AI-Driven Autonomous Network Operation for Mobile Network

Cloud RAN and AI Service Integration

MWC26

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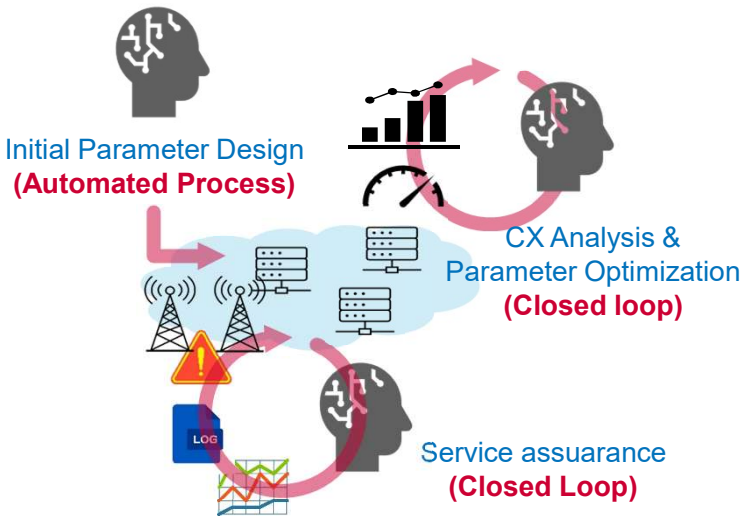
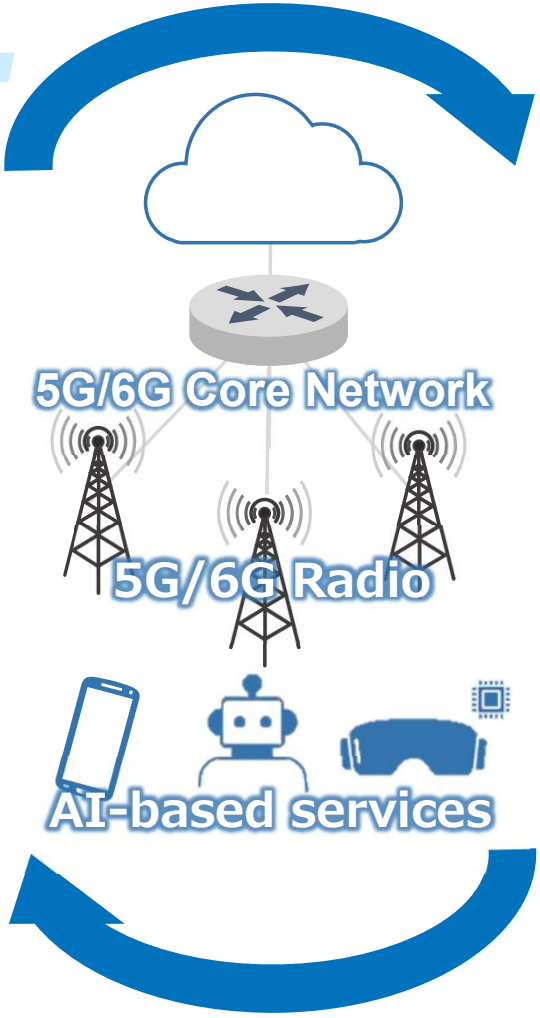
DOCOMO's AI-Centric Network Initiatives

AI for Network

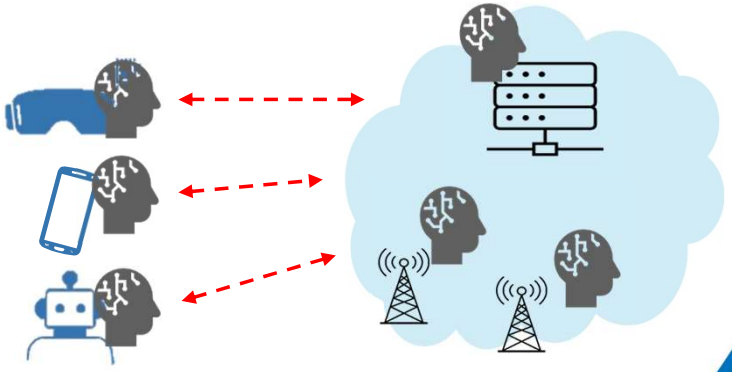
- Autonomous Networks
  - AI-driven network deployment
  - Agentic AI service assurance
  - CX-based network optimization
- Self-aware networks





Network for AI

- In-Network Computing
- New AI services on mobile
  (e.g. robots, smart glasses)
- Handling increased AI traffic



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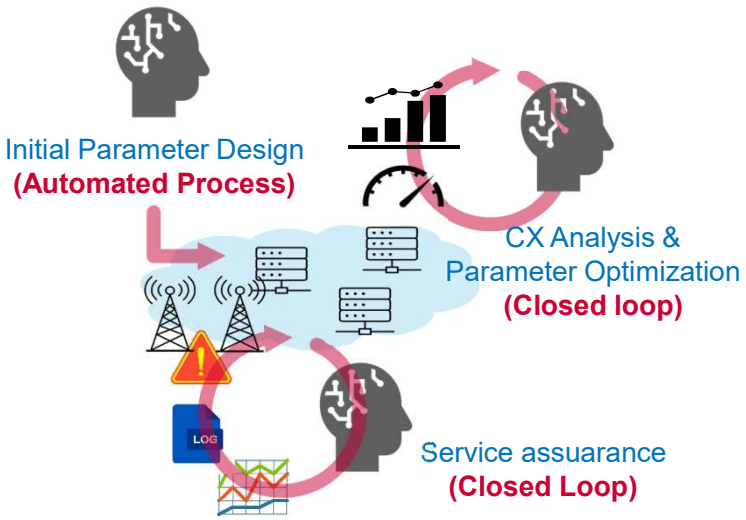

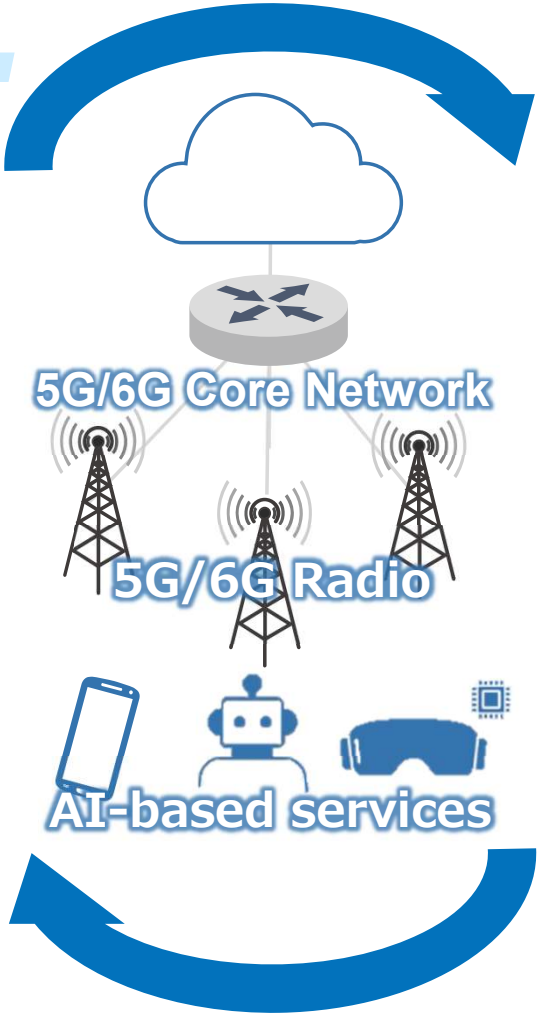

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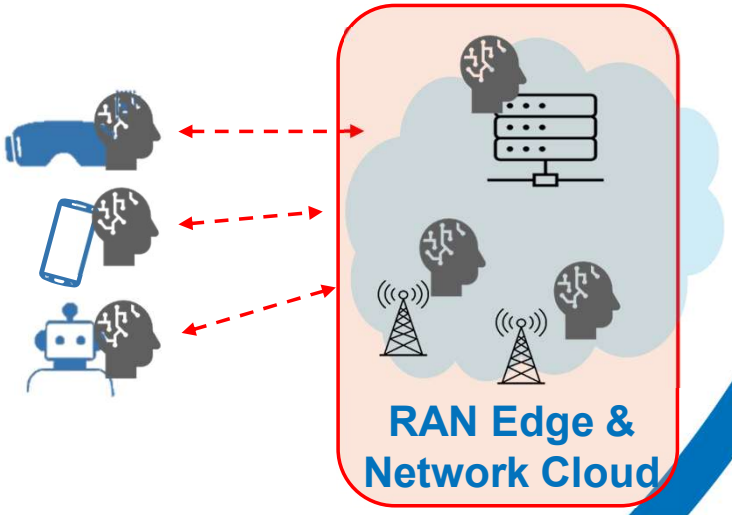
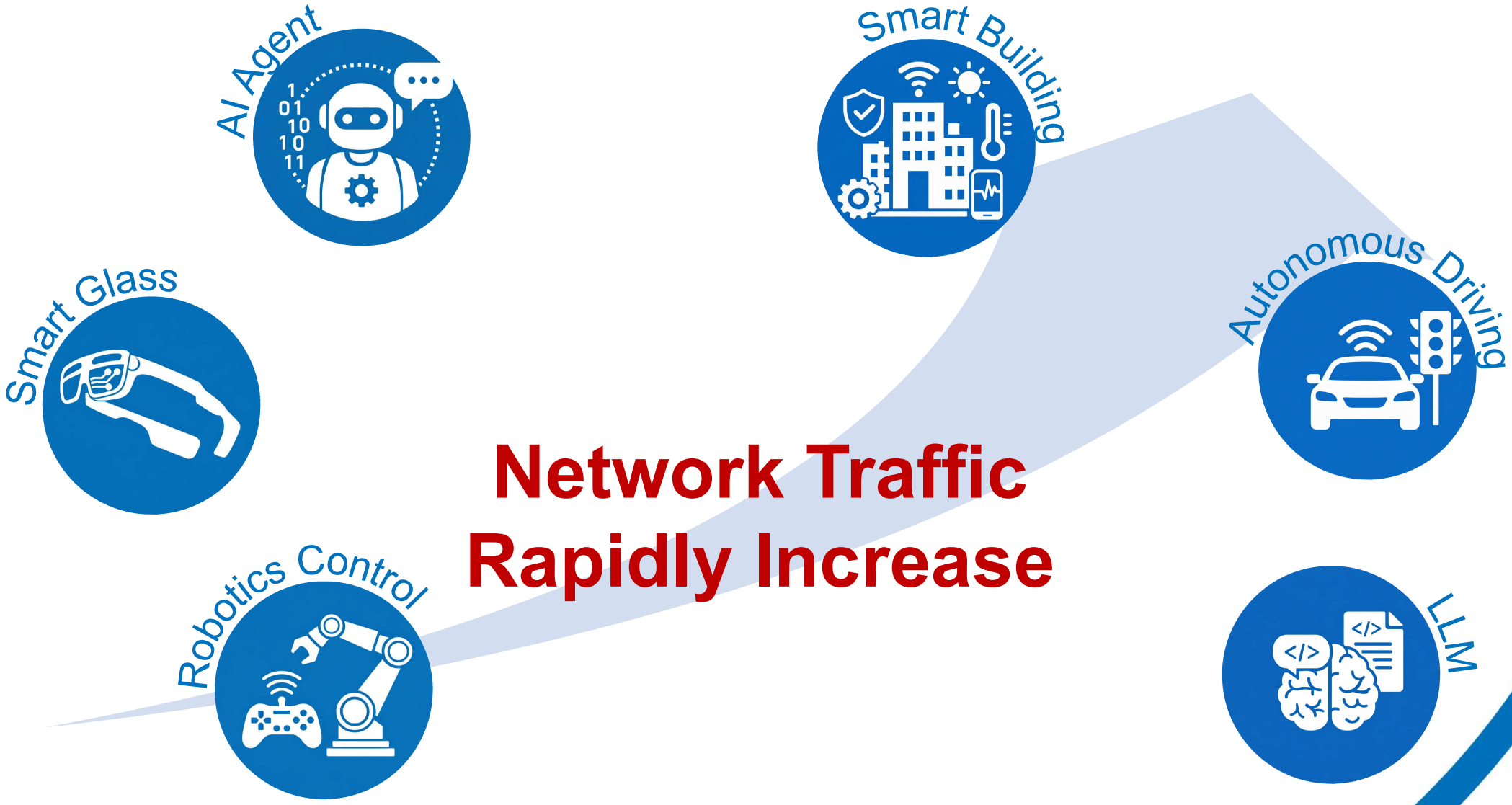
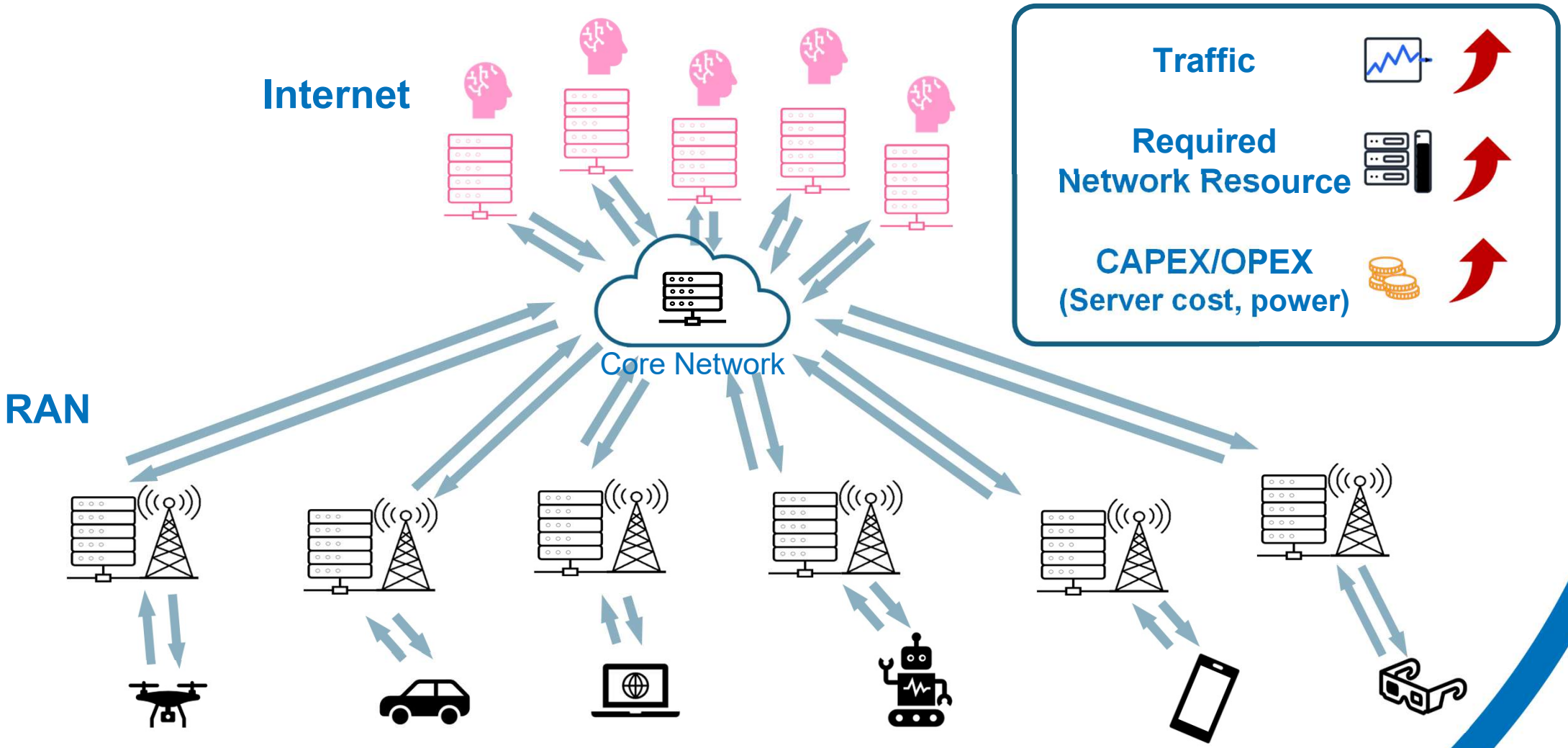


Background: AI market rapidly growing



Network Traffic Rapidly Increase

Challenges: AI Applications Drive Up Traffic & Costs



Solution: Edge Computing in Cloud RAN

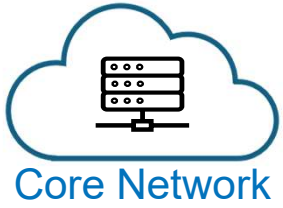
Integrating AI applications directly into RAN base stations

- ✓ Transactions between AI servers and devices can be terminated within RAN
- ✓ Utilizing xPU resources in vRAN (general-purpose server) for AI task
  - ✓ Especially, CPU utilization is key to realize cost-efficient network

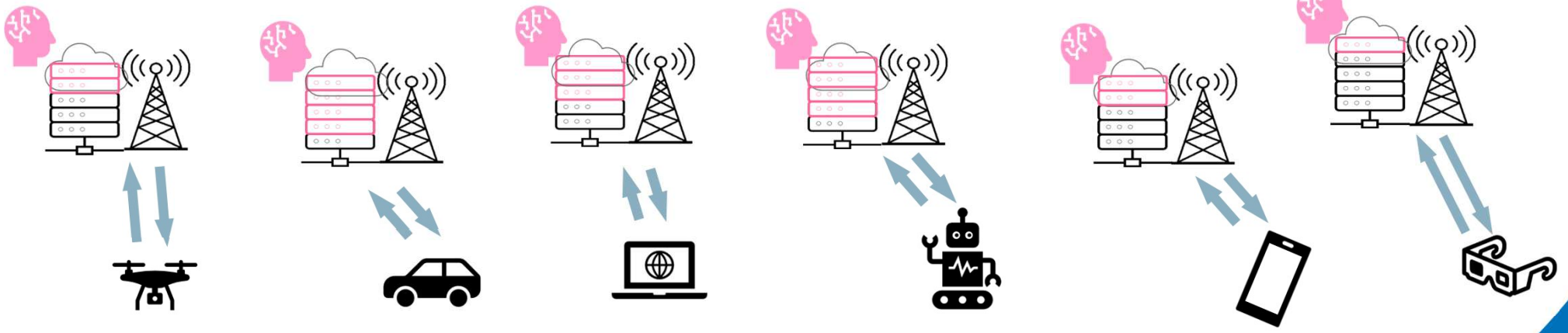
Traffic
*within network

Required Network Resource

CAPEX/OPEX (Server cost, power)

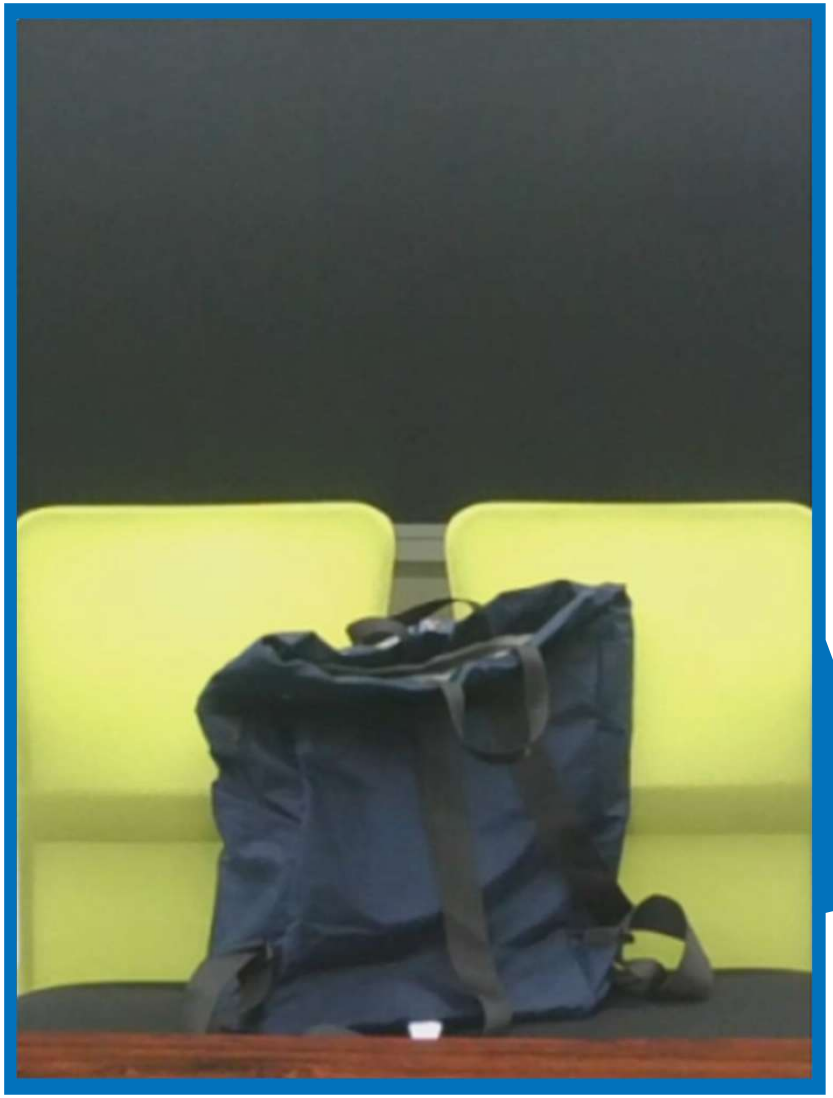


RAN



Demo #1

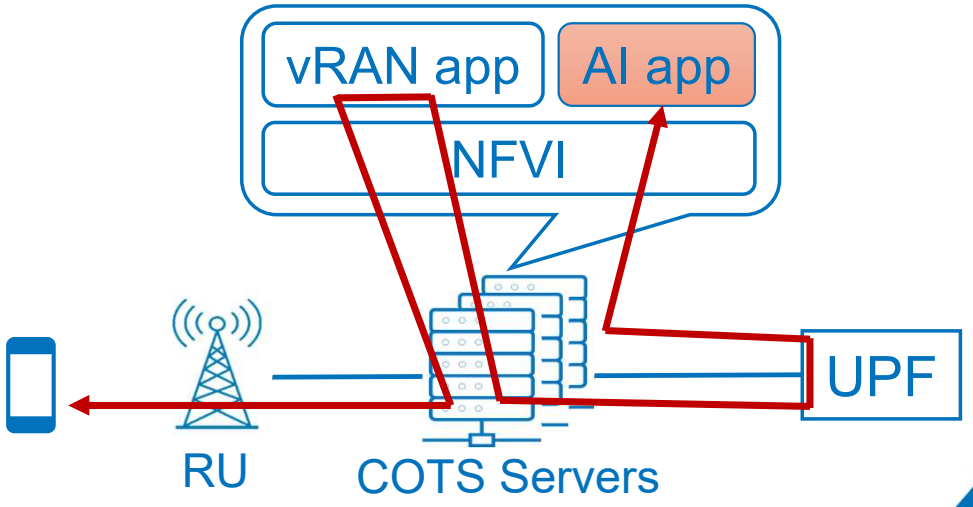
境では実施していないので、「商用環境
と勘違いされないような言い方にした



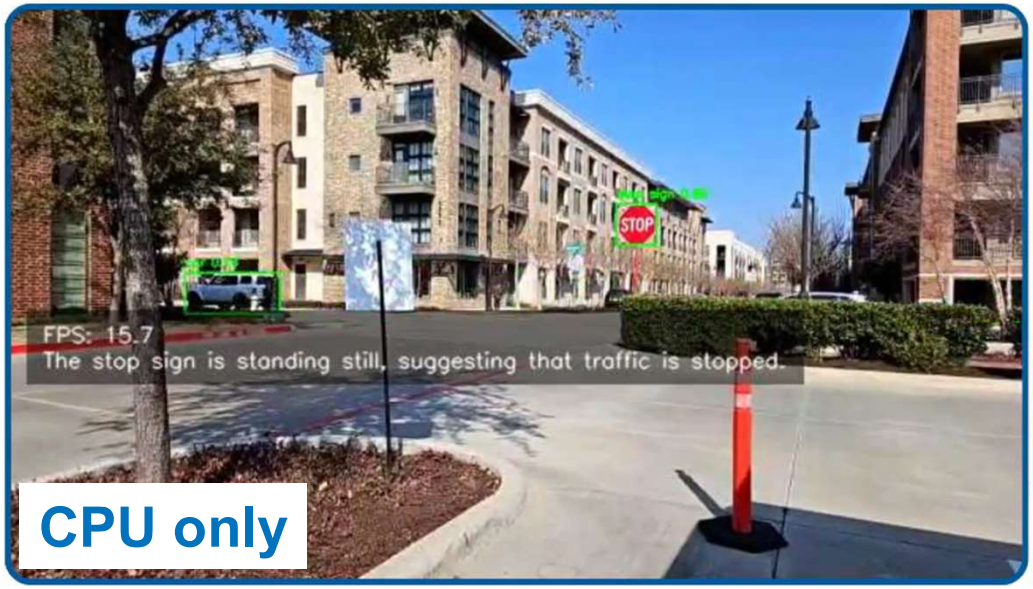
- Using equipme[illegible]which is…
  - deployed commercially
    → We ready to deploy
  - without a GPU

Network Configuration

- In verified network



Demo #2



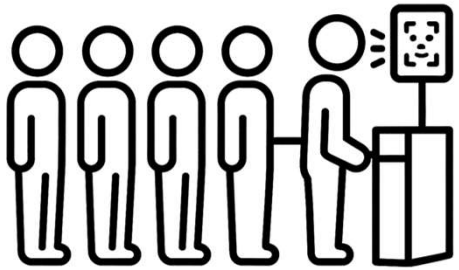
- vRAN general-purpose server* with CPU&GPU is used

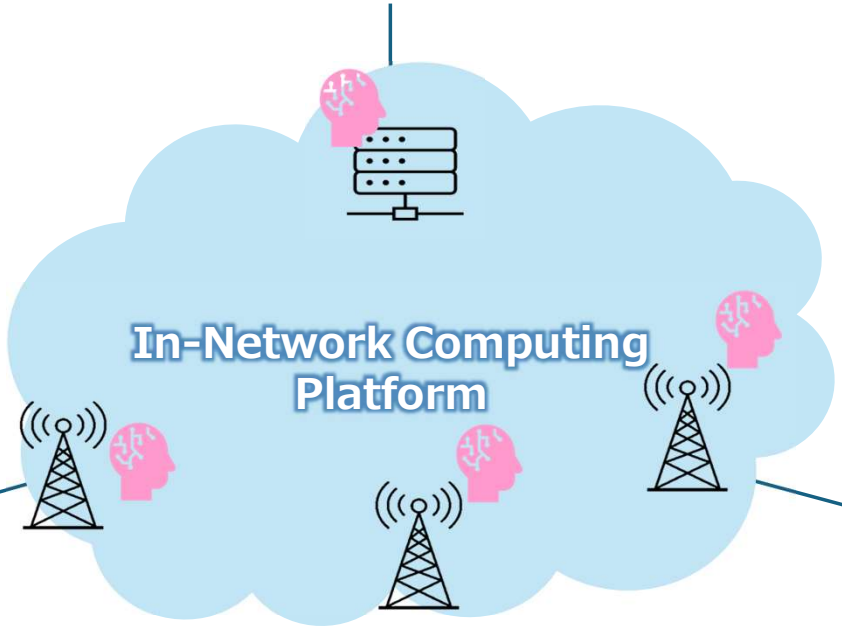
*not commercially deployed equipment

Future Vision

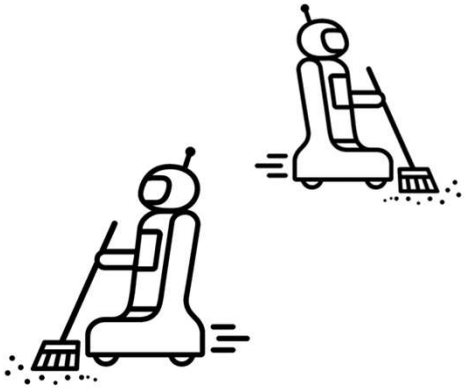
In-Network Computing will be deployed to whole network, enabling to support various use cases

Face Recognition

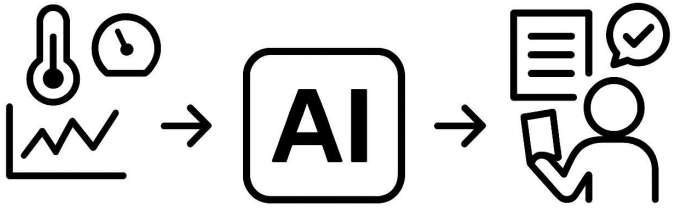


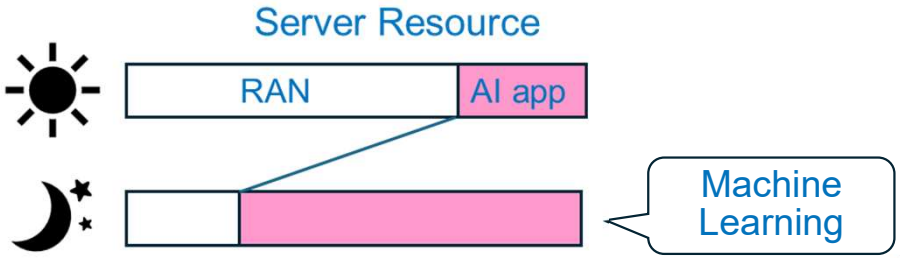


Autopilot Robot



Gen AI with Machine Learning



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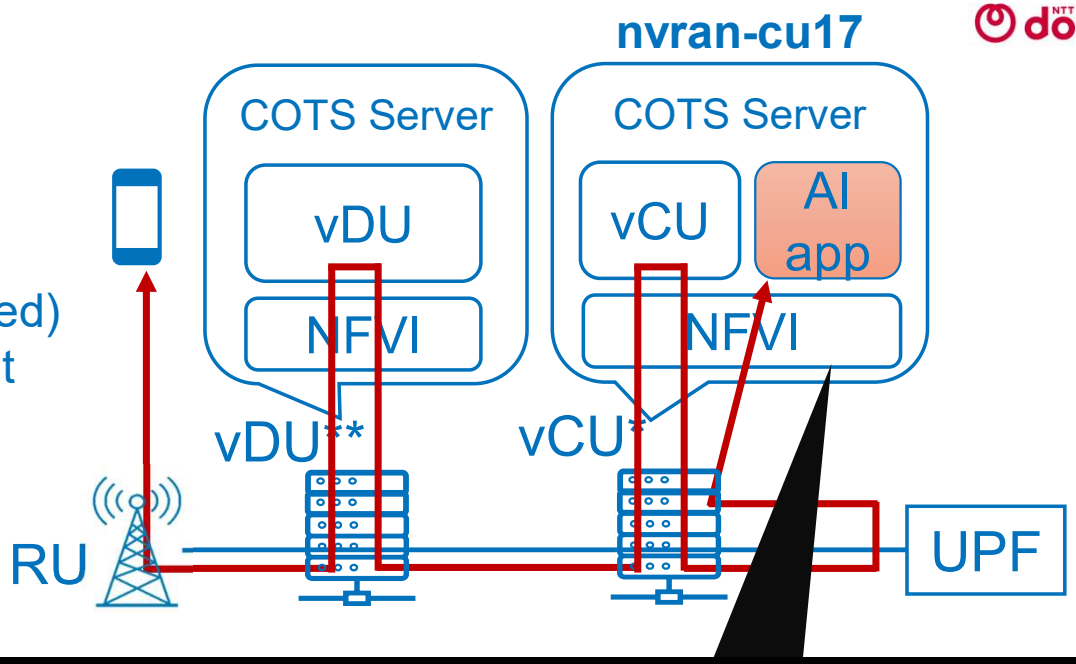
Demo #1

Network Configuration

- Uses vRAN general-purpose server
  - Runs on CPU only (No GPU required)
- Uses commercially deployed equipment (in verification network)
  → Deployment-Ready

*vCU: Central Unit in vRAN
**vDU: Distributed Unit in vRAN




```
===NODE: cloudr-cisvcu-a-1-20-26-1-3===
NAMESPACE                NAME                          STATUS   NODE
                                                       Running  cloudr-cisvcu-a-1-20-26-1-3
default                  camera-app-deploymer          Running  cloudr-cisvcu-a-1-20-26-1-3
                                                       Running  cloudr-cisvcu-a-1-20-26-1-3
                                                       Running  cloudr-cisvcu-a-1-20-26-1-3
gnb02-524289--cu-u01     streamingmgr-oam-675          Running  cloudr-cisvcu-a-1-20-26-1-3
gnb02-524289--cu-u01                                   Running  cloudr-cisvcu-a-1-20-26-1-3
gnb02-524289--cu-u01                                   Running  cloudr-cisvcu-a-1-20-26-1-3
gnb02-524289--cu-u01                                   Running  cloudr-cisvcu-a-1-20-26-1-3
```

AI App

vCU Apps

Deployed same Node

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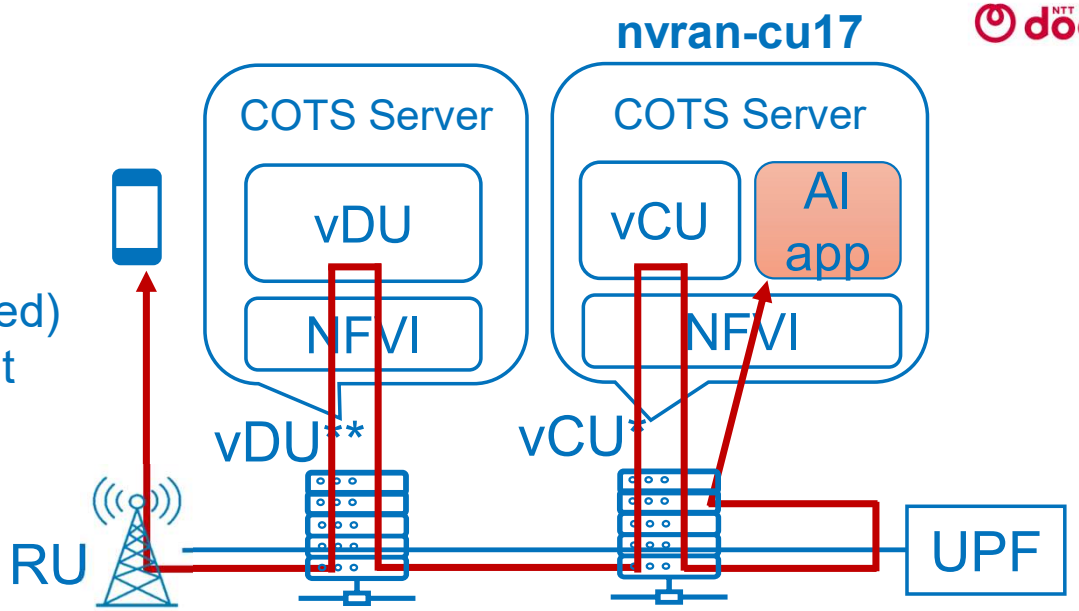

User screen