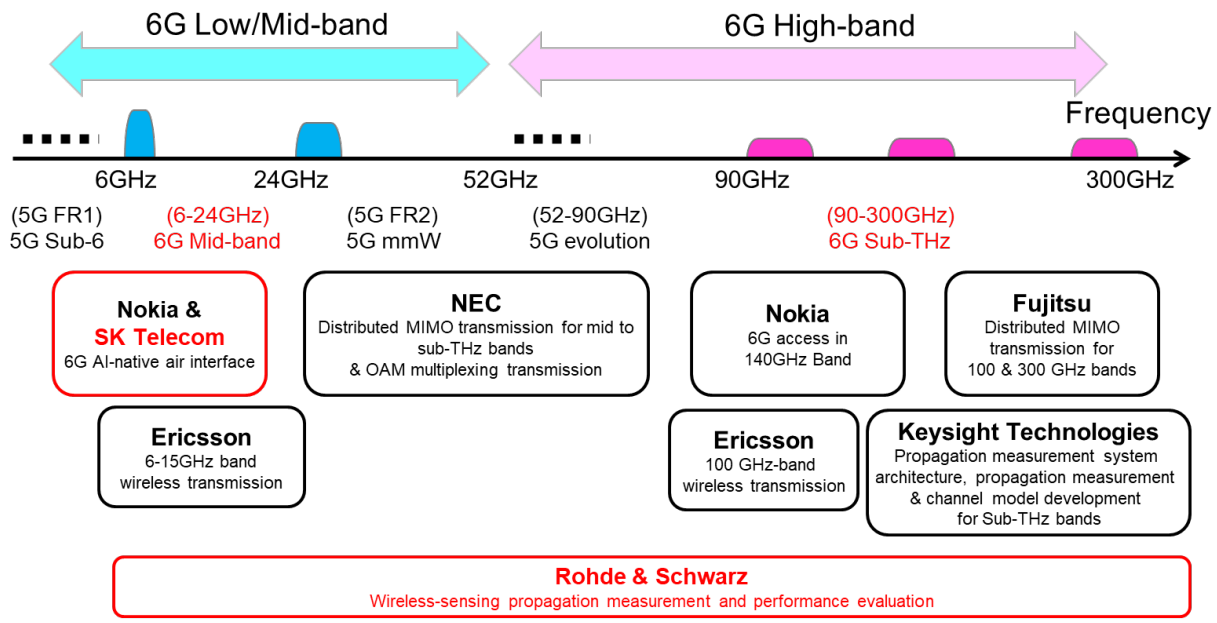
DOCOMO and NTT Expand 6G Collaborations with SK Telecom and Rohde & Schwarz

-Highlighting trial progress with Nokia, Fujitsu and Keysight Technologies-

Tokyo, February 22, 2024—NTT DOCOMO, INC. (DOCOMO) and NTT Corporation (NTT) announced today that they have added two new global partners to their collaborative 6G trials with the world's leading vendors and global operators: SK Telecom Co., Ltd (SK Telecom), a telecom operator, and Rohde & Schwarz GmbH & Co. KG (Rohde & Schwarz), a manufacturer of high-frequency high-performance measurement instruments.

The two new companies join existing collaborators[1,2] Fujitsu Limited (Fujitsu), NEC Corporation (NEC), Nokia, Ericsson and Keysight Technologies, Inc. (Keysight Technologies) to expand the joint effort with DOCOMO and NTT to seven companies participating in trials of potential frequency bands for 6G telecommunications.

The details of the cooperation between the two newly added companies are as follows. As part of its technical collaboration[3] with DOCOMO and NTT, SK Telecom will participate in trials using AI technology to tailor radio interfaces for various propagation environments, which is being conducted jointly by DOCOMO with NTT and Nokia. The trial will now be expanded to include environments closer to envisioned uses, leveraging SK Telecom’s expertise as a telecom operator and ecosystem creator, similar to DOCOMO. In addition, Rohde & Schwarz will use its measurement-system design technology in channel models to evaluate new wireless-sensing solutions beyond mobile communication technologies, and evaluate wireless-sensing performance using measurements and channel models in real-world environments.



Trials with seven collaborators, including two new companies

Separately, DOCOMO and NTT also announced the results of trials[4,5] using new wireless communication technologies and AI, which have been conducted since June 2022. This time, we achieved the following new results.

Nokia: Trial of wireless access technology for 140GHz

Results

Beamforming trials were successfully conducted using Nokia's 140GHz-band radio system prototype and a 128-element phased-array antenna[6] in Japan, confirming the effectiveness of phased-array beam steering in different directions to achieve good reception when the receiver is moving.

Future Plans

Further trials will focus on more specific applications to confirm the practicality of sub-terahertz (sub-THz) signals[7] in indoor environments.

Fujitsu: Trial of distributed MIMO at 100GHz and 300GHz

Results

The trial successfully acquired propagation channel information equivalent to a distributed MIMO system using Fujitsu's 100GHz phased-array antenna prototype and wireless circuit.

Future Plans

Simulations will be performed to analyze factors such as shielding resistance and distributed MIMO characteristics.

Keysight Technologies: Architecture for sub-THz propagation

measurement, propagation measurement and channel model formulation

Results

A device for real-time visualization of the spatial arrival of sub-THz radio waves was successfully realized by combining an 896-element super multi-element antenna developed by NTT and a receiving signal analyzer developed by Keysight Technologies. Also, combining a SISO channel sounder developed mainly by DOCOMO and a signal transceiver built by Keysight Technologies enabled ultra-high-resolution observation of the temporal arrival of sub-THz signals. Using these equipments, DOCOMO and NTT have successfully conducted radio propagation experiments for ultra-broadband communications in the sub-THz band.

Future Plans

Channel models with dynamic tracking capabilities in real-world environments will be further developed for the design of an efficient ultra-wideband 6G communication system.

Going forward, DOCOMO and NTT will continue to conduct trials in collaboration with major global and Japanese vendors as well as overseas telecom operators. They will further expand their partners and promote various initiatives that leverage their respective strengths, to research and develop various mobile communication technologies. Through these efforts, DOCOMO and NTT aim to accelerate research and development that will contribute to the global standardization and commercialization of 6G.

Various trials mentioned above will be showcased at DOCOMO's booth at MWC Barcelona 2024 in Barcelona, Spain, starting February 26.

*For reference: SK Telecom and Nokia held press releases at the same time today.
Press Release (SK Telecom): SKT, DOCOMO, NTT and SKT team up to implement AI in the 6G air interface
(https://www.sktelecom.com/en/press/press_detail.do?idx=1602)
Press Release (Nokia): Nokia, SKT, NTT and DOCOMO team up to implement AI in the 6G air interface
(https://www.nokia.com/about-us/news/releases/2024/02/22/nokia-skt-ntt-and-docomo-team-up-to-implement-ai-in-the-6g-air-interface-mwc24/)

[1] DOCOMO and NTT to Collaborate on 6G Experimental Trials with World-leading Mobile Technology Vendors
https://group.ntt/en/newsrelease/2022/06/06/220606a.html
[2] DOCOMO and NTT Expand 6G Collaborations with World-leading Vendors Including Ericsson and Keysight Technologies

https://group.ntt/en/newsrelease/2023/02/27/230227a.html

[3] DOCOMO and SK Telecom to Collaborate on Technological Advancement of Metaverse, Digital Media and 5G/6G
https://www.docomo.ne.jp/english/info/media_center/pr/2022/1121_00.html

[4] World's first successful demonstration of distributed MIMO that continues wireless connections in the 28 GHz band by eliminating shielding issues
https://group.ntt/en/newsrelease/2022/10/31/221031a.html

[5] Nokia, DOCOMO and NTT make two key 6G advances #MWC23
https://www.nokia.com/about-us/news/releases/2023/02/15/nokia-docomo-and-ntt-make-two-key-6g-advances-mwc23/

[6] The phase of multiple antenna elements was controlled to orient the antenna's directionality towards location of the receiver.

[7] 90 to 300GHz bands, which are more directional and susceptible to shielding by obstacles than 5G Evolution millimeter waves.

About NTT DOCOMO

NTT DOCOMO, Japan's leading mobile operator with over 89 million subscriptions, is one of the world's foremost contributors to 3G, 4G and 5G mobile network technologies. Beyond core communications services, DOCOMO is challenging new frontiers in collaboration with a growing number of entities ("+d" partners), creating exciting and convenient value-added services that change the way people live and work. Under a medium-term plan toward 2020 and beyond, DOCOMO is pioneering a leading-edge 5G network to facilitate innovative services that will amaze and inspire customers beyond their expectations.
https://www.docomo.ne.jp/english/

About NTT

NTT contributes to a sustainable society through the power of innovation. We are a leading global technology company providing services to consumers and business as a mobile operator, infrastructure, networks, applications, and consulting provider. Our offerings include digital business consulting, managed application services, workplace and cloud solutions, data center and edge computing, all supported by our deep global industry expertise. We are over $97B in revenue and 330,000 employees, with $3.6B in annual R&D investments. Our operations span across 80+ countries and regions, allowing us to serve clients in over 190 of them. We serve over 75% of Fortune Global 100 companies, thousands of other enterprise and government clients and millions of consumers.
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