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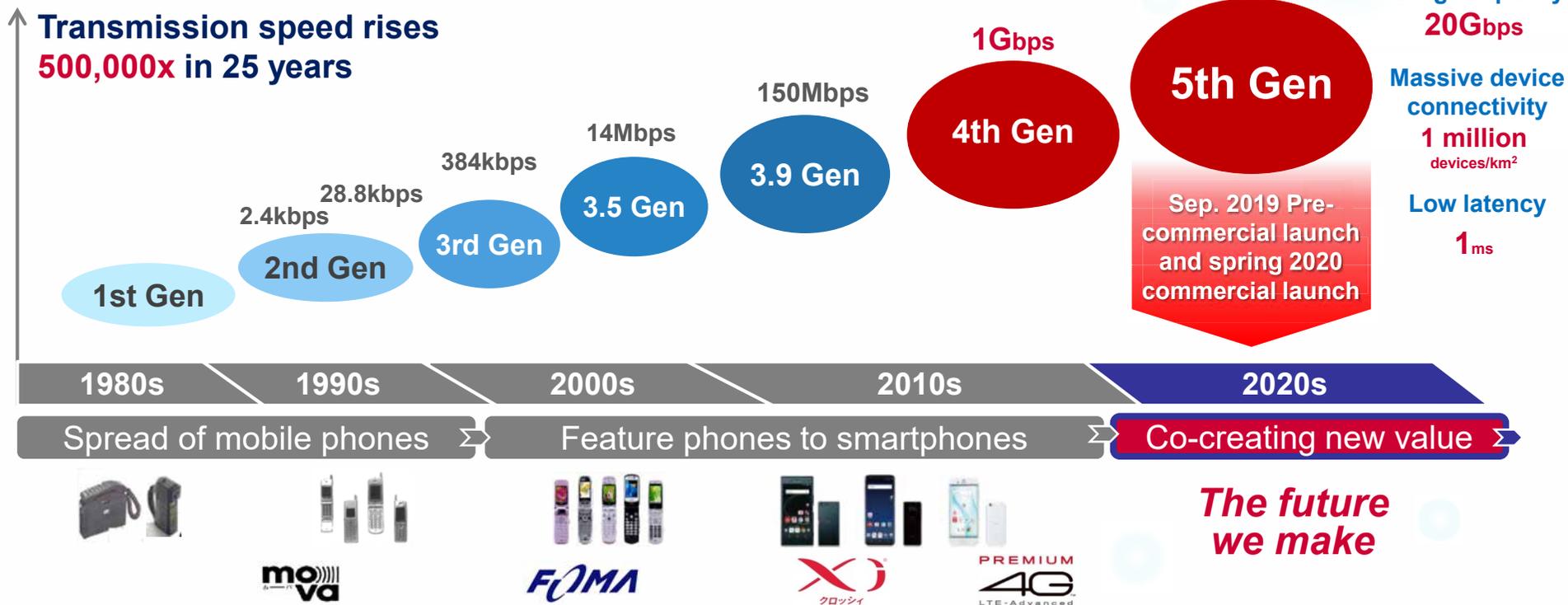
DOCOMO 5G

»5G

DOCOMO's 5G Strategy

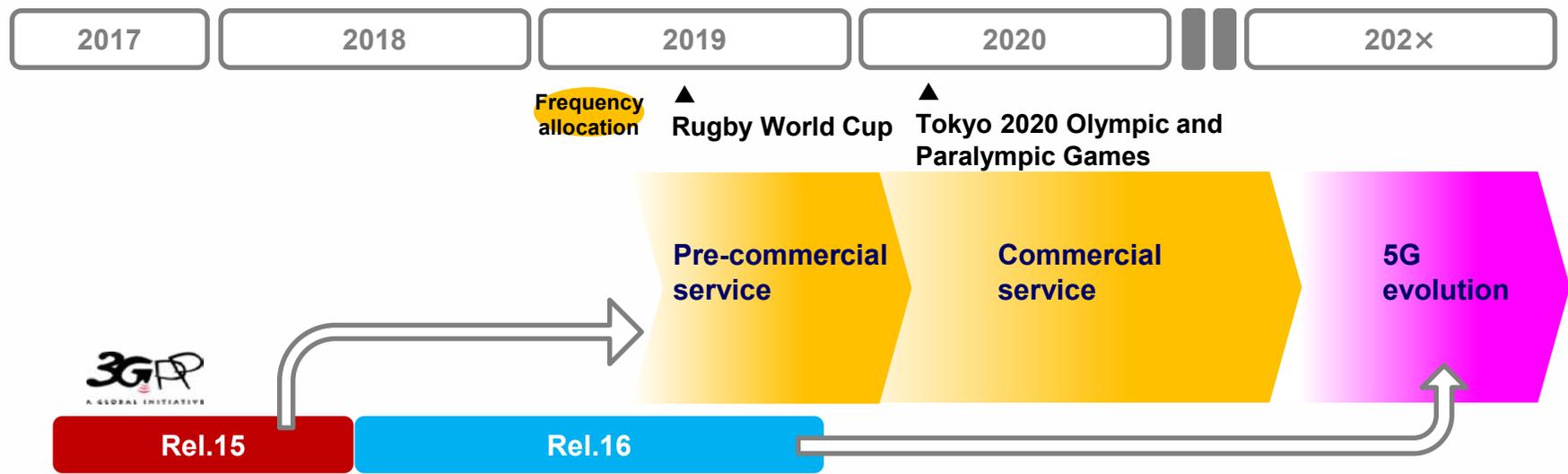
Evolution of Mobile Networks

Advancing high-speed wireless communications to meet market needs



5G Service Rollout

Sep. 2019 pre-commercial launch and early 2020 commercial launch

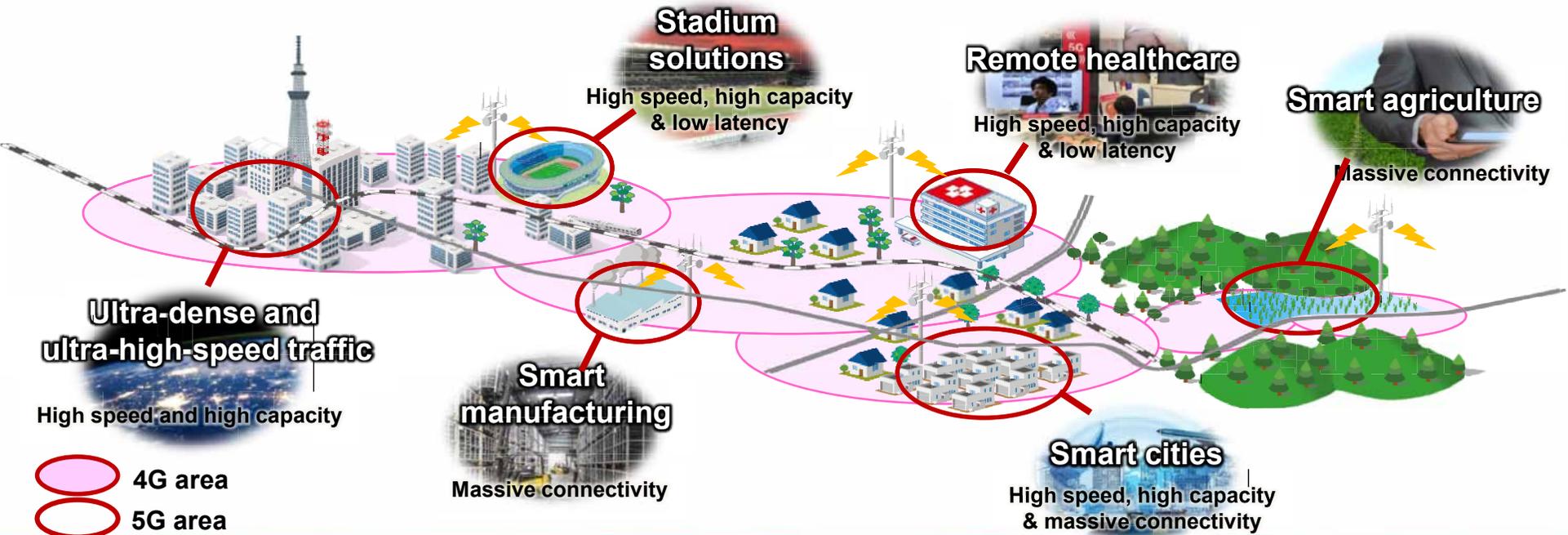


NTT DOCOMO, INC. is a Gold Partner (telecommunications services) for the Tokyo 2020 Olympic and Paralympic Games.

Concept of 5G Service Deployment

Functions and frequency bands as needed

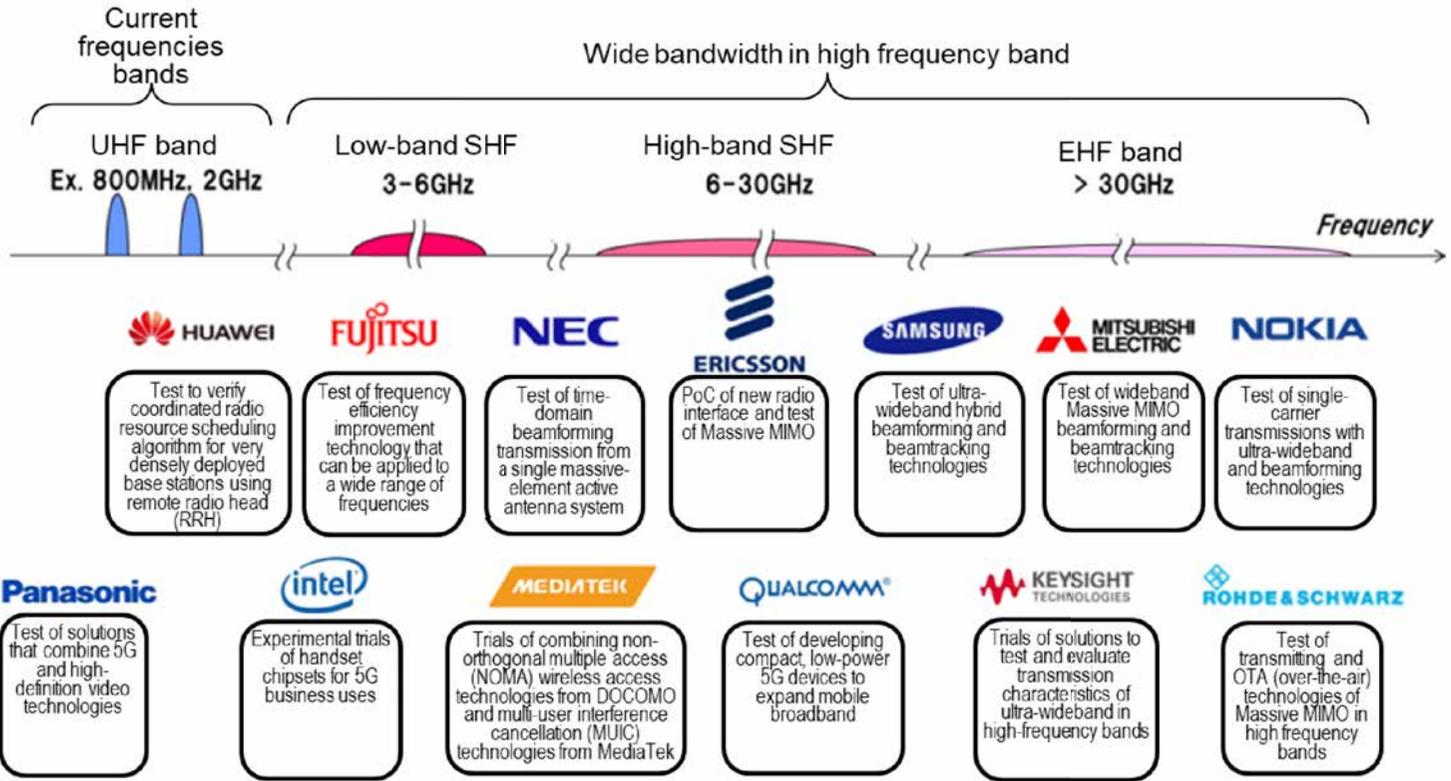
- In areas of high data traffic
- For new solutions and businesses



DOCOMO's Contribution Towards the Realization of 5G

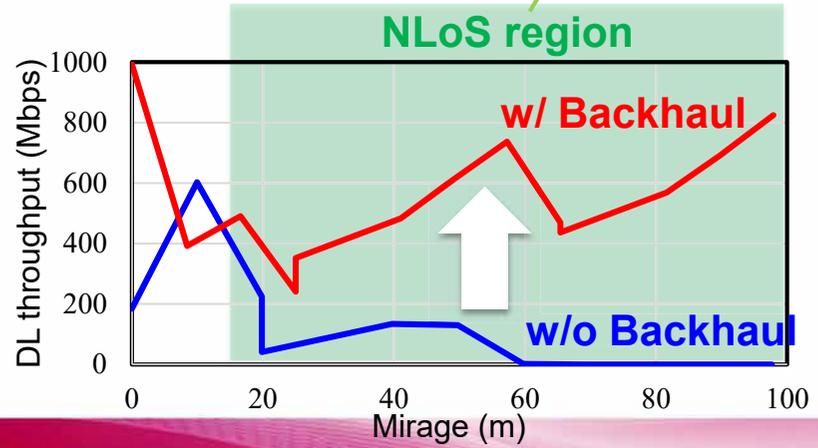
Field Trials with Major Vendors

Trialing 5G technologies with diverse partners for global standardization

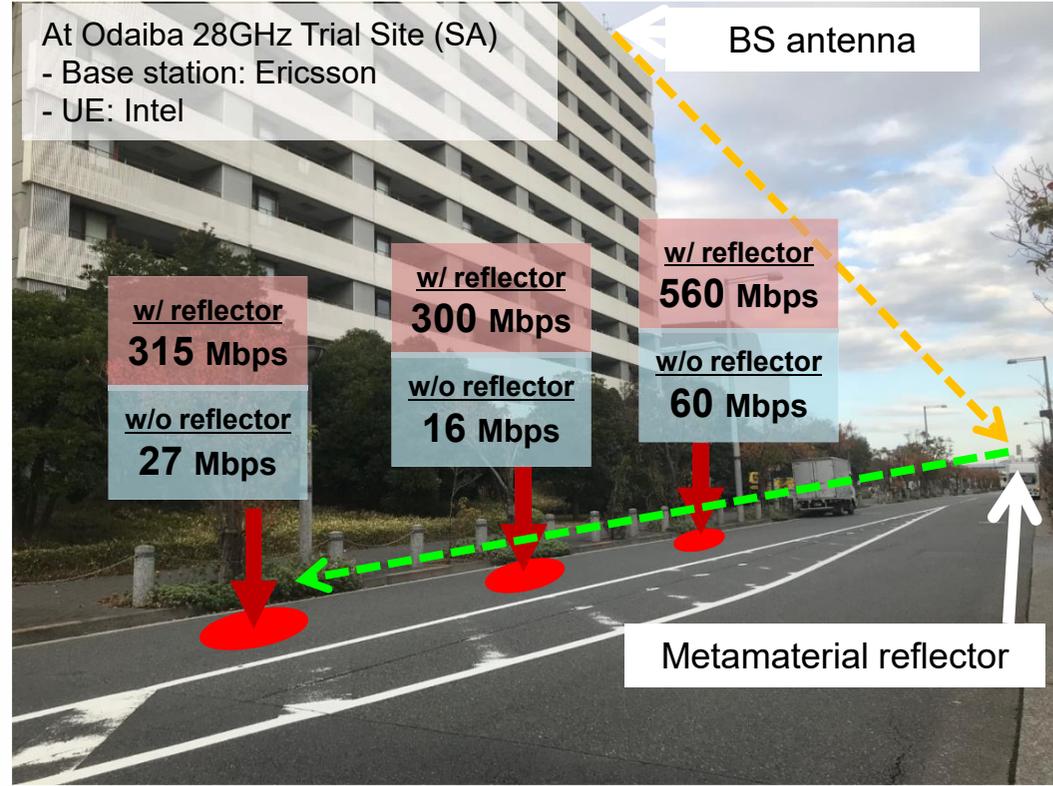
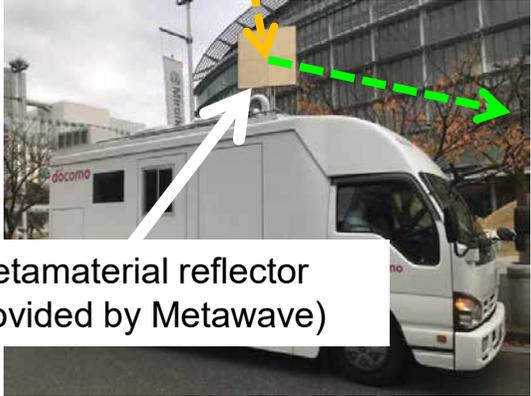
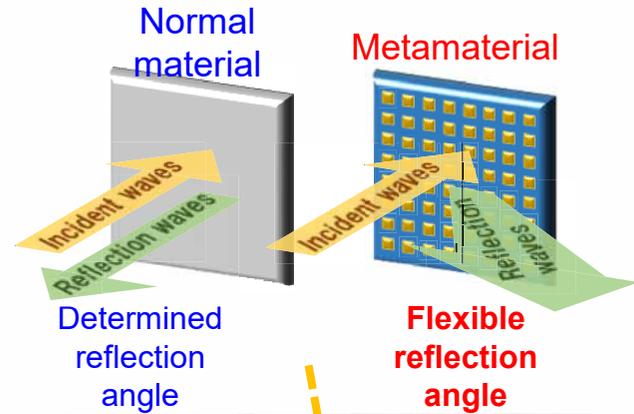


Trial 1: 5G Coverage Expansion Using Wireless Backhaul

5G remote base station using wireless backhaul (NEC PASOLINK) to improve coverage in Odaiba 28GHz Trial Site

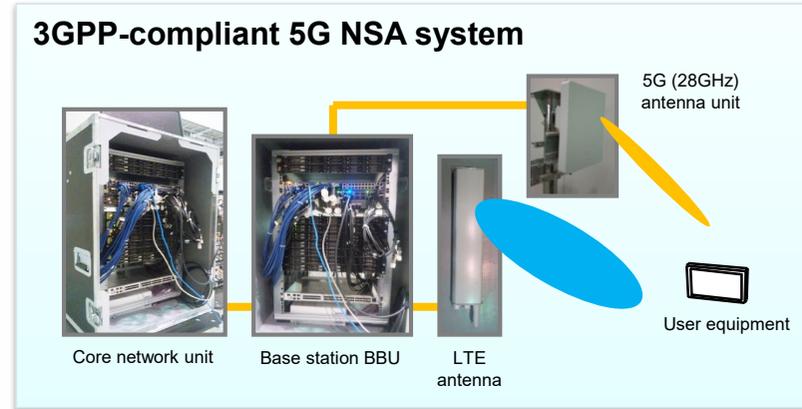


Trial 2: 5G Coverage Compensation using Metamaterial



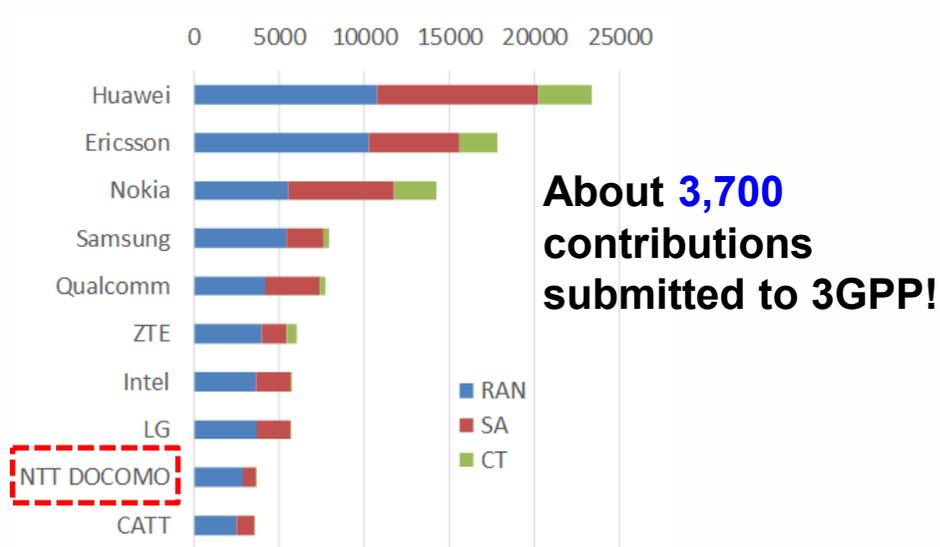
Trial 3: NSA System Tests in Urban Environment

- 5G transmission with 3GPP-compliant 5G non-standalone (NSA) system to be tested in Japan
- Uses 400MHz at 28GHz and 100MHz at 4.8 GHz for 5G
- Tested for urban use at 5G Trial Site in Odaiba
- Base station with Massive MIMO antenna used to test beamforming and beamtracking
- Hand-held 5G mobile station used to verify transmission and multi-access for practical use



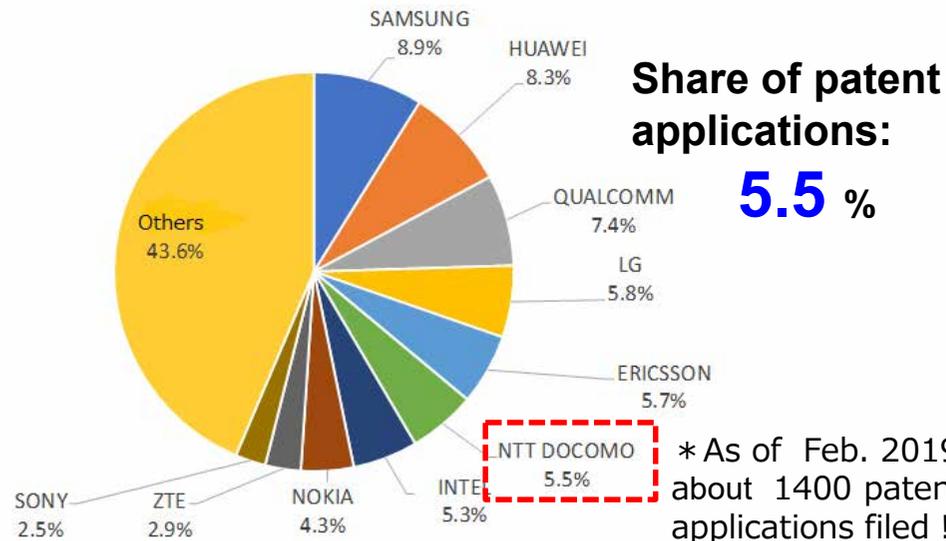
Contributions to 5G standardization under 3GPP

DOCOMO is the world's leading mobile operator in 5G-related patent applications and 3GPP submissions for the development of 5G technologies



About **3,700** contributions submitted to 3GPP!

5G contributions to 3GPP



Share of patent applications:
5.5 %

* As of Feb. 2019, about 1400 patent applications filed !

Top 5G-SEP candidate applicants

Source: Cyber Creative Institute Co. Ltd. (<https://www.cybersoken.com/file/press190206eng.pdf>)

Co-creation Initiatives

Co-creation with Partners

Since May 2017

5G trial sites

SPORTS AR/multi-view demonstrations	GAMES VR game playing/watching
	

106 trials underway for new 5G services

Since Feb. 2018

»5G **DOCOMO 5G Open Partner Program**

5G workshops

5G technological verification centers (DOCOMO 5G Open Labs) in Tokyo, Osaka and Okinawa

Provision of latest 5G information

2,000 participating companies & organizations

Deployment of 5G services



DOCOMO 5G Open Lab™ / DOCOMO 5G Open Cloud™

Providing latest 5G technologies and specifications to co-develop new solutions

DOCOMO 5G Open Lab™



DOCOMO 5G Open Lab™
Yotsuya

4K-video streaming system

Comparisons of 4K high-definition video and 5G streaming using encoder/decoder

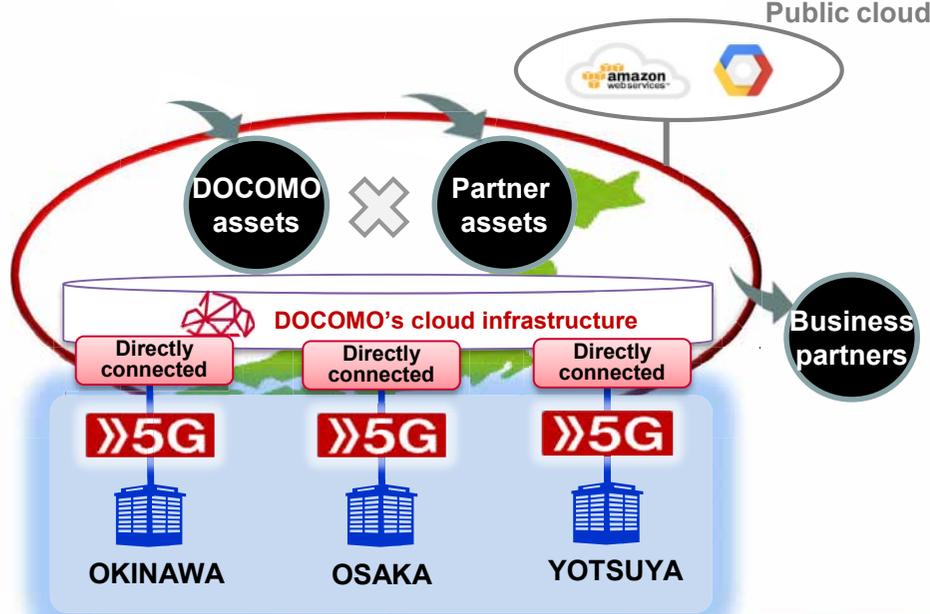


High-definition VR system

Testing high-definition VR, including live video streaming in 8K/4K, via high-speed, large-capacity 5G



DOCOMO 5G Open Cloud™



Industries Participating in Open Partnership

- 5 % Others
- 3 % Medical
- 3 % Infrastructure
- 4 % Transportation
- 4 % Construction
- 4 % Local governments
- 5 % Finance/Insurance
- 12 % Media



- 24 % Services
- 21 % Retail/Restaurants
- 15 % Manufacturing

Examples of Co-created Solutions

Healthcare



Diagram illustrating a healthcare solution using 5G. It shows a hospital scene on the left and a control room with multiple monitors on the right, connected by a red box with '5G' and double arrows.

Factories & hazardous work

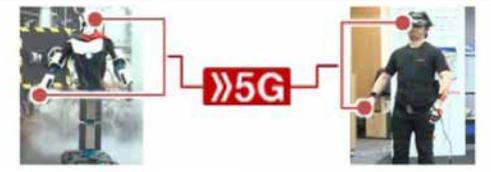


Diagram illustrating a factory and hazardous work solution using 5G. It shows a robot in a hazardous environment on the left and a worker in a control room on the right, connected by a red box with '5G' and double arrows.

Workstyle reform

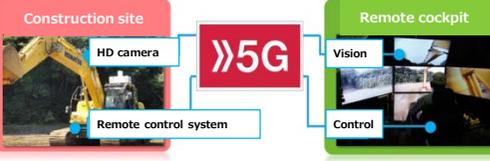


Diagram illustrating a workstyle reform solution using 5G. It shows a construction site with an excavator on the left and a remote cockpit with vision and control screens on the right, connected by a red box with '5G' and double arrows.

Regional stimulation

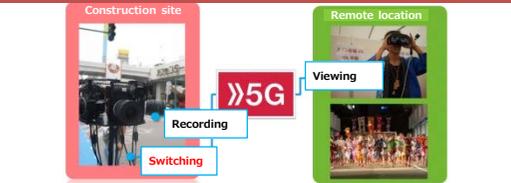


Diagram illustrating a regional stimulation solution using 5G. It shows a construction site with recording and switching equipment on the left and a remote location with viewing equipment on the right, connected by a red box with '5G' and double arrows.

Tourism



Diagram illustrating a tourism solution using 5G. It shows a large transmission room with an OLED screen on the left and an avatar robot with a 360-degree 4K camera on the right, connected by a red box with '5G' and double arrows.

Disaster preparedness

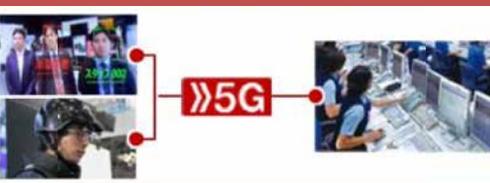


Diagram illustrating a disaster preparedness solution using 5G. It shows a control room with multiple monitors on the left and a person in a control room on the right, connected by a red box with '5G' and double arrows.

Education



Diagram illustrating an education solution using 5G. It shows a classroom scene with a teacher and students on the left and a student using a laptop on the right, connected by a red box with '5G' and double arrows.

Mobility



Image of a self-driving bus labeled "Hello!".

Sports

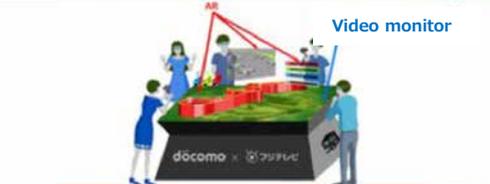
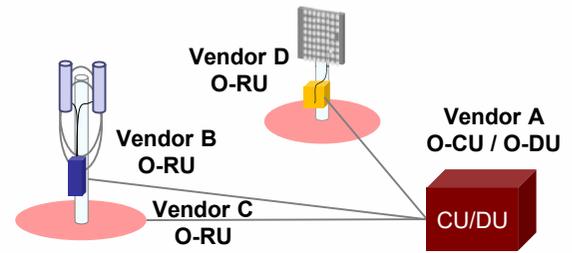


Diagram illustrating a sports solution using 5G. It shows a video monitor displaying a sports scene on the left and a person in a control room on the right, connected by a red box with '5G' and double arrows.

O-RAN fronthaul interface compliant implementations

Multi-vendor interoperable open fronthaul interface



Product development started and tests planned

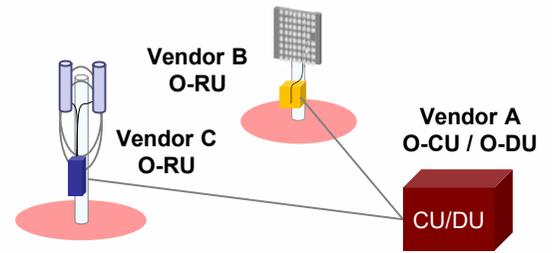


Multi-vendor interoperability testing underway

Test with	O-CU/O-DU and O-RU vendor pair	Status
		<p>completed</p> <p>completed</p>
		<p>ongoing</p> <p>Initial IOT done</p> <p>And much more being planned</p>

O-RAN fronthaul interface compliant implementations

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NOKIA

SOLiD TECHNOLOGIES

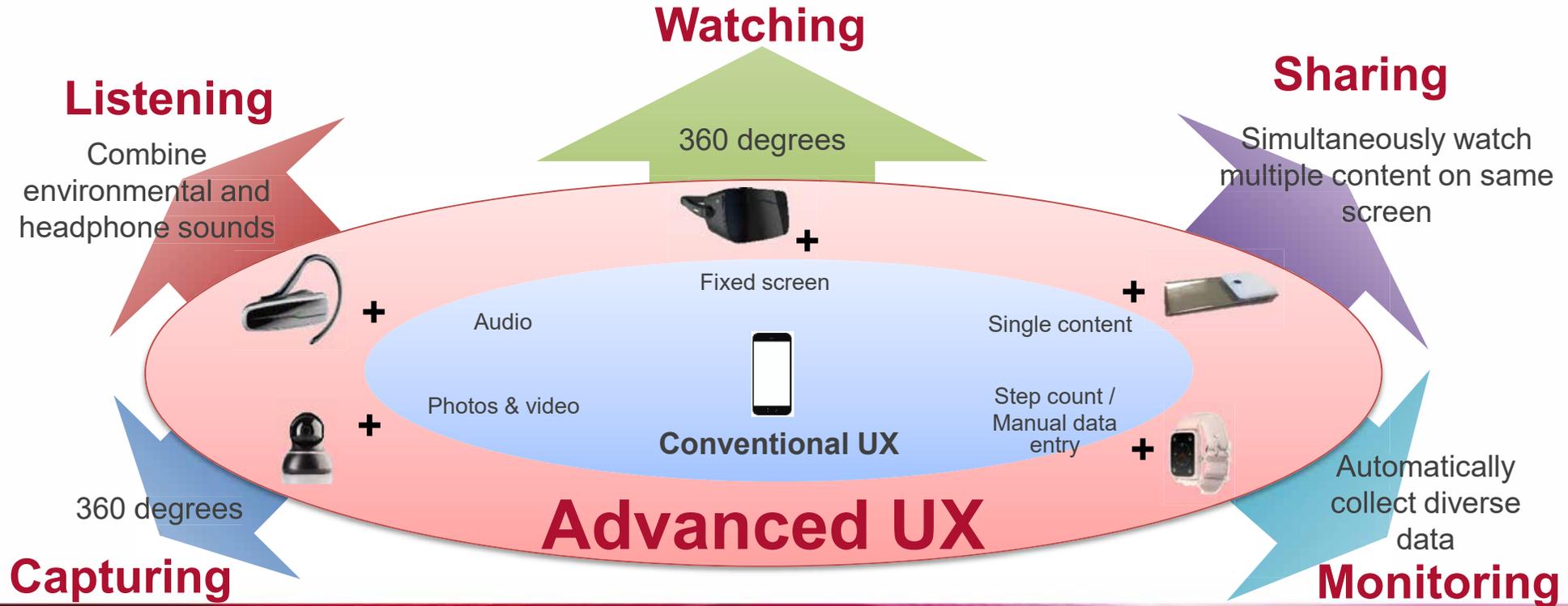
completed
completed
ongoing

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And much more being planned



Advanced User Experiences (UX) with Peripherals through 5G



The Road Ahead

5G Pre-commercial Service Launch (Sep. 2019)

Examples: Stadium solutions (New watching style of sports)

Watching at stadium



Public viewing



Public viewing site

Sharing experiences



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