

Beyond 5G International Conference

# Fujitsu's Activities toward Beyond 5G

**Shingo Mizuno**

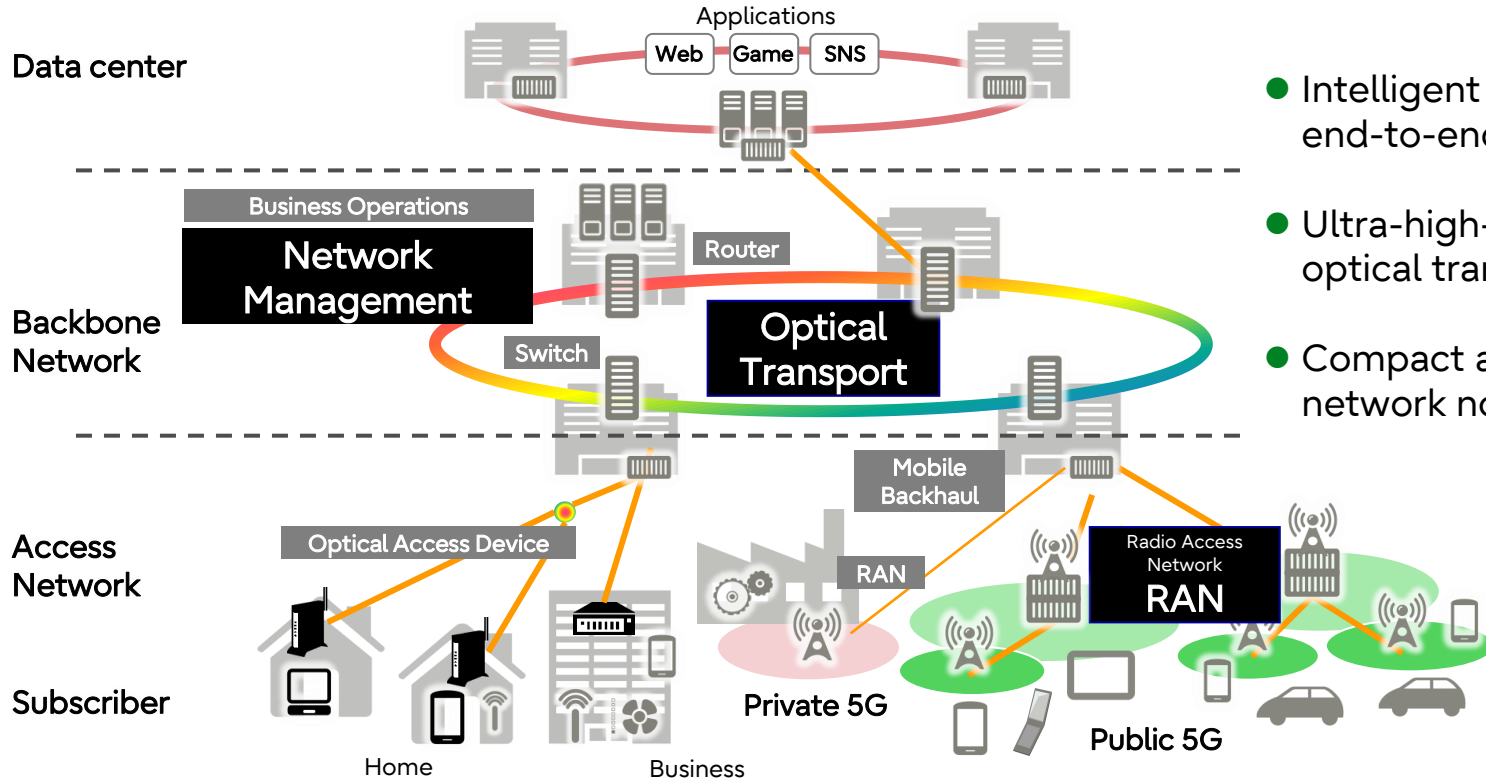
Corporate Executive Officer  
EVP, Vice Head of System Platform  
(in charge of Network Business)

**Fujitsu Limited**

February 1, 2024



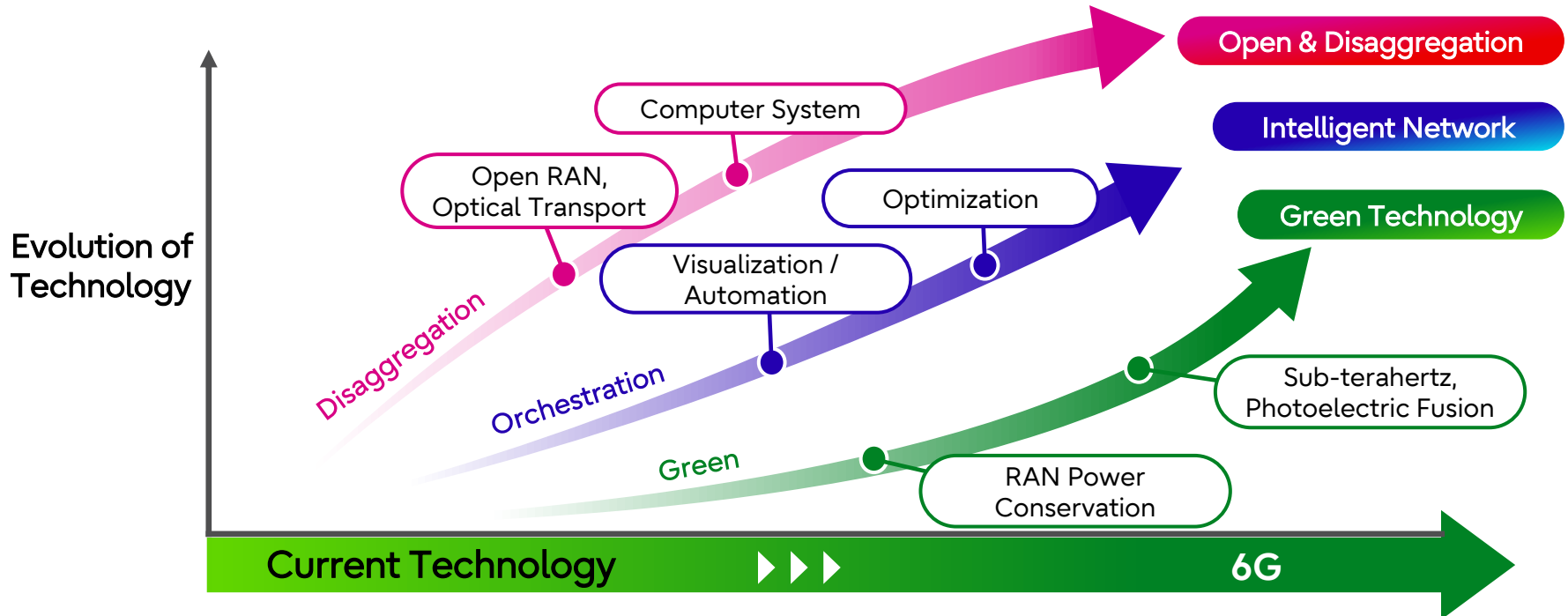
## Leading Open Network innovation across domains



- Intelligent and flexible end-to-end network controller
- Ultra-high-capacity optical transport technologies
- Compact and energy efficient network nodes

# Open Network for Sustainability

- Update connectivity infrastructure toward “AI everywhere” society
- Enhance greener network technologies, leveraging AI technology



# Fujitsu's Track Record in Open Network

## Fujitsu 5G Open RAN RU for **DISH Network**

*DISH Network Corporation (June 30, 2020)*

*"DISH advances O-RAN network, Selects Fujitsu for 5G radio units and Altistar for virtualized RAN software solution"*

<https://about.dish.com/2020-06-30-DISH-advances-O-RAN-network-Selects-Fujitsu-for-5G-radio-units-and-Altistar-for-virtualized-RAN-software-solution>

## Fujitsu 1FINITY supports **TIP's Open Optical Project**

*Fujitsu Network Communications, Inc. (February 2, 2021)*

*"Fujitsu Joins Tier 1 Operators and the Telecom Infra Project to Advance 400G Transponder Disaggregation"*

<https://www.fujitsu.com/us/about/resources/news/press-releases/2021/fnc20210202.html>

## NTIA awards **DISH** for ORCID

*DISH Wireless (January 10, 2024)*

*"DISH Wireless Awarded \$50 Million NTIA Grant for 5G Open RAN Integration and Deployment Center"*

<https://ir.dish.com/news-releases/news-release-details/dish-wireless-awarded-50-million-ntia-grant-5g-open-ran>

## **KDDI** launched 5G SA Open RAN deployment in Japan

*KDDI CORPORATION, Samsung Electronics Co., Ltd., Fujitsu Limited (February 18, 2022)*

*"KDDI Successfully Turns on the World's First 5G Standalone Open RAN Site Powered by vRAN in Japan"*

<https://www.fujitsu.com/global/about/resources/news/press-releases/2022/0218-01.html>

## Fujitsu and **IP Infusion** work to deliver Open, 5G Networking

*IP Infusion (August 30, 2022)*

*"IP Infusion Partners with Fujitsu Network Communications to Deliver Open, 5G Networking"*

<https://www.ipinfusion.com/news-events/ip-infusion-partners-with-fujitsu-network-communications-to-deliver-open-5g-networking/>

## 5G Open RAN trial with **Northrop Grumman** and **AT&T**

*Northrop Grumman Corporation (January 18, 2023)*

*"Northrop Grumman, AT&T and Fujitsu Demonstrate New 5G-powered Open Architecture Capabilities to Support Joint Force"*

<https://news.northropgrumman.com/news/releases/northrop-grumman-at-t-and-fujitsu-demonstrate-new-5g-powered-open-architecture-capabilities-to-support-joint-force>

## **Deutsche Telekom** selects Fujitsu 5G Open RAN RU

*Deutsche Telekom (February 27, 2023)*

*"First commercial deployment of Open RAN with multiple partners"*

<https://www.telekom.com/en/media/media-information/archive/first-commercial-open-ran-in-2023-1027618>

## **NTT** selects Fujitsu Ultra Optical System for **IOWN** Open APN

*Fujitsu Limited (June 6, 2023)*

*"Fujitsu 1FINITY™ Ultra Optical System selected by NTT for next Japan-wide core network"*

<https://www.fujitsu.com/global/about/resources/news/press-releases/2023/0606-01.html>

## Fujitsu and **AT&T** team up for **NTIA's 5G Challenge**

*5G CHALLENGE*

<https://5gchallenge.ntia.gov/>

## **AT&T** to accelerate Open RAN in the US

*AT&T (December 4, 2023)*

*"AT&T to Accelerate Open and Interoperable Radio Access Networks (RAN) in the United States through new collaboration with Ericsson"*

<https://about.att.com/story/2023/commercial-scale-open-radio-access-network.html>

## Fujitsu Open RAN Virtualized RAN solution for **NTT DOCOMO**

*Fujitsu Limited (September 27, 2023)*

*"Fujitsu delivers O-RAN ALLIANCE-compliant 5G virtualized RAN solution for NTT DOCOMO's 5G commercial network services"*

<https://www.fujitsu.com/global/about/resources/news/press-releases/2023/0927-01.html>

\*IOWN® is a trademark or registered trademark of NIPPON TELEGRAPH AND TELEPHONE CORPORATION

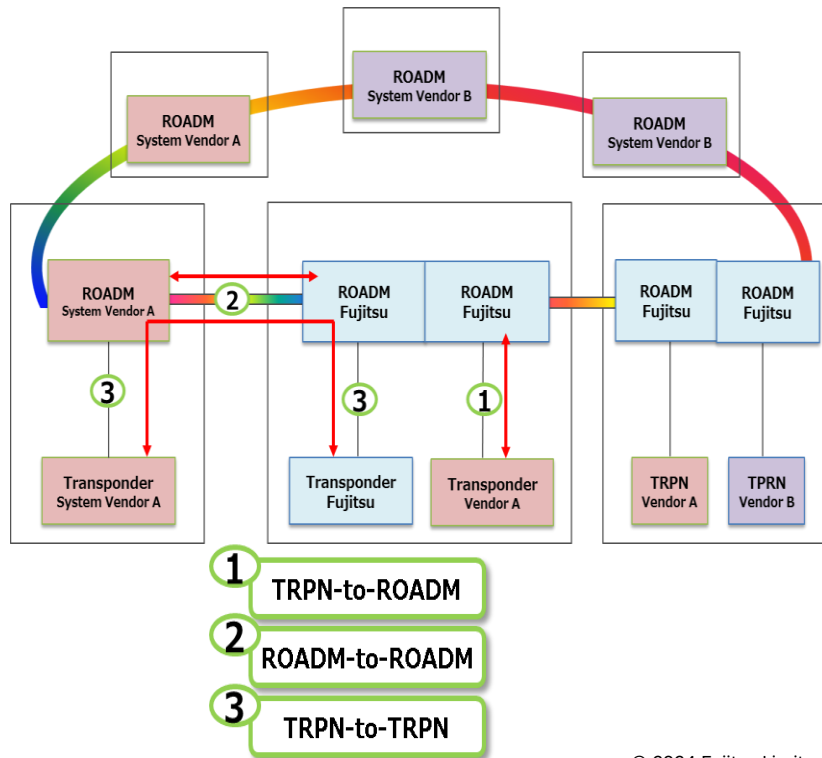
# Advocate Open Optical Transport

## Working actively in "Open ROADM" forum

- Fujitsu is a founding member since the establishment in 2015
- Participants: 31 (as of January 2024)
- Main purpose
  - "Open & Flexible"  
(Multi-vendor environment)
  - "Software controlled ROADM"

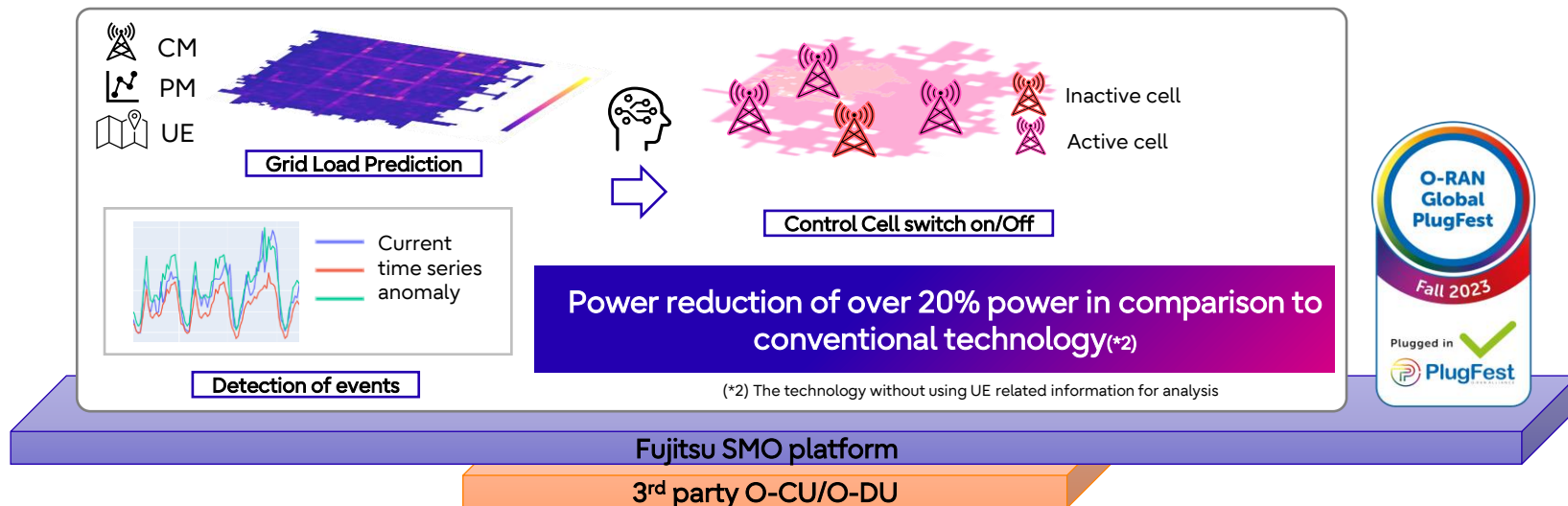
For further info: <http://www.openroadm.org>

## Interoperability Model



## Power-saving rApp enabled by AI technology (\*1) and SMO platform

- Successful performance demonstrated with a third-party system-level RAN emulator at O-RAN ALLIANCE Global PlugFest Fall 2023

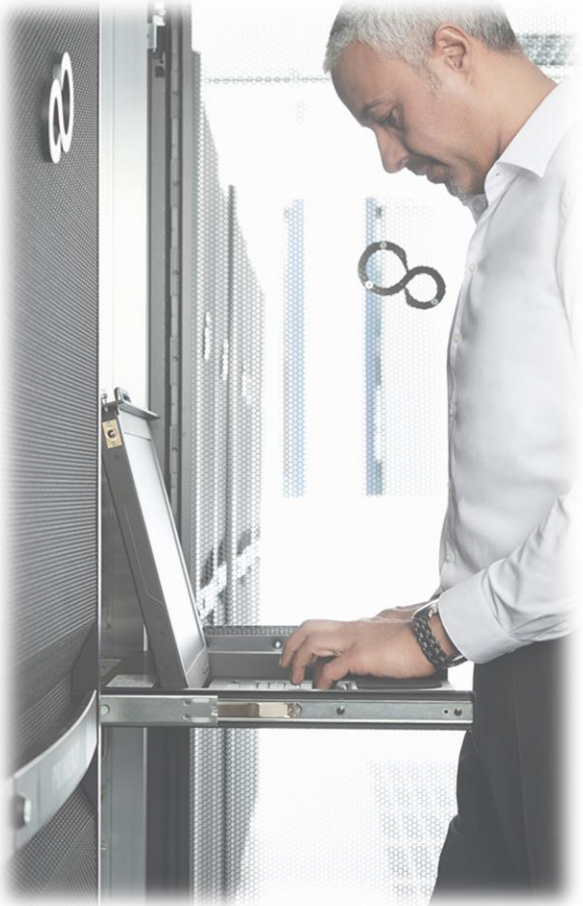


Press Release: Fujitsu leverages AI technology to realize energy saving in network operations

<https://www.fujitsu.com/global/about/resources/news/press-releases/2023/1219-01.html>

(\*1) This technology is based on results obtained from "Research and Development Project of the Enhanced Infrastructures for Post 5G Information and Communication Systems" (JPNP20017), commissioned by the New Energy and Industrial Technology Development Organization (NEDO).

# Interoperability Lab Collaboration



- Multi-vendor interoperability verification is requisite for successful introduction of open networks
- Dell Technologies and Fujitsu collaborate to accelerate Open RAN global adoption

**Dell Open Telecom Ecosystem Lab**

**Fujitsu Interoperability Lab**

Open RAN

**Mobile Integration and  
Testing Center (MITC)**

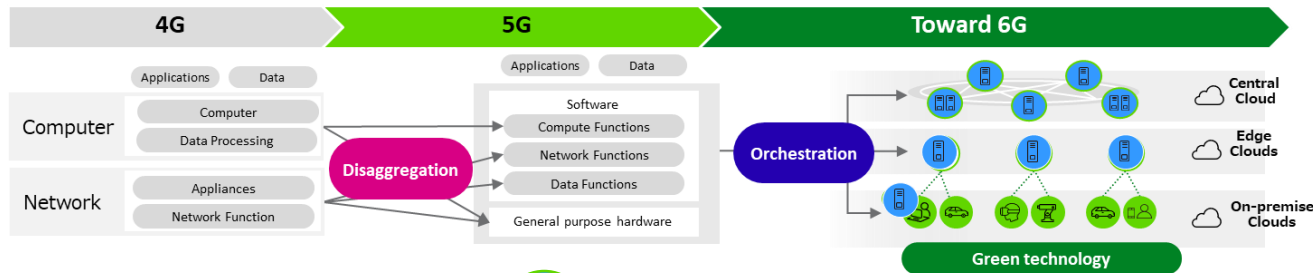
Open Optical Transport  
& Open Management

**Advanced Technology &  
Solutions Center (ATSC)**

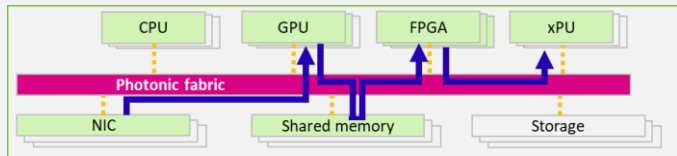
# Realizing IT and CT Convergence

## Disaggregation between hardware and software accelerates computing - connectivity convergence toward Beyond 5G/6G

### Network Architecture Transition



### Photonic disaggregated computer



- New computer architecture which aligns with “Data-centric infrastructure” architecture.
- Achieve high energy efficiency, low latency and dynamic configuration.

### Features

- Disaggregation** ① Flexible reconfiguration of devices
- Orchestration** ② Device-to-device communication without CPU
- Green technology** ③ Photonics connection



# Network Digital Twin for Open Network FUJITSU

## High resilience and optimization of multi-vendor Open networks through Digital Twin and AI technology

### PMO: Reactive Operation

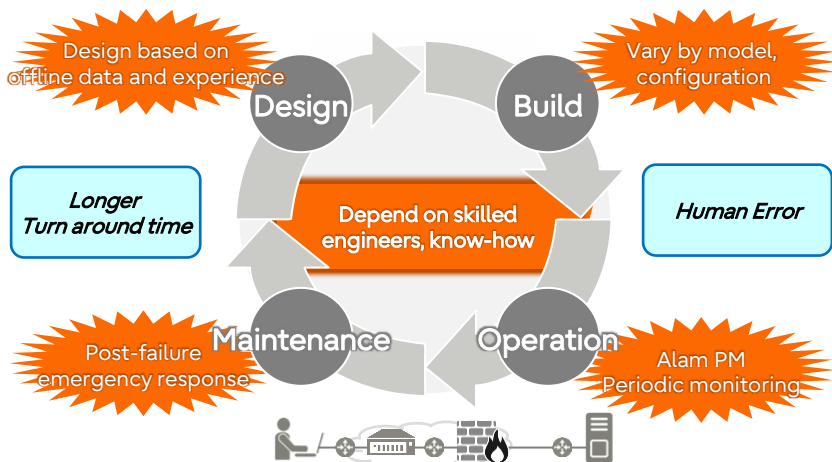


- Mainly manual labor by skilled engineers
- Responding on an ad hoc basis after a failure

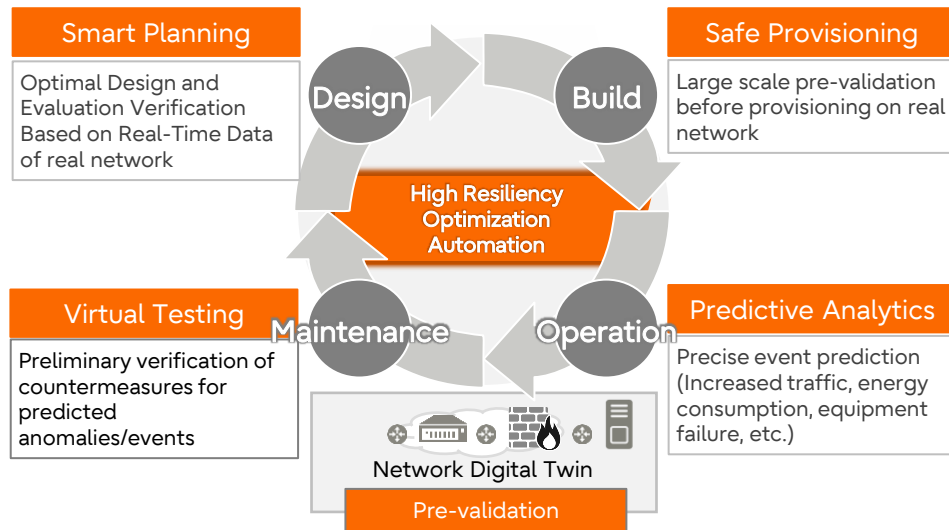
### FMO: Proactive Operation



- Network changes and failures are analyzed in the digital space
- Simulate and take measures in advance



( PMO: Present Mode of Operation  
FMO: Future Mode of Operation )



# Beyond 5G/6G in Open Communities

- ITU-R recommendation for IMT-2030 framework was released in 2023
- Promoting implementation of Beyond 5G/6G in the global open communities

## Japan

Beyond 5G  
Promotion Consortium

Vision

Contribution to white paper and deliver visions for Beyond 5G

## Global

IOWN Global Forum

Vision

Technology

Board Member

Contribution to the discussion related to "Open APN" and "Data-Centric Infrastructure".

## North America

Next G Alliance

Vision

Contributing Member

Contribution to 6G discussions, whitepapers and research of Wide Area Cloud Evolution

## Global

LF Edge  
The Linux Foundation

Technology

Board Member

Contribution to whitepapers and collaboration with IOWN GF

# Fujitsu's Key Technologies

- Focusing on the following five technology areas, working together with a wider range of partners
- Integrating computing, network, data and security and converging technologies with AI technology

## 5 technology megatrends

### Amplifying creativity

#### AI



- Semantic graph AI (Semantic graph, Graph AI)
- Explainable AI
- Discovery AI
- Actlyzer

### Being connected, inclusive

#### Network × AI



- 6G technologies
- Disaggregated Computing
- Optical transmission and photoelectric fusion



- Intelligent networks (AI controlled network)

### Developing at quantum speed

#### Computing × AI



- HPC(High performance Processor)
- Quantum computer
- Computing Workload Broker



- Discovery AI
- Materials Informatics

### Redesigning the future

#### Converging Tech. × AI



- Federated digital twins
- Social Digital Twin
- Enterprise metaverse



- Multi-aspect simulation
- Behavior prediction

### Evolving Web

#### Data & Security × AI



- Web3/Blockchain
- IDYX, CDL, Transparent trust transfer
- Trust network



- AI Security and Trust
- Continuous authentication

## Fujitsu's key technologies



Computing



Network



AI



Data & Security



Converging Technologies

# Digitalized Future Society



Prepare



Make



Live



Move



Protect

Smart City

Smart Building

Local Production for  
Local Consumption

Digital Resilience

Smart Agriculture

MaaS

Autonomous Driving

Smart Grid

Smart Home

Smart Factory

Cyber-Physical Systems / Digital Twin

High Capacity

Low Latency

Multi-  
Connectivity

Energy  
Efficiency

Flexibility

High Reliability

Beyond 5G /  
6G Networks

IT Systems

**Thank you**

