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NTT Press Releases

(Press Release)

February 7, 2014

Collaborative Study on Server Architecture for Future Networks
~ Aiming at a World Standard for a Telecom Server Platform to Achieve Faster Service Development ~

Nippon Telegraph and Telephone Corporation (Chiyoda-ku, Tokyo, President and CEO: Hiroo Unoura, hereafter: NTT) launched a collaborative study with Alcatel-Lucent Japan Ltd. (Shinagawa-ku, Tokyo, President: Nicolas Bouverot, hereafter: Alcatel-Lucent Japan) and Fujitsu Limited (Minato-ku, Tokyo, President: Masami Yamamoto, hereafter: Fujitsu) to develop server architecture[1] for core systems of telecom networks.

Telecom network functions that have typically been realized through hardware are gradually being realized through software, and this makes service applications more complex. However, the software development scale for service applications must be reduced for faster deployment of services. This project will promote the study of server architecture that enables faster development of service applications by merging NTT laboratories' core technologies and the industry's latest technologies on top of general-purpose hardware. Another objective of the project is to apply the results of this study worldwide in industries outside the telecom field as a world standard. (Figure 1 ▢)

Background

As seen in activities such as NFV[2], which is designed to take advantage of virtualization technologies in the telecom field, more and more traditional network functions are being realized through software, which increases the complexity of service applications. This will require a server platform[3] with architecture that enables a reduction of the software scale in order to respond to dramatic changes in service and technology trends.

Rapid development and scheme to introduce new services into the market are also important to meet user needs. Collaboration between teams in developing innovative services will be more advantageous than developing services separately.

Problems for telecom carriers with future networks

Telecom network systems consist of various network devices, each of which is sufficiently sophisticated to ensure highly reliable and available network services. This means that different types of platform software and hardware are selected for each network device, and reliability and scalability are achieved within each application. Consequently, it takes time to develop service applications, building equipment, and setting up management systems. For future networks which would provide various kinds of services and promote network functions realized by software, it is expected that the software development scale for service applications would be larger and larger because of varied and numerous network devices. We have to solve this problem as a carrier service provider.

Solving the problem (Figure 2 ▢)

This project aims to realize a server architecture which maximizes the common part of various functionalities of communication network with reliability, scalability, and maintainability which are cultivated by telecom carriers and partners. Using this architecture, service providers can develop their services efficiently by focusing only on their logic. In this server architecture, all network functionalities are realized on network-wide virtualized hardware in order to prevent variety of devices from spreading.

NTT has set up an alliance with Alcatel-Lucent Japan and Fujitsu to collaborate on server technology to establish new technology, advance its level of sophistication, and enable early feasibility checking of the technology. Alcatel-Lucent Japan is one of the leading firms developing virtualization and orchestration technologies for network server systems, and Fujitsu has extensive experience in systematization of distributed computing and maintaining large-scale server systems.

Concept of collaborative study (Figure 3 ▢)

1. Server virtualization and orchestration technologies considering telecom carriers' requirements:
   We will research on server virtualization and orchestration technologies which allow sharing of virtualized resources among several systems and dynamic resource management while meeting carrier grade requirements.

2. Server composition technology of scale-out communication control server:
   We will research on highly reliable server composition technology of scale-out communication control servers. This will enable us to increase the system performance linearly along with the increase in general-purpose hardware of the system, and also to achieve appropriate load balancing for hardware and destination control for backup servers when the system is down.
3. Maintenance and operation technology of scale-out communication control server:
   We will research on maintenance and operation technology of scale-out communication control servers that are achieved by points 1 and 2 above.

Primary roles of three participating companies (Figure 3 🗖)

- NTT: to provide the telecom carrier requirements and the core technology for distributed computing with scale-out and redundant architecture.
- Alcatel-Lucent Japan: to provide the system requirements based on the global market and to provide the technologies for server virtualization and orchestration that meet the operation and maintenance requirements of telecom carriers.
- Fujitsu: to provide the systematization of distributed computing and to provide maintenance and operation technology of scale-out communication control server.

Plans and prospects in the future

This collaborative study between the three companies started in February, with the goal of creating advanced technology, increasing its level of sophistication, and achieving early feasibility checking for it. We aim to establish new server architecture that will enable us to develop service applications at an early stage. In addition, we aim to expand and apply the resulting technology to support other fields that require reliability, scalability, and maintainability (financial or medical fields, etc.), as well as in the communication network field in the future. Our desire is to see this technology spread and become a global standard. (The core technology for distributed computing with scale-out and redundant architecture will be presented in NTT R&D Forum 2014, which will be held at NTT's Musashino Research and Development Center on February 13(Thu) and 14(Fri).)

Terminology

*1 server architecture

Components of server system, relationship between server components or between inside and outside the server system, definition of components' behavior.

*2 NFV (Network Functions Virtualization)

A system in which we can utilize network functions more flexibly by using a virtual technology and made up of general-purpose hardware in order to realize various network functions through software.

*3 platform

Hardware, OS, and middleware serving as the foundation necessary to use other types of software or hardware.

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Attachment·Reference
▶ Objectives 🗖
▶ Solution - Proposed architecture design of server systems 🗖
▶ Outline and roles in collaborative study 🗖

Contact details for inquiries

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