FreeCloud: A Trial Service for OpenStack

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Abstract

This article describes NTT's work on the OpenStack trial service FreeCloud, which is intended to improve the operability of OpenStack and expand the set of operation tools.

1. Introduction

OpenStack [1] is a cloud management platform that has been attracting attention. It is open source software for virtual machine infrastructure in the form of infrastructure as a service (IaaS). NTT is participating in the FreeCloud project, which is operating Free-Cloud as a trial service for OpenStack[*1]. The Free-Cloud project is managed by the OpenStack community, which currently has over 60 corporate participants, including NTT DATA and the NTT R&D Laboratory Group. With over 70 active developers, the community is engaged in vigorous activity, so it is highly likely that OpenStack will become an industry standard for IaaS open source software.

2. Toward higher operability

The objectives of FreeCloud are to construct a DevOps[*2] system, expand the set of operation tools, and define a reference architecture that combines hardware configuration and setup standards to improve OpenStack operability.

2.1 DevOps

The insufficiency of operation manuals and operating tools is a problem for OpenStack. To solve that problem, the FreeCloud project is working on a development method called DevOps. This maintains tighter coupling between the operation and develop-ment teams by adding functions while the system is operating. The DevOps method permits early feedback of operational problems to the developers. The trends in DevOps are (1) resource virtualization through cloud computing and IaaS and (2) automation of many operations by using the Puppet middle-ware setup automation tool [2] and tools such as Chef [3]. This reduction in the distance between develop-ment and operation has attracted the attention of many engineers. The creation of a DevOps system in the FreeCloud project can improve operability through clear documentation of the operating proce-dures and feedback from operations to the develop-ment community.

2.2 Implementation of efficient operation tools

The FreeCloud project is developing OpenStack operation tools. The specific tools planned for devel-opment include an autoinstall function and a monitor-ing function. The OpenStack automatic installation system comprises Cobbler, a tool that automates operating system (OS) installation [4], and Puppet. The OpenStack monitoring function uses the notifi-cation function that was implemented in the Septem-ber 2011 release of OpenStack [5].

2.3 Reference architecture

OpenStack has various settings to support many different kinds of virtualization software. The

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*1 Since this topic is still under study, the final details may differ somewhat.
*2 DevOps: A coined term that combines development and opera-tions.

FreeCloud project provides for the sharing of a reference architecture and service operation by the community and for the preparation of community standard operating manuals and operation tools.

3. Operation by the community

Volunteer developers from the OpenStack community are operating FreeCloud. The tool set developed in the FreeCloud project is also planned to be open to the OpenStack community. Community management of FreeCloud will make it possible to produce industry standard manuals and tools for OpenStack operation.

4. Free offering to users

FreeCloud is intended to be made available to any user without charge. It is offered free because it is a trial version, so it is difficult to guarantee commercial quality. It is open to any user for two reasons: as a way to expand the community and as a way to reproduce the environment for providing actual services in which it is impossible to assume a user base. The plan is to select a certain number of users from among applicants and let each one use a virtual machine service for about one week.

5. System configuration

The FreeCloud project currently has two setup patterns for FreeCloud, both of which are planned to be included in the next OpenStack release.

The first FreeCloud setup pattern assumes a public cloud environment that provides IaaS to general users. The public cloud settings are the Ubuntu (Linux) OS and Xen virtualization software, which are widely used in the U.S. market. For the network setup as well, all of the virtual machines exist on the same network.

The second FreeCloud setup pattern assumes a private cloud that provides IaaS within an enterprise. It uses Red Hat Enterprise Linux 6 or an equivalent OS and kernel-based virtual machine (KVM) virtualization software, which has a large share of the market in Japan. A virtual local area network function is used to isolate virtual user networks.

Both patterns include functions such as ones for starting up virtual machines from a web application program interface (API)[*3] or web graphical user

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[*3] Web API: Application programming interface that can be used via the web.

interface (GUI)[*4]. Two web APIs are provided. One is OpenStack's own API and the other is compatible with Amazon EC2, which is compatible with the IaaS offered by Amazon. For the web GUI, two versions are planned: OpenStack Dashboard [6] and the Clanavi interface being developed by DOCOMO Communications Laboratories USA, Inc. [7].

6. FreeCloud project management system

Discussions within the FreeCloud project as well as the materials and tools are published on the project's website [8]. FreeCloud is being managed by members registered on that website [9]. The leader of the OpenStack virtual machine image[*5] management function development project and the leader of the OpenStack quality improvement project are currently participating as committee members in addition to NTT members. The weekly development meetings are conducted online. Because the entire process is public, anyone who is interested can participate and comment.

7. Schedule

The FreeCloud release is expected to be announced and the service inaugurated at OpenStack Design Summit 2011, in October 2011. We encourage anyone who is interested to try the service. The OpenStack Design Summit will bring together the companies that are developing OpenStack and companies that may plan to use it. The previous event in San Jose was attended by over 400 persons and was very successful. At the Design Summit, we also plan to enlist sponsors to support the continuation of FreeCloud.

8. Concluding remarks

The FreeCloud project is intended to improve the operability of OpenStack through actual operation. The expected results are operating procedures, an expanded set of operation tools, and a reference architecture definition.

[*4] Web GUI: Graphical user interface that can be used via the web.
[*5] Virtual machine image: Data for generating a virtual machine.

References

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[4] Cobbler. https://fedorahosted.org/cobbler/
[5] OpenStack notification function.
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[6] Openstack Dashboard. https://github.com/openstack/horizon
[7] Clanavi. http://drupal.org/project/clanavi
[8] Freecloud website. https://launchpad.net/freecloud
[9] Freecloud admins. https://launchpad.net/~freecloud-admins

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