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Sony Delivers World's First Second-Level Cycle Mobile Base Station Control Using Dynamic Spectrum Access Technology*1

Globally rolling out initiatives for effective use of limited radio frequency resources with the spread of 5G networks

Sony Corporation announced today that it has developed Dynamic Spectrum Access (DSA) technology for the optimized use of radio frequency resources, achieving fast spectrum assignment and control in a cycle of seconds for the first time in the world[*1]. While radio frequency is traditionally manually managed for each frequency band, DSA technology provides centralized management of radio frequency via a database. The technology enables new operators and users to utilize a spatio-temporally underutilized

spectrum already assigned to incumbent operators while without risk of radio interference. With the development of 5G networks, R&D and legislation have accelerated globally in recent years aimed at implementing DSA technology in society to make more efficient use of existing limited radio frequency resources.

As of April 2020, Sony acquired experimental testing station licenses from Japan's Ministry of Internal Affairs and Communications (MIC) and installed multiple 4G LTE base stations supporting 2.3–2.4 GHz frequency band (3GPP B40/n40) at Sony's office in Osaki (Shinagawa, Tokyo). Various proof-of-concept trials were conducted, including video transmission experiments using a 4G LTE compatible smartphone, in an evaluation environment in which Sony employed a Spectrum Access System (SAS), which is a U.S. CBRS[*2] compliant spectrum management database, adjusted for the above-mentioned frequency band. Moreover, Sony has succeeded in developing a technology for accelerating remote control of base stations in this environment, achieving the world's first[*1] sub 60-second time span from the moment a transmission parameter switching command is sent (such as one relating to changing transmission frequencies or altering maximum transmission powers for multiple base stations) until the switching operation is applied. The experiments have successfully demonstrated a reduction in the time required for spectrum assignment and parameter switching in spectrum sharing – where previously the process had taken hours[*3] or even days, to be completed in second-level cycles. This technology is expected to dramatically increase opportunities to take advantage of underutilized frequencies and contribute to the efficient use of limited radio frequency resources.

In Japan, the MIC has spearheaded an R&D initiative for the advancement of DSA technologies among differing systems. In this project, Sony bears the responsibility for research and development of spectrum sharing management technologies. The above-mentioned proof-of-concept experiments are part of this initiative, and Sony is working together with other industry and academia partners to progress practical applications of DSA technologies in Japan.

Sony will present the results of our development announced today at the Institute of Electronics, Information and Communication Engineers Society Conference 2020, to be held online from September 15 to 18, 2020.

Sony has already been approved by the U.S. Federal Communications Commission (FCC) [*4] for commercial operation of SAS to provide spectrum management services (spectrum assignment, spectrum use authorization, operational parameter configuration such as maximum allowable transmission power) in 3.5 GHz band (3GPP B48/n48) and is currently running an SAS in the United States. Additionally, a private (cellular) network has been deployed at the Sony Pictures Entertainment studio lot in Culver City, California, under the same SAS management with

considerations underway to develop it for new applications. Sony plans to conduct the same proof-of-concept experiments at Sony Europe's UK Technology Centre in Pencoed, United Kingdom.

Starting with the development of technologies to advance use of underutilized European TV broadcast frequencies (TV white spaces), Sony has built a foundation of relevant technologies over many years. By applying these technologies, Sony has contributed significantly to the field of wireless communications, and now DSA technology continues this legacy.

Sony initiatives in DSA technologies can be found at the following site.

https://www.sony.net/SonyInfo/technology/stories/DSA/

*1 In the 2.3 GHz band. According to Sony research, as of announcement in September 2020.

*2 Citizens Broadband Radio Service (CBRS) is the name of Title 47 Code of Federal Regulation Part 96 and the collective name of wireless services utilizing the spectrum in accordance with Part 96. Part 96 governs the use of underutilized radio frequency resources in the 3550-3700MHz band primarily assigned to the Department of Defense, fixed satellite services, wireless broadband services, etc. Under the Part 96, SAS is defined to manage the use of underutilized radio frequency resources by base stations (CBSD, CBRS device).

*3 Because SAS data needs to be synchronized between multiple SAS administrators in CBRS, update frequency in current operation is in single-day units.

*4 Announced to the public by the FCC Public Notice on January 27, 2020. WTB And OET Approve Four Spectrum Access System Administrators For Full Scale Commercial Deployment In The 3.5 GHz Band And Emphasize Licensee Compliance Obligations In The 3650-3700 MHz Band Under Part 96https://www.fcc.gov/document/full-commercial-deployments-authorized-35-ghz-band

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About Sony Corporation

Sony Corporation is a creative entertainment company with a solid foundation of technology. From game and network services to music, pictures, electronics, semiconductors and financial services - Sony's purpose is to fill the world with emotion through the power of creativity and technology. For more information, visit: http://www.sony.net/

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