Approach to the Globalization of M2M Business

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Abstract

This paper introduces our collaborative work with communication carriers, our approach to the construction of NEC's cloud center and the most appropriate network systems for the deployment of M2M cloud computing businesses in the global market.

Keywords

carrier cloud, global cloud center, connectivity, MVNO

1. Introduction

M2M is expected to grow into a commercial domain that generates new revenues for various industries including the communication carriers. The number of devices connected to M2M solutions is currently running at a little less than a hundred million. However, this number is predicted to increase to four hundred million connections by 2014, and to two billion or even fifteen billion connections by 2020. The M2M solution market involves various domains such as the "smart project" (Smart City, Smart House, etc.) including a smart meter that is also expected to secure a large market, security (home security, building security, etc.), automotive and transportation domains. Moreover, markets such as health care, agriculture, fisheries, engineering industry, public services, financial business, etc. are becoming increasingly aware of M2M solutions. In order to meet the needs of such diverse commercial operations a variety of M2M service models is needed. To cope with this demand, NEC is promoting standardization activities via the OMA (Open Mobile Alliance) and ETSI (European Telecommunications Standards Institute) while carrying out collaborative work with communication carriers and equipment vendors that support network based businesses. This paper describes NEC's approach to the global deployment of CONNEXIVE M2M solutions (hereinafter referred to as M2M solutions).

2. The M2M Global Business Deployment Model

In the past, systems configurations using the "vertical integration" model were main stream for achieving M2M solutions. Such system configurations usually employed device network platforms specializing in specific solutions. However, NEC is aiming to develop a "horizontal integration" model solution that locates the M2M service platform as the core platform of the system. Providing M2M service platforms of the "horizontal integration" model as cloud computing services will allow us to offer more business opportunities to our clients and business partners. Under such a trend our clients' businesses will tend to become more and more global. It is therefore essential to provide M2M solutions for the global market and it is also vital to provide suitable solutions via the projected cloud computing services.

The following two main business models are planned for the M2M solution via the cloud computing services.

(1) Carrier cloud

The first model is to achieve the deployment of M2M solutions by using the cloud computing services already held by communications carriers located in various countries. The M2M services platform controls the entire data input from the sensors located in broad area networks, and is able to utilize this data securely. In such a flow of data, the communications carriers such as those already possessing network infrastructures and the various enterprise users could take up an ideal position to conduct the M2M services. On the other hand, NEC also provides various services in the telecommunications market such as network facility provisions, added values services and also cloud computing solutions using SaaS.

By optimally using these advantages and facilities that communications carriers and NEC already possess, we are able to provide M2M solutions for those communications carriers that provide M2M services to companies and consumers. NEC will support the business strategies of the communications carriers and their various demands by providing not only platforms, network peripherals, devices, and applica-

tions, etc. but also by outsourcing contracts for the operation of cloud data centers and their services.

(2) The global cloud center

The second model is to provide solutions of M2M service platforms for client companies directly from NEC via cloud computing.

It is expected that new M2M solutions will be created by linking IT and telecommunications systems. Most of the new M2M solutions are predicted to bring innovations to business models in various industries. Different countries have different market growth environments and their own local conditions so that even more business models can be expected to be launched. Under such market trends, NEC will promote the creation of new solutions and business models to promote flexible and speedy business operations by providing adaptable and robust cloud computing services for our customers.

Some Japanese device manufacturers already have market shares in foreign countries. NEC will consider these not only as our customers but also as our partners. By arranging partnerships with these manufacturers, we will be able to reinforce our M2M solution business from the aspects of devices and applications.

3. Deployment of Data Centers that Provide M2M Cloud Computing Services

In promoting the deployment of global cloud computing centers, we are planning to use our overseas data centers as our market bases.

In order to expand global business, NEC is carrying out reinforcement of the five bases located in North America, Latin America, EMEA, APAC and Greater China. The M2M cloud computing services will be developed mainly in these five bases and we aim to provide even more advanced solutions through a close relationship with our customers.

The data centers of the "carrier cloud" that are located in EMEA, APAC and Latin America are scheduled to be reinforced as the first step and the data centers in North America and Greater China will follow in the next step.

Moreover, NEC will cope flexibly with construction of cloud computing centers with consideration for the demands of communications carriers and other customers, characteristics of solutions, laws and regulations of each country and various other conditions. If necessary, even the global cloud
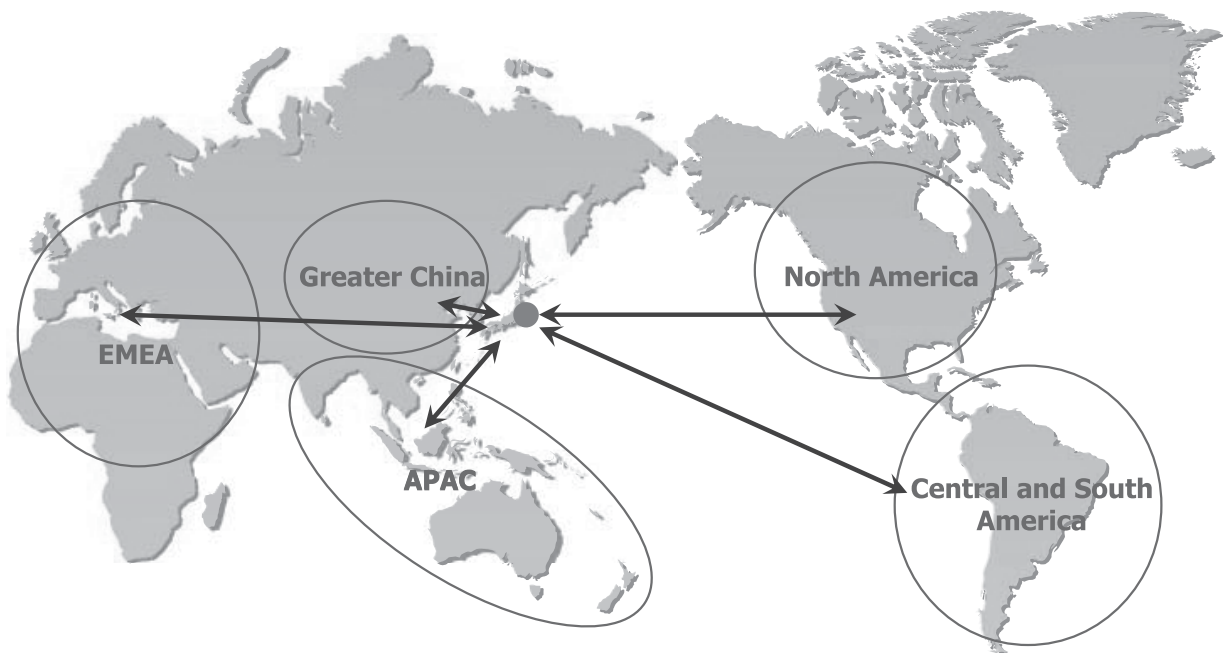

Fig. 1　The global five regions formation and cloud computing service centers (providing M2M services to customers from the closest location).

centers will be constructed with the cooperation of the communications carriers and data centers in each country.

These activities will result in constructing our business systems in places where they are geographically closer to our customers (**Fig. 1**), and enabling provision of our various services and solutions, such as integration services, end-to-end connection verification services and their operation and maintenance, all of which are essential for constructing viable M2M solution provision services.

4. M2M Connectivity

Connectivity is an essential function in providing M2M cloud computing services. Various factors related to business development will be involved in providing connectivity for the M2M services. Therefore, most appropriate factors should be selected and combined to enable the solutions to match the needs of the market of the region in which the M2M solutions will be offered.

The items to be considered in providing the connectivity required to develop M2M solutions are described below (**Fig. 2**).

(1) Selecting the communication carriers

In case no specifically desirable conditions are requested by customers for use of M2M solutions, the use of networks provided by communications carriers should be considered as a primary choice. Expansion of M2M solution business will directly reflect the number of connections (increase of the number of SIMs: Subscriber Identity Modules). Therefore, we consider that expansion of M2M solution business will greatly contribute to the sales and revenues of the communications carriers.

On the other hand, billings and charge collections of network usage, user management and their authentications are important factors for companies that introduce M2M solutions or end users who receive these services. In order to resolve these issues and promote our M2M solution business, we are considering the use of networks run by MVNOs (Mobile Virtual Network Operator) depending on the needs of roaming services between countries and their charging systems.

(2) Dependency on providing services and businesses

Alternative carriers or networks should be selectable in case of a communication failure, and also as an option according to different conditions and features, so that device and application providers can select the most suitable network for their businesses to connect to the M2M service platform.

(3) Relationships with partners collaborating in providing solutions

When providing M2M solutions, the devices and interfaces to be connected to the M2M service platform must be prepared in advance in order to achieve optimum connectivity. It is also essential to consider the network selection to be performed in accordance with the business experience of the device provider.

(4) Network selection depends on customer requests

In a case where the customer has already introduced the M2M solution or cloud computing services (especially private cloud computing systems), the network that is newly introduced should be considered to be compatible with their existing cloud computing network.

(5) Utilizing the Internet

The Internet can be one of the choices besides a mobile network or a fixed line network for constructing the network for providing M2M solutions. When using the Internet, it is important to ensure the network security. NEC's M2M service platform is equipped with robust security functions so that a reliable end-to-end connection becomes available when using the Internet.
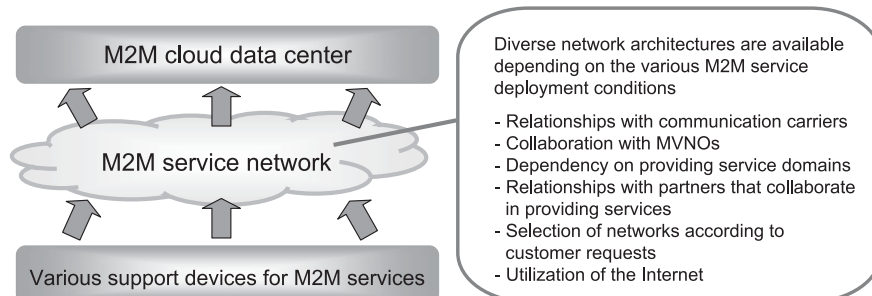

Fig. 2   A variety of network architectures.

As described above, when providing M2M solutions as cloud computing services, it is necessary to provide network connections to cope with various business factors. NEC will support customers in introducing the services speedily by relieving them of the bother of the line preparation in each country. In order to achieve this, we will provide not only M2M service platforms and data centers but also network connectivity in a global market under the one-stop service system.

Furthermore, NEC is considering becoming a MVNO (Mobile Virtual Network Operator) in order to develop and provide M2M solutions from our global cloud centers for customers in an even greater variety of business circumstances.

5. Conclusion

The transition from the present network to the next-generation advanced network will enable more flexible strategies to cope with the large volume of network traffic that continues to increase. This will be essential for achieving satisfactory M2M solution services. At the same time, embedding M2M communication modules in a greater variety of devices will tend to accelerate the creation of richer business solutions.

NEC is capable of providing M2M service platforms and also devices, network equipment and related applications that are essential in achieving the provision of M2M services. We can even provide them under the one-stop service system.

We aim to apply these advantages optimally in order to develop our M2M solutions globally. We will also provide CON-NEXIVE in order to cope quickly with dynamic changes in the markets and we aim to further develop M2M total solutions to meet the expanding needs of our customers.

*WiMAX is a trademark and/or a registered trademark of WiMAX Forum.

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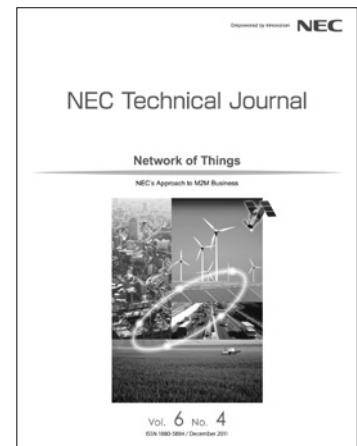
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