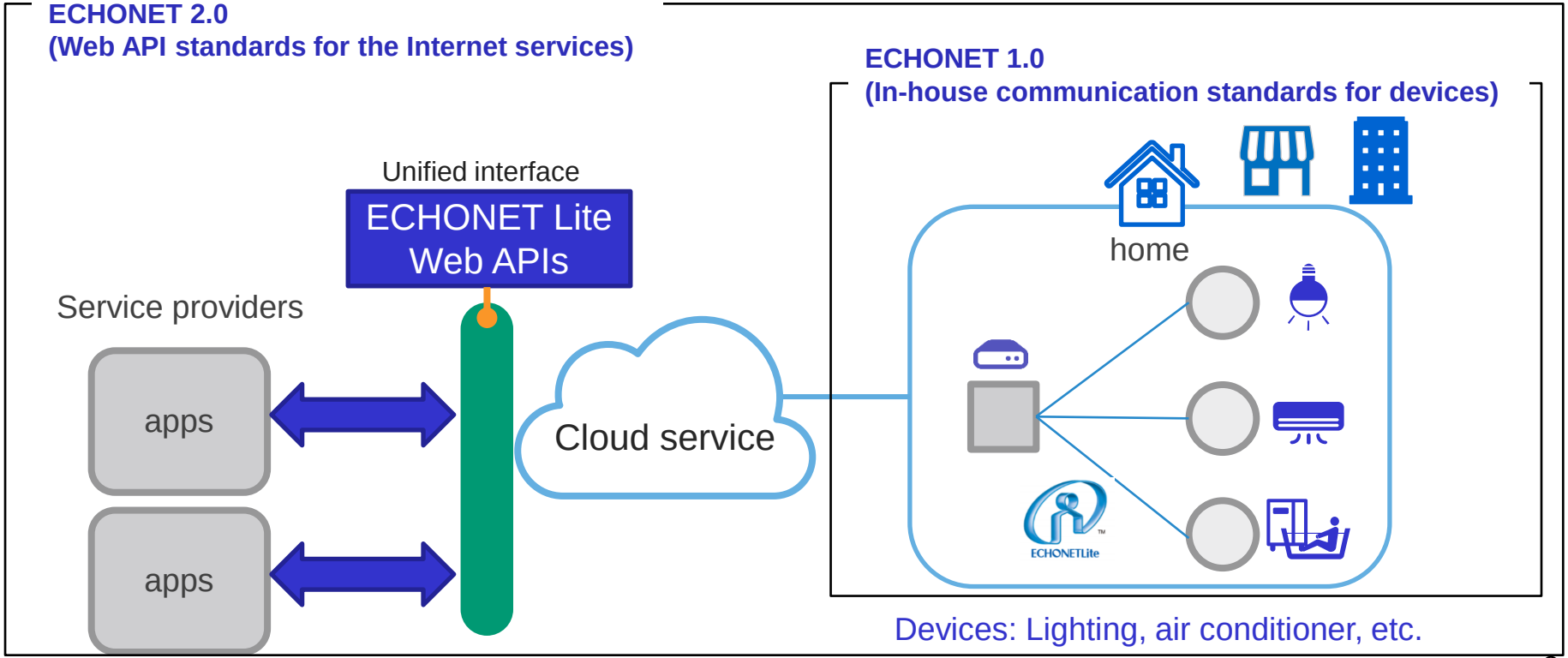
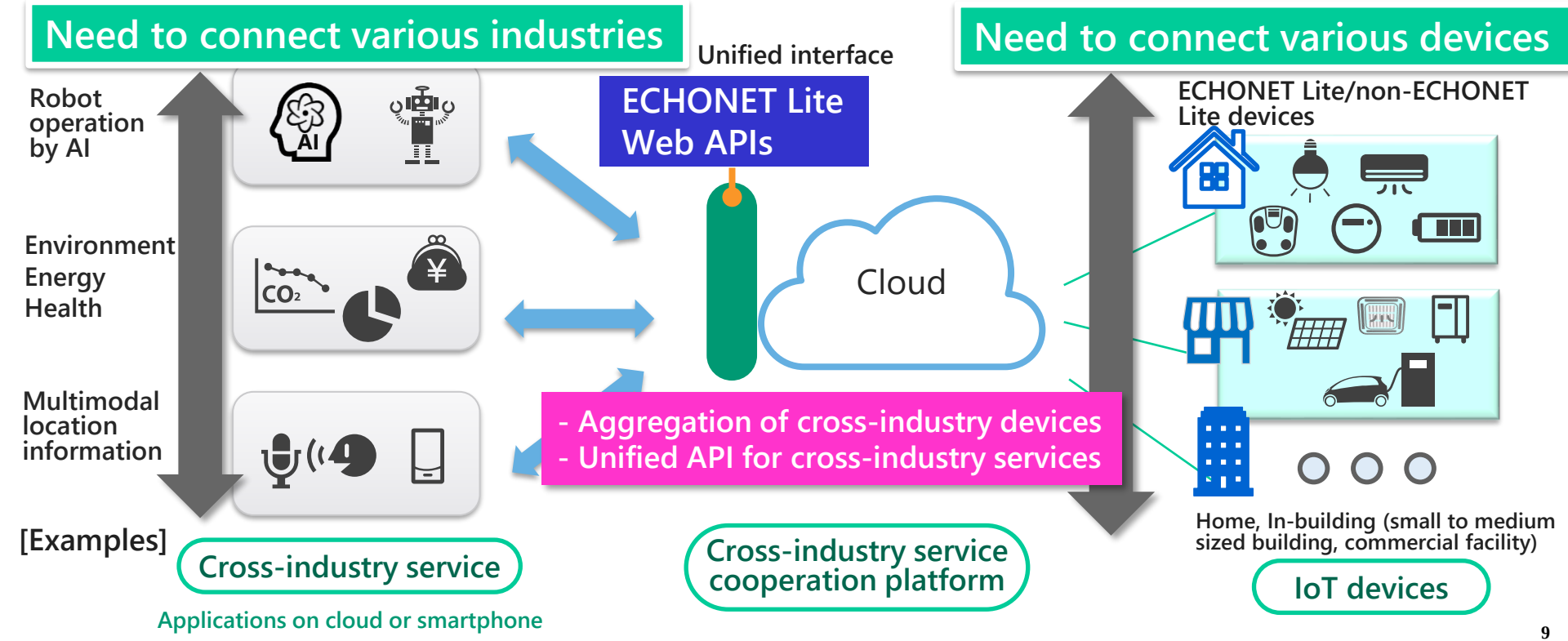
From ECHONET 1.0 to ECHONET 2.0

Web API provides the unified interface to operate ECHONET Lite devices via cloud service



Cross-industry service cooperation platform with ECHONET Lite Web API

For the standard platform of IoT cloud that promotes cross-industry cooperation



Structure of ECHONET Lite WebAPI

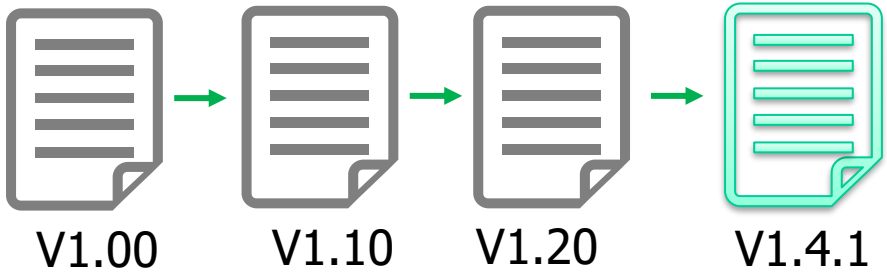
- ECHONET Lite Web API specification
  presents the scope of coverage (basic use cases), Web API model guidelines, and guidelines for mapping ECHONET Lite specifications to Web API
- ECHONET Lite Web API Device Descriptions
  specifies Device Description (data type and property resource specifications) for each device (e.g. Air conditioner, Storage battery, Fuel cell, Photovoltaic system, Electric vehicle charger / discharger, Smart meter, Lighting)
- ECHONET Lite Web API referred to the early draft version of W3C WoT.

New function
(under consideration)

Basic specifications (V1.1.4)

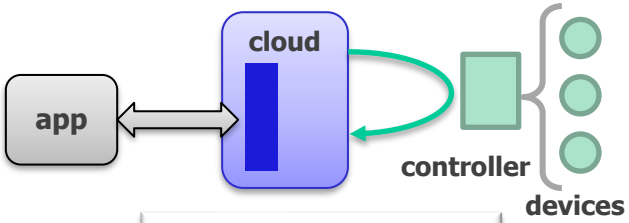
ECHONET Lite Web API specification

Add target devices and properties

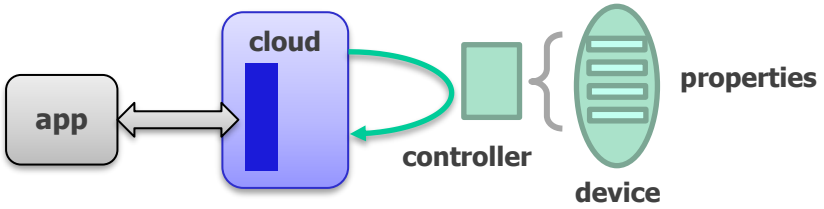


ECHONET Lite Web API Device Descriptions

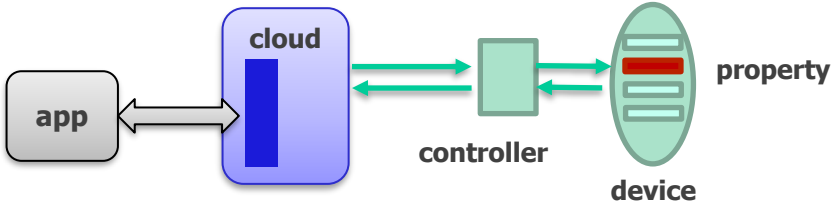
Basic operations supported by ECHONET Lite Web API



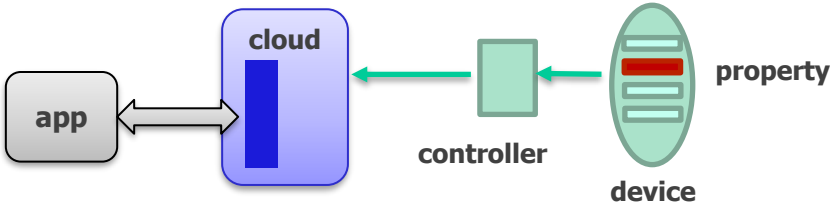
Get device lists



Get the status of devices



Control or monitor devices



Notification of the status of devices

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Liaison activities in 2021

- July: Study on how to transform EL Web API Device Description to WoT Thing Description.
- Sept.: Proposal of a WoT use case using ECHONET Lite Web API.
- Sept.: Testing the interoperation between WoT and ECHONET Lite Web API with WoT-ECHONET Lite Web API Intermediary in WoT Sept. 2021 Plugfest.

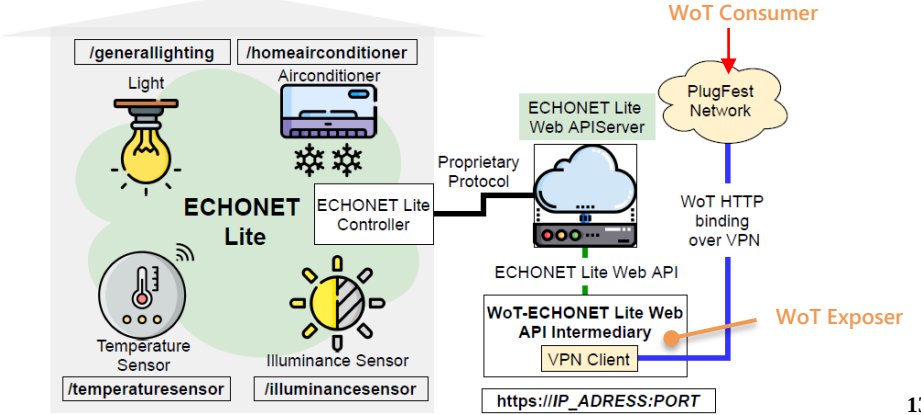
WoT Sept. 2021 Plugfest/Testfest

Peers: WoT Consumers from Hitachi, Fujitsu and Technical University of Munich.

Result: All the WoT Consumers from the above peers could control physical devices, which are connected to an ECHONET Lite Web API server, via WoT Exposer.

Supplement: WoT Exposer translates between a WoT HTTP message and an ECHONET Lite Web API HTTP message.

System for Plugfest



Use case for controlling home appliances when leaving and coming home

- **Title: Leaving and Coming Home**

- **Target Users:**
  - device user
  - service provider
    (Home Management Service Provider)
  - device manufacturer

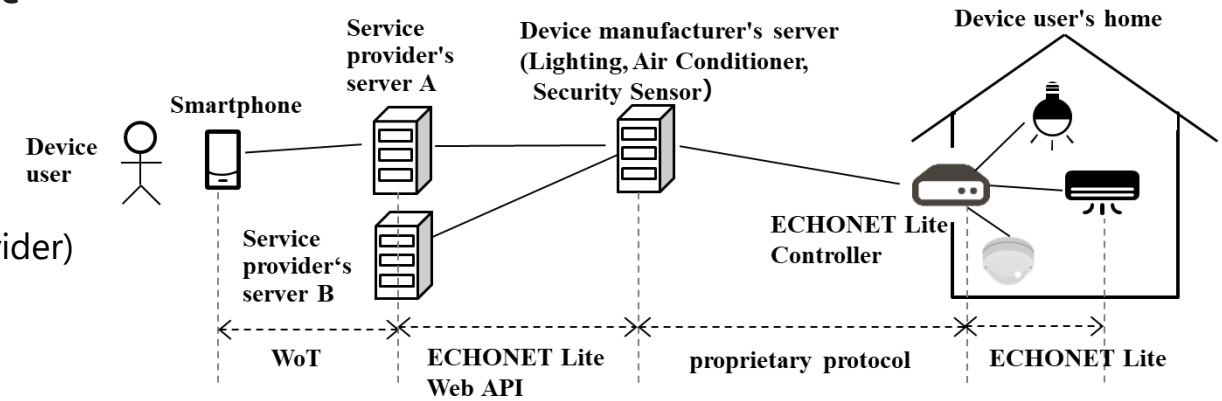


Figure: example system structure

- **Motivation :**
  - The purpose of this use case is to improve the usability of home appliances for device users by allowing device users to configure the operation modes of all devices at home without configuring those devices one by one when they leave and come home.

- **Status:** Merged into the editor's draft of Use Case document.

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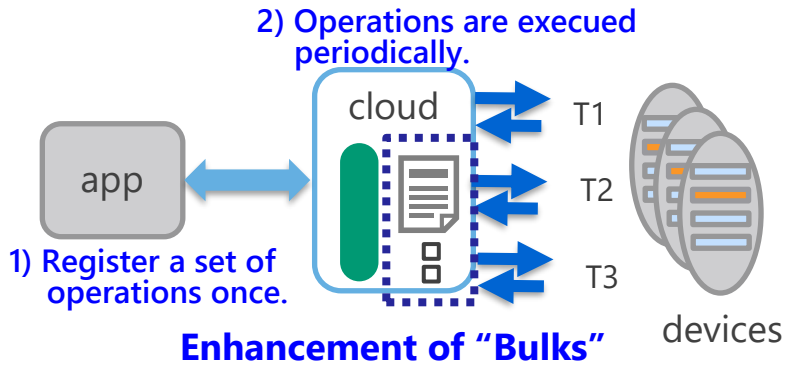
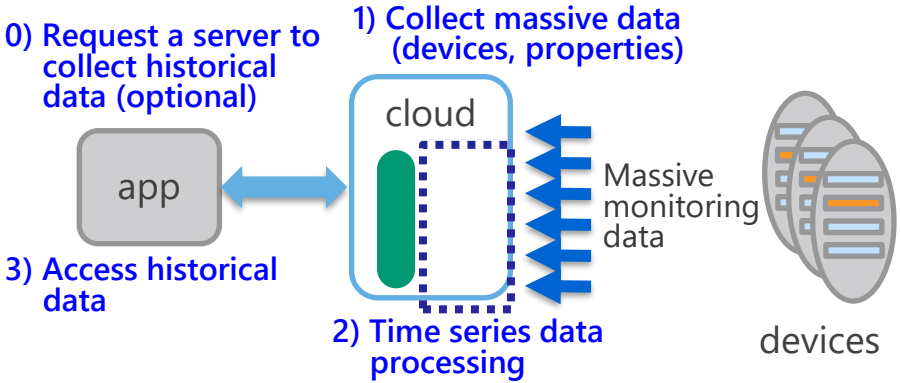
Sharing information on the study of new features

To enhance features for enabling requirements of realworld applications

- **Reserving the execution of a set of operations and executing the reservation**
  - Need to register and execute a set of operations that are done repeatedly in a server
    - Need to reuse the set of operations registered in a server. (“Bulks” defined in ECHONET Lite Web API is for this functionality.)
    - **Need to execute a set of operations at specified intervals periodically.**
- **Historical data processing**
  - Need to provide Web API client with aggregated historical data.
- **Authentication and authorization cooperation between servers**





THANK YOU FOR YOUR ATTENTION!!