IoT System for Factory

Proposal Document

2018. 09. 27

Preface

Industrial Revolution and IoT

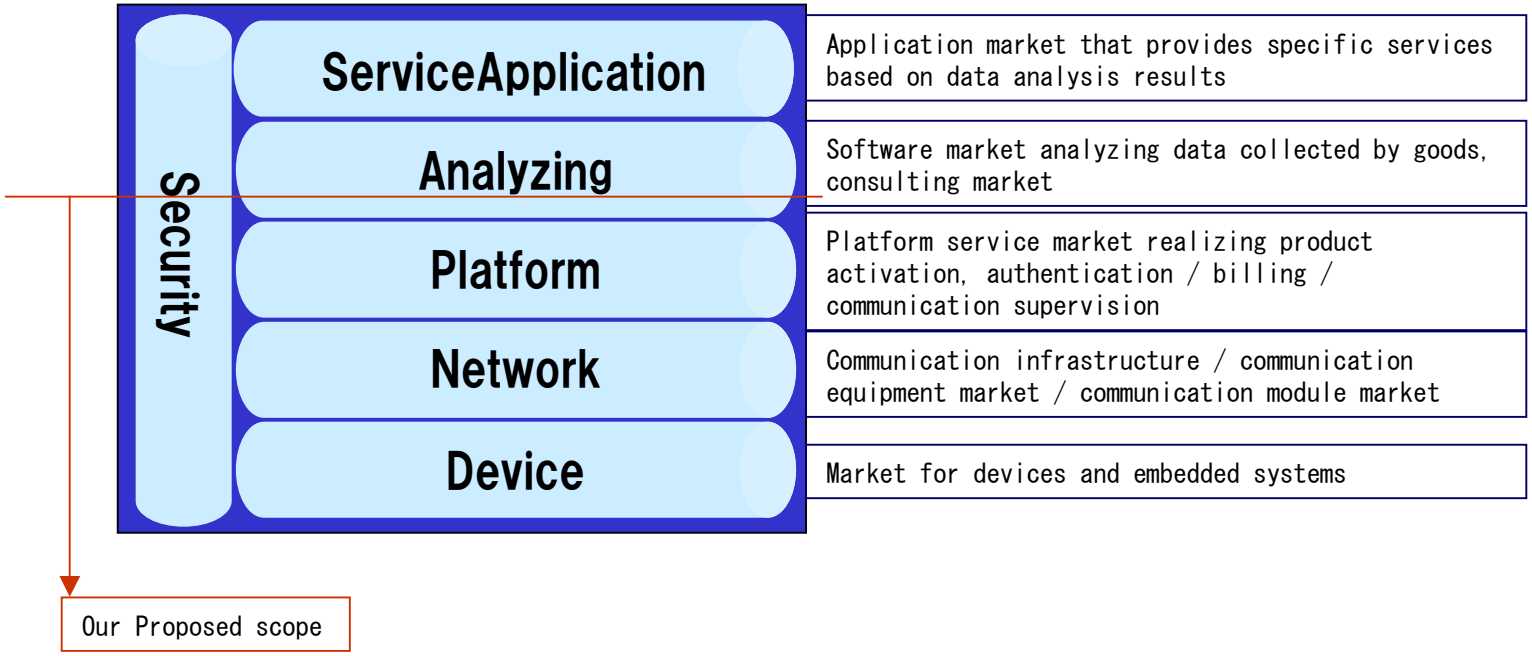
Protected Content

Protected Content

Trends surrounding IoT

The **ICT** market research company **IDC** calculates the market size of the domestic IoT market in 2013 to be about 11 trillion yen. It is expected to increase to 21 trillion yen, which is nearly twice (the figure in 2013) in 2018.

The IoT market is formed in several markets. In addition to the **device** market that corresponds to "goods" and the **network** market which carries out connectivity connecting goods and goods, there are **platform** market of operation management system, **analytical processing** market etc collected data.



Overview

IoT system environment that we propose (build), it is basically the field of **platform**, **network** and **device**.

It is possible to construct IoT system on consignment, and it is also possible to provide IoT system as service.

In the case of building IoT system, it is possible to produce existing products or custom order from server construction to devices to be used.

We are proposing to provide IoT system services for IoT systems in small and medium scale factories, but we propose parallel processing of multiple servers in large factories.

We propose the standard configuration as follows.

※Device side

A standard device that connects a PLC (sequencer) that is often used as factory production equipment.

※Telecommunications Infrastructure

We will use the existing Internet infrastructure. This eliminates the need for new capital investment for telecommunications infrastructure.

※Server side

By using rental server we provide low cost, high reliability server environment.
(Server: OS = CentOS, Database = MySQL / PostgreSQL)

As a result, we can offer low-cost services. In addition, customization is possible at extra cost.

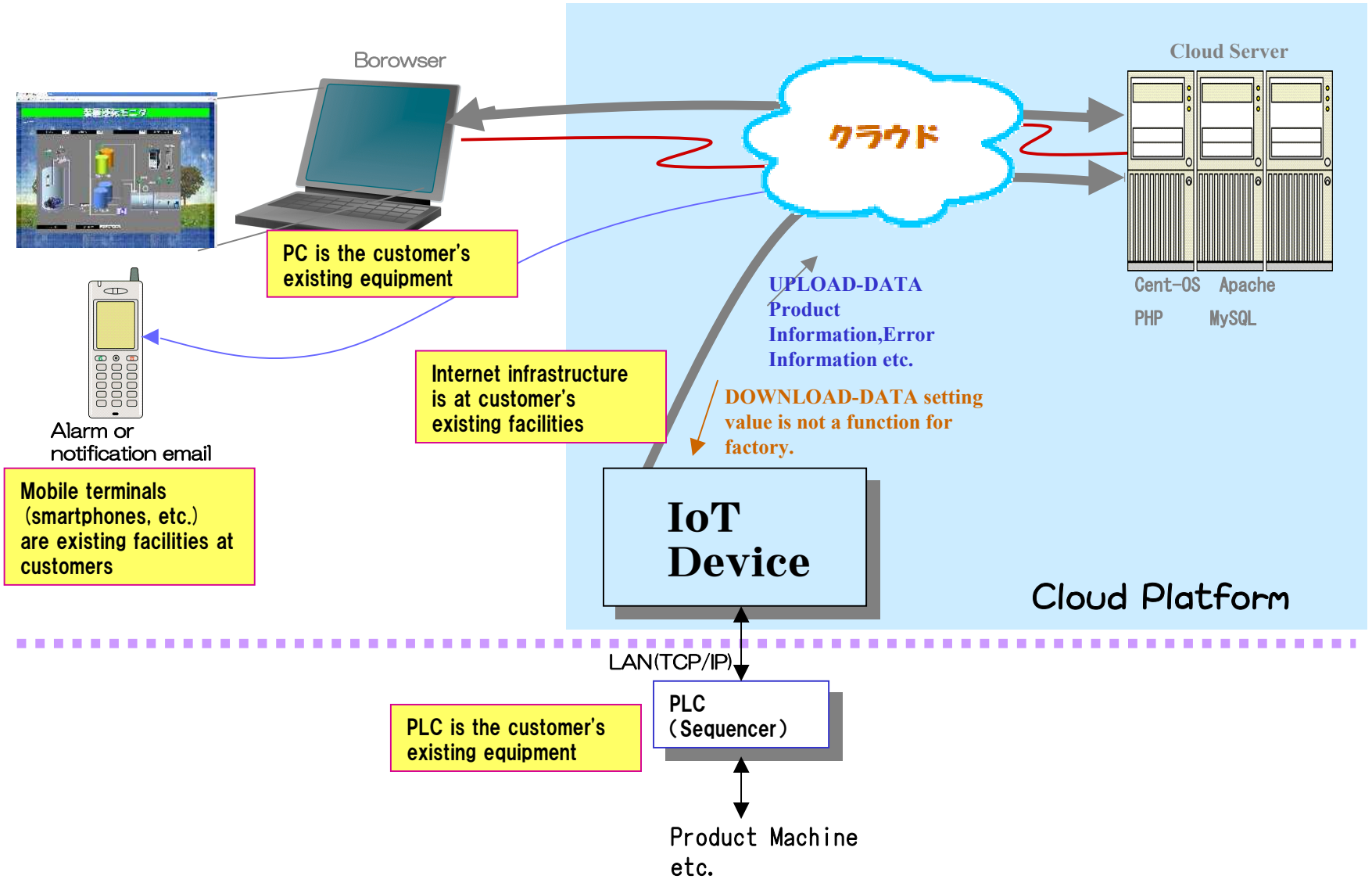
Proposal composition

This IoT system will be connected to any device by customization, but the proposed basic configuration will be connected with PLC.

At domestic plants, there are always Sequencer / PLC (Programmable Logic Controller) in production equipments etc. It is installed in an inconspicuous place inside the control panel etc.

IoT System Platform

Standard configuration for small and medium-sized factories (platform)



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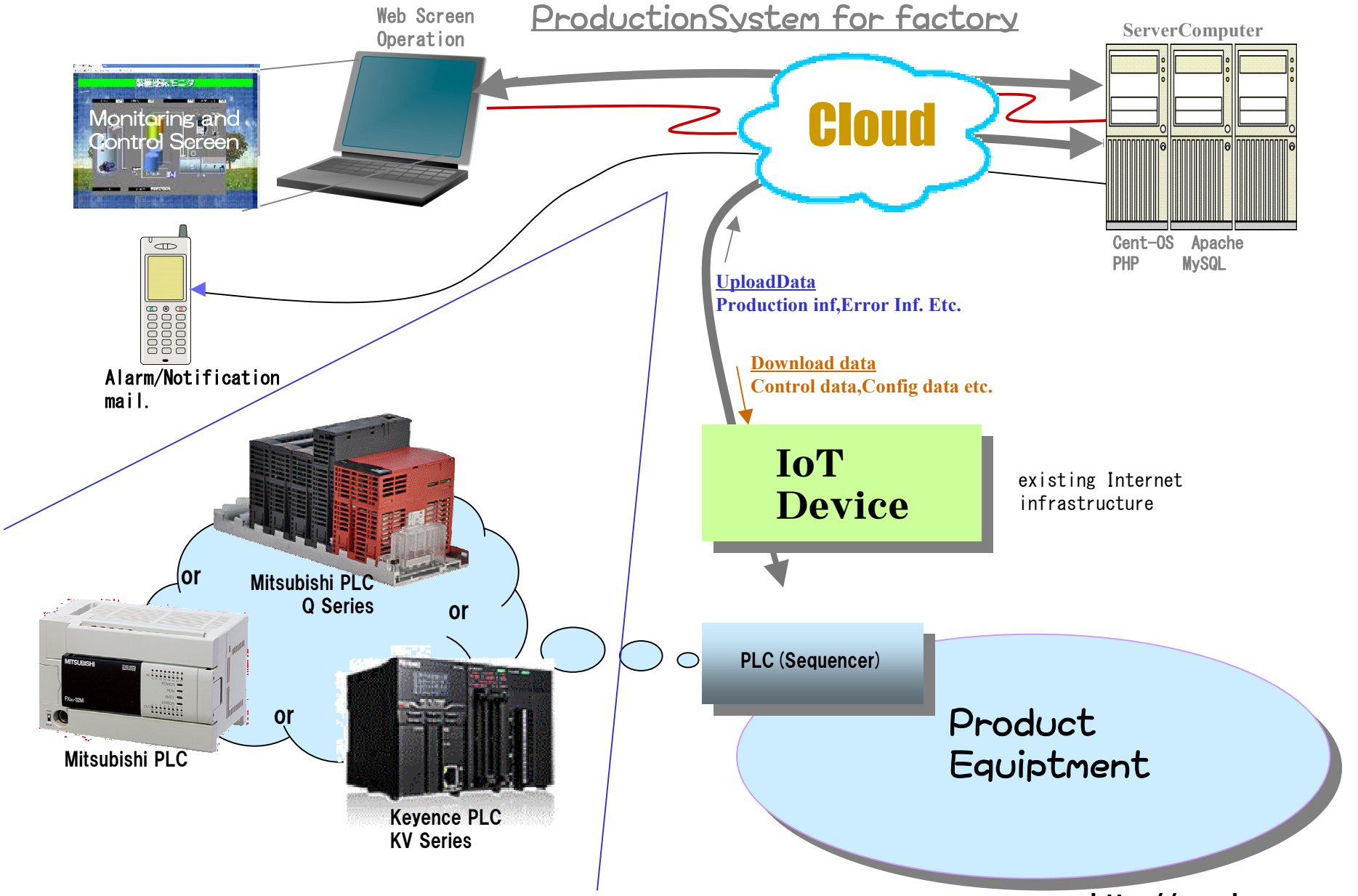
IoT System Standard Equiptment Configuration



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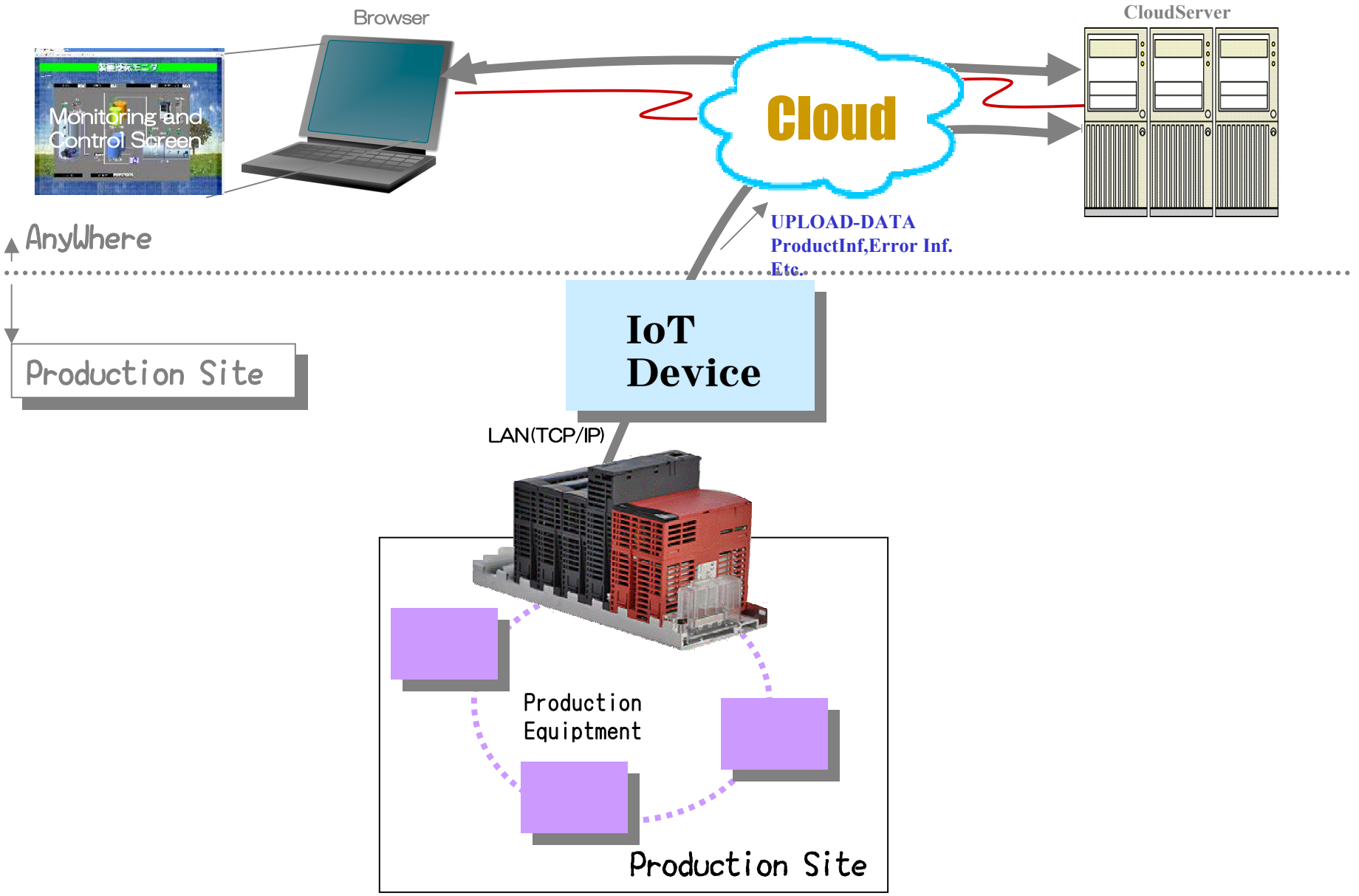
IoT System Standard Equiptment Configuration (Q-Series case)



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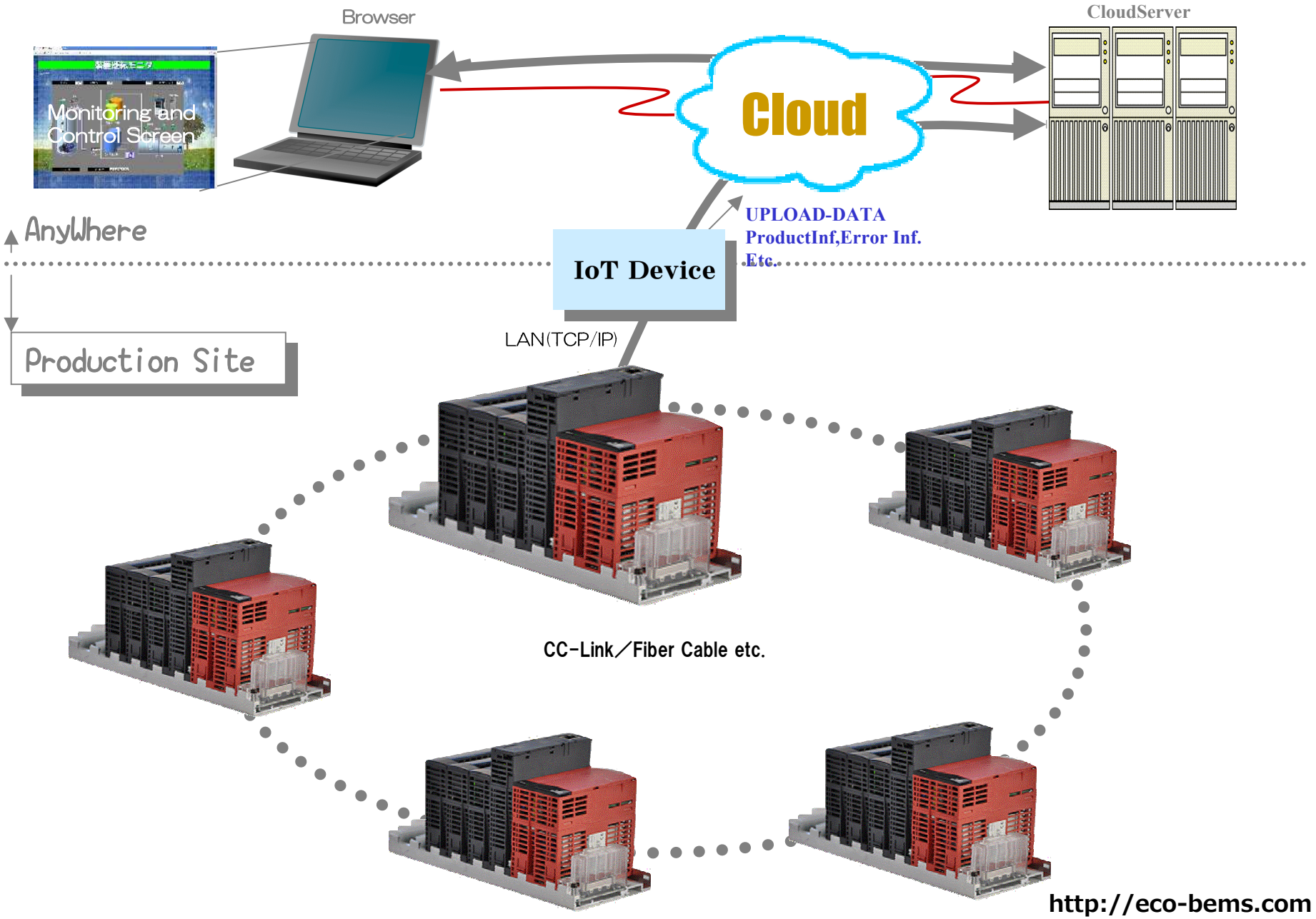
IoT System Standard Equiptment Configuration (CC-LINK etc)



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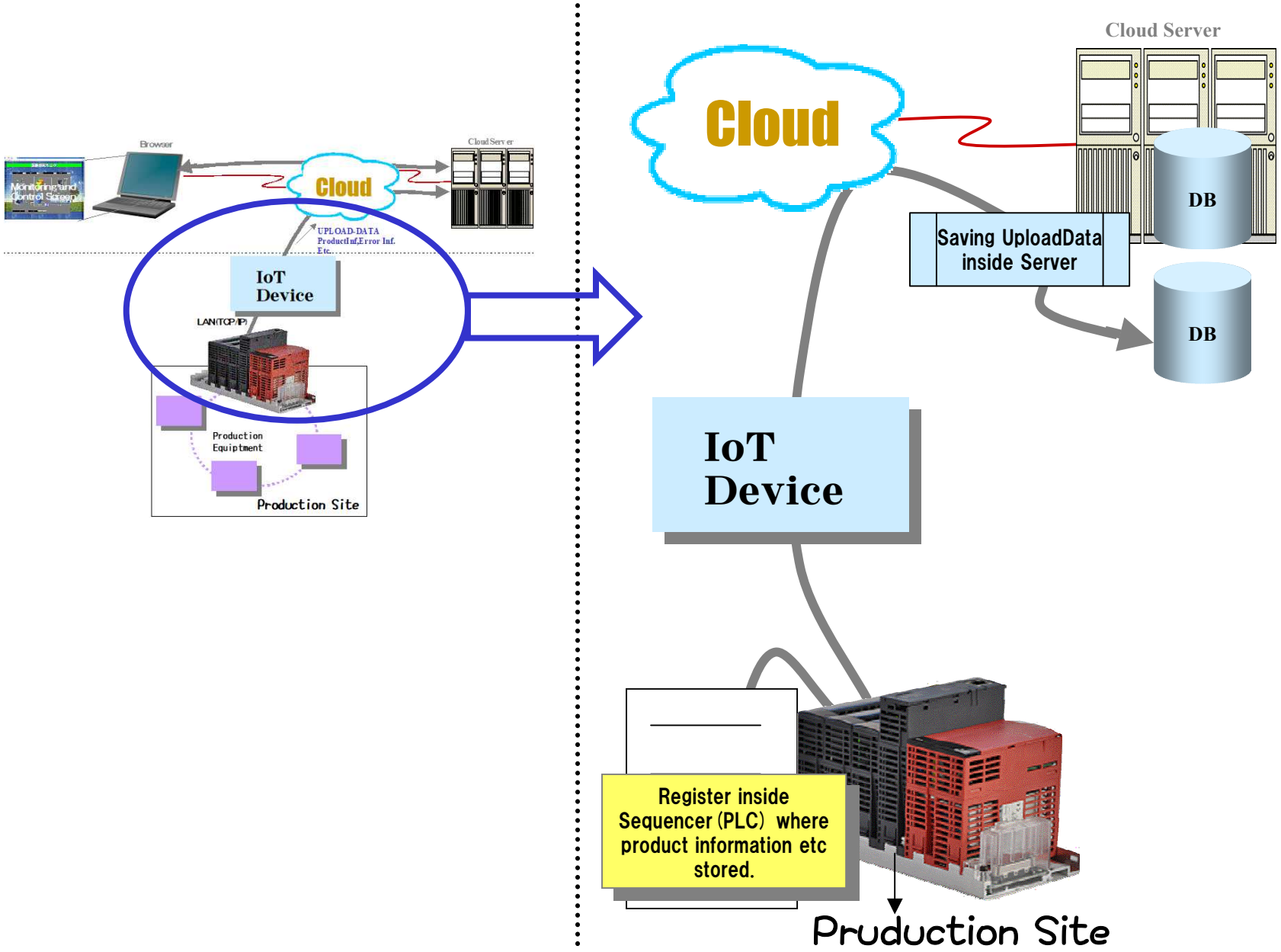
About Upload Operation



Each field that composes IoT

⑥Cloud/Server on DataCenter
(InformationService)

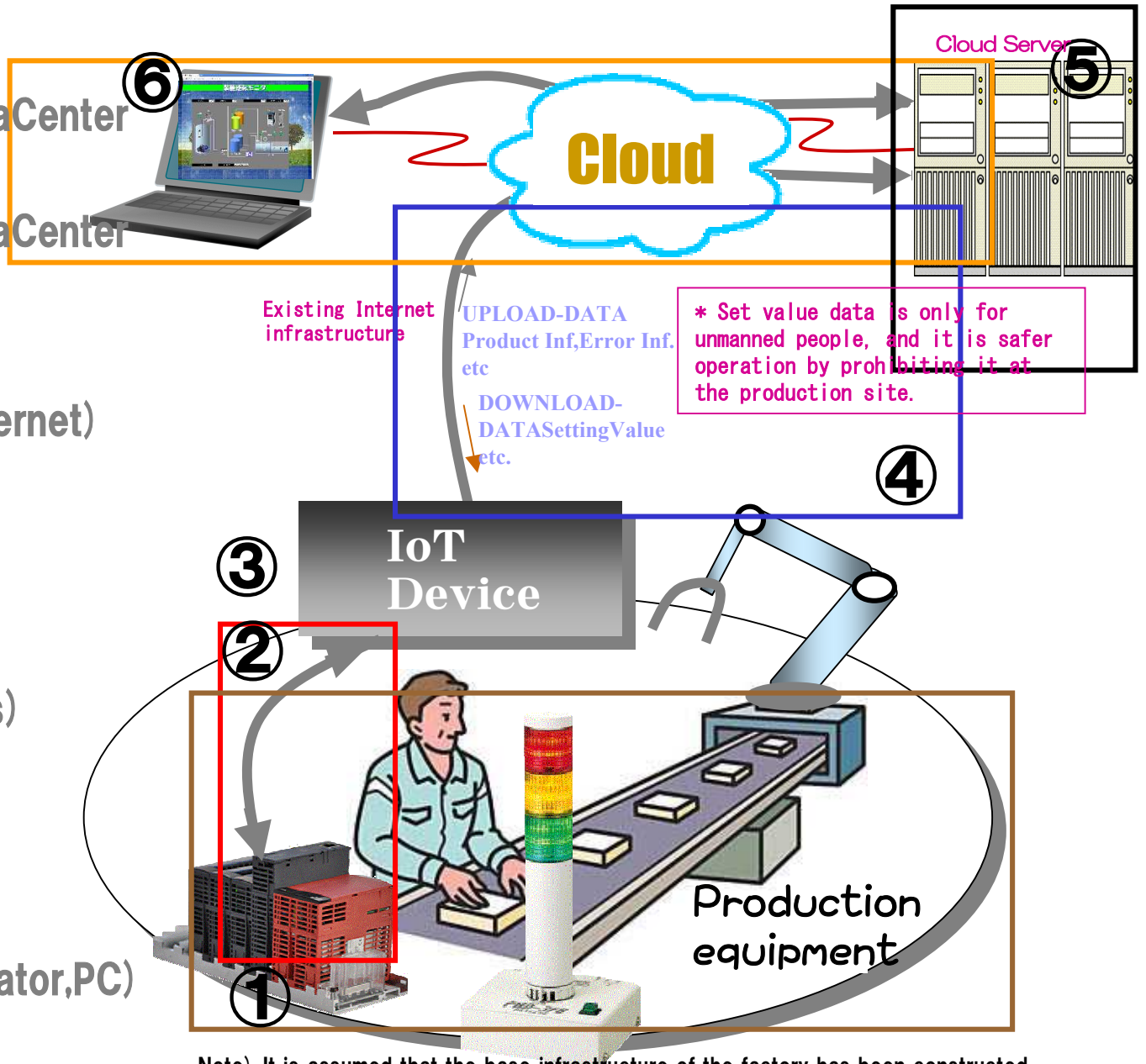
⑤Cloud/Server on DataCenter
(Store field data)

④WideAreaNetwork (Internet)

③IoT Gateway

②AccessNetwork
(FieldEquiptmentAccess)

①Machine (Sensor,Actuator,PC)

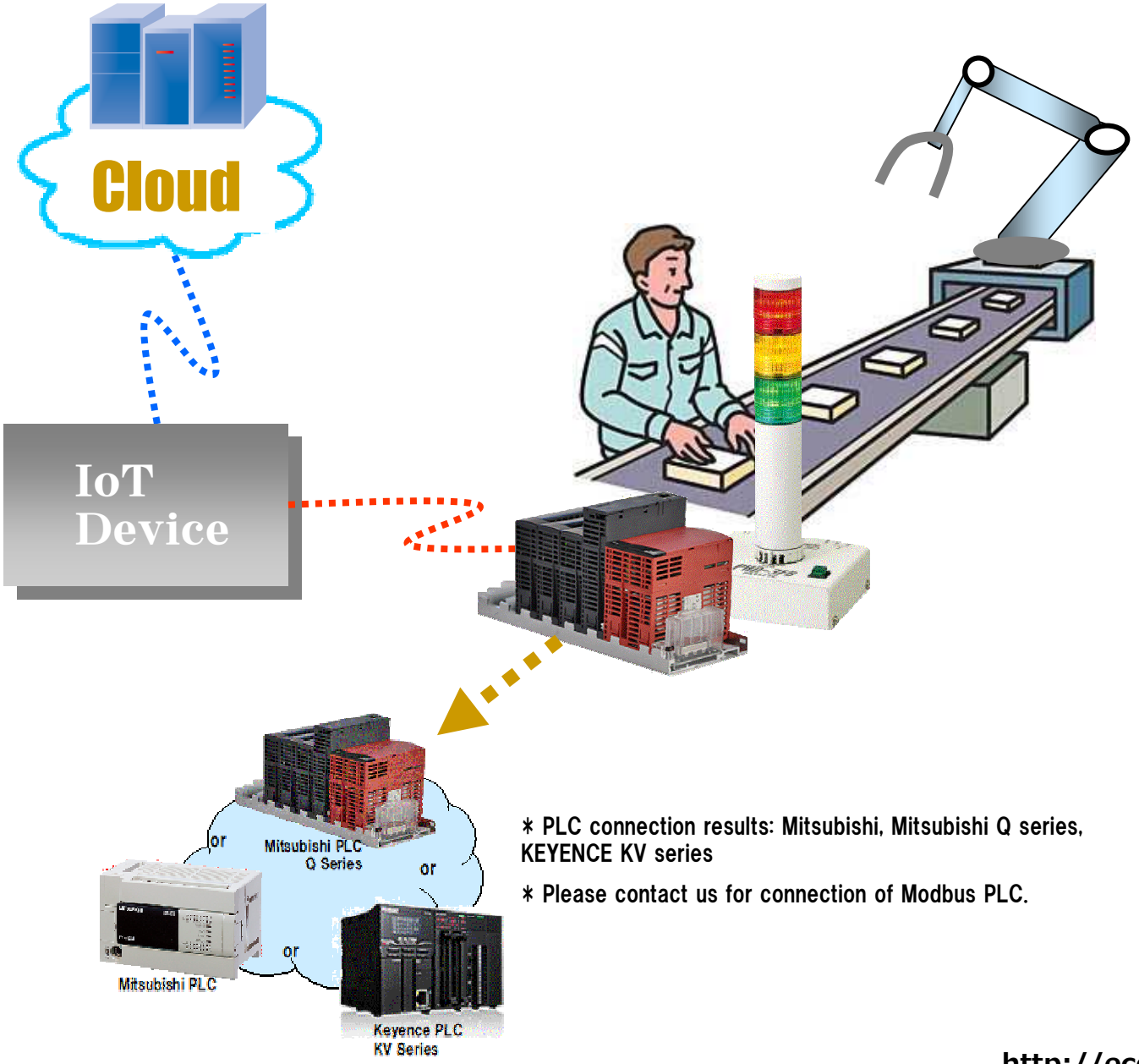


Note) It is assumed that the base infrastructure of the factory has been constructed.

Factory Information Collection Pattern

This IoT system can be connected to any device by customizing, but the basic configuration proposed is connection with PLC.
We assume the following information collection pattern when there is no PLC, including the PLC connection.

Information collection pattern 1: PLC connection



* PLC connection results: Mitsubishi, Mitsubishi Q series, KEYENCE KV series

* Please contact us for connection of Modbus PLC.

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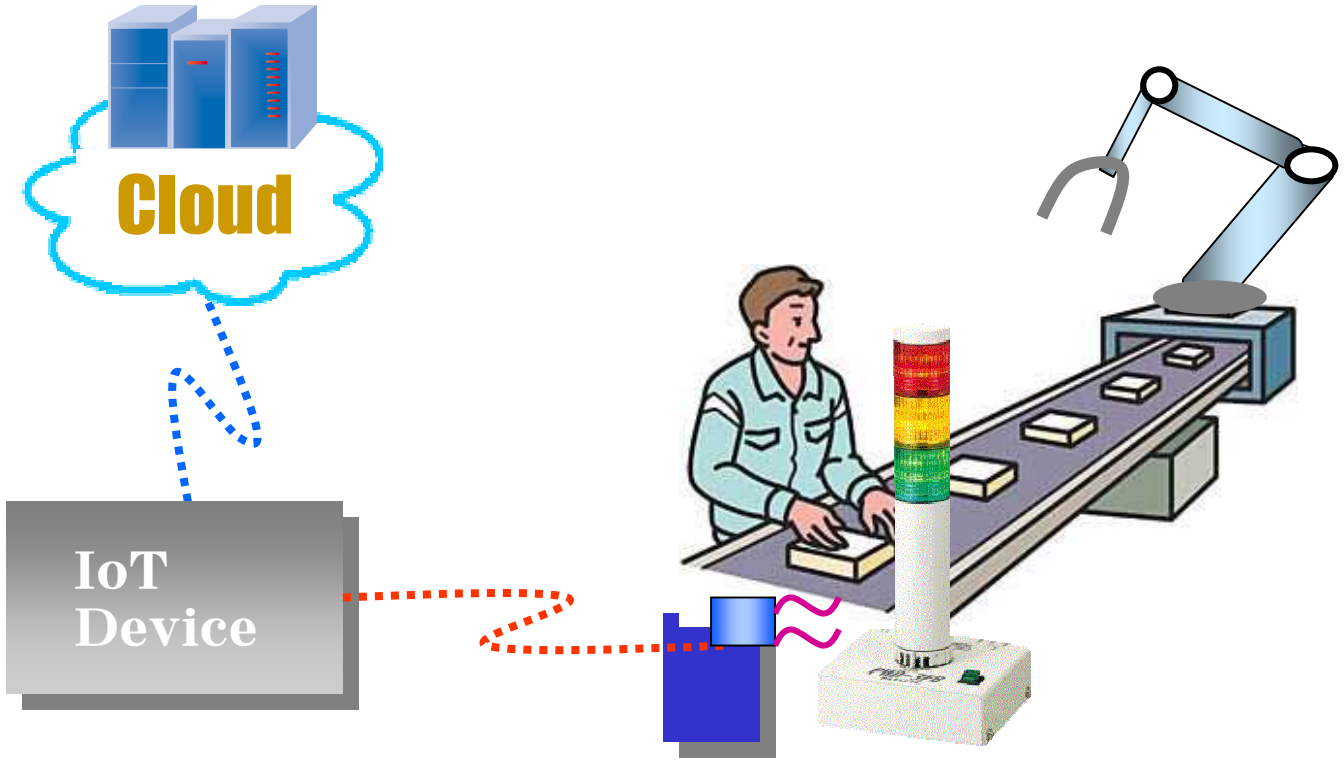
Information collection pattern 2 (A) :LightSensor



Example of optical sensor) (However, interface with IoT terminal)

* Cds / cadmium sulfide cell 20-200 yen

Http://akizukidenshi.com/catalog/g/gI-05863/

* TSL2561 digital optical sensor board (about 800 yen)

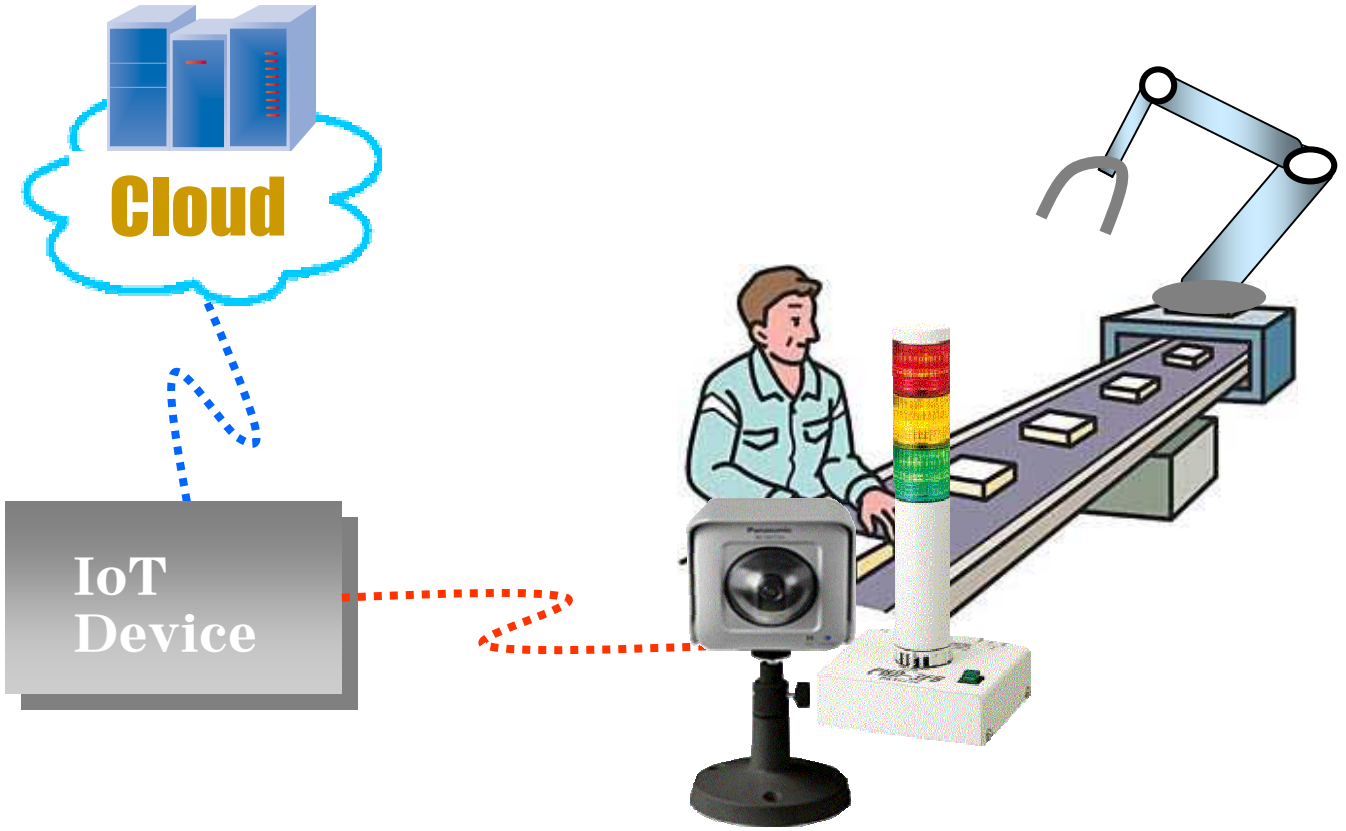
Https://www.switch-science.com/catalog/1801/

Note)

* Adjustment required for ON / OFF judgment threshold

* IoT terminals use flash memory, so be careful about the number of writes

Information collection pattern 2 (B) :IP Camera



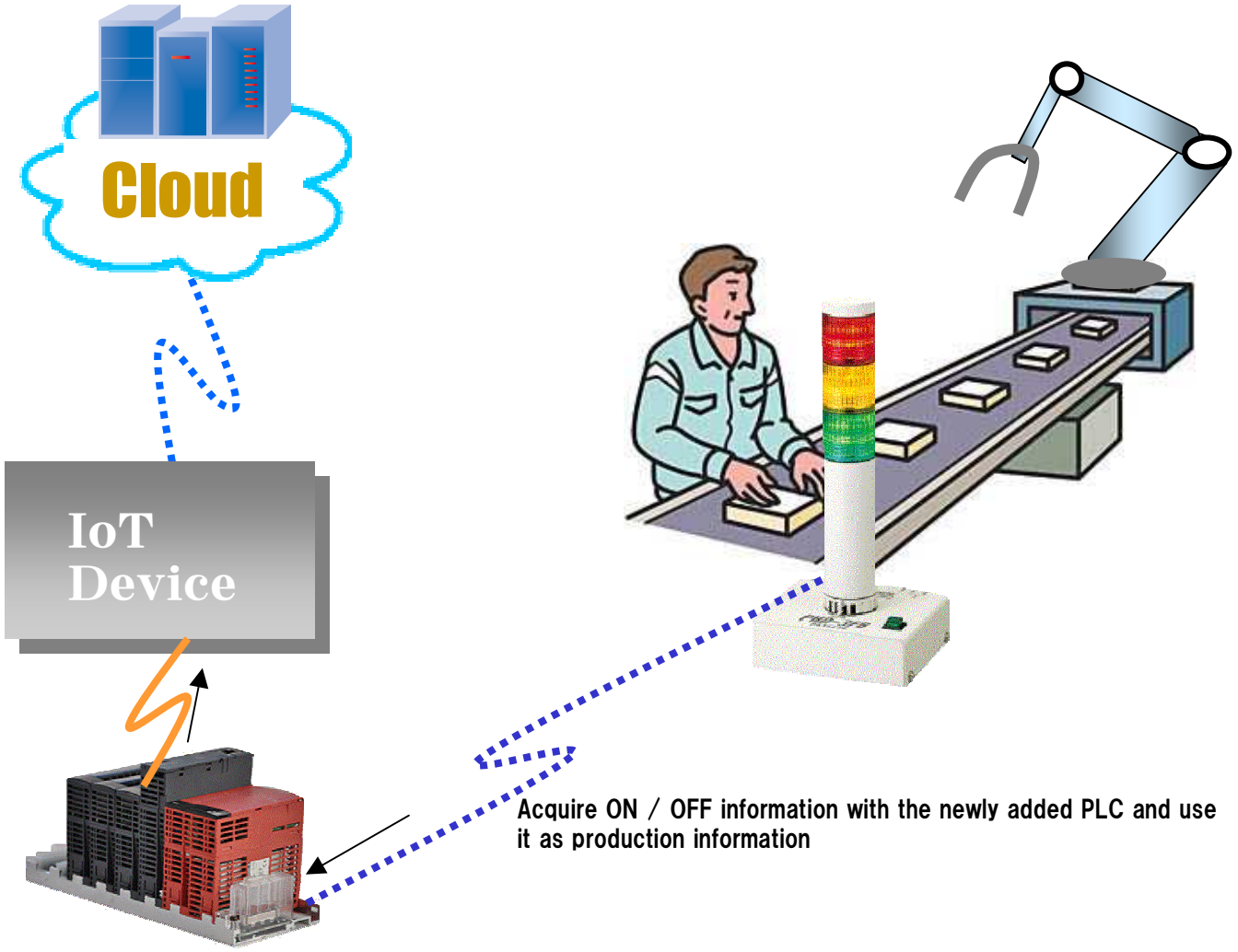
Determines the lighting status of the corresponding location based on the image of the fixed IP camera.

Note)

* Adjustment required for ON / OFF judgment threshold

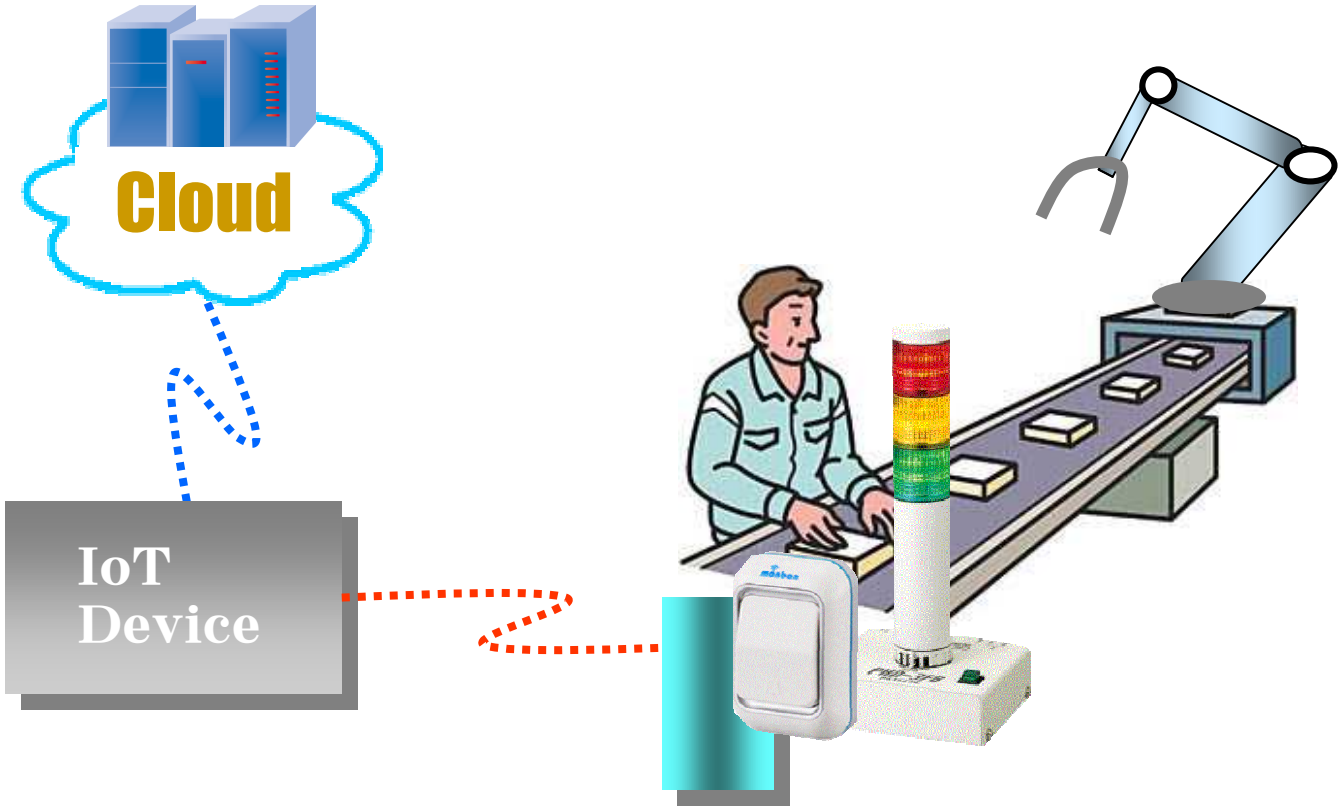
* IoT terminals use flash memory, so be careful about the number of writes

Information collection pattern 2 (C) :Newly Added PLC



Acquire ON / OFF information with the newly added PLC and use it as production information

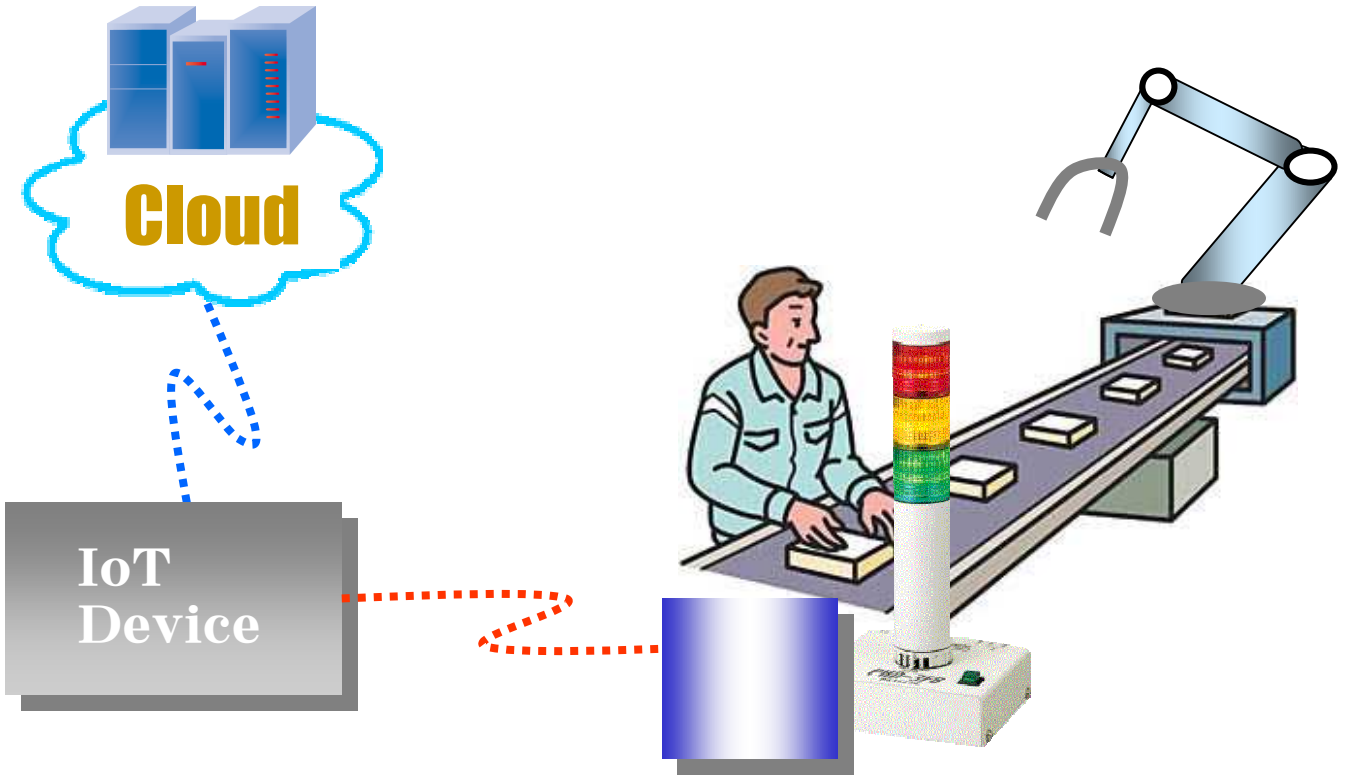
Information collection pattern 3: Push Button



At a production site such as a cell system, the cycle time information can be obtained by pressing the push button when the operator completes the production of the specified unit.

In addition, desired information such as failures is realized by a combination of push buttons.

Information collection pattern 4: Other (customized)



The required information varies depending on the production equipment.

We manufacture interface boards etc. to obtain necessary information according to the needs of production equipment.

Example of system achievement

Remote monitoring system for construction related

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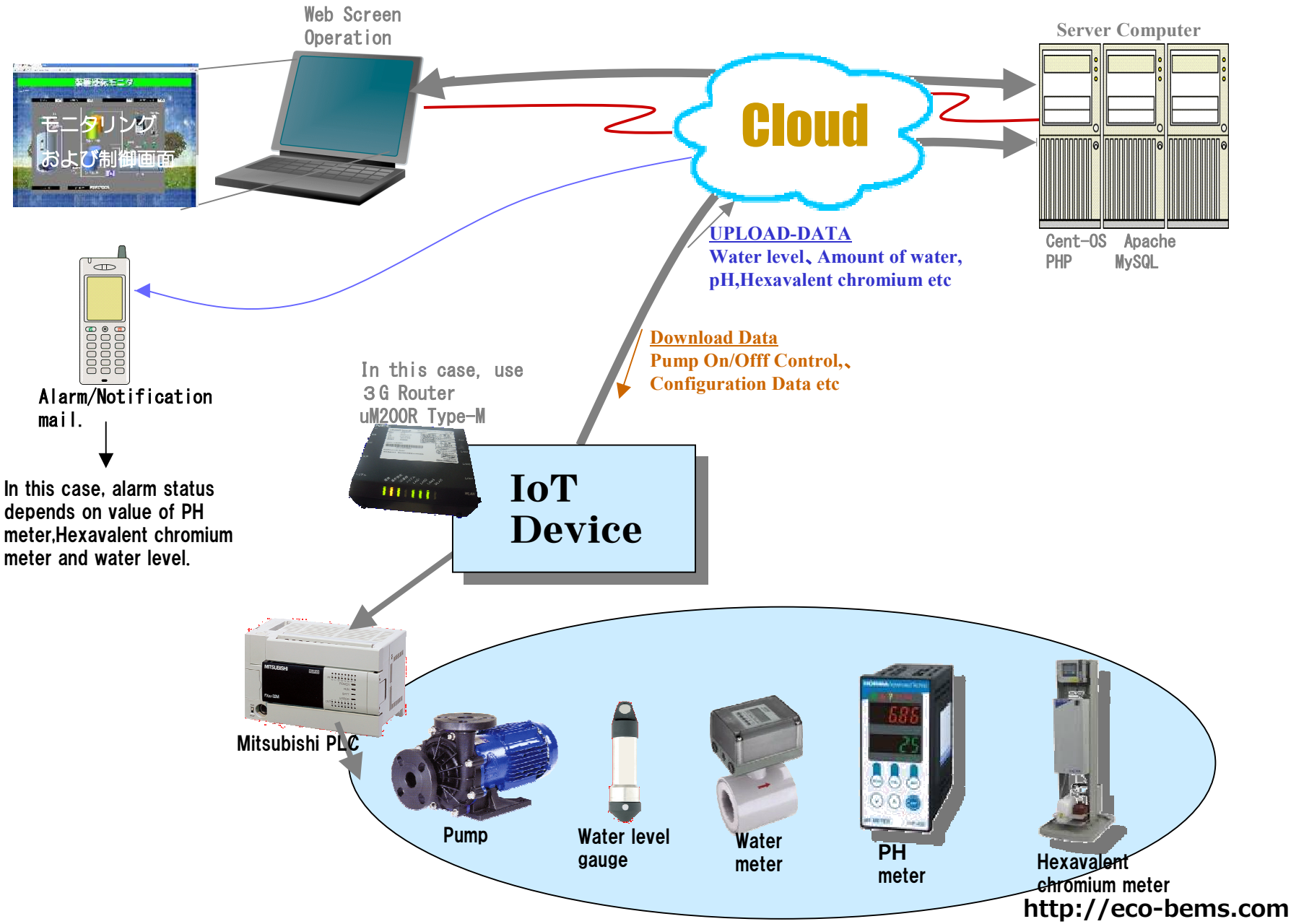
IoT System Equipment Configuration (customization/application example)



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Screen Sample/Monitoring Screen
(Remote monitoring system for construction related)

Water level

Amount of water

Hexavalent chromium

pH meter

Status 1

Date time of data

Status 2

In monitoring page, trend data updated real time (every 5minutes in this case) by Ajax/Java of Web Technology.

Status1 express status like self-driving, remote-operation, auto, manual mode.

Status2 represent motor status like pump-rotation status, MA electrode for prevention of idle rotation ON status.

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