

OpenStack: A Status Report January 31, 2014

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Glossary

AWS	Amazon Web Services
COTS	Commercial Off the Shelf
IaaS	Infrastructure as a Service
PaaS	Platform as a Service
SaaS	Software as a Service

Executive Summary

Launched in 2010 jointly by NASA and Rackspace Hosting, OpenStack has gained tremendous momentum with over 275 companies in more than 70 countries worldwide, thanks to the efforts of the OpenStack Foundation and its community. Whereas AWS is the dominant *public* cloud, OpenStack is the dominant *private* cloud. OpenStack will succeed if it focuses on its core strengths to grow and thrive and not on trying to replace AWS, although it will face competitive pressures from CloudStack, Eucalyptus, and OpenNebula.

Introduction

We attended two interesting events, both focused on OpenStack, earlier this week in Silicon Valley:

1. [Red Hat Forum 2014: Building IT for the Future](#)
2. [OpenStack: Breaking into the Enterprise](#)

The purpose of this report is *not* to write a tome on OpenStack—there are tons of articles, whitepapers, and presentations on the subject at the OpenStack [website](#) and elsewhere—but rather to provide a status on its adoption, benefits derived therefrom, and some of the most commonly raised objections to its adoption.

What is OpenStack?

It is an open-source software initiative, originally launched by [Rackspace Hosting](#) and [NASA](#) in July 2010, to build and manage cloud infrastructure. Over 275 companies—Alcatel-Lucent, Arista Networks, Cisco, Dell, EMC, Ericsson, HP, IBM, Juniper, NetApp, Rackspace, Red Hat, SUSE, VMware, and Yahoo!—have since joined the project. However, NASA dumped OpenStack in 2012 and moved to a Web services model that uses AWS for cloud-based enterprise infrastructure. One of the last holdouts—Salesforce.com—is [rumored](#) to be joining OpenStack soon. Regardless, because of the momentum behind it, OpenStack has grown tremendously in just three years.

Interestingly, when the above question was posed at the above events, the answers we got were:

- It is middleware.
- It is not middleware, but something that sits between IaaS and PaaS (Figure 1):

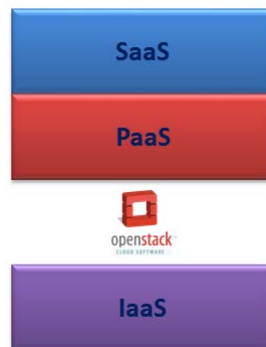


Figure 1. OpenStack?

The basic components of OpenStack are shown in Figure 2.

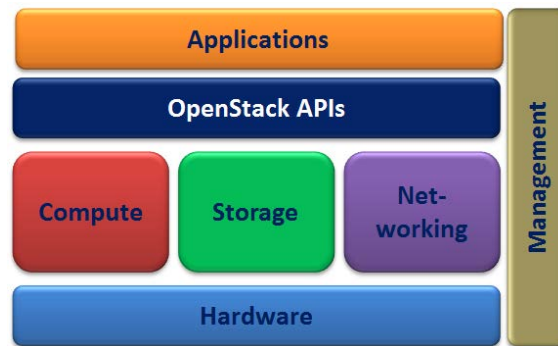
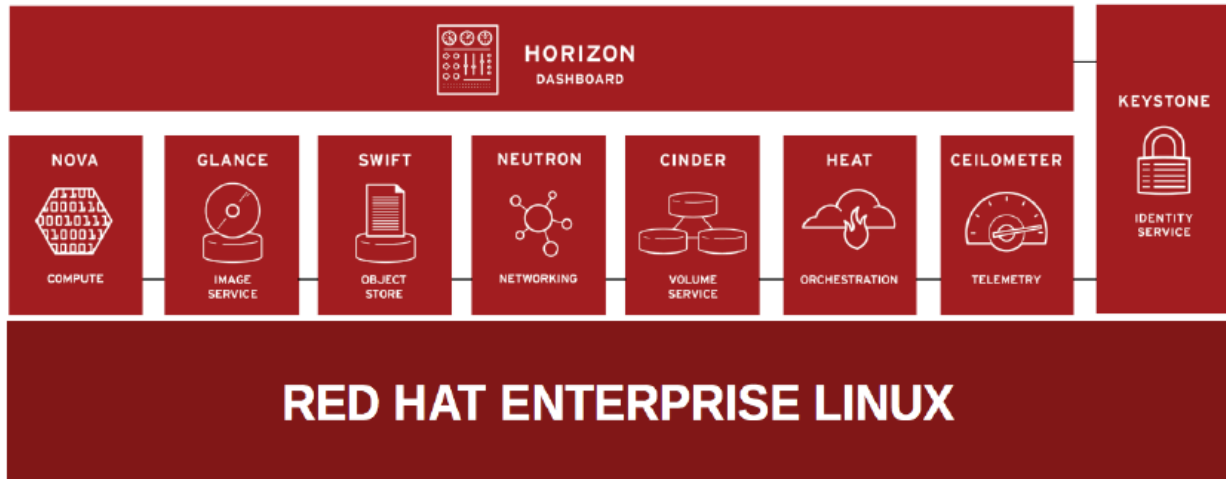


Figure 2. OpenStack Components

Red Hat defines its Enterprise Linux OpenStack Platform as something that “...delivers an integrated foundation to create, deploy, and scale a secure and reliable public or private OpenStack cloud,” and comprises the elements from OpenStack (Figure 3). The company goes on to say its platform “enables enterprises to build private clouds that provide AWS-type services on their own/hosted infrastructures.”



Source: [Red Hat](#)

Figure 3. Red Hat Enterprise Linux OpenStack Platform

Why was OpenStack created?

Its original intention was to aid organizations in building cloud solutions on standard, COTS hardware. Critics would argue it was a knee-jerk reaction to Amazon’s dominance in IaaS. Remember, Amazon launched AWS in 2006. The company does not disclose AWS revenue in its financial statements and dumps it in the “Other” category, which “includes sales from non-retail activities, such as AWS sales, which are included in the North America segment, and advertising services and our co-branded credit card agreements, which are included in both segments,” according to Amazon. This segment accounted for over \$3.7 billion in FY2013. So, although any AWS revenue reported by analysts and media is pure guestimate, we suspect it’s still substantial.

What are some of the hypes, myths, realities, and barriers to adoption of OpenStack?

Hype: OpenStack is stable and ready for the enterprise.

Yes and No. The response at the OpenStack event was, “OpenStack has to mature before enterprises can embrace it. But it won’t mature unless enterprises adopt it.” So, it is chicken-or-the-egg problem. Having said that, OpenStack has been embraced by eBay, PayPal, Comcast Xfinity, and reportedly over 165 sites in production environments as of November 2013.¹

¹ "[State of the Stack v2](#)," Randy Bias, OpenStack Summit, Hong Kong, November 7, 2013.

Myth: OpenStack is going to UNIX-ify

Although developed by AT&T Bell Labs., UNIX at one time had over 150 versions floating around, down to about 20 that really mattered in the 1990s, and less than 10 that made it to the enterprise—HP-UX, IBM AIX, and Sun Solaris among the prominent ones. Then came along Linux. Albeit started by a '[benevolent dictator](#)' back in 1991, Linux attracted thousands of contributors from around the world. Linux didn't grow out of a green field; its seeds were sown by Bell Labs and its growth was nurtured by thousands of customers worldwide. The initial reaction to Linux by the incumbents mirrored [Elizabeth Kübler-Ross's Five Stages of Grief](#)—Denial, Anger, Bargaining, Depression, and Acceptance. Once Linux started gaining acceptance, even IBM 'donated' over \$1 billion worth of efforts on Linux and open-source software. Today, some of the world's largest mega datacenters—Amazon, Google, Facebook, twitter—run on Linux.

OpenStack, on the other hand, is led by vendors and governed by the OpenStack Foundation. The open-source model it embraced has been accepted by the industry. That's the good news, but will they accept an open-source *cloud model*? The bad news could be, with over 200 vendors supporting OpenStack, will they add proprietary extensions to differentiate themselves from the rest of the crowd? We hope not, thus avoiding customization, fragmentation, and splintering and, in the long run, we expect a handful of resourceful vendors with deep pockets to become the dominant players.

Reality: Is OpenStack ready for the enterprise?

Even with a limited number of enterprise deployments, OpenStack has been found to be fairly stable. Its major challenges are:

- Can it get mass commercial adoption? This requires ease of installation, managing, tuning, upgrading, training...
- Compared to Linux which, at the end of the day, was just an operating environment, can enterprises deploy and manage a massive undertaking with all the underpinnings (see Figure 3) to make it really useful?

Barriers: Inertia and Legacy

- Unless they see a compelling reason, enterprises don't easily get off of their legacy software environments which often last 10 to 15 years.
- As with any cloud deployment, most organizations don't know where to start and what to start with—public, private, or hybrid cloud?
- Another challenge is integration and interoperability with existing applications.
- Once they deploy one vendor's OpenStack, can they easily switch partially or entirely to another OpenStack vendor or a different cloud (AWS, Microsoft Azure, or Google Compute Engine), if they choose to do so? What about the associated issues with interoperability and portability?
- How does OpenStack address 'shadow IT'-related concerns?

How does OpenStack compare with CloudStack, Eucalyptus, and OpenNebula?

That is a topic for another report we intend to publish in the near future.

Conclusions

Enterprises will reap benefits from OpenStack implementations if they realize its scope and limitations. OpenStack is a cloud *infrastructure* platform and neither a *management* nor an *application* platform. As with any other cloud, it is not ideal for all workloads; it is suitable for *cloud* workloads requiring *application* resiliency, and is not ideal for *traditional* workloads demanding *infrastructure* resiliency. OpenStack will succeed in the long run if there is no fragmentation and if its goal is to mature and grow and not to kill AWS. The cloud pie is big enough for all to share.