Portable SIM | psim proxy | PSIM Suite

Packaged Portable SIM Technology "PSIM Suite" Licensing to Begin

Communication Device Development Department
Kazuma Nachi
Yuta Higuchi
Kazuoki Ichikawa

Portable SIM technology lets users use the Subscriber Identity Module (SIM)*1 card usually inserted in their mobile terminals (e.g. smartphone, tablet) for connecting to a mobile network as another device separated from the terminal. This technology enables the user to remove the SIM card from the terminal and insert it into another compact device for different purposes based on the concept of SIM card secure authentication and seamless telephone number switching [1].

In June 2014, NTT DOCOMO announced the world's first Portable SIM concept and a prototype device, and has continued to engage in development of related technologies since then. In March 2015, NTT DOCOMO announced expanded functionality to enable sending and receiving of SIM data between smartphones, and then in August 2016 with the development of new technologies such as "psim proxy," began licensing the "PSIM Suite," which consists of the Portable SIM-related technologies (hereinafter referred to as "Portable SIM technology").

1) Circumstances Surrounding Licensing

Conventionally, the use of a smartphone and SIM card entailed insertion of one SIM card into a smartphone, which meant if the user wanted to change lines (his or her telephone number or telecommunication carrier) due to a change in situation such as travel overseas, the user had to insert a different SIM card each time.

PSIM Suite enables sending data from a master device containing the SIM card to different devices, hence releasing the user from the one-to-one smartphone - SIM card relationship and enabling more flexible combinations.

The left of **Figure 1** shows an example of switching with one master device and several slave devices, and on the right, shows switching with several master devices and one slave device.

NTT DOCOMO has begun licensing PSIM Suite to enable various companies to use the features and technologies of the Portable SIM and drive development of devices and solutions with new concepts and value.

2) Elements of PSIM Suite

PSIM Suite basically consists of three parts - (1) a Portable SIM device technology, (2) psim proxy, and (3) Portable SIM software. **Figure 2** describes an overview of the system.

(1) Portable SIM device technology (Fig. 2 (1))

Technology to enable a master device (Portable

*1 **SIM:** An IC card which stores mobile phone subscriber information.

SIM device) to send data from an inserted SIM card to slave devices via Bluetooth®*2.

(2) psim proxy (Fig. 2 (2))

Technology to enable a terminal containing a SIM-sized card with Bluetooth functionality to connect to a Portable SIM device via Bluetooth and receive SIM data (the card is also referred to as a psim proxy). Simply inserting the card into the smartphone's SIM slot turns an existing smartphone into a Portable SIM slave device without the need for any modifications*.

*2 **Bluetooth®:** A short-range wireless communication standard for interconnecting mobile terminals such as mobile phones and notebook computers. Bluetooth and the Bluetooth logo are registered trademarks of Bluetooth SIG Inc. in the United States.

* Requires installation of a dedicated app.

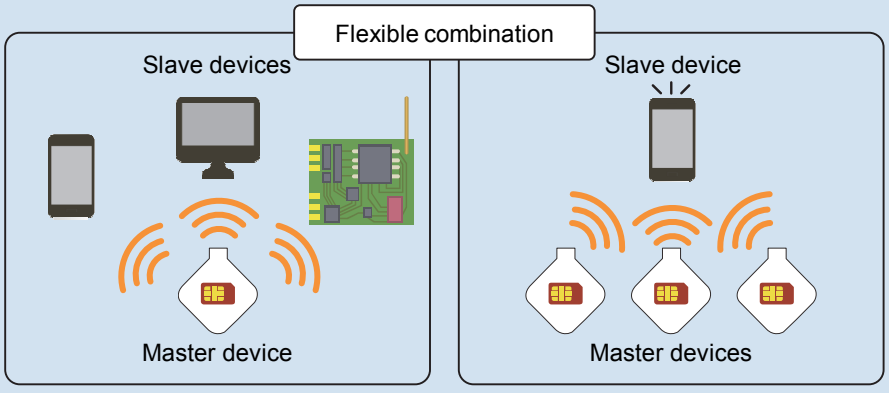
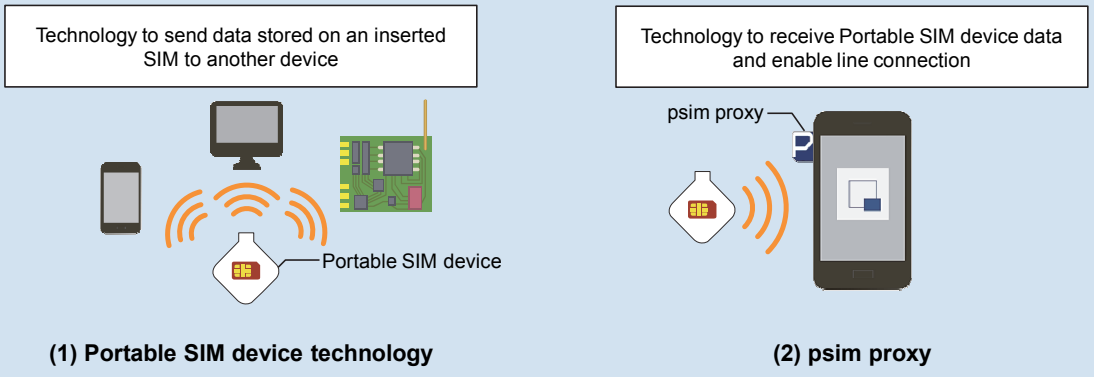
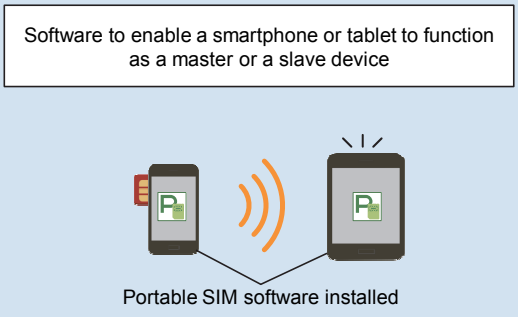


Figure 1 Example of flexible combination of master and slave devices with PSIM Suite



(1) Portable SIM device technology **(2) psim proxy**



(3) Portable SIM software

Figure 2 Elements of PSIM Suite

(3) Portable SIM software (Fig. 2 (3))

Software to enable a smartphone or tablet to function as either a master or a slave device.

Figure 3 shows a connection image of a Portable SIM device and psim proxy.

Table 1 describes the contents of this licensing in terms of the above elements. These three technological elements are not only licensed in a batch, but can also be licensed separately to suite the purposes of the licensee, making it more attractive to use.

3) PSIM Suite Licensing Example

The first round of PSIM Suite licensing was offered to a hardware startup company, Cerevo.

NTT DOCOMO has licensed the PSIM Suite to Cerevo, and Cerevo has developed "SIM CHANGER ◿ (Sim changer delta) to enable communications with flexible SIM switching. On August 2, 2016, to confirm marketability, Cerevo started to collect funds through the "Makuake" crowdfunding website [2]. This crowdfunding project reached its funding target in 12 hours from commencement, enabling Cerevo to begin manufacture of the product [3].

SIM CHANGER◿ developed by Cerevo is shown in **Photo 1**.

SIM CHANGER◿ uses (1) Portable SIM device technology and (2) psim proxy from the PSIM Suite.

SIM CHANGER◿ with the Portable SIM device technology enables up to four SIM cards to be inserted, while a "bridge card" with the psim proxy technology is inserted into a smartphone. Users can flexibly switch and use data from any of four SIM cards via a dedicated app running on the smartphone.

With this licensing, NTT DOCOMO is leveraging the strengths and specializations of its partnerships with its business partner Cerevo taking the

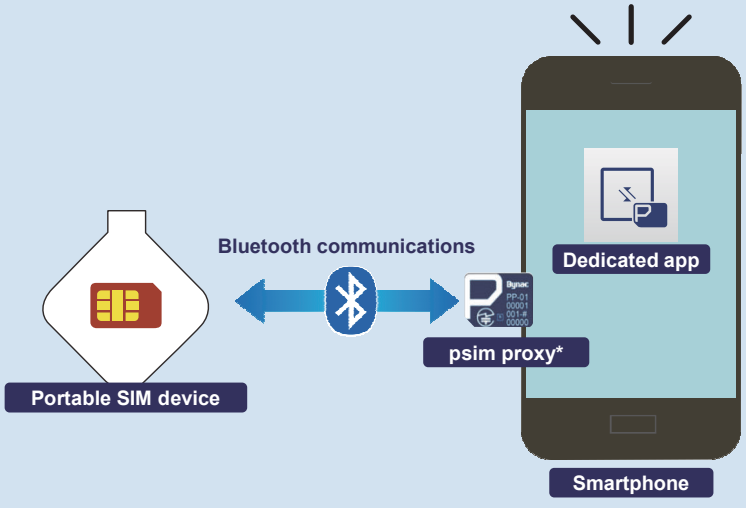


Figure 3 Connection image of a Portable SIM device and psim proxy

Table 1 PSIM Suite licensing content

(1) Portable SIM device technology	(2) psim proxy	(3) Portable SIM software
・Firmware source code ・Hardware circuit diagram ・Related documents	・SIM-type hardware with Bluetooth ・Firmware binary ・Dedicated app source code (Android™/iOS) ・Dedicated app related documents	・App source code (Android™) ・Related documents ・Chipset software*

*Some vendors only

Android™: A trademark or registered trademark of Google Inc.

iOS: A trademark or registered trademark of Apple in the United States and other countries.

"+d*3" initiative to create new value. Through this, Cerevo has developed SIM CHANGER◿ in an extremely short amount of time. Its release and confirmation of market reaction has led to manufacture and sales.

4) Portal Site Built

To enable many users to use Portable SIM technologies, it is necessary to diversify products and services that use PSIM Suite. To provide PSIM Suite licenses to many companies, we opened a portal site at the same time as commencement of the licensing to provide descriptions of the Portable SIM technology, an overview of the licensing as well as examples of its use (**Figure 4**) [4].

Companies interested in the licensing of this technology can use the site to download handouts and make inquires, and close a licensing agreement.

With the commencement of PSIM Suite licensing, this article has presented details of the PSIM Suite license and the case of Cerevo, a hardware start-up involved in the first-round licensing of the technology. Going forward, we would like to expand the number of licensers and broaden the range of

*3 **+d:** The name of an NTT DOCOMO initiative for creating new value together with partner companies.

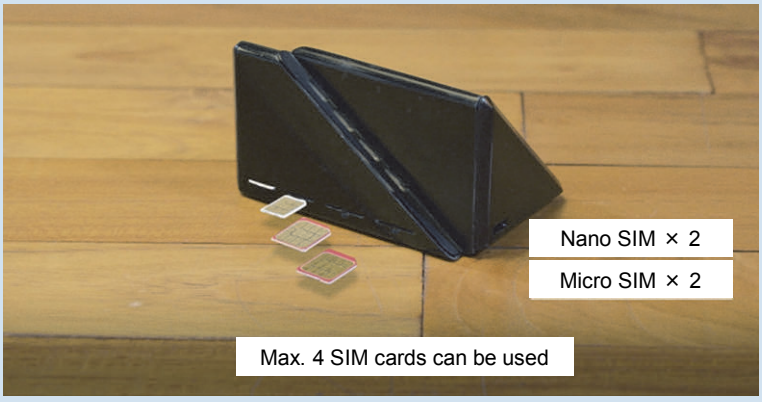


Photo 1 SIM CHANGER◿

Figure 4 PSIM portal site

new services using Portable SIM technology.

References

[1] A. Shibutani et al.: "Portable SIM: Empowering the User in the IoT Era," NTT DOCOMO Technical Journal, Vol.16, No.4, pp.22-30, Apr. 2015.

[2] Makuake home page (In Japanese).
https://www.makuake.com/

[3] Makuake: "4 subscription SIMs manipulated freely. 'SIM CHANGER Delta' for switching communications lines," (In Japanese).
https://www.makuake.com/project/simchanger/

[4] PSIM Suite home page.
http://portablesim.idc.nttdocomo.co.jp/en/index.html