# NTT DOCOMO Technical Journal Vol.23 No.2 | Oct. 2021

\_

 $\succ$ 

 $\bigcirc$ 

# DOCOMO Today

• Evolution of Al Services in the 5G Era

#### **Technology Reports (Special Articles)**

# Special Articles on 5G evolution & 6G (1)

- Trends and Target Implementations for 5G evolution & 6G
- Research of Transparent RIS Technology toward 5G evolution & 6G
- Research on NTN Technology for 5G evolution & 6G
- Improving Communication Performance in High-Mobility Environments by Millimeter-Wave Base Station Cooperation for 5G evolution

## **Technology Reports**

- Migrating an Agile Application Development System to an Efficient Remote Work Environment

   A Case Study
- Study on Practical Application of the Touchless Function to Osaifu-Keitai Using UWB Ranging Technology





# [Contents]



1

14

Evolution of AI Services in the 5G Era Ken Ohta

# **Technology Reports (Special Articles)** Special Articles on 5G evolution & 6G (1)

Trends and Target Implementations for 5G evolution & 6G \_\_\_\_\_

5G evolution & 6G Requirements Wireless Technology

Research of Transparent RIS Technology toward 5G evolution & 6G

Research on NTN Technology for 5G evolution & 6G 24

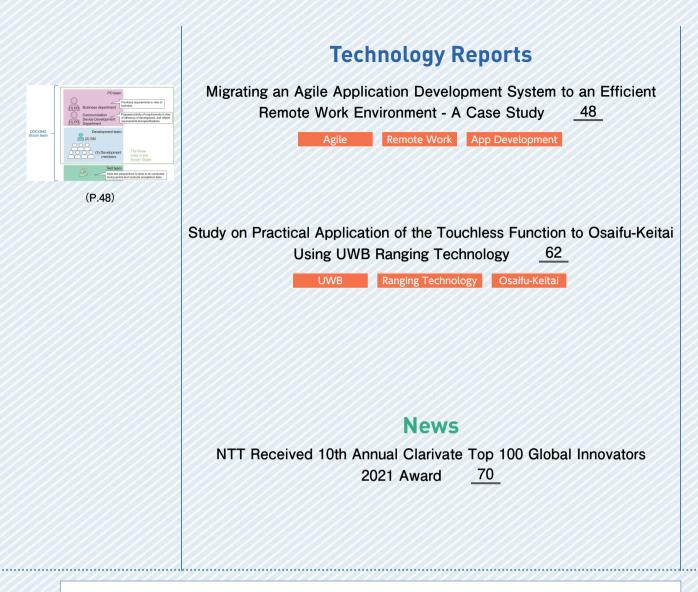
NTN HAPS Extreme Coverage Extension

(P.24)

(P.14)

Improving Communication Performance in High-Mobility Environments by Millimeter-Wave Base Station Cooperation for 5G evolution <u>38</u>

Digital Beamforming Base Station Cooperation Outdoor Experimental Trials



DOCOMO 5G (FRA)       Presentation at an early concept conference       DOCOMO 5G (FRA)       DOCOMO 5G (FRA)         Presentation at an early concept conference       METIS launched       Start of experiments announced       3GPP standardization       3GPP standardizat	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
5GG ARIE 105 Inductive ARIE 20B AH aunched Basic concept Study project launched Demonstration experiments Standardization System development Standardization System development			Pre	sentation at a	an early	(Europe)	Ctart of	COMO 5G	5G demonstration exp			periments		
Study project launched         Demonstration experiments         Standardization         Standardization         Standardization         System development         Standardization         System development         Standardization         System development         System development <th col<="" td=""><td></td><td>E</td><td></td><td>oncept confe</td><td>rence</td><td>AIB 20B AH</td><td>nounced 5GMF</td><td>_</td><td colspan="2">3GPP standard</td><td>dization</td><td></td><td></td></th>	<td></td> <td>E</td> <td></td> <td>oncept confe</td> <td>rence</td> <td>AIB 20B AH</td> <td>nounced 5GMF</td> <td>_</td> <td colspan="2">3GPP standard</td> <td>dization</td> <td></td> <td></td>		E		oncept confe		rence	AIB 20B AH	nounced 5GMF	_	3GPP standard		dization	
Demonstration experiments         Demonstration experiments         Standardization         System development         2017       2018       2019       2020       2021       2022       2023       2024       2025       2026       2027       2028       2029       20         DOCOMO B5G resentation at an early concept conference 6Genesis haunched (Europe)       Version DOCOM 66 White paper published Beyond 56 Promotion Consortium       Next G Alliance (USA) Beyond 56 Promotion Consortium       WRC23       WRC27       Commercial 66		JG	j	E	Basic conce	pt			d		System	n developr		
2017       2018       2019       2020       2021       2022       2023       2024       2025       2026       2027       2028       2029       2029       2029         DOCOMO B5G Presentation at an early concept conference 6Genesis       Version 1.0       Version 0.0							otady projec		emonstratio	n experimer	s			
2017       2018       2019       2020       2021       2022       2023       2024       2025       2026       2027       2028       2029       20         DOCOMO B5G Presentation at an early concept conference       Version 1.0 DOCOMO 6G white paper published       Version 0.3.0 DOCOMO 6G white paper published       WRC23       WRC27       WRC27       WRC27         6Genesis launched (Europe)       Promotion of Beyond 5G Strategy meeting       Next G Alliance (USA) Beyond 5G Promotion Consortium       Beyond 5G Promotion Consortium       DOCOMO 6G       Commercial 6G										Stan	Standardization			
DOCOMO B5G Presentation at an early concept conference 6Genesis launched (Europe) Basic concept Basic concept Commercial 6G Basic concept Concept										System development				12
DOCOMO B5G Presentation at an early concept conference 6Genesis launched (Europe) Promotion of Beyond 5G Basic concept	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
6Genesis launched (Europe) Promotion of Beyond 5G Strategy meeting Basic concept Commercial 6G			1.0	2.0	3.0	shed	WRC2	3			WRC:	27		
Basic concept Commercial 6G	6Gene	sis Pro			Beyond 5G P	romotion	6	6						
		Basic	concept									-	ommercial	G
			Study p	roject laund	hed									
Demonstration experiments – Standardization – System development														

Technology Reports (Special Articles) Trends and Target Implementations for 5G evolution & 6G (P.4) 5G development history and 6G schedule

# NTT DOCOMO

Technical Journal Vol.23 No.2

# Editorship and Publication

NTT DOCOMO Technical Journal is a quarterly journal edited by NTT DOCOMO, INC. and published by The Telecommunications Association.

# Editorial Correspondence

NTT DOCOMO Technical Journal Editorial Office R&D Strategy Department NTT DOCOMO, INC. Sanno Park Tower 2-11-1, Nagata-cho, Chiyoda-ku, Tokyo 100-6150, Japan e-mail: dtj@nttdocomo.com

## Copyright

© 2021 NTT DOCOMO, INC. Copies of articles may be reproduced only for personal, noncommercial use, provided that the name NTT DOCOMO Technical Journal, the name(s) of the author(s), the title and date of the article appear in the copies.