



Benefitting from OpenStack Momentum

By Syed Raza

OpenStack is a four-year-old open source infrastructure-as-a-service (IaaS) project that has grown into one of the largest collaborative development platforms globally. It is beginning to underpin a variety of public IaaS clouds and target an increasing number of market segments. OpenStack is attractive to enterprises and service providers as it provides flexibility, cost savings, avoids vendor lock-in and enables community-driven innovation. However, it is perceived to be complex, fragmented, and lacking key capabilities, which has hindered acceptance. This paper describes the main issues surrounding OpenStack, explores the benefits and opportunities for service providers, and discusses approaches to offer competitive, differentiated services against conflicting ecosystems such as Amazon AWS, Google and Microsoft.

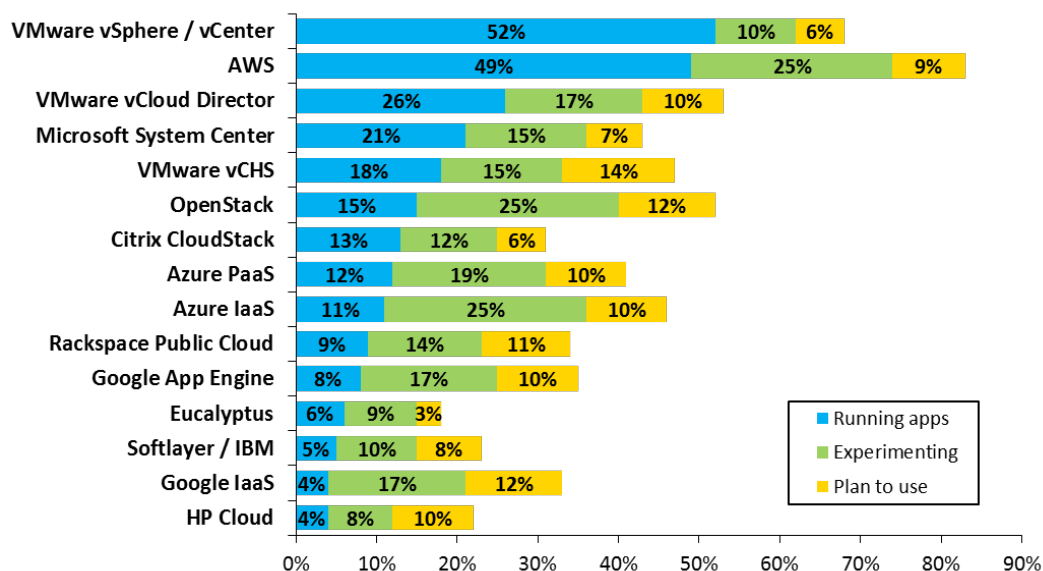
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OpenStack: Background and Context

The open-source OpenStack project consists of a number of related, modular, autonomous projects that enable users to create and manage service-oriented delivery models such as public and private cloud operations. Originally perceived to be architected for service provider-powered public clouds and mega-scale web properties, OpenStack is now increasingly being evaluated for enterprise private and hybrid cloud deployments. OpenStack commercial distributions are available today from a variety of vendors with differentiated business models and capabilities, targeting service providers, enterprises, public sector and SMBs. Given the growth of cloud computing, and the momentum OpenStack has generated in the past four years, the question is no longer whether or not OpenStack will succeed, but how, through which vendors, to what extent, and in which market segment(s)¹.

Today, the OpenStack community includes over 16,500 members from 139 countries². This makes it the best resourced cloud management platform, with backers including IBM, HP, Rackspace, AT&T, Red Hat, Ubuntu, Cisco, etc. Although VMware dominates enterprise virtualization and private cloud, OpenStack has raced to become a top contender for enterprise cloud usage (Figure 1).

Figure 1: Public and Private Cloud Usage – Enterprises (1,000+ Employees)



Source: RightScale 2014 State of the Cloud report, based on their third annual State of the Cloud Survey of 1,068 participants.

¹ "OpenStack: Between Expansion and Focus", Ovum, May 2014

² "OpenStack Foundation: A Competent Start" Ovum, May 2014

OpenStack currently offers thirteen infrastructure components, including compute, networking, object and block storage, identity and queue service. These modules are compatible with most forms of Linux and the majority of third-party hypervisors and hardware.

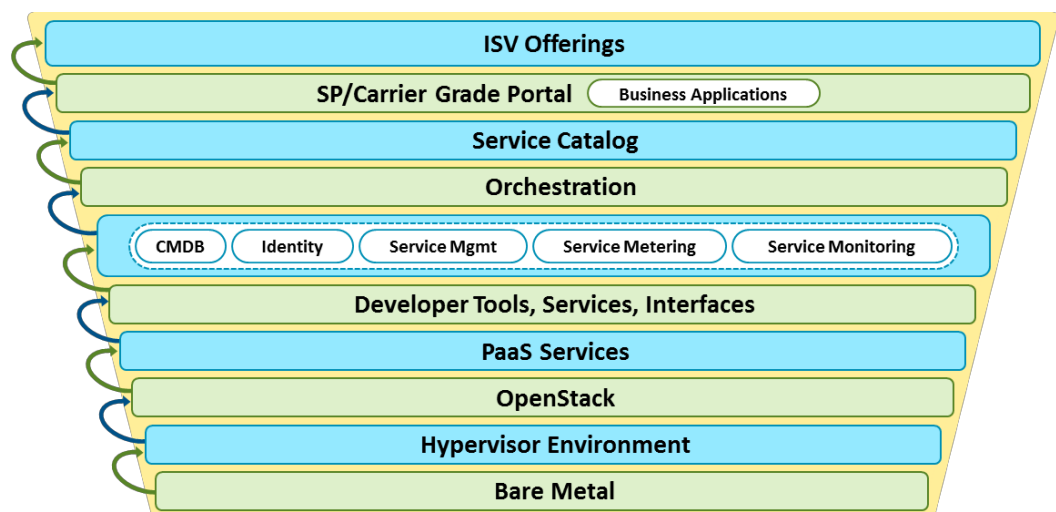
The velocity of updates and contributions, as well as the significant support and resources from established vendors, ensure the continued success of the platform. For example, the ninth release, Icehouse (April 2014), implemented more than 350 features from 1,202 individuals employed by 120 organizations³.

Emerging Business Models

There are several emerging OpenStack-related business models, including: developing products/distributions, providing support, providing services, offering managed services and cloud management. Revenue for these OpenStack business models is expected to exceed \$3.3 billion in 2018⁴, representing a CAGR of 40%. Service providers with public and private IaaS clouds enabled by OpenStack are expected to represent more than 70% of that revenue total.

The OpenStack IaaS platform is part of a large, modular and complex cloud delivery model, providing opportunities for vendors to differentiate themselves based on different service mixes.

Figure 2: OpenStack in the Cloud Delivery model. Note that each layer presents opportunities for cloud providers to develop differentiated business models



³ OpenStack Foundation

⁴ 451 Research Market Monitor Service

OpenStack project evolution leaves a lot of gaps for solution providers to fill and offers many third-party opportunities. For example:

- Since OpenStack lacks certain enterprise-grade functionalities, vendors can provide commercial cloud management platforms and capabilities to augment the functionality,
- Vendors can offer enterprise-grade support beyond the lifecycle of OpenStack releases⁵,
- OpenStack's complexity benefits vendors as they can sell professional services to organizations seeking to deploy it,
- OpenStack helps intermediaries, such as providers of middleware, connect OpenStack with the application programming interfaces (APIs) from public clouds,
- Vendors can offer solutions that simplify the deployment, management and scaling of OpenStack components. For example, SwiftStack offers a software-defined storage product based on the OpenStack Object Storage project (code named Swift).
- SIs can offer end-to-end solutions to complement OpenStack cloud design and implementation services,
- ISVs have the opportunity to re-architect their applications for the cloud and offer unique monetization models to drive faster and broader uptake,
- OpenStack enables federation, or 'cloud-of-clouds' business models such as federation and brokerage, with vendors such as Cisco (with Intercloud) and HP (with Helion Network) racing to provide global networks of service providers on their platform,
- Providers of integrated OpenStack systems can bundle hardware, management software, and associated services,
- Additional areas include integration services for billing, payment gateways, identity management, fraud management, DNS, log analysis, etc.

Service Provider OpenStack Adoption: Key Considerations

Service providers are first-generation OpenStack customers. With the shift to cloud delivery models and the emergence of cloud-native, elastic applications, enterprises require low-latency, resilient and fault-tolerant network and application infrastructure to support critical workloads. Service providers are positioned to provide differentiated value to enterprises by combining their network infrastructure and platform strengths with OpenStack capabilities – thereby potentially challenging more established cloud player such as Amazon Web Services, Azure, Google, etc.

⁵ Alessandro Perilli, Gartner (2013)

Service Provider Key Benefits

Lower Cost	<ul style="list-style-type: none"> • Reduce R&D costs via access to an open source cloud services portfolio (OpenStack ecosystem) • Reduce delivery costs by opting for open source software and supported industry-standard components instead of traditional OEM hardware • Reduce reliance on other vendors' products and the need to pay licensing fees, thereby also reducing dependency on third-party components
Provide Business Continuity	<ul style="list-style-type: none"> • Enable customer choice by creating future-proofed clouds, without needing to re-architect legacy workloads to coexist with cloud-native applications • Integrate existing communications networks with IT networks to drive high utilization and efficiencies as well as cost savings • Provide certified, legacy applications but also offer support for specific, new enterprise use cases such as big data technologies (Hadoop and Cassandra)
Faster Time to Market	<ul style="list-style-type: none"> • Enable a software delivery model with feature velocity and continuous innovation • Enable a diverse and vital ecosystem via add-on components and plug-ins by utilizing OpenStack modularity • Use the power of OpenStack enabled 'DevOps' to combine software and IT operations efforts in order to ensure a continuous delivery cycle
Flexibility and Agility	<ul style="list-style-type: none"> • Benefit from taking an open standards based approach: avoiding vendor lock-in and leveraging rapid community-based continuous innovation • Take advantage of OpenStack 'pluggability' model to get leverage between suppliers and work with a broader set of vendors • Achieve integration with Software Defined Networking and Network Virtualization initiatives
Market Differentiation	<ul style="list-style-type: none"> • Differentiate on more than the hosting/platform by servicing non-functional requirements like data and security compliance, SLA/QoS guarantees, financial and operational compliance • Help organizations rationalize, reduce and integrate the number of virtualization technologies in use • Offer flexibility in cloud management and consumption models to enterprises

Source: Mirantis, Ericsson, Ovum, Gartner, AT&T, IDC, IDG

Service Provider OpenStack Use Cases

All sorts of companies, including cloud service providers, independent software vendors, telecoms service providers, research institutions and government agencies, are taking advantage of OpenStack. Telcos such as AT&T, Verizon and Huawei are just a few of the many that have made significant capital and engineering outlays for OpenStack programs. In this section, we highlight specific use cases that demonstrate how OpenStack may eventually become a solid open-source core at the heart of significant transformation in service provider platforms for delivering customer products and services.

1. Ericsson announced plans to deploy OpenStack in the Ericsson cloud software platform used for the telecommunications networks, internal datacenters, and cloud computing services and IT operation of mobile operators and service providers.

2. AT&T: Despite its history as originator of C and UNIX platforms, open source use was until very recently forbidden at AT&T. However, AT&T is today using OpenStack as one of the key drivers of innovation within the company and is an active participant in the OpenStack community sharing insights and experience. AT&T has over 120 deployed OpenStack projects today including Dual Persona, mHealth and Address Book backends, with plans to develop big data and NFV solutions in order to take content distribution closer to the user⁶.
3. Huawei launched FusionCloud, a carrier focused cloud with a variety of components including FusionSphere, an operating system for running cloud deployments, as well as FusionCube, a converged infrastructure component that incorporates compute, storage and networking.

OpenStack: Outlook

A well-architected cloud provides a stable IT environment that offers easy access to needed resources, usage-based expenses, extra capacity on demand, disaster recovery, and a secure environment⁷. OpenStack has broad vendor and developer participation, many viable options for enterprise-grade support, and is available free for experimentation/pilots. These attributes make it attractive to enterprises and service providers embarking on cloud journeys.

As a result, it has quickly become one of the four most important cloud computing infrastructure ecosystems along with Amazon Web Services, VMware and Microsoft. It resolves the problems of both enterprises and service providers. Service providers can take advantage of the open source, industry standard OpenStack software to deploy a cloud in weeks rather than months or years. Enterprises can adopt OpenStack-based clouds that will lower costs and provide flexibility without sacrificing performance.

However, OpenStack remains a highly complex technology project and ecosystem. The software is still very complicated, is difficult to deploy and manage, and suffers from talent shortage. Significant challenges such as lack of key capabilities, undue vendor influence and fragmentation, difficulty with workload interoperability and portability, etc. still remain.

Many expect the OpenStack market to consolidate around a handful of offerings in the same way that Linux did. Some distributions will successfully focus on niche segments instead of going for mainstream adoption.

OpenStack constitutes a disruptive force within the cloud marketplace. However, it is a platform that will coexist with traditional virtualization and cloud platforms. It addresses many of the problems service providers have in providing market-leading, enterprise-grade cloud services with attractive economics, and can be a compelling resource for them to capture market share.

⁶ OpenStack Summit, Atlanta, May 2014

⁷ OpenStack Architecture Design Guide, 2014



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