Open Source Software Research Activities in NTT Laboratories

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Abstract

The ongoing development of open source software by a worldwide open source community of software developers and users is expected to bring great changes to conventional system development. This article introduces activities in NTT Laboratories that aim at greater use of open source software.

1. Introduction

Open source software (OSS) is software whose source code is open to the public. It can be freely modified and redistributed and there is no charge for using it. It is undergoing continuous functional development and troubleshooting in an open source community made up of software developers and users from all over the world (see **Fig. 1**). Some notable examples of OSS are the Linux and FreeBSD operating systems, Apache Web server, Sendmail e-mail software, and PostgreSQL and MySQL database-management sys-

tems. The distribution of these programs over the Internet is promoting the ongoing development and growing use of OSS in many systems as an infrastructure in support of the Internet. Likewise, the use of OSS in business has been increasing recently.

2. Advantages of using OSS

Various types of systems are developed in the NTT Group. These include communication services systems and many management systems to support these services. And some solution systems are being devel-
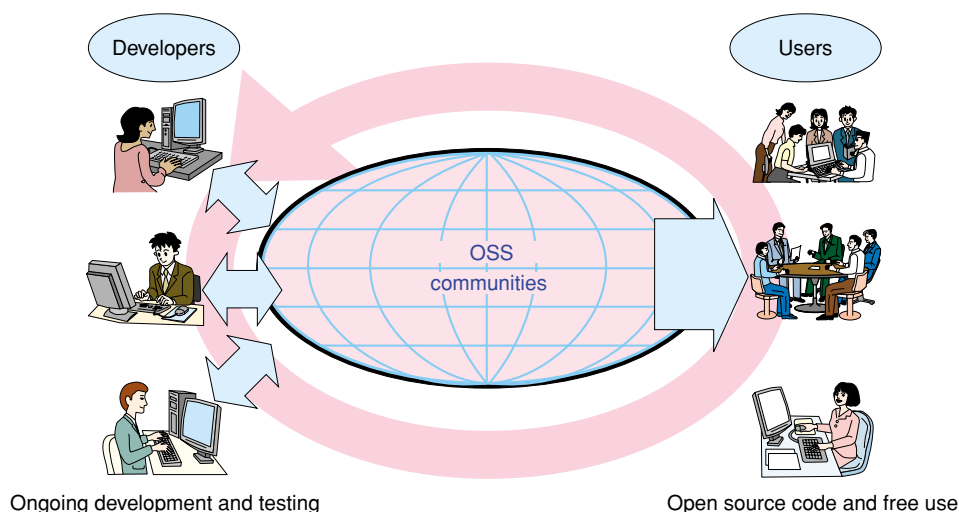

Fig. 1.   Open source software.

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oped in the system integration business field. Using OSS, which has freely available source code, eliminates any dependence on particular vendors and facilitates the development and introduction of services according to a company's own strategies. In the case of solution systems, OSS enables the creation of new business-expansion schemes, which leads to greater competitiveness in the marketplace. Furthermore, with OSS, the costs of initial system construction and system upgrades are often lower than when proprietary software is used.

3. OSS activities in NTT Laboratories

NTT Laboratories is involved in the following activities with the aim of expanding the use of OSS.
• Research and development of OSS fundamental technology

To make the most efficient use of OSS, its performance and functional features must be exploited, and new functions must be developed as needed. To this end, researchers are analyzing the source code for application servers, database management systems, and operating systems, and researching and developing ways of enhancing the functions and performance to expand OSS use.
• Accumulation of OSS usage knowledge

While promoting the use of OSS in actual system development, we are evaluating some OSS systems that have almost reached the level of being practical systems and accumulating knowledge in relation to OSS usage in collaboration with NTT operating companies.
• Promotion of community collaboration

Collaboration with the open source community is an essential part of using OSS. NTT is a member of Open Source Development Labs (OSDL) [1], an organization founded to advance the adoption and growth of Linux on commercial systems. It is active in developing CGL (Carrier Grade Linux) for communication services and DCL (Data Center Linux) for enterprise services [2]. NTT is also active in the PostgreSQL community [3] and Linux kernel community [4].

4. OSS promotional system

NTT is working to expand the use of OSS through "Comprehensive Commercialization Functions", a system that plans for and promotes the commercialization of fundamental technologies. In this system, a person called a "producer" is given specific authority and a budget to introduce NTT R&D results for commercial purposes while assessing market trends and the needs of operating companies. The application of comprehensive commercialization functions to OSS began in April 2004 and activities centered about OSS producers have been progressing since then (see **Fig. 2**). This OSS promotional system features the
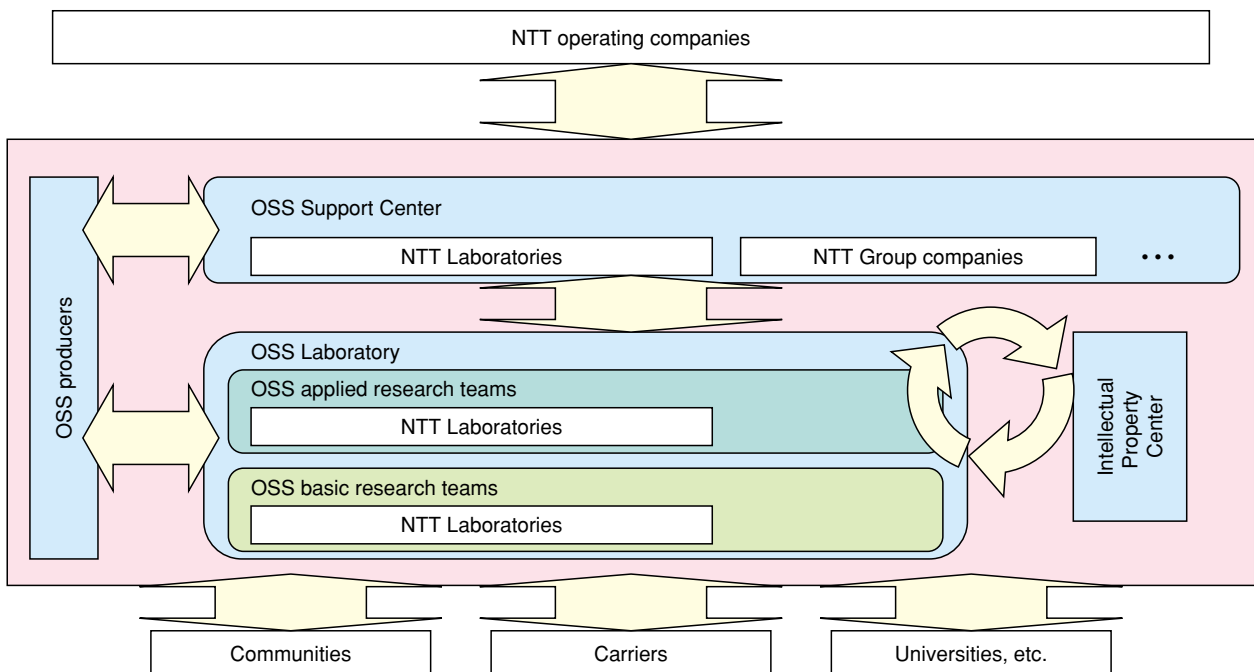

Fig. 2.   Promotion system.

following centers of activity.

(1) OSS producer

An OSS producer evaluates market trends and enterprise needs and plans and executes total strategies to expand the use of OSS.

(2) OSS Support Center

NTT operating companies must be provided with comprehensive support to ease their concerns about using OSS. The OSS Support Center was established with NTT Laboratories for this purpose. It accumulates technology from NTT Laboratories and OSS usage knowledge and provides full support while working closely with NTT Group companies.

(3) OSS Laboratory

The OSS Laboratory was founded to advance research and development toward expanded use of OSS. It consists of OSS applied research teams to advance R&D on OSS-related functions needed for specific types of businesses and several OSS basic research teams to advance R&D needed for OSS technology fields. The OSS Laboratory works together with the OSS Support Center to expand the use of OSS and receives support from the Intellectual Property Center regarding the proper handling of intellectual property.

References

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