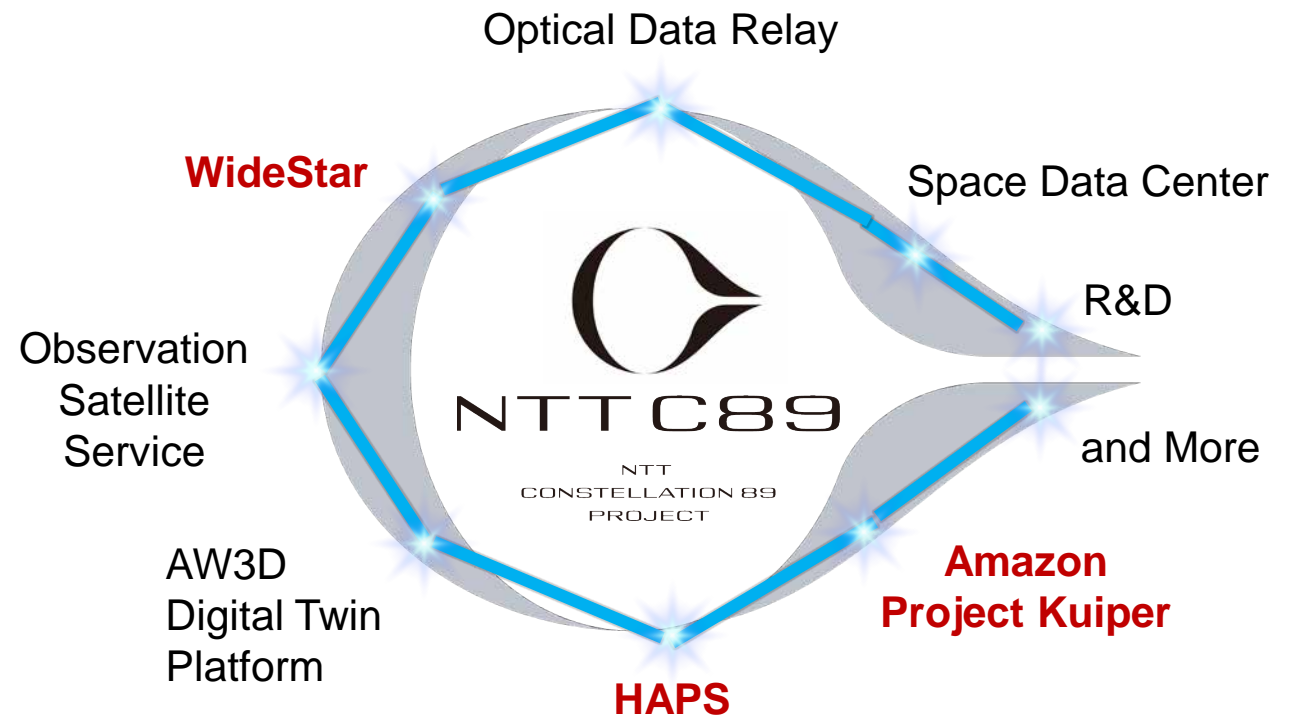


DOCOMO's NTN Initiatives for the 6G Era

Brightening today, guiding tomorrow

1. Constellations have always guided us, both past and present.
2. By connecting each NTT Group initiative (stars), we create the 89th new constellation.
3. NTT Group will become a modern constellation, contributing to the advancement of Japan's space industry.



DOCOMO is committed to expanding connectivity by delivering mobile communication services from the sky and space, ensuring seamless coverage even in the most remote areas.

Terrestrial Network (TN)

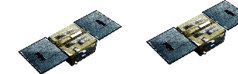


Non-terrestrial network (NTN)

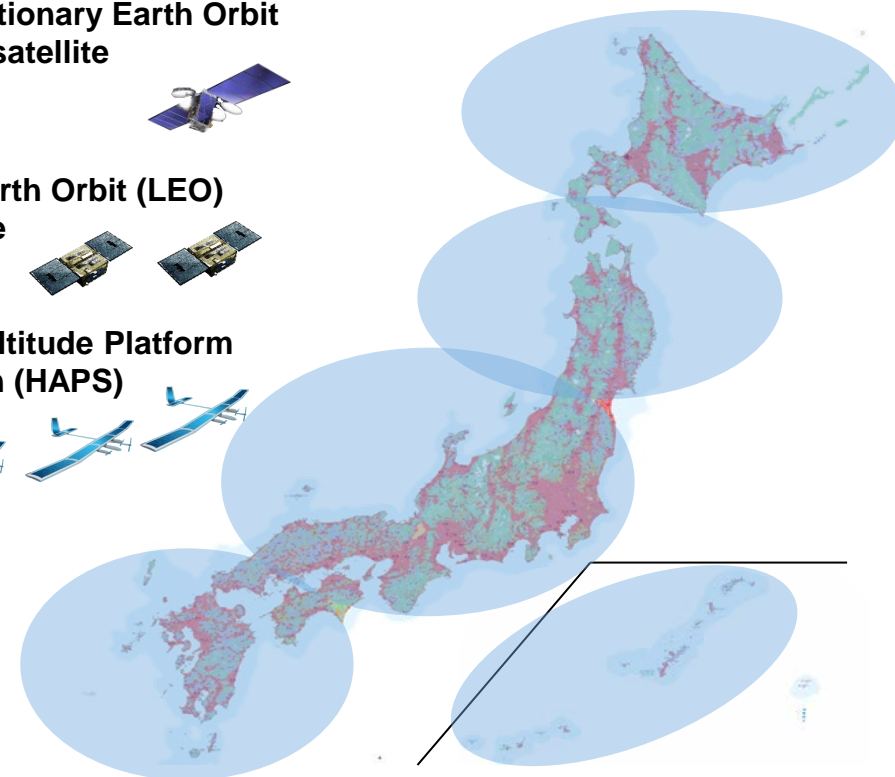
Geostationary Earth Orbit (GEO) satellite



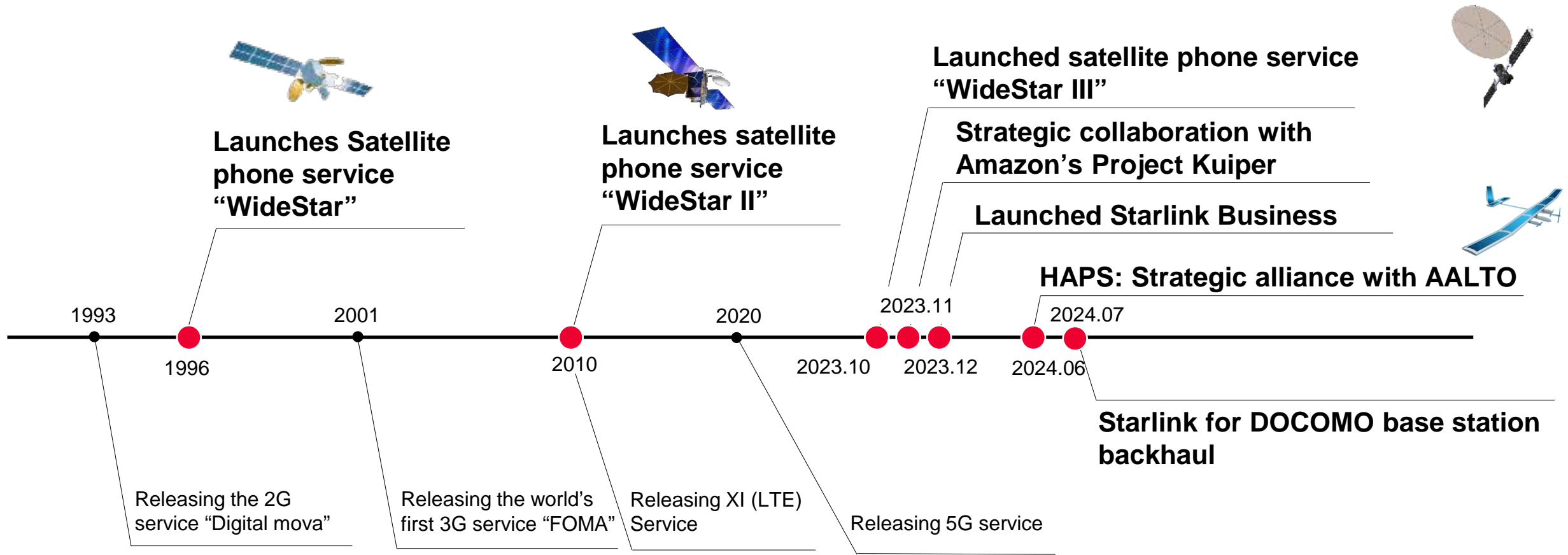
Low Earth Orbit (LEO) satellite



High Altitude Platform Station (HAPS)



DOCOMO has been offering WideStar as NTN service since 1996. From 2023, we have been releasing new services and signed partnerships for expanding NTN.



NTN Strategy Towards “Always Connected, Anywhere, Anytime”

With a unique multi-orbit approach integrating GEO, LEO, HAPS, and TN,
DOCOMO aims to realize seamless communication anytime, anywhere.

Coverage

Data

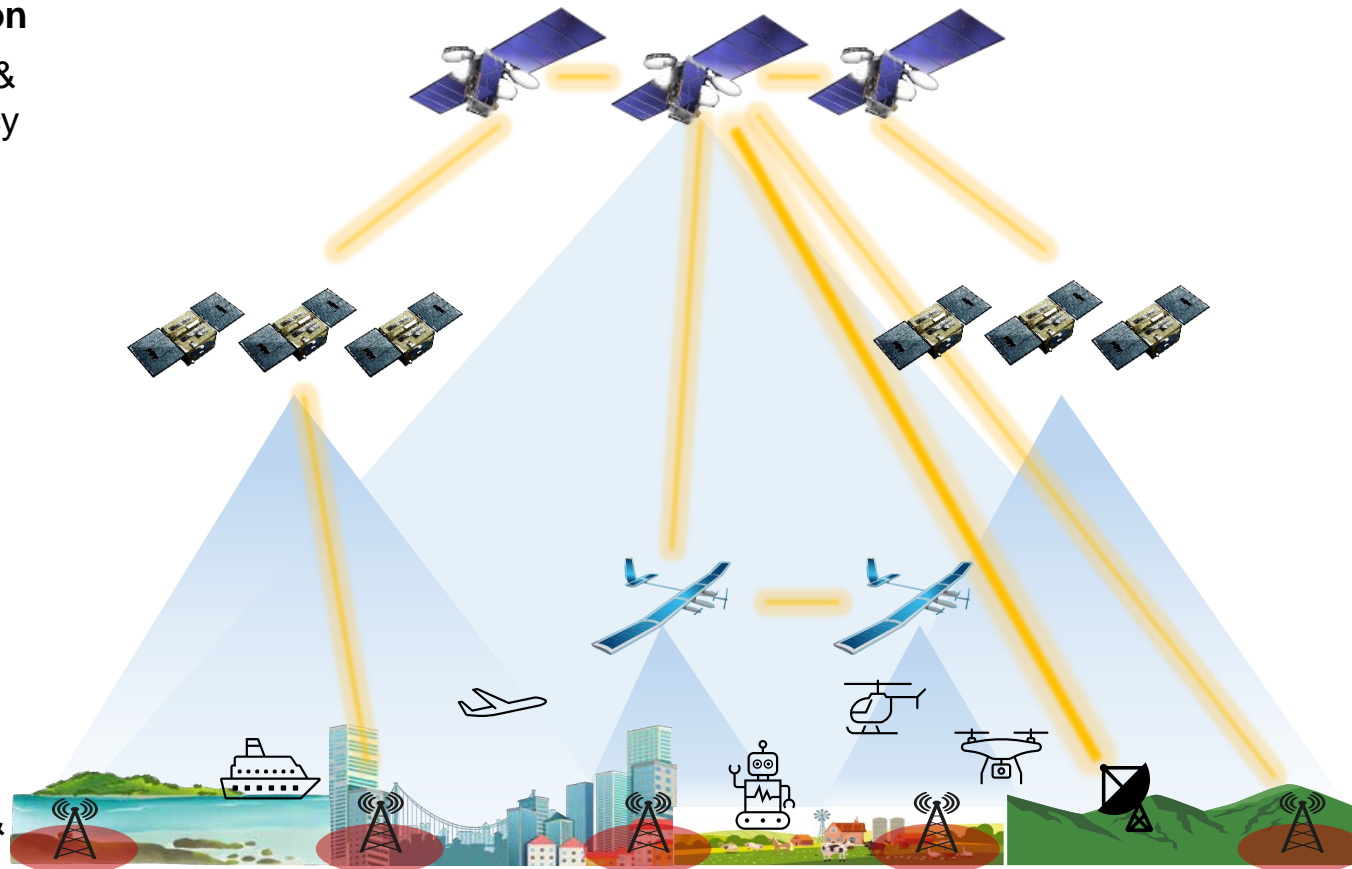
Transmission

Wide

Low Speed &
High Latency

Narrow

High Speed &
Low Latency



GEO

In Service: WIDESTAR

- Covers from land in Japan to the Exclusive Economic Zone (EEZ)
- Supports Global Maritime Distress and Safety System (GMDSS)

R&D on Optical Data Relay

LEO

In Service: Starlink business

On Going: Project Kuiper

HAPS

Conducting PoC toward commercialization

- Commercialization is planned to proceed gradually from low-latitude regions.

Terrestrial Network (TN)

HAPS operates in the stratosphere, delivering both communication and remote sensing services. Its key advantages include rapid deployment and the ability to provide temporary coverage in areas where it is needed.

HAPS

- Unanimated aircraft providing wide-area connectivity from stratosphere
- Operates in the stratosphere for ensuring communication and remote sensing

High Altitude Platform Station

Direct high-speed smartphone communication

Enabling low-latency, high-speed direct-to-smartphone connectivity

Service flexibility

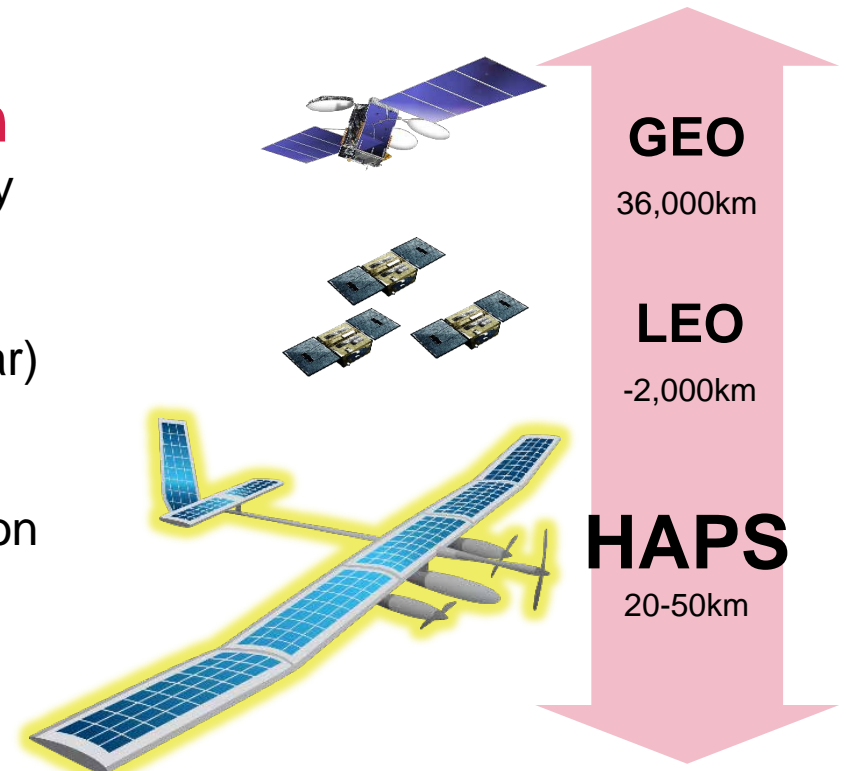
Swappable payloads (from 5G to 6G devices, optical camera, radar)

Easy transportability

Coverage in specific areas, such as disaster zones or event location

Environmentally friendly

100% solar-powered.



DOCOMO successfully conducted a flight and communication test for HAPS in Kenya in January to February 2025 and will conduct next test in Japan by 2026.

Successful Communication Test Between HAPS in the Stratosphere and the Ground

- Data link confirmed and achieving a communication speed(downlink) of 4.46 Mbps
- Communication test was succussed using specific message application.

Achieved High-Precision Flight

- To be flight stratosphere zone around 20km altitude (22.5km as maximum) during 13days

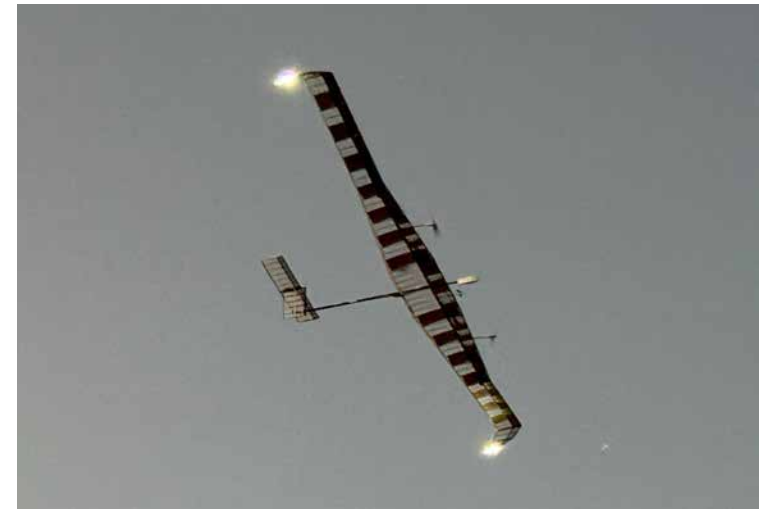
Ground Station Gateway



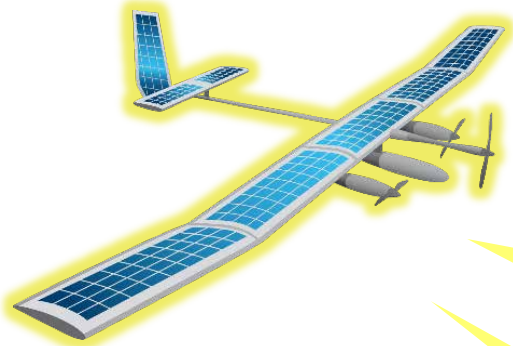
HAPS catapult



HAPS flight



HAPS payloads can be configured flexibly, which unlocks a wide range of applications beyond conventional communication and remote sensing.



Communication module

Infrastructure & Digital Transformation Promotion

Provides high-speed, low-latency direct communication to devices for disaster scenarios and/or communication infrastructure



Optical camera

Real-Time Observations

Real-time delivery of high-resolution observation data for monitoring and rescue support

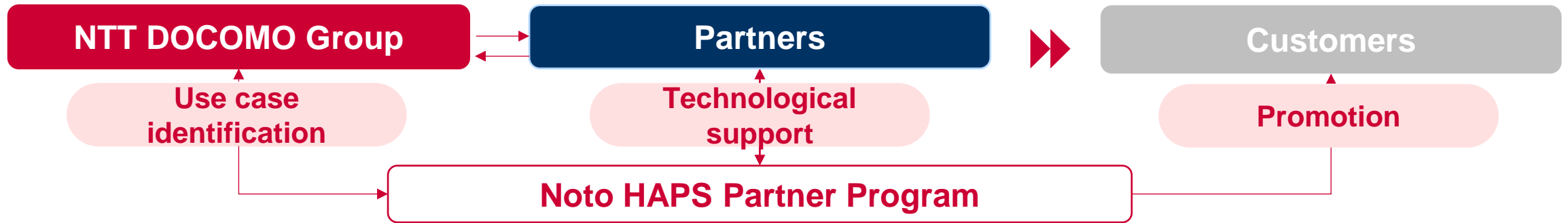


Sensor integration
(Under consideration)

Other specialized applications

Detect CO₂ levels, locate mineral veins and monitor illegal radio waves, etc.

In response to the devastating earthquakes in Noto Peninsula (Japan) and its ongoing recovery, DOCOMO is launching a collaborative initiative to leverage HAPS technology to enhance network resilience and drive industrial revitalization in Japan.



Launch Date	March 3, 2025
Application Method	Online application form
Target Participants	Enterprises, Universities, Research Institutions and Local Governments
Potential Partner	Komatsu Ltd. , National Institute of Informatics, and other companies are included
Planned Activities	<ul style="list-style-type: none"> • Research and deployment of HAPS & NTN. • Host visits to the on-site demonstrations of HAPS test flights. • Identify regional challenges and align them with potential solutions. • Organize workshops, lectures, and participate in a joint exhibitions.

Potential Partner List

- EARTHBRAIN Ltd.
- EXEO Group, Inc.
- Hakusan Inc.
- IT Disaster Assistance and Response Team
- Japan Advanced Institute of Science and Technology
- Kanazawa University Emerging Media Initiative
- Keio University Graduate School of Media Design Kato Network Media Project
- Kokusai Kogyo Co., Ltd.
- Komatsu Ltd.
- MIRAIT ONE Corporation
- National Institute of Informatics