

# PFUの組み込みビジネスと マスカスタマイゼーションへの挑戦

PFU's Embedded system business and  
challenge to mass customization

**PFU**

a Fujitsu company

株式会社PFU  
エンベデッドBU  
エンベデッド販売支援統括部  
橋本 芳文

Yoshifumi Hashimoto  
General Manager,  
Embedded System Sales Support Div.  
PFU Limited

## 1. はじめに

Computer from Ishikawa

## 2. エンベデッド製品紹介

Embedded Computer

## 3. 新しい取り組み

New Product for IoT

## 4. IoT想定

IoT Forecasts

## 5. まとめ

Conclusion

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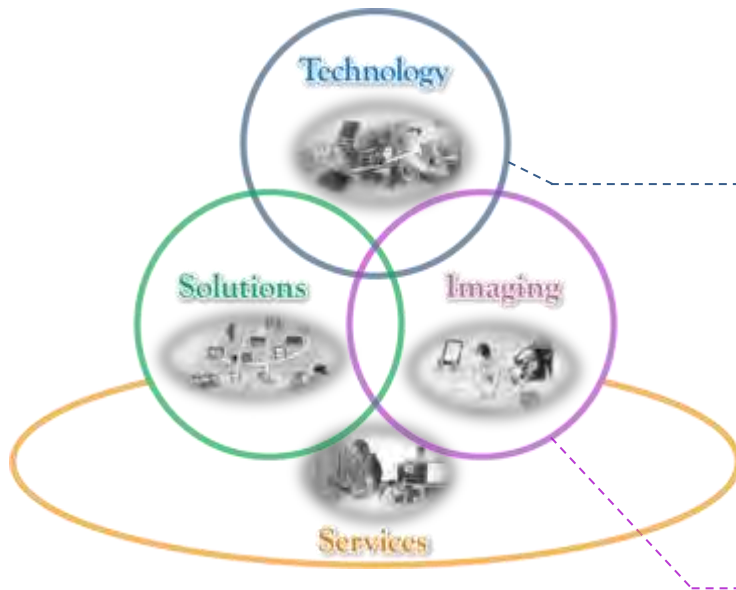
IoT Forecasts

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# 1-1. PFU is

A technology-led company that provides IT products and services, mainly focusing on technologies related to the boundary between analog and digital



## Headquarters, Factory



**Headquarters**  
(Kahoku city, Ishikawa)



**ProDeS Center**  
(Kahoku city, Ishikawa)

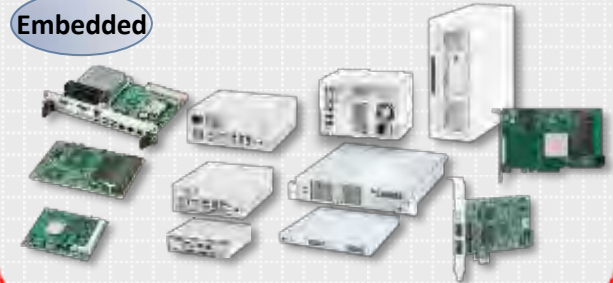


**Yokohama Headquarters**  
(Yokohama city, Kanagawa)

## Products

### Industry Computer Products

#### Embedded



#### KIOSK



#### Security



### Image Scanner

#### fi series



#### ScanSnap



# 1-2. Industrial Computer Business



PFU Ishikawa Factory

**Over 1 Million  
Embedded Computers  
From Ishikawa**



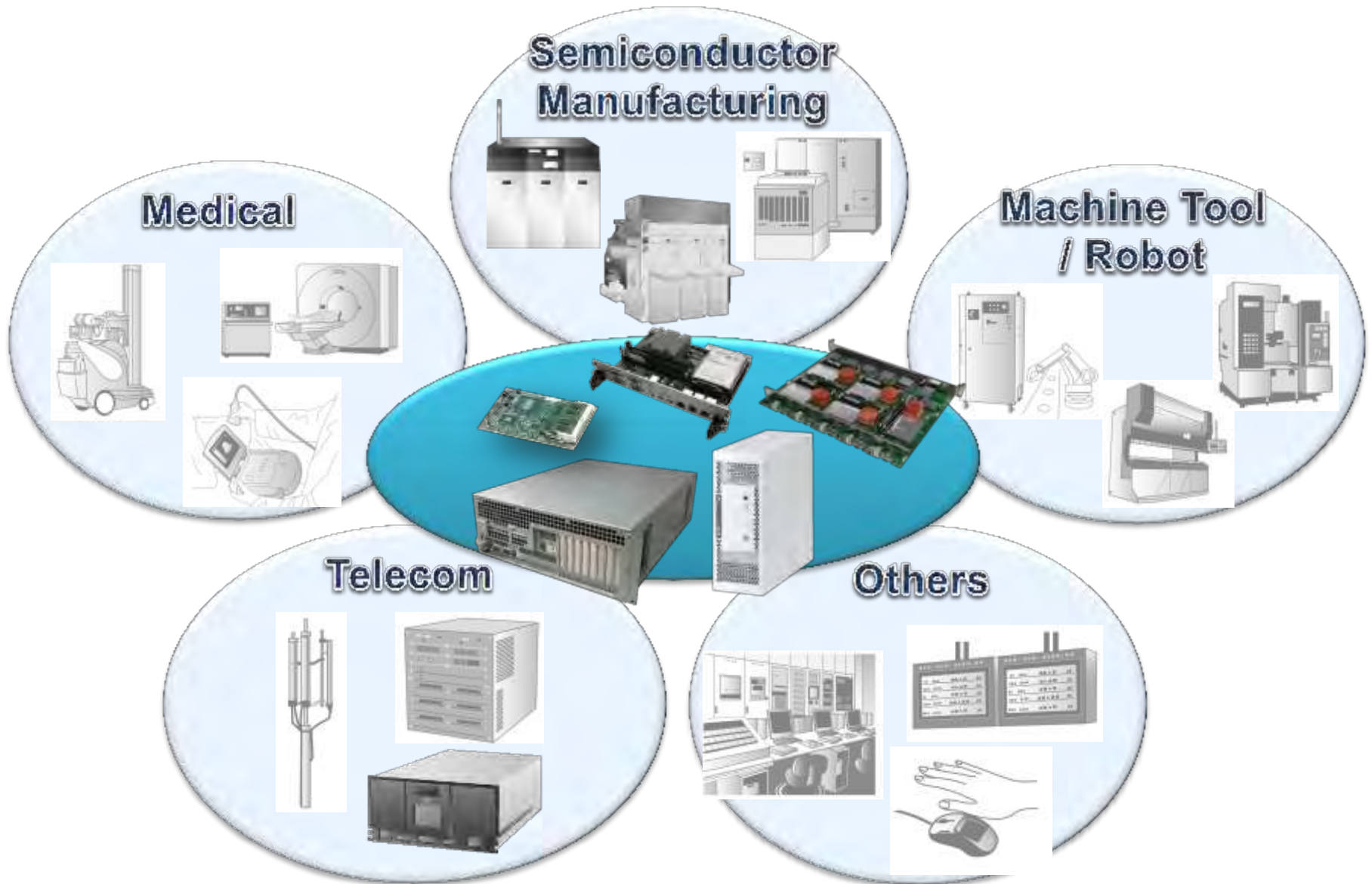


# 1-3. PFU's Achievement on Embedded

**More than 100 companies of customers**



# 1-4. Embedded Market



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# 2-1. Embedded Computer

2005

2010

2015

2018~

AI  
/AW

Storage  
AW Series



Option Cards  
AI Series



Embedded Computer  
AR8000 Series



Embedded Computer  
AR6000 Series



Embedded Computer  
AR4000 Series



Embedded Computer  
AR2000 Series



Embedded Computer  
AR1000 Series



Board Computer  
AM500 Series



Board Computer  
AM300 Series



System on Module  
AM100 Series



System on Module  
PD2200/2300 Series



AM



# 2-2. AM Series (Ready-made Board)

## Intel based Board Computer over 23 years

Board Computer AM500 Series



Board Computer AM300 Series



System on Module AM100 Series



1995

2005

2010

2015

2018

System on Module  
**AM100 Series**



AM105model235K



AM120model215L/210L

Board Computer  
**AM300 Series**



Mini-ITX form factor



SSI form factor

Board Computer  
**AM500 Series**



3U CompactPCI



AM530model210L



# 2-3. AR Series (Ready-made PC)

## Intel based Embedded PC over 14 years

**AR8000 Series**



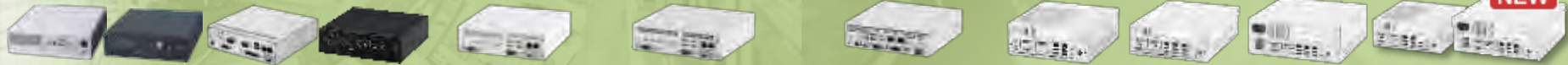
**AR6000 Series**



**AR4000 Series**



**AR2000 Series**



2004

2010

2015

2018

**AR2000 Series**



**AR2100model100K**



**AR2200model120L**

**AR4000 Series**



**AR4400model100H**



**AR4400model200K**

**AR6000 Series**



**AR6100model130J**



**AR6200model140K**

**AR8000 Series**



**AR8300model300L/310L**



**AR8300model320L**



# 2-4. Customized Board/PC

## Customized Board



**Xeon Board**



**Multiple CPU board  
On Carrier**



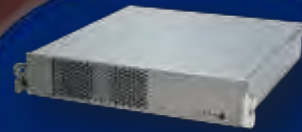
**Specific to  
Customers**



**CompactPCI**



## Customized PC



**2U Rack Mount**



**Multiple CPU module  
In 1 chassis**



**6 x HDD PC**



**Touch Panel  
PC**





*Customized Board*

*Customized PC*

## 当社エンベデッドの解決課題

Our Mission

### A. IoTにどう挑戦するのか

How to challenge on IoT?

### B. この多品種製造をどうこなすのか？

How to deal with multi-product manufacturing?

e

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# 3-1. IoTにどう挑戦するのか

## How to Challenge on IoT?

**+ Industrial Network**

**+ Deep Learning**

**Embedded Computer  
AM, AR**

**+ Storage**

**+ Remote Maintenance**

2018/9/27  
産業用ネットワーク搭載の  
セットモデル  
Industrial network model  
in sets with AR products



2018/11/6  
産業向けコンピュータ  
ストレージ機能の充実  
Computers for industry  
Enhance storage function



2018/10/10  
車載向けシステム参入  
まず開発車用機器  
Entry on-vehicle system  
For development first



2018/7/4  
機械に組み込むコンピュータ  
深層学習機能を搭載  
Computer embedded in machines  
Mounting deep learning function



# 3-2. Option Cards/Software

## Industrial Network



NEW

## Deep Learning



NEW



NEW

Sharing Memory Space  
b/w multiple PCs

## Storage



NEW



NEW

**FOR  
INDUSTRY  
MARKET**

## Remote Maintenance



RMS  
(Remote Management System)



SysMon  
(System Monitoring Software)



Planning

## EmbedWare /SysMon

ローカル監視  
Local Monitoring



## BMC

(Baseboard Management Controller)

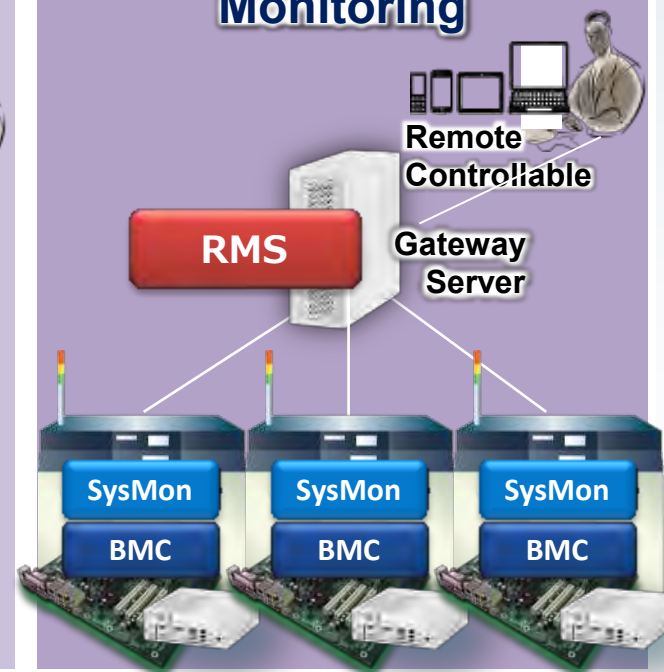
リモート監視  
Remote Monitoring



## RMS

(Remote Management System)

システム統合監視  
System Integrated Monitoring





EtherCAT

Application Example

MECHATROLINK



Applicable to various control for such as semiconductor producing equipment or machine tools.

Provide certain synchronous control for such as torque, velocity, or position. (Control devices for motion or rolling)



Machine Tool



Semiconductor Equipment




Tester



Machine Tool



Semiconductor Equipment



Bonding



Building Management



Press Brake



Robot Equipment



Tester



Robot Equipment



Press Brake

Connect many slave devices(max.2048). Various slave devices are provided.

Advantage of motion control. (Flexible and High Accuracy)

Smart Factory

## *AI Series* **Deep Learning Accelerator Card**

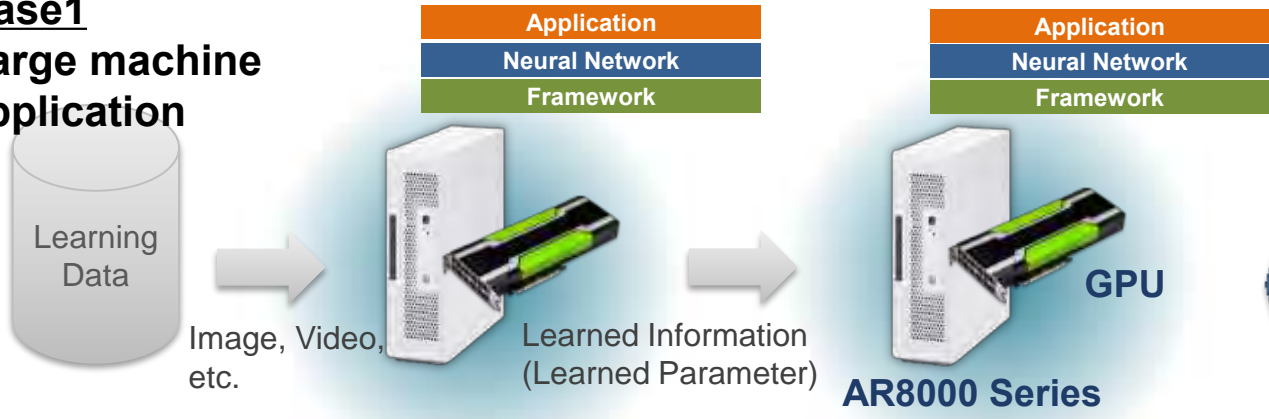


Realize **small size** and **low power consumption** required for industrial embedded AI and **edge computing**.  
(Inference Engine Card)

- Mountable in a PC with PCI slots including small size controllers(AR2100, AR4400, etc.).
- Perform inference processes on the PCI card engine. It leads to CPU offload and low power consumption(25W).
- Compatible with the deep learning framework(Chainer®). \*Other frameworks are also arrangeable.
- Current AI applications are useable.
- Tuning according to a purpose. (for a fee)
- Supported OS : Linux or Windows.
- PCI Express x8, standard height, and half length.
- Long-term supply, long-term maintenance.

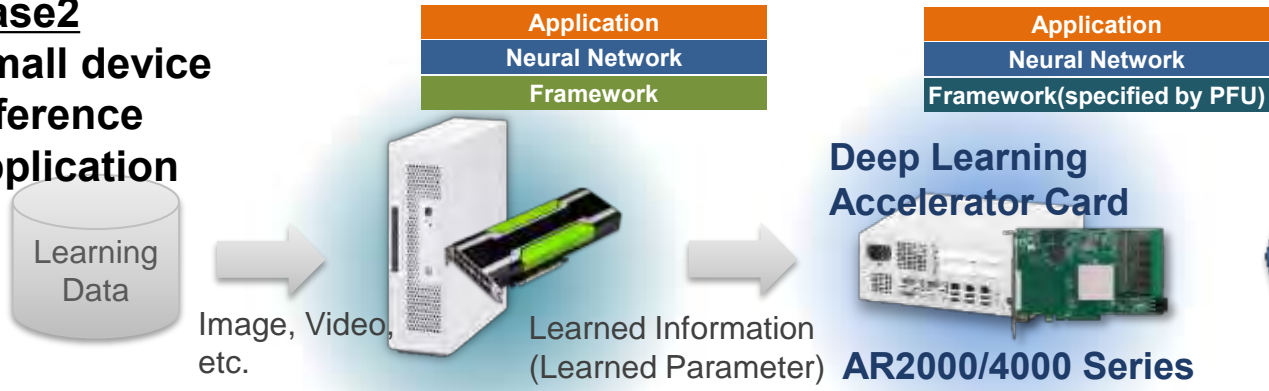
## Provide deep learning environment according to the purpose of use.

### Case1 Large machine application



PFU provides nVIDIA card(GPU).  
**Providing in sets with PFU's AR products (PCs) certifies stable operation.**

### Case2 Small device inference application



**Deep Learning Accelerator Card lowers power consumption. Efficient inference process with a small PC environment.**





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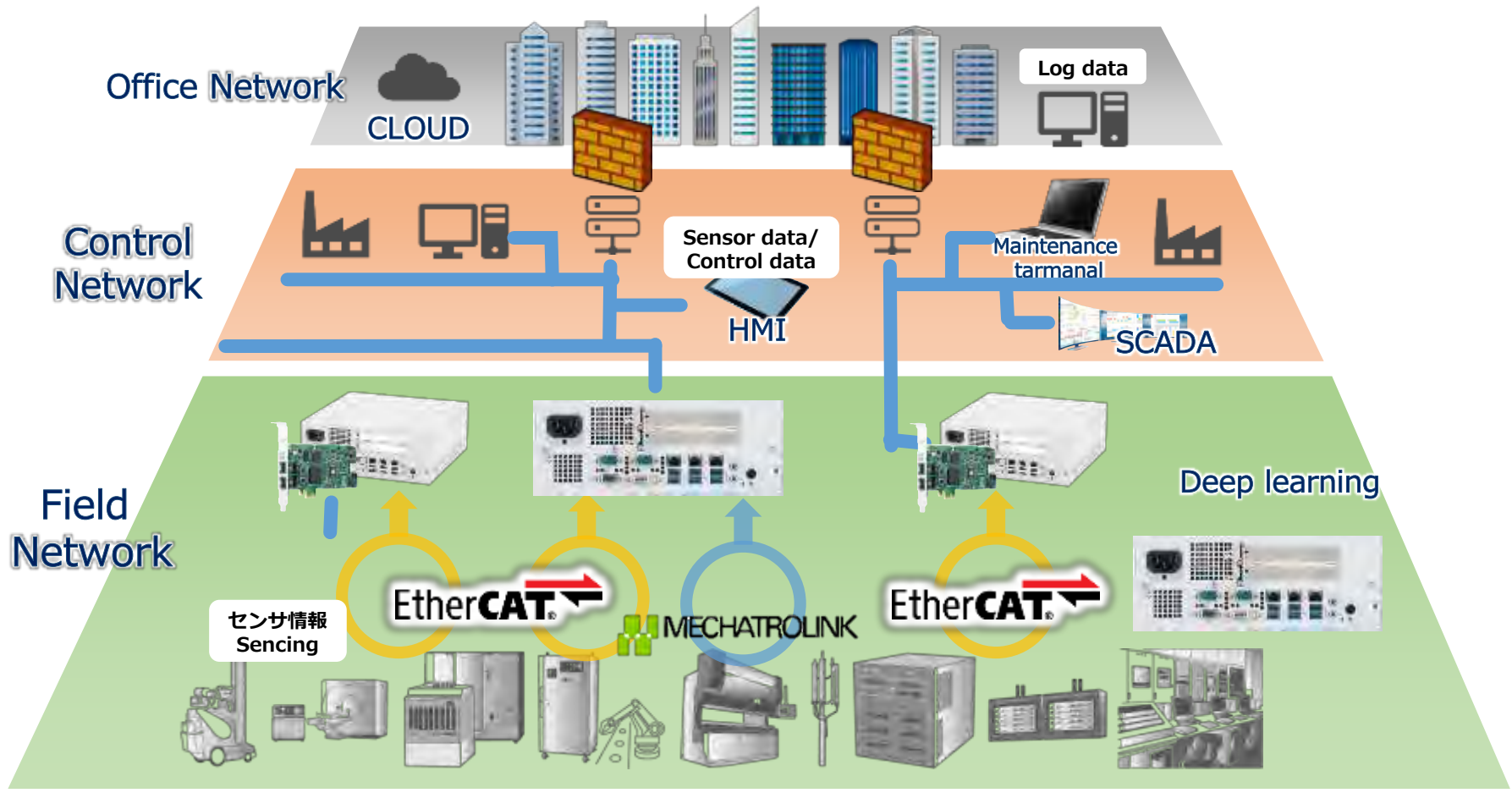
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# 4-1. Connected Industriesへの取組み

## Efforts to Connected Industries

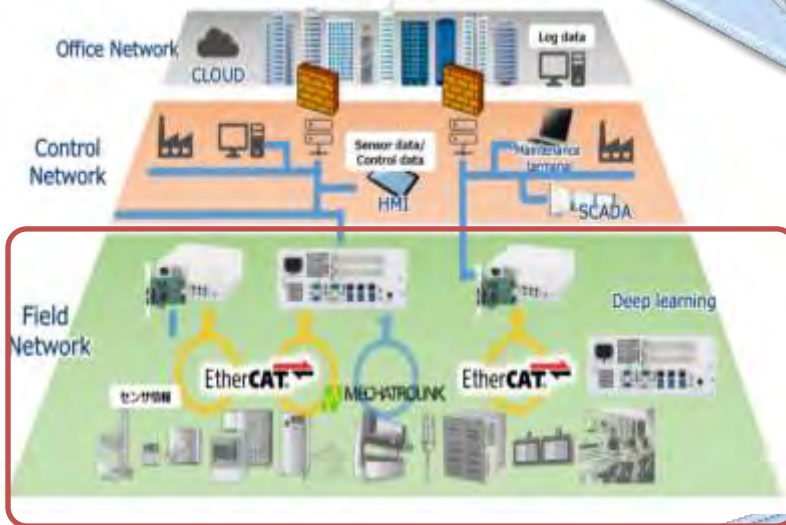
### Efforts to Connected Industries



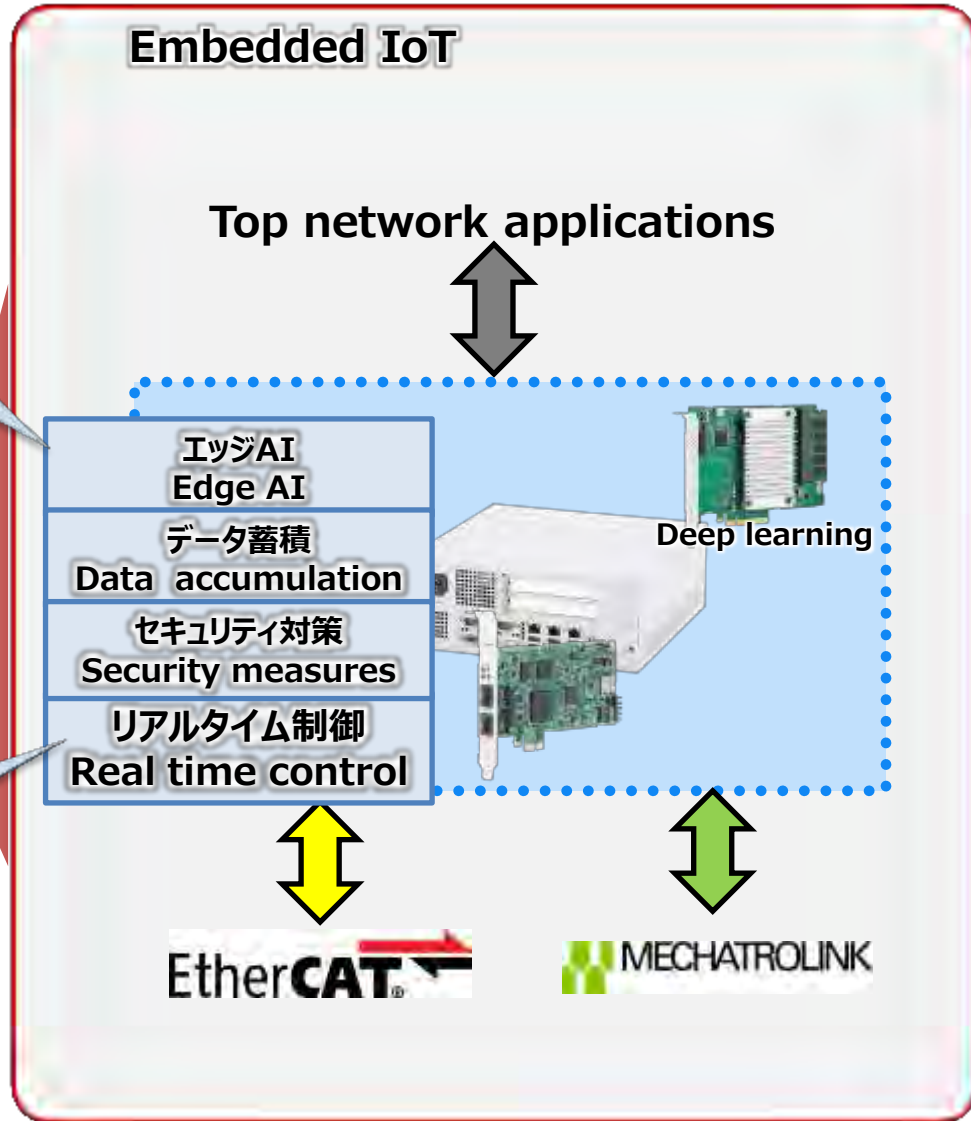
# 4-2. 組み込みIoT / Embedded IoT

装置内蔵AIは、装置の  
長期供給が求められる  
Long-term supply is  
essential for AI in  
equipment

Efforts to Connected Industries



応答時間保証しながら  
コストダウンもしたい  
Want to reduce costs  
while guaranteeing  
response time





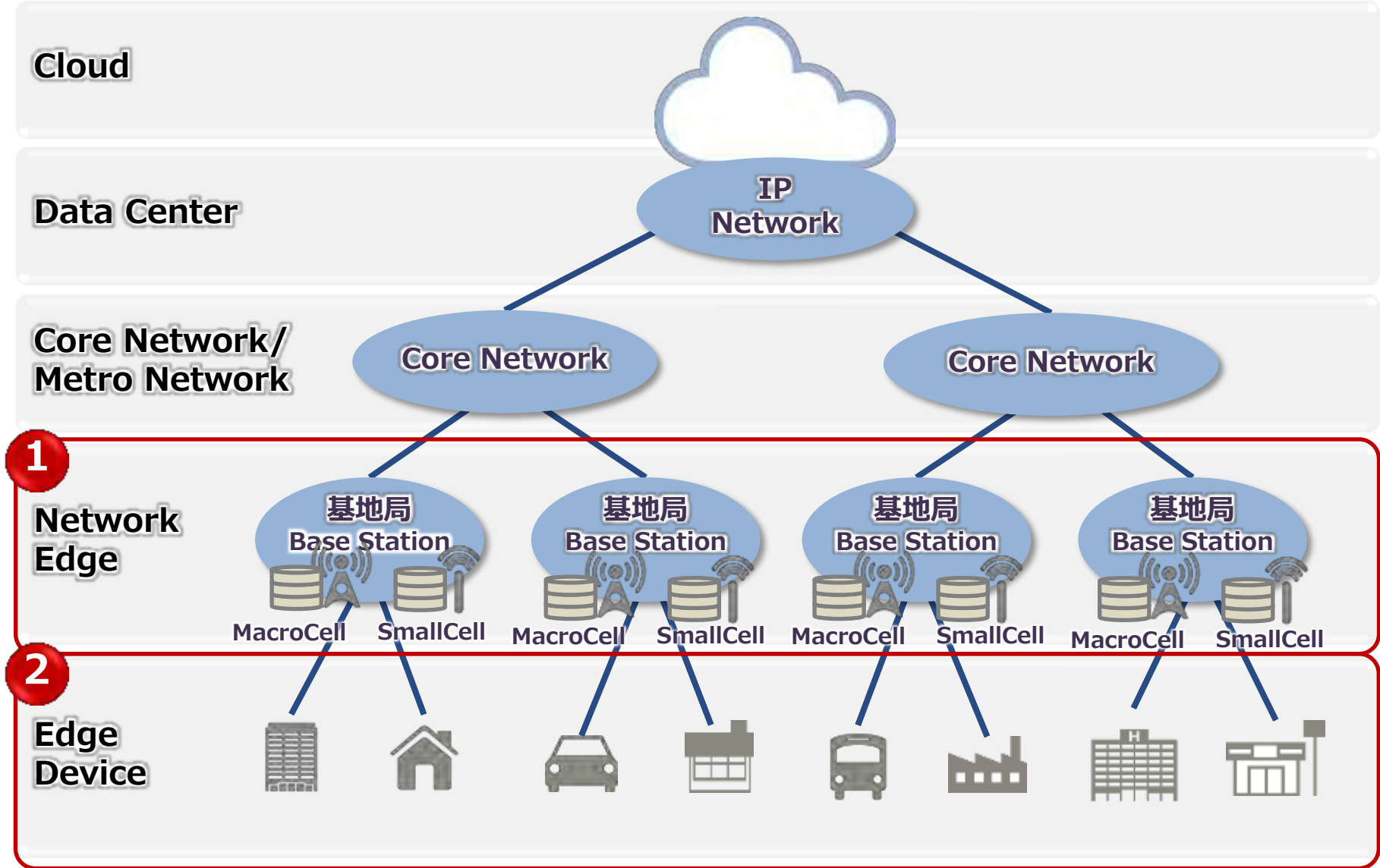


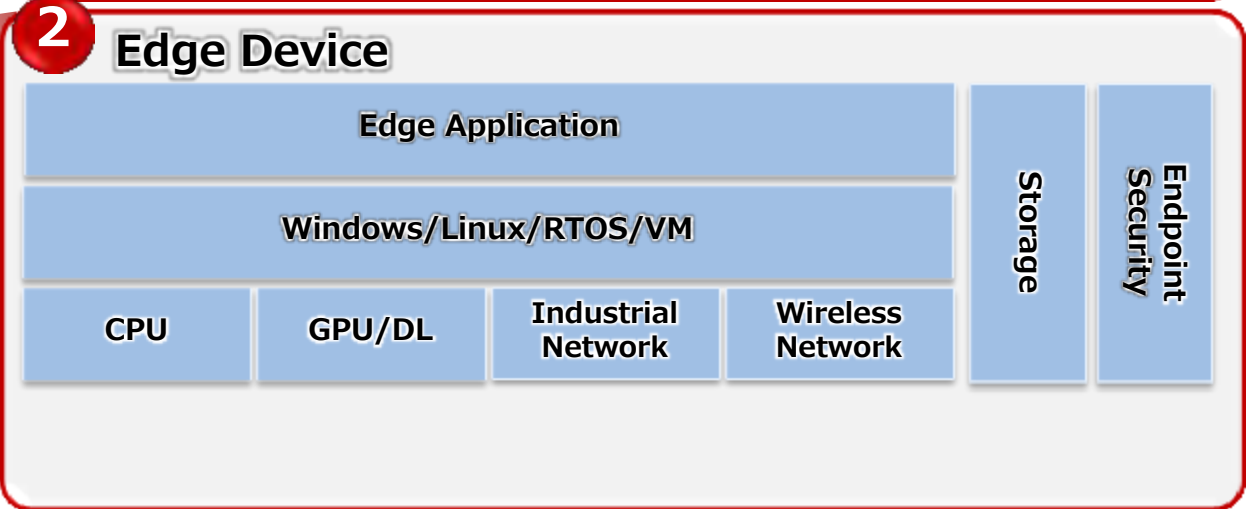
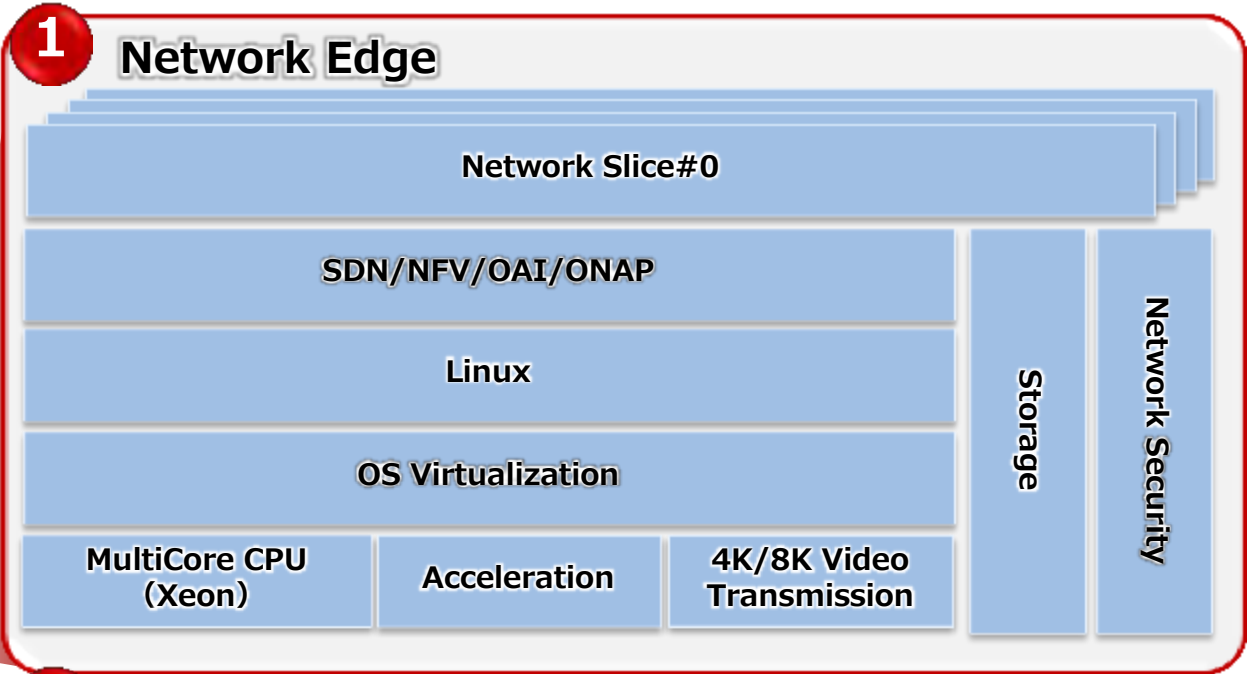
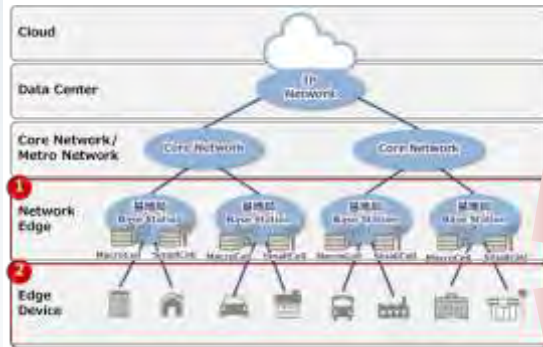
# 4-4. 5Gによる新たな産業変革

5G will change the world

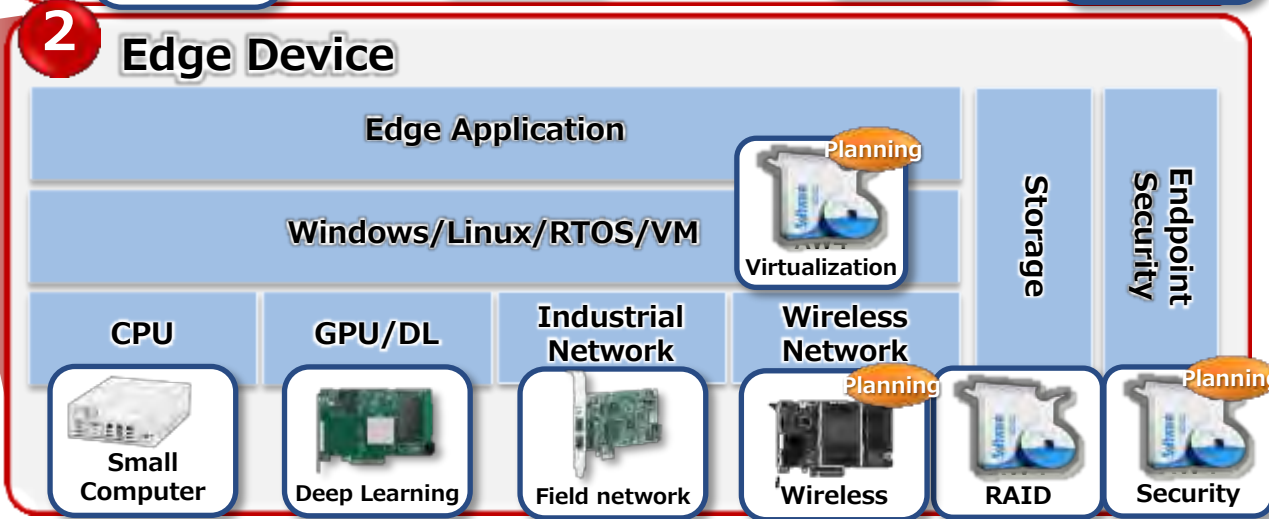
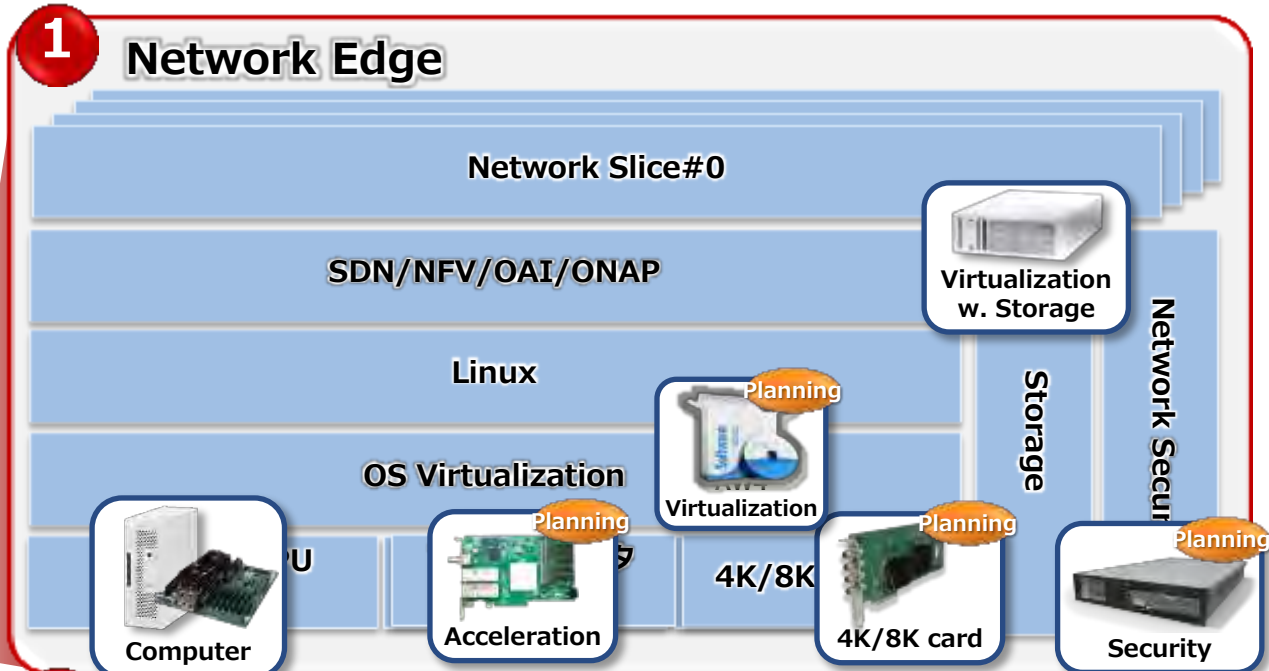
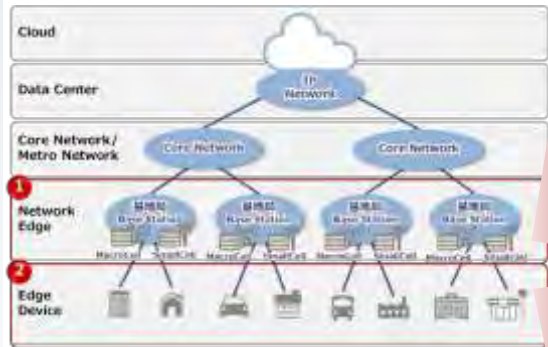


# 4-5. 5G Network and Edge Computing



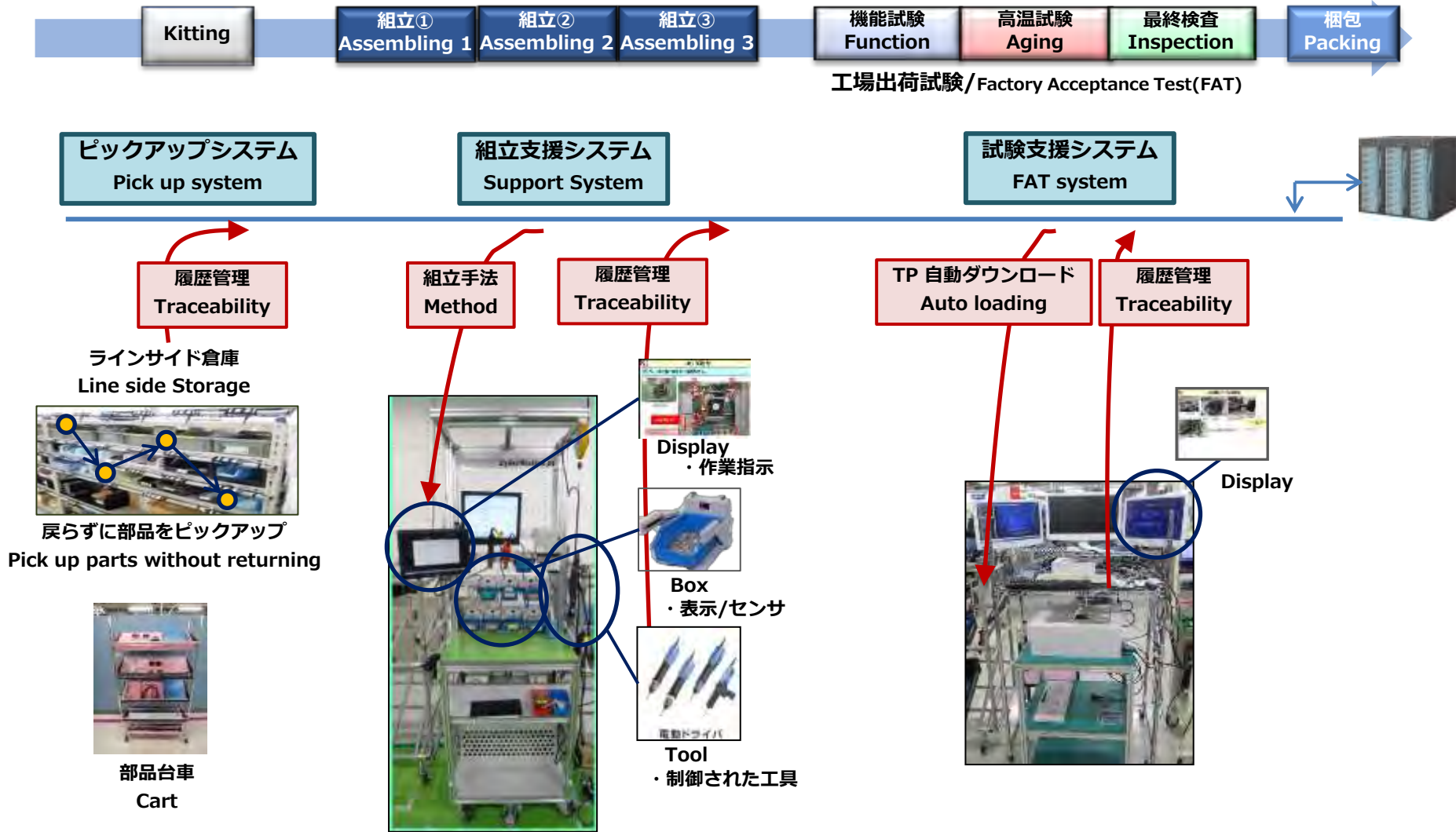








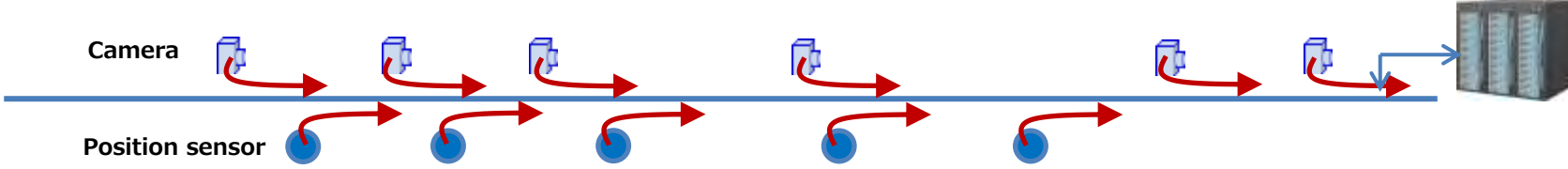
# 4-8. Practice of IoT at our factory (Sensing/Control)



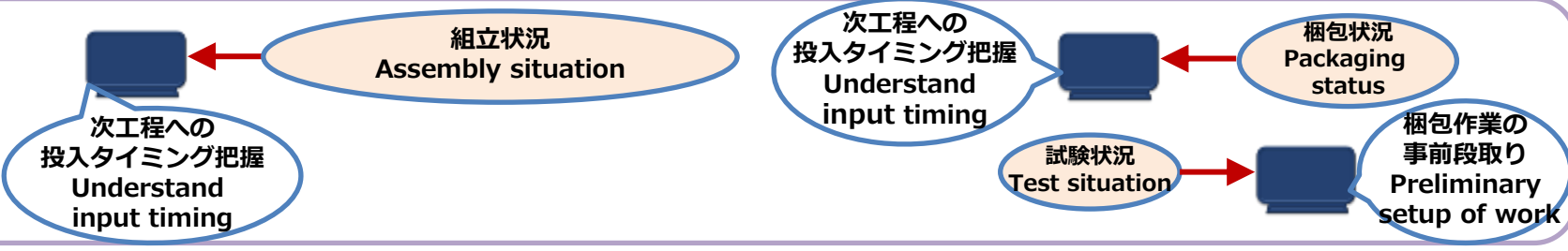
# 4-9. Practice of IoT at our factory(visualization)



Information aggregation



Visualization Between steps



Visualization In process

組立状況  
Assembly situation

トラッキング  
tracking

製品毎作業時間  
Product work time

滞留見える化  
Make visible

試験状況  
Test situation

Worker analysis  
Individual work time

個人毎作業時間  
Individual work time

習得の見える化  
Make acquisition visible

Tact analysis  
Engineering work time per process

工程毎作業時間  
processing time per process

工程バランス分析  
Process Balance Analysis

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## IoTへの組み込みコンピュータを整備

Maintain embedded computer in IoT

### a) センシング, 見える化, 分析

Sensing, visualization, analysis

Industrial Network, Remote Maintenance, Deep Learning, Storage

### b) 5Gへの備え

Preparation for 5G

**ぜひ 問い合わせください**

Please contact us

<http://www.pfu.fujitsu.com/embedded/>



# PFU

a Fujitsu company



さあ、組み込んでください。  
PFUという「信頼」を。

# PFU

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変わらぬ想い、変えてゆく未来。