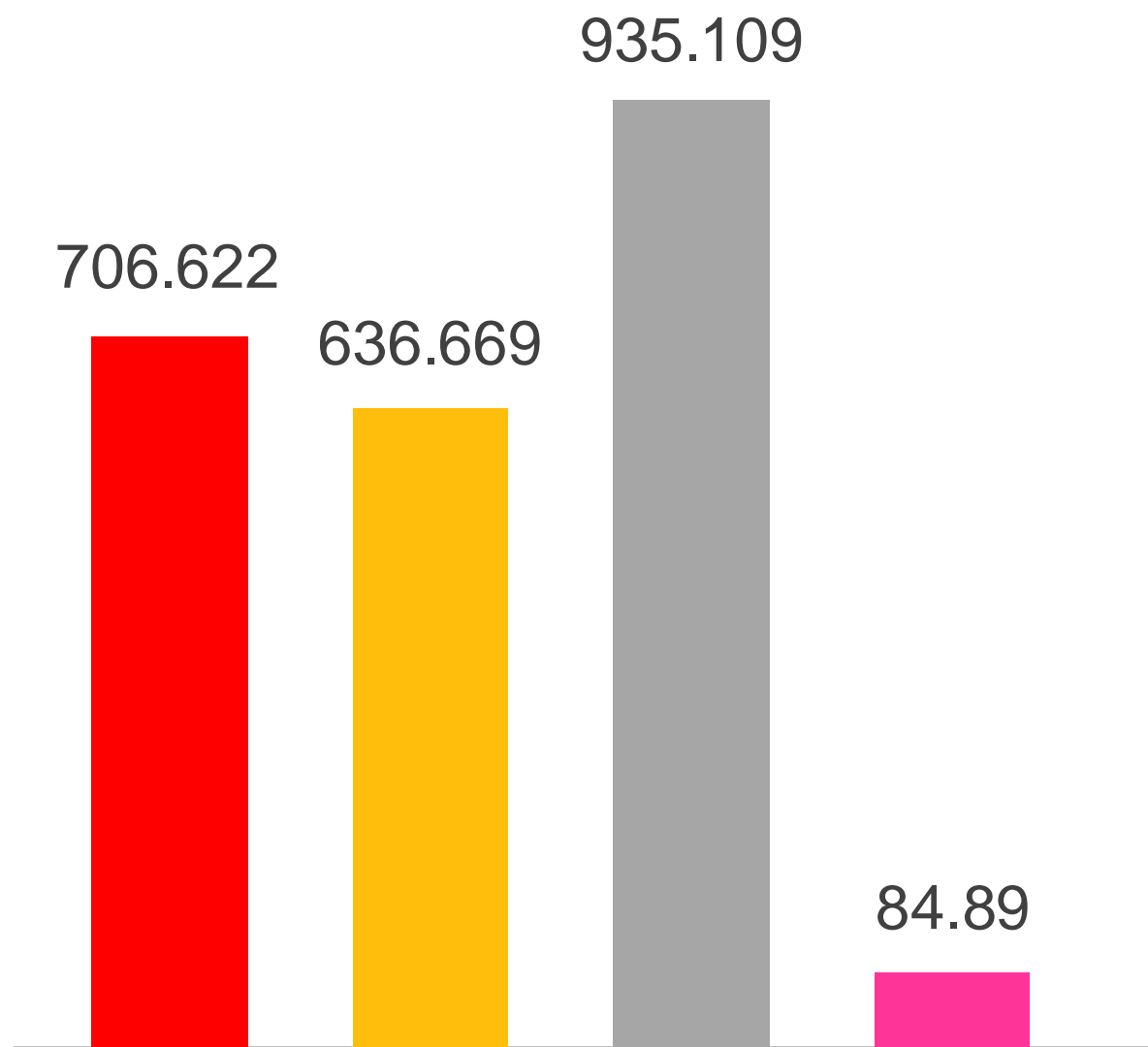


Development of AI-RAN Solution

SoftBank Corp.

Monthly Aggregate Network Traffic of All Users (Unit : PB)



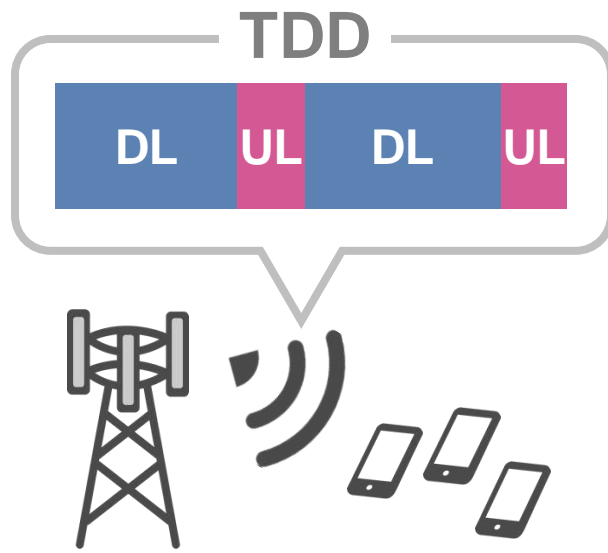
SoftBank is the operator with the highest network traffic in Japan

※By group (3G, 4G/5G, Advanced BWA + 5G)

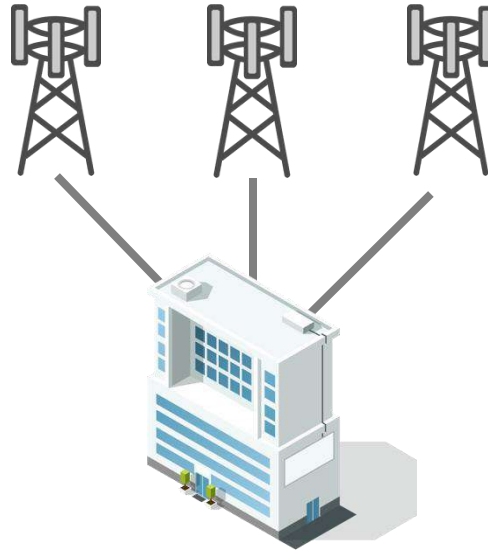
Source: created based on "Summary of the Results of the FY2023 Survey on Actual Radio Spectrum Usage on Mobile Phones and Nationwide BWA"

SoftBank's Measures on Network Capacity Expansion

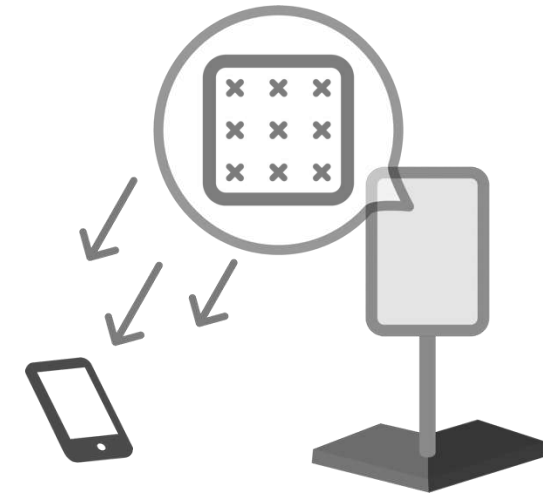
Implementation of TD-LTE



Implementation of C-RAN



Implementation of Massive MIMO



Global TD-LTE Initiative (GTI)

February 2011
at MWC

LTE TDD/FDD International Summit 2011

Global Standard , Global Deployment

Venue: Hotel Arts Barcelona
Date: March, 2011



From GTI1.0 to GTI 3.0



SoftBank
China Mobile
Clearwire
Airtel
Vodafone

2011

Established by **5** companies

2016

2023

GTI2.0

GT3.0

Operator
Members

146
members

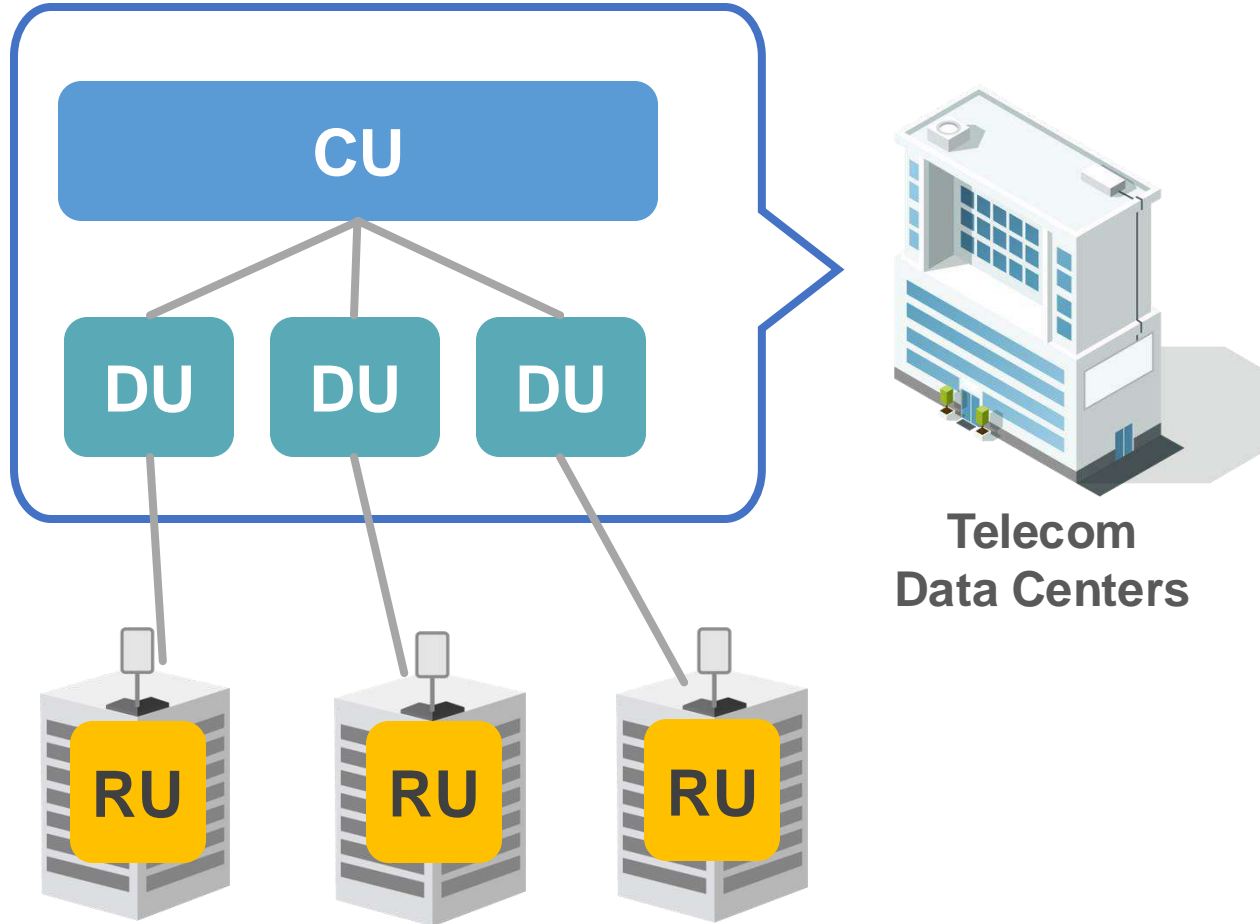
Partners

262
partners

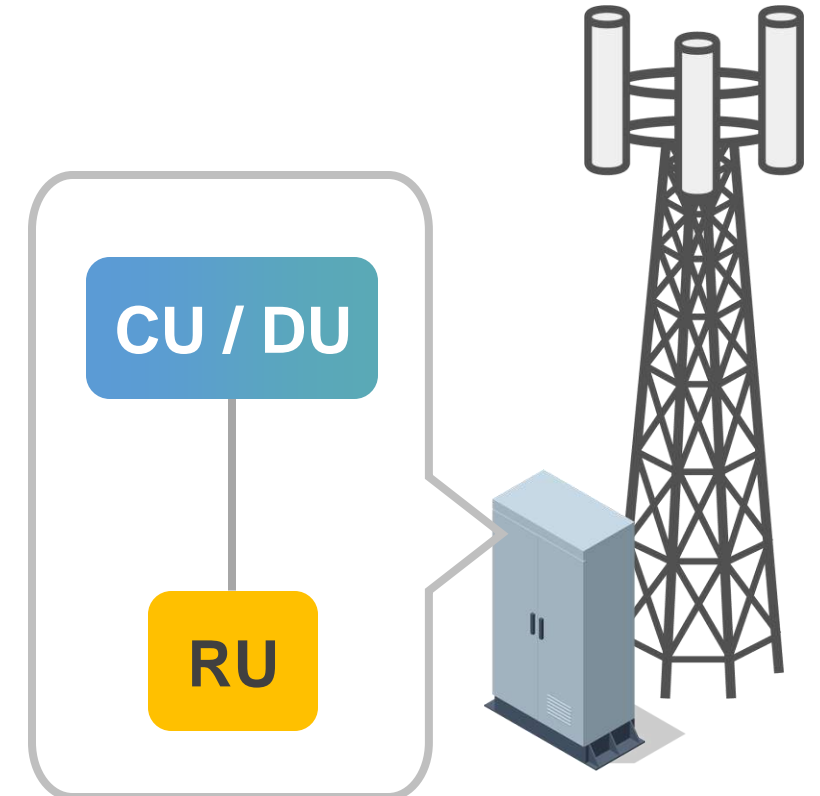
Number of Members
up to **408** members

Difference between C-RAN and D-RAN

C-RAN



D-RAN



Difficulty of
interference control in
high-density areas



**C-RAN implemented
to enable better coordination
between base stations**

Implementation of Massive MIMO in LTE

Developed pricing strategies to address high traffic needs

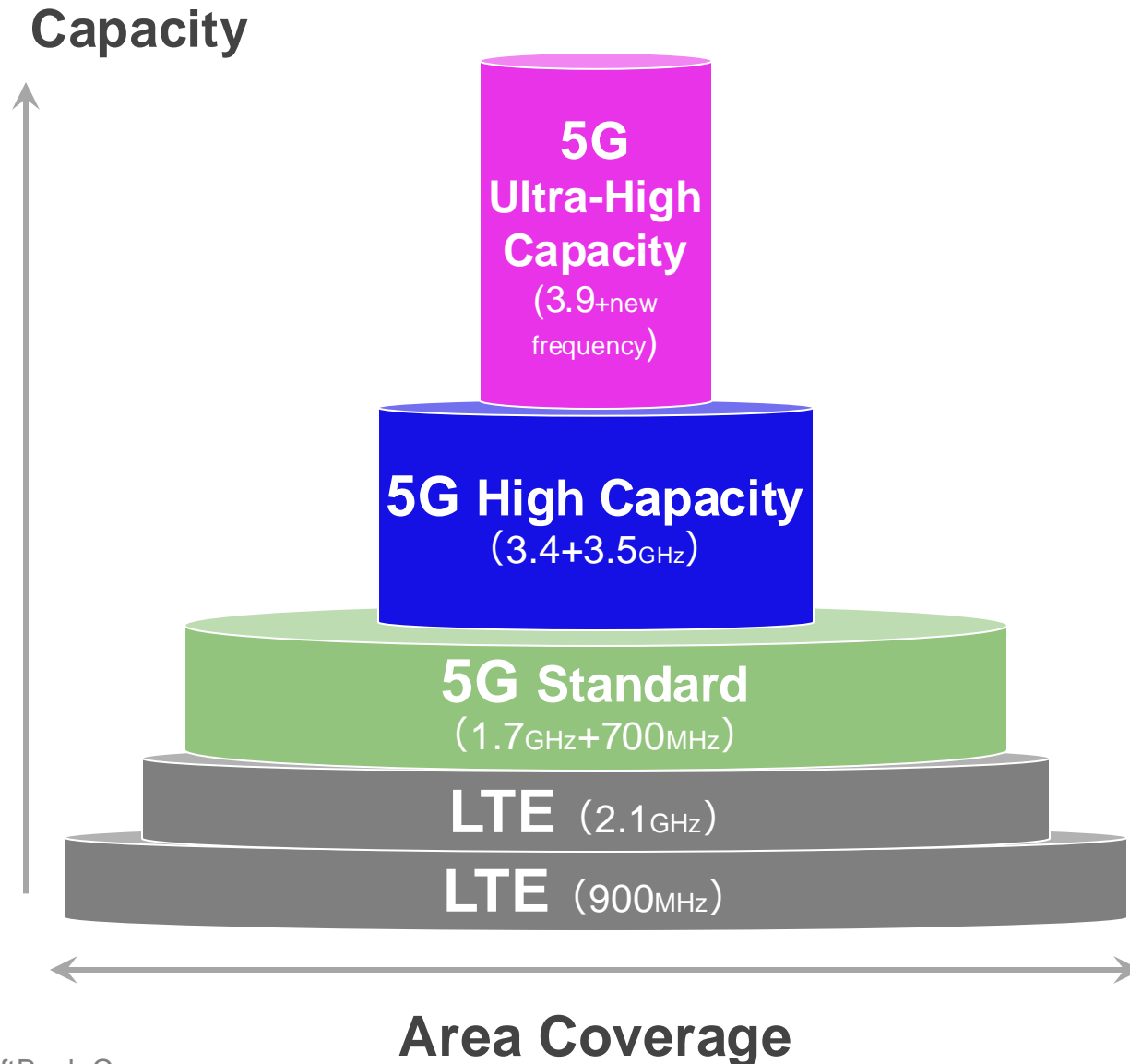


Spectral efficiency:
Achieving breakthrough improvement in wireless capacity



Launch of service plan with
per-bit cost reduced to one-third

Area Coverage vs. Capacity

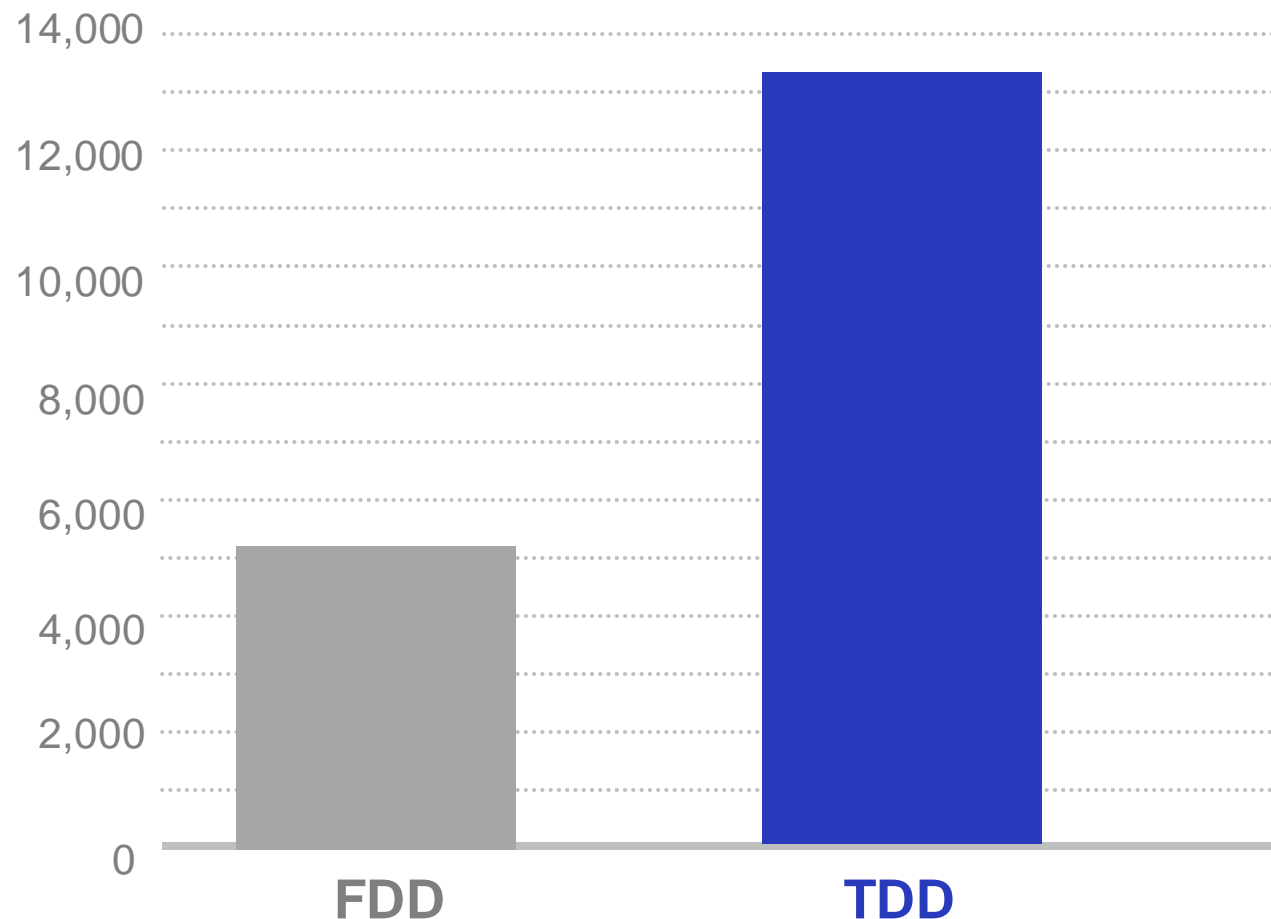


Low-band :
area coverage

Mid-high band :
high capacity

Significance of TDD

Total traffic / month / cell [GB] (SoftBank)



**TDD is capable of
carrying more traffic
than FDD**

Source: created based on "Summary of the Results of the FY2023 Survey on Actual Radio Spectrum Usage on Mobile Phones and Nationwide BWA"

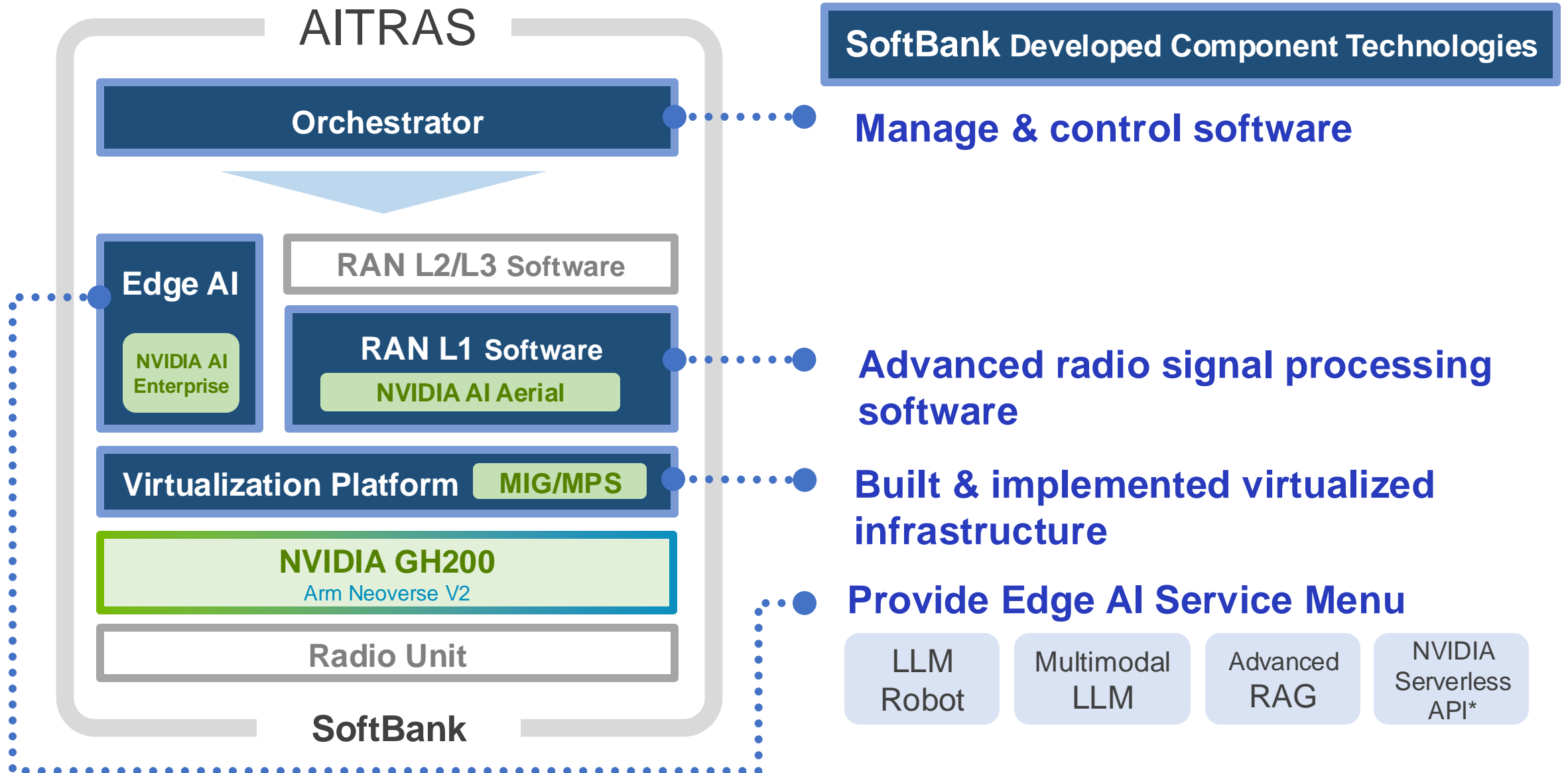
※Note: The 700MHz-3.5GHz bands for 5G shown above are aggregated, and due to difficulty in separating FD/TD, they are not included in this graph.

SoftBank's Next Move

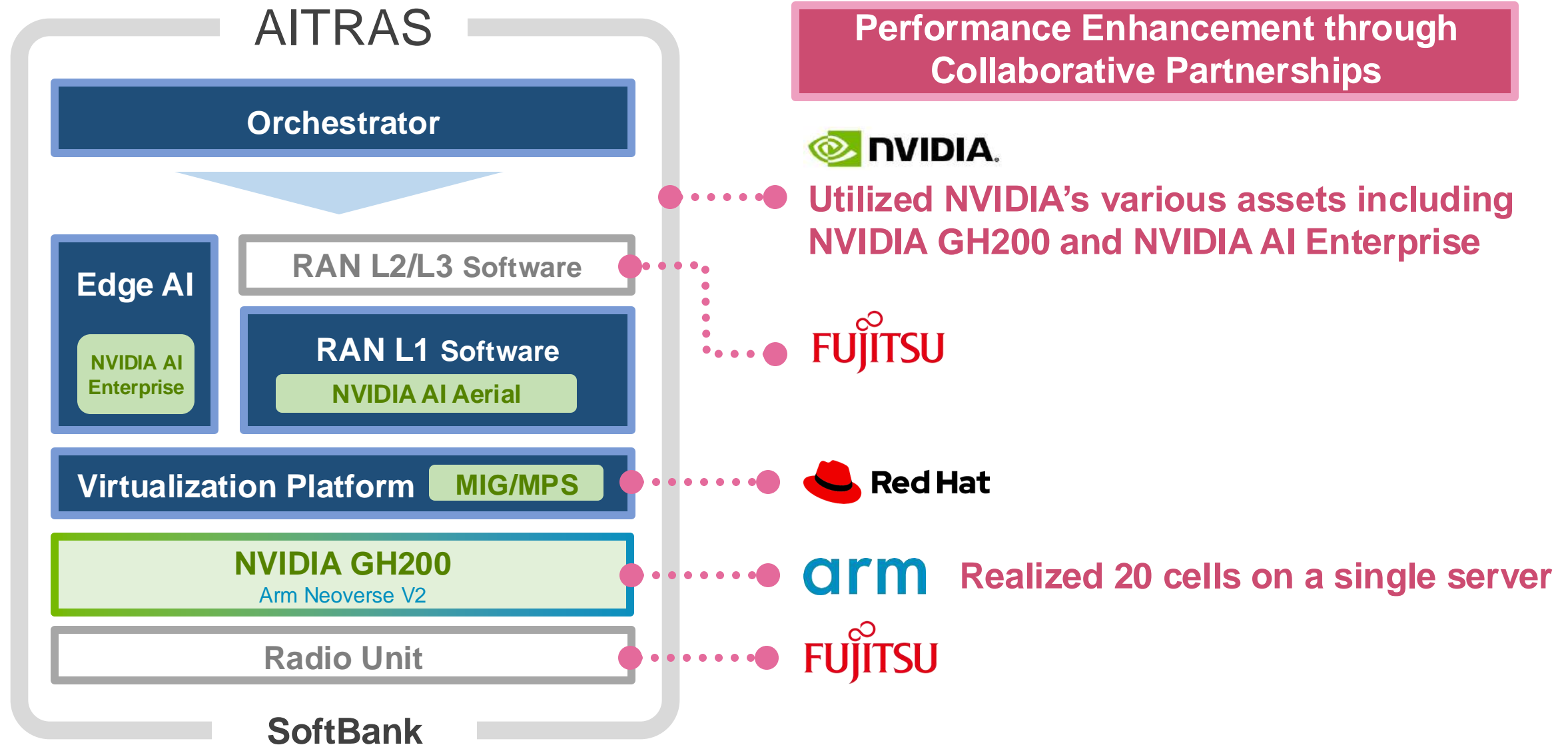
AITRAS

SoftBank's original product
based on the AI-RAN concept

AITRAS System Elements



AITRAS System Elements



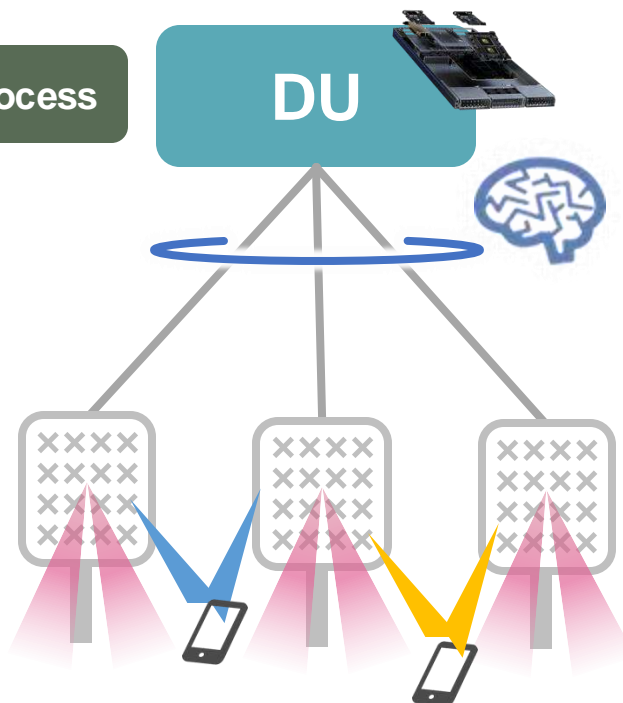
Inter-Cell Coordination Control

AITRAS

Inter-Cell Coordination Control & AI-Driven Enhancement

Process

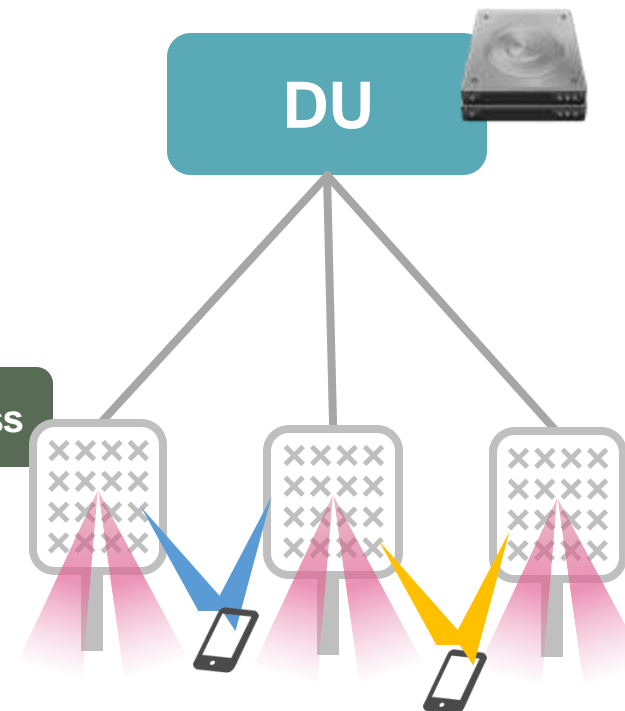
DU



Others

DU

Process



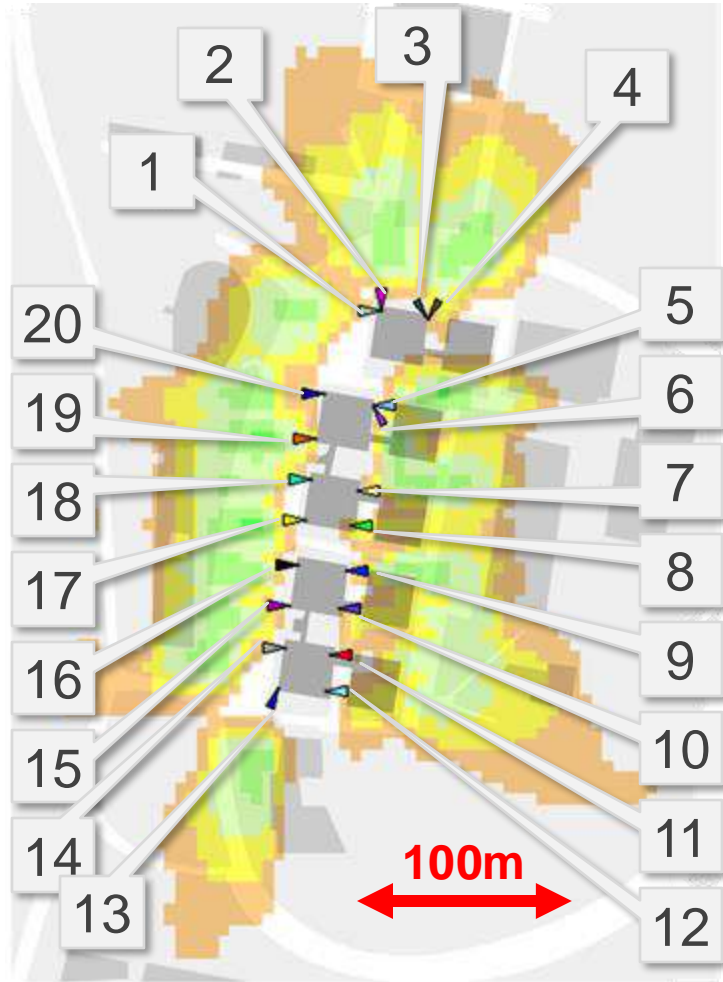
AITRAS : RAN Overview



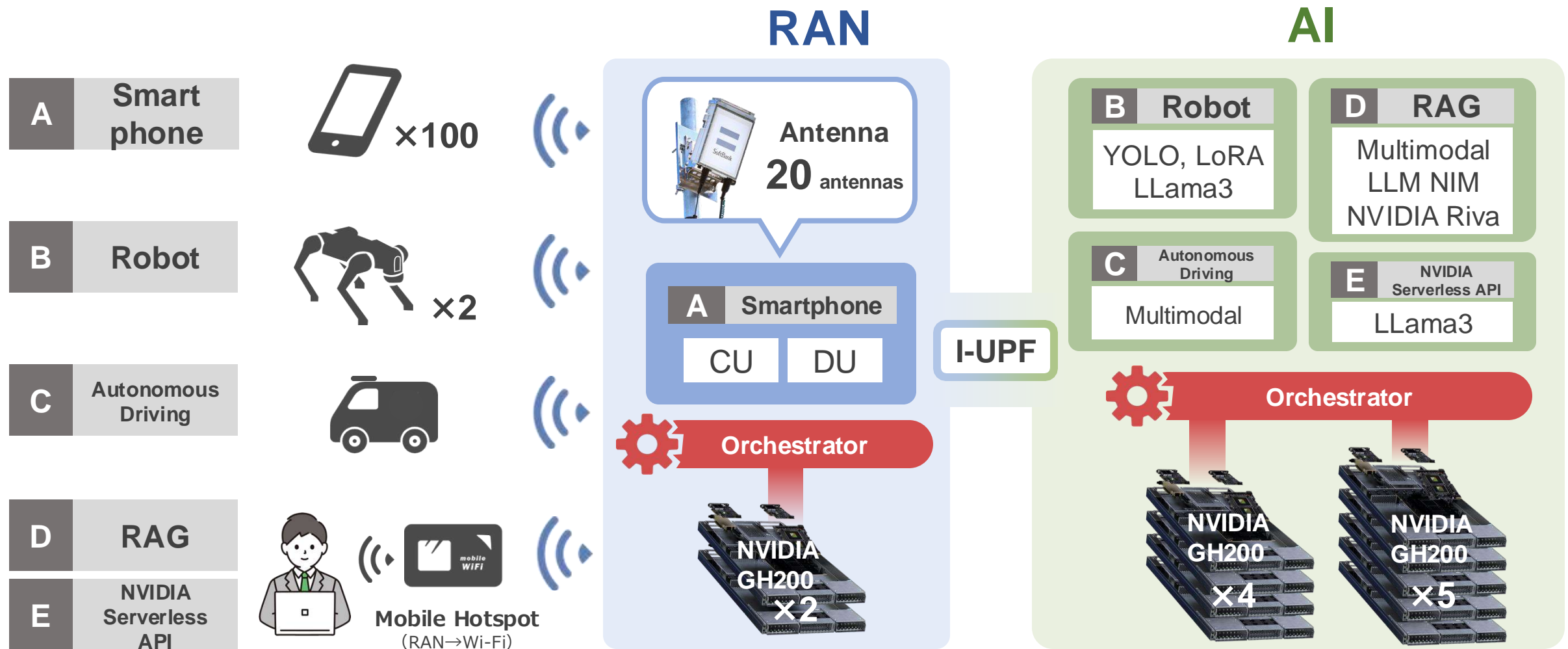
Main Specifications (As of Nov. 2024)

Supported Frequency Bands	4.8GHz~4.9GHz (TDD)
Supported Bandwidth	Max. 100MHz bandwidth
Single User MIMO	Max. 4 layers
Antenna	4T4R
# of Cells on a Single Server	20 cells / NVIDIA GH200
EIRP	Max. 46.2dBm

AITRAS 20 Cells On-Air



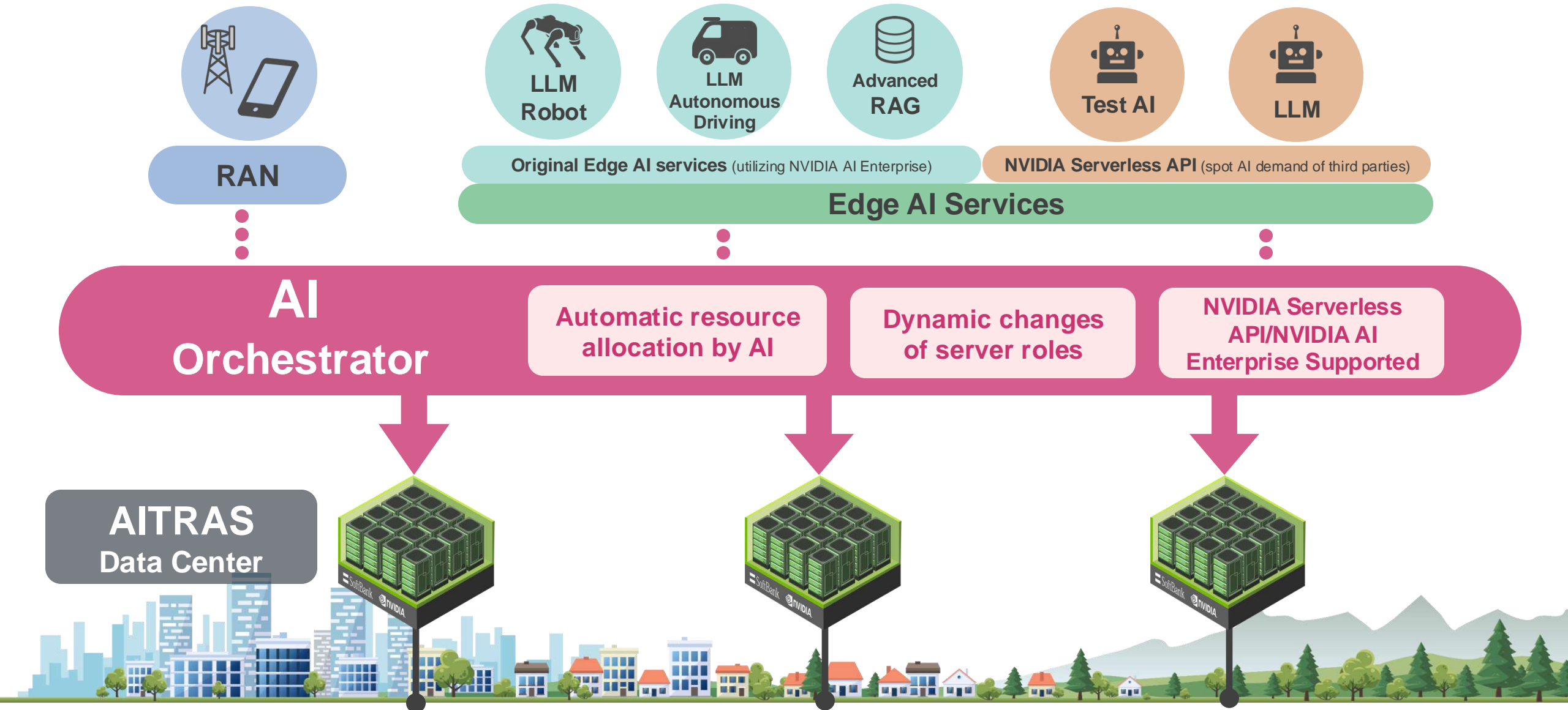
System Architecture Overview



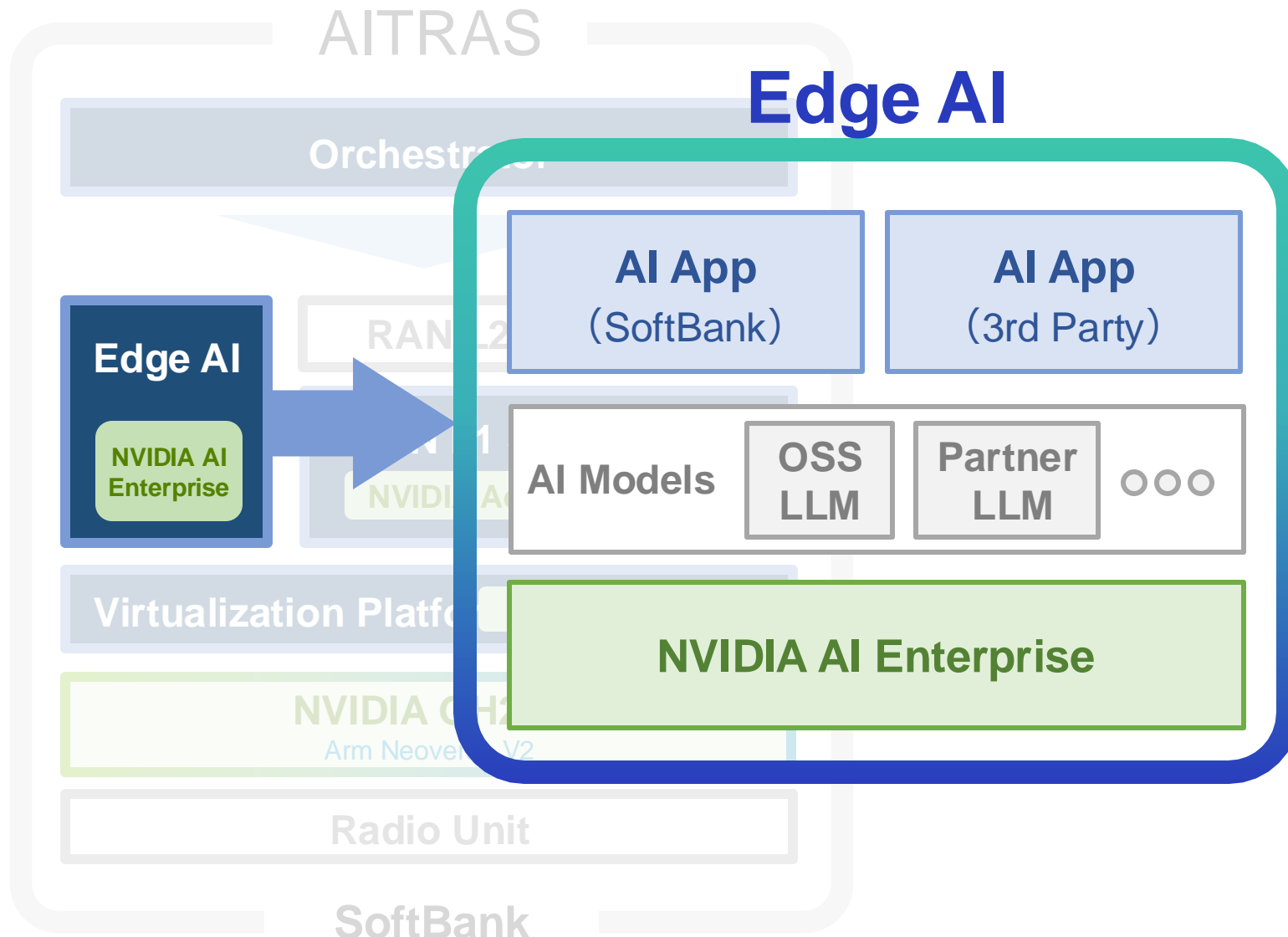
Keio University SFC

Takeshiba
(SB HQ)

AITRAS : Orchestrator Overview



AITRAS : Edge AI Overview



Original AI Service

- Autonomous driving monitoring app
- Cloud robot
- RAG Menu @edge, etc.

NVIDIA Serverless API

Spot allocation of available resources based on customer demand

NVIDIA AI Enterprise

Industry-standard AI framework

AITRAS Verification Lab Expansions

Keio University SFC

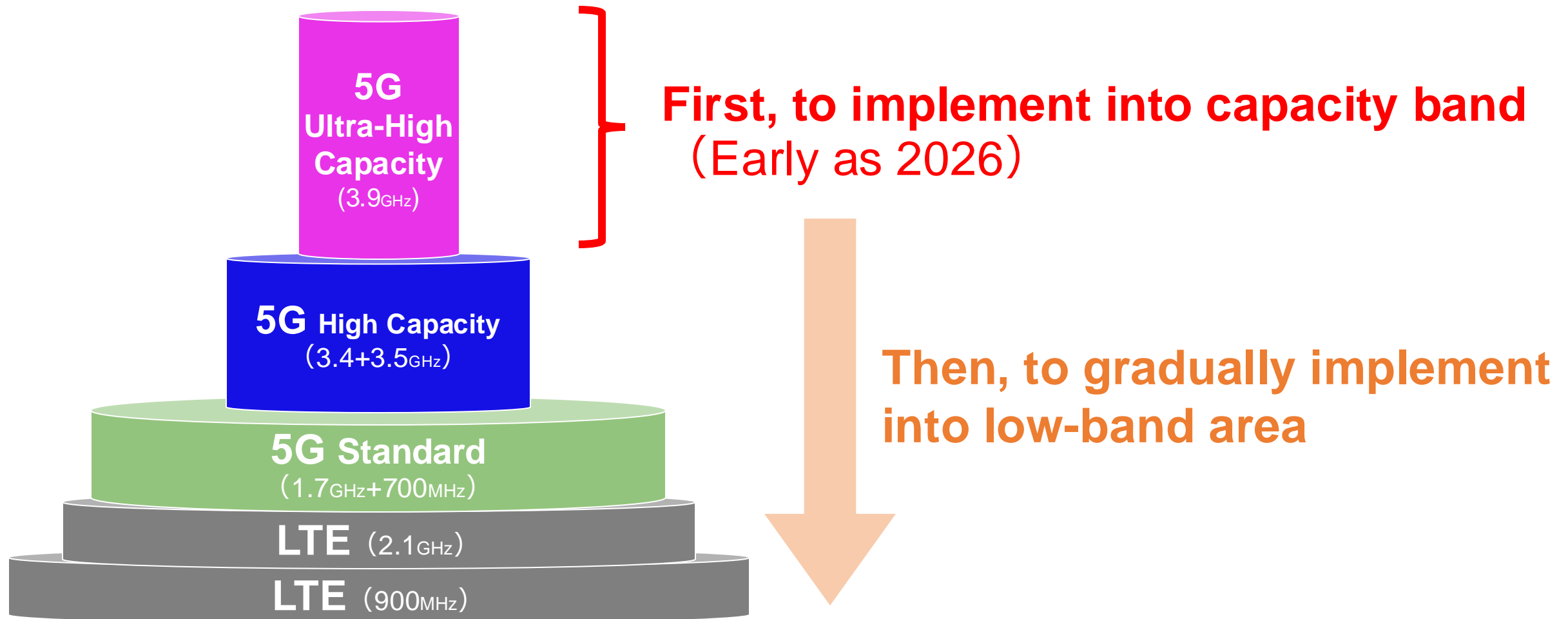


Dallas (US)



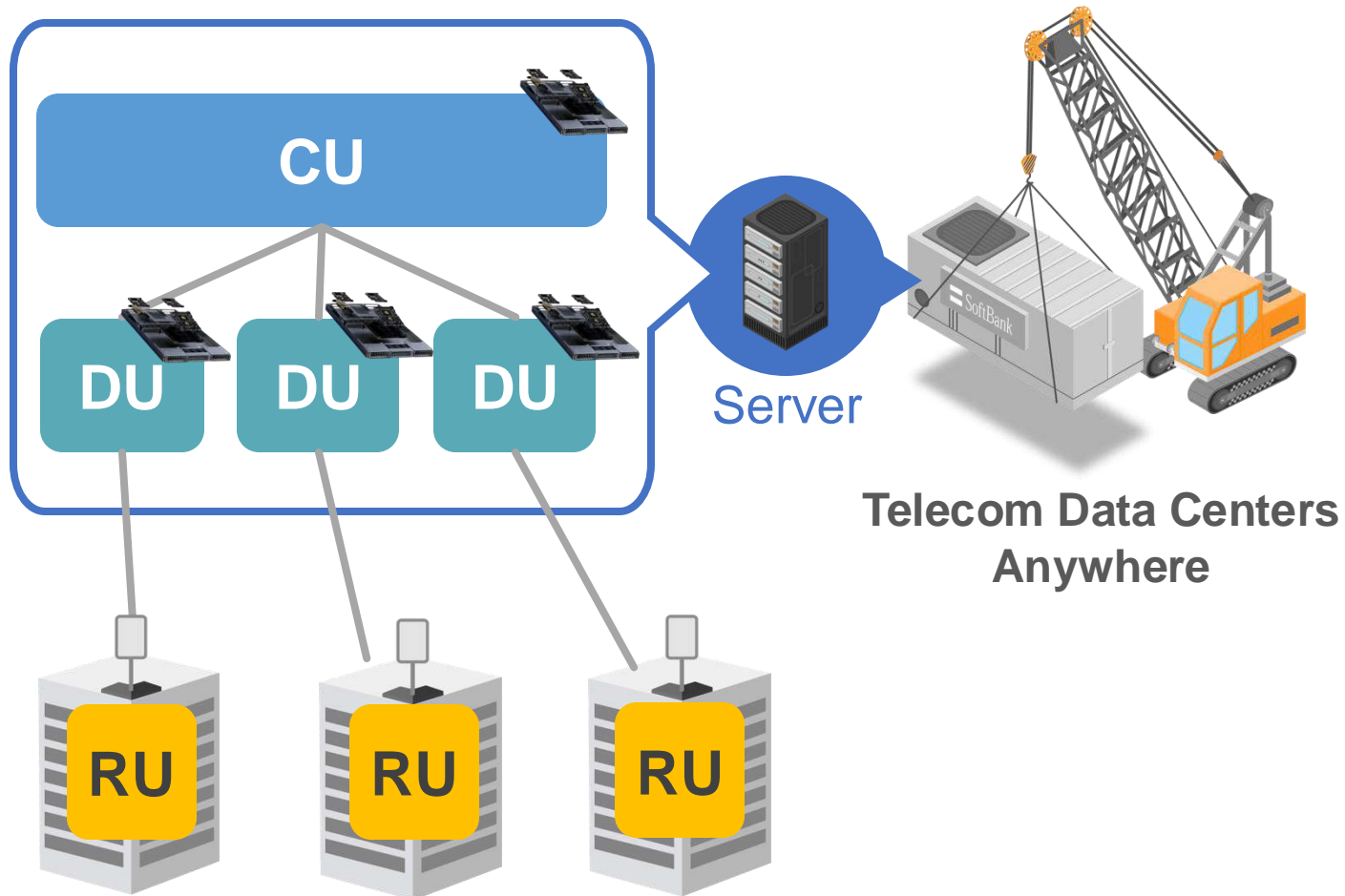
Details to be announced at a later date

AITRAS Roadmap

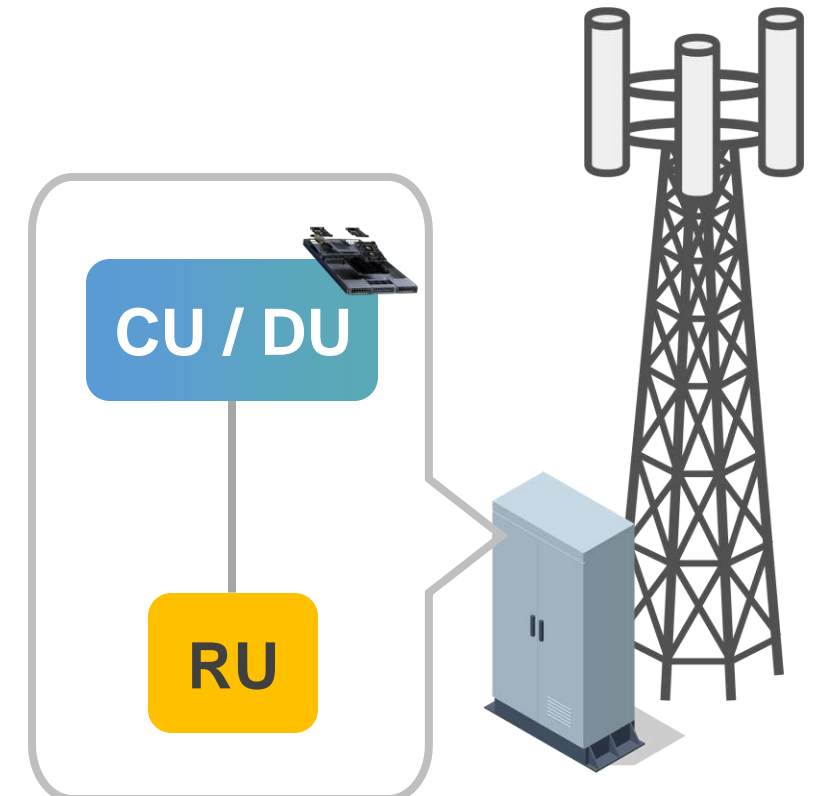


Capable of Realizing Both C-RAN & D-RAN SoftBank

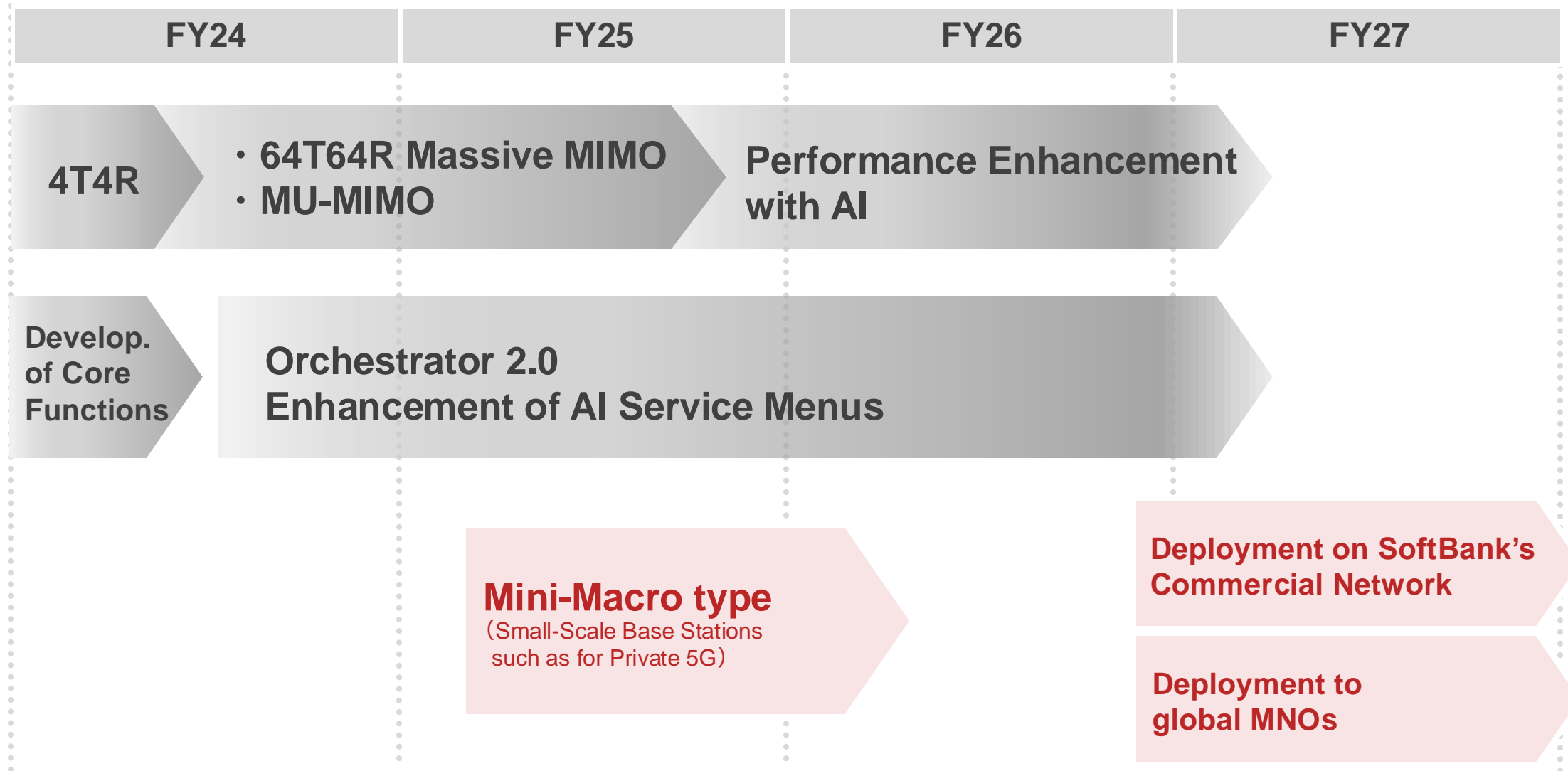
C-RAN



D-RAN



AITRAS Development Roadmap



SoftBank's Continued Commitment in Realizing AITRAS and AI-RAN



 SoftBank

Active Participation
in R&D Efforts for
O-RAN 2.0



 SoftBank

Newly Joined
(Platinum Member / Board)



 SoftBank

Appointment
to Chair

Accelerating Partnership Initiatives

**Accelerating collaboration
towards commercialization of AI-
RAN**



- Development towards commercialization (Migration to GB200-NVL2, etc.)
- Leading digital twin initiatives by utilizing Aerial Omniverse Digital Twin
- Cross-domain AI applications
- Leading AI-for-RAN initiatives

**Forming partnership
engagement towards realization
of AI-RAN**



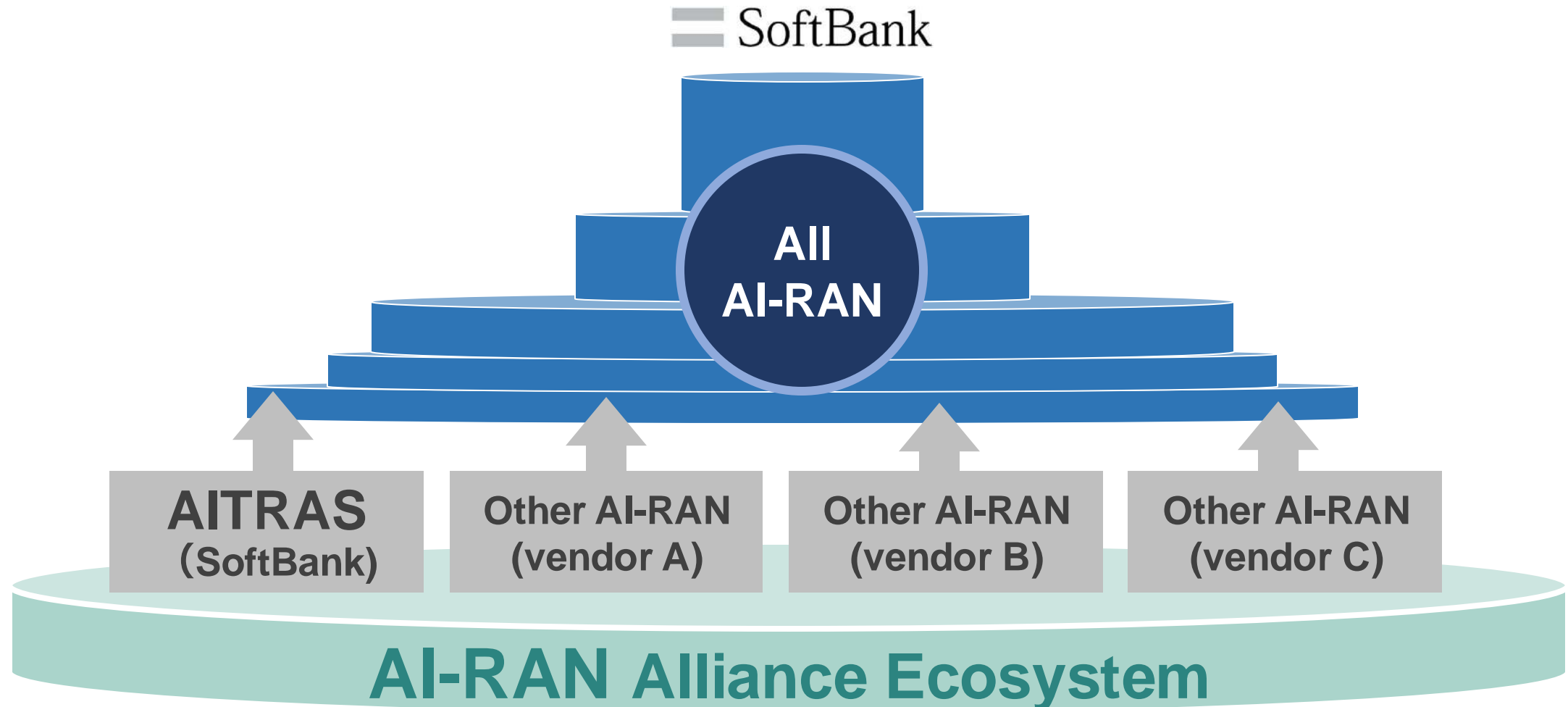
- Investigation of OSS use cases
- Optimization for architecture
- Computing resource management
- Provision of GPU
- Formation of joint project team

**Strengthening partnership
for realization of AI-RAN
commercialization**



- Establishment of verification lab at Fujitsu's US office
- Joint R&D of software to maximize AI-RAN performance

Beyond the Complete AI-RAN Transformation of Infrastructure



 SoftBank